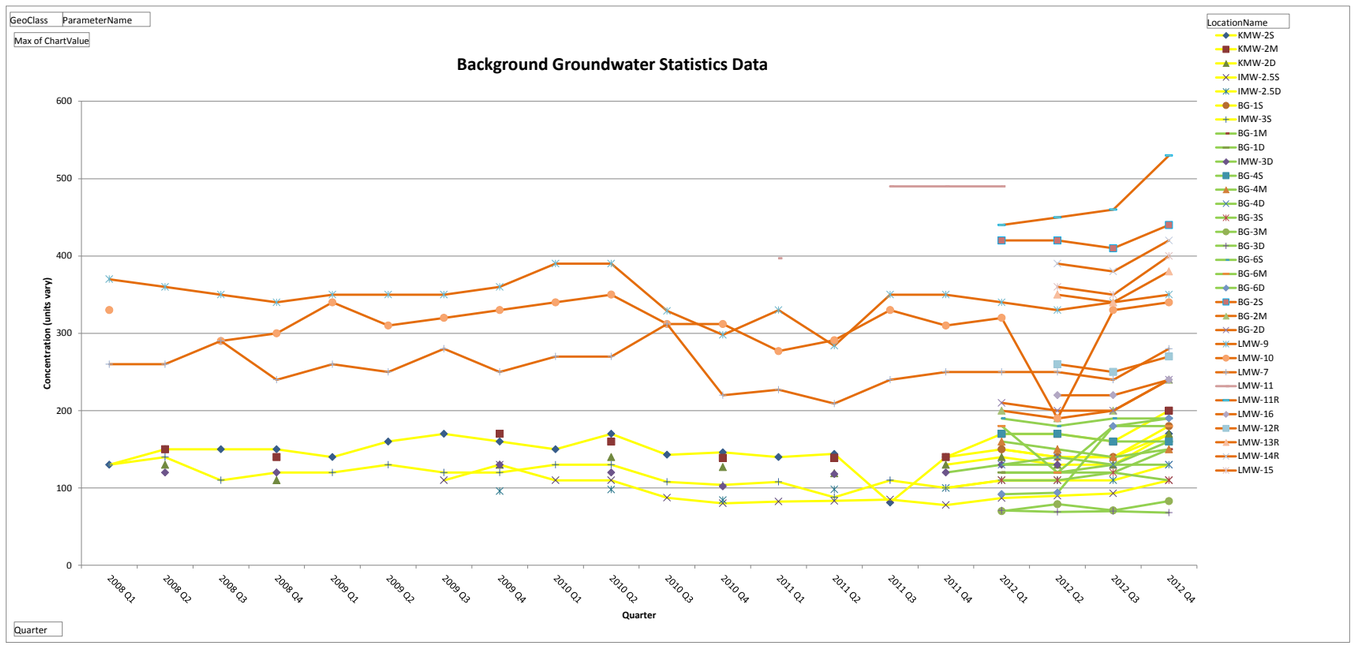
Files on CD

GeoClass	(All)
ParameterName	Calcium, Dissolved

Max of ChartValue	Column Labels																																
Row Labels	**KMW-2S**	**KMW-2M**	**KMW-2D**	**IMW-2.5S**	**IMW-2.5D**	**BG-1S**	**IMW-3S**	**BG-1M**	**BG-1D**	**IMW-3D**	**BG-4S**	**BG-4M**	**BG-4D**	**BG-3S**	**BG-3M**	**BG-3D**	**BG-6S**	**BG-6M**	**BG-6D**	**BG-2S**	**BG-2M**	**BG-2D**	**LMW-9**	**LMW-10**	**LMW-7**	**LMW-11**	**LMW-11R**	**LMW-16**	**LMW-12R**	**LMW-13R**	**LMW-14R**	**LMW-15**
2008 Q1	130						130																370	330	260								
2008 Q2	150	150	130				140				120												360		260								
2008 Q3	150						110																350	290	290								
2008 Q4	150	140	110				120				120												340	300	240								
2009 Q1	140						120																350	340	260								
2009 Q2	160						130																350	310	250								
2009 Q3	170			110			120																350	320	280								
2009 Q4	160	170	130	130	96		120				130												360	330	250								
2010 Q1	150			110			130																390	340	270								
2010 Q2	170	160	140	110	98		130				120												390	350	270								
2010 Q3	143			87.4			108																329	312	312								
2010 Q4	146	139	127	80.2	84.3		104				102												298	312	220								
2011 Q1	140			82.4			108																330	277	227	397							
2011 Q2	144	139	119	83.3	98.1		88.1				118												284	291	209								
2011 Q3	81			85			110																350	330	240	490							
2011 Q4	140	140	130	78	100		100				120												350	310	250	490							
2012 Q1	150	170	140	87	110	150	110	120	120	130	170	160	130	110	70	71	190	180	92	420	200	210	340	320	250	490	440						
2012 Q2	140	170	130	90	110	140	110	120	120	130	170	150	140	110	79	69	180	120	94	420	190	200	330	190	250		450	220	260	350	390	360	
2012 Q3	140	160	130	93	110	140		120	130		160	140	130	120	71	70	190	180	180	410	200	200	340	330	240		460	220	250	340	380	350	
2012 Q4	170	200	170	110	130	180		150	160		160	150	130	110	83	68	190	180	190	440	240	240	350	340	280		530	240	270	380	420	400	



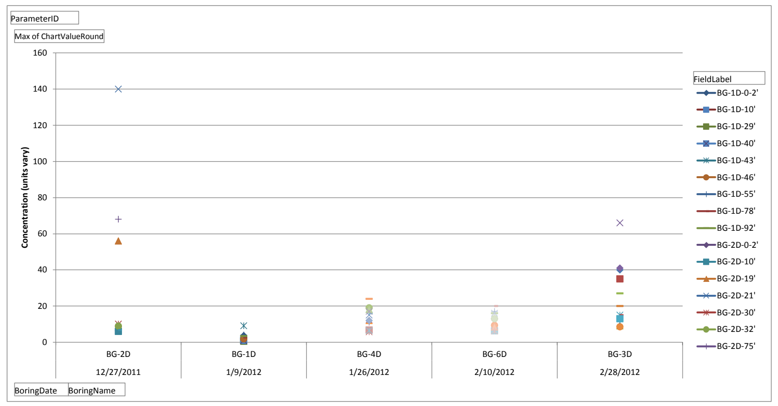
ParameterID	Arsenic

Max of ChartValueRound	Column Labels																
Row Labels	BG-1D-0-2'	BG-1D-10'	BG-1D-29'	BG-1D-40'	BG-1D-43'	BG-1D-46'	BG-1D-55'	BG-1D-78'	BG-1D-92'	BG-2D-0-2'	BG-2D-10'	BG-2D-19'	BG-2D-21'	BG-2D-30'	BG-2D-32'	BG-2D-75'	BG-2D-81'
12/27/2011										**6.5**	**6**	**56**	**140**	**10**	**8.9**	**68**	**6.7**
BG-2D										6.5	6	56	140	10	8.9	68	6.7
1/9/2012	**3.6**	**1**	**0.5**	**0.97**	**9.1**	**1.8**	**4**	**2.6**	**3.4**								
BG-1D	3.6	1	0.5	0.97	9.1	1.8	4	2.6	3.4								
1/26/2012																	
BG-4D																	
2/10/2012																	
BG-6D																	
2/28/2012																	
BG-3D																	
Grand Total	**3.6**	**1**	**0.5**	**0.97**	**9.1**	**1.8**	**4**	**2.6**	**3.4**	**6.5**	**6**	**56**	**140**	**10**	**8.9**	**68**	**6.7**

Row Labels	BG-3D-0-2'	BG-3D-10'	BG-3D-105'	BG-3D-131'	BG-3D-136'	BG-3D-17'	BG-3D-22'	BG-3D-29'	BG-3D-63'	BG-3D-65'	BG-3D-69'	BG-3D-95'
12/27/2011												
BG-2D												
1/9/2012												
BG-1D												
1/26/2012												
BG-4D												
2/10/2012												
BG-6D												
2/28/2012	**20**	**40**	**35**	**9.1**	**66**	**15**	**8.5**	**12**	**15**	**27**	**41**	**13**
BG-3D	20	40	35	9.1	66	15	8.5	12	15	27	41	13
Grand Total	**20**	**40**	**35**	**9.1**	**66**	**15**	**8.5**	**12**	**15**	**27**	**41**	**13**

Row Labels	BG-4D-0-2'	BG-4D-10'	BG-4D-117'	BG-4D-120'	BG-4D-161'	BG-4D-163'	BG-4D-19'	BG-4D-40'	BG-4D-65'	BG-4D-79'	BG-4D-82'	BG-4D-95'
12/27/2011												
BG-2D												
1/9/2012												
BG-1D												
1/26/2012	**12**	**15**	**5.7**	**19**	**11**	**16**	**24**	**12**	**6.7**	**18**	**17**	**6.4**
BG-4D	12	15	5.7	19	11	16	24	12	6.7	18	17	6.4
2/10/2012												
BG-6D												
2/28/2012												
BG-3D												
Grand Total	**12**	**15**	**5.7**	**19**	**11**	**16**	**24**	**12**	**6.7**	**18**	**17**	**6.4**

Row Labels	BG-6D-0-2'	BG-6D-114'	BG-6D-127'	BG-6D-28'	BG-6D-53'	BG-6D-58'	BG-6D-75'	BG-6D-87'	BG-6D-9'	BG-6D-98'	Grand Total
12/27/2011											**140**
BG-2D											140
1/9/2012											**9.1**
BG-1D											9.1
1/26/2012											**24**
BG-4D											24
2/10/2012	**9.3**	**17**	**20**	**16**	**13**	**6.3**	**8.4**	**16**	**6.1**	**13**	**20**
BG-6D	9.3	17	20	16	13	6.3	8.4	16	6.1	13	20
2/28/2012											**66**
BG-3D											66
Grand Total	**9.3**	**17**	**20**	**16**	**13**	**6.3**	**8.4**	**16**	**6.1**	**13**	**140**



Grouping	LocationName	FieldLabel	Quarter	ParameterName	Location	Synonyms	Source	SampleDate	Sample	Value	Unit of Measurement	NonDetect	Detecti	LabQual	Validati	MeasurementComment	GeoClass	WaterZone	Well_Depth_Constru	AnalyticalMetho	DecimalPlaces	SDG	SamplingEven	ChartValue
Background	BG-1D	BG-1D	2012 Q1	Barium, Dissolved	Well		Lab	3/20/2012		0.021	mg/L	FALSE	0.005				Muddy Creek North	Deep	105	6010B	3	L565977	12	0.021
Background	BG-1D	BG-1D	2012 Q2	Barium, Dissolved	Well		Lab	5/24/2012	Sample	0.018	mg/L	FALSE	0.005				Muddy Creek North	Deep	105	6010B	3	L577071	13	0.018
Background	BG-1D	BG-1D	2012 Q3	Barium, Dissolved	Well		Lab	8/23/2012		0.02	mg/L	FALSE	0.005				Muddy Creek North	Deep	105	6010B	3	L591646	22	0.02
Background	BG-1D	BG-1D	2012 Q4	Barium, Dissolved	Well		Lab	11/26/2012		0.019	mg/L	FALSE	0.005				Muddy Creek North	Deep	105	6010B	3	V12K063	26	0.019
Background	BG-1M	BG-1M	2012 Q1	Barium, Dissolved	Well		Lab	3/20/2012		0.029	mg/L	FALSE	0.005				Muddy Creek North	Medium	72	6010B	3	L565977	12	0.029
Background	BG-1M	BG-1M	2012 Q2	Barium, Dissolved	Well		Lab	5/24/2012	Sample	0.028	mg/L	FALSE	0.005				Muddy Creek North	Medium	72	6010B	3	L577071	13	0.028
Background	BG-1M	BG-1M	2012 Q3	Barium, Dissolved	Well		Lab	8/23/2012		0.03	mg/L	FALSE	0.005				Muddy Creek North	Medium	72	6010B	3	L591646	22	0.03
Background	BG-1M	BG-1M	2012 Q4	Barium, Dissolved	Well		Lab	11/26/2012		0.029	mg/L	FALSE	0.005				Muddy Creek North	Medium	72	6010B	3	V12K063	26	0.029
Background	BG-1S	BG-1S	2012 Q1	Barium, Dissolved	Well		Lab	3/20/2012		0.025	mg/L	FALSE	0.005				Alluvial	Shallow	43	6010B	3	L565977	12	0.025
Background	BG-1S	BG-1S	2012 Q2	Barium, Dissolved	Well		Lab	5/24/2012	Sample	0.022	mg/L	FALSE	0.005				Alluvial	Shallow	43	6010B	3	L577071	13	0.022
Background	BG-1S	BG-1S	2012 Q3	Barium, Dissolved	Well		Lab	8/23/2012		0.021	mg/L	FALSE	0.005				Alluvial	Shallow	43	6010B	3	L591646	22	0.021
Background	BG-1S	BG-1S	2012 Q4	Barium, Dissolved	Well		Lab	11/26/2012		0.026	mg/L	FALSE	0.005				Alluvial	Shallow	43	6010B	3	V12K063	26	0.026
Background	BG-2D	BG-2D	2012 Q1	Barium, Dissolved	Well		Lab	3/21/2012		0.014	mg/L	FALSE	0.005				Muddy Creek Mesa	Deep	98	6010B	3	L566193	12	0.014
Background	BG-2D	BG-2D	2012 Q2	Barium, Dissolved	Well		Lab	5/24/2012	Sample	0.015	mg/L	FALSE	0.005				Muddy Creek Mesa	Deep	98	6010B	3	L577071	13	0.015
Background	BG-2D	BG-2D	2012 Q3	Barium, Dissolved	Well		Lab	8/23/2012		0.015	mg/L	FALSE	0.005				Muddy Creek Mesa	Deep	98	6010B	3	L591646	22	0.015
Background	BG-2D	BG-2D	2012 Q4	Barium, Dissolved	Well		Lab	11/26/2012		0.014	mg/L	FALSE	0.005				Muddy Creek Mesa	Deep	98	6010B	3	V12K063	26	0.014
Background	BG-2M	BG-2M	2012 Q1	Barium, Dissolved	Well		Lab	3/21/2012		0.022	mg/L	FALSE	0.005				Muddy Creek Mesa	Medium	65	6010B	3	L566193	12	0.022
Background	BG-2M	BG-2M	2012 Q2	Barium, Dissolved	Well		Lab	5/24/2012	Sample	0.024	mg/L	FALSE	0.005				Muddy Creek Mesa	Medium	65	6010B	3	L577071	13	0.024
Background	BG-2M	BG-2M	2012 Q3	Barium, Dissolved	Well		Lab	8/23/2012		0.016	mg/L	FALSE	0.005				Muddy Creek Mesa	Medium	65	6010B	3	L591646	22	0.016
Background	BG-2M	BG-2M	2012 Q4	Barium, Dissolved	Well		Lab	11/26/2012		0.018	mg/L	FALSE	0.005				Muddy Creek Mesa	Medium	65	6010B	3	V12K063	26	0.018
Background	BG-2S	BG-2S	2012 Q1	Barium, Dissolved	Well		Lab	3/21/2012		0.028	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	40	6010B	3	L566422	12	0.028
Background	BG-2S	BG-2S	2012 Q2	Barium, Dissolved	Well		Lab	5/24/2012	Sample	0.038	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	40	6010B	3	L577071	13	0.038
Background	BG-2S	BG-2S	2012 Q3	Barium, Dissolved	Well		Lab	8/23/2012		0.036	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	40	6010B	3	L591646	22	0.036
Background	BG-2S	BG-2S	2012 Q4	Barium, Dissolved	Well		Lab	11/26/2012		0.046	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	40	6010B	3	V12K063	26	0.046
Background	BG-3D	BG-3D	2012 Q1	Barium, Dissolved	Well		Lab	3/21/2012		0.066	mg/L	FALSE	0.005				Muddy Creek North	Deep	150	6010B	3	L566193	12	0.066
Background	BG-3D	BG-3D	2012 Q2	Barium, Dissolved	Well		Lab	5/23/2012	Sample	0.067	mg/L	FALSE	0.005				Muddy Creek North	Deep	150	6010B	3	L576832	13	0.067
Background	BG-3D	BG-3D	2012 Q3	Barium, Dissolved	Well		Lab	8/21/2012		0.026	mg/L	FALSE	0.005				Muddy Creek North	Deep	150	6010B	3	L591208	22	0.026
Background	BG-3D	BG-3D	2012 Q4	Barium, Dissolved	Well		Lab	11/27/2012	Initial S	0.023	mg/L	FALSE	0.005				Muddy Creek North	Deep	150	6010B	3	V12K071	26	0.023
Background	BG-3M	BG-3M	2012 Q1	Barium, Dissolved	Well		Lab	3/21/2012		0.038	mg/L	FALSE	0.005				Muddy Creek North	Medium	117	6010B	3	L566193	12	0.038
Background	BG-3M	BG-3M	2012 Q2	Barium, Dissolved	Well		Lab	5/24/2012	Sample	0.02	mg/L	FALSE	0.005				Muddy Creek North	Medium	117	6010B	3	L577071	13	0.02
Background	BG-3M	BG-3M	2012 Q3	Barium, Dissolved	Well		Lab	8/22/2012		0.036	mg/L	FALSE	0.005				Muddy Creek North	Medium	117	6010B	3	L591420	22	0.036
Background	BG-3M	BG-3M	2012 Q4	Barium, Dissolved	Well		Lab	11/27/2012		0.016	mg/L	FALSE	0.005				Muddy Creek North	Medium	117	6010B	3	V12K071	26	0.016
Background	BG-3S	BG-3S	2012 Q1	Barium, Dissolved	Well		Lab	3/21/2012		0.064	mg/L	FALSE	0.005				Muddy Creek North	Shallow	80	6010B	3	L566193	12	0.064
Background	BG-3S	BG-3S	2012 Q2	Barium, Dissolved	Well		Lab	5/23/2012	Sample	0.041	mg/L	FALSE	0.005				Muddy Creek North	Shallow	80	6010B	3	L576832	13	0.041
Background	BG-3S	BG-3S	2012 Q3	Barium, Dissolved	Well		Lab	8/22/2012	Sl. Silty	0.035	mg/L	FALSE	0.005				Muddy Creek North	Shallow	80	6010B	3	L591208	22	0.035
Background	BG-3S	BG-3S	2012 Q4	Barium, Dissolved	Well		Lab	11/27/2012	Initial S	0.036	mg/L	FALSE	0.005				Muddy Creek North	Shallow	80	6010B	3	V12K071	26	0.036
Background	BG-4D	BG-4D	2012 Q1	Barium, Dissolved	Well		Lab	3/20/2012		0.021	mg/L	FALSE	0.005				Muddy Creek North	Deep	172	6010B	3	L565977	12	0.021
Background	BG-4D	BG-4D	2012 Q2	Barium, Dissolved	Well		Lab	5/30/2012	Sample	0.018	mg/L	FALSE	0.005				Muddy Creek North	Deep	172	6010B	3	L577721	13	0.018
Background	BG-4D	BG-4D	2012 Q3	Barium, Dissolved	Well		Lab	8/30/2012		0.02	mg/L	FALSE	0.005				Muddy Creek North	Deep	172	6010B	3	L592755	22	0.02
Background	BG-4D	BG-4D	2012 Q4	Barium, Dissolved	Well		Lab	11/27/2012	Collect	0.017	mg/L	FALSE	0.005				Muddy Creek North	Deep	172	6010B	3	V12K071	26	0.017
Background	BG-4M	BG-4M	2012 Q1	Barium, Dissolved	Well		Lab	3/20/2012		0.025	mg/L	FALSE	0.005				Muddy Creek North	Medium	135	6010B	3	L565977	12	0.025
Background	BG-4M	BG-4M	2012 Q2	Barium, Dissolved	Well		Lab	5/30/2012	Sample	0.018	mg/L	FALSE	0.005				Muddy Creek North	Medium	135	6010B	3	L577721	13	0.018
Background	BG-4M	BG-4M	2012 Q3	Barium, Dissolved	Well		Lab	8/30/2012		0.019	mg/L	FALSE	0.005				Muddy Creek North	Medium	135	6010B	3	L592755	22	0.019
Background	BG-4M	BG-4M	2012 Q4	Barium, Dissolved	Well		Lab	11/27/2012		0.031	mg/L	FALSE	0.005				Muddy Creek North	Medium	135	6010B	3	V12K071	26	0.031
Background	BG-4S	BG-4S	2012 Q1	Barium, Dissolved	Well		Lab	3/20/2012		0.039	mg/L	FALSE	0.005				Muddy Creek North	Shallow	102	6010B	3	L565977	12	0.039
Background	BG-4S	BG-4S	2012 Q2	Barium, Dissolved	Well		Lab	5/30/2012	Sample	0.029	mg/L	FALSE	0.005				Muddy Creek North	Shallow	102	6010B	3	L577721	13	0.029
Background	BG-4S	BG-4S	2012 Q3	Barium, Dissolved	Well		Lab	8/30/2012		0.024	mg/L	FALSE	0.005				Muddy Creek North	Shallow	102	6010B	3	L592755	22	0.024
Background	BG-4S	BG-4S	2012 Q4	Barium, Dissolved	Well		Lab	11/27/2012		0.018	mg/L	FALSE	0.005				Muddy Creek North	Shallow	102	6010B	3	V12K071	26	0.018
Background	BG-6D	BG-6D	2012 Q1	Barium, Dissolved	Well		Lab	3/21/2012		0.037	mg/L	FALSE	0.005				Muddy Creek North	Deep	135	6010B	3	L566193	12	0.037
Background	BG-6D	BG-6D	2012 Q2	Barium, Dissolved	Well		Lab	5/25/2012	Sample	0.038	mg/L	FALSE	0.005				Muddy Creek North	Deep	135	6010B	3	L577355	13	0.038
Background	BG-6D	BG-6D	2012 Q3	Barium, Dissolved	Well		Lab	8/22/2012		0.014	mg/L	FALSE	0.005				Muddy Creek North	Deep	135	6010B	3	L591420	22	0.014
Background	BG-6D	BG-6D	2012 Q4	Barium, Dissolved	Well		Lab	11/27/2012		0.014	mg/L	FALSE	0.005				Muddy Creek North	Deep	135	6010B	3	V12K071	26	0.014
Background	BG-6M	BG-6M	2012 Q1	Barium, Dissolved	Well		Lab	3/21/2012		0.031	mg/L	FALSE	0.005				Muddy Creek North	Medium	104	6010B	3	L566193	12	0.031
Background	BG-6M	BG-6M	2012 Q2	Barium, Dissolved	Well		Lab	5/25/2012	Sample	0.033	mg/L	FALSE	0.005				Muddy Creek North	Medium	104	6010B	3	L577355	13	0.033
Background	BG-6M	BG-6M	2012 Q3	Barium, Dissolved	Well		Lab	8/22/2012	Clear to	0.024	mg/L	FALSE	0.005				Muddy Creek North	Medium	104	6010B	3	L591420	22	0.024
Background	BG-6M	BG-6M	2012 Q4	Barium, Dissolved	Well		Lab	11/27/2012		0.018	mg/L	FALSE	0.005				Muddy Creek North	Medium	104	6010B	3	V12K071	26	0.018
Background	BG-6S	BG-6S	2012 Q1	Barium, Dissolved	Well		Lab	3/21/2012		0.048	mg/L	FALSE	0.005				Muddy Creek North	Shallow	72	6010B	3	L566193	12	0.048
Background	BG-6S	BG-6S	2012 Q2	Barium, Dissolved	Well		Lab	5/25/2012	Sample	0.054	mg/L	FALSE	0.005				Muddy Creek North	Shallow	72	6010B	3	L577355	13	0.054
Background	BG-6S	BG-6S	2012 Q3	Barium, Dissolved	Well		Lab	8/23/2012		0.042	mg/L	FALSE	0.005				Muddy Creek North	Shallow	72	6010B	3	L591646	22	0.042
Background	BG-6S	BG-6S	2012 Q4	Barium, Dissolved	Well		Lab	11/27/2012		0.041	mg/L	FALSE	0.005				Muddy Creek North	Shallow	72	6010B	3	V12K071	26	0.041
Unit 4 Pond Wells	IMW-2.5D	IMW-2.5D-ESC	2012 Q1	Barium, Dissolved	Well		Lab	3/21/2012		0.015	mg/L	FALSE	0.005				Alluvial	Medium	72	6010B	3	L566193	12	0.015
Unit 4 Pond Wells	IMW-2.5D	IMW-2.5D	2012 Q2	Barium, Dissolved	Well		Lab	5/21/2012	Sampl ed	0.019	mg/L	FALSE	0.005				Alluvial	Medium	72	6010B	3	L576403	13	0.019
Unit 4 Pond Wells	IMW-2.5D	IMW-2.5D-ESC	2012 Q3	Barium, Dissolved	Well		Lab	8/24/2012		0.015	mg/L	FALSE	0.005				Alluvial	Medium	72	6010B	3	L591995	23	0.015
Unit 4 Pond Wells	IMW-2.5D	IMW-2.5D	2012 Q4	Barium, Dissolved	Well		Lab	11/26/2012		0.018	mg/L	FALSE	0.005				Alluvial	Medium	72	6010B	3	V12K066	26	0.018
Unit 4 Pond Wells	IMW-2.5S	IMW-2.5S-ESC	2012 Q1	Barium, Dissolved	Well		Lab	3/21/2012		0.025	mg/L	FALSE	0.005				Alluvial	Shallow	20	6010B	3	L566193	12	0.025
Unit 4 Pond Wells	IMW-2.5S	IMW-2.5S	2012 Q2	Barium, Dissolved	Well		Lab	5/21/2012	Sampl ed	0.025	mg/L	FALSE	0.005				Alluvial	Shallow	20	6010B	3	L576403	13	0.025
Unit 4 Pond Wells	IMW-2.5S	IMW-2.5S-ESC	2012 Q3	Barium, Dissolved	Well		Lab	8/24/2012		0.025	mg/L	FALSE	0.005				Alluvial	Shallow	20	6010B	3	L591995	23	0.025
Unit 4 Pond Wells	IMW-2.5S	IMW-2.5S	2012 Q4	Barium, Dissolved	Well		Lab	11/26/2012		0.029	mg/L	FALSE	0.005				Alluvial	Shallow	20	6010B	3	V12K066	26	0.029
Unit 4 Pond Wells	IMW-3D	IMW-3D-ESC	2012 Q1	Barium, Dissolved	Well		Lab	3/22/2012		0.013	mg/L	FALSE	0.005				Muddy Creek North	Deep	100	6010B	3	L566422	12	0.013
Unit 4 Pond Wells	IMW-3D	IMW-3D	2012 Q2	Barium, Dissolved	Well		Lab	5/25/2012	Sampl ed	0.017	mg/L	FALSE	0.005				Muddy Creek North	Deep	100	6010B	3	L577355	13	0.017

Unit 4 Pond Wells	IMW-3S	IMW-3S-ESC	2012 Q1	Barium, Dissolved	Well		Lab	3/20/2012		0.017	mg/L	FALSE	0.005				Alluvial	Shallow	25	6010B	3	L565977	12	0.017
Unit 4 Pond Wells	IMW-3S	IMW-3S	2012 Q2	Barium, Dissolved	Well		Lab	5/21/2012	Sampl ed	0.018	mg/L	FALSE	0.005				Alluvial	Shallow	25	6010B	3	L576403	13	0.018
Unit 4 Pond Wells	KMW-2D	KMW-2D-ESC	2012 Q1	Barium, Dissolved	Well		Lab	3/23/2012		0.017	mg/L	FALSE	0.005				Alluvial	Deep	74	6010B	3	L567168,L5667 03	12	0.017
Unit 4 Pond Wells	KMW-2D	KMW-2D	2012 Q2	Barium, Dissolved	Well		Lab	5/21/2012	Sampl ed	0.018	mg/L	FALSE	0.005				Alluvial	Deep	74	6010B	3	L576403	13	0.018
Unit 4 Pond Wells	KMW-2D	KMW-2D-ESC	2012 Q3	Barium, Dissolved	Well		Lab	8/24/2012		0.016	mg/L	FALSE	0.005				Alluvial	Deep	74	6010B	3	L591995	23	0.016
Unit 4 Pond Wells	KMW-2D	KMW-2D	2012 Q4	Barium, Dissolved	Well		Lab	11/26/2012		0.021	mg/L	FALSE	0.005				Alluvial	Deep	74	6010B	3	V12K066	26	0.021
Unit 4 Pond Wells	KMW-2M	KMW-2M-ESC	2012 Q1	Barium, Dissolved	Well		Lab	3/23/2012		0.019	mg/L	FALSE	0.005				Alluvial	Medium	50	6010B	3	L567168,L5667 03	12	0.019
Unit 4 Pond Wells	KMW-2M	KMW-2M	2012 Q2	Barium, Dissolved	Well		Lab	5/21/2012	Sampl ed	0.019	mg/L	FALSE	0.005				Alluvial	Medium	50	6010B	3	L576403	13	0.019
Unit 4 Pond Wells	KMW-2M	KMW-2M-ESC	2012 Q3	Barium, Dissolved	Well		Lab	8/24/2012		0.018	mg/L	FALSE	0.005				Alluvial	Medium	50	6010B	3	L591995	22	0.018
Unit 4 Pond Wells	KMW-2M	KMW-2M	2012 Q4	Barium, Dissolved	Well		Lab	11/26/2012		0.022	mg/L	FALSE	0.005				Alluvial	Medium	50	6010B	3	V12K066	26	0.022
Unit 4 Pond Wells	KMW-2S	KMW-2S-ESC	2012 Q1	Barium, Dissolved	Well		Lab	3/23/2012		0.017	mg/L	FALSE	0.005				Alluvial	Shallow	25	6010B	3	L567168,L5667 03	12	0.017
Unit 4 Pond Wells	KMW-2S	KMW-2S	2012 Q2	Barium, Dissolved	Well		Lab	5/21/2012	Sampl ed	0.019	mg/L	FALSE	0.005				Alluvial	Shallow	25	6010B	3	L576403	13	0.019
Unit 4 Pond Wells	KMW-2S	KMW-2S-ESC	2012 Q3	Barium, Dissolved	Well		Lab	8/24/2012		0.017	mg/L	FALSE	0.005				Alluvial	Shallow	25	6010B	3	L591995	23	0.017
Unit 4 Pond Wells	KMW-2S	KMW-2S	2012 Q4	Barium, Dissolved	Well		Lab	11/26/2012	Silty - tan	0.028	mg/L	FALSE	0.005				Alluvial	Shallow	25	6010B	3	V12K066	26	0.028
Mesa Landfill Wells	LMW-10	LMW-10-ESC	2012 Q1	Barium, Dissolved	Well		Lab	3/22/2012		0.012	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	154	6010B	3	L566422	12	0.012
Mesa Landfill Wells	LMW-10	LMW-10-ESC	2012 Q3	Barium, Dissolved	Well		Lab	8/27/2012	Very Si	0.015	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	154	6010B	3	L592097	23	0.015
Mesa Landfill Wells	LMW-10	LMW-10-ESC	2012 Q4	Barium, Dissolved	Well		Lab	11/28/2012	Sample	0.011	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	154	6010B	3	V12K075	27	0.011
Mesa Landfill Wells	LMW-10	LMW-10	2011 Q4	Barium, Dissolved	Well		Lab	12/6/2011	sl. Silty	0.005	mg/L	FALSE	0.003				Muddy Creek Mesa	Shallow	154	EPA 6010B	4	V1112019 / V111	9	0.005
Mesa Landfill Wells	LMW-10	LMW-10-ESC	2012 Q2	Barium, Dissolved	Well		Lab	5/30/2012	Sample	0.0023	mg/L	FALSE	0.005	J		(EPA) - Estimated value b	Muddy Creek Mesa	Shallow	154	EPA 6010B	4	L577721	13	0.0023
Mesa Pond Wells	LMW-11R	LMW-11R	2012 Q1	Barium, Dissolved	Well		Lab	3/23/2012		0.018	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	180	6010B	3	L567168,L56670	12	0.018
Mesa Pond Wells	LMW-11R	LMW-11R-ESC	2012 Q2	Barium, Dissolved	Well		Lab	5/29/2012	Sample	0.011	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	180	6010B	3	L577528	13	0.011
Mesa Pond Wells	LMW-11R	LMW-11R-ESC	2012 Q3	Barium, Dissolved	Well		Lab	8/21/2012		0.014	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	180	6010B	3	L591208	23	0.014
Mesa Pond Wells	LMW-11R	LMW-11R-ESC	2012 Q4	Barium, Dissolved	Well		Lab	11/26/2012	Sample	0.012	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	180	6010B	3	V12K067	27	0.012
Mesa Landfill Wells	LMW-7	LMW-7	2011 Q4	Barium, Dissolved	Well		Lab	12/5/2011	clear to	0.019	mg/L	FALSE	0.003				Muddy Creek Mesa	Shallow	178	EPA 6010B	3	V1112009 / V111	9	0.019
Mesa Landfill Wells	LMW-7	LMW-7-ESC	2012 Q1	Barium, Dissolved	Well		Lab	3/23/2012		0.024	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	178	6010B	3	L567168,L56670	12	0.024
Mesa Landfill Wells	LMW-7	LMW-7-ESC	2012 Q2	Barium, Dissolved	Well		Lab	5/31/2012	Sample	0.026	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	178	EPA 6010B	3	L577917	13	0.026
Mesa Landfill Wells	LMW-7	LMW-7-ESC	2012 Q3	Barium, Dissolved	Well		Lab	8/27/2012	Silty	0.026	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	178	6010B	3	L592097	23	0.026
Mesa Landfill Wells	LMW-7	LMW-7-ESC	2012 Q4	Barium, Dissolved	Well		Lab	11/28/2012	Sample	0.026	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	178	6010B	3	V12K075	27	0.026
Mesa Landfill Wells	LMW-9	LMW-9-ESC	2012 Q1	Barium, Dissolved	Well		Lab	3/23/2012		0.011	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	153	6010B	3	L567168,L56670	12	0.011
Mesa Landfill Wells	LMW-9	LMW-9-ESC	2012 Q2	Barium, Dissolved	Well		Lab	5/31/2012	Sl. Silty	0.013	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	153	EPA 6010B	3	L577917	13	0.013
Mesa Landfill Wells	LMW-9	LMW-9-ESC	2012 Q3	Barium, Dissolved	Well		Lab	8/27/2012	Sl. Silty	0.016	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	153	6010B	3	L592097	22	0.016
Mesa Landfill Wells	LMW-9	LMW-9-ESC	2012 Q4	Barium, Dissolved	Well		Lab	11/28/2012	Sample	0.011	mg/L	FALSE	0.005				Muddy Creek Mesa	Shallow	153	6010B	3	V12K075	27	0.011
Mesa Landfill Wells	LMW-9	LMW-9	2011 Q4	Barium, Dissolved	Well		Lab	12/5/2011		0.0089	mg/L	FALSE	0.003				Muddy Creek Mesa	Shallow	153	EPA 6010B	4	V1112009 / V111	9	0.0089

Source	Grouping	BoringDate	BoringName	ParameterID	SampleTop	SampleBotto	LabMethod	FieldLabel	Value	of Measure	NonDetect	ectionThres	LabQualifie	urementCor	Synonyms	SortName	AnalysisGroup	ChartValueRound
Lab	Backgroun	12/27/2011	BG-2D	Arsenic	0	2	EPA 6010B	BG-2D-0-2'	6.5	mg/kg	FALSE	1				Arsenic	Metals	6.5
Lab	Backgroun	12/27/2011	BG-2D	Barium	0	2	EPA 6010B	BG-2D-0-2'	44	mg/kg	FALSE	0.25				Barium	Metals	44
Lab	Backgroun	12/27/2011	BG-2D	Cadmium	0	2	EPA 6010B	BG-2D-0-2'		mg/kg	TRUE	0.25				Cadmium	Metals	0.125
Lab	Backgroun	12/27/2011	BG-2D	Lead	0	2	EPA 6010B	BG-2D-0-2'	3.9	mg/kg	FALSE	0.25				Lead	Metals	3.9
Lab	Backgroun	12/27/2011	BG-2D	Mercury	0	2	EPA 7471A	BG-2D-0-2'	0.0028	mg/kg	FALSE	0.02	J	(EPA) - Esti		Mercury	Metals	0.0028
Lab	Backgroun	12/27/2011	BG-2D	Selenium	0	2	EPA 6010B	BG-2D-0-2'		mg/kg	TRUE	1				Selenium	Metals	0.5
Lab	Backgroun	12/27/2011	BG-2D	Silver	0	2	EPA 6010B	BG-2D-0-2'	0.25	mg/kg	FALSE	0.5	J	(EPA) - Esti		Silver	Metals	0.25
Lab	Backgroun	12/27/2011	BG-2D	pH	0	2	EPA 9045C	BG-2D-0-2'	8.4	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.4
Lab	Backgroun	12/27/2011	BG-2D	Acenaphthene	0	2	EPA 8270C	BG-2D-0-2'		ug/kg	TRUE	6				Acenaphth	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Anthracene	0	2	EPA 8270C	BG-2D-0-2'		ug/kg	TRUE	6				Anthracene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(a)anthracene	0	2	EPA 8270C	BG-2D-0-2'		ug/kg	TRUE	6				Benzo(a)an	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(g,h,i)perylene	0	2	EPA 8270C	BG-2D-0-2'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(a)pyrene	0	2	EPA 8270C	BG-2D-0-2'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Bis(2-ethylhexyl)phthalate	0	2	EPA 8270C	BG-2D-0-2'		ug/kg	TRUE	330				Bis(2-ethyll	SVOC	165
Lab	Backgroun	12/27/2011	BG-2D	Chrysene	0	2	EPA 8270C	BG-2D-0-2'		ug/kg	TRUE	6				Chrysene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Fluoranthene	0	2	EPA 8270C	BG-2D-0-2'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Indeno(1,2,3-cd)pyrene	0	2	EPA 8270C	BG-2D-0-2'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Phenanthrene	0	2	EPA 8270C	BG-2D-0-2'		ug/kg	TRUE	6				Phenanthre	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Pyrene	0	2	EPA 8270C	BG-2D-0-2'		ug/kg	TRUE	6				Pyrene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Asbestos	0	2	EPA 600-R-	BG-2D-0-2'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	12/27/2011	BG-2D	Aluminum	0	2	EPA 6010B	BG-2D-0-2'	4600	mg/kg	FALSE	5				Aluminum	Metals	4600
Lab	Backgroun	12/27/2011	BG-2D	Ammonia	0	2	SM4500-NI	BG-2D-0-2'		mg/kg	TRUE	5			Nitrogen, A	Ammonia	General Chemistry	2.5
Lab	Backgroun	12/27/2011	BG-2D	Antimony	0	2	EPA 6010B	BG-2D-0-2'		mg/kg	TRUE	1				Antimony	Metals	0.5
Lab	Backgroun	12/27/2011	BG-2D	Beryllium	0	2	EPA 6010B	BG-2D-0-2'		mg/kg	TRUE	0.5	O	(ESC) Samp		Beryllium	Metals	0.25
Lab	Backgroun	12/27/2011	BG-2D	Biphenyl	0	2	EPA 8270C	BG-2D-0-2'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
Lab	Backgroun	12/27/2011	BG-2D	Boron	0	2	EPA 6010B	BG-2D-0-2'	9.3	mg/kg	FALSE	10	J	(EPA) - Esti		Boron	Metals	9.3
Lab	Backgroun	12/27/2011	BG-2D	Calcium	0	2	EPA 6010B	BG-2D-0-2'	23000	mg/kg	FALSE	25				Calcium	Metals	23000
Lab	Backgroun	12/27/2011	BG-2D	Chloride	0	2	EPA 9056	BG-2D-0-2'	8.2	mg/kg	FALSE	10	J	(EPA) - Esti		Chloride	General Chemistry	8.2
Lab	Backgroun	12/27/2011	BG-2D	Chromium (total)	0	2	EPA 6010B	BG-2D-0-2'	5.3	mg/kg	FALSE	0.5			Total chror	Chromium,	Metals	5.3
Lab	Backgroun	12/27/2011	BG-2D	Chromium (hexavalent)	0	2	EPA 7199	BG-2D-0-2'		mg/kg	TRUE	2				Chromium,	Metals	1
Lab	Backgroun	12/27/2011	BG-2D	Cobalt	0	2	EPA 6010B	BG-2D-0-2'	2	mg/kg	FALSE	0.5				Cobalt	Metals	2
Lab	Backgroun	12/27/2011	BG-2D	Copper	0	2	EPA 6010B	BG-2D-0-2'	2.5	mg/kg	FALSE	1				Copper	Metals	2.5
Lab	Backgroun	12/27/2011	BG-2D	Fluoride	0	2	EPA 300.0	BG-2D-0-2'	2.1	mg/kg	FALSE	1				Fluoride	General Chemistry	2.1
Lab	Backgroun	12/27/2011	BG-2D	Iron	0	2	EPA 6010B	BG-2D-0-2'	5800	mg/kg	FALSE	5				Iron	Metals	5800
Lab	Backgroun	12/27/2011	BG-2D	Magnesium	0	2	EPA 6010B	BG-2D-0-2'	4000	mg/kg	FALSE	5				Magnesiun	Metals	4000
Lab	Backgroun	12/27/2011	BG-2D	Manganese	0	2	EPA 6010B	BG-2D-0-2'	100	mg/kg	FALSE	0.5				Manganese	Metals	100
Lab	Backgroun	12/27/2011	BG-2D	Molybdenum	0	2	EPA 6010B	BG-2D-0-2'	0.62	mg/kg	FALSE	0.25				Molybdenu	Metals	0.62
Lab	Backgroun	12/27/2011	BG-2D	Nickel	0	2	EPA 6010B	BG-2D-0-2'	2.6	mg/kg	FALSE	1				Nickel	Metals	2.6
Lab	Backgroun	12/27/2011	BG-2D	Nitrate	0	2	EPA 300.0	BG-2D-0-2'	1.3	mg/kg	FALSE	1			Nitrogen, N	Nitrate	General Chemistry	1.3
Lab	Backgroun	12/27/2011	BG-2D	Potassium	0	2	EPA 6010B	BG-2D-0-2'	1800	mg/kg	FALSE	25				Potassium	Metals	1800
Lab	Backgroun	12/27/2011	BG-2D	Silica	0	2	EPA 6010B	BG-2D-0-2'	600	mg/kg	FALSE	110				Silica	Metals	600
Lab	Backgroun	12/27/2011	BG-2D	Sodium	0	2	EPA 6010B	BG-2D-0-2'	160	mg/kg	FALSE	25				Sodium	Metals	160
Lab	Backgroun	12/27/2011	BG-2D	Sulfate	0	2	EPA 9056	BG-2D-0-2'	62	mg/kg	FALSE	50				Sulfate	General Chemistry	62
Lab	Backgroun	12/27/2011	BG-2D	Thallium	0	2	EPA 6010B	BG-2D-0-2'		mg/kg	TRUE	1				Thallium	Metals	0.5
Lab	Backgroun	12/27/2011	BG-2D	Phosphate as P	0	2	EPA 9056	BG-2D-0-2'	0.72	mg/kg	FALSE	1	J	(EPA) - Esti		Phosphoro	General Chemistry	0.72
Lab	Backgroun	12/27/2011	BG-2D	Vanadium	0	2	EPA 6010B	BG-2D-0-2'	12	mg/kg	FALSE	0.5				Vanadium	Metals	12
Lab	Backgroun	12/27/2011	BG-2D	Zinc	0	2	EPA 6010B	BG-2D-0-2'	13	mg/kg	FALSE	1.5				Zinc	Metals	13
Lab	Backgroun	12/27/2011	BG-2D	Benzo(b)fluoranthene	0	2	EPA 8270C	BG-2D-0-2'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(k)fluoranthene	0	2	EPA 8270C	BG-2D-0-2'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Titanium	0	2	EPA 6010B	BG-2D-0-2'	180	mg/kg	FALSE	0.5				Titanium	Metals	180
Lab	Backgroun	12/27/2011	BG-2D	Naphthalene (PAH)	0	2	EPA 8270C	BG-2D-0-2'		ug/kg	TRUE	6				Naphthaler	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Arsenic	19		EPA 6010B	BG-2D-19'	56	mg/kg	FALSE	10				Arsenic	Metals	56
Lab	Backgroun	12/27/2011	BG-2D	Barium	19		EPA 6010B	BG-2D-19'	190	mg/kg	FALSE	0.25				Barium	Metals	190
Lab	Backgroun	12/27/2011	BG-2D	Cadmium	19		EPA 6010B	BG-2D-19'	0.11	mg/kg	FALSE	0.25	J	(EPA) - Esti		Cadmium	Metals	0.11
Lab	Backgroun	12/27/2011	BG-2D	Lead	19		EPA 6010B	BG-2D-19'	8.7	mg/kg	FALSE	2.5				Lead	Metals	8.7
Lab	Backgroun	12/27/2011	BG-2D	Mercury	19		EPA 7471A	BG-2D-19'	0.0047	mg/kg	FALSE	0.02	J	(EPA) - Esti		Mercury	Metals	0.0047
Lab	Backgroun	12/27/2011	BG-2D	Selenium	19		EPA 6010B	BG-2D-19'		mg/kg	TRUE	10	O	(ESC) Samp		Selenium	Metals	5
Lab	Backgroun	12/27/2011	BG-2D	Silver	19		EPA 6010B	BG-2D-19'		mg/kg	TRUE	0.5				Silver	Metals	0.25
Lab	Backgroun	12/27/2011	BG-2D	pH	19		EPA 9045C	BG-2D-19'	8	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8
Lab	Backgroun	12/27/2011	BG-2D	Acenaphthene	19		EPA 8270C	BG-2D-19'		ug/kg	TRUE	6				Acenaphth	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Anthracene	19		EPA 8270C	BG-2D-19'		ug/kg	TRUE	6				Anthracene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(a)anthracene	19		EPA 8270C	BG-2D-19'		ug/kg	TRUE	6				Benzo(a)an	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(g,h,i)perylene	19		EPA 8270C	BG-2D-19'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(a)pyrene	19		EPA 8270C	BG-2D-19'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Bis(2-ethylhexyl)phthalate	19		EPA 8270C	BG-2D-19'		ug/kg	TRUE	330				Bis(2-ethyll	SVOC	165
Lab	Backgroun	12/27/2011	BG-2D	Chrysene	19		EPA 8270C	BG-2D-19'		ug/kg	TRUE	6				Chrysene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Fluoranthene	19		EPA 8270C	BG-2D-19'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Indeno(1,2,3-cd)pyrene	19		EPA 8270C	BG-2D-19'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Phenanthrene	19		EPA 8270C	BG-2D-19'		ug/kg	TRUE	6				Phenanthre	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Pyrene	19		EPA 8270C	BG-2D-19'		ug/kg	TRUE	6				Pyrene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Asbestos	19		EPA 600-R-	BG-2D-19'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	12/27/2011	BG-2D	Aluminum	19		EPA 6010B	BG-2D-19'	5400	mg/kg	FALSE	5				Aluminum	Metals	5400
Lab	Backgroun	12/27/2011	BG-2D	Ammonia	19		SM4500-NI	BG-2D-19'		mg/kg	TRUE	5			Nitrogen, A	Ammonia	General Chemistry	2.5
Lab	Backgroun	12/27/2011	BG-2D	Antimony	19		EPA 6010B	BG-2D-19'		mg/kg	TRUE	10	O	(ESC) Samp		Antimony	Metals	5
Lab	Backgroun	12/27/2011	BG-2D	Beryllium	19		EPA 6010B	BG-2D-19'		mg/kg	TRUE	1	O	(ESC) Samp		Beryllium	Metals	0.5
Lab	Backgroun	12/27/2011	BG-2D	Biphenyl	19		EPA 8270C	BG-2D-19'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
Lab	Backgroun	12/27/2011	BG-2D	Boron	19		EPA 6010B	BG-2D-19'	13	mg/kg	FALSE	10				Boron	Metals	13
Lab	Backgroun	12/27/2011	BG-2D	Calcium	19		EPA 6010B	BG-2D-19'	160000	mg/kg	FALSE	250				Calcium	Metals	160000
Lab	Backgroun	12/27/2011	BG-2D	Chloride	19		EPA 9056	BG-2D-19'	7.6	mg/kg	FALSE	10	J	(EPA) - Esti		Chloride	General Chemistry	7.6
Lab	Backgroun	12/27/2011	BG-2D	Chromium (total)	19		EPA 6010B	BG-2D-19'	8.8	mg/kg	FALSE	0.5			Total chror	Chromium,	Metals	8.8
Lab	Backgroun	12/27/2011	BG-2D	Chromium (hexavalent)	19		EPA 7199	BG-2D-19'		mg/kg	TRUE	2				Chromium,	Metals	1
Lab	Backgroun	12/27/2011	BG-2D	Cobalt	19		EPA 6010B	BG-2D-19'	1.6	mg/kg	FALSE	0.5				Cobalt	Metals	1.6
Lab	Backgroun	12/27/2011	BG-2D	Copper	19		EPA 6010B	BG-2D-19'	3.2	mg/kg	FALSE	1				Copper	Metals	3.2
Lab	Backgroun	12/27/2011	BG-2D	Fluoride	19		EPA 300.0	BG-2D-19'	2.7	mg/kg	FALSE	1				Fluoride	General Chemistry	2.7
Lab	Backgroun	12/27/2011	BG-2D	Iron	19		EPA 6010B	BG-2D-19'	5400	mg/kg	FALSE	5				Iron	Metals	5400
Lab	Backgroun	12/27/2011	BG-2D	Magnesium	19		EPA 6010B	BG-2D-19'	9200	mg/kg	FALSE	5				Magnesiun	Metals	9200
Lab	Backgroun	12/27/2011	BG-2D	Manganese	19		EPA 6010B	BG-2D-19'	90	mg/kg	FALSE	0.5				Manganese	Metals	90
Lab	Backgroun	12/27/2011	BG-2D	Molybdenum	19		EPA 6010B	BG-2D-19'	8.7	mg/kg	FALSE	0.25				Molybdenu	Metals	8.7
Lab	Backgroun	12/27/2011	BG-2D	Nickel	19		EPA 6010B	BG-2D-19'	4.7	mg/kg	FALSE	10	J	(EPA) - Esti		Nickel	Metals	4.7
Lab	Backgroun	12/27/2011	BG-2D	Nitrate	19		EPA 300.0	BG-2D-19'		mg/kg	TRUE	1			Nitrogen, N	Nitrate	General Chemistry	0.5
Lab	Backgroun	12/27/2011	BG-2D	Potassium	19		EPA 6010B	BG-2D-19'	2100	mg/kg	FALSE	25				Potassium	Metals	2100
Lab	Backgroun	12/27/2011	BG-2D	Silica	19		EPA 6010B	BG-2D-19'	570	mg/kg	FALSE	110				Silica	Metals	570
Lab	Backgroun	12/27/2011	BG-2D	Sodium	19		EPA 6010B	BG-2D-19'	260	mg/kg	FALSE	25				Sodium	Metals	260
Lab	Backgroun	12/27/2011	BG-2D	Sulfate	19		EPA 9056	BG-2D-19'	16000	mg/kg	FALSE	5000				Sulfate	General Chemistry	16000
Lab	Backgroun	12/27/2011	BG-2D	Thallium	19		EPA 6010B	BG-2D-19'		mg/kg	TRUE	10	O	(ESC) Samp		Thallium	Metals	5
Lab	Backgroun	12/27/2011	BG-2D	Phosphate as P	19		EPA 9056	BG-2D-19'		mg/kg	TRUE	1				Phosphoro	General Chemistry	0.5
Lab	Backgroun	12/27/2011	BG-2D	Vanadium	19		EPA 6010B	BG-2D-19'	14	mg/kg	FALSE	0.5				Vanadium	Metals	14
Lab	Backgroun	12/27/2011	BG-2D	Zinc	19		EPA 6010B	BG-2D-19'	16	mg/kg	FALSE	1.5				Zinc	Metals	16
Lab	Backgroun	12/27/2011	BG-2D	Benzo(b)fluoranthene	19		EPA 8270C	BG-2D-19'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(k)fluoranthene	19		EPA 8270C	BG-2D-19'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Titanium	19		EPA 6010B	BG-2D-19'	190	mg/kg	FALSE	0.5				Titanium	Metals	190
Lab	Backgroun	12/27/2011	BG-2D	Naphthalene (PAH)	19		EPA 8270C	BG-2D-19'		ug/kg	TRUE	6				Naphthaler	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Arsenic	21		EPA 6010B	BG-2D-21'	140	mg/kg	FALSE	1				Arsenic	Metals	140
Lab	Backgroun	12/27/2011	BG-2D	Barium	21		EPA 6010B	BG-2D-21'	35	mg/kg	FALSE	0.25				Barium	Metals	35
Lab	Backgroun	12/27/2011	BG-2D	Cadmium	21		EPA 6010B	BG-2D-21'		mg/kg	TRUE	0.25				Cadmium	Metals	0.125
Lab	Backgroun	12/27/2011	BG-2D	Lead	21		EPA 6010B	BG-2D-21'	4.3	mg/kg	FALSE	0.25				Lead	Metals	4.3
Lab	Backgroun	12/27/2011	BG-2D	Mercury	21		EPA 7471A	BG-2D-21'	0.0021	mg/kg	FALSE	0.02	J	(EPA) - Esti		Mercury	Metals	0.0021
Lab	Backgroun	12/27/2011	BG-2D	Selenium	21		EPA 6010B	BG-2D-21'		mg/kg	TRUE	5	O	(ESC) Samp		Selenium	Metals	2.5
Lab	Backgroun	12/27/2011	BG-2D	Silver	21		EPA 6010B	BG-2D-21'	0.48	mg/kg	FALSE	0.5	J	(EPA) - Esti		Silver	Metals	0.48
Lab	Backgroun	12/27/2011	BG-2D	pH	21		EPA 9045C	BG-2D-21'	7.8	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	7.8
Lab	Backgroun	12/27/2011	BG-2D	Acenaphthene	21		EPA 8270C	BG-2D-21'		ug/kg	TRUE	6				Acenaphth	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Anthracene	21		EPA 8270C	BG-2D-21'		ug/kg	TRUE	6				Anthracene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(a)anthracene	21		EPA 8270C	BG-2D-21'		ug/kg	TRUE	6				Benzo(a)an	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(g,h,i)perylene	21		EPA 8270C	BG-2D-21'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(a)pyrene	21		EPA 8270C	BG-2D-21'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Bis(2-ethylhexyl)phthalate	21		EPA 8270C	BG-2D-21'		ug/kg	TRUE	330				Bis(2-ethyll	SVOC	165
Lab	Backgroun	12/27/2011	BG-2D	Chrysene	21		EPA 8270C	BG-2D-21'		ug/kg	TRUE	6				Chrysene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Fluoranthene	21		EPA 8270C	BG-2D-21'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Indeno(1,2,3-cd)pyrene	21		EPA 8270C	BG-2D-21'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Phenanthrene	21		EPA 8270C	BG-2D-21'		ug/kg	TRUE	6				Phenanthre	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Pyrene	21		EPA 8270C	BG-2D-21'		ug/kg	TRUE	6				Pyrene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Asbestos	21		EPA 600-R-	BG-2D-21'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	12/27/2011	BG-2D	Aluminum	21		EPA 6010B	BG-2D-21'	4800	mg/kg	FALSE	5				Aluminum	Metals	4800
Lab	Backgroun	12/27/2011	BG-2D	Ammonia	21		SM4500-NI	BG-2D-21'		mg/kg	TRUE	5			Nitrogen, A	Ammonia	General Chemistry	2.5
Lab	Backgroun	12/27/2011	BG-2D	Antimony	21		EPA 6010B	BG-2D-21'		mg/kg	TRUE	1				Antimony	Metals	0.5
Lab	Backgroun	12/27/2011	BG-2D	Beryllium	21		EPA 6010B	BG-2D-21'		mg/kg	TRUE	0.5	O	(ESC) Samp		Beryllium	Metals	0.25
Lab	Backgroun	12/27/2011	BG-2D	Biphenyl	21		EPA 8270C	BG-2D-21'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
Lab	Backgroun	12/27/2011	BG-2D	Boron	21		EPA 6010B	BG-2D-21'	13	mg/kg	FALSE	10				Boron	Metals	13
Lab	Backgroun	12/27/2011	BG-2D	Calcium	21		EPA 6010B	BG-2D-21'	42000	mg/kg	FALSE	25				Calcium	Metals	42000
Lab	Backgroun	12/27/2011	BG-2D	Chloride	21		EPA 9056	BG-2D-21'	18	mg/kg	FALSE	10				Chloride	General Chemistry	18
Lab	Backgroun	12/27/2011	BG-2D	Chromium (total)	21		EPA 6010B	BG-2D-21'	5.1	mg/kg	FALSE	0.5			Total chror	Chromium,	Metals	5.1

Lab	Backgroun	12/27/2011	BG-2D	Chromium (hexavalent)	21
Lab	Backgroun	12/27/2011	BG-2D	Cobalt	21
Lab	Backgroun	12/27/2011	BG-2D	Copper	21
Lab	Backgroun	12/27/2011	BG-2D	Fluoride	21
Lab	Backgroun	12/27/2011	BG-2D	Iron	21
Lab	Backgroun	12/27/2011	BG-2D	Magnesium	21
Lab	Backgroun	12/27/2011	BG-2D	Manganese	21
Lab	Backgroun	12/27/2011	BG-2D	Molybdenum	21
Lab	Backgroun	12/27/2011	BG-2D	Nickel	21
Lab	Backgroun	12/27/2011	BG-2D	Nitrate	21
Lab	Backgroun	12/27/2011	BG-2D	Potassium	21
Lab	Backgroun	12/27/2011	BG-2D	Silica	21
Lab	Backgroun	12/27/2011	BG-2D	Sodium	21
Lab	Backgroun	12/27/2011	BG-2D	Sulfate	21
Lab	Backgroun	12/27/2011	BG-2D	Thallium	21
Lab	Backgroun	12/27/2011	BG-2D	Phosphate as P	21
Lab	Backgroun	12/27/2011	BG-2D	Vanadium	21
Lab	Backgroun	12/27/2011	BG-2D	Zinc	21
Lab	Backgroun	12/27/2011	BG-2D	Benzo(b)fluoranthene	21
Lab	Backgroun	12/27/2011	BG-2D	Benzo(k)fluoranthene	21
Lab	Backgroun	12/27/2011	BG-2D	Titanium	21
Lab	Backgroun	12/27/2011	BG-2D	Naphthalene (PAH)	21
Lab	Backgroun	12/27/2011	BG-2D	Arsenic	30
Lab	Backgroun	12/27/2011	BG-2D	Barium	30
Lab	Backgroun	12/27/2011	BG-2D	Cadmium	30
Lab	Backgroun	12/27/2011	BG-2D	Lead	30
Lab	Backgroun	12/27/2011	BG-2D	Mercury	30
Lab	Backgroun	12/27/2011	BG-2D	Selenium	30
Lab	Backgroun	12/27/2011	BG-2D	Silver	30
Lab	Backgroun	12/27/2011	BG-2D	pH	30
Lab	Backgroun	12/27/2011	BG-2D	Acenaphthene	30
Lab	Backgroun	12/27/2011	BG-2D	Anthracene	30
Lab	Backgroun	12/27/2011	BG-2D	Benzo(a)anthracene	30
Lab	Backgroun	12/27/2011	BG-2D	Benzo(g,h,i)perylene	30
Lab	Backgroun	12/27/2011	BG-2D	Benzo(a)pyrene	30
Lab	Backgroun	12/27/2011	BG-2D	Bis(2-ethylhexyl)phthalate	30
Lab	Backgroun	12/27/2011	BG-2D	Chrysene	30
Lab	Backgroun	12/27/2011	BG-2D	Fluoranthene	30
Lab	Backgroun	12/27/2011	BG-2D	Indeno(1,2,3-cd)pyrene	30
Lab	Backgroun	12/27/2011	BG-2D	Phenanthrene	30
Lab	Backgroun	12/27/2011	BG-2D	Pyrene	30
Lab	Backgroun	12/27/2011	BG-2D	Asbestos	30
Lab	Backgroun	12/27/2011	BG-2D	Aluminum	30
Lab	Backgroun	12/27/2011	BG-2D	Ammonia	30
Lab	Backgroun	12/27/2011	BG-2D	Antimony	30
Lab	Backgroun	12/27/2011	BG-2D	Beryllium	30
Lab	Backgroun	12/27/2011	BG-2D	Biphenyl	30
Lab	Backgroun	12/27/2011	BG-2D	Boron	30
Lab	Backgroun	12/27/2011	BG-2D	Calcium	30
Lab	Backgroun	12/27/2011	BG-2D	Chloride	30
Lab	Backgroun	12/27/2011	BG-2D	Chromium (total)	30
Lab	Backgroun	12/27/2011	BG-2D	Chromium (hexavalent)	30
Lab	Backgroun	12/27/2011	BG-2D	Cobalt	30
Lab	Backgroun	12/27/2011	BG-2D	Copper	30
Lab	Backgroun	12/27/2011	BG-2D	Fluoride	30
Lab	Backgroun	12/27/2011	BG-2D	Iron	30
Lab	Backgroun	12/27/2011	BG-2D	Magnesium	30
Lab	Backgroun	12/27/2011	BG-2D	Manganese	30
Lab	Backgroun	12/27/2011	BG-2D	Molybdenum	30
Lab	Backgroun	12/27/2011	BG-2D	Nickel	30
Lab	Backgroun	12/27/2011	BG-2D	Nitrate	30
Lab	Backgroun	12/27/2011	BG-2D	Potassium	30
Lab	Backgroun	12/27/2011	BG-2D	Silica	30
Lab	Backgroun	12/27/2011	BG-2D	Sodium	30
Lab	Backgroun	12/27/2011	BG-2D	Sulfate	30
Lab	Backgroun	12/27/2011	BG-2D	Thallium	30
Lab	Backgroun	12/27/2011	BG-2D	Phosphate as P	30
Lab	Backgroun	12/27/2011	BG-2D	Vanadium	30
Lab	Backgroun	12/27/2011	BG-2D	Zinc	30
Lab	Backgroun	12/27/2011	BG-2D	Benzo(b)fluoranthene	30
Lab	Backgroun	12/27/2011	BG-2D	Benzo(k)fluoranthene	30
Lab	Backgroun	12/27/2011	BG-2D	Titanium	30
Lab	Backgroun	12/27/2011	BG-2D	Naphthalene (PAH)	30
Lab	Backgroun	12/27/2011	BG-2D	Arsenic	32
Lab	Backgroun	12/27/2011	BG-2D	Barium	32
Lab	Backgroun	12/27/2011	BG-2D	Cadmium	32
Lab	Backgroun	12/27/2011	BG-2D	Lead	32
Lab	Backgroun	12/27/2011	BG-2D	Mercury	32
Lab	Backgroun	12/27/2011	BG-2D	Selenium	32
Lab	Backgroun	12/27/2011	BG-2D	Silver	32
Lab	Backgroun	12/27/2011	BG-2D	pH	32
Lab	Backgroun	12/27/2011	BG-2D	Acenaphthene	32
Lab	Backgroun	12/27/2011	BG-2D	Anthracene	32
Lab	Backgroun	12/27/2011	BG-2D	Benzo(a)anthracene	32
Lab	Backgroun	12/27/2011	BG-2D	Benzo(g,h,i)perylene	32
Lab	Backgroun	12/27/2011	BG-2D	Benzo(a)pyrene	32
Lab	Backgroun	12/27/2011	BG-2D	Bis(2-ethylhexyl)phthalate	32
Lab	Backgroun	12/27/2011	BG-2D	Chrysene	32
Lab	Backgroun	12/27/2011	BG-2D	Fluoranthene	32
Lab	Backgroun	12/27/2011	BG-2D	Indeno(1,2,3-cd)pyrene	32
Lab	Backgroun	12/27/2011	BG-2D	Phenanthrene	32
Lab	Backgroun	12/27/2011	BG-2D	Pyrene	32
Lab	Backgroun	12/27/2011	BG-2D	Asbestos	32
Lab	Backgroun	12/27/2011	BG-2D	Aluminum	32
Lab	Backgroun	12/27/2011	BG-2D	Ammonia	32
Lab	Backgroun	12/27/2011	BG-2D	Antimony	32
Lab	Backgroun	12/27/2011	BG-2D	Beryllium	32
Lab	Backgroun	12/27/2011	BG-2D	Biphenyl	32
Lab	Backgroun	12/27/2011	BG-2D	Boron	32
Lab	Backgroun	12/27/2011	BG-2D	Calcium	32
Lab	Backgroun	12/27/2011	BG-2D	Chloride	32
Lab	Backgroun	12/27/2011	BG-2D	Chromium (total)	32
Lab	Backgroun	12/27/2011	BG-2D	Chromium (hexavalent)	32
Lab	Backgroun	12/27/2011	BG-2D	Cobalt	32
Lab	Backgroun	12/27/2011	BG-2D	Copper	32
Lab	Backgroun	12/27/2011	BG-2D	Fluoride	32
Lab	Backgroun	12/27/2011	BG-2D	Iron	32
Lab	Backgroun	12/27/2011	BG-2D	Magnesium	32
Lab	Backgroun	12/27/2011	BG-2D	Manganese	32
Lab	Backgroun	12/27/2011	BG-2D	Molybdenum	32
Lab	Backgroun	12/27/2011	BG-2D	Nickel	32
Lab	Backgroun	12/27/2011	BG-2D	Nitrate	32
Lab	Backgroun	12/27/2011	BG-2D	Potassium	32
Lab	Backgroun	12/27/2011	BG-2D	Silica	32
Lab	Backgroun	12/27/2011	BG-2D	Sodium	32
Lab	Backgroun	12/27/2011	BG-2D	Sulfate	32
Lab	Backgroun	12/27/2011	BG-2D	Thallium	32
Lab	Backgroun	12/27/2011	BG-2D	Phosphate as P	32
Lab	Backgroun	12/27/2011	BG-2D	Vanadium	32
Lab	Backgroun	12/27/2011	BG-2D	Zinc	32
Lab	Backgroun	12/27/2011	BG-2D	Benzo(b)fluoranthene	32
Lab	Backgroun	12/27/2011	BG-2D	Benzo(k)fluoranthene	32
Lab	Backgroun	12/27/2011	BG-2D	Titanium	32
Lab	Backgroun	12/27/2011	BG-2D	Naphthalene (PAH)	32
Lab	Backgroun	12/27/2011	BG-2D	Arsenic	75
Lab	Backgroun	12/27/2011	BG-2D	Barium	75
Lab	Backgroun	12/27/2011	BG-2D	Cadmium	75
Lab	Backgroun	12/27/2011	BG-2D	Lead	75
Lab	Backgroun	12/27/2011	BG-2D	Mercury	75
Lab	Backgroun	12/27/2011	BG-2D	Selenium	75
Lab	Backgroun	12/27/2011	BG-2D	Silver	75
Lab	Backgroun	12/27/2011	BG-2D	pH	75

EPA 7199	BG-2D-21'		mg/kg	TRUE	2				Chromium,	Metals	1
EPA 6010B	BG-2D-21'	1.4	mg/kg	FALSE	0.5				Cobalt	Metals	1.4
EPA 6010B	BG-2D-21'	1.2	mg/kg	FALSE	1				Copper	Metals	1.2
EPA 300.0	BG-2D-21'	4.4	mg/kg	FALSE	1				Fluoride	General Chemistry	4.4
EPA 6010B	BG-2D-21'	10000	mg/kg	FALSE	5				Iron	Metals	10000
EPA 6010B	BG-2D-21'	6200	mg/kg	FALSE	5				Magnesiun	Metals	6200
EPA 6010B	BG-2D-21'	520	mg/kg	FALSE	0.5				Manganese	Metals	520
EPA 6010B	BG-2D-21'	12	mg/kg	FALSE	0.25				Molybdenu	Metals	12
EPA 6010B	BG-2D-21'	2	mg/kg	FALSE	1				Nickel	Metals	2
EPA 300.0	BG-2D-21'		mg/kg	TRUE	1			Nitrogen, N	Nitrate	General Chemistry	0.5
EPA 6010B	BG-2D-21'	2000	mg/kg	FALSE	25				Potassium	Metals	2000
EPA 6010B	BG-2D-21'	520	mg/kg	FALSE	120				Silica	Metals	520
EPA 6010B	BG-2D-21'	330	mg/kg	FALSE	25				Sodium	Metals	330
EPA 9056	BG-2D-21'	16000	mg/kg	FALSE	5000				Sulfate	General Chemistry	16000
EPA 6010B	BG-2D-21'		mg/kg	TRUE	5	O	(ESC) Samp		Thallium	Metals	2.5
EPA 9056	BG-2D-21'		mg/kg	TRUE	1				Phosphoro	General Chemistry	0.5
EPA 6010B	BG-2D-21'	12	mg/kg	FALSE	0.5				Vanadium	Metals	12
EPA 6010B	BG-2D-21'	13	mg/kg	FALSE	1.5				Zinc	Metals	13
EPA 8270C	BG-2D-21'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
EPA 8270C	BG-2D-21'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
EPA 6010B	BG-2D-21'	160	mg/kg	FALSE	0.5				Titanium	Metals	160
EPA 8270C	BG-2D-21'		ug/kg	TRUE	6				Naphthaler	PAHs	3
EPA 6010B	BG-2D-30'	10	mg/kg	FALSE	1				Arsenic	Metals	10
EPA 6010B	BG-2D-30'	34	mg/kg	FALSE	0.25				Barium	Metals	34
EPA 6010B	BG-2D-30'		mg/kg	TRUE	0.25				Cadmium	Metals	0.125
EPA 6010B	BG-2D-30'	11	mg/kg	FALSE	0.25				Lead	Metals	11
EPA 7471A	BG-2D-30'	0.02	mg/kg	FALSE	0.02				Mercury	Metals	0.02
EPA 6010B	BG-2D-30'		mg/kg	TRUE	5	O	(ESC) Samp		Selenium	Metals	2.5
EPA 6010B	BG-2D-30'	0.79	mg/kg	FALSE	0.5				Silver	Metals	0.79
EPA 9045C	BG-2D-30'	9	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	9
EPA 8270C	BG-2D-30'		ug/kg	TRUE	6				Acenaphth	PAHs	3
EPA 8270C	BG-2D-30'		ug/kg	TRUE	6				Anthracene	PAHs	3
EPA 8270C	BG-2D-30'		ug/kg	TRUE	6				Benzo(a)an	PAHs	3
EPA 8270C	BG-2D-30'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
EPA 8270C	BG-2D-30'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
EPA 8270C	BG-2D-30'		ug/kg	TRUE	330				Bis(2-ethyll	SVOC	165
EPA 8270C	BG-2D-30'		ug/kg	TRUE	6				Chrysene	PAHs	3
EPA 8270C	BG-2D-30'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
EPA 8270C	BG-2D-30'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3
EPA 8270C	BG-2D-30'		ug/kg	TRUE	6				Phenanthre	PAHs	3
EPA 8270C	BG-2D-30'		ug/kg	TRUE	6				Pyrene	PAHs	3
EPA 600-R-	BG-2D-30'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-2D-30'	18000	mg/kg	FALSE	5				Aluminum	Metals	18000
SM4500-NI	BG-2D-30'	7.1	mg/kg	FALSE	5			Nitrogen, A	Ammonia	General Chemistry	7.1
EPA 6010B	BG-2D-30'		mg/kg	TRUE	1				Antimony	Metals	0.5
EPA 6010B	BG-2D-30'	0.33	mg/kg	FALSE	0.1				Beryllium	Metals	0.33
EPA 8270C	BG-2D-30'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
EPA 6010B	BG-2D-30'	25	mg/kg	FALSE	10				Boron	Metals	25
EPA 6010B	BG-2D-30'	17000	mg/kg	FALSE	25				Calcium	Metals	17000
EPA 9056	BG-2D-30'	9.4	mg/kg	FALSE	10	J	(EPA) - Esti		Chloride	General Chemistry	9.4
EPA 6010B	BG-2D-30'	15	mg/kg	FALSE	0.5			Total chror	Chromium,	Metals	15
EPA 7199	BG-2D-30'		mg/kg	TRUE	2				Chromium,	Metals	1
EPA 6010B	BG-2D-30'	6.9	mg/kg	FALSE	0.5				Cobalt	Metals	6.9
EPA 6010B	BG-2D-30'	16	mg/kg	FALSE	1				Copper	Metals	16
EPA 300.0	BG-2D-30'	13	mg/kg	FALSE	1				Fluoride	General Chemistry	13
EPA 6010B	BG-2D-30'	17000	mg/kg	FALSE	5				Iron	Metals	17000
EPA 6010B	BG-2D-30'	15000	mg/kg	FALSE	5				Magnesiun	Metals	15000
EPA 6010B	BG-2D-30'	270	mg/kg	FALSE	0.5				Manganese	Metals	270
EPA 6010B	BG-2D-30'	10	mg/kg	FALSE	0.25				Molybdenu	Metals	10
EPA 6010B	BG-2D-30'	24	mg/kg	FALSE	1				Nickel	Metals	24
EPA 300.0	BG-2D-30'		mg/kg	TRUE	1			Nitrogen, N	Nitrate	General Chemistry	0.5
EPA 6010B	BG-2D-30'	6800	mg/kg	FALSE	25				Potassium	Metals	6800
EPA 6010B	BG-2D-30'	1100	mg/kg	FALSE	120				Silica	Metals	1100
EPA 6010B	BG-2D-30'	520	mg/kg	FALSE	25				Sodium	Metals	520
EPA 9056	BG-2D-30'	350	mg/kg	FALSE	50				Sulfate	General Chemistry	350
EPA 6010B	BG-2D-30'		mg/kg	TRUE	5	O	(ESC) Samp		Thallium	Metals	2.5
EPA 9056	BG-2D-30'	0.72	mg/kg	FALSE	1	J	(EPA) - Esti		Phosphoro	General Chemistry	0.72
EPA 6010B	BG-2D-30'	25	mg/kg	FALSE	0.5				Vanadium	Metals	25
EPA 6010B	BG-2D-30'	49	mg/kg	FALSE	1.5				Zinc	Metals	49
EPA 8270C	BG-2D-30'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
EPA 8270C	BG-2D-30'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
EPA 6010B	BG-2D-30'	150	mg/kg	FALSE	0.5				Titanium	Metals	150
EPA 8270C	BG-2D-30'		ug/kg	TRUE	6				Naphthaler	PAHs	3
EPA 6010B	BG-2D-32'	8.9	mg/kg	FALSE	1				Arsenic	Metals	8.9
EPA 6010B	BG-2D-32'	12	mg/kg	FALSE	0.25				Barium	Metals	12
EPA 6010B	BG-2D-32'		mg/kg	TRUE	0.25				Cadmium	Metals	0.125
EPA 6010B	BG-2D-32'	3.5	mg/kg	FALSE	0.25				Lead	Metals	3.5
EPA 7471A	BG-2D-32'	0.0017	mg/kg	FALSE	0.02	J	(EPA) - Esti		Mercury	Metals	0.0017
EPA 6010B	BG-2D-32'		mg/kg	TRUE	1				Selenium	Metals	0.5
EPA 6010B	BG-2D-32'	0.31	mg/kg	FALSE	0.5	J	(EPA) - Esti		Silver	Metals	0.31
EPA 9045C	BG-2D-32'	8	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8
EPA 8270C	BG-2D-32'		ug/kg	TRUE	6				Acenaphth	PAHs	3
EPA 8270C	BG-2D-32'		ug/kg	TRUE	6				Anthracene	PAHs	3
EPA 8270C	BG-2D-32'		ug/kg	TRUE	6				Benzo(a)an	PAHs	3
EPA 8270C	BG-2D-32'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
EPA 8270C	BG-2D-32'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
EPA 8270C	BG-2D-32'		ug/kg	TRUE	330				Bis(2-ethyll	SVOC	165
EPA 8270C	BG-2D-32'		ug/kg	TRUE	6				Chrysene	PAHs	3
EPA 8270C	BG-2D-32'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
EPA 8270C	BG-2D-32'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3
EPA 8270C	BG-2D-32'		ug/kg	TRUE	6				Phenanthre	PAHs	3
EPA 8270C	BG-2D-32'		ug/kg	TRUE	6				Pyrene	PAHs	3
EPA 600-R-	BG-2D-32'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-2D-32'	5700	mg/kg	FALSE	5				Aluminum	Metals	5700
SM4500-NI	BG-2D-32'		mg/kg	TRUE	5			Nitrogen, A	Ammonia	General Chemistry	2.5
EPA 6010B	BG-2D-32'		mg/kg	TRUE	1				Antimony	Metals	0.5
EPA 6010B	BG-2D-32'		mg/kg	TRUE	0.5	O	(ESC) Samp		Beryllium	Metals	0.25
EPA 8270C	BG-2D-32'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
EPA 6010B	BG-2D-32'	10	mg/kg	FALSE	10				Boron	Metals	10
EPA 6010B	BG-2D-32'	4000	mg/kg	FALSE	25				Calcium	Metals	4000
EPA 9056	BG-2D-32'	14	mg/kg	FALSE	10				Chloride	General Chemistry	14
EPA 6010B	BG-2D-32'	6.1	mg/kg	FALSE	0.5			Total chror	Chromium,	Metals	6.1
EPA 7199	BG-2D-32'		mg/kg	TRUE	2				Chromium,	Metals	1
EPA 6010B	BG-2D-32'	2.2	mg/kg	FALSE	0.5				Cobalt	Metals	2.2
EPA 6010B	BG-2D-32'	2.9	mg/kg	FALSE	1				Copper	Metals	2.9
EPA 300.0	BG-2D-32'	6.2	mg/kg	FALSE	1				Fluoride	General Chemistry	6.2
EPA 6010B	BG-2D-32'	6300	mg/kg	FALSE	5				Iron	Metals	6300
EPA 6010B	BG-2D-32'	3900	mg/kg	FALSE	5				Magnesiun	Metals	3900
EPA 6010B	BG-2D-32'	63	mg/kg	FALSE	0.5				Manganese	Metals	63
EPA 6010B	BG-2D-32'	1.5	mg/kg	FALSE	0.25				Molybdenu	Metals	1.5
EPA 6010B	BG-2D-32'	3.2	mg/kg	FALSE	1				Nickel	Metals	3.2
EPA 300.0	BG-2D-32'		mg/kg	TRUE	1			Nitrogen, N	Nitrate	General Chemistry	0.5
EPA 6010B	BG-2D-32'	2200	mg/kg	FALSE	25				Potassium	Metals	2200
EPA 6010B	BG-2D-32'	630	mg/kg	FALSE	120				Silica	Metals	630
EPA 6010B	BG-2D-32'	180	mg/kg	FALSE	25				Sodium	Metals	180
EPA 9056	BG-2D-32'	410	mg/kg	FALSE	50				Sulfate	General Chemistry	410
EPA 6010B	BG-2D-32'		mg/kg	TRUE	1				Thallium	Metals	0.5
EPA 9056	BG-2D-32'		mg/kg	TRUE	1				Phosphoro	General Chemistry	0.5
EPA 6010B	BG-2D-32'	14	mg/kg	FALSE	0.5				Vanadium	Metals	14
EPA 6010B	BG-2D-32'	16	mg/kg	FALSE	1.5				Zinc	Metals	16
EPA 8270C	BG-2D-32'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
EPA 8270C	BG-2D-32'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
EPA 6010B	BG-2D-32'	210	mg/kg	FALSE	0.5				Titanium	Metals	210
EPA 8270C	BG-2D-32'		ug/kg	TRUE	6				Naphthaler	PAHs	3
EPA 6010B	BG-2D-75'	68	mg/kg	FALSE	1				Arsenic	Metals	68
EPA 6010B	BG-2D-75'	6.9	mg/kg	FALSE	0.25				Barium	Metals	6.9
EPA 6010B	BG-2D-75'		mg/kg	TRUE	0.25				Cadmium	Metals	0.125
EPA 6010B	BG-2D-75'	3.2	mg/kg	FALSE	0.25				Lead	Metals	3.2
EPA 7471A	BG-2D-75'		mg/kg	TRUE	0.02				Mercury	Metals	0.01
EPA 6010B	BG-2D-75'		mg/kg	TRUE	1				Selenium	Metals	0.5
EPA 6010B	BG-2D-75'	0.43	mg/kg	FALSE	0.5	J	(EPA) - Esti		Silver	Metals	0.43
EPA 9045C	BG-2D-75'	8.2	su	FALSE					pH	General Chemistry	8.2

Lab	Backgroun	12/27/2011	BG-2D	Acenaphthene	75	EPA 8270C	BG-2D-75'		ug/kg	TRUE	6				Acenaphth	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Anthracene	75	EPA 8270C	BG-2D-75'		ug/kg	TRUE	6				Anthracene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(a)anthracene	75	EPA 8270C	BG-2D-75'		ug/kg	TRUE	6				Benzo(a)an	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(g,h,i)perylene	75	EPA 8270C	BG-2D-75'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(a)pyrene	75	EPA 8270C	BG-2D-75'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Bis(2-ethylhexyl)phthalate	75	EPA 8270C	BG-2D-75'		ug/kg	TRUE	330				Bis(2-ethyll	SVOC	165
Lab	Backgroun	12/27/2011	BG-2D	Chrysene	75	EPA 8270C	BG-2D-75'		ug/kg	TRUE	6				Chrysene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Fluoranthene	75	EPA 8270C	BG-2D-75'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Indeno(1,2,3-cd)pyrene	75	EPA 8270C	BG-2D-75'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Phenanthrene	75	EPA 8270C	BG-2D-75'		ug/kg	TRUE	6				Phenanthre	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Pyrene	75	EPA 8270C	BG-2D-75'		ug/kg	TRUE	6				Pyrene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Asbestos	75	EPA 600-R-	BG-2D-75'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	12/27/2011	BG-2D	Aluminum	75	EPA 6010B	BG-2D-75'	3600	mg/kg	FALSE	5				Aluminum	Metals	3600
Lab	Backgroun	12/27/2011	BG-2D	Ammonia	75	SM4500-NI	BG-2D-75'		mg/kg	TRUE	5			Nitrogen, A	Ammonia	General Chemistry	2.5
Lab	Backgroun	12/27/2011	BG-2D	Antimony	75	EPA 6010B	BG-2D-75'		mg/kg	TRUE	1				Antimony	Metals	0.5
Lab	Backgroun	12/27/2011	BG-2D	Beryllium	75	EPA 6010B	BG-2D-75'	0.13	mg/kg	FALSE	0.1				Beryllium	Metals	0.13
Lab	Backgroun	12/27/2011	BG-2D	Biphenyl	75	EPA 8270C	BG-2D-75'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
Lab	Backgroun	12/27/2011	BG-2D	Boron	75	EPA 6010B	BG-2D-75'	9.3	mg/kg	FALSE	10	J	(EPA) - Esti		Boron	Metals	9.3
Lab	Backgroun	12/27/2011	BG-2D	Calcium	75	EPA 6010B	BG-2D-75'	19000	mg/kg	FALSE	25				Calcium	Metals	19000
Lab	Backgroun	12/27/2011	BG-2D	Chloride	75	EPA 9056	BG-2D-75'		mg/kg	TRUE	10				Chloride	General Chemistry	5
Lab	Backgroun	12/27/2011	BG-2D	Chromium (total)	75	EPA 6010B	BG-2D-75'	4.4	mg/kg	FALSE	0.5			Total chror	Chromium,	Metals	4.4
Lab	Backgroun	12/27/2011	BG-2D	Chromium (hexavalent)	75	EPA 7199	BG-2D-75'		mg/kg	TRUE	2				Chromium,	Metals	1
Lab	Backgroun	12/27/2011	BG-2D	Cobalt	75	EPA 6010B	BG-2D-75'	1.6	mg/kg	FALSE	0.5				Cobalt	Metals	1.6
Lab	Backgroun	12/27/2011	BG-2D	Copper	75	EPA 6010B	BG-2D-75'	3	mg/kg	FALSE	1				Copper	Metals	3
Lab	Backgroun	12/27/2011	BG-2D	Fluoride	75	EPA 300.0	BG-2D-75'	7.6	mg/kg	FALSE	1				Fluoride	General Chemistry	7.6
Lab	Backgroun	12/27/2011	BG-2D	Iron	75	EPA 6010B	BG-2D-75'	6800	mg/kg	FALSE	5				Iron	Metals	6800
Lab	Backgroun	12/27/2011	BG-2D	Magnesium	75	EPA 6010B	BG-2D-75'	4400	mg/kg	FALSE	5				Magnesiun	Metals	4400
Lab	Backgroun	12/27/2011	BG-2D	Manganese	75	EPA 6010B	BG-2D-75'	69	mg/kg	FALSE	0.5				Manganese	Metals	69
Lab	Backgroun	12/27/2011	BG-2D	Molybdenum	75	EPA 6010B	BG-2D-75'	3.7	mg/kg	FALSE	0.25				Molybdenu	Metals	3.7
Lab	Backgroun	12/27/2011	BG-2D	Nickel	75	EPA 6010B	BG-2D-75'	3.6	mg/kg	FALSE	1				Nickel	Metals	3.6
Lab	Backgroun	12/27/2011	BG-2D	Nitrate	75	EPA 300.0	BG-2D-75'		mg/kg	TRUE	1			Nitrogen, N	Nitrate	General Chemistry	0.5
Lab	Backgroun	12/27/2011	BG-2D	Potassium	75	EPA 6010B	BG-2D-75'	1400	mg/kg	FALSE	25				Potassium	Metals	1400
Lab	Backgroun	12/27/2011	BG-2D	Silica	75	EPA 6010B	BG-2D-75'	700	mg/kg	FALSE	110				Silica	Metals	700
Lab	Backgroun	12/27/2011	BG-2D	Sodium	75	EPA 6010B	BG-2D-75'	72	mg/kg	FALSE	25				Sodium	Metals	72
Lab	Backgroun	12/27/2011	BG-2D	Sulfate	75	EPA 9056	BG-2D-75'	320	mg/kg	FALSE	50				Sulfate	General Chemistry	320
Lab	Backgroun	12/27/2011	BG-2D	Thallium	75	EPA 6010B	BG-2D-75'		mg/kg	TRUE	1				Thallium	Metals	0.5
Lab	Backgroun	12/27/2011	BG-2D	Phosphate as P	75	EPA 9056	BG-2D-75'		mg/kg	TRUE	1				Phosphoro	General Chemistry	0.5
Lab	Backgroun	12/27/2011	BG-2D	Vanadium	75	EPA 6010B	BG-2D-75'	7.4	mg/kg	FALSE	0.5				Vanadium	Metals	7.4
Lab	Backgroun	12/27/2011	BG-2D	Zinc	75	EPA 6010B	BG-2D-75'	13	mg/kg	FALSE	1.5				Zinc	Metals	13
Lab	Backgroun	12/27/2011	BG-2D	Benzo(b)fluoranthene	75	EPA 8270C	BG-2D-75'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(k)fluoranthene	75	EPA 8270C	BG-2D-75'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Titanium	75	EPA 6010B	BG-2D-75'	35	mg/kg	FALSE	0.5				Titanium	Metals	35
Lab	Backgroun	12/27/2011	BG-2D	Naphthalene (PAH)	75	EPA 8270C	BG-2D-75'		ug/kg	TRUE	6				Naphthaler	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Arsenic	10	EPA 6010B	BG-2D-10'	6	mg/kg	FALSE	1				Arsenic	Metals	6
Lab	Backgroun	12/27/2011	BG-2D	Barium	10	EPA 6010B	BG-2D-10'	40	mg/kg	FALSE	0.25				Barium	Metals	40
Lab	Backgroun	12/27/2011	BG-2D	Cadmium	10	EPA 6010B	BG-2D-10'		mg/kg	TRUE	0.25				Cadmium	Metals	0.125
Lab	Backgroun	12/27/2011	BG-2D	Lead	10	EPA 6010B	BG-2D-10'	3.4	mg/kg	FALSE	0.25				Lead	Metals	3.4
Lab	Backgroun	12/27/2011	BG-2D	Mercury	10	EPA 7471A	BG-2D-10'		mg/kg	TRUE	0.02				Mercury	Metals	0.01
Lab	Backgroun	12/27/2011	BG-2D	Selenium	10	EPA 6010B	BG-2D-10'		mg/kg	TRUE	1				Selenium	Metals	0.5
Lab	Backgroun	12/27/2011	BG-2D	Silver	10	EPA 6010B	BG-2D-10'	0.2	mg/kg	FALSE	0.5	J	(EPA) - Esti		Silver	Metals	0.2
Lab	Backgroun	12/27/2011	BG-2D	pH	10	EPA 9045C	BG-2D-10'	8.2	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.2
Lab	Backgroun	12/27/2011	BG-2D	Acenaphthene	10	EPA 8270C	BG-2D-10'		ug/kg	TRUE	6				Acenaphth	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Anthracene	10	EPA 8270C	BG-2D-10'		ug/kg	TRUE	6				Anthracene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(a)anthracene	10	EPA 8270C	BG-2D-10'		ug/kg	TRUE	6				Benzo(a)an	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(g,h,i)perylene	10	EPA 8270C	BG-2D-10'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(a)pyrene	10	EPA 8270C	BG-2D-10'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Bis(2-ethylhexyl)phthalate	10	EPA 8270C	BG-2D-10'		ug/kg	TRUE	330				Bis(2-ethyll	SVOC	165
Lab	Backgroun	12/27/2011	BG-2D	Chrysene	10	EPA 8270C	BG-2D-10'		ug/kg	TRUE	6				Chrysene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Fluoranthene	10	EPA 8270C	BG-2D-10'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Indeno(1,2,3-cd)pyrene	10	EPA 8270C	BG-2D-10'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Phenanthrene	10	EPA 8270C	BG-2D-10'		ug/kg	TRUE	6				Phenanthre	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Pyrene	10	EPA 8270C	BG-2D-10'		ug/kg	TRUE	6				Pyrene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Asbestos	10	EPA 600-R-	BG-2D-10'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	12/27/2011	BG-2D	Aluminum	10	EPA 6010B	BG-2D-10'	3500	mg/kg	FALSE	5				Aluminum	Metals	3500
Lab	Backgroun	12/27/2011	BG-2D	Ammonia	10	SM4500-NI	BG-2D-10'		mg/kg	TRUE	5			Nitrogen, A	Ammonia	General Chemistry	2.5
Lab	Backgroun	12/27/2011	BG-2D	Antimony	10	EPA 6010B	BG-2D-10'		mg/kg	TRUE	1				Antimony	Metals	0.5
Lab	Backgroun	12/27/2011	BG-2D	Beryllium	10	EPA 6010B	BG-2D-10'		mg/kg	TRUE	0.5	O	(ESC) Samp		Beryllium	Metals	0.25
Lab	Backgroun	12/27/2011	BG-2D	Biphenyl	10	EPA 8270C	BG-2D-10'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
Lab	Backgroun	12/27/2011	BG-2D	Boron	10	EPA 6010B	BG-2D-10'	8.5	mg/kg	FALSE	10	J	(EPA) - Esti		Boron	Metals	8.5
Lab	Backgroun	12/27/2011	BG-2D	Calcium	10	EPA 6010B	BG-2D-10'	19000	mg/kg	FALSE	25				Calcium	Metals	19000
Lab	Backgroun	12/27/2011	BG-2D	Chloride	10	EPA 9056	BG-2D-10'	25	mg/kg	FALSE	10				Chloride	General Chemistry	25
Lab	Backgroun	12/27/2011	BG-2D	Chromium (total)	10	EPA 6010B	BG-2D-10'	4.6	mg/kg	FALSE	0.5			Total chror	Chromium,	Metals	4.6
Lab	Backgroun	12/27/2011	BG-2D	Chromium (hexavalent)	10	EPA 7199	BG-2D-10'		mg/kg	TRUE	2				Chromium,	Metals	1
Lab	Backgroun	12/27/2011	BG-2D	Cobalt	10	EPA 6010B	BG-2D-10'	1.9	mg/kg	FALSE	0.5				Cobalt	Metals	1.9
Lab	Backgroun	12/27/2011	BG-2D	Copper	10	EPA 6010B	BG-2D-10'	1.9	mg/kg	FALSE	1				Copper	Metals	1.9
Lab	Backgroun	12/27/2011	BG-2D	Fluoride	10	EPA 300.0	BG-2D-10'	4.1	mg/kg	FALSE	1				Fluoride	General Chemistry	4.1
Lab	Backgroun	12/27/2011	BG-2D	Iron	10	EPA 6010B	BG-2D-10'	5300	mg/kg	FALSE	5				Iron	Metals	5300
Lab	Backgroun	12/27/2011	BG-2D	Magnesium	10	EPA 6010B	BG-2D-10'	3100	mg/kg	FALSE	5				Magnesiun	Metals	3100
Lab	Backgroun	12/27/2011	BG-2D	Manganese	10	EPA 6010B	BG-2D-10'	85	mg/kg	FALSE	0.5				Manganese	Metals	85
Lab	Backgroun	12/27/2011	BG-2D	Molybdenum	10	EPA 6010B	BG-2D-10'	0.63	mg/kg	FALSE	0.25				Molybdenu	Metals	0.63
Lab	Backgroun	12/27/2011	BG-2D	Nickel	10	EPA 6010B	BG-2D-10'	2.2	mg/kg	FALSE	1				Nickel	Metals	2.2
Lab	Backgroun	12/27/2011	BG-2D	Nitrate	10	EPA 300.0	BG-2D-10'	0.54	mg/kg	FALSE	1	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.54
Lab	Backgroun	12/27/2011	BG-2D	Potassium	10	EPA 6010B	BG-2D-10'	1300	mg/kg	FALSE	25				Potassium	Metals	1300
Lab	Backgroun	12/27/2011	BG-2D	Silica	10	EPA 6010B	BG-2D-10'	530	mg/kg	FALSE	99				Silica	Metals	530
Lab	Backgroun	12/27/2011	BG-2D	Sodium	10	EPA 6010B	BG-2D-10'	220	mg/kg	FALSE	25				Sodium	Metals	220
Lab	Backgroun	12/27/2011	BG-2D	Sulfate	10	EPA 9056	BG-2D-10'	220	mg/kg	FALSE	50				Sulfate	General Chemistry	220
Lab	Backgroun	12/27/2011	BG-2D	Thallium	10	EPA 6010B	BG-2D-10'		mg/kg	TRUE	1				Thallium	Metals	0.5
Lab	Backgroun	12/27/2011	BG-2D	Phosphate as P	10	EPA 9056	BG-2D-10'	0.41	mg/kg	FALSE	1	J	(EPA) - Esti		Phosphoro	General Chemistry	0.41
Lab	Backgroun	12/27/2011	BG-2D	Vanadium	10	EPA 6010B	BG-2D-10'	12	mg/kg	FALSE	0.5				Vanadium	Metals	12
Lab	Backgroun	12/27/2011	BG-2D	Zinc	10	EPA 6010B	BG-2D-10'	11	mg/kg	FALSE	1.5				Zinc	Metals	11
Lab	Backgroun	12/27/2011	BG-2D	Benzo(b)fluoranthene	10	EPA 8270C	BG-2D-10'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(k)fluoranthene	10	EPA 8270C	BG-2D-10'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Titanium	10	EPA 6010B	BG-2D-10'	170	mg/kg	FALSE	0.5				Titanium	Metals	170
Lab	Backgroun	12/27/2011	BG-2D	Naphthalene (PAH)	10	EPA 8270C	BG-2D-10'		ug/kg	TRUE	6				Naphthaler	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Arsenic	81	EPA 6010B	BG-2D-81'	6.7	mg/kg	FALSE	1				Arsenic	Metals	6.7
Lab	Backgroun	12/27/2011	BG-2D	Barium	81	EPA 6010B	BG-2D-81'	26	mg/kg	FALSE	0.25				Barium	Metals	26
Lab	Backgroun	12/27/2011	BG-2D	Cadmium	81	EPA 6010B	BG-2D-81'	0.46	mg/kg	FALSE	0.25				Cadmium	Metals	0.46
Lab	Backgroun	12/27/2011	BG-2D	Lead	81	EPA 6010B	BG-2D-81'	16	mg/kg	FALSE	0.25				Lead	Metals	16
Lab	Backgroun	12/27/2011	BG-2D	Mercury	81	EPA 7471A	BG-2D-81'	0.36	mg/kg	FALSE	0.02				Mercury	Metals	0.36
Lab	Backgroun	12/27/2011	BG-2D	Selenium	81	EPA 6010B	BG-2D-81'	11	mg/kg	FALSE	1				Selenium	Metals	11
Lab	Backgroun	12/27/2011	BG-2D	Silver	81	EPA 6010B	BG-2D-81'		mg/kg	TRUE	0.5				Silver	Metals	0.25
Lab	Backgroun	12/27/2011	BG-2D	pH	81	EPA 9045C	BG-2D-81'	8.9	su	FALSE		J3	The associa		pH	General Chemistry	8.9
Lab	Backgroun	12/27/2011	BG-2D	Acenaphthene	81	EPA 8270C	BG-2D-81'		ug/kg	TRUE	6				Acenaphth	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Anthracene	81	EPA 8270C	BG-2D-81'		ug/kg	TRUE	6				Anthracene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(a)anthracene	81	EPA 8270C	BG-2D-81'		ug/kg	TRUE	6				Benzo(a)an	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(g,h,i)perylene	81	EPA 8270C	BG-2D-81'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(a)pyrene	81	EPA 8270C	BG-2D-81'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Bis(2-ethylhexyl)phthalate	81	EPA 8270C	BG-2D-81'		ug/kg	TRUE	330	J3	The associa		Bis(2-ethyll	SVOC	165
Lab	Backgroun	12/27/2011	BG-2D	Chrysene	81	EPA 8270C	BG-2D-81'		ug/kg	TRUE	6				Chrysene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Fluoranthene	81	EPA 8270C	BG-2D-81'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Indeno(1,2,3-cd)pyrene	81	EPA 8270C	BG-2D-81'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Phenanthrene	81	EPA 8270C	BG-2D-81'		ug/kg	TRUE	6				Phenanthre	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Pyrene	81	EPA 8270C	BG-2D-81'		ug/kg	TRUE	6				Pyrene	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Asbestos	81	EPA 600-R-	BG-2D-81'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	12/27/2011	BG-2D	Aluminum	81	EPA 6010B	BG-2D-81'	18000	mg/kg	FALSE	5				Aluminum	Metals	18000
Lab	Backgroun	12/27/2011	BG-2D	Ammonia	81	SM4500-NI	BG-2D-81'	7.2	mg/kg	FALSE	5	P1	RPD value	Nitrogen, A	Ammonia	General Chemistry	7.2
Lab	Backgroun	12/27/2011	BG-2D	Antimony	81	EPA 6010B	BG-2D-81'		mg/kg	TRUE	5	O	(ESC) Samp		Antimony	Metals	2.5
Lab	Backgroun	12/27/2011	BG-2D	Beryllium	81	EPA 6010B	BG-2D-81'	0.87	mg/kg	FALSE	0.1				Beryllium	Metals	0.87
Lab	Backgroun	12/27/2011	BG-2D	Biphenyl	81	EPA 8270C	BG-2D-81'		ug/kg	TRUE	330	J3	The associa	1,1-Biphen	Biphenyl	SVOC	165
Lab	Backgroun	12/27/2011	BG-2D	Boron	81	EPA 6010B	BG-2D-81'	29	mg/kg	FALSE	10				Boron	Metals	29
Lab	Backgroun	12/27/2011	BG-2D	Calcium	81	EPA 6010B	BG-2D-81'	57000	mg/kg	FALSE	130				Calcium	Metals	57000
Lab	Backgroun	12/27/2011	BG-2D	Chloride	81	EPA 9056	BG-2D-81'	75	mg/kg	FALSE	10				Chloride	General Chemistry	75
Lab	Backgroun	12/27/2011	BG-2D	Chromium (total)	81	EPA 6010B	BG-2D-81'	17	mg/kg	FALSE	0.5			Total chror	Chromium,	Metals	17
Lab	Backgroun	12/27/2011	BG-2D	Chromium (hexavalent)	81	EPA 7199	BG-2D-81'		mg/kg	TRUE	2				Chromium,	Metals	1
Lab	Backgroun	12/27/2011	BG-2D	Cobalt	81	EPA 6010B	BG-2D-81'	4.3	mg/kg	FALSE	0.5				Cobalt	Metals	4.3
Lab	Backgroun	12/27/2011	BG-2D	Copper	81	EPA 6010B	BG-2D-81'	22	mg/kg	FALSE	1				Copper	Metals	22
Lab	Backgroun	12/27/2011	BG-2D	Fluoride	81	EPA 300.0	BG-2D-81'	18	mg/kg	FALSE	1				Fluoride	General Chemistry	18
Lab	Backgroun	12/27/2011	BG-2D	Iron	81	EPA 6010B	BG-2D-81'	18000	mg/kg	FALSE	5				Iron	Metals	18000
Lab	Backgroun	12/27/2011	BG-2D	Magnesium	81	EPA 6010B	BG-2D-81'	14000	mg/kg	FALSE	5				Magnesiun	Metals	14000
Lab	Backgroun	12/27/2011	BG-2D	Manganese	81	EPA 6010B	BG-2D-81'	250	mg/kg	FALSE	0.5				Manganese	Metals	250
Lab	Backgroun	12/27/2011	BG-2D	Molybdenum	81	EPA 6010B	BG-2D-81'	3.8	mg/kg	FALSE	0.25				Molybdenu	Metals	3.8
Lab	Backgroun	12/27/2011	BG-2D	Nickel	81	EPA 6010B	BG-2D-81'	16	mg/kg	FALSE	5				Nickel	Metals	16

Lab	Backgroun	12/27/2011	BG-2D	Nitrate	81		EPA 300.0	BG-2D-81'	0.56	mg/kg	FALSE	1	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.56
Lab	Backgroun	12/27/2011	BG-2D	Potassium	81		EPA 6010B	BG-2D-81'	6600	mg/kg	FALSE	25				Potassium	Metals	6600
Lab	Backgroun	12/27/2011	BG-2D	Silica	81		EPA 6010B	BG-2D-81'	1100	mg/kg	FALSE	120				Silica	Metals	1100
Lab	Backgroun	12/27/2011	BG-2D	Sodium	81		EPA 6010B	BG-2D-81'	230	mg/kg	FALSE	25				Sodium	Metals	230
Lab	Backgroun	12/27/2011	BG-2D	Sulfate	81		EPA 9056	BG-2D-81'	190	mg/kg	FALSE	50				Sulfate	General Chemistry	190
Lab	Backgroun	12/27/2011	BG-2D	Thallium	81		EPA 6010B	BG-2D-81'		mg/kg	TRUE	5	O	(ESC) Samp		Thallium	Metals	2.5
Lab	Backgroun	12/27/2011	BG-2D	Phosphate as P	81		EPA 9056	BG-2D-81'		mg/kg	TRUE	1				Phosphoro	General Chemistry	0.5
Lab	Backgroun	12/27/2011	BG-2D	Vanadium	81		EPA 6010B	BG-2D-81'	27	mg/kg	FALSE	0.5				Vanadium	Metals	27
Lab	Backgroun	12/27/2011	BG-2D	Zinc	81		EPA 6010B	BG-2D-81'	62	mg/kg	FALSE	7.5				Zinc	Metals	62
Lab	Backgroun	12/27/2011	BG-2D	Benzo(b)fluoranthene	81		EPA 8270C	BG-2D-81'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Benzo(k)fluoranthene	81		EPA 8270C	BG-2D-81'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
Lab	Backgroun	12/27/2011	BG-2D	Titanium	81		EPA 6010B	BG-2D-81'	84	mg/kg	FALSE	2.5				Titanium	Metals	84
Lab	Backgroun	12/27/2011	BG-2D	Naphthalene (PAH)	81		EPA 8270C	BG-2D-81'		ug/kg	TRUE	6				Naphthaler	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Arsenic	0	2	EPA 6010B	BG-1D-0-2'	3.6	mg/kg	FALSE	1				Arsenic	Metals	3.6
Lab	Backgroun	1/9/2012	BG-1D	Barium	0	2	EPA 6010B	BG-1D-0-2'	37	mg/kg	FALSE	0.25				Barium	Metals	37
Lab	Backgroun	1/9/2012	BG-1D	Cadmium	0	2	EPA 6010B	BG-1D-0-2'		mg/kg	TRUE	0.25				Cadmium	Metals	0.125
Lab	Backgroun	1/9/2012	BG-1D	Lead	0	2	EPA 6010B	BG-1D-0-2'	6.8	mg/kg	FALSE	0.25				Lead	Metals	6.8
Lab	Backgroun	1/9/2012	BG-1D	Mercury	0	2	EPA 7471A	BG-1D-0-2'	0.012	mg/kg	FALSE	0.02	J	(EPA) - Esti		Mercury	Metals	0.012
Lab	Backgroun	1/9/2012	BG-1D	Selenium	0	2	EPA 6010B	BG-1D-0-2'	0.71	mg/kg	FALSE	1	J	(EPA) - Esti		Selenium	Metals	0.71
Lab	Backgroun	1/9/2012	BG-1D	Silver	0	2	EPA 6010B	BG-1D-0-2'		mg/kg	TRUE	0.5				Silver	Metals	0.25
Lab	Backgroun	1/9/2012	BG-1D	pH	0	2	EPA 9045C	BG-1D-0-2'	8.7	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.7
Lab	Backgroun	1/9/2012	BG-1D	Acenaphthene	0	2	EPA 8270C	BG-1D-0-2'		ug/kg	TRUE	6				Acenaphth	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Anthracene	0	2	EPA 8270C	BG-1D-0-2'		ug/kg	TRUE	6				Anthracene	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)anthracene	0	2	EPA 8270C	BG-1D-0-2'		ug/kg	TRUE	6				Benzo(a)an	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Benzo(g,h,i)perylene	0	2	EPA 8270C	BG-1D-0-2'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)pyrene	0	2	EPA 8270C	BG-1D-0-2'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Bis(2-ethylhexyl)phthalate	0	2	EPA 8270C	BG-1D-0-2'	21	ug/kg	FALSE	330	J	(EPA) - Esti		Bis(2-ethyl	SVOC	21
Lab	Backgroun	1/9/2012	BG-1D	Chrysene	0	2	EPA 8270C	BG-1D-0-2'		ug/kg	TRUE	6				Chrysene	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Fluoranthene	0	2	EPA 8270C	BG-1D-0-2'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Indeno(1,2,3-cd)pyrene	0	2	EPA 8270C	BG-1D-0-2'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Phenanthrene	0	2	EPA 8270C	BG-1D-0-2'		ug/kg	TRUE	6				Phenanthre	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Pyrene	0	2	EPA 8270C	BG-1D-0-2'		ug/kg	TRUE	6				Pyrene	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Asbestos	0	2	EPA 600-R-	BG-1D-0-2'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	1/9/2012	BG-1D	Aluminum	0	2	EPA 6010B	BG-1D-0-2'	17000	mg/kg	FALSE	5				Aluminum	Metals	17000
Lab	Backgroun	1/9/2012	BG-1D	Ammonia	0	2	SM4500-NI	BG-1D-0-2'	5.2	mg/kg	FALSE	5			Nitrogen, A	Ammonia	General Chemistry	5.2
Lab	Backgroun	1/9/2012	BG-1D	Antimony	0	2	EPA 6010B	BG-1D-0-2'		mg/kg	TRUE	1				Antimony	Metals	0.5
Lab	Backgroun	1/9/2012	BG-1D	Beryllium	0	2	EPA 6010B	BG-1D-0-2'	0.05	mg/kg	FALSE	0.1	J	(EPA) - Esti		Beryllium	Metals	0.05
Lab	Backgroun	1/9/2012	BG-1D	Biphenyl	0	2	EPA 8270C	BG-1D-0-2'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
Lab	Backgroun	1/9/2012	BG-1D	Boron	0	2	EPA 6010B	BG-1D-0-2'	30	mg/kg	FALSE	10				Boron	Metals	30
Lab	Backgroun	1/9/2012	BG-1D	Calcium	0	2	EPA 6010B	BG-1D-0-2'	100000	mg/kg	FALSE	130				Calcium	Metals	100000
Lab	Backgroun	1/9/2012	BG-1D	Chloride	0	2	EPA 9056	BG-1D-0-2'	2200	mg/kg	FALSE	50				Chloride	General Chemistry	2200
Lab	Backgroun	1/9/2012	BG-1D	Chromium (total)	0	2	EPA 6010B	BG-1D-0-2'	13	mg/kg	FALSE	0.5			Total chror	Chromium,	Metals	13
Lab	Backgroun	1/9/2012	BG-1D	Chromium (hexavalent)	0	2	EPA 7199	BG-1D-0-2'		mg/kg	TRUE	2				Chromium,	Metals	1
Lab	Backgroun	1/9/2012	BG-1D	Cobalt	0	2	EPA 6010B	BG-1D-0-2'	4.9	mg/kg	FALSE	0.5				Cobalt	Metals	4.9
Lab	Backgroun	1/9/2012	BG-1D	Copper	0	2	EPA 6010B	BG-1D-0-2'	11	mg/kg	FALSE	1				Copper	Metals	11
Lab	Backgroun	1/9/2012	BG-1D	Fluoride	0	2	EPA 300.0	BG-1D-0-2'	6.1	mg/kg	FALSE	1				Fluoride	General Chemistry	6.1
Lab	Backgroun	1/9/2012	BG-1D	Iron	0	2	EPA 6010B	BG-1D-0-2'	12000	mg/kg	FALSE	5				Iron	Metals	12000
Lab	Backgroun	1/9/2012	BG-1D	Magnesium	0	2	EPA 6010B	BG-1D-0-2'	19000	mg/kg	FALSE	5				Magnesiun	Metals	19000
Lab	Backgroun	1/9/2012	BG-1D	Manganese	0	2	EPA 6010B	BG-1D-0-2'	270	mg/kg	FALSE	0.5				Manganese	Metals	270
Lab	Backgroun	1/9/2012	BG-1D	Molybdenum	0	2	EPA 6010B	BG-1D-0-2'	0.39	mg/kg	FALSE	0.25				Molybdenu	Metals	0.39
Lab	Backgroun	1/9/2012	BG-1D	Nickel	0	2	EPA 6010B	BG-1D-0-2'	14	mg/kg	FALSE	5				Nickel	Metals	14
Lab	Backgroun	1/9/2012	BG-1D	Nitrate	0	2	EPA 300.0	BG-1D-0-2'	0.4	mg/kg	FALSE	1	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.4
Lab	Backgroun	1/9/2012	BG-1D	Potassium	0	2	EPA 6010B	BG-1D-0-2'	5100	mg/kg	FALSE	25				Potassium	Metals	5100
Lab	Backgroun	1/9/2012	BG-1D	Silica	0	2	EPA 6010B	BG-1D-0-2'	830	mg/kg	FALSE	130				Silica	Metals	830
Lab	Backgroun	1/9/2012	BG-1D	Sodium	0	2	EPA 6010B	BG-1D-0-2'	6100	mg/kg	FALSE	25				Sodium	Metals	6100
Lab	Backgroun	1/9/2012	BG-1D	Sulfate	0	2	EPA 9056	BG-1D-0-2'	6400	mg/kg	FALSE	500				Sulfate	General Chemistry	6400
Lab	Backgroun	1/9/2012	BG-1D	Thallium	0	2	EPA 6010B	BG-1D-0-2'		mg/kg	TRUE	5	O	(ESC) Samp		Thallium	Metals	2.5
Lab	Backgroun	1/9/2012	BG-1D	Phosphate as P	0	2	EPA 9056	BG-1D-0-2'		mg/kg	TRUE	1				Phosphoro	General Chemistry	0.5
Lab	Backgroun	1/9/2012	BG-1D	Vanadium	0	2	EPA 6010B	BG-1D-0-2'	23	mg/kg	FALSE	0.5				Vanadium	Metals	23
Lab	Backgroun	1/9/2012	BG-1D	Zinc	0	2	EPA 6010B	BG-1D-0-2'	78	mg/kg	FALSE	7.5				Zinc	Metals	78
Lab	Backgroun	1/9/2012	BG-1D	Benzo(b)fluoranthene	0	2	EPA 8270C	BG-1D-0-2'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Benzo(k)fluoranthene	0	2	EPA 8270C	BG-1D-0-2'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Titanium	0	2	EPA 6010B	BG-1D-0-2'	260	mg/kg	FALSE	2.5				Titanium	Metals	260
Lab	Backgroun	1/9/2012	BG-1D	Naphthalene (PAH)	0	2	EPA 8270C	BG-1D-0-2'		ug/kg	TRUE	6				Naphthaler	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Arsenic	10		EPA 6010B	BG-1D-10'	1	mg/kg	FALSE	1	P1	RPD value		Arsenic	Metals	1
Lab	Backgroun	1/9/2012	BG-1D	Barium	10		EPA 6010B	BG-1D-10'	37	mg/kg	FALSE	0.25	J3	The associa		Barium	Metals	37
Lab	Backgroun	1/9/2012	BG-1D	Cadmium	10		EPA 6010B	BG-1D-10'		mg/kg	TRUE	0.25				Cadmium	Metals	0.125
Lab	Backgroun	1/9/2012	BG-1D	Lead	10		EPA 6010B	BG-1D-10'	3.8	mg/kg	FALSE	0.25				Lead	Metals	3.8
Lab	Backgroun	1/9/2012	BG-1D	Mercury	10		EPA 7471A	BG-1D-10'	0.005	mg/kg	FALSE	0.02	J	(EPA) - Esti		Mercury	Metals	0.005
Lab	Backgroun	1/9/2012	BG-1D	Selenium	10		EPA 6010B	BG-1D-10'	0.66	mg/kg	FALSE	1	J, P1	J-(EPA) - Es		Selenium	Metals	0.66
Lab	Backgroun	1/9/2012	BG-1D	Silver	10		EPA 6010B	BG-1D-10'		mg/kg	TRUE	0.5				Silver	Metals	0.25
Lab	Backgroun	1/9/2012	BG-1D	pH	10		EPA 9045C	BG-1D-10'	8.6	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.6
Lab	Backgroun	1/9/2012	BG-1D	Acenaphthene	10		EPA 8270C	BG-1D-10'		ug/kg	TRUE	6				Acenaphth	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Anthracene	10		EPA 8270C	BG-1D-10'		ug/kg	TRUE	6				Anthracene	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)anthracene	10		EPA 8270C	BG-1D-10'		ug/kg	TRUE	6				Benzo(a)an	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Benzo(g,h,i)perylene	10		EPA 8270C	BG-1D-10'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)pyrene	10		EPA 8270C	BG-1D-10'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Bis(2-ethylhexyl)phthalate	10		EPA 8270C	BG-1D-10'		ug/kg	TRUE	330				Bis(2-ethyl	SVOC	165
Lab	Backgroun	1/9/2012	BG-1D	Chrysene	10		EPA 8270C	BG-1D-10'		ug/kg	TRUE	6				Chrysene	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Fluoranthene	10		EPA 8270C	BG-1D-10'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Indeno(1,2,3-cd)pyrene	10		EPA 8270C	BG-1D-10'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Phenanthrene	10		EPA 8270C	BG-1D-10'		ug/kg	TRUE	6				Phenanthre	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Pyrene	10		EPA 8270C	BG-1D-10'		ug/kg	TRUE	6				Pyrene	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Asbestos	10		EPA 600-R-	BG-1D-10'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	1/9/2012	BG-1D	Aluminum	10		EPA 6010B	BG-1D-10'	6400	mg/kg	FALSE	5	V	Additional		Aluminum	Metals	6400
Lab	Backgroun	1/9/2012	BG-1D	Ammonia	10		SM4500-NI	BG-1D-10'		mg/kg	TRUE	5	J6	The sample	Nitrogen, A	Ammonia	General Chemistry	2.5
Lab	Backgroun	1/9/2012	BG-1D	Antimony	10		EPA 6010B	BG-1D-10'		mg/kg	TRUE	1	J6	The sample		Antimony	Metals	0.5
Lab	Backgroun	1/9/2012	BG-1D	Beryllium	10		EPA 6010B	BG-1D-10'		mg/kg	TRUE	0.5	O	(ESC) Samp		Beryllium	Metals	0.25
Lab	Backgroun	1/9/2012	BG-1D	Biphenyl	10		EPA 8270C	BG-1D-10'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
Lab	Backgroun	1/9/2012	BG-1D	Boron	10		EPA 6010B	BG-1D-10'	6.5	mg/kg	FALSE	10	J, P1	J-(EPA) - Es		Boron	Metals	6.5
Lab	Backgroun	1/9/2012	BG-1D	Calcium	10		EPA 6010B	BG-1D-10'	79000	mg/kg	FALSE	130	V	Additional		Calcium	Metals	79000
Lab	Backgroun	1/9/2012	BG-1D	Chloride	10		EPA 9056	BG-1D-10'	490	mg/kg	FALSE	10				Chloride	General Chemistry	490
Lab	Backgroun	1/9/2012	BG-1D	Chromium (total)	10		EPA 6010B	BG-1D-10'	5.5	mg/kg	FALSE	0.5			Total chror	Chromium,	Metals	5.5
Lab	Backgroun	1/9/2012	BG-1D	Chromium (hexavalent)	10		EPA 7199	BG-1D-10'	1.1	mg/kg	FALSE	2	J	(EPA) - Esti		Chromium,	Metals	1.1
Lab	Backgroun	1/9/2012	BG-1D	Cobalt	10		EPA 6010B	BG-1D-10'	2.6	mg/kg	FALSE	0.5				Cobalt	Metals	2.6
Lab	Backgroun	1/9/2012	BG-1D	Copper	10		EPA 6010B	BG-1D-10'	4.2	mg/kg	FALSE	1				Copper	Metals	4.2
Lab	Backgroun	1/9/2012	BG-1D	Fluoride	10		EPA 300.0	BG-1D-10'	4.4	mg/kg	FALSE	1				Fluoride	General Chemistry	4.4
Lab	Backgroun	1/9/2012	BG-1D	Iron	10		EPA 6010B	BG-1D-10'	6500	mg/kg	FALSE	5	V	Additional		Iron	Metals	6500
Lab	Backgroun	1/9/2012	BG-1D	Magnesium	10		EPA 6010B	BG-1D-10'	13000	mg/kg	FALSE	5	V	Additional		Magnesiun	Metals	13000
Lab	Backgroun	1/9/2012	BG-1D	Manganese	10		EPA 6010B	BG-1D-10'	140	mg/kg	FALSE	0.5	J6	The sample		Manganese	Metals	140
Lab	Backgroun	1/9/2012	BG-1D	Molybdenum	10		EPA 6010B	BG-1D-10'	0.41	mg/kg	FALSE	0.25	P1	RPD value		Molybdenu	Metals	0.41
Lab	Backgroun	1/9/2012	BG-1D	Nickel	10		EPA 6010B	BG-1D-10'	5.9	mg/kg	FALSE	5	P1	RPD value		Nickel	Metals	5.9
Lab	Backgroun	1/9/2012	BG-1D	Nitrate	10		EPA 300.0	BG-1D-10'	0.3	mg/kg	FALSE	1	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.3
Lab	Backgroun	1/9/2012	BG-1D	Potassium	10		EPA 6010B	BG-1D-10'	2000	mg/kg	FALSE	25	V	Additional		Potassium	Metals	2000
Lab	Backgroun	1/9/2012	BG-1D	Silica	10		EPA 6010B	BG-1D-10'	740	mg/kg	FALSE	110				Silica	Metals	740
Lab	Backgroun	1/9/2012	BG-1D	Sodium	10		EPA 6010B	BG-1D-10'	2300	mg/kg	FALSE	25	V	Additional		Sodium	Metals	2300
Lab	Backgroun	1/9/2012	BG-1D	Sulfate	10		EPA 9056	BG-1D-10'	1700	mg/kg	FALSE	250				Sulfate	General Chemistry	1700
Lab	Backgroun	1/9/2012	BG-1D	Thallium	10		EPA 6010B	BG-1D-10'		mg/kg	TRUE	5	O	(ESC) Samp		Thallium	Metals	2.5
Lab	Backgroun	1/9/2012	BG-1D	Phosphate as P	10		EPA 9056	BG-1D-10'	0.4	mg/kg	FALSE	1	J	(EPA) - Esti		Phosphoro	General Chemistry	0.4
Lab	Backgroun	1/9/2012	BG-1D	Vanadium	10		EPA 6010B	BG-1D-10'	13	mg/kg	FALSE	0.5				Vanadium	Metals	13
Lab	Backgroun	1/9/2012	BG-1D	Zinc	10		EPA 6010B	BG-1D-10'	52	mg/kg	FALSE	7.5				Zinc	Metals	52
Lab	Backgroun	1/9/2012	BG-1D	Benzo(b)fluoranthene	10		EPA 8270C	BG-1D-10'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Benzo(k)fluoranthene	10		EPA 8270C	BG-1D-10'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Titanium	10		EPA 6010B	BG-1D-10'	300	mg/kg	FALSE	2.5				Titanium	Metals	300
Lab	Backgroun	1/9/2012	BG-1D	Naphthalene (PAH)	10		EPA 8270C	BG-1D-10'		ug/kg	TRUE	6				Naphthaler	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Arsenic	29		EPA 6010B	BG-1D-29'		mg/kg	TRUE	1				Arsenic	Metals	0.5
Lab	Backgroun	1/9/2012	BG-1D	Barium	29		EPA 6010B	BG-1D-29'	34	mg/kg	FALSE	0.25				Barium	Metals	34
Lab	Backgroun	1/9/2012	BG-1D	Cadmium	29		EPA 6010B	BG-1D-29'		mg/kg	TRUE	0.25				Cadmium	Metals	0.125
Lab	Backgroun	1/9/2012	BG-1D	Lead	29		EPA 6010B	BG-1D-29'	4.3	mg/kg	FALSE	0.25				Lead	Metals	4.3
Lab	Backgroun	1/9/2012	BG-1D	Mercury	29		EPA 7471A	BG-1D-29'	0.0093	mg/kg	FALSE	0.02	J	(EPA) - Esti		Mercury	Metals	0.0093
Lab	Backgroun	1/9/2012	BG-1D	Selenium	29		EPA 6010B	BG-1D-29'		mg/kg	TRUE	1				Selenium	Metals	0.5
Lab	Backgroun	1/9/2012	BG-1D	Silver	29		EPA 6010B	BG-1D-29'		mg/kg	TRUE	0.5				Silver	Metals	0.25
Lab	Backgroun	1/9/2012	BG-1D	pH	29		EPA 9045C	BG-1D-29'	8.2	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.2
Lab	Backgroun	1/9/2012	BG-1D	Acenaphthene	29		EPA 8270C	BG-1D-29'		ug/kg	TRUE	6				Acenaphth	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Anthracene	29		EPA 8270C	BG-1D-29'		ug/kg	TRUE	6				Anthracene	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)anthracene	29		EPA 8270C	BG-1D-29'		ug/kg	TRUE	6				Benzo(a)an	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Benzo(g,h,i)perylene	29		EPA 8270C	BG-1D-29'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)pyrene	29		EPA 8270C	BG-1D-29'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Bis(2-ethylhexyl)phthalate	29		EPA 8270C	BG-1D-29'		ug/kg	TRUE	330				Bis(2-ethyl	SVOC	165
Lab	Backgroun	1/9/2012	BG-1D	Chrysene	29		EPA 8270C	BG-1D-29'		ug/kg	TRUE	6				Chrysene	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Fluoranthene	29		EPA 8270C	BG-1D-29'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Indeno(1,2,3-cd)pyrene	29		EPA 8270C	BG-1D-29'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3

Lab	Backgroun	1/9/2012	BG-1D	Phenanthrene	29
Lab	Backgroun	1/9/2012	BG-1D	Pyrene	29
Lab	Backgroun	1/9/2012	BG-1D	Asbestos	29
Lab	Backgroun	1/9/2012	BG-1D	Aluminum	29
Lab	Backgroun	1/9/2012	BG-1D	Ammonia	29
Lab	Backgroun	1/9/2012	BG-1D	Antimony	29
Lab	Backgroun	1/9/2012	BG-1D	Beryllium	29
Lab	Backgroun	1/9/2012	BG-1D	Biphenyl	29
Lab	Backgroun	1/9/2012	BG-1D	Boron	29
Lab	Backgroun	1/9/2012	BG-1D	Calcium	29
Lab	Backgroun	1/9/2012	BG-1D	Chloride	29
Lab	Backgroun	1/9/2012	BG-1D	Chromium (total)	29
Lab	Backgroun	1/9/2012	BG-1D	Chromium (hexavalent)	29
Lab	Backgroun	1/9/2012	BG-1D	Cobalt	29
Lab	Backgroun	1/9/2012	BG-1D	Copper	29
Lab	Backgroun	1/9/2012	BG-1D	Fluoride	29
Lab	Backgroun	1/9/2012	BG-1D	Iron	29
Lab	Backgroun	1/9/2012	BG-1D	Magnesium	29
Lab	Backgroun	1/9/2012	BG-1D	Manganese	29
Lab	Backgroun	1/9/2012	BG-1D	Molybdenum	29
Lab	Backgroun	1/9/2012	BG-1D	Nickel	29
Lab	Backgroun	1/9/2012	BG-1D	Nitrate	29
Lab	Backgroun	1/9/2012	BG-1D	Potassium	29
Lab	Backgroun	1/9/2012	BG-1D	Silica	29
Lab	Backgroun	1/9/2012	BG-1D	Sodium	29
Lab	Backgroun	1/9/2012	BG-1D	Sulfate	29
Lab	Backgroun	1/9/2012	BG-1D	Thallium	29
Lab	Backgroun	1/9/2012	BG-1D	Phosphate as P	29
Lab	Backgroun	1/9/2012	BG-1D	Vanadium	29
Lab	Backgroun	1/9/2012	BG-1D	Zinc	29
Lab	Backgroun	1/9/2012	BG-1D	Benzo(b)fluoranthene	29
Lab	Backgroun	1/9/2012	BG-1D	Benzo(k)fluoranthene	29
Lab	Backgroun	1/9/2012	BG-1D	Titanium	29
Lab	Backgroun	1/9/2012	BG-1D	Naphthalene (PAH)	29
Lab	Backgroun	1/9/2012	BG-1D	Arsenic	40
Lab	Backgroun	1/9/2012	BG-1D	Barium	40
Lab	Backgroun	1/9/2012	BG-1D	Cadmium	40
Lab	Backgroun	1/9/2012	BG-1D	Lead	40
Lab	Backgroun	1/9/2012	BG-1D	Mercury	40
Lab	Backgroun	1/9/2012	BG-1D	Selenium	40
Lab	Backgroun	1/9/2012	BG-1D	Silver	40
Lab	Backgroun	1/9/2012	BG-1D	pH	40
Lab	Backgroun	1/9/2012	BG-1D	Acenaphthene	40
Lab	Backgroun	1/9/2012	BG-1D	Anthracene	40
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)anthracene	40
Lab	Backgroun	1/9/2012	BG-1D	Benzo(g,h,i)perylene	40
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)pyrene	40
Lab	Backgroun	1/9/2012	BG-1D	Bis(2-ethylhexyl)phthalate	40
Lab	Backgroun	1/9/2012	BG-1D	Chrysene	40
Lab	Backgroun	1/9/2012	BG-1D	Fluoranthene	40
Lab	Backgroun	1/9/2012	BG-1D	Indeno(1,2,3-cd)pyrene	40
Lab	Backgroun	1/9/2012	BG-1D	Phenanthrene	40
Lab	Backgroun	1/9/2012	BG-1D	Pyrene	40
Lab	Backgroun	1/9/2012	BG-1D	Asbestos	40
Lab	Backgroun	1/9/2012	BG-1D	Aluminum	40
Lab	Backgroun	1/9/2012	BG-1D	Ammonia	40
Lab	Backgroun	1/9/2012	BG-1D	Antimony	40
Lab	Backgroun	1/9/2012	BG-1D	Beryllium	40
Lab	Backgroun	1/9/2012	BG-1D	Biphenyl	40
Lab	Backgroun	1/9/2012	BG-1D	Boron	40
Lab	Backgroun	1/9/2012	BG-1D	Calcium	40
Lab	Backgroun	1/9/2012	BG-1D	Chloride	40
Lab	Backgroun	1/9/2012	BG-1D	Chromium (total)	40
Lab	Backgroun	1/9/2012	BG-1D	Chromium (hexavalent)	40
Lab	Backgroun	1/9/2012	BG-1D	Cobalt	40
Lab	Backgroun	1/9/2012	BG-1D	Copper	40
Lab	Backgroun	1/9/2012	BG-1D	Fluoride	40
Lab	Backgroun	1/9/2012	BG-1D	Iron	40
Lab	Backgroun	1/9/2012	BG-1D	Magnesium	40
Lab	Backgroun	1/9/2012	BG-1D	Manganese	40
Lab	Backgroun	1/9/2012	BG-1D	Molybdenum	40
Lab	Backgroun	1/9/2012	BG-1D	Nickel	40
Lab	Backgroun	1/9/2012	BG-1D	Nitrate	40
Lab	Backgroun	1/9/2012	BG-1D	Potassium	40
Lab	Backgroun	1/9/2012	BG-1D	Silica	40
Lab	Backgroun	1/9/2012	BG-1D	Sodium	40
Lab	Backgroun	1/9/2012	BG-1D	Sulfate	40
Lab	Backgroun	1/9/2012	BG-1D	Thallium	40
Lab	Backgroun	1/9/2012	BG-1D	Phosphate as P	40
Lab	Backgroun	1/9/2012	BG-1D	Vanadium	40
Lab	Backgroun	1/9/2012	BG-1D	Zinc	40
Lab	Backgroun	1/9/2012	BG-1D	Benzo(b)fluoranthene	40
Lab	Backgroun	1/9/2012	BG-1D	Benzo(k)fluoranthene	40
Lab	Backgroun	1/9/2012	BG-1D	Titanium	40
Lab	Backgroun	1/9/2012	BG-1D	Naphthalene (PAH)	40
Lab	Backgroun	1/9/2012	BG-1D	Arsenic	43
Lab	Backgroun	1/9/2012	BG-1D	Barium	43
Lab	Backgroun	1/9/2012	BG-1D	Cadmium	43
Lab	Backgroun	1/9/2012	BG-1D	Lead	43
Lab	Backgroun	1/9/2012	BG-1D	Mercury	43
Lab	Backgroun	1/9/2012	BG-1D	Selenium	43
Lab	Backgroun	1/9/2012	BG-1D	Silver	43
Lab	Backgroun	1/9/2012	BG-1D	pH	43
Lab	Backgroun	1/9/2012	BG-1D	Acenaphthene	43
Lab	Backgroun	1/9/2012	BG-1D	Anthracene	43
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)anthracene	43
Lab	Backgroun	1/9/2012	BG-1D	Benzo(g,h,i)perylene	43
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)pyrene	43
Lab	Backgroun	1/9/2012	BG-1D	Bis(2-ethylhexyl)phthalate	43
Lab	Backgroun	1/9/2012	BG-1D	Chrysene	43
Lab	Backgroun	1/9/2012	BG-1D	Fluoranthene	43
Lab	Backgroun	1/9/2012	BG-1D	Indeno(1,2,3-cd)pyrene	43
Lab	Backgroun	1/9/2012	BG-1D	Phenanthrene	43
Lab	Backgroun	1/9/2012	BG-1D	Pyrene	43
Lab	Backgroun	1/9/2012	BG-1D	Asbestos	43
Lab	Backgroun	1/9/2012	BG-1D	Aluminum	43
Lab	Backgroun	1/9/2012	BG-1D	Ammonia	43
Lab	Backgroun	1/9/2012	BG-1D	Antimony	43
Lab	Backgroun	1/9/2012	BG-1D	Beryllium	43
Lab	Backgroun	1/9/2012	BG-1D	Biphenyl	43
Lab	Backgroun	1/9/2012	BG-1D	Boron	43
Lab	Backgroun	1/9/2012	BG-1D	Calcium	43
Lab	Backgroun	1/9/2012	BG-1D	Chloride	43
Lab	Backgroun	1/9/2012	BG-1D	Chromium (total)	43
Lab	Backgroun	1/9/2012	BG-1D	Chromium (hexavalent)	43
Lab	Backgroun	1/9/2012	BG-1D	Cobalt	43
Lab	Backgroun	1/9/2012	BG-1D	Copper	43
Lab	Backgroun	1/9/2012	BG-1D	Fluoride	43
Lab	Backgroun	1/9/2012	BG-1D	Iron	43
Lab	Backgroun	1/9/2012	BG-1D	Magnesium	43
Lab	Backgroun	1/9/2012	BG-1D	Manganese	43
Lab	Backgroun	1/9/2012	BG-1D	Molybdenum	43
Lab	Backgroun	1/9/2012	BG-1D	Nickel	43
Lab	Backgroun	1/9/2012	BG-1D	Nitrate	43
Lab	Backgroun	1/9/2012	BG-1D	Potassium	43
Lab	Backgroun	1/9/2012	BG-1D	Silica	43
Lab	Backgroun	1/9/2012	BG-1D	Sodium	43
Lab	Backgroun	1/9/2012	BG-1D	Sulfate	43
Lab	Backgroun	1/9/2012	BG-1D	Thallium	43
Lab	Backgroun	1/9/2012	BG-1D	Phosphate as P	43
Lab	Backgroun	1/9/2012	BG-1D	Vanadium	43
Lab	Backgroun	1/9/2012	BG-1D	Zinc	43

EPA 8270C	BG-1D-29'		ug/kg	TRUE	6				Phenanthre	PAHs	3
EPA 8270C	BG-1D-29'		ug/kg	TRUE	6				Pyrene	PAHs	3
EPA 600-R-	BG-1D-29'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-1D-29'	8600	mg/kg	FALSE	5				Aluminum	Metals	8600
SM4500-NI	BG-1D-29'		mg/kg	TRUE	5			Nitrogen, A	Ammonia	General Chemistry	2.5
EPA 6010B	BG-1D-29'		mg/kg	TRUE	1				Antimony	Metals	0.5
EPA 6010B	BG-1D-29'		mg/kg	TRUE	0.5	O	(ESC) Samp		Beryllium	Metals	0.25
EPA 8270C	BG-1D-29'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
EPA 6010B	BG-1D-29'	3.3	mg/kg	FALSE	10	J	(EPA) - Esti		Boron	Metals	3.3
EPA 6010B	BG-1D-29'	48000	mg/kg	FALSE	25				Calcium	Metals	48000
EPA 9056	BG-1D-29'	89	mg/kg	FALSE	10				Chloride	General Chemistry	89
EPA 6010B	BG-1D-29'	7.5	mg/kg	FALSE	0.5			Total chror	Chromium,	Metals	7.5
EPA 7199	BG-1D-29'	0.92	mg/kg	FALSE	2	J	(EPA) - Esti		Chromium,	Metals	0.92
EPA 6010B	BG-1D-29'	2.7	mg/kg	FALSE	0.5				Cobalt	Metals	2.7
EPA 6010B	BG-1D-29'	5.8	mg/kg	FALSE	1				Copper	Metals	5.8
EPA 300.0	BG-1D-29'	11	mg/kg	FALSE	1				Fluoride	General Chemistry	11
EPA 6010B	BG-1D-29'	8000	mg/kg	FALSE	5				Iron	Metals	8000
EPA 6010B	BG-1D-29'	11000	mg/kg	FALSE	5				Magnesiun	Metals	11000
EPA 6010B	BG-1D-29'	110	mg/kg	FALSE	0.5				Manganese	Metals	110
EPA 6010B	BG-1D-29'		mg/kg	TRUE	0.25				Molybdenu	Metals	0.125
EPA 6010B	BG-1D-29'	6.5	mg/kg	FALSE	1				Nickel	Metals	6.5
EPA 300.0	BG-1D-29'	0.33	mg/kg	FALSE	1	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.33
EPA 6010B	BG-1D-29'	2400	mg/kg	FALSE	25				Potassium	Metals	2400
EPA 6010B	BG-1D-29'	720	mg/kg	FALSE	130				Silica	Metals	720
EPA 6010B	BG-1D-29'	370	mg/kg	FALSE	25				Sodium	Metals	370
EPA 9056	BG-1D-29'	170	mg/kg	FALSE	50				Sulfate	General Chemistry	170
EPA 6010B	BG-1D-29'		mg/kg	TRUE	5	O	(ESC) Samp		Thallium	Metals	2.5
EPA 9056	BG-1D-29'		mg/kg	TRUE	1				Phosphoro	General Chemistry	0.5
EPA 6010B	BG-1D-29'	18	mg/kg	FALSE	0.5				Vanadium	Metals	18
EPA 6010B	BG-1D-29'	41	mg/kg	FALSE	1.5				Zinc	Metals	41
EPA 8270C	BG-1D-29'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
EPA 8270C	BG-1D-29'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
EPA 6010B	BG-1D-29'	280	mg/kg	FALSE	0.5				Titanium	Metals	280
EPA 8270C	BG-1D-29'		ug/kg	TRUE	6				Naphthaler	PAHs	3
EPA 6010B	BG-1D-40'	0.97	mg/kg	FALSE	1	J	(EPA) - Esti		Arsenic	Metals	0.97
EPA 6010B	BG-1D-40'	22	mg/kg	FALSE	0.25				Barium	Metals	22
EPA 6010B	BG-1D-40'		mg/kg	TRUE	0.25				Cadmium	Metals	0.125
EPA 6010B	BG-1D-40'	0.76	mg/kg	FALSE	0.25				Lead	Metals	0.76
EPA 7471A	BG-1D-40'	0.0068	mg/kg	FALSE	0.02	J	(EPA) - Esti		Mercury	Metals	0.0068
EPA 6010B	BG-1D-40'		mg/kg	TRUE	1				Selenium	Metals	0.5
EPA 6010B	BG-1D-40'		mg/kg	TRUE	0.5				Silver	Metals	0.25
EPA 9045C	BG-1D-40'	9.1	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	9.1
EPA 8270C	BG-1D-40'		ug/kg	TRUE	6				Acenaphth	PAHs	3
EPA 8270C	BG-1D-40'		ug/kg	TRUE	6				Anthracene	PAHs	3
EPA 8270C	BG-1D-40'		ug/kg	TRUE	6				Benzo(a)an	PAHs	3
EPA 8270C	BG-1D-40'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
EPA 8270C	BG-1D-40'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
EPA 8270C	BG-1D-40'		ug/kg	TRUE	330				Bis(2-ethyl	SVOC	165
EPA 8270C	BG-1D-40'		ug/kg	TRUE	6				Chrysene	PAHs	3
EPA 8270C	BG-1D-40'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
EPA 8270C	BG-1D-40'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3
EPA 8270C	BG-1D-40'		ug/kg	TRUE	6				Phenanthre	PAHs	3
EPA 8270C	BG-1D-40'		ug/kg	TRUE	6				Pyrene	PAHs	3
EPA 600-R-	BG-1D-40'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-1D-40'	2800	mg/kg	FALSE	5				Aluminum	Metals	2800
SM4500-NI	BG-1D-40'		mg/kg	TRUE	5			Nitrogen, A	Ammonia	General Chemistry	2.5
EPA 6010B	BG-1D-40'		mg/kg	TRUE	1				Antimony	Metals	0.5
EPA 6010B	BG-1D-40'		mg/kg	TRUE	0.5	O	(ESC) Samp		Beryllium	Metals	0.25
EPA 8270C	BG-1D-40'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
EPA 6010B	BG-1D-40'		mg/kg	TRUE	10				Boron	Metals	5
EPA 6010B	BG-1D-40'	140000	mg/kg	FALSE	130				Calcium	Metals	140000
EPA 9056	BG-1D-40'	65	mg/kg	FALSE	10				Chloride	General Chemistry	65
EPA 6010B	BG-1D-40'	3.2	mg/kg	FALSE	0.5			Total chror	Chromium,	Metals	3.2
EPA 7199	BG-1D-40'		mg/kg	TRUE	2				Chromium,	Metals	1
EPA 6010B	BG-1D-40'	0.89	mg/kg	FALSE	0.5				Cobalt	Metals	0.89
EPA 6010B	BG-1D-40'	2.9	mg/kg	FALSE	1				Copper	Metals	2.9
EPA 300.0	BG-1D-40'	4.2	mg/kg	FALSE	1				Fluoride	General Chemistry	4.2
EPA 6010B	BG-1D-40'	3800	mg/kg	FALSE	5				Iron	Metals	3800
EPA 6010B	BG-1D-40'	30000	mg/kg	FALSE	5				Magnesiun	Metals	30000
EPA 6010B	BG-1D-40'	68	mg/kg	FALSE	0.5				Manganese	Metals	68
EPA 6010B	BG-1D-40'	0.61	mg/kg	FALSE	0.25				Molybdenu	Metals	0.61
EPA 6010B	BG-1D-40'		mg/kg	TRUE	5	O	(ESC) Samp		Nickel	Metals	2.5
EPA 300.0	BG-1D-40'	0.32	mg/kg	FALSE	1	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.32
EPA 6010B	BG-1D-40'	670	mg/kg	FALSE	25				Potassium	Metals	670
EPA 6010B	BG-1D-40'	550	mg/kg	FALSE	110				Silica	Metals	550
EPA 6010B	BG-1D-40'	350	mg/kg	FALSE	25				Sodium	Metals	350
EPA 9056	BG-1D-40'	58	mg/kg	FALSE	50				Sulfate	General Chemistry	58
EPA 6010B	BG-1D-40'	1.6	mg/kg	FALSE	1				Thallium	Metals	1.6
EPA 9056	BG-1D-40'		mg/kg	TRUE	1				Phosphoro	General Chemistry	0.5
EPA 6010B	BG-1D-40'	8.1	mg/kg	FALSE	0.5				Vanadium	Metals	8.1
EPA 6010B	BG-1D-40'	63	mg/kg	FALSE	7.5				Zinc	Metals	63
EPA 8270C	BG-1D-40'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
EPA 8270C	BG-1D-40'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
EPA 6010B	BG-1D-40'	160	mg/kg	FALSE	2.5				Titanium	Metals	160
EPA 8270C	BG-1D-40'		ug/kg	TRUE	6				Naphthaler	PAHs	3
EPA 6010B	BG-1D-43'	9.1	mg/kg	FALSE	1				Arsenic	Metals	9.1
EPA 6010B	BG-1D-43'	23	mg/kg	FALSE	0.25				Barium	Metals	23
EPA 6010B	BG-1D-43'		mg/kg	TRUE	0.25				Cadmium	Metals	0.125
EPA 6010B	BG-1D-43'	11	mg/kg	FALSE	0.25				Lead	Metals	11
EPA 7471A	BG-1D-43'	0.0091	mg/kg	FALSE	0.02	J	(EPA) - Esti		Mercury	Metals	0.0091
EPA 6010B	BG-1D-43'	1.4	mg/kg	FALSE	1				Selenium	Metals	1.4
EPA 6010B	BG-1D-43'		mg/kg	TRUE	0.5				Silver	Metals	0.25
EPA 9045C	BG-1D-43'	8.2	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.2
EPA 8270C	BG-1D-43'		ug/kg	TRUE	6				Acenaphth	PAHs	3
EPA 8270C	BG-1D-43'		ug/kg	TRUE	6				Anthracene	PAHs	3
EPA 8270C	BG-1D-43'		ug/kg	TRUE	6				Benzo(a)an	PAHs	3
EPA 8270C	BG-1D-43'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
EPA 8270C	BG-1D-43'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
EPA 8270C	BG-1D-43'		ug/kg	TRUE	330				Bis(2-ethyl	SVOC	165
EPA 8270C	BG-1D-43'		ug/kg	TRUE	6				Chrysene	PAHs	3
EPA 8270C	BG-1D-43'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
EPA 8270C	BG-1D-43'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3
EPA 8270C	BG-1D-43'		ug/kg	TRUE	6				Phenanthre	PAHs	3
EPA 8270C	BG-1D-43'		ug/kg	TRUE	6				Pyrene	PAHs	3
EPA 600-R-	BG-1D-43'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-1D-43'	22000	mg/kg	FALSE	5				Aluminum	Metals	22000
SM4500-NI	BG-1D-43'	10	mg/kg	FALSE	5			Nitrogen, A	Ammonia	General Chemistry	10
EPA 6010B	BG-1D-43'		mg/kg	TRUE	1				Antimony	Metals	0.5
EPA 6010B	BG-1D-43'	1.1	mg/kg	FALSE	0.1				Beryllium	Metals	1.1
EPA 8270C	BG-1D-43'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
EPA 6010B	BG-1D-43'	16	mg/kg	FALSE	10				Boron	Metals	16
EPA 6010B	BG-1D-43'	31000	mg/kg	FALSE	25				Calcium	Metals	31000
EPA 9056	BG-1D-43'	210	mg/kg	FALSE	10				Chloride	General Chemistry	210
EPA 6010B	BG-1D-43'	20	mg/kg	FALSE	0.5			Total chror	Chromium,	Metals	20
EPA 7199	BG-1D-43'		mg/kg	TRUE	2				Chromium,	Metals	1
EPA 6010B	BG-1D-43'	5.9	mg/kg	FALSE	0.5				Cobalt	Metals	5.9
EPA 6010B	BG-1D-43'	12	mg/kg	FALSE	1				Copper	Metals	12
EPA 300.0	BG-1D-43'	14	mg/kg	FALSE	1				Fluoride	General Chemistry	14
EPA 6010B	BG-1D-43'	17000	mg/kg	FALSE	5				Iron	Metals	17000
EPA 6010B	BG-1D-43'	10000	mg/kg	FALSE	5				Magnesiun	Metals	10000
EPA 6010B	BG-1D-43'	160	mg/kg	FALSE	0.5				Manganese	Metals	160
EPA 6010B	BG-1D-43'		mg/kg	TRUE	1.3	O	(ESC) Samp		Molybdenu	Metals	0.65
EPA 6010B	BG-1D-43'	20	mg/kg	FALSE	1				Nickel	Metals	20
EPA 300.0	BG-1D-43'	0.55	mg/kg	FALSE	1	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.55
EPA 6010B	BG-1D-43'	6700	mg/kg	FALSE	25				Potassium	Metals	6700
EPA 6010B	BG-1D-43'	1300	mg/kg	FALSE	120				Silica	Metals	1300
EPA 6010B	BG-1D-43'	440	mg/kg	FALSE	25				Sodium	Metals	440
EPA 9056	BG-1D-43'	140	mg/kg	FALSE	50				Sulfate	General Chemistry	140
EPA 6010B	BG-1D-43'		mg/kg	TRUE	5	O	(ESC) Samp		Thallium	Metals	2.5
EPA 9056	BG-1D-43'		mg/kg	TRUE	1				Phosphoro	General Chemistry	0.5
EPA 6010B	BG-1D-43'	27	mg/kg	FALSE	0.5				Vanadium	Metals	27
EPA 6010B	BG-1D-43'	64	mg/kg	FALSE	1.5				Zinc	Metals	64

Lab	Backgroun	1/9/2012	BG-1D	Benzo(b)fluoranthene	43
Lab	Backgroun	1/9/2012	BG-1D	Benzo(k)fluoranthene	43
Lab	Backgroun	1/9/2012	BG-1D	Titanium	43
Lab	Backgroun	1/9/2012	BG-1D	Naphthalene (PAH)	43
Lab	Backgroun	1/9/2012	BG-1D	Arsenic	46
Lab	Backgroun	1/9/2012	BG-1D	Barium	46
Lab	Backgroun	1/9/2012	BG-1D	Cadmium	46
Lab	Backgroun	1/9/2012	BG-1D	Lead	46
Lab	Backgroun	1/9/2012	BG-1D	Mercury	46
Lab	Backgroun	1/9/2012	BG-1D	Selenium	46
Lab	Backgroun	1/9/2012	BG-1D	Silver	46
Lab	Backgroun	1/9/2012	BG-1D	pH	46
Lab	Backgroun	1/9/2012	BG-1D	Acenaphthene	46
Lab	Backgroun	1/9/2012	BG-1D	Anthracene	46
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)anthracene	46
Lab	Backgroun	1/9/2012	BG-1D	Benzo(g,h,i)perylene	46
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)pyrene	46
Lab	Backgroun	1/9/2012	BG-1D	Bis(2-ethylhexyl)phthalate	46
Lab	Backgroun	1/9/2012	BG-1D	Chrysene	46
Lab	Backgroun	1/9/2012	BG-1D	Fluoranthene	46
Lab	Backgroun	1/9/2012	BG-1D	Indeno(1,2,3-cd)pyrene	46
Lab	Backgroun	1/9/2012	BG-1D	Phenanthrene	46
Lab	Backgroun	1/9/2012	BG-1D	Pyrene	46
Lab	Backgroun	1/9/2012	BG-1D	Asbestos	46
Lab	Backgroun	1/9/2012	BG-1D	Aluminum	46
Lab	Backgroun	1/9/2012	BG-1D	Ammonia	46
Lab	Backgroun	1/9/2012	BG-1D	Antimony	46
Lab	Backgroun	1/9/2012	BG-1D	Beryllium	46
Lab	Backgroun	1/9/2012	BG-1D	Biphenyl	46
Lab	Backgroun	1/9/2012	BG-1D	Boron	46
Lab	Backgroun	1/9/2012	BG-1D	Calcium	46
Lab	Backgroun	1/9/2012	BG-1D	Chloride	46
Lab	Backgroun	1/9/2012	BG-1D	Chromium (total)	46
Lab	Backgroun	1/9/2012	BG-1D	Chromium (hexavalent)	46
Lab	Backgroun	1/9/2012	BG-1D	Cobalt	46
Lab	Backgroun	1/9/2012	BG-1D	Copper	46
Lab	Backgroun	1/9/2012	BG-1D	Fluoride	46
Lab	Backgroun	1/9/2012	BG-1D	Iron	46
Lab	Backgroun	1/9/2012	BG-1D	Magnesium	46
Lab	Backgroun	1/9/2012	BG-1D	Manganese	46
Lab	Backgroun	1/9/2012	BG-1D	Molybdenum	46
Lab	Backgroun	1/9/2012	BG-1D	Nickel	46
Lab	Backgroun	1/9/2012	BG-1D	Nitrate	46
Lab	Backgroun	1/9/2012	BG-1D	Potassium	46
Lab	Backgroun	1/9/2012	BG-1D	Silica	46
Lab	Backgroun	1/9/2012	BG-1D	Sodium	46
Lab	Backgroun	1/9/2012	BG-1D	Sulfate	46
Lab	Backgroun	1/9/2012	BG-1D	Thallium	46
Lab	Backgroun	1/9/2012	BG-1D	Phosphate as P	46
Lab	Backgroun	1/9/2012	BG-1D	Vanadium	46
Lab	Backgroun	1/9/2012	BG-1D	Zinc	46
Lab	Backgroun	1/9/2012	BG-1D	Benzo(b)fluoranthene	46
Lab	Backgroun	1/9/2012	BG-1D	Benzo(k)fluoranthene	46
Lab	Backgroun	1/9/2012	BG-1D	Titanium	46
Lab	Backgroun	1/9/2012	BG-1D	Naphthalene (PAH)	46
Lab	Backgroun	1/9/2012	BG-1D	Arsenic	55
Lab	Backgroun	1/9/2012	BG-1D	Barium	55
Lab	Backgroun	1/9/2012	BG-1D	Cadmium	55
Lab	Backgroun	1/9/2012	BG-1D	Lead	55
Lab	Backgroun	1/9/2012	BG-1D	Mercury	55
Lab	Backgroun	1/9/2012	BG-1D	Selenium	55
Lab	Backgroun	1/9/2012	BG-1D	Silver	55
Lab	Backgroun	1/9/2012	BG-1D	pH	55
Lab	Backgroun	1/9/2012	BG-1D	Acenaphthene	55
Lab	Backgroun	1/9/2012	BG-1D	Anthracene	55
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)anthracene	55
Lab	Backgroun	1/9/2012	BG-1D	Benzo(g,h,i)perylene	55
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)pyrene	55
Lab	Backgroun	1/9/2012	BG-1D	Bis(2-ethylhexyl)phthalate	55
Lab	Backgroun	1/9/2012	BG-1D	Chrysene	55
Lab	Backgroun	1/9/2012	BG-1D	Fluoranthene	55
Lab	Backgroun	1/9/2012	BG-1D	Indeno(1,2,3-cd)pyrene	55
Lab	Backgroun	1/9/2012	BG-1D	Phenanthrene	55
Lab	Backgroun	1/9/2012	BG-1D	Pyrene	55
Lab	Backgroun	1/9/2012	BG-1D	Asbestos	55
Lab	Backgroun	1/9/2012	BG-1D	Aluminum	55
Lab	Backgroun	1/9/2012	BG-1D	Ammonia	55
Lab	Backgroun	1/9/2012	BG-1D	Antimony	55
Lab	Backgroun	1/9/2012	BG-1D	Beryllium	55
Lab	Backgroun	1/9/2012	BG-1D	Biphenyl	55
Lab	Backgroun	1/9/2012	BG-1D	Boron	55
Lab	Backgroun	1/9/2012	BG-1D	Calcium	55
Lab	Backgroun	1/9/2012	BG-1D	Chloride	55
Lab	Backgroun	1/9/2012	BG-1D	Chromium (total)	55
Lab	Backgroun	1/9/2012	BG-1D	Chromium (hexavalent)	55
Lab	Backgroun	1/9/2012	BG-1D	Cobalt	55
Lab	Backgroun	1/9/2012	BG-1D	Copper	55
Lab	Backgroun	1/9/2012	BG-1D	Fluoride	55
Lab	Backgroun	1/9/2012	BG-1D	Iron	55
Lab	Backgroun	1/9/2012	BG-1D	Magnesium	55
Lab	Backgroun	1/9/2012	BG-1D	Manganese	55
Lab	Backgroun	1/9/2012	BG-1D	Molybdenum	55
Lab	Backgroun	1/9/2012	BG-1D	Nickel	55
Lab	Backgroun	1/9/2012	BG-1D	Nitrate	55
Lab	Backgroun	1/9/2012	BG-1D	Potassium	55
Lab	Backgroun	1/9/2012	BG-1D	Silica	55
Lab	Backgroun	1/9/2012	BG-1D	Sodium	55
Lab	Backgroun	1/9/2012	BG-1D	Sulfate	55
Lab	Backgroun	1/9/2012	BG-1D	Thallium	55
Lab	Backgroun	1/9/2012	BG-1D	Phosphate as P	55
Lab	Backgroun	1/9/2012	BG-1D	Vanadium	55
Lab	Backgroun	1/9/2012	BG-1D	Zinc	55
Lab	Backgroun	1/9/2012	BG-1D	Benzo(b)fluoranthene	55
Lab	Backgroun	1/9/2012	BG-1D	Benzo(k)fluoranthene	55
Lab	Backgroun	1/9/2012	BG-1D	Titanium	55
Lab	Backgroun	1/9/2012	BG-1D	Naphthalene (PAH)	55
Lab	Backgroun	1/9/2012	BG-1D	Arsenic	78
Lab	Backgroun	1/9/2012	BG-1D	Barium	78
Lab	Backgroun	1/9/2012	BG-1D	Cadmium	78
Lab	Backgroun	1/9/2012	BG-1D	Lead	78
Lab	Backgroun	1/9/2012	BG-1D	Mercury	78
Lab	Backgroun	1/9/2012	BG-1D	Selenium	78
Lab	Backgroun	1/9/2012	BG-1D	Silver	78
Lab	Backgroun	1/9/2012	BG-1D	pH	78
Lab	Backgroun	1/9/2012	BG-1D	Acenaphthene	78
Lab	Backgroun	1/9/2012	BG-1D	Anthracene	78
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)anthracene	78
Lab	Backgroun	1/9/2012	BG-1D	Benzo(g,h,i)perylene	78
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)pyrene	78
Lab	Backgroun	1/9/2012	BG-1D	Bis(2-ethylhexyl)phthalate	78
Lab	Backgroun	1/9/2012	BG-1D	Chrysene	78
Lab	Backgroun	1/9/2012	BG-1D	Fluoranthene	78
Lab	Backgroun	1/9/2012	BG-1D	Indeno(1,2,3-cd)pyrene	78
Lab	Backgroun	1/9/2012	BG-1D	Phenanthrene	78
Lab	Backgroun	1/9/2012	BG-1D	Pyrene	78
Lab	Backgroun	1/9/2012	BG-1D	Asbestos	78
Lab	Backgroun	1/9/2012	BG-1D	Aluminum	78
Lab	Backgroun	1/9/2012	BG-1D	Ammonia	78
Lab	Backgroun	1/9/2012	BG-1D	Antimony	78
Lab	Backgroun	1/9/2012	BG-1D	Beryllium	78
Lab	Backgroun	1/9/2012	BG-1D	Biphenyl	78
Lab	Backgroun	1/9/2012	BG-1D	Boron	78

EPA 8270C	BG-1D-43'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
EPA 8270C	BG-1D-43'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
EPA 6010B	BG-1D-43'	21	mg/kg	FALSE	0.5				Titanium	Metals	21
EPA 8270C	BG-1D-43'		ug/kg	TRUE	6				Naphthaler	PAHs	3
EPA 6010B	BG-1D-46'	1.8	mg/kg	FALSE	1				Arsenic	Metals	1.8
EPA 6010B	BG-1D-46'	140	mg/kg	FALSE	0.25				Barium	Metals	140
EPA 6010B	BG-1D-46'		mg/kg	TRUE	0.25				Cadmium	Metals	0.125
EPA 6010B	BG-1D-46'	3.1	mg/kg	FALSE	0.25				Lead	Metals	3.1
EPA 7471A	BG-1D-46'	0.0018	mg/kg	FALSE	0.02	J	(EPA) - Esti		Mercury	Metals	0.0018
EPA 6010B	BG-1D-46'		mg/kg	TRUE	1				Selenium	Metals	0.5
EPA 6010B	BG-1D-46'		mg/kg	TRUE	0.5				Silver	Metals	0.25
EPA 9045C	BG-1D-46'	8.6	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.6
EPA 8270C	BG-1D-46'		ug/kg	TRUE	6				Acenaphth	PAHs	3
EPA 8270C	BG-1D-46'		ug/kg	TRUE	6				Anthracene	PAHs	3
EPA 8270C	BG-1D-46'		ug/kg	TRUE	6				Benzo(a)ar	PAHs	3
EPA 8270C	BG-1D-46'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
EPA 8270C	BG-1D-46'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
EPA 8270C	BG-1D-46'		ug/kg	TRUE	330				Bis(2-ethyl	SVOC	165
EPA 8270C	BG-1D-46'		ug/kg	TRUE	6				Chrysene	PAHs	3
EPA 8270C	BG-1D-46'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
EPA 8270C	BG-1D-46'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3
EPA 8270C	BG-1D-46'		ug/kg	TRUE	6				Phenanthre	PAHs	3
EPA 8270C	BG-1D-46'		ug/kg	TRUE	6				Pyrene	PAHs	3
EPA 600-R-	BG-1D-46'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-1D-46'	5600	mg/kg	FALSE	5				Aluminum	Metals	5600
SM4500-NI	BG-1D-46'		mg/kg	TRUE	5			Nitrogen, A	Ammonia	General Chemistry	2.5
EPA 6010B	BG-1D-46'		mg/kg	TRUE	1				Antimony	Metals	0.5
EPA 6010B	BG-1D-46'	0.13	mg/kg	FALSE	0.1				Beryllium	Metals	0.13
EPA 8270C	BG-1D-46'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
EPA 6010B	BG-1D-46'	11	mg/kg	FALSE	10				Boron	Metals	11
EPA 6010B	BG-1D-46'	46000	mg/kg	FALSE	25				Calcium	Metals	46000
EPA 9056	BG-1D-46'	67	mg/kg	FALSE	10				Chloride	General Chemistry	67
EPA 6010B	BG-1D-46'	5.3	mg/kg	FALSE	0.5			Total chror	Chromium,	Metals	5.3
EPA 7199	BG-1D-46'		mg/kg	TRUE	2				Chromium,	Metals	1
EPA 6010B	BG-1D-46'	1.8	mg/kg	FALSE	0.5				Cobalt	Metals	1.8
EPA 6010B	BG-1D-46'	3.3	mg/kg	FALSE	1				Copper	Metals	3.3
EPA 300.0	BG-1D-46'	4.9	mg/kg	FALSE	1				Fluoride	General Chemistry	4.9
EPA 6010B	BG-1D-46'	4500	mg/kg	FALSE	5				Iron	Metals	4500
EPA 6010B	BG-1D-46'	5500	mg/kg	FALSE	5				Magnesiun	Metals	5500
EPA 6010B	BG-1D-46'	300	mg/kg	FALSE	0.5				Manganese	Metals	300
EPA 6010B	BG-1D-46'		mg/kg	TRUE	0.25				Molybdenu	Metals	0.125
EPA 6010B	BG-1D-46'	4.1	mg/kg	FALSE	1				Nickel	Metals	4.1
EPA 300.0	BG-1D-46'		mg/kg	TRUE	1			Nitrogen, N	Nitrate	General Chemistry	0.5
EPA 6010B	BG-1D-46'	2100	mg/kg	FALSE	25				Potassium	Metals	2100
EPA 6010B	BG-1D-46'	760	mg/kg	FALSE	120				Silica	Metals	760
EPA 6010B	BG-1D-46'	130	mg/kg	FALSE	25				Sodium	Metals	130
EPA 9056	BG-1D-46'	88	mg/kg	FALSE	50				Sulfate	General Chemistry	88
EPA 6010B	BG-1D-46'		mg/kg	TRUE	5	O	(ESC) Samp		Thallium	Metals	2.5
EPA 9056	BG-1D-46'		mg/kg	TRUE	1				Phosphoro	General Chemistry	0.5
EPA 6010B	BG-1D-46'	8.5	mg/kg	FALSE	0.5				Vanadium	Metals	8.5
EPA 6010B	BG-1D-46'	31	mg/kg	FALSE	1.5				Zinc	Metals	31
EPA 8270C	BG-1D-46'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
EPA 8270C	BG-1D-46'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
EPA 6010B	BG-1D-46'	34	mg/kg	FALSE	0.5				Titanium	Metals	34
EPA 8270C	BG-1D-46'		ug/kg	TRUE	6				Naphthaler	PAHs	3
EPA 6010B	BG-1D-55'	4	mg/kg	FALSE	1				Arsenic	Metals	4
EPA 6010B	BG-1D-55'	7.8	mg/kg	FALSE	0.25				Barium	Metals	7.8
EPA 6010B	BG-1D-55'		mg/kg	TRUE	0.25				Cadmium	Metals	0.125
EPA 6010B	BG-1D-55'	2.7	mg/kg	FALSE	0.25				Lead	Metals	2.7
EPA 7471A	BG-1D-55'		mg/kg	TRUE	0.02				Mercury	Metals	0.01
EPA 6010B	BG-1D-55'		mg/kg	TRUE	1				Selenium	Metals	0.5
EPA 6010B	BG-1D-55'		mg/kg	TRUE	0.5				Silver	Metals	0.25
EPA 9045C	BG-1D-55'	8.7	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.7
EPA 8270C	BG-1D-55'		ug/kg	TRUE	6				Acenaphth	PAHs	3
EPA 8270C	BG-1D-55'		ug/kg	TRUE	6				Anthracene	PAHs	3
EPA 8270C	BG-1D-55'		ug/kg	TRUE	6				Benzo(a)ar	PAHs	3
EPA 8270C	BG-1D-55'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
EPA 8270C	BG-1D-55'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
EPA 8270C	BG-1D-55'	540	ug/kg	FALSE	330				Bis(2-ethyl	SVOC	540
EPA 8270C	BG-1D-55'		ug/kg	TRUE	6				Chrysene	PAHs	3
EPA 8270C	BG-1D-55'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
EPA 8270C	BG-1D-55'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3
EPA 8270C	BG-1D-55'		ug/kg	TRUE	6				Phenanthre	PAHs	3
EPA 8270C	BG-1D-55'		ug/kg	TRUE	6				Pyrene	PAHs	3
EPA 600-R-	BG-1D-55'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-1D-55'	1900	mg/kg	FALSE	5				Aluminum	Metals	1900
SM4500-NI	BG-1D-55'		mg/kg	TRUE	5			Nitrogen, A	Ammonia	General Chemistry	2.5
EPA 6010B	BG-1D-55'		mg/kg	TRUE	1				Antimony	Metals	0.5
EPA 6010B	BG-1D-55'		mg/kg	TRUE	0.1				Beryllium	Metals	0.05
EPA 8270C	BG-1D-55'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
EPA 6010B	BG-1D-55'	1.2	mg/kg	FALSE	10	J	(EPA) - Esti		Boron	Metals	1.2
EPA 6010B	BG-1D-55'	38000	mg/kg	FALSE	25				Calcium	Metals	38000
EPA 9056	BG-1D-55'	81	mg/kg	FALSE	10				Chloride	General Chemistry	81
EPA 6010B	BG-1D-55'	2.8	mg/kg	FALSE	0.5			Total chror	Chromium,	Metals	2.8
EPA 7199	BG-1D-55'		mg/kg	TRUE	2				Chromium,	Metals	1
EPA 6010B	BG-1D-55'	1.2	mg/kg	FALSE	0.5				Cobalt	Metals	1.2
EPA 6010B	BG-1D-55'	2.1	mg/kg	FALSE	1				Copper	Metals	2.1
EPA 300.0	BG-1D-55'	3	mg/kg	FALSE	1				Fluoride	General Chemistry	3
EPA 6010B	BG-1D-55'	3600	mg/kg	FALSE	5				Iron	Metals	3600
EPA 6010B	BG-1D-55'	6000	mg/kg	FALSE	5				Magnesiun	Metals	6000
EPA 6010B	BG-1D-55'	240	mg/kg	FALSE	0.5				Manganese	Metals	240
EPA 6010B	BG-1D-55'	0.18	mg/kg	FALSE	0.25	J	(EPA) - Esti		Molybdenu	Metals	0.18
EPA 6010B	BG-1D-55'	2.7	mg/kg	FALSE	1				Nickel	Metals	2.7
EPA 300.0	BG-1D-55'		mg/kg	TRUE	1			Nitrogen, N	Nitrate	General Chemistry	0.5
EPA 6010B	BG-1D-55'	620	mg/kg	FALSE	25				Potassium	Metals	620
EPA 6010B	BG-1D-55'	750	mg/kg	FALSE	120				Silica	Metals	750
EPA 6010B	BG-1D-55'	110	mg/kg	FALSE	25				Sodium	Metals	110
EPA 9056	BG-1D-55'	120	mg/kg	FALSE	50				Sulfate	General Chemistry	120
EPA 6010B	BG-1D-55'		mg/kg	TRUE	5	O	(ESC) Samp		Thallium	Metals	2.5
EPA 9056	BG-1D-55'		mg/kg	TRUE	1				Phosphoro	General Chemistry	0.5
EPA 6010B	BG-1D-55'	7.4	mg/kg	FALSE	0.5				Vanadium	Metals	7.4
EPA 6010B	BG-1D-55'	23	mg/kg	FALSE	1.5				Zinc	Metals	23
EPA 8270C	BG-1D-55'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
EPA 8270C	BG-1D-55'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
EPA 6010B	BG-1D-55'	36	mg/kg	FALSE	0.5				Titanium	Metals	36
EPA 8270C	BG-1D-55'		ug/kg	TRUE	6				Naphthaler	PAHs	3
EPA 6010B	BG-1D-78'	2.6	mg/kg	FALSE	1				Arsenic	Metals	2.6
EPA 6010B	BG-1D-78'	200	mg/kg	FALSE	0.25				Barium	Metals	200
EPA 6010B	BG-1D-78'		mg/kg	TRUE	0.25				Cadmium	Metals	0.125
EPA 6010B	BG-1D-78'	7.8	mg/kg	FALSE	0.25				Lead	Metals	7.8
EPA 7471A	BG-1D-78'	0.036	mg/kg	FALSE	0.02				Mercury	Metals	0.036
EPA 6010B	BG-1D-78'	1	mg/kg	FALSE	1				Selenium	Metals	1
EPA 6010B	BG-1D-78'		mg/kg	TRUE	0.5				Silver	Metals	0.25
EPA 9045C	BG-1D-78'	8.2	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.2
EPA 8270C	BG-1D-78'		ug/kg	TRUE	6				Acenaphth	PAHs	3
EPA 8270C	BG-1D-78'		ug/kg	TRUE	6				Anthracene	PAHs	3
EPA 8270C	BG-1D-78'		ug/kg	TRUE	6				Benzo(a)ar	PAHs	3
EPA 8270C	BG-1D-78'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
EPA 8270C	BG-1D-78'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
EPA 8270C	BG-1D-78'		ug/kg	TRUE	330				Bis(2-ethyl	SVOC	165
EPA 8270C	BG-1D-78'		ug/kg	TRUE	6				Chrysene	PAHs	3
EPA 8270C	BG-1D-78'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
EPA 8270C	BG-1D-78'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3
EPA 8270C	BG-1D-78'		ug/kg	TRUE	6				Phenanthre	PAHs	3
EPA 8270C	BG-1D-78'		ug/kg	TRUE	6				Pyrene	PAHs	3
EPA 600-R-	BG-1D-78'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-1D-78'	15000	mg/kg	FALSE	5				Aluminum	Metals	15000
SM4500-NI	BG-1D-78'		mg/kg	TRUE	5			Nitrogen, A	Ammonia	General Chemistry	2.5
EPA 6010B	BG-1D-78'		mg/kg	TRUE	1				Antimony	Metals	0.5
EPA 6010B	BG-1D-78'	0.59	mg/kg	FALSE	0.1				Beryllium	Metals	0.59
EPA 8270C	BG-1D-78'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
EPA 6010B	BG-1D-78'	16	mg/kg	FALSE	10	J	(EPA) - Esti		Boron	Metals	16

Lab	Backgroun	1/9/2012	BG-1D	Calcium	78		EPA 6010B	BG-1D-78'	71000	mg/kg	FALSE	130				Calcium	Metals	71000
Lab	Backgroun	1/9/2012	BG-1D	Chloride	78		EPA 9056	BG-1D-78'	66	mg/kg	FALSE	10				Chloride	General Chemistry	66
Lab	Backgroun	1/9/2012	BG-1D	Chromium (total)	78		EPA 6010B	BG-1D-78'	15	mg/kg	FALSE	0.5			Total chrom	Chromium,	Metals	15
Lab	Backgroun	1/9/2012	BG-1D	Chromium (hexavalent)	78		EPA 7199	BG-1D-78'		mg/kg	TRUE	2				Chromium,	Metals	1
Lab	Backgroun	1/9/2012	BG-1D	Cobalt	78		EPA 6010B	BG-1D-78'	4.7	mg/kg	FALSE	0.5				Cobalt	Metals	4.7
Lab	Backgroun	1/9/2012	BG-1D	Copper	78		EPA 6010B	BG-1D-78'	20	mg/kg	FALSE	1				Copper	Metals	20
Lab	Backgroun	1/9/2012	BG-1D	Fluoride	78		EPA 300.0	BG-1D-78'	7	mg/kg	FALSE	1				Fluoride	General Chemistry	7
Lab	Backgroun	1/9/2012	BG-1D	Iron	78		EPA 6010B	BG-1D-78'	10000	mg/kg	FALSE	5				Iron	Metals	10000
Lab	Backgroun	1/9/2012	BG-1D	Magnesium	78		EPA 6010B	BG-1D-78'	11000	mg/kg	FALSE	5				Magnesiun	Metals	11000
Lab	Backgroun	1/9/2012	BG-1D	Manganese	78		EPA 6010B	BG-1D-78'	450	mg/kg	FALSE	0.5				Manganese	Metals	450
Lab	Backgroun	1/9/2012	BG-1D	Molybdenum	78		EPA 6010B	BG-1D-78'		mg/kg	TRUE	0.25	J	(EPA) - Esti		Molybdenu	Metals	0.125
Lab	Backgroun	1/9/2012	BG-1D	Nickel	78		EPA 6010B	BG-1D-78'	12	mg/kg	FALSE	5				Nickel	Metals	12
Lab	Backgroun	1/9/2012	BG-1D	Nitrate	78		EPA 300.0	BG-1D-78'		mg/kg	TRUE	1			Nitrogen, N	Nitrate	General Chemistry	0.5
Lab	Backgroun	1/9/2012	BG-1D	Potassium	78		EPA 6010B	BG-1D-78'	4400	mg/kg	FALSE	25				Potassium	Metals	4400
Lab	Backgroun	1/9/2012	BG-1D	Silica	78		EPA 6010B	BG-1D-78'	940	mg/kg	FALSE	120				Silica	Metals	940
Lab	Backgroun	1/9/2012	BG-1D	Sodium	78		EPA 6010B	BG-1D-78'	250	mg/kg	FALSE	25				Sodium	Metals	250
Lab	Backgroun	1/9/2012	BG-1D	Sulfate	78		EPA 9056	BG-1D-78'	120	mg/kg	FALSE	50				Sulfate	General Chemistry	120
Lab	Backgroun	1/9/2012	BG-1D	Thallium	78		EPA 6010B	BG-1D-78'		mg/kg	TRUE	5	O	(ESC) Samp		Thallium	Metals	2.5
Lab	Backgroun	1/9/2012	BG-1D	Phosphate as P	78		EPA 9056	BG-1D-78'		mg/kg	TRUE	1				Phosphoro	General Chemistry	0.5
Lab	Backgroun	1/9/2012	BG-1D	Vanadium	78		EPA 6010B	BG-1D-78'	27	mg/kg	FALSE	0.5				Vanadium	Metals	27
Lab	Backgroun	1/9/2012	BG-1D	Zinc	78		EPA 6010B	BG-1D-78'	69	mg/kg	FALSE	7.5				Zinc	Metals	69
Lab	Backgroun	1/9/2012	BG-1D	Benzo(b)fluoranthene	78		EPA 8270C	BG-1D-78'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Benzo(k)fluoranthene	78		EPA 8270C	BG-1D-78'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Titanium	78		EPA 6010B	BG-1D-78'	59	mg/kg	FALSE	2.5				Titanium	Metals	59
Lab	Backgroun	1/9/2012	BG-1D	Naphthalene (PAH)	78		EPA 8270C	BG-1D-78'		ug/kg	TRUE	6				Naphthaler	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Arsenic	92		EPA 6010B	BG-1D-92'	3.4	mg/kg	FALSE	1				Arsenic	Metals	3.4
Lab	Backgroun	1/9/2012	BG-1D	Barium	92		EPA 6010B	BG-1D-92'	92	mg/kg	FALSE	0.25				Barium	Metals	92
Lab	Backgroun	1/9/2012	BG-1D	Cadmium	92		EPA 6010B	BG-1D-92'		mg/kg	TRUE	0.25				Cadmium	Metals	0.125
Lab	Backgroun	1/9/2012	BG-1D	Lead	92		EPA 6010B	BG-1D-92'	2.4	mg/kg	FALSE	0.25				Lead	Metals	2.4
Lab	Backgroun	1/9/2012	BG-1D	Mercury	92		EPA 7471A	BG-1D-92'		mg/kg	TRUE	0.02				Mercury	Metals	0.01
Lab	Backgroun	1/9/2012	BG-1D	Selenium	92		EPA 6010B	BG-1D-92'		mg/kg	TRUE	1				Selenium	Metals	0.5
Lab	Backgroun	1/9/2012	BG-1D	Silver	92		EPA 6010B	BG-1D-92'		mg/kg	TRUE	0.5				Silver	Metals	0.25
Lab	Backgroun	1/9/2012	BG-1D	pH	92		EPA 9045C	BG-1D-92'	8.1	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.1
Lab	Backgroun	1/9/2012	BG-1D	Acenaphthene	92		EPA 8270C	BG-1D-92'		ug/kg	TRUE	6				Acenaphth	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Anthracene	92		EPA 8270C	BG-1D-92'		ug/kg	TRUE	6				Anthracene	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)anthracene	92		EPA 8270C	BG-1D-92'		ug/kg	TRUE	6				Benzo(a)an	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Benzo(g,h,i)perylene	92		EPA 8270C	BG-1D-92'		ug/kg	TRUE	6				Benzo(g,h,i	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Benzo(a)pyrene	92		EPA 8270C	BG-1D-92'		ug/kg	TRUE	6				Benzo(a)py	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Bis(2-ethylhexyl)phthalate	92		EPA 8270C	BG-1D-92'		ug/kg	TRUE	330				Bis(2-ethyll	SVOC	165
Lab	Backgroun	1/9/2012	BG-1D	Chrysene	92		EPA 8270C	BG-1D-92'		ug/kg	TRUE	6				Chrysene	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Fluoranthene	92		EPA 8270C	BG-1D-92'		ug/kg	TRUE	6				Fluoranthe	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Indeno(1,2,3-cd)pyrene	92		EPA 8270C	BG-1D-92'		ug/kg	TRUE	6				Indeno(1,2	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Phenanthrene	92		EPA 8270C	BG-1D-92'		ug/kg	TRUE	6				Phenanthre	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Pyrene	92		EPA 8270C	BG-1D-92'		ug/kg	TRUE	6				Pyrene	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Asbestos	92		EPA 600-R-	BG-1D-92'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	1/9/2012	BG-1D	Aluminum	92		EPA 6010B	BG-1D-92'	3100	mg/kg	FALSE	5				Aluminum	Metals	3100
Lab	Backgroun	1/9/2012	BG-1D	Ammonia	92		SM4500-NI	BG-1D-92'		mg/kg	TRUE	5			Nitrogen, A	Ammonia	General Chemistry	2.5
Lab	Backgroun	1/9/2012	BG-1D	Antimony	92		EPA 6010B	BG-1D-92'		mg/kg	TRUE	1				Antimony	Metals	0.5
Lab	Backgroun	1/9/2012	BG-1D	Beryllium	92		EPA 6010B	BG-1D-92'	0.058	mg/kg	FALSE	0.1	J	(EPA) - Esti		Beryllium	Metals	0.058
Lab	Backgroun	1/9/2012	BG-1D	Biphenyl	92		EPA 8270C	BG-1D-92'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
Lab	Backgroun	1/9/2012	BG-1D	Boron	92		EPA 6010B	BG-1D-92'	3.1	mg/kg	FALSE	10	J	(EPA) - Esti		Boron	Metals	3.1
Lab	Backgroun	1/9/2012	BG-1D	Calcium	92		EPA 6010B	BG-1D-92'	26000	mg/kg	FALSE	25				Calcium	Metals	26000
Lab	Backgroun	1/9/2012	BG-1D	Chloride	92		EPA 9056	BG-1D-92'	77	mg/kg	FALSE	10				Chloride	General Chemistry	77
Lab	Backgroun	1/9/2012	BG-1D	Chromium (total)	92		EPA 6010B	BG-1D-92'	5.3	mg/kg	FALSE	0.5			Total chrom	Chromium,	Metals	5.3
Lab	Backgroun	1/9/2012	BG-1D	Chromium (hexavalent)	92		EPA 7199	BG-1D-92'	1.4	mg/kg	FALSE	2	J	(EPA) - Esti		Chromium,	Metals	1.4
Lab	Backgroun	1/9/2012	BG-1D	Cobalt	92		EPA 6010B	BG-1D-92'	1.2	mg/kg	FALSE	0.5				Cobalt	Metals	1.2
Lab	Backgroun	1/9/2012	BG-1D	Copper	92		EPA 6010B	BG-1D-92'	2.7	mg/kg	FALSE	1				Copper	Metals	2.7
Lab	Backgroun	1/9/2012	BG-1D	Fluoride	92		EPA 300.0	BG-1D-92'	3.5	mg/kg	FALSE	1				Fluoride	General Chemistry	3.5
Lab	Backgroun	1/9/2012	BG-1D	Iron	92		EPA 6010B	BG-1D-92'	3800	mg/kg	FALSE	5				Iron	Metals	3800
Lab	Backgroun	1/9/2012	BG-1D	Magnesium	92		EPA 6010B	BG-1D-92'	3600	mg/kg	FALSE	5				Magnesiun	Metals	3600
Lab	Backgroun	1/9/2012	BG-1D	Manganese	92		EPA 6010B	BG-1D-92'	130	mg/kg	FALSE	0.5				Manganese	Metals	130
Lab	Backgroun	1/9/2012	BG-1D	Molybdenum	92		EPA 6010B	BG-1D-92'	0.24	mg/kg	FALSE	0.25	J	(EPA) - Esti		Molybdenu	Metals	0.24
Lab	Backgroun	1/9/2012	BG-1D	Nickel	92		EPA 6010B	BG-1D-92'	3.3	mg/kg	FALSE	1				Nickel	Metals	3.3
Lab	Backgroun	1/9/2012	BG-1D	Nitrate	92		EPA 300.0	BG-1D-92'		mg/kg	TRUE	1			Nitrogen, N	Nitrate	General Chemistry	0.5
Lab	Backgroun	1/9/2012	BG-1D	Potassium	92		EPA 6010B	BG-1D-92'	1000	mg/kg	FALSE	25				Potassium	Metals	1000
Lab	Backgroun	1/9/2012	BG-1D	Silica	92		EPA 6010B	BG-1D-92'	850	mg/kg	FALSE	120				Silica	Metals	850
Lab	Backgroun	1/9/2012	BG-1D	Sodium	92		EPA 6010B	BG-1D-92'	100	mg/kg	FALSE	25				Sodium	Metals	100
Lab	Backgroun	1/9/2012	BG-1D	Sulfate	92		EPA 9056	BG-1D-92'	110	mg/kg	FALSE	50				Sulfate	General Chemistry	110
Lab	Backgroun	1/9/2012	BG-1D	Thallium	92		EPA 6010B	BG-1D-92'		mg/kg	TRUE	1				Thallium	Metals	0.5
Lab	Backgroun	1/9/2012	BG-1D	Phosphate as P	92		EPA 9056	BG-1D-92'		mg/kg	TRUE	1				Phosphoro	General Chemistry	0.5
Lab	Backgroun	1/9/2012	BG-1D	Vanadium	92		EPA 6010B	BG-1D-92'	6.7	mg/kg	FALSE	0.5				Vanadium	Metals	6.7
Lab	Backgroun	1/9/2012	BG-1D	Zinc	92		EPA 6010B	BG-1D-92'	19	mg/kg	FALSE	1.5				Zinc	Metals	19
Lab	Backgroun	1/9/2012	BG-1D	Benzo(b)fluoranthene	92		EPA 8270C	BG-1D-92'		ug/kg	TRUE	6				Benzo(b)flu	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Benzo(k)fluoranthene	92		EPA 8270C	BG-1D-92'		ug/kg	TRUE	6				Benzo(k)flu	PAHs	3
Lab	Backgroun	1/9/2012	BG-1D	Titanium	92		EPA 6010B	BG-1D-92'	26	mg/kg	FALSE	0.5				Titanium	Metals	26
Lab	Backgroun	1/9/2012	BG-1D	Naphthalene (PAH)	92		EPA 8270C	BG-1D-92'		ug/kg	TRUE	6				Naphthaler	PAHs	3
Lab	Backgroun	1/26/2012	BG-4D	Arsenic	0	2	EPA 6010B	BG-4D-0-2'	12	mg/kg	FALSE	1				Arsenic	Metals	12
Lab	Backgroun	1/26/2012	BG-4D	Barium	0	2	EPA 6010B	BG-4D-0-2'	16	mg/kg	FALSE	0.26				Barium	Metals	16
Lab	Backgroun	1/26/2012	BG-4D	Cadmium	0	2	EPA 6010B	BG-4D-0-2'	0.061	mg/kg	FALSE	0.26	J	(EPA) - Esti		Cadmium	Metals	0.061
Lab	Backgroun	1/26/2012	BG-4D	Lead	0	2	EPA 6010B	BG-4D-0-2'	6.4	mg/kg	FALSE	0.26				Lead	Metals	6.4
Lab	Backgroun	1/26/2012	BG-4D	Mercury	0	2	EPA 7471A	BG-4D-0-2'		mg/kg	TRUE	0.021				Mercury	Metals	0.0105
Lab	Backgroun	1/26/2012	BG-4D	Selenium	0	2	EPA 6010B	BG-4D-0-2'		mg/kg	TRUE	5.3	O	(ESC) Samp		Selenium	Metals	2.65
Lab	Backgroun	1/26/2012	BG-4D	Silver	0	2	EPA 6010B	BG-4D-0-2'		mg/kg	TRUE	0.53				Silver	Metals	0.265
Lab	Backgroun	1/26/2012	BG-4D	pH	0	2	EPA 9045C	BG-4D-0-2'	8.6	su	FALSE					pH	General Chemistry	8.6
Lab	Backgroun	1/26/2012	BG-4D	Acenaphthene	0	2	EPA 8270C	BG-4D-0-2'		ug/kg	TRUE	6.3	Q	Sample hel		Acenaphth	PAHs	3.15
Lab	Backgroun	1/26/2012	BG-4D	Anthracene	0	2	EPA 8270C	BG-4D-0-2'		ug/kg	TRUE	6.3	Q	Sample hel		Anthracene	PAHs	3.15
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)anthracene	0	2	EPA 8270C	BG-4D-0-2'		ug/kg	TRUE	6.3	Q	Sample hel		Benzo(a)an	PAHs	3.15
Lab	Backgroun	1/26/2012	BG-4D	Benzo(g,h,i)perylene	0	2	EPA 8270C	BG-4D-0-2'		ug/kg	TRUE	6.3	Q	Sample hel		Benzo(g,h,i	PAHs	3.15
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)pyrene	0	2	EPA 8270C	BG-4D-0-2'		ug/kg	TRUE	6.3	Q	Sample hel		Benzo(a)py	PAHs	3.15
Lab	Backgroun	1/26/2012	BG-4D	Bis(2-ethylhexyl)phthalate	0	2	EPA 8270C	BG-4D-0-2'		ug/kg	TRUE	350				Bis(2-ethyll	SVOC	175
Lab	Backgroun	1/26/2012	BG-4D	Chrysene	0	2	EPA 8270C	BG-4D-0-2'		ug/kg	TRUE	6.3	Q	Sample hel		Chrysene	PAHs	3.15
Lab	Backgroun	1/26/2012	BG-4D	Fluoranthene	0	2	EPA 8270C	BG-4D-0-2'		ug/kg	TRUE	6.3	Q	Sample hel		Fluoranthe	PAHs	3.15
Lab	Backgroun	1/26/2012	BG-4D	Indeno(1,2,3-cd)pyrene	0	2	EPA 8270C	BG-4D-0-2'		ug/kg	TRUE	6.3	Q	Sample hel		Indeno(1,2	PAHs	3.15
Lab	Backgroun	1/26/2012	BG-4D	Phenanthrene	0	2	EPA 8270C	BG-4D-0-2'		ug/kg	TRUE	6.3	Q	Sample hel		Phenanthre	PAHs	3.15
Lab	Backgroun	1/26/2012	BG-4D	Pyrene	0	2	EPA 8270C	BG-4D-0-2'		ug/kg	TRUE	6.3	Q	Sample hel		Pyrene	PAHs	3.15
Lab	Backgroun	1/26/2012	BG-4D	Asbestos	0	2	EPA 600-R-	BG-4D-0-2'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	1/26/2012	BG-4D	Aluminum	0	2	EPA 6010B	BG-4D-0-2'	10000	mg/kg	FALSE	5.3				Aluminum	Metals	10000
Lab	Backgroun	1/26/2012	BG-4D	Ammonia	0	2	SM4500-NI	BG-4D-0-2'		mg/kg	TRUE	5.3			Nitrogen, A	Ammonia	General Chemistry	2.65
Lab	Backgroun	1/26/2012	BG-4D	Antimony	0	2	EPA 6010B	BG-4D-0-2'		mg/kg	TRUE	1				Antimony	Metals	0.5
Lab	Backgroun	1/26/2012	BG-4D	Beryllium	0	2	EPA 6010B	BG-4D-0-2'	0.46	mg/kg	FALSE	0.1				Beryllium	Metals	0.46
Lab	Backgroun	1/26/2012	BG-4D	Biphenyl	0	2	EPA 8270C	BG-4D-0-2'		ug/kg	TRUE	350			1,1-Biphen	Biphenyl	SVOC	175
Lab	Backgroun	1/26/2012	BG-4D	Boron	0	2	EPA 6010B	BG-4D-0-2'	24	mg/kg	FALSE	10				Boron	Metals	24
Lab	Backgroun	1/26/2012	BG-4D	Calcium	0	2	EPA 6010B	BG-4D-0-2'	35000	mg/kg	FALSE	26				Calcium	Metals	35000
Lab	Backgroun	1/26/2012	BG-4D	Chloride	0	2	EPA 9056	BG-4D-0-2'	3800	mg/kg	FALSE	100				Chloride	General Chemistry	3800
Lab	Backgroun	1/26/2012	BG-4D	Chromium (total)	0	2	EPA 6010B	BG-4D-0-2'	12	mg/kg	FALSE	0.53			Total chrom	Chromium,	Metals	12
Lab	Backgroun	1/26/2012	BG-4D	Chromium (hexavalent)	0	2	EPA 7199	BG-4D-0-2'		mg/kg	TRUE	2.1				Chromium,	Metals	1.05
Lab	Backgroun	1/26/2012	BG-4D	Cobalt	0	2	EPA 6010B	BG-4D-0-2'	3.8	mg/kg	FALSE	0.53				Cobalt	Metals	3.8
Lab	Backgroun	1/26/2012	BG-4D	Copper	0	2	EPA 6010B	BG-4D-0-2'	8.3	mg/kg	FALSE	1				Copper	Metals	8.3
Lab	Backgroun	1/26/2012	BG-4D	Fluoride	0	2	EPA 300.0	BG-4D-0-2'	3.7	mg/kg	FALSE	1				Fluoride	General Chemistry	3.7
Lab	Backgroun	1/26/2012	BG-4D	Iron	0	2	EPA 6010B	BG-4D-0-2'	9900	mg/kg	FALSE	5.3				Iron	Metals	9900
Lab	Backgroun	1/26/2012	BG-4D	Magnesium	0	2	EPA 6010B	BG-4D-0-2'	8100	mg/kg	FALSE	5.3				Magnesiun	Metals	8100
Lab	Backgroun	1/26/2012	BG-4D	Manganese	0	2	EPA 6010B	BG-4D-0-2'	130	mg/kg	FALSE	0.53				Manganese	Metals	130
Lab	Backgroun	1/26/2012	BG-4D	Molybdenum	0	2	EPA 6010B	BG-4D-0-2'	0.44	mg/kg	FALSE	0.26				Molybdenu	Metals	0.44
Lab	Backgroun	1/26/2012	BG-4D	Nickel	0	2	EPA 6010B	BG-4D-0-2'	9	mg/kg	FALSE	1				Nickel	Metals	9
Lab	Backgroun	1/26/2012	BG-4D	Nitrate	0	2	EPA 300.0	BG-4D-0-2'	25	mg/kg	FALSE	1			Nitrogen, N	Nitrate	General Chemistry	25
Lab	Backgroun	1/26/2012	BG-4D	Potassium	0	2	EPA 6010B	BG-4D-0-2'	3100	mg/kg	FALSE	26				Potassium	Metals	3100
Lab	Backgroun	1/26/2012	BG-4D	Silica	0	2	EPA 6010B	BG-4D-0-2'	670	mg/kg	FALSE	110				Silica	Metals	670
Lab	Backgroun	1/26/2012	BG-4D	Sodium	0	2	EPA 6010B	BG-4D-0-2'	5400	mg/kg	FALSE	26				Sodium	Metals	5400
Lab	Backgroun	1/26/2012	BG-4D	Sulfate	0	2	EPA 9056	BG-4D-0-2'	8100	mg/kg	FALSE	530				Sulfate	General Chemistry	8100
Lab	Backgroun	1/26/2012	BG-4D	Thallium	0	2	EPA 6010B	BG-4D-0-2'		mg/kg	TRUE	5.3	O	(ESC) Samp		Thallium	Metals	2.65
Lab	Backgroun	1/26/2012	BG-4D	Phosphate as P	0	2	EPA 9056	BG-4D-0-2'		mg/kg	TRUE	1				Phosphoro	General Chemistry	0.5
Lab	Backgroun	1/26/2012	BG-4D	Vanadium	0	2	EPA 6010B	BG-4D-0-2'	19	mg/kg	FALSE	0.53				Vanadium	Metals	19
Lab	Backgroun	1/26/2012	BG-4D	Zinc	0	2	EPA 6010B	BG-4D-0-2'	30	mg/kg	FALSE	1.6				Zinc	Metals	30
Lab	Backgroun	1/26/2012	BG-4D	Benzo(b)fluoranthene	0	2	EPA 8270C	BG-4D-0-2'		ug/kg	TRUE	6.3	Q	Sample hel		Benzo(b)flu	PAHs	3.15
Lab	Backgroun	1/26/2012	BG-4D	Benzo(k)fluoranthene	0	2	EPA 8270C	BG-4D-0-2'		ug/kg	TRUE	6.3	Q	Sample hel		Benzo(k)flu	PAHs	3.15
Lab	Backgroun	1/26/2012	BG-4D	Titanium	0	2	EPA 6010B	BG-4D-0-2'	62	mg/kg	FALSE	0.53				Titanium	Metals	62
Lab	Backgroun	1/26/2012	BG-4D	Naphthalene (PAH)	0	2	EPA 8270C	BG-4D-0-2'		ug/kg	TRUE	6.3	Q	Sample hel		Naphthaler	PAHs	3.15
Lab	Backgroun	1/26/2012	BG-4D	Total Solids	0	2	EPA 2540G	BG-4D-0-2'	94.7	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	94.7
Lab	Backgroun	1/26/2012	BG-4D	Arsenic	10		EPA 6010B	BG-4D-10'	15	mg/kg	FALSE	1.1				Arsenic	Metals	15
Lab	Backgroun	1/26/2012	BG-4D	Barium	10		EPA 6010B	BG-4D-10'	24	mg/kg	FALSE	0.27				Barium	Metals	24
Lab	Backgroun	1/26/2012	BG-4D	Cadmium	10		EPA 6010B	BG-4D-10'	0.08	mg/kg	FALSE	0.27	J	(EPA) - Esti		Cadmium	Metals	0.08
Lab	Backgroun	1/26/2012	BG-4D	Lead	10		EPA 6010B	BG-4D-10'	9.4	mg/kg	FALSE	0.27				Lead	Metals	9.4

Lab	Backgroun	1/26/2012	BG-4D	Mercury	10
Lab	Backgroun	1/26/2012	BG-4D	Selenium	10
Lab	Backgroun	1/26/2012	BG-4D	Silver	10
Lab	Backgroun	1/26/2012	BG-4D	pH	10
Lab	Backgroun	1/26/2012	BG-4D	Acenaphthene	10
Lab	Backgroun	1/26/2012	BG-4D	Anthracene	10
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)anthracene	10
Lab	Backgroun	1/26/2012	BG-4D	Benzo(g,h,i)perylene	10
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)pyrene	10
Lab	Backgroun	1/26/2012	BG-4D	Bis(2-ethylhexyl)phthalate	10
Lab	Backgroun	1/26/2012	BG-4D	Chrysene	10
Lab	Backgroun	1/26/2012	BG-4D	Fluoranthene	10
Lab	Backgroun	1/26/2012	BG-4D	Indeno(1,2,3-cd)pyrene	10
Lab	Backgroun	1/26/2012	BG-4D	Phenanthrene	10
Lab	Backgroun	1/26/2012	BG-4D	Pyrene	10
Lab	Backgroun	1/26/2012	BG-4D	Asbestos	10
Lab	Backgroun	1/26/2012	BG-4D	Aluminum	10
Lab	Backgroun	1/26/2012	BG-4D	Ammonia	10
Lab	Backgroun	1/26/2012	BG-4D	Antimony	10
Lab	Backgroun	1/26/2012	BG-4D	Beryllium	10
Lab	Backgroun	1/26/2012	BG-4D	Biphenyl	10
Lab	Backgroun	1/26/2012	BG-4D	Boron	10
Lab	Backgroun	1/26/2012	BG-4D	Calcium	10
Lab	Backgroun	1/26/2012	BG-4D	Chloride	10
Lab	Backgroun	1/26/2012	BG-4D	Chromium (total)	10
Lab	Backgroun	1/26/2012	BG-4D	Chromium (hexavalent)	10
Lab	Backgroun	1/26/2012	BG-4D	Cobalt	10
Lab	Backgroun	1/26/2012	BG-4D	Copper	10
Lab	Backgroun	1/26/2012	BG-4D	Fluoride	10
Lab	Backgroun	1/26/2012	BG-4D	Iron	10
Lab	Backgroun	1/26/2012	BG-4D	Magnesium	10
Lab	Backgroun	1/26/2012	BG-4D	Manganese	10
Lab	Backgroun	1/26/2012	BG-4D	Molybdenum	10
Lab	Backgroun	1/26/2012	BG-4D	Nickel	10
Lab	Backgroun	1/26/2012	BG-4D	Nitrate	10
Lab	Backgroun	1/26/2012	BG-4D	Potassium	10
Lab	Backgroun	1/26/2012	BG-4D	Silica	10
Lab	Backgroun	1/26/2012	BG-4D	Sodium	10
Lab	Backgroun	1/26/2012	BG-4D	Sulfate	10
Lab	Backgroun	1/26/2012	BG-4D	Thallium	10
Lab	Backgroun	1/26/2012	BG-4D	Phosphate as P	10
Lab	Backgroun	1/26/2012	BG-4D	Vanadium	10
Lab	Backgroun	1/26/2012	BG-4D	Zinc	10
Lab	Backgroun	1/26/2012	BG-4D	Benzo(b)fluoranthene	10
Lab	Backgroun	1/26/2012	BG-4D	Benzo(k)fluoranthene	10
Lab	Backgroun	1/26/2012	BG-4D	Titanium	10
Lab	Backgroun	1/26/2012	BG-4D	Naphthalene (PAH)	10
Lab	Backgroun	1/26/2012	BG-4D	Total Solids	10
Lab	Backgroun	1/26/2012	BG-4D	Arsenic	19
Lab	Backgroun	1/26/2012	BG-4D	Barium	19
Lab	Backgroun	1/26/2012	BG-4D	Cadmium	19
Lab	Backgroun	1/26/2012	BG-4D	Lead	19
Lab	Backgroun	1/26/2012	BG-4D	Mercury	19
Lab	Backgroun	1/26/2012	BG-4D	Selenium	19
Lab	Backgroun	1/26/2012	BG-4D	Silver	19
Lab	Backgroun	1/26/2012	BG-4D	pH	19
Lab	Backgroun	1/26/2012	BG-4D	Acenaphthene	19
Lab	Backgroun	1/26/2012	BG-4D	Anthracene	19
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)anthracene	19
Lab	Backgroun	1/26/2012	BG-4D	Benzo(g,h,i)perylene	19
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)pyrene	19
Lab	Backgroun	1/26/2012	BG-4D	Bis(2-ethylhexyl)phthalate	19
Lab	Backgroun	1/26/2012	BG-4D	Chrysene	19
Lab	Backgroun	1/26/2012	BG-4D	Fluoranthene	19
Lab	Backgroun	1/26/2012	BG-4D	Indeno(1,2,3-cd)pyrene	19
Lab	Backgroun	1/26/2012	BG-4D	Phenanthrene	19
Lab	Backgroun	1/26/2012	BG-4D	Pyrene	19
Lab	Backgroun	1/26/2012	BG-4D	Asbestos	19
Lab	Backgroun	1/26/2012	BG-4D	Aluminum	19
Lab	Backgroun	1/26/2012	BG-4D	Ammonia	19
Lab	Backgroun	1/26/2012	BG-4D	Antimony	19
Lab	Backgroun	1/26/2012	BG-4D	Beryllium	19
Lab	Backgroun	1/26/2012	BG-4D	Biphenyl	19
Lab	Backgroun	1/26/2012	BG-4D	Boron	19
Lab	Backgroun	1/26/2012	BG-4D	Calcium	19
Lab	Backgroun	1/26/2012	BG-4D	Chloride	19
Lab	Backgroun	1/26/2012	BG-4D	Chromium (total)	19
Lab	Backgroun	1/26/2012	BG-4D	Chromium (hexavalent)	19
Lab	Backgroun	1/26/2012	BG-4D	Cobalt	19
Lab	Backgroun	1/26/2012	BG-4D	Copper	19
Lab	Backgroun	1/26/2012	BG-4D	Fluoride	19
Lab	Backgroun	1/26/2012	BG-4D	Iron	19
Lab	Backgroun	1/26/2012	BG-4D	Magnesium	19
Lab	Backgroun	1/26/2012	BG-4D	Manganese	19
Lab	Backgroun	1/26/2012	BG-4D	Molybdenum	19
Lab	Backgroun	1/26/2012	BG-4D	Nickel	19
Lab	Backgroun	1/26/2012	BG-4D	Nitrate	19
Lab	Backgroun	1/26/2012	BG-4D	Potassium	19
Lab	Backgroun	1/26/2012	BG-4D	Silica	19
Lab	Backgroun	1/26/2012	BG-4D	Sodium	19
Lab	Backgroun	1/26/2012	BG-4D	Sulfate	19
Lab	Backgroun	1/26/2012	BG-4D	Thallium	19
Lab	Backgroun	1/26/2012	BG-4D	Phosphate as P	19
Lab	Backgroun	1/26/2012	BG-4D	Vanadium	19
Lab	Backgroun	1/26/2012	BG-4D	Zinc	19
Lab	Backgroun	1/26/2012	BG-4D	Benzo(b)fluoranthene	19
Lab	Backgroun	1/26/2012	BG-4D	Benzo(k)fluoranthene	19
Lab	Backgroun	1/26/2012	BG-4D	Titanium	19
Lab	Backgroun	1/26/2012	BG-4D	Naphthalene (PAH)	19
Lab	Backgroun	1/26/2012	BG-4D	Total Solids	19
Lab	Backgroun	1/26/2012	BG-4D	Arsenic	40
Lab	Backgroun	1/26/2012	BG-4D	Barium	40
Lab	Backgroun	1/26/2012	BG-4D	Cadmium	40
Lab	Backgroun	1/26/2012	BG-4D	Lead	40
Lab	Backgroun	1/26/2012	BG-4D	Mercury	40
Lab	Backgroun	1/26/2012	BG-4D	Selenium	40
Lab	Backgroun	1/26/2012	BG-4D	Silver	40
Lab	Backgroun	1/26/2012	BG-4D	pH	40
Lab	Backgroun	1/26/2012	BG-4D	Acenaphthene	40
Lab	Backgroun	1/26/2012	BG-4D	Anthracene	40
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)anthracene	40
Lab	Backgroun	1/26/2012	BG-4D	Benzo(g,h,i)perylene	40
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)pyrene	40
Lab	Backgroun	1/26/2012	BG-4D	Bis(2-ethylhexyl)phthalate	40
Lab	Backgroun	1/26/2012	BG-4D	Chrysene	40
Lab	Backgroun	1/26/2012	BG-4D	Fluoranthene	40
Lab	Backgroun	1/26/2012	BG-4D	Indeno(1,2,3-cd)pyrene	40
Lab	Backgroun	1/26/2012	BG-4D	Phenanthrene	40
Lab	Backgroun	1/26/2012	BG-4D	Pyrene	40
Lab	Backgroun	1/26/2012	BG-4D	Asbestos	40
Lab	Backgroun	1/26/2012	BG-4D	Aluminum	40
Lab	Backgroun	1/26/2012	BG-4D	Ammonia	40
Lab	Backgroun	1/26/2012	BG-4D	Antimony	40
Lab	Backgroun	1/26/2012	BG-4D	Beryllium	40
Lab	Backgroun	1/26/2012	BG-4D	Biphenyl	40
Lab	Backgroun	1/26/2012	BG-4D	Boron	40
Lab	Backgroun	1/26/2012	BG-4D	Calcium	40
Lab	Backgroun	1/26/2012	BG-4D	Chloride	40
Lab	Backgroun	1/26/2012	BG-4D	Chromium (total)	40
Lab	Backgroun	1/26/2012	BG-4D	Chromium (hexavalent)	40
Lab	Backgroun	1/26/2012	BG-4D	Cobalt	40
Lab	Backgroun	1/26/2012	BG-4D	Copper	40

EPA 7471A	BG-4D-10'		mg/kg	TRUE	0.022	J	(EPA) - Esti		Mercury	Metals	0.011
EPA 6010B	BG-4D-10'		mg/kg	TRUE	5.4	O	(ESC) Samp		Selenium	Metals	2.7
EPA 6010B	BG-4D-10'		mg/kg	TRUE	0.54				Silver	Metals	0.27
EPA 9045C	BG-4D-10'	8.7	su	FALSE					pH	General Chemistry	8.7
EPA 8270C	BG-4D-10'		ug/kg	TRUE	6.5	Q	Sample hel		Acenaphth	PAHs	3.25
EPA 8270C	BG-4D-10'		ug/kg	TRUE	6.5	Q	Sample hel		Anthracene	PAHs	3.25
EPA 8270C	BG-4D-10'		ug/kg	TRUE	6.5	Q	Sample hel		Benzo(a)an	PAHs	3.25
EPA 8270C	BG-4D-10'		ug/kg	TRUE	6.5	Q	Sample hel		Benzo(g,h,i	PAHs	3.25
EPA 8270C	BG-4D-10'		ug/kg	TRUE	6.5	Q	Sample hel		Benzo(a)py	PAHs	3.25
EPA 8270C	BG-4D-10'		ug/kg	TRUE	360				Bis(2-ethyl	SVOC	180
EPA 8270C	BG-4D-10'		ug/kg	TRUE	6.5	Q	Sample hel		Chrysene	PAHs	3.25
EPA 8270C	BG-4D-10'		ug/kg	TRUE	6.5	Q	Sample hel		Fluoranthe	PAHs	3.25
EPA 8270C	BG-4D-10'		ug/kg	TRUE	6.5	Q	Sample hel		Indeno(1,2	PAHs	3.25
EPA 8270C	BG-4D-10'		ug/kg	TRUE	6.5	Q	Sample hel		Phenanthre	PAHs	3.25
EPA 8270C	BG-4D-10'		ug/kg	TRUE	6.5	Q	Sample hel		Pyrene	PAHs	3.25
EPA 600-R-	BG-4D-10'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-4D-10'	12000	mg/kg	FALSE	5.4				Aluminum	Metals	12000
SM4500-NI	BG-4D-10'		mg/kg	TRUE	5.4	J6	The sample	Nitrogen, A	Ammonia	General Chemistry	2.7
EPA 6010B	BG-4D-10'		mg/kg	TRUE	1.1				Antimony	Metals	0.55
EPA 6010B	BG-4D-10'	0.46	mg/kg	FALSE	0.11				Beryllium	Metals	0.46
EPA 8270C	BG-4D-10'		ug/kg	TRUE	360			1,1-Biphen	Biphenyl	SVOC	180
EPA 6010B	BG-4D-10'	13	mg/kg	FALSE	11				Boron	Metals	13
EPA 6010B	BG-4D-10'	46000	mg/kg	FALSE	27				Calcium	Metals	46000
EPA 9056	BG-4D-10'	310	mg/kg	FALSE	11				Chloride	General Chemistry	310
EPA 6010B	BG-4D-10'	14	mg/kg	FALSE	0.54			Total chror	Chromium,	Metals	14
EPA 7199	BG-4D-10'		mg/kg	TRUE	2.2				Chromium,	Metals	1.1
EPA 6010B	BG-4D-10'	5.3	mg/kg	FALSE	0.54				Cobalt	Metals	5.3
EPA 6010B	BG-4D-10'	11	mg/kg	FALSE	1.1				Copper	Metals	11
EPA 300.0	BG-4D-10'	7	mg/kg	FALSE	1.1				Fluoride	General Chemistry	7
EPA 6010B	BG-4D-10'	13000	mg/kg	FALSE	5.4				Iron	Metals	13000
EPA 6010B	BG-4D-10'	12000	mg/kg	FALSE	5.4				Magnesiun	Metals	12000
EPA 6010B	BG-4D-10'	200	mg/kg	FALSE	0.54				Manganese	Metals	200
EPA 6010B	BG-4D-10'	0.38	mg/kg	FALSE	0.27				Molybdenu	Metals	0.38
EPA 6010B	BG-4D-10'	11	mg/kg	FALSE	1.1				Nickel	Metals	11
EPA 300.0	BG-4D-10'		mg/kg	TRUE	1.1	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.55
EPA 6010B	BG-4D-10'	3100	mg/kg	FALSE	27				Potassium	Metals	3100
EPA 6010B	BG-4D-10'	810	mg/kg	FALSE	120				Silica	Metals	810
EPA 6010B	BG-4D-10'	1200	mg/kg	FALSE	27				Sodium	Metals	1200
EPA 9056	BG-4D-10'	230	mg/kg	FALSE	54				Sulfate	General Chemistry	230
EPA 6010B	BG-4D-10'		mg/kg	TRUE	5.4	O	(ESC) Samp		Thallium	Metals	2.7
EPA 9056	BG-4D-10'		mg/kg	TRUE	1.1	B4	(ESC) - The		Phosphoro	General Chemistry	0.55
EPA 6010B	BG-4D-10'	25	mg/kg	FALSE	0.54				Vanadium	Metals	25
EPA 6010B	BG-4D-10'	39	mg/kg	FALSE	1.6				Zinc	Metals	39
EPA 8270C	BG-4D-10'		ug/kg	TRUE	6.5	Q	Sample hel		Benzo(b)flu	PAHs	3.25
EPA 8270C	BG-4D-10'		ug/kg	TRUE	6.5	Q	Sample hel		Benzo(k)flu	PAHs	3.25
EPA 6010B	BG-4D-10'	84	mg/kg	FALSE	0.54				Titanium	Metals	84
EPA 8270C	BG-4D-10'		ug/kg	TRUE	6.5	Q	Sample hel		Naphthaler	PAHs	3.25
EPA 2540G	BG-4D-10'	92.6	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	92.6
EPA 6010B	BG-4D-19'	24	mg/kg	FALSE	1.2				Arsenic	Metals	24
EPA 6010B	BG-4D-19'	36	mg/kg	FALSE	0.29				Barium	Metals	36
EPA 6010B	BG-4D-19'	0.18	mg/kg	FALSE	0.29	J	(EPA) - Esti		Cadmium	Metals	0.18
EPA 6010B	BG-4D-19'	14	mg/kg	FALSE	0.29				Lead	Metals	14
EPA 7471A	BG-4D-19'		mg/kg	TRUE	0.024	J	(EPA) - Esti		Mercury	Metals	0.012
EPA 6010B	BG-4D-19'		mg/kg	TRUE	5.9	O	(ESC) Samp		Selenium	Metals	2.95
EPA 6010B	BG-4D-19'		mg/kg	TRUE	0.59				Silver	Metals	0.295
EPA 9045C	BG-4D-19'	8.2	su	FALSE					pH	General Chemistry	8.2
EPA 8270C	BG-4D-19'		ug/kg	TRUE	7.1	Q	Sample hel		Acenaphth	PAHs	3.55
EPA 8270C	BG-4D-19'		ug/kg	TRUE	7.1	Q	Sample hel		Anthracene	PAHs	3.55
EPA 8270C	BG-4D-19'		ug/kg	TRUE	7.1	Q	Sample hel		Benzo(a)an	PAHs	3.55
EPA 8270C	BG-4D-19'		ug/kg	TRUE	7.1	Q	Sample hel		Benzo(g,h,i	PAHs	3.55
EPA 8270C	BG-4D-19'		ug/kg	TRUE	7.1	Q	Sample hel		Benzo(a)py	PAHs	3.55
EPA 8270C	BG-4D-19'		ug/kg	TRUE	390				Bis(2-ethyl	SVOC	195
EPA 8270C	BG-4D-19'		ug/kg	TRUE	7.1	Q	Sample hel		Chrysene	PAHs	3.55
EPA 8270C	BG-4D-19'		ug/kg	TRUE	7.1	Q	Sample hel		Fluoranthe	PAHs	3.55
EPA 8270C	BG-4D-19'		ug/kg	TRUE	7.1	Q	Sample hel		Indeno(1,2	PAHs	3.55
EPA 8270C	BG-4D-19'		ug/kg	TRUE	7.1	Q	Sample hel		Phenanthre	PAHs	3.55
EPA 8270C	BG-4D-19'		ug/kg	TRUE	7.1	Q	Sample hel		Pyrene	PAHs	3.55
EPA 600-R-	BG-4D-19'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-4D-19'	28000	mg/kg	FALSE	5.9				Aluminum	Metals	28000
SM4500-NI	BG-4D-19'		mg/kg	TRUE	5.9			Nitrogen, A	Ammonia	General Chemistry	2.95
EPA 6010B	BG-4D-19'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
EPA 6010B	BG-4D-19'	1.6	mg/kg	FALSE	0.12				Beryllium	Metals	1.6
EPA 8270C	BG-4D-19'		ug/kg	TRUE	390			1,1-Biphen	Biphenyl	SVOC	195
EPA 6010B	BG-4D-19'	28	mg/kg	FALSE	12				Boron	Metals	28
EPA 6010B	BG-4D-19'	47000	mg/kg	FALSE	29				Calcium	Metals	47000
EPA 9056	BG-4D-19'	340	mg/kg	FALSE	12				Chloride	General Chemistry	340
EPA 6010B	BG-4D-19'	32	mg/kg	FALSE	0.59			Total chror	Chromium,	Metals	32
EPA 7199	BG-4D-19'		mg/kg	TRUE	2.4	J	(EPA) - Esti		Chromium,	Metals	1.2
EPA 6010B	BG-4D-19'	8.4	mg/kg	FALSE	0.59				Cobalt	Metals	8.4
EPA 6010B	BG-4D-19'	20	mg/kg	FALSE	1.2				Copper	Metals	20
EPA 300.0	BG-4D-19'	7.6	mg/kg	FALSE	1.2				Fluoride	General Chemistry	7.6
EPA 6010B	BG-4D-19'	24000	mg/kg	FALSE	5.9				Iron	Metals	24000
EPA 6010B	BG-4D-19'	13000	mg/kg	FALSE	5.9				Magnesiun	Metals	13000
EPA 6010B	BG-4D-19'	260	mg/kg	FALSE	0.59				Manganese	Metals	260
EPA 6010B	BG-4D-19'	0.24	mg/kg	FALSE	0.29	J	(EPA) - Esti		Molybdenu	Metals	0.24
EPA 6010B	BG-4D-19'	22	mg/kg	FALSE	1.2				Nickel	Metals	22
EPA 300.0	BG-4D-19'		mg/kg	TRUE	1.2	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.6
EPA 6010B	BG-4D-19'	7500	mg/kg	FALSE	29				Potassium	Metals	7500
EPA 6010B	BG-4D-19'	840	mg/kg	FALSE	120				Silica	Metals	840
EPA 6010B	BG-4D-19'	740	mg/kg	FALSE	29				Sodium	Metals	740
EPA 9056	BG-4D-19'	250	mg/kg	FALSE	59				Sulfate	General Chemistry	250
EPA 6010B	BG-4D-19'		mg/kg	TRUE	5.9	O	(ESC) Samp		Thallium	Metals	2.95
EPA 9056	BG-4D-19'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-4D-19'	46	mg/kg	FALSE	0.59				Vanadium	Metals	46
EPA 6010B	BG-4D-19'	73	mg/kg	FALSE	1.8				Zinc	Metals	73
EPA 8270C	BG-4D-19'		ug/kg	TRUE	7.1	Q	Sample hel		Benzo(b)flu	PAHs	3.55
EPA 8270C	BG-4D-19'		ug/kg	TRUE	7.1	Q	Sample hel		Benzo(k)flu	PAHs	3.55
EPA 6010B	BG-4D-19'	56	mg/kg	FALSE	0.59				Titanium	Metals	56
EPA 8270C	BG-4D-19'		ug/kg	TRUE	7.1	Q	Sample hel		Naphthaler	PAHs	3.55
EPA 2540G	BG-4D-19'	84.9	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	84.9
EPA 6010B	BG-4D-40'	12	mg/kg	FALSE	2.3				Arsenic	Metals	12
EPA 6010B	BG-4D-40'	93	mg/kg	FALSE	0.29				Barium	Metals	93
EPA 6010B	BG-4D-40'	0.13	mg/kg	FALSE	0.29	J	(EPA) - Esti		Cadmium	Metals	0.13
EPA 6010B	BG-4D-40'	12	mg/kg	FALSE	0.58				Lead	Metals	12
EPA 7471A	BG-4D-40'		mg/kg	TRUE	0.023	J	(EPA) - Esti		Mercury	Metals	0.0115
EPA 6010B	BG-4D-40'		mg/kg	TRUE	5.8	O	(ESC) Samp		Selenium	Metals	2.9
EPA 6010B	BG-4D-40'		mg/kg	TRUE	0.58				Silver	Metals	0.29
EPA 9045C	BG-4D-40'	8.4	su	FALSE					pH	General Chemistry	8.4
EPA 8270C	BG-4D-40'		ug/kg	TRUE	7	Q	Sample hel		Acenaphth	PAHs	3.5
EPA 8270C	BG-4D-40'		ug/kg	TRUE	7	Q	Sample hel		Anthracene	PAHs	3.5
EPA 8270C	BG-4D-40'		ug/kg	TRUE	7	Q	Sample hel		Benzo(a)an	PAHs	3.5
EPA 8270C	BG-4D-40'		ug/kg	TRUE	7	Q	Sample hel		Benzo(g,h,i	PAHs	3.5
EPA 8270C	BG-4D-40'		ug/kg	TRUE	7	Q	Sample hel		Benzo(a)py	PAHs	3.5
EPA 8270C	BG-4D-40'		ug/kg	TRUE	380				Bis(2-ethyl	SVOC	190
EPA 8270C	BG-4D-40'		ug/kg	TRUE	7	Q	Sample hel		Chrysene	PAHs	3.5
EPA 8270C	BG-4D-40'		ug/kg	TRUE	7	Q	Sample hel		Fluoranthe	PAHs	3.5
EPA 8270C	BG-4D-40'		ug/kg	TRUE	7	Q	Sample hel		Indeno(1,2	PAHs	3.5
EPA 8270C	BG-4D-40'		ug/kg	TRUE	7	Q	Sample hel		Phenanthre	PAHs	3.5
EPA 8270C	BG-4D-40'		ug/kg	TRUE	7	Q	Sample hel		Pyrene	PAHs	3.5
EPA 600-R-	BG-4D-40'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-4D-40'	21000	mg/kg	FALSE	5.8				Aluminum	Metals	21000
SM4500-NI	BG-4D-40'		mg/kg	TRUE	5.8			Nitrogen, A	Ammonia	General Chemistry	2.9
EPA 6010B	BG-4D-40'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
EPA 6010B	BG-4D-40'	1	mg/kg	FALSE	0.12				Beryllium	Metals	1
EPA 8270C	BG-4D-40'		ug/kg	TRUE	380			1,1-Biphen	Biphenyl	SVOC	190
EPA 6010B	BG-4D-40'	28	mg/kg	FALSE	12				Boron	Metals	28
EPA 6010B	BG-4D-40'	57000	mg/kg	FALSE	58				Calcium	Metals	57000
EPA 9056	BG-4D-40'	180	mg/kg	FALSE	12				Chloride	General Chemistry	180
EPA 6010B	BG-4D-40'	23	mg/kg	FALSE	0.58			Total chror	Chromium,	Metals	23
EPA 7199	BG-4D-40'		mg/kg	TRUE	2.3				Chromium,	Metals	1.15
EPA 6010B	BG-4D-40'	6.1	mg/kg	FALSE	0.58				Cobalt	Metals	6.1
EPA 6010B	BG-4D-40'	14	mg/kg	FALSE	1.2				Copper	Metals	14

Lab	Backgroun	1/26/2012	BG-4D	Fluoride	40
Lab	Backgroun	1/26/2012	BG-4D	Iron	40
Lab	Backgroun	1/26/2012	BG-4D	Magnesium	40
Lab	Backgroun	1/26/2012	BG-4D	Manganese	40
Lab	Backgroun	1/26/2012	BG-4D	Molybdenum	40
Lab	Backgroun	1/26/2012	BG-4D	Nickel	40
Lab	Backgroun	1/26/2012	BG-4D	Nitrate	40
Lab	Backgroun	1/26/2012	BG-4D	Potassium	40
Lab	Backgroun	1/26/2012	BG-4D	Silica	40
Lab	Backgroun	1/26/2012	BG-4D	Sodium	40
Lab	Backgroun	1/26/2012	BG-4D	Sulfate	40
Lab	Backgroun	1/26/2012	BG-4D	Thallium	40
Lab	Backgroun	1/26/2012	BG-4D	Phosphate as P	40
Lab	Backgroun	1/26/2012	BG-4D	Vanadium	40
Lab	Backgroun	1/26/2012	BG-4D	Zinc	40
Lab	Backgroun	1/26/2012	BG-4D	Benzo(b)fluoranthene	40
Lab	Backgroun	1/26/2012	BG-4D	Benzo(k)fluoranthene	40
Lab	Backgroun	1/26/2012	BG-4D	Titanium	40
Lab	Backgroun	1/26/2012	BG-4D	Naphthalene (PAH)	40
Lab	Backgroun	1/26/2012	BG-4D	Total Solids	40
Lab	Backgroun	1/26/2012	BG-4D	Arsenic	65
Lab	Backgroun	1/26/2012	BG-4D	Barium	65
Lab	Backgroun	1/26/2012	BG-4D	Cadmium	65
Lab	Backgroun	1/26/2012	BG-4D	Lead	65
Lab	Backgroun	1/26/2012	BG-4D	Mercury	65
Lab	Backgroun	1/26/2012	BG-4D	Selenium	65
Lab	Backgroun	1/26/2012	BG-4D	Silver	65
Lab	Backgroun	1/26/2012	BG-4D	pH	65
Lab	Backgroun	1/26/2012	BG-4D	Acenaphthene	65
Lab	Backgroun	1/26/2012	BG-4D	Anthracene	65
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)anthracene	65
Lab	Backgroun	1/26/2012	BG-4D	Benzo(g,h,i)perylene	65
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)pyrene	65
Lab	Backgroun	1/26/2012	BG-4D	Bis(2-ethylhexyl)phthalate	65
Lab	Backgroun	1/26/2012	BG-4D	Chrysene	65
Lab	Backgroun	1/26/2012	BG-4D	Fluoranthene	65
Lab	Backgroun	1/26/2012	BG-4D	Indeno(1,2,3-cd)pyrene	65
Lab	Backgroun	1/26/2012	BG-4D	Phenanthrene	65
Lab	Backgroun	1/26/2012	BG-4D	Pyrene	65
Lab	Backgroun	1/26/2012	BG-4D	Asbestos	65
Lab	Backgroun	1/26/2012	BG-4D	Aluminum	65
Lab	Backgroun	1/26/2012	BG-4D	Ammonia	65
Lab	Backgroun	1/26/2012	BG-4D	Antimony	65
Lab	Backgroun	1/26/2012	BG-4D	Beryllium	65
Lab	Backgroun	1/26/2012	BG-4D	Biphenyl	65
Lab	Backgroun	1/26/2012	BG-4D	Boron	65
Lab	Backgroun	1/26/2012	BG-4D	Calcium	65
Lab	Backgroun	1/26/2012	BG-4D	Chloride	65
Lab	Backgroun	1/26/2012	BG-4D	Chromium (total)	65
Lab	Backgroun	1/26/2012	BG-4D	Chromium (hexavalent)	65
Lab	Backgroun	1/26/2012	BG-4D	Cobalt	65
Lab	Backgroun	1/26/2012	BG-4D	Copper	65
Lab	Backgroun	1/26/2012	BG-4D	Fluoride	65
Lab	Backgroun	1/26/2012	BG-4D	Iron	65
Lab	Backgroun	1/26/2012	BG-4D	Magnesium	65
Lab	Backgroun	1/26/2012	BG-4D	Manganese	65
Lab	Backgroun	1/26/2012	BG-4D	Molybdenum	65
Lab	Backgroun	1/26/2012	BG-4D	Nickel	65
Lab	Backgroun	1/26/2012	BG-4D	Nitrate	65
Lab	Backgroun	1/26/2012	BG-4D	Potassium	65
Lab	Backgroun	1/26/2012	BG-4D	Silica	65
Lab	Backgroun	1/26/2012	BG-4D	Sodium	65
Lab	Backgroun	1/26/2012	BG-4D	Sulfate	65
Lab	Backgroun	1/26/2012	BG-4D	Thallium	65
Lab	Backgroun	1/26/2012	BG-4D	Phosphate as P	65
Lab	Backgroun	1/26/2012	BG-4D	Vanadium	65
Lab	Backgroun	1/26/2012	BG-4D	Zinc	65
Lab	Backgroun	1/26/2012	BG-4D	Benzo(b)fluoranthene	65
Lab	Backgroun	1/26/2012	BG-4D	Benzo(k)fluoranthene	65
Lab	Backgroun	1/26/2012	BG-4D	Titanium	65
Lab	Backgroun	1/26/2012	BG-4D	Naphthalene (PAH)	65
Lab	Backgroun	1/26/2012	BG-4D	Total Solids	65
Lab	Backgroun	1/26/2012	BG-4D	Arsenic	79
Lab	Backgroun	1/26/2012	BG-4D	Barium	79
Lab	Backgroun	1/26/2012	BG-4D	Cadmium	79
Lab	Backgroun	1/26/2012	BG-4D	Lead	79
Lab	Backgroun	1/26/2012	BG-4D	Mercury	79
Lab	Backgroun	1/26/2012	BG-4D	Selenium	79
Lab	Backgroun	1/26/2012	BG-4D	Silver	79
Lab	Backgroun	1/26/2012	BG-4D	pH	79
Lab	Backgroun	1/26/2012	BG-4D	Acenaphthene	79
Lab	Backgroun	1/26/2012	BG-4D	Anthracene	79
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)anthracene	79
Lab	Backgroun	1/26/2012	BG-4D	Benzo(g,h,i)perylene	79
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)pyrene	79
Lab	Backgroun	1/26/2012	BG-4D	Bis(2-ethylhexyl)phthalate	79
Lab	Backgroun	1/26/2012	BG-4D	Chrysene	79
Lab	Backgroun	1/26/2012	BG-4D	Fluoranthene	79
Lab	Backgroun	1/26/2012	BG-4D	Indeno(1,2,3-cd)pyrene	79
Lab	Backgroun	1/26/2012	BG-4D	Phenanthrene	79
Lab	Backgroun	1/26/2012	BG-4D	Pyrene	79
Lab	Backgroun	1/26/2012	BG-4D	Asbestos	79
Lab	Backgroun	1/26/2012	BG-4D	Aluminum	79
Lab	Backgroun	1/26/2012	BG-4D	Ammonia	79
Lab	Backgroun	1/26/2012	BG-4D	Antimony	79
Lab	Backgroun	1/26/2012	BG-4D	Beryllium	79
Lab	Backgroun	1/26/2012	BG-4D	Biphenyl	79
Lab	Backgroun	1/26/2012	BG-4D	Boron	79
Lab	Backgroun	1/26/2012	BG-4D	Calcium	79
Lab	Backgroun	1/26/2012	BG-4D	Chloride	79
Lab	Backgroun	1/26/2012	BG-4D	Chromium (total)	79
Lab	Backgroun	1/26/2012	BG-4D	Chromium (hexavalent)	79
Lab	Backgroun	1/26/2012	BG-4D	Cobalt	79
Lab	Backgroun	1/26/2012	BG-4D	Copper	79
Lab	Backgroun	1/26/2012	BG-4D	Fluoride	79
Lab	Backgroun	1/26/2012	BG-4D	Iron	79
Lab	Backgroun	1/26/2012	BG-4D	Magnesium	79
Lab	Backgroun	1/26/2012	BG-4D	Manganese	79
Lab	Backgroun	1/26/2012	BG-4D	Molybdenum	79
Lab	Backgroun	1/26/2012	BG-4D	Nickel	79
Lab	Backgroun	1/26/2012	BG-4D	Nitrate	79
Lab	Backgroun	1/26/2012	BG-4D	Potassium	79
Lab	Backgroun	1/26/2012	BG-4D	Silica	79
Lab	Backgroun	1/26/2012	BG-4D	Sodium	79
Lab	Backgroun	1/26/2012	BG-4D	Sulfate	79
Lab	Backgroun	1/26/2012	BG-4D	Thallium	79
Lab	Backgroun	1/26/2012	BG-4D	Phosphate as P	79
Lab	Backgroun	1/26/2012	BG-4D	Vanadium	79
Lab	Backgroun	1/26/2012	BG-4D	Zinc	79
Lab	Backgroun	1/26/2012	BG-4D	Benzo(b)fluoranthene	79
Lab	Backgroun	1/26/2012	BG-4D	Benzo(k)fluoranthene	79
Lab	Backgroun	1/26/2012	BG-4D	Titanium	79
Lab	Backgroun	1/26/2012	BG-4D	Naphthalene (PAH)	79
Lab	Backgroun	1/26/2012	BG-4D	Total Solids	79
Lab	Backgroun	1/26/2012	BG-4D	Arsenic	82
Lab	Backgroun	1/26/2012	BG-4D	Barium	82
Lab	Backgroun	1/26/2012	BG-4D	Cadmium	82
Lab	Backgroun	1/26/2012	BG-4D	Lead	82
Lab	Backgroun	1/26/2012	BG-4D	Mercury	82
Lab	Backgroun	1/26/2012	BG-4D	Selenium	82
Lab	Backgroun	1/26/2012	BG-4D	Silver	82
Lab	Backgroun	1/26/2012	BG-4D	pH	82

EPA 300.0	BG-4D-40'	9.5	mg/kg	FALSE	1.2				Fluoride	General Chemistry	9.5
EPA 6010B	BG-4D-40'	17000	mg/kg	FALSE	5.8				Iron	Metals	17000
EPA 6010B	BG-4D-40'	11000	mg/kg	FALSE	5.8				Magnesiun	Metals	11000
EPA 6010B	BG-4D-40'	260	mg/kg	FALSE	0.58				Manganese	Metals	260
EPA 6010B	BG-4D-40'	0.34	mg/kg	FALSE	0.58	J	(EPA) - Esti		Molybdenu	Metals	0.34
EPA 6010B	BG-4D-40'	17	mg/kg	FALSE	2.3				Nickel	Metals	17
EPA 300.0	BG-4D-40'		mg/kg	TRUE	1.2	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.6
EPA 6010B	BG-4D-40'	6300	mg/kg	FALSE	29				Potassium	Metals	6300
EPA 6010B	BG-4D-40'	830	mg/kg	FALSE	120				Silica	Metals	830
EPA 6010B	BG-4D-40'	390	mg/kg	FALSE	29				Sodium	Metals	390
EPA 9056	BG-4D-40'	72	mg/kg	FALSE	58				Sulfate	General Chemistry	72
EPA 6010B	BG-4D-40'		mg/kg	TRUE	5.8	O	(ESC) Samp		Thallium	Metals	2.9
EPA 9056	BG-4D-40'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-4D-40'	35	mg/kg	FALSE	0.58				Vanadium	Metals	35
EPA 6010B	BG-4D-40'	52	mg/kg	FALSE	1.7				Zinc	Metals	52
EPA 8270C	BG-4D-40'		ug/kg	TRUE	7	Q	Sample hel		Benzo(b)flu	PAHs	3.5
EPA 8270C	BG-4D-40'		ug/kg	TRUE	7	Q	Sample hel		Benzo(k)flu	PAHs	3.5
EPA 6010B	BG-4D-40'	88	mg/kg	FALSE	1.2				Titanium	Metals	88
EPA 8270C	BG-4D-40'		ug/kg	TRUE	7	Q	Sample hel		Naphthaler	PAHs	3.5
EPA 2540G	BG-4D-40'	86.2	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	86.2
EPA 6010B	BG-4D-65'	6.7	mg/kg	FALSE	1				Arsenic	Metals	6.7
EPA 6010B	BG-4D-65'	9.9	mg/kg	FALSE	0.26				Barium	Metals	9.9
EPA 6010B	BG-4D-65'	0.043	mg/kg	FALSE	0.26	J,P1	J-(EPA) - Es		Cadmium	Metals	0.043
EPA 6010B	BG-4D-65'	4	mg/kg	FALSE	0.26				Lead	Metals	4
EPA 7471A	BG-4D-65'		mg/kg	TRUE	0.02	J	(EPA) - Esti		Mercury	Metals	0.01
EPA 6010B	BG-4D-65'		mg/kg	TRUE	5.1	O,J6	O-(ESC) Sar		Selenium	Metals	2.55
EPA 6010B	BG-4D-65'		mg/kg	TRUE	0.51				Silver	Metals	0.255
EPA 9045C	BG-4D-65'	8.8	su	FALSE					pH	General Chemistry	8.8
EPA 8270C	BG-4D-65'		ug/kg	TRUE	6.2	Q	Sample hel		Acenaphth	PAHs	3.1
EPA 8270C	BG-4D-65'		ug/kg	TRUE	6.2	Q	Sample hel		Anthracene	PAHs	3.1
EPA 8270C	BG-4D-65'		ug/kg	TRUE	6.2	Q	Sample hel		Benzo(a)an	PAHs	3.1
EPA 8270C	BG-4D-65'		ug/kg	TRUE	6.2	Q	Sample hel		Benzo(g,h,i	PAHs	3.1
EPA 8270C	BG-4D-65'		ug/kg	TRUE	6.2	Q	Sample hel		Benzo(a)py	PAHs	3.1
EPA 8270C	BG-4D-65'		ug/kg	TRUE	340				Bis(2-ethyll	SVOC	170
EPA 8270C	BG-4D-65'		ug/kg	TRUE	6.2	Q	Sample hel		Chrysene	PAHs	3.1
EPA 8270C	BG-4D-65'		ug/kg	TRUE	6.2	Q	Sample hel		Fluoranthe	PAHs	3.1
EPA 8270C	BG-4D-65'		ug/kg	TRUE	6.2	Q	Sample hel		Indeno(1,2	PAHs	3.1
EPA 8270C	BG-4D-65'		ug/kg	TRUE	6.2	Q	Sample hel		Phenanthre	PAHs	3.1
EPA 8270C	BG-4D-65'		ug/kg	TRUE	6.2	Q	Sample hel		Pyrene	PAHs	3.1
EPA 600-R-	BG-4D-65'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-4D-65'	3900	mg/kg	FALSE	5.1	V,J3	V-Addition		Aluminum	Metals	3900
SM4500-NI	BG-4D-65'		mg/kg	TRUE	5.1			Nitrogen, A	Ammonia	General Chemistry	2.55
EPA 6010B	BG-4D-65'		mg/kg	TRUE	1	J6	The sample		Antimony	Metals	0.5
EPA 6010B	BG-4D-65'	0.11	mg/kg	FALSE	0.1	P1	RPD value		Beryllium	Metals	0.11
EPA 8270C	BG-4D-65'		ug/kg	TRUE	340			1,1-Biphen	Biphenyl	SVOC	170
EPA 6010B	BG-4D-65'	7	mg/kg	FALSE	10	J,P1	J-(EPA) - Es		Boron	Metals	7
EPA 6010B	BG-4D-65'	30000	mg/kg	FALSE	26	V	Additional		Calcium	Metals	30000
EPA 9056	BG-4D-65'	52	mg/kg	FALSE	10				Chloride	General Chemistry	52
EPA 6010B	BG-4D-65'	5.5	mg/kg	FALSE	0.51			Total chror	Chromium,	Metals	5.5
EPA 7199	BG-4D-65'		mg/kg	TRUE	2				Chromium,	Metals	1
EPA 6010B	BG-4D-65'	1.6	mg/kg	FALSE	0.51				Cobalt	Metals	1.6
EPA 6010B	BG-4D-65'	3.2	mg/kg	FALSE	1				Copper	Metals	3.2
EPA 300.0	BG-4D-65'	2.9	mg/kg	FALSE	1				Fluoride	General Chemistry	2.9
EPA 6010B	BG-4D-65'	4800	mg/kg	FALSE	5.1	V	Additional		Iron	Metals	4800
EPA 6010B	BG-4D-65'	5300	mg/kg	FALSE	5.1	V	Additional		Magnesiun	Metals	5300
EPA 6010B	BG-4D-65'	90	mg/kg	FALSE	0.51				Manganese	Metals	90
EPA 6010B	BG-4D-65'	0.32	mg/kg	FALSE	0.26	J	(EPA) - Esti		Molybdenu	Metals	0.32
EPA 6010B	BG-4D-65'	3.4	mg/kg	FALSE	1				Nickel	Metals	3.4
EPA 300.0	BG-4D-65'		mg/kg	TRUE	1	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.5
EPA 6010B	BG-4D-65'	1200	mg/kg	FALSE	26	V	Additional		Potassium	Metals	1200
EPA 6010B	BG-4D-65'	480	mg/kg	FALSE	100				Silica	Metals	480
EPA 6010B	BG-4D-65'	60	mg/kg	FALSE	26				Sodium	Metals	60
EPA 9056	BG-4D-65'		mg/kg	TRUE	51	J	(EPA) - Esti		Sulfate	General Chemistry	25.5
EPA 6010B	BG-4D-65'		mg/kg	TRUE	5.1	O	(ESC) Samp		Thallium	Metals	2.55
EPA 9056	BG-4D-65'		mg/kg	TRUE	1	B4	(ESC) - The		Phosphoro	General Chemistry	0.5
EPA 6010B	BG-4D-65'	9.6	mg/kg	FALSE	0.51				Vanadium	Metals	9.6
EPA 6010B	BG-4D-65'	13	mg/kg	FALSE	1.5				Zinc	Metals	13
EPA 8270C	BG-4D-65'		ug/kg	TRUE	6.2	Q	Sample hel		Benzo(b)flu	PAHs	3.1
EPA 8270C	BG-4D-65'		ug/kg	TRUE	6.2	Q	Sample hel		Benzo(k)flu	PAHs	3.1
EPA 6010B	BG-4D-65'	40	mg/kg	FALSE	0.51				Titanium	Metals	40
EPA 8270C	BG-4D-65'		ug/kg	TRUE	6.2	Q	Sample hel		Naphthaler	PAHs	3.1
EPA 2540G	BG-4D-65'	97.3	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	97.3
EPA 6010B	BG-4D-79'	18	mg/kg	FALSE	2.3				Arsenic	Metals	18
EPA 6010B	BG-4D-79'	29	mg/kg	FALSE	0.29				Barium	Metals	29
EPA 6010B	BG-4D-79'	0.22	mg/kg	FALSE	0.29	J	(EPA) - Esti		Cadmium	Metals	0.22
EPA 6010B	BG-4D-79'	11	mg/kg	FALSE	0.59				Lead	Metals	11
EPA 7471A	BG-4D-79'		mg/kg	TRUE	0.02	J	(EPA) - Esti		Mercury	Metals	0.01
EPA 6010B	BG-4D-79'		mg/kg	TRUE	5.9	O	(ESC) Samp		Selenium	Metals	2.95
EPA 6010B	BG-4D-79'		mg/kg	TRUE	0.59				Silver	Metals	0.295
EPA 9045C	BG-4D-79'	8.4	su	FALSE					pH	General Chemistry	8.4
EPA 8270C	BG-4D-79'		ug/kg	TRUE	7				Acenaphth	PAHs	3.5
EPA 8270C	BG-4D-79'		ug/kg	TRUE	7				Anthracene	PAHs	3.5
EPA 8270C	BG-4D-79'		ug/kg	TRUE	7				Benzo(a)an	PAHs	3.5
EPA 8270C	BG-4D-79'		ug/kg	TRUE	7				Benzo(g,h,i	PAHs	3.5
EPA 8270C	BG-4D-79'		ug/kg	TRUE	7				Benzo(a)py	PAHs	3.5
EPA 8270C	BG-4D-79'		ug/kg	TRUE	390				Bis(2-ethyll	SVOC	195
EPA 8270C	BG-4D-79'		ug/kg	TRUE	7				Chrysene	PAHs	3.5
EPA 8270C	BG-4D-79'		ug/kg	TRUE	7				Fluoranthe	PAHs	3.5
EPA 8270C	BG-4D-79'		ug/kg	TRUE	7				Indeno(1,2	PAHs	3.5
EPA 8270C	BG-4D-79'		ug/kg	TRUE	7				Phenanthre	PAHs	3.5
EPA 8270C	BG-4D-79'		ug/kg	TRUE	7				Pyrene	PAHs	3.5
EPA 600-R-	BG-4D-79'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-4D-79'	16000	mg/kg	FALSE	5.9				Aluminum	Metals	16000
SM4500-NI	BG-4D-79'		mg/kg	TRUE	5.9			Nitrogen, A	Ammonia	General Chemistry	2.95
EPA 6010B	BG-4D-79'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
EPA 6010B	BG-4D-79'	0.69	mg/kg	FALSE	0.12				Beryllium	Metals	0.69
EPA 8270C	BG-4D-79'		ug/kg	TRUE	390			1,1-Biphen	Biphenyl	SVOC	195
EPA 6010B	BG-4D-79'	19	mg/kg	FALSE	12				Boron	Metals	19
EPA 6010B	BG-4D-79'	70000	mg/kg	FALSE	59				Calcium	Metals	70000
EPA 9056	BG-4D-79'	120	mg/kg	FALSE	12				Chloride	General Chemistry	120
EPA 6010B	BG-4D-79'	19	mg/kg	FALSE	0.59			Total chror	Chromium,	Metals	19
EPA 7199	BG-4D-79'		mg/kg	TRUE	2.3				Chromium,	Metals	1.15
EPA 6010B	BG-4D-79'	6.6	mg/kg	FALSE	0.59				Cobalt	Metals	6.6
EPA 6010B	BG-4D-79'	14	mg/kg	FALSE	1.2				Copper	Metals	14
EPA 300.0	BG-4D-79'	6.3	mg/kg	FALSE	1.2				Fluoride	General Chemistry	6.3
EPA 6010B	BG-4D-79'	15000	mg/kg	FALSE	5.9	V	Additional		Iron	Metals	15000
EPA 6010B	BG-4D-79'	13000	mg/kg	FALSE	5.9				Magnesiun	Metals	13000
EPA 6010B	BG-4D-79'	360	mg/kg	FALSE	0.59				Manganese	Metals	360
EPA 6010B	BG-4D-79'	0.27	mg/kg	FALSE	0.59	J	(EPA) - Esti		Molybdenu	Metals	0.27
EPA 6010B	BG-4D-79'	15	mg/kg	FALSE	2.3				Nickel	Metals	15
EPA 300.0	BG-4D-79'		mg/kg	TRUE	1	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.5
EPA 6010B	BG-4D-79'	4900	mg/kg	FALSE	29				Potassium	Metals	4900
EPA 6010B	BG-4D-79'	730	mg/kg	FALSE	110				Silica	Metals	730
EPA 6010B	BG-4D-79'	220	mg/kg	FALSE	29				Sodium	Metals	220
EPA 9056	BG-4D-79'	140	mg/kg	FALSE	59	J	(EPA) - Esti		Sulfate	General Chemistry	140
EPA 6010B	BG-4D-79'		mg/kg	TRUE	5.9	O	(ESC) Samp		Thallium	Metals	2.95
EPA 9056	BG-4D-79'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-4D-79'	32	mg/kg	FALSE	0.59				Vanadium	Metals	32
EPA 6010B	BG-4D-79'	52	mg/kg	FALSE	1.8				Zinc	Metals	52
EPA 8270C	BG-4D-79'		ug/kg	TRUE	7				Benzo(b)flu	PAHs	3.5
EPA 8270C	BG-4D-79'		ug/kg	TRUE	7				Benzo(k)flu	PAHs	3.5
EPA 6010B	BG-4D-79'	110	mg/kg	FALSE	1.2				Titanium	Metals	110
EPA 8270C	BG-4D-79'		ug/kg	TRUE	7				Naphthaler	PAHs	3.5
EPA 2540G	BG-4D-79'	85.2	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	85.2
EPA 6010B	BG-4D-82'	17	mg/kg	FALSE	1.2				Arsenic	Metals	17
EPA 6010B	BG-4D-82'	18	mg/kg	FALSE	0.3				Barium	Metals	18
EPA 6010B	BG-4D-82'	0.092	mg/kg	FALSE	0.3	J	(EPA) - Esti		Cadmium	Metals	0.092
EPA 6010B	BG-4D-82'	7.3	mg/kg	FALSE	0.3				Lead	Metals	7.3
EPA 7471A	BG-4D-82'		mg/kg	TRUE	0.024	J	(EPA) - Esti		Mercury	Metals	0.012
EPA 6010B	BG-4D-82'		mg/kg	TRUE	12	O	(ESC) Samp		Selenium	Metals	6
EPA 6010B	BG-4D-82'		mg/kg	TRUE	0.6				Silver	Metals	0.3
EPA 9045C	BG-4D-82'	8.4	su	FALSE					pH	General Chemistry	8.4

Lab	Backgroun	1/26/2012	BG-4D	Acenaphthene	82	EPA 8270C	BG-4D-82'		ug/kg	TRUE	7.2				Acenaphth	PAHs	3.6
Lab	Backgroun	1/26/2012	BG-4D	Anthracene	82	EPA 8270C	BG-4D-82'		ug/kg	TRUE	7.2				Anthracene	PAHs	3.6
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)anthracene	82	EPA 8270C	BG-4D-82'		ug/kg	TRUE	7.2				Benzo(a)an	PAHs	3.6
Lab	Backgroun	1/26/2012	BG-4D	Benzo(g,h,i)perylene	82	EPA 8270C	BG-4D-82'		ug/kg	TRUE	7.2				Benzo(g,h,i	PAHs	3.6
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)pyrene	82	EPA 8270C	BG-4D-82'		ug/kg	TRUE	7.2				Benzo(a)py	PAHs	3.6
Lab	Backgroun	1/26/2012	BG-4D	Bis(2-ethylhexyl)phthalate	82	EPA 8270C	BG-4D-82'		ug/kg	TRUE	400				Bis(2-ethyll	SVOC	200
Lab	Backgroun	1/26/2012	BG-4D	Chrysene	82	EPA 8270C	BG-4D-82'		ug/kg	TRUE	7.2				Chrysene	PAHs	3.6
Lab	Backgroun	1/26/2012	BG-4D	Fluoranthene	82	EPA 8270C	BG-4D-82'		ug/kg	TRUE	7.2				Fluoranthe	PAHs	3.6
Lab	Backgroun	1/26/2012	BG-4D	Indeno(1,2,3-cd)pyrene	82	EPA 8270C	BG-4D-82'		ug/kg	TRUE	7.2				Indeno(1,2	PAHs	3.6
Lab	Backgroun	1/26/2012	BG-4D	Phenanthrene	82	EPA 8270C	BG-4D-82'		ug/kg	TRUE	7.2				Phenanthre	PAHs	3.6
Lab	Backgroun	1/26/2012	BG-4D	Pyrene	82	EPA 8270C	BG-4D-82'		ug/kg	TRUE	7.2				Pyrene	PAHs	3.6
Lab	Backgroun	1/26/2012	BG-4D	Asbestos	82	EPA 600-R-	BG-4D-82'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	1/26/2012	BG-4D	Aluminum	82	EPA 6010B	BG-4D-82'	8200	mg/kg	FALSE	6				Aluminum	Metals	8200
Lab	Backgroun	1/26/2012	BG-4D	Ammonia	82	SM4500-NI	BG-4D-82'		mg/kg	TRUE	6			Nitrogen, A	Ammonia	General Chemistry	3
Lab	Backgroun	1/26/2012	BG-4D	Antimony	82	EPA 6010B	BG-4D-82'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
Lab	Backgroun	1/26/2012	BG-4D	Beryllium	82	EPA 6010B	BG-4D-82'		mg/kg	TRUE	0.12				Beryllium	Metals	0.06
Lab	Backgroun	1/26/2012	BG-4D	Biphenyl	82	EPA 8270C	BG-4D-82'		ug/kg	TRUE	400			1,1-Biphen	Biphenyl	SVOC	200
Lab	Backgroun	1/26/2012	BG-4D	Boron	82	EPA 6010B	BG-4D-82'	12	mg/kg	FALSE	12	J	(EPA) - Esti		Boron	Metals	12
Lab	Backgroun	1/26/2012	BG-4D	Calcium	82	EPA 6010B	BG-4D-82'	50000	mg/kg	FALSE	30				Calcium	Metals	50000
Lab	Backgroun	1/26/2012	BG-4D	Chloride	82	EPA 9056	BG-4D-82'	110	mg/kg	FALSE	12				Chloride	General Chemistry	110
Lab	Backgroun	1/26/2012	BG-4D	Chromium (total)	82	EPA 6010B	BG-4D-82'	10	mg/kg	FALSE	0.6			Total chror	Chromium,	Metals	10
Lab	Backgroun	1/26/2012	BG-4D	Chromium (hexavalent)	82	EPA 7199	BG-4D-82'		mg/kg	TRUE	2.4				Chromium,	Metals	1.2
Lab	Backgroun	1/26/2012	BG-4D	Cobalt	82	EPA 6010B	BG-4D-82'	4	mg/kg	FALSE	0.6				Cobalt	Metals	4
Lab	Backgroun	1/26/2012	BG-4D	Copper	82	EPA 6010B	BG-4D-82'	8.4	mg/kg	FALSE	1.2				Copper	Metals	8.4
Lab	Backgroun	1/26/2012	BG-4D	Fluoride	82	EPA 300.0	BG-4D-82'	4.6	mg/kg	FALSE	1.2				Fluoride	General Chemistry	4.6
Lab	Backgroun	1/26/2012	BG-4D	Iron	82	EPA 6010B	BG-4D-82'	10000	mg/kg	FALSE	6				Iron	Metals	10000
Lab	Backgroun	1/26/2012	BG-4D	Magnesium	82	EPA 6010B	BG-4D-82'	12000	mg/kg	FALSE	6				Magnesiun	Metals	12000
Lab	Backgroun	1/26/2012	BG-4D	Manganese	82	EPA 6010B	BG-4D-82'	190	mg/kg	FALSE	0.6				Manganese	Metals	190
Lab	Backgroun	1/26/2012	BG-4D	Molybdenum	82	EPA 6010B	BG-4D-82'	0.43	mg/kg	FALSE	0.3				Molybdenu	Metals	0.43
Lab	Backgroun	1/26/2012	BG-4D	Nickel	82	EPA 6010B	BG-4D-82'	8	mg/kg	FALSE	1.2				Nickel	Metals	8
Lab	Backgroun	1/26/2012	BG-4D	Nitrate	82	EPA 300.0	BG-4D-82'		mg/kg	TRUE	1.2	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.6
Lab	Backgroun	1/26/2012	BG-4D	Potassium	82	EPA 6010B	BG-4D-82'	2800	mg/kg	FALSE	30				Potassium	Metals	2800
Lab	Backgroun	1/26/2012	BG-4D	Silica	82	EPA 6010B	BG-4D-82'	770	mg/kg	FALSE	130				Silica	Metals	770
Lab	Backgroun	1/26/2012	BG-4D	Sodium	82	EPA 6010B	BG-4D-82'	170	mg/kg	FALSE	30				Sodium	Metals	170
Lab	Backgroun	1/26/2012	BG-4D	Sulfate	82	EPA 9056	BG-4D-82'	200	mg/kg	FALSE	60				Sulfate	General Chemistry	200
Lab	Backgroun	1/26/2012	BG-4D	Thallium	82	EPA 6010B	BG-4D-82'		mg/kg	TRUE	6	O	(ESC) Samp		Thallium	Metals	3
Lab	Backgroun	1/26/2012	BG-4D	Phosphate as P	82	EPA 9056	BG-4D-82'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
Lab	Backgroun	1/26/2012	BG-4D	Vanadium	82	EPA 6010B	BG-4D-82'	20	mg/kg	FALSE	0.6				Vanadium	Metals	20
Lab	Backgroun	1/26/2012	BG-4D	Zinc	82	EPA 6010B	BG-4D-82'	29	mg/kg	FALSE	1.8				Zinc	Metals	29
Lab	Backgroun	1/26/2012	BG-4D	Benzo(b)fluoranthene	82	EPA 8270C	BG-4D-82'		ug/kg	TRUE	7.2				Benzo(b)flu	PAHs	3.6
Lab	Backgroun	1/26/2012	BG-4D	Benzo(k)fluoranthene	82	EPA 8270C	BG-4D-82'		ug/kg	TRUE	7.2				Benzo(k)flu	PAHs	3.6
Lab	Backgroun	1/26/2012	BG-4D	Titanium	82	EPA 6010B	BG-4D-82'	140	mg/kg	FALSE	0.6				Titanium	Metals	140
Lab	Backgroun	1/26/2012	BG-4D	Naphthalene (PAH)	82	EPA 8270C	BG-4D-82'		ug/kg	TRUE	7.2				Naphthaler	PAHs	3.6
Lab	Backgroun	1/26/2012	BG-4D	Total Solids	82	EPA 2540G	BG-4D-82'	83.3	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	83.3
Lab	Backgroun	1/26/2012	BG-4D	Arsenic	95	EPA 6010B	BG-4D-95'	6.4	mg/kg	FALSE	1.2				Arsenic	Metals	6.4
Lab	Backgroun	1/26/2012	BG-4D	Barium	95	EPA 6010B	BG-4D-95'	20	mg/kg	FALSE	0.3				Barium	Metals	20
Lab	Backgroun	1/26/2012	BG-4D	Cadmium	95	EPA 6010B	BG-4D-95'		mg/kg	TRUE	0.3				Cadmium	Metals	0.15
Lab	Backgroun	1/26/2012	BG-4D	Lead	95	EPA 6010B	BG-4D-95'	3.3	mg/kg	FALSE	0.3				Lead	Metals	3.3
Lab	Backgroun	1/26/2012	BG-4D	Mercury	95	EPA 7471A	BG-4D-95'		mg/kg	TRUE	0.024	J	(EPA) - Esti		Mercury	Metals	0.012
Lab	Backgroun	1/26/2012	BG-4D	Selenium	95	EPA 6010B	BG-4D-95'		mg/kg	TRUE	6.1	O	(ESC) Samp		Selenium	Metals	3.05
Lab	Backgroun	1/26/2012	BG-4D	Silver	95	EPA 6010B	BG-4D-95'		mg/kg	TRUE	0.61				Silver	Metals	0.305
Lab	Backgroun	1/26/2012	BG-4D	pH	95	EPA 9045C	BG-4D-95'	8.7	su	FALSE					pH	General Chemistry	8.7
Lab	Backgroun	1/26/2012	BG-4D	Acenaphthene	95	EPA 8270C	BG-4D-95'		ug/kg	TRUE	7.3				Acenaphth	PAHs	3.65
Lab	Backgroun	1/26/2012	BG-4D	Anthracene	95	EPA 8270C	BG-4D-95'		ug/kg	TRUE	7.3				Anthracene	PAHs	3.65
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)anthracene	95	EPA 8270C	BG-4D-95'		ug/kg	TRUE	7.3				Benzo(a)an	PAHs	3.65
Lab	Backgroun	1/26/2012	BG-4D	Benzo(g,h,i)perylene	95	EPA 8270C	BG-4D-95'		ug/kg	TRUE	7.3				Benzo(g,h,i	PAHs	3.65
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)pyrene	95	EPA 8270C	BG-4D-95'		ug/kg	TRUE	7.3				Benzo(a)py	PAHs	3.65
Lab	Backgroun	1/26/2012	BG-4D	Bis(2-ethylhexyl)phthalate	95	EPA 8270C	BG-4D-95'	920	ug/kg	FALSE	400				Bis(2-ethyll	SVOC	920
Lab	Backgroun	1/26/2012	BG-4D	Chrysene	95	EPA 8270C	BG-4D-95'		ug/kg	TRUE	7.3				Chrysene	PAHs	3.65
Lab	Backgroun	1/26/2012	BG-4D	Fluoranthene	95	EPA 8270C	BG-4D-95'		ug/kg	TRUE	7.3				Fluoranthe	PAHs	3.65
Lab	Backgroun	1/26/2012	BG-4D	Indeno(1,2,3-cd)pyrene	95	EPA 8270C	BG-4D-95'		ug/kg	TRUE	7.3				Indeno(1,2	PAHs	3.65
Lab	Backgroun	1/26/2012	BG-4D	Phenanthrene	95	EPA 8270C	BG-4D-95'		ug/kg	TRUE	7.3				Phenanthre	PAHs	3.65
Lab	Backgroun	1/26/2012	BG-4D	Pyrene	95	EPA 8270C	BG-4D-95'		ug/kg	TRUE	7.3				Pyrene	PAHs	3.65
Lab	Backgroun	1/26/2012	BG-4D	Asbestos	95	EPA 600-R-	BG-4D-95'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	1/26/2012	BG-4D	Aluminum	95	EPA 6010B	BG-4D-95'	3300	mg/kg	FALSE	6.1				Aluminum	Metals	3300
Lab	Backgroun	1/26/2012	BG-4D	Ammonia	95	SM4500-NI	BG-4D-95'		mg/kg	TRUE	6.1			Nitrogen, A	Ammonia	General Chemistry	3.05
Lab	Backgroun	1/26/2012	BG-4D	Antimony	95	EPA 6010B	BG-4D-95'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
Lab	Backgroun	1/26/2012	BG-4D	Beryllium	95	EPA 6010B	BG-4D-95'	0.057	mg/kg	FALSE	0.12	J	(EPA) - Esti		Beryllium	Metals	0.057
Lab	Backgroun	1/26/2012	BG-4D	Biphenyl	95	EPA 8270C	BG-4D-95'		ug/kg	TRUE	400			1,1-Biphen	Biphenyl	SVOC	200
Lab	Backgroun	1/26/2012	BG-4D	Boron	95	EPA 6010B	BG-4D-95'	5.5	mg/kg	FALSE	12	J	(EPA) - Esti		Boron	Metals	5.5
Lab	Backgroun	1/26/2012	BG-4D	Calcium	95	EPA 6010B	BG-4D-95'	30000	mg/kg	FALSE	30				Calcium	Metals	30000
Lab	Backgroun	1/26/2012	BG-4D	Chloride	95	EPA 9056	BG-4D-95'	110	mg/kg	FALSE	12				Chloride	General Chemistry	110
Lab	Backgroun	1/26/2012	BG-4D	Chromium (total)	95	EPA 6010B	BG-4D-95'	4.2	mg/kg	FALSE	0.61			Total chror	Chromium,	Metals	4.2
Lab	Backgroun	1/26/2012	BG-4D	Chromium (hexavalent)	95	EPA 7199	BG-4D-95'		mg/kg	TRUE	2.4				Chromium,	Metals	1.2
Lab	Backgroun	1/26/2012	BG-4D	Cobalt	95	EPA 6010B	BG-4D-95'	1.2	mg/kg	FALSE	0.61				Cobalt	Metals	1.2
Lab	Backgroun	1/26/2012	BG-4D	Copper	95	EPA 6010B	BG-4D-95'	2.6	mg/kg	FALSE	1.2				Copper	Metals	2.6
Lab	Backgroun	1/26/2012	BG-4D	Fluoride	95	EPA 300.0	BG-4D-95'	2.6	mg/kg	FALSE	1.2				Fluoride	General Chemistry	2.6
Lab	Backgroun	1/26/2012	BG-4D	Iron	95	EPA 6010B	BG-4D-95'	3800	mg/kg	FALSE	6.1				Iron	Metals	3800
Lab	Backgroun	1/26/2012	BG-4D	Magnesium	95	EPA 6010B	BG-4D-95'	5500	mg/kg	FALSE	6.1				Magnesiun	Metals	5500
Lab	Backgroun	1/26/2012	BG-4D	Manganese	95	EPA 6010B	BG-4D-95'	79	mg/kg	FALSE	0.61				Manganese	Metals	79
Lab	Backgroun	1/26/2012	BG-4D	Molybdenum	95	EPA 6010B	BG-4D-95'	0.34	mg/kg	FALSE	0.3				Molybdenu	Metals	0.34
Lab	Backgroun	1/26/2012	BG-4D	Nickel	95	EPA 6010B	BG-4D-95'	2.4	mg/kg	FALSE	1.2				Nickel	Metals	2.4
Lab	Backgroun	1/26/2012	BG-4D	Nitrate	95	EPA 300.0	BG-4D-95'		mg/kg	TRUE	1.2	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.6
Lab	Backgroun	1/26/2012	BG-4D	Potassium	95	EPA 6010B	BG-4D-95'	1100	mg/kg	FALSE	30				Potassium	Metals	1100
Lab	Backgroun	1/26/2012	BG-4D	Silica	95	EPA 6010B	BG-4D-95'	600	mg/kg	FALSE	110				Silica	Metals	600
Lab	Backgroun	1/26/2012	BG-4D	Sodium	95	EPA 6010B	BG-4D-95'	130	mg/kg	FALSE	30				Sodium	Metals	130
Lab	Backgroun	1/26/2012	BG-4D	Sulfate	95	EPA 9056	BG-4D-95'	200	mg/kg	FALSE	61				Sulfate	General Chemistry	200
Lab	Backgroun	1/26/2012	BG-4D	Thallium	95	EPA 6010B	BG-4D-95'		mg/kg	TRUE	1.2				Thallium	Metals	0.6
Lab	Backgroun	1/26/2012	BG-4D	Phosphate as P	95	EPA 9056	BG-4D-95'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
Lab	Backgroun	1/26/2012	BG-4D	Vanadium	95	EPA 6010B	BG-4D-95'	7.3	mg/kg	FALSE	0.61				Vanadium	Metals	7.3
Lab	Backgroun	1/26/2012	BG-4D	Zinc	95	EPA 6010B	BG-4D-95'	11	mg/kg	FALSE	1.8				Zinc	Metals	11
Lab	Backgroun	1/26/2012	BG-4D	Benzo(b)fluoranthene	95	EPA 8270C	BG-4D-95'		ug/kg	TRUE	7.3				Benzo(b)flu	PAHs	3.65
Lab	Backgroun	1/26/2012	BG-4D	Benzo(k)fluoranthene	95	EPA 8270C	BG-4D-95'		ug/kg	TRUE	7.3				Benzo(k)flu	PAHs	3.65
Lab	Backgroun	1/26/2012	BG-4D	Titanium	95	EPA 6010B	BG-4D-95'	43	mg/kg	FALSE	0.61				Titanium	Metals	43
Lab	Backgroun	1/26/2012	BG-4D	Naphthalene (PAH)	95	EPA 8270C	BG-4D-95'		ug/kg	TRUE	7.3				Naphthaler	PAHs	3.65
Lab	Backgroun	1/26/2012	BG-4D	Total Solids	95	EPA 2540G	BG-4D-95'	81.8	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	81.8
Lab	Backgroun	1/26/2012	BG-4D	Arsenic	117	EPA 6010B	BG-4D-117	5.7	mg/kg	FALSE	1.2				Arsenic	Metals	5.7
Lab	Backgroun	1/26/2012	BG-4D	Barium	117	EPA 6010B	BG-4D-117	58	mg/kg	FALSE	0.3				Barium	Metals	58
Lab	Backgroun	1/26/2012	BG-4D	Cadmium	117	EPA 6010B	BG-4D-117	0.057	mg/kg	FALSE	0.3	J	(EPA) - Esti		Cadmium	Metals	0.057
Lab	Backgroun	1/26/2012	BG-4D	Lead	117	EPA 6010B	BG-4D-117	2.7	mg/kg	FALSE	0.3				Lead	Metals	2.7
Lab	Backgroun	1/26/2012	BG-4D	Mercury	117	EPA 7471A	BG-4D-117'		mg/kg	TRUE	0.024	J	(EPA) - Esti		Mercury	Metals	0.012
Lab	Backgroun	1/26/2012	BG-4D	Selenium	117	EPA 6010B	BG-4D-117'		mg/kg	TRUE	5.9	O	(ESC) Samp		Selenium	Metals	2.95
Lab	Backgroun	1/26/2012	BG-4D	Silver	117	EPA 6010B	BG-4D-117'		mg/kg	TRUE	0.59				Silver	Metals	0.295
Lab	Backgroun	1/26/2012	BG-4D	pH	117	EPA 9045C	BG-4D-117	8.4	su	FALSE					pH	General Chemistry	8.4
Lab	Backgroun	1/26/2012	BG-4D	Acenaphthene	117	EPA 8270C	BG-4D-117'		ug/kg	TRUE	7.1				Acenaphth	PAHs	3.55
Lab	Backgroun	1/26/2012	BG-4D	Anthracene	117	EPA 8270C	BG-4D-117'		ug/kg	TRUE	7.1				Anthracene	PAHs	3.55
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)anthracene	117	EPA 8270C	BG-4D-117'		ug/kg	TRUE	7.1				Benzo(a)an	PAHs	3.55
Lab	Backgroun	1/26/2012	BG-4D	Benzo(g,h,i)perylene	117	EPA 8270C	BG-4D-117'		ug/kg	TRUE	7.1				Benzo(g,h,i	PAHs	3.55
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)pyrene	117	EPA 8270C	BG-4D-117'		ug/kg	TRUE	7.1				Benzo(a)py	PAHs	3.55
Lab	Backgroun	1/26/2012	BG-4D	Bis(2-ethylhexyl)phthalate	117	EPA 8270C	BG-4D-117'		ug/kg	TRUE	390				Bis(2-ethyll	SVOC	195
Lab	Backgroun	1/26/2012	BG-4D	Chrysene	117	EPA 8270C	BG-4D-117'		ug/kg	TRUE	7.1				Chrysene	PAHs	3.55
Lab	Backgroun	1/26/2012	BG-4D	Fluoranthene	117	EPA 8270C	BG-4D-117'		ug/kg	TRUE	7.1				Fluoranthe	PAHs	3.55
Lab	Backgroun	1/26/2012	BG-4D	Indeno(1,2,3-cd)pyrene	117	EPA 8270C	BG-4D-117'		ug/kg	TRUE	7.1				Indeno(1,2	PAHs	3.55
Lab	Backgroun	1/26/2012	BG-4D	Phenanthrene	117	EPA 8270C	BG-4D-117'		ug/kg	TRUE	7.1				Phenanthre	PAHs	3.55
Lab	Backgroun	1/26/2012	BG-4D	Pyrene	117	EPA 8270C	BG-4D-117'		ug/kg	TRUE	7.1				Pyrene	PAHs	3.55
Lab	Backgroun	1/26/2012	BG-4D	Asbestos	117	EPA 600-R-	BG-4D-117'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	1/26/2012	BG-4D	Aluminum	117	EPA 6010B	BG-4D-117	1500	mg/kg	FALSE	5.9				Aluminum	Metals	1500
Lab	Backgroun	1/26/2012	BG-4D	Ammonia	117	SM4500-NI	BG-4D-117'		mg/kg	TRUE	5.9			Nitrogen, A	Ammonia	General Chemistry	2.95
Lab	Backgroun	1/26/2012	BG-4D	Antimony	117	EPA 6010B	BG-4D-117	1.3	mg/kg	FALSE	1.2				Antimony	Metals	1.3
Lab	Backgroun	1/26/2012	BG-4D	Beryllium	117	EPA 6010B	BG-4D-117'		mg/kg	TRUE	0.12				Beryllium	Metals	0.06
Lab	Backgroun	1/26/2012	BG-4D	Biphenyl	117	EPA 8270C	BG-4D-117'		ug/kg	TRUE	390			1,1-Biphen	Biphenyl	SVOC	195
Lab	Backgroun	1/26/2012	BG-4D	Boron	117	EPA 6010B	BG-4D-117	2.8	mg/kg	FALSE	12	J	(EPA) - Esti		Boron	Metals	2.8
Lab	Backgroun	1/26/2012	BG-4D	Calcium	117	EPA 6010B	BG-4D-117	25000	mg/kg	FALSE	30				Calcium	Metals	25000
Lab	Backgroun	1/26/2012	BG-4D	Chloride	117	EPA 9056	BG-4D-117	140	mg/kg	FALSE	12				Chloride	General Chemistry	140
Lab	Backgroun	1/26/2012	BG-4D	Chromium (total)	117	EPA 6010B	BG-4D-117	2.8	mg/kg	FALSE	0.59			Total chror	Chromium,	Metals	2.8
Lab	Backgroun	1/26/2012	BG-4D	Chromium (hexavalent)	117	EPA 7199	BG-4D-117'		mg/kg	TRUE	2.4				Chromium,	Metals	1.2
Lab	Backgroun	1/26/2012	BG-4D	Cobalt	117	EPA 6010B	BG-4D-117	0.89	mg/kg	FALSE	0.59				Cobalt	Metals	0.89
Lab	Backgroun	1/26/2012	BG-4D	Copper	117	EPA 6010B	BG-4D-117	1.9	mg/kg	FALSE	1.2				Copper	Metals	1.9
Lab	Backgroun	1/26/2012	BG-4D	Fluoride	117	EPA 300.0	BG-4D-117	2.5	mg/kg	FALSE	1.2				Fluoride	General Chemistry	2.5
Lab	Backgroun	1/26/2012	BG-4D	Iron	117	EPA 6010B	BG-4D-117	2800	mg/kg	FALSE	5.9				Iron	Metals	2800
Lab	Backgroun	1/26/2012	BG-4D	Magnesium	117	EPA 6010B	BG-4D-117	4500	mg/kg	FALSE	5.9				Magnesiun	Metals	4500
Lab	Backgroun	1/26/2012	BG-4D	Manganese	117	EPA 6010B	BG-4D-117	73	mg/kg	FALSE	0.59				Manganese	Metals	73

Lab	Backgroun	1/26/2012	BG-4D	Molybdenum	117
Lab	Backgroun	1/26/2012	BG-4D	Nickel	117
Lab	Backgroun	1/26/2012	BG-4D	Nitrate	117
Lab	Backgroun	1/26/2012	BG-4D	Potassium	117
Lab	Backgroun	1/26/2012	BG-4D	Silica	117
Lab	Backgroun	1/26/2012	BG-4D	Sodium	117
Lab	Backgroun	1/26/2012	BG-4D	Sulfate	117
Lab	Backgroun	1/26/2012	BG-4D	Thallium	117
Lab	Backgroun	1/26/2012	BG-4D	Phosphate as P	117
Lab	Backgroun	1/26/2012	BG-4D	Vanadium	117
Lab	Backgroun	1/26/2012	BG-4D	Zinc	117
Lab	Backgroun	1/26/2012	BG-4D	Benzo(b)fluoranthene	117
Lab	Backgroun	1/26/2012	BG-4D	Benzo(k)fluoranthene	117
Lab	Backgroun	1/26/2012	BG-4D	Titanium	117
Lab	Backgroun	1/26/2012	BG-4D	Naphthalene (PAH)	117
Lab	Backgroun	1/26/2012	BG-4D	Total Solids	117
Lab	Backgroun	1/26/2012	BG-4D	Arsenic	120
Lab	Backgroun	1/26/2012	BG-4D	Barium	120
Lab	Backgroun	1/26/2012	BG-4D	Cadmium	120
Lab	Backgroun	1/26/2012	BG-4D	Lead	120
Lab	Backgroun	1/26/2012	BG-4D	Mercury	120
Lab	Backgroun	1/26/2012	BG-4D	Selenium	120
Lab	Backgroun	1/26/2012	BG-4D	Silver	120
Lab	Backgroun	1/26/2012	BG-4D	pH	120
Lab	Backgroun	1/26/2012	BG-4D	Acenaphthene	120
Lab	Backgroun	1/26/2012	BG-4D	Anthracene	120
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)anthracene	120
Lab	Backgroun	1/26/2012	BG-4D	Benzo(g,h,i)perylene	120
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)pyrene	120
Lab	Backgroun	1/26/2012	BG-4D	Bis(2-ethylhexyl)phthalate	120
Lab	Backgroun	1/26/2012	BG-4D	Chrysene	120
Lab	Backgroun	1/26/2012	BG-4D	Fluoranthene	120
Lab	Backgroun	1/26/2012	BG-4D	Indeno(1,2,3-cd)pyrene	120
Lab	Backgroun	1/26/2012	BG-4D	Phenanthrene	120
Lab	Backgroun	1/26/2012	BG-4D	Pyrene	120
Lab	Backgroun	1/26/2012	BG-4D	Asbestos	120
Lab	Backgroun	1/26/2012	BG-4D	Aluminum	120
Lab	Backgroun	1/26/2012	BG-4D	Ammonia	120
Lab	Backgroun	1/26/2012	BG-4D	Antimony	120
Lab	Backgroun	1/26/2012	BG-4D	Beryllium	120
Lab	Backgroun	1/26/2012	BG-4D	Biphenyl	120
Lab	Backgroun	1/26/2012	BG-4D	Boron	120
Lab	Backgroun	1/26/2012	BG-4D	Calcium	120
Lab	Backgroun	1/26/2012	BG-4D	Chloride	120
Lab	Backgroun	1/26/2012	BG-4D	Chromium (total)	120
Lab	Backgroun	1/26/2012	BG-4D	Chromium (hexavalent)	120
Lab	Backgroun	1/26/2012	BG-4D	Cobalt	120
Lab	Backgroun	1/26/2012	BG-4D	Copper	120
Lab	Backgroun	1/26/2012	BG-4D	Fluoride	120
Lab	Backgroun	1/26/2012	BG-4D	Iron	120
Lab	Backgroun	1/26/2012	BG-4D	Magnesium	120
Lab	Backgroun	1/26/2012	BG-4D	Manganese	120
Lab	Backgroun	1/26/2012	BG-4D	Molybdenum	120
Lab	Backgroun	1/26/2012	BG-4D	Nickel	120
Lab	Backgroun	1/26/2012	BG-4D	Nitrate	120
Lab	Backgroun	1/26/2012	BG-4D	Potassium	120
Lab	Backgroun	1/26/2012	BG-4D	Silica	120
Lab	Backgroun	1/26/2012	BG-4D	Sodium	120
Lab	Backgroun	1/26/2012	BG-4D	Sulfate	120
Lab	Backgroun	1/26/2012	BG-4D	Thallium	120
Lab	Backgroun	1/26/2012	BG-4D	Phosphate as P	120
Lab	Backgroun	1/26/2012	BG-4D	Vanadium	120
Lab	Backgroun	1/26/2012	BG-4D	Zinc	120
Lab	Backgroun	1/26/2012	BG-4D	Benzo(b)fluoranthene	120
Lab	Backgroun	1/26/2012	BG-4D	Benzo(k)fluoranthene	120
Lab	Backgroun	1/26/2012	BG-4D	Titanium	120
Lab	Backgroun	1/26/2012	BG-4D	Naphthalene (PAH)	120
Lab	Backgroun	1/26/2012	BG-4D	Total Solids	120
Lab	Backgroun	1/26/2012	BG-4D	Arsenic	161
Lab	Backgroun	1/26/2012	BG-4D	Barium	161
Lab	Backgroun	1/26/2012	BG-4D	Cadmium	161
Lab	Backgroun	1/26/2012	BG-4D	Lead	161
Lab	Backgroun	1/26/2012	BG-4D	Mercury	161
Lab	Backgroun	1/26/2012	BG-4D	Selenium	161
Lab	Backgroun	1/26/2012	BG-4D	Silver	161
Lab	Backgroun	1/26/2012	BG-4D	pH	161
Lab	Backgroun	1/26/2012	BG-4D	Acenaphthene	161
Lab	Backgroun	1/26/2012	BG-4D	Anthracene	161
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)anthracene	161
Lab	Backgroun	1/26/2012	BG-4D	Benzo(g,h,i)perylene	161
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)pyrene	161
Lab	Backgroun	1/26/2012	BG-4D	Bis(2-ethylhexyl)phthalate	161
Lab	Backgroun	1/26/2012	BG-4D	Chrysene	161
Lab	Backgroun	1/26/2012	BG-4D	Fluoranthene	161
Lab	Backgroun	1/26/2012	BG-4D	Indeno(1,2,3-cd)pyrene	161
Lab	Backgroun	1/26/2012	BG-4D	Phenanthrene	161
Lab	Backgroun	1/26/2012	BG-4D	Pyrene	161
Lab	Backgroun	1/26/2012	BG-4D	Asbestos	161
Lab	Backgroun	1/26/2012	BG-4D	Aluminum	161
Lab	Backgroun	1/26/2012	BG-4D	Ammonia	161
Lab	Backgroun	1/26/2012	BG-4D	Antimony	161
Lab	Backgroun	1/26/2012	BG-4D	Beryllium	161
Lab	Backgroun	1/26/2012	BG-4D	Biphenyl	161
Lab	Backgroun	1/26/2012	BG-4D	Boron	161
Lab	Backgroun	1/26/2012	BG-4D	Calcium	161
Lab	Backgroun	1/26/2012	BG-4D	Chloride	161
Lab	Backgroun	1/26/2012	BG-4D	Chromium (total)	161
Lab	Backgroun	1/26/2012	BG-4D	Chromium (hexavalent)	161
Lab	Backgroun	1/26/2012	BG-4D	Cobalt	161
Lab	Backgroun	1/26/2012	BG-4D	Copper	161
Lab	Backgroun	1/26/2012	BG-4D	Fluoride	161
Lab	Backgroun	1/26/2012	BG-4D	Iron	161
Lab	Backgroun	1/26/2012	BG-4D	Magnesium	161
Lab	Backgroun	1/26/2012	BG-4D	Manganese	161
Lab	Backgroun	1/26/2012	BG-4D	Molybdenum	161
Lab	Backgroun	1/26/2012	BG-4D	Nickel	161
Lab	Backgroun	1/26/2012	BG-4D	Nitrate	161
Lab	Backgroun	1/26/2012	BG-4D	Potassium	161
Lab	Backgroun	1/26/2012	BG-4D	Silica	161
Lab	Backgroun	1/26/2012	BG-4D	Sodium	161
Lab	Backgroun	1/26/2012	BG-4D	Sulfate	161
Lab	Backgroun	1/26/2012	BG-4D	Thallium	161
Lab	Backgroun	1/26/2012	BG-4D	Phosphate as P	161
Lab	Backgroun	1/26/2012	BG-4D	Vanadium	161
Lab	Backgroun	1/26/2012	BG-4D	Zinc	161
Lab	Backgroun	1/26/2012	BG-4D	Benzo(b)fluoranthene	161
Lab	Backgroun	1/26/2012	BG-4D	Benzo(k)fluoranthene	161
Lab	Backgroun	1/26/2012	BG-4D	Titanium	161
Lab	Backgroun	1/26/2012	BG-4D	Naphthalene (PAH)	161
Lab	Backgroun	1/26/2012	BG-4D	Total Solids	161
Lab	Backgroun	1/26/2012	BG-4D	Arsenic	163
Lab	Backgroun	1/26/2012	BG-4D	Barium	163
Lab	Backgroun	1/26/2012	BG-4D	Cadmium	163
Lab	Backgroun	1/26/2012	BG-4D	Lead	163
Lab	Backgroun	1/26/2012	BG-4D	Mercury	163
Lab	Backgroun	1/26/2012	BG-4D	Selenium	163
Lab	Backgroun	1/26/2012	BG-4D	Silver	163
Lab	Backgroun	1/26/2012	BG-4D	pH	163
Lab	Backgroun	1/26/2012	BG-4D	Acenaphthene	163
Lab	Backgroun	1/26/2012	BG-4D	Anthracene	163
Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)anthracene	163
Lab	Backgroun	1/26/2012	BG-4D	Benzo(g,h,i)perylene	163

EPA 6010B	BG-4D-117	0.38	mg/kg	FALSE	0.3				Molybdenu	Metals	0.38
EPA 6010B	BG-4D-117	1.8	mg/kg	FALSE	1.2				Nickel	Metals	1.8
EPA 300.0	BG-4D-117'		mg/kg	TRUE	1.2			Nitrogen, N	Nitrate	General Chemistry	0.6
EPA 6010B	BG-4D-117	590	mg/kg	FALSE	30				Potassium	Metals	590
EPA 6010B	BG-4D-117	480	mg/kg	FALSE	120				Silica	Metals	480
EPA 6010B	BG-4D-117	110	mg/kg	FALSE	30				Sodium	Metals	110
EPA 9056	BG-4D-117	300	mg/kg	FALSE	59				Sulfate	General Chemistry	300
EPA 6010B	BG-4D-117'		mg/kg	TRUE	1.2				Thallium	Metals	0.6
EPA 9056	BG-4D-117'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-4D-117	6	mg/kg	FALSE	0.59				Vanadium	Metals	6
EPA 6010B	BG-4D-117	7.3	mg/kg	FALSE	1.8				Zinc	Metals	7.3
EPA 8270C	BG-4D-117'		ug/kg	TRUE	7.1				Benzo(b)flu	PAHs	3.55
EPA 8270C	BG-4D-117'		ug/kg	TRUE	7.1				Benzo(k)flu	PAHs	3.55
EPA 6010B	BG-4D-117	30	mg/kg	FALSE	0.59				Titanium	Metals	30
EPA 8270C	BG-4D-117'		ug/kg	TRUE	7.1				Naphthaler	PAHs	3.55
EPA 2540G	BG-4D-117	84.5	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	84.5
EPA 6010B	BG-4D-120	19	mg/kg	FALSE	1.2				Arsenic	Metals	19
EPA 6010B	BG-4D-120	21	mg/kg	FALSE	0.3				Barium	Metals	21
EPA 6010B	BG-4D-120	0.083	mg/kg	FALSE	0.3	J	(EPA) - Esti		Cadmium	Metals	0.083
EPA 6010B	BG-4D-120	8.6	mg/kg	FALSE	0.3				Lead	Metals	8.6
EPA 7471A	BG-4D-120'		mg/kg	TRUE	0.024	J	(EPA) - Esti		Mercury	Metals	0.012
EPA 6010B	BG-4D-120'		mg/kg	TRUE	6	O	(ESC) Samp		Selenium	Metals	3
EPA 6010B	BG-4D-120'		mg/kg	TRUE	0.6				Silver	Metals	0.3
EPA 9045C	BG-4D-120	8.6	su	FALSE					pH	General Chemistry	8.6
EPA 8270C	BG-4D-120'		ug/kg	TRUE	7.2				Acenaphth	PAHs	3.6
EPA 8270C	BG-4D-120'		ug/kg	TRUE	7.2				Anthracene	PAHs	3.6
EPA 8270C	BG-4D-120'		ug/kg	TRUE	7.2				Benzo(a)an	PAHs	3.6
EPA 8270C	BG-4D-120'		ug/kg	TRUE	7.2				Benzo(g,h,i	PAHs	3.6
EPA 8270C	BG-4D-120'		ug/kg	TRUE	7.2				Benzo(a)py	PAHs	3.6
EPA 8270C	BG-4D-120'		ug/kg	TRUE	390				Bis(2-ethyll	SVOC	195
EPA 8270C	BG-4D-120'		ug/kg	TRUE	7.2				Chrysene	PAHs	3.6
EPA 8270C	BG-4D-120'		ug/kg	TRUE	7.2				Fluoranthe	PAHs	3.6
EPA 8270C	BG-4D-120'		ug/kg	TRUE	7.2				Indeno(1,2	PAHs	3.6
EPA 8270C	BG-4D-120'		ug/kg	TRUE	7.2				Phenanthre	PAHs	3.6
EPA 8270C	BG-4D-120'		ug/kg	TRUE	7.2				Pyrene	PAHs	3.6
EPA 600-R-	BG-4D-120'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-4D-120	15000	mg/kg	FALSE	6				Aluminum	Metals	15000
SM4500-NI	BG-4D-120'		mg/kg	TRUE	6			Nitrogen, A	Ammonia	General Chemistry	3
EPA 6010B	BG-4D-120'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
EPA 6010B	BG-4D-120	0.79	mg/kg	FALSE	0.12				Beryllium	Metals	0.79
EPA 8270C	BG-4D-120'		ug/kg	TRUE	390			1,1-Biphen	Biphenyl	SVOC	195
EPA 6010B	BG-4D-120	12	mg/kg	FALSE	12				Boron	Metals	12
EPA 6010B	BG-4D-120	39000	mg/kg	FALSE	30				Calcium	Metals	39000
EPA 9056	BG-4D-120	140	mg/kg	FALSE	12				Chloride	General Chemistry	140
EPA 6010B	BG-4D-120	18	mg/kg	FALSE	0.6			Total chror	Chromium,	Metals	18
EPA 7199	BG-4D-120'		mg/kg	TRUE	2.4	J	(EPA) - Esti		Chromium,	Metals	1.2
EPA 6010B	BG-4D-120	5.2	mg/kg	FALSE	0.6				Cobalt	Metals	5.2
EPA 6010B	BG-4D-120	12	mg/kg	FALSE	1.2				Copper	Metals	12
EPA 300.0	BG-4D-120	9.4	mg/kg	FALSE	1.2				Fluoride	General Chemistry	9.4
EPA 6010B	BG-4D-120	13000	mg/kg	FALSE	6				Iron	Metals	13000
EPA 6010B	BG-4D-120	9500	mg/kg	FALSE	6				Magnesiun	Metals	9500
EPA 6010B	BG-4D-120	170	mg/kg	FALSE	0.6				Manganese	Metals	170
EPA 6010B	BG-4D-120	0.27	mg/kg	FALSE	0.3	J	(EPA) - Esti		Molybdenu	Metals	0.27
EPA 6010B	BG-4D-120	14	mg/kg	FALSE	1.2				Nickel	Metals	14
EPA 300.0	BG-4D-120'		mg/kg	TRUE	1.2	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.6
EPA 6010B	BG-4D-120	4400	mg/kg	FALSE	30				Potassium	Metals	4400
EPA 6010B	BG-4D-120	1100	mg/kg	FALSE	110				Silica	Metals	1100
EPA 6010B	BG-4D-120	330	mg/kg	FALSE	30				Sodium	Metals	330
EPA 9056	BG-4D-120	210	mg/kg	FALSE	60				Sulfate	General Chemistry	210
EPA 6010B	BG-4D-120'		mg/kg	TRUE	6	O	(ESC) Samp		Thallium	Metals	3
EPA 9056	BG-4D-120'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-4D-120	25	mg/kg	FALSE	0.6				Vanadium	Metals	25
EPA 6010B	BG-4D-120	43	mg/kg	FALSE	1.8				Zinc	Metals	43
EPA 8270C	BG-4D-120'		ug/kg	TRUE	7.2				Benzo(b)flu	PAHs	3.6
EPA 8270C	BG-4D-120'		ug/kg	TRUE	7.2				Benzo(k)flu	PAHs	3.6
EPA 6010B	BG-4D-120	43	mg/kg	FALSE	0.6				Titanium	Metals	43
EPA 8270C	BG-4D-120'		ug/kg	TRUE	7.2				Naphthaler	PAHs	3.6
EPA 2540G	BG-4D-120	83.9	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	83.9
EPA 6010B	BG-4D-161	11	mg/kg	FALSE	1.2				Arsenic	Metals	11
EPA 6010B	BG-4D-161	250	mg/kg	FALSE	0.3				Barium	Metals	250
EPA 6010B	BG-4D-161	0.14	mg/kg	FALSE	0.3	J	(EPA) - Esti		Cadmium	Metals	0.14
EPA 6010B	BG-4D-161	6.7	mg/kg	FALSE	0.3				Lead	Metals	6.7
EPA 7471A	BG-4D-161'		mg/kg	TRUE	0.024	J	(EPA) - Esti		Mercury	Metals	0.012
EPA 6010B	BG-4D-161'		mg/kg	TRUE	6	O	(ESC) Samp		Selenium	Metals	3
EPA 6010B	BG-4D-161'		mg/kg	TRUE	0.6				Silver	Metals	0.3
EPA 9045C	BG-4D-161	8.5	su	FALSE					pH	General Chemistry	8.5
EPA 8270C	BG-4D-161'		ug/kg	TRUE	7.2				Acenaphth	PAHs	3.6
EPA 8270C	BG-4D-161'		ug/kg	TRUE	7.2				Anthracene	PAHs	3.6
EPA 8270C	BG-4D-161'		ug/kg	TRUE	7.2				Benzo(a)an	PAHs	3.6
EPA 8270C	BG-4D-161'		ug/kg	TRUE	7.2				Benzo(g,h,i	PAHs	3.6
EPA 8270C	BG-4D-161'		ug/kg	TRUE	7.2				Benzo(a)py	PAHs	3.6
EPA 8270C	BG-4D-161'		ug/kg	TRUE	400				Bis(2-ethyll	SVOC	200
EPA 8270C	BG-4D-161'		ug/kg	TRUE	7.2				Chrysene	PAHs	3.6
EPA 8270C	BG-4D-161'		ug/kg	TRUE	7.2				Fluoranthe	PAHs	3.6
EPA 8270C	BG-4D-161'		ug/kg	TRUE	7.2				Indeno(1,2	PAHs	3.6
EPA 8270C	BG-4D-161'		ug/kg	TRUE	7.2				Phenanthre	PAHs	3.6
EPA 8270C	BG-4D-161'		ug/kg	TRUE	7.2				Pyrene	PAHs	3.6
EPA 600-R-	BG-4D-161'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-4D-161	8300	mg/kg	FALSE	6				Aluminum	Metals	8300
SM4500-NI	BG-4D-161'		mg/kg	TRUE	6			Nitrogen, A	Ammonia	General Chemistry	3
EPA 6010B	BG-4D-161'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
EPA 6010B	BG-4D-161	0.29	mg/kg	FALSE	0.12				Beryllium	Metals	0.29
EPA 8270C	BG-4D-161'		ug/kg	TRUE	400			1,1-Biphen	Biphenyl	SVOC	200
EPA 6010B	BG-4D-161	8.3	mg/kg	FALSE	12	J	(EPA) - Esti		Boron	Metals	8.3
EPA 6010B	BG-4D-161	52000	mg/kg	FALSE	30				Calcium	Metals	52000
EPA 9056	BG-4D-161	98	mg/kg	FALSE	12				Chloride	General Chemistry	98
EPA 6010B	BG-4D-161	10	mg/kg	FALSE	0.6			Total chror	Chromium,	Metals	10
EPA 7199	BG-4D-161'		mg/kg	TRUE	2.4				Chromium,	Metals	1.2
EPA 6010B	BG-4D-161	2.9	mg/kg	FALSE	0.6				Cobalt	Metals	2.9
EPA 6010B	BG-4D-161	7	mg/kg	FALSE	1.2				Copper	Metals	7
EPA 300.0	BG-4D-161	4.3	mg/kg	FALSE	1.2				Fluoride	General Chemistry	4.3
EPA 6010B	BG-4D-161	8200	mg/kg	FALSE	6				Iron	Metals	8200
EPA 6010B	BG-4D-161	7800	mg/kg	FALSE	6				Magnesiun	Metals	7800
EPA 6010B	BG-4D-161	290	mg/kg	FALSE	0.6				Manganese	Metals	290
EPA 6010B	BG-4D-161	0.34	mg/kg	FALSE	0.3				Molybdenu	Metals	0.34
EPA 6010B	BG-4D-161	7	mg/kg	FALSE	1.2				Nickel	Metals	7
EPA 300.0	BG-4D-161'		mg/kg	TRUE	1.2	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.6
EPA 6010B	BG-4D-161	2400	mg/kg	FALSE	30				Potassium	Metals	2400
EPA 6010B	BG-4D-161	810	mg/kg	FALSE	130				Silica	Metals	810
EPA 6010B	BG-4D-161	130	mg/kg	FALSE	30				Sodium	Metals	130
EPA 9056	BG-4D-161	160	mg/kg	FALSE	60				Sulfate	General Chemistry	160
EPA 6010B	BG-4D-161'		mg/kg	TRUE	6	O	(ESC) Samp		Thallium	Metals	3
EPA 9056	BG-4D-161'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-4D-161	17	mg/kg	FALSE	0.6				Vanadium	Metals	17
EPA 6010B	BG-4D-161	24	mg/kg	FALSE	1.8				Zinc	Metals	24
EPA 8270C	BG-4D-161'		ug/kg	TRUE	7.2				Benzo(b)flu	PAHs	3.6
EPA 8270C	BG-4D-161'		ug/kg	TRUE	7.2				Benzo(k)flu	PAHs	3.6
EPA 6010B	BG-4D-161	59	mg/kg	FALSE	0.6				Titanium	Metals	59
EPA 8270C	BG-4D-161'		ug/kg	TRUE	7.2				Naphthaler	PAHs	3.6
EPA 2540G	BG-4D-161	83.2	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	83.2
EPA 6010B	BG-4D-163	16	mg/kg	FALSE	2.3				Arsenic	Metals	16
EPA 6010B	BG-4D-163	26	mg/kg	FALSE	0.29				Barium	Metals	26
EPA 6010B	BG-4D-163	0.32	mg/kg	FALSE	0.29				Cadmium	Metals	0.32
EPA 6010B	BG-4D-163	11	mg/kg	FALSE	0.59				Lead	Metals	11
EPA 7471A	BG-4D-163'		mg/kg	TRUE	0.023	J	(EPA) - Esti		Mercury	Metals	0.0115
EPA 6010B	BG-4D-163'		mg/kg	TRUE	12	O	(ESC) Samp		Selenium	Metals	6
EPA 6010B	BG-4D-163'		mg/kg	TRUE	0.59				Silver	Metals	0.295
EPA 9045C	BG-4D-163	8.5	su	FALSE					pH	General Chemistry	8.5
EPA 8270C	BG-4D-163'		ug/kg	TRUE	7	J3	The associa		Acenaphth	PAHs	3.5
EPA 8270C	BG-4D-163'		ug/kg	TRUE	7	J3	The associa		Anthracene	PAHs	3.5
EPA 8270C	BG-4D-163'		ug/kg	TRUE	7				Benzo(a)an	PAHs	3.5
EPA 8270C	BG-4D-163'		ug/kg	TRUE	7				Benzo(g,h,i	PAHs	3.5

Lab	Backgroun	1/26/2012	BG-4D	Benzo(a)pyrene	163		EPA 8270C	BG-4D-163'		ug/kg	TRUE	7				Benzo(a)py	PAHs	3.5
Lab	Backgroun	1/26/2012	BG-4D	Bis(2-ethylhexyl)phthalate	163		EPA 8270C	BG-4D-163'		ug/kg	TRUE	390				Bis(2-ethyl	SVOC	195
Lab	Backgroun	1/26/2012	BG-4D	Chrysene	163		EPA 8270C	BG-4D-163'		ug/kg	TRUE	7				Chrysene	PAHs	3.5
Lab	Backgroun	1/26/2012	BG-4D	Fluoranthene	163		EPA 8270C	BG-4D-163'		ug/kg	TRUE	7	J3	The associa		Fluoranthe	PAHs	3.5
Lab	Backgroun	1/26/2012	BG-4D	Indeno(1,2,3-cd)pyrene	163		EPA 8270C	BG-4D-163'		ug/kg	TRUE	7				Indeno(1,2	PAHs	3.5
Lab	Backgroun	1/26/2012	BG-4D	Phenanthrene	163		EPA 8270C	BG-4D-163'		ug/kg	TRUE	7	J3	The associa		Phenanthre	PAHs	3.5
Lab	Backgroun	1/26/2012	BG-4D	Pyrene	163		EPA 8270C	BG-4D-163'		ug/kg	TRUE	7	J3	The associa		Pyrene	PAHs	3.5
Lab	Backgroun	1/26/2012	BG-4D	Asbestos	163		EPA 600-R-	BG-4D-163'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	1/26/2012	BG-4D	Aluminum	163		EPA 6010B	BG-4D-163	13000	mg/kg	FALSE	5.9				Aluminum	Metals	13000
Lab	Backgroun	1/26/2012	BG-4D	Ammonia	163		SM4500-NI	BG-4D-163'		mg/kg	TRUE	5.9			Nitrogen, A	Ammonia	General Chemistry	2.95
Lab	Backgroun	1/26/2012	BG-4D	Antimony	163		EPA 6010B	BG-4D-163'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
Lab	Backgroun	1/26/2012	BG-4D	Beryllium	163		EPA 6010B	BG-4D-163	0.48	mg/kg	FALSE	0.12				Beryllium	Metals	0.48
Lab	Backgroun	1/26/2012	BG-4D	Biphenyl	163		EPA 8270C	BG-4D-163'		ug/kg	TRUE	390			1,1-Biphen	Biphenyl	SVOC	195
Lab	Backgroun	1/26/2012	BG-4D	Boron	163		EPA 6010B	BG-4D-163	10	mg/kg	FALSE	12	J	(EPA) - Esti		Boron	Metals	10
Lab	Backgroun	1/26/2012	BG-4D	Calcium	163		EPA 6010B	BG-4D-163	90000	mg/kg	FALSE	59				Calcium	Metals	90000
Lab	Backgroun	1/26/2012	BG-4D	Chloride	163		EPA 9056	BG-4D-163	80	mg/kg	FALSE	12				Chloride	General Chemistry	80
Lab	Backgroun	1/26/2012	BG-4D	Chromium (total)	163		EPA 6010B	BG-4D-163	16	mg/kg	FALSE	0.59			Total chror	Chromium,	Metals	16
Lab	Backgroun	1/26/2012	BG-4D	Chromium (hexavalent)	163		EPA 7199	BG-4D-163'		mg/kg	TRUE	2.3				Chromium,	Metals	1.15
Lab	Backgroun	1/26/2012	BG-4D	Cobalt	163		EPA 6010B	BG-4D-163	4.8	mg/kg	FALSE	0.59				Cobalt	Metals	4.8
Lab	Backgroun	1/26/2012	BG-4D	Copper	163		EPA 6010B	BG-4D-163	13	mg/kg	FALSE	1.2				Copper	Metals	13
Lab	Backgroun	1/26/2012	BG-4D	Fluoride	163		EPA 300.0	BG-4D-163	9.4	mg/kg	FALSE	1.2				Fluoride	General Chemistry	9.4
Lab	Backgroun	1/26/2012	BG-4D	Iron	163		EPA 6010B	BG-4D-163	12000	mg/kg	FALSE	5.9				Iron	Metals	12000
Lab	Backgroun	1/26/2012	BG-4D	Magnesium	163		EPA 6010B	BG-4D-163	13000	mg/kg	FALSE	5.9				Magnesiun	Metals	13000
Lab	Backgroun	1/26/2012	BG-4D	Manganese	163		EPA 6010B	BG-4D-163	360	mg/kg	FALSE	0.59				Manganese	Metals	360
Lab	Backgroun	1/26/2012	BG-4D	Molybdenum	163		EPA 6010B	BG-4D-163	0.34	mg/kg	FALSE	0.59	J	(EPA) - Esti		Molybdenu	Metals	0.34
Lab	Backgroun	1/26/2012	BG-4D	Nickel	163		EPA 6010B	BG-4D-163	13	mg/kg	FALSE	2.3				Nickel	Metals	13
Lab	Backgroun	1/26/2012	BG-4D	Nitrate	163		EPA 300.0	BG-4D-163'		mg/kg	TRUE	1.2	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.6
Lab	Backgroun	1/26/2012	BG-4D	Potassium	163		EPA 6010B	BG-4D-163	3800	mg/kg	FALSE	29				Potassium	Metals	3800
Lab	Backgroun	1/26/2012	BG-4D	Silica	163		EPA 6010B	BG-4D-163	780	mg/kg	FALSE	120				Silica	Metals	780
Lab	Backgroun	1/26/2012	BG-4D	Sodium	163		EPA 6010B	BG-4D-163	290	mg/kg	FALSE	29				Sodium	Metals	290
Lab	Backgroun	1/26/2012	BG-4D	Sulfate	163		EPA 9056	BG-4D-163	130	mg/kg	FALSE	59				Sulfate	General Chemistry	130
Lab	Backgroun	1/26/2012	BG-4D	Thallium	163		EPA 6010B	BG-4D-163'		mg/kg	TRUE	12	O	(ESC) Samp		Thallium	Metals	6
Lab	Backgroun	1/26/2012	BG-4D	Phosphate as P	163		EPA 9056	BG-4D-163'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
Lab	Backgroun	1/26/2012	BG-4D	Vanadium	163		EPA 6010B	BG-4D-163	30	mg/kg	FALSE	0.59				Vanadium	Metals	30
Lab	Backgroun	1/26/2012	BG-4D	Zinc	163		EPA 6010B	BG-4D-163	41	mg/kg	FALSE	1.8				Zinc	Metals	41
Lab	Backgroun	1/26/2012	BG-4D	Benzo(b)fluoranthene	163		EPA 8270C	BG-4D-163'		ug/kg	TRUE	7				Benzo(b)flu	PAHs	3.5
Lab	Backgroun	1/26/2012	BG-4D	Benzo(k)fluoranthene	163		EPA 8270C	BG-4D-163'		ug/kg	TRUE	7	J3	The associa		Benzo(k)flu	PAHs	3.5
Lab	Backgroun	1/26/2012	BG-4D	Titanium	163		EPA 6010B	BG-4D-163	110	mg/kg	FALSE	1.2				Titanium	Metals	110
Lab	Backgroun	1/26/2012	BG-4D	Naphthalene (PAH)	163		EPA 8270C	BG-4D-163'		ug/kg	TRUE	7				Naphthaler	PAHs	3.5
Lab	Backgroun	1/26/2012	BG-4D	Total Solids	163		EPA 2540G	BG-4D-163	85.2	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	85.2
Lab	Backgroun	2/28/2012	BG-3D	Arsenic	0	2	EPA 6010B	BG-3D-0-2'	20	mg/kg	FALSE	5.1				Arsenic	Metals	20
Lab	Backgroun	2/28/2012	BG-3D	Barium	0	2	EPA 6010B	BG-3D-0-2'	140	mg/kg	FALSE	0.26				Barium	Metals	140
Lab	Backgroun	2/28/2012	BG-3D	Cadmium	0	2	EPA 6010B	BG-3D-0-2'	0.16	mg/kg	FALSE	0.26	J	(EPA) - Esti		Cadmium	Metals	0.16
Lab	Backgroun	2/28/2012	BG-3D	Lead	0	2	EPA 6010B	BG-3D-0-2'	5.9	mg/kg	FALSE	1.3				Lead	Metals	5.9
Lab	Backgroun	2/28/2012	BG-3D	Mercury	0	2	EPA 7471A	BG-3D-0-2'	0.0026	mg/kg	FALSE	0.02	J	(EPA) - Esti		Mercury	Metals	0.0026
Lab	Backgroun	2/28/2012	BG-3D	Selenium	0	2	EPA 6010B	BG-3D-0-2'		mg/kg	TRUE	10	O	(ESC) Samp		Selenium	Metals	5
Lab	Backgroun	2/28/2012	BG-3D	Silver	0	2	EPA 6010B	BG-3D-0-2'		mg/kg	TRUE	0.51				Silver	Metals	0.255
Lab	Backgroun	2/28/2012	BG-3D	pH	0	2	EPA 9045C	BG-3D-0-2'	8	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8
Lab	Backgroun	2/28/2012	BG-3D	Acenaphthene	0	2	EPA 8270C	BG-3D-0-2'		ug/kg	TRUE	6.1				Acenaphth	PAHs	3.05
Lab	Backgroun	2/28/2012	BG-3D	Anthracene	0	2	EPA 8270C	BG-3D-0-2'		ug/kg	TRUE	6.1				Anthracene	PAHs	3.05
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)anthracene	0	2	EPA 8270C	BG-3D-0-2'		ug/kg	TRUE	6.1				Benzo(a)an	PAHs	3.05
Lab	Backgroun	2/28/2012	BG-3D	Benzo(g,h,i)perylene	0	2	EPA 8270C	BG-3D-0-2'		ug/kg	TRUE	6.1				Benzo(g,h,i	PAHs	3.05
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)pyrene	0	2	EPA 8270C	BG-3D-0-2'		ug/kg	TRUE	6.1				Benzo(a)py	PAHs	3.05
Lab	Backgroun	2/28/2012	BG-3D	Bis(2-ethylhexyl)phthalate	0	2	EPA 8270C	BG-3D-0-2'		ug/kg	TRUE	340				Bis(2-ethyl	SVOC	170
Lab	Backgroun	2/28/2012	BG-3D	Chrysene	0	2	EPA 8270C	BG-3D-0-2'		ug/kg	TRUE	6.1				Chrysene	PAHs	3.05
Lab	Backgroun	2/28/2012	BG-3D	Fluoranthene	0	2	EPA 8270C	BG-3D-0-2'		ug/kg	TRUE	6.1				Fluoranthe	PAHs	3.05
Lab	Backgroun	2/28/2012	BG-3D	Indeno(1,2,3-cd)pyrene	0	2	EPA 8270C	BG-3D-0-2'		ug/kg	TRUE	6.1				Indeno(1,2	PAHs	3.05
Lab	Backgroun	2/28/2012	BG-3D	Phenanthrene	0	2	EPA 8270C	BG-3D-0-2'		ug/kg	TRUE	6.1				Phenanthre	PAHs	3.05
Lab	Backgroun	2/28/2012	BG-3D	Pyrene	0	2	EPA 8270C	BG-3D-0-2'		ug/kg	TRUE	6.1				Pyrene	PAHs	3.05
Lab	Backgroun	2/28/2012	BG-3D	Asbestos	0	2	EPA 600-R-	BG-3D-0-2'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	2/28/2012	BG-3D	Aluminum	0	2	EPA 6010B	BG-3D-0-2'	4500	mg/kg	FALSE	5.1				Aluminum	Metals	4500
Lab	Backgroun	2/28/2012	BG-3D	Ammonia	0	2	SM4500-NI	BG-3D-0-2'	2.6	mg/kg	FALSE	5.1	J	(EPA) - Esti	Nitrogen, A	Ammonia	General Chemistry	2.6
Lab	Backgroun	2/28/2012	BG-3D	Antimony	0	2	EPA 6010B	BG-3D-0-2'		mg/kg	TRUE	1				Antimony	Metals	0.5
Lab	Backgroun	2/28/2012	BG-3D	Beryllium	0	2	EPA 6010B	BG-3D-0-2'	0.022	mg/kg	FALSE	0.1	J	(EPA) - Esti		Beryllium	Metals	0.022
Lab	Backgroun	2/28/2012	BG-3D	Biphenyl	0	2	EPA 8270C	BG-3D-0-2'		ug/kg	TRUE	340			1,1-Biphen	Biphenyl	SVOC	170
Lab	Backgroun	2/28/2012	BG-3D	Boron	0	2	EPA 6010B	BG-3D-0-2'	6.6	mg/kg	FALSE	10	J	(EPA) - Esti		Boron	Metals	6.6
Lab	Backgroun	2/28/2012	BG-3D	Calcium	0	2	EPA 6010B	BG-3D-0-2'	100000	mg/kg	FALSE	130				Calcium	Metals	100000
Lab	Backgroun	2/28/2012	BG-3D	Chloride	0	2	EPA 9056	BG-3D-0-2'	110	mg/kg	FALSE	10				Chloride	General Chemistry	110
Lab	Backgroun	2/28/2012	BG-3D	Chromium (total)	0	2	EPA 6010B	BG-3D-0-2'	5.1	mg/kg	FALSE	0.51			Total chror	Chromium,	Metals	5.1
Lab	Backgroun	2/28/2012	BG-3D	Chromium (hexavalent)	0	2	EPA 7199	BG-3D-0-2'	1.3	mg/kg	FALSE	2	J	(EPA) - Esti		Chromium,	Metals	1.3
Lab	Backgroun	2/28/2012	BG-3D	Cobalt	0	2	EPA 6010B	BG-3D-0-2'	1.6	mg/kg	FALSE	0.51				Cobalt	Metals	1.6
Lab	Backgroun	2/28/2012	BG-3D	Copper	0	2	EPA 6010B	BG-3D-0-2'	3	mg/kg	FALSE	1				Copper	Metals	3
Lab	Backgroun	2/28/2012	BG-3D	Fluoride	0	2	EPA 300.0	BG-3D-0-2'	7.6	mg/kg	FALSE	1				Fluoride	General Chemistry	7.6
Lab	Backgroun	2/28/2012	BG-3D	Iron	0	2	EPA 6010B	BG-3D-0-2'	4400	mg/kg	FALSE	5.1				Iron	Metals	4400
Lab	Backgroun	2/28/2012	BG-3D	Magnesium	0	2	EPA 6010B	BG-3D-0-2'	2600	mg/kg	FALSE	5.1				Magnesiun	Metals	2600
Lab	Backgroun	2/28/2012	BG-3D	Manganese	0	2	EPA 6010B	BG-3D-0-2'	200	mg/kg	FALSE	0.51				Manganese	Metals	200
Lab	Backgroun	2/28/2012	BG-3D	Molybdenum	0	2	EPA 6010B	BG-3D-0-2'	1.6	mg/kg	FALSE	1.3				Molybdenu	Metals	1.6
Lab	Backgroun	2/28/2012	BG-3D	Nickel	0	2	EPA 6010B	BG-3D-0-2'	4	mg/kg	FALSE	5.1	J	(EPA) - Esti		Nickel	Metals	4
Lab	Backgroun	2/28/2012	BG-3D	Nitrate	0	2	EPA 300.0	BG-3D-0-2'	4.8	mg/kg	FALSE	1			Nitrogen, N	Nitrate	General Chemistry	4.8
Lab	Backgroun	2/28/2012	BG-3D	Potassium	0	2	EPA 6010B	BG-3D-0-2'	1100	mg/kg	FALSE	26				Potassium	Metals	1100
Lab	Backgroun	2/28/2012	BG-3D	Silica	0	2	EPA 6010B	BG-3D-0-2'	520	mg/kg	FALSE	100				Silica	Metals	520
Lab	Backgroun	2/28/2012	BG-3D	Sodium	0	2	EPA 6010B	BG-3D-0-2'	240	mg/kg	FALSE	26				Sodium	Metals	240
Lab	Backgroun	2/28/2012	BG-3D	Sulfate	0	2	EPA 9056	BG-3D-0-2'	10000	mg/kg	FALSE	510				Sulfate	General Chemistry	10000
Lab	Backgroun	2/28/2012	BG-3D	Thallium	0	2	EPA 6010B	BG-3D-0-2'		mg/kg	TRUE	5.1	O	(ESC) Samp		Thallium	Metals	2.55
Lab	Backgroun	2/28/2012	BG-3D	Phosphate as P	0	2	EPA 9056	BG-3D-0-2'		mg/kg	TRUE	1	B4	(ESC) - The		Phosphoro	General Chemistry	0.5
Lab	Backgroun	2/28/2012	BG-3D	Vanadium	0	2	EPA 6010B	BG-3D-0-2'	9.4	mg/kg	FALSE	0.51				Vanadium	Metals	9.4
Lab	Backgroun	2/28/2012	BG-3D	Zinc	0	2	EPA 6010B	BG-3D-0-2'	12	mg/kg	FALSE	1.5				Zinc	Metals	12
Lab	Backgroun	2/28/2012	BG-3D	Benzo(b)fluoranthene	0	2	EPA 8270C	BG-3D-0-2'		ug/kg	TRUE	6.1				Benzo(b)flu	PAHs	3.05
Lab	Backgroun	2/28/2012	BG-3D	Benzo(k)fluoranthene	0	2	EPA 8270C	BG-3D-0-2'		ug/kg	TRUE	6.1				Benzo(k)flu	PAHs	3.05
Lab	Backgroun	2/28/2012	BG-3D	Titanium	0	2	EPA 6010B	BG-3D-0-2'	56	mg/kg	FALSE	0.51				Titanium	Metals	56
Lab	Backgroun	2/28/2012	BG-3D	Naphthalene (PAH)	0	2	EPA 8270C	BG-3D-0-2'		ug/kg	TRUE	6.1				Naphthaler	PAHs	3.05
Lab	Backgroun	2/28/2012	BG-3D	Total Solids	0	2	EPA 2540G	BG-3D-0-2'	98	%	FALSE	0.1				Total Solids	General Chemistry	98
Lab	Backgroun	2/28/2012	BG-3D	Arsenic	10		EPA 6010B	BG-3D-10'	40	mg/kg	FALSE	5.4				Arsenic	Metals	40
Lab	Backgroun	2/28/2012	BG-3D	Barium	10		EPA 6010B	BG-3D-10'	67	mg/kg	FALSE	0.27				Barium	Metals	67
Lab	Backgroun	2/28/2012	BG-3D	Cadmium	10		EPA 6010B	BG-3D-10'	0.07	mg/kg	FALSE	0.27	J	(EPA) - Esti		Cadmium	Metals	0.07
Lab	Backgroun	2/28/2012	BG-3D	Lead	10		EPA 6010B	BG-3D-10'	5.5	mg/kg	FALSE	1.4				Lead	Metals	5.5
Lab	Backgroun	2/28/2012	BG-3D	Mercury	10		EPA 7471A	BG-3D-10'	0.0041	mg/kg	FALSE	0.022	J	(EPA) - Esti		Mercury	Metals	0.0041
Lab	Backgroun	2/28/2012	BG-3D	Selenium	10		EPA 6010B	BG-3D-10'		mg/kg	TRUE	5.4	O	(ESC) Samp		Selenium	Metals	2.7
Lab	Backgroun	2/28/2012	BG-3D	Silver	10		EPA 6010B	BG-3D-10'		mg/kg	TRUE	0.54				Silver	Metals	0.27
Lab	Backgroun	2/28/2012	BG-3D	pH	10		EPA 9045C	BG-3D-10'	8	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8
Lab	Backgroun	2/28/2012	BG-3D	Acenaphthene	10		EPA 8270C	BG-3D-10'		ug/kg	TRUE	6.5				Acenaphth	PAHs	3.25
Lab	Backgroun	2/28/2012	BG-3D	Anthracene	10		EPA 8270C	BG-3D-10'		ug/kg	TRUE	6.5				Anthracene	PAHs	3.25
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)anthracene	10		EPA 8270C	BG-3D-10'		ug/kg	TRUE	6.5				Benzo(a)an	PAHs	3.25
Lab	Backgroun	2/28/2012	BG-3D	Benzo(g,h,i)perylene	10		EPA 8270C	BG-3D-10'		ug/kg	TRUE	6.5				Benzo(g,h,i	PAHs	3.25
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)pyrene	10		EPA 8270C	BG-3D-10'		ug/kg	TRUE	6.5				Benzo(a)py	PAHs	3.25
Lab	Backgroun	2/28/2012	BG-3D	Bis(2-ethylhexyl)phthalate	10		EPA 8270C	BG-3D-10'		ug/kg	TRUE	360				Bis(2-ethyl	SVOC	180
Lab	Backgroun	2/28/2012	BG-3D	Chrysene	10		EPA 8270C	BG-3D-10'		ug/kg	TRUE	6.5				Chrysene	PAHs	3.25
Lab	Backgroun	2/28/2012	BG-3D	Fluoranthene	10		EPA 8270C	BG-3D-10'		ug/kg	TRUE	6.5				Fluoranthe	PAHs	3.25
Lab	Backgroun	2/28/2012	BG-3D	Indeno(1,2,3-cd)pyrene	10		EPA 8270C	BG-3D-10'		ug/kg	TRUE	6.5				Indeno(1,2	PAHs	3.25
Lab	Backgroun	2/28/2012	BG-3D	Phenanthrene	10		EPA 8270C	BG-3D-10'		ug/kg	TRUE	6.5				Phenanthre	PAHs	3.25
Lab	Backgroun	2/28/2012	BG-3D	Pyrene	10		EPA 8270C	BG-3D-10'		ug/kg	TRUE	6.5				Pyrene	PAHs	3.25
Lab	Backgroun	2/28/2012	BG-3D	Asbestos	10		EPA 600-R-	BG-3D-10'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	2/28/2012	BG-3D	Aluminum	10		EPA 6010B	BG-3D-10'	10000	mg/kg	FALSE	5.4				Aluminum	Metals	10000
Lab	Backgroun	2/28/2012	BG-3D	Ammonia	10		SM4500-NI	BG-3D-10'	3	mg/kg	FALSE	5.4	J	(EPA) - Esti	Nitrogen, A	Ammonia	General Chemistry	3
Lab	Backgroun	2/28/2012	BG-3D	Antimony	10		EPA 6010B	BG-3D-10'		mg/kg	TRUE	1.1				Antimony	Metals	0.55
Lab	Backgroun	2/28/2012	BG-3D	Beryllium	10		EPA 6010B	BG-3D-10'	0.28	mg/kg	FALSE	0.11				Beryllium	Metals	0.28
Lab	Backgroun	2/28/2012	BG-3D	Biphenyl	10		EPA 8270C	BG-3D-10'		ug/kg	TRUE	360			1,1-Biphen	Biphenyl	SVOC	180
Lab	Backgroun	2/28/2012	BG-3D	Boron	10		EPA 6010B	BG-3D-10'	8.1	mg/kg	FALSE	11	J	(EPA) - Esti		Boron	Metals	8.1
Lab	Backgroun	2/28/2012	BG-3D	Calcium	10		EPA 6010B	BG-3D-10'	70000	mg/kg	FALSE	140				Calcium	Metals	70000
Lab	Backgroun	2/28/2012	BG-3D	Chloride	10		EPA 9056	BG-3D-10'	1900	mg/kg	FALSE	54				Chloride	General Chemistry	1900
Lab	Backgroun	2/28/2012	BG-3D	Chromium (total)	10		EPA 6010B	BG-3D-10'	14	mg/kg	FALSE	0.54			Total chror	Chromium,	Metals	14
Lab	Backgroun	2/28/2012	BG-3D	Chromium (hexavalent)	10		EPA 7199	BG-3D-10'	1.4	mg/kg	FALSE	2.2	J, P1	J-(EPA) - Es		Chromium,	Metals	1.4
Lab	Backgroun	2/28/2012	BG-3D	Cobalt	10		EPA 6010B	BG-3D-10'	3.9	mg/kg	FALSE	0.54				Cobalt	Metals	3.9
Lab	Backgroun	2/28/2012	BG-3D	Copper	10		EPA 6010B	BG-3D-10'	9.3	mg/kg	FALSE	1.1				Copper	Metals	9.3
Lab	Backgroun	2/28/2012	BG-3D	Fluoride	10		EPA 300.0	BG-3D-10'	12	mg/kg	FALSE	1.1				Fluoride	General Chemistry	12
Lab	Backgroun	2/28/2012	BG-3D	Iron	10		EPA 6010B	BG-3D-10'	11000	mg/kg	FALSE	5.4				Iron	Metals	11000
Lab	Backgroun	2/28/2012	BG-3D	Magnesium	10		EPA 6010B	BG-3D-10'	3700	mg/kg	FALSE	5.4				Magnesiun	Metals	3700
Lab	Backgroun	2/28/2012	BG-3D	Manganese	10		EPA 6010B	BG-3D-10'	180	mg/kg	FALSE	0.54				Manganese	Metals	180
Lab	Backgroun	2/28/2012	BG-3D	Molybdenum	10		EPA 6010B	BG-3D-10'	2.6	mg/kg	FALSE	1.4				Molybdenu	Metals	2.6
Lab	Backgroun	2/28/2012	BG-3D	Nickel	10		EPA 6010B	BG-3D-10'	11	mg/kg	FALSE	5.4				Nickel	Metals	11
Lab	Backgroun	2/28/2012	BG-3D	Nitrate	10		EPA 300.0	BG-3D-10'	0.71	mg/kg	FALSE	1.1	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.71
Lab	Backgroun	2/28/2012	BG-3D	Potassium	10		EPA 6010B	BG-3D-10'	2200	mg/kg	FALSE	27				Potassium	Metals	2200

Lab	Backgroun	2/28/2012	BG-3D	Silica	10
Lab	Backgroun	2/28/2012	BG-3D	Sodium	10
Lab	Backgroun	2/28/2012	BG-3D	Sulfate	10
Lab	Backgroun	2/28/2012	BG-3D	Thallium	10
Lab	Backgroun	2/28/2012	BG-3D	Phosphate as P	10
Lab	Backgroun	2/28/2012	BG-3D	Vanadium	10
Lab	Backgroun	2/28/2012	BG-3D	Zinc	10
Lab	Backgroun	2/28/2012	BG-3D	Benzo(b)fluoranthene	10
Lab	Backgroun	2/28/2012	BG-3D	Benzo(k)fluoranthene	10
Lab	Backgroun	2/28/2012	BG-3D	Titanium	10
Lab	Backgroun	2/28/2012	BG-3D	Naphthalene (PAH)	10
Lab	Backgroun	2/28/2012	BG-3D	Total Solids	10
Lab	Backgroun	2/28/2012	BG-3D	Arsenic	17
Lab	Backgroun	2/28/2012	BG-3D	Barium	17
Lab	Backgroun	2/28/2012	BG-3D	Cadmium	17
Lab	Backgroun	2/28/2012	BG-3D	Lead	17
Lab	Backgroun	2/28/2012	BG-3D	Mercury	17
Lab	Backgroun	2/28/2012	BG-3D	Selenium	17
Lab	Backgroun	2/28/2012	BG-3D	Silver	17
Lab	Backgroun	2/28/2012	BG-3D	pH	17
Lab	Backgroun	2/28/2012	BG-3D	Acenaphthene	17
Lab	Backgroun	2/28/2012	BG-3D	Anthracene	17
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)anthracene	17
Lab	Backgroun	2/28/2012	BG-3D	Benzo(g,h,i)perylene	17
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)pyrene	17
Lab	Backgroun	2/28/2012	BG-3D	Bis(2-ethylhexyl)phthalate	17
Lab	Backgroun	2/28/2012	BG-3D	Chrysene	17
Lab	Backgroun	2/28/2012	BG-3D	Fluoranthene	17
Lab	Backgroun	2/28/2012	BG-3D	Indeno(1,2,3-cd)pyrene	17
Lab	Backgroun	2/28/2012	BG-3D	Phenanthrene	17
Lab	Backgroun	2/28/2012	BG-3D	Pyrene	17
Lab	Backgroun	2/28/2012	BG-3D	Asbestos	17
Lab	Backgroun	2/28/2012	BG-3D	Aluminum	17
Lab	Backgroun	2/28/2012	BG-3D	Ammonia	17
Lab	Backgroun	2/28/2012	BG-3D	Antimony	17
Lab	Backgroun	2/28/2012	BG-3D	Beryllium	17
Lab	Backgroun	2/28/2012	BG-3D	Biphenyl	17
Lab	Backgroun	2/28/2012	BG-3D	Boron	17
Lab	Backgroun	2/28/2012	BG-3D	Calcium	17
Lab	Backgroun	2/28/2012	BG-3D	Chloride	17
Lab	Backgroun	2/28/2012	BG-3D	Chromium (total)	17
Lab	Backgroun	2/28/2012	BG-3D	Chromium (hexavalent)	17
Lab	Backgroun	2/28/2012	BG-3D	Cobalt	17
Lab	Backgroun	2/28/2012	BG-3D	Copper	17
Lab	Backgroun	2/28/2012	BG-3D	Fluoride	17
Lab	Backgroun	2/28/2012	BG-3D	Iron	17
Lab	Backgroun	2/28/2012	BG-3D	Magnesium	17
Lab	Backgroun	2/28/2012	BG-3D	Manganese	17
Lab	Backgroun	2/28/2012	BG-3D	Molybdenum	17
Lab	Backgroun	2/28/2012	BG-3D	Nickel	17
Lab	Backgroun	2/28/2012	BG-3D	Nitrate	17
Lab	Backgroun	2/28/2012	BG-3D	Potassium	17
Lab	Backgroun	2/28/2012	BG-3D	Silica	17
Lab	Backgroun	2/28/2012	BG-3D	Sodium	17
Lab	Backgroun	2/28/2012	BG-3D	Sulfate	17
Lab	Backgroun	2/28/2012	BG-3D	Thallium	17
Lab	Backgroun	2/28/2012	BG-3D	Phosphate as P	17
Lab	Backgroun	2/28/2012	BG-3D	Vanadium	17
Lab	Backgroun	2/28/2012	BG-3D	Zinc	17
Lab	Backgroun	2/28/2012	BG-3D	Benzo(b)fluoranthene	17
Lab	Backgroun	2/28/2012	BG-3D	Benzo(k)fluoranthene	17
Lab	Backgroun	2/28/2012	BG-3D	Titanium	17
Lab	Backgroun	2/28/2012	BG-3D	Naphthalene (PAH)	17
Lab	Backgroun	2/28/2012	BG-3D	Total Solids	17
Lab	Backgroun	2/28/2012	BG-3D	Arsenic	22
Lab	Backgroun	2/28/2012	BG-3D	Barium	22
Lab	Backgroun	2/28/2012	BG-3D	Cadmium	22
Lab	Backgroun	2/28/2012	BG-3D	Lead	22
Lab	Backgroun	2/28/2012	BG-3D	Mercury	22
Lab	Backgroun	2/28/2012	BG-3D	Selenium	22
Lab	Backgroun	2/28/2012	BG-3D	Silver	22
Lab	Backgroun	2/28/2012	BG-3D	pH	22
Lab	Backgroun	2/28/2012	BG-3D	Acenaphthene	22
Lab	Backgroun	2/28/2012	BG-3D	Anthracene	22
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)anthracene	22
Lab	Backgroun	2/28/2012	BG-3D	Benzo(g,h,i)perylene	22
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)pyrene	22
Lab	Backgroun	2/28/2012	BG-3D	Bis(2-ethylhexyl)phthalate	22
Lab	Backgroun	2/28/2012	BG-3D	Chrysene	22
Lab	Backgroun	2/28/2012	BG-3D	Fluoranthene	22
Lab	Backgroun	2/28/2012	BG-3D	Indeno(1,2,3-cd)pyrene	22
Lab	Backgroun	2/28/2012	BG-3D	Phenanthrene	22
Lab	Backgroun	2/28/2012	BG-3D	Pyrene	22
Lab	Backgroun	2/28/2012	BG-3D	Asbestos	22
Lab	Backgroun	2/28/2012	BG-3D	Aluminum	22
Lab	Backgroun	2/28/2012	BG-3D	Ammonia	22
Lab	Backgroun	2/28/2012	BG-3D	Antimony	22
Lab	Backgroun	2/28/2012	BG-3D	Beryllium	22
Lab	Backgroun	2/28/2012	BG-3D	Biphenyl	22
Lab	Backgroun	2/28/2012	BG-3D	Boron	22
Lab	Backgroun	2/28/2012	BG-3D	Calcium	22
Lab	Backgroun	2/28/2012	BG-3D	Chloride	22
Lab	Backgroun	2/28/2012	BG-3D	Chromium (total)	22
Lab	Backgroun	2/28/2012	BG-3D	Chromium (hexavalent)	22
Lab	Backgroun	2/28/2012	BG-3D	Cobalt	22
Lab	Backgroun	2/28/2012	BG-3D	Copper	22
Lab	Backgroun	2/28/2012	BG-3D	Fluoride	22
Lab	Backgroun	2/28/2012	BG-3D	Iron	22
Lab	Backgroun	2/28/2012	BG-3D	Magnesium	22
Lab	Backgroun	2/28/2012	BG-3D	Manganese	22
Lab	Backgroun	2/28/2012	BG-3D	Molybdenum	22
Lab	Backgroun	2/28/2012	BG-3D	Nickel	22
Lab	Backgroun	2/28/2012	BG-3D	Nitrate	22
Lab	Backgroun	2/28/2012	BG-3D	Potassium	22
Lab	Backgroun	2/28/2012	BG-3D	Silica	22
Lab	Backgroun	2/28/2012	BG-3D	Sodium	22
Lab	Backgroun	2/28/2012	BG-3D	Sulfate	22
Lab	Backgroun	2/28/2012	BG-3D	Thallium	22
Lab	Backgroun	2/28/2012	BG-3D	Phosphate as P	22
Lab	Backgroun	2/28/2012	BG-3D	Vanadium	22
Lab	Backgroun	2/28/2012	BG-3D	Zinc	22
Lab	Backgroun	2/28/2012	BG-3D	Benzo(b)fluoranthene	22
Lab	Backgroun	2/28/2012	BG-3D	Benzo(k)fluoranthene	22
Lab	Backgroun	2/28/2012	BG-3D	Titanium	22
Lab	Backgroun	2/28/2012	BG-3D	Naphthalene (PAH)	22
Lab	Backgroun	2/28/2012	BG-3D	Total Solids	22
Lab	Backgroun	2/28/2012	BG-3D	Arsenic	29
Lab	Backgroun	2/28/2012	BG-3D	Barium	29
Lab	Backgroun	2/28/2012	BG-3D	Cadmium	29
Lab	Backgroun	2/28/2012	BG-3D	Lead	29
Lab	Backgroun	2/28/2012	BG-3D	Mercury	29
Lab	Backgroun	2/28/2012	BG-3D	Selenium	29
Lab	Backgroun	2/28/2012	BG-3D	Silver	29
Lab	Backgroun	2/28/2012	BG-3D	pH	29
Lab	Backgroun	2/28/2012	BG-3D	Acenaphthene	29
Lab	Backgroun	2/28/2012	BG-3D	Anthracene	29
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)anthracene	29
Lab	Backgroun	2/28/2012	BG-3D	Benzo(g,h,i)perylene	29
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)pyrene	29
Lab	Backgroun	2/28/2012	BG-3D	Bis(2-ethylhexyl)phthalate	29
Lab	Backgroun	2/28/2012	BG-3D	Chrysene	29
Lab	Backgroun	2/28/2012	BG-3D	Fluoranthene	29

EPA 6010B	BG-3D-10'	730	mg/kg	FALSE	120				Silica	Metals	730
EPA 6010B	BG-3D-10'	980	mg/kg	FALSE	27				Sodium	Metals	980
EPA 9056	BG-3D-10'	2300	mg/kg	FALSE	270				Sulfate	General Chemistry	2300
EPA 6010B	BG-3D-10'		mg/kg	TRUE	5.4	O	(ESC) Samp		Thallium	Metals	2.7
EPA 9056	BG-3D-10'	0.69	mg/kg	FALSE	1.1	J	(EPA) - Esti		Phosphoro	General Chemistry	0.69
EPA 6010B	BG-3D-10'	19	mg/kg	FALSE	0.54				Vanadium	Metals	19
EPA 6010B	BG-3D-10'	31	mg/kg	FALSE	1.6				Zinc	Metals	31
EPA 8270C	BG-3D-10'		ug/kg	TRUE	6.5				Benzo(b)flu	PAHs	3.25
EPA 8270C	BG-3D-10'		ug/kg	TRUE	6.5				Benzo(k)flu	PAHs	3.25
EPA 6010B	BG-3D-10'	85	mg/kg	FALSE	0.54				Titanium	Metals	85
EPA 8270C	BG-3D-10'		ug/kg	TRUE	6.5				Naphthaler	PAHs	3.25
EPA 2540G	BG-3D-10'	92.4	%	FALSE	0.1				Total Solids	General Chemistry	92.4
EPA 6010B	BG-3D-17'	15	mg/kg	FALSE	5.2				Arsenic	Metals	15
EPA 6010B	BG-3D-17'	200	mg/kg	FALSE	0.26				Barium	Metals	200
EPA 6010B	BG-3D-17'	0.057	mg/kg	FALSE	0.26	J	(EPA) - Esti		Cadmium	Metals	0.057
EPA 6010B	BG-3D-17'	4	mg/kg	FALSE	1.3				Lead	Metals	4
EPA 7471A	BG-3D-17'	0.0034	mg/kg	FALSE	0.021	J	(EPA) - Esti		Mercury	Metals	0.0034
EPA 6010B	BG-3D-17'		mg/kg	TRUE	5.2	O	(ESC) Samp		Selenium	Metals	2.6
EPA 6010B	BG-3D-17'		mg/kg	TRUE	0.52				Silver	Metals	0.26
EPA 9045C	BG-3D-17'	9.1	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	9.1
EPA 8270C	BG-3D-17'		ug/kg	TRUE	6.3				Acenaphth	PAHs	3.15
EPA 8270C	BG-3D-17'		ug/kg	TRUE	6.3				Anthracene	PAHs	3.15
EPA 8270C	BG-3D-17'		ug/kg	TRUE	6.3				Benzo(a)an	PAHs	3.15
EPA 8270C	BG-3D-17'		ug/kg	TRUE	6.3				Benzo(g,h,i	PAHs	3.15
EPA 8270C	BG-3D-17'		ug/kg	TRUE	6.3				Benzo(a)py	PAHs	3.15
EPA 8270C	BG-3D-17'		ug/kg	TRUE	350				Bis(2-ethyll	SVOC	175
EPA 8270C	BG-3D-17'		ug/kg	TRUE	6.3				Chrysene	PAHs	3.15
EPA 8270C	BG-3D-17'		ug/kg	TRUE	6.3				Fluoranthe	PAHs	3.15
EPA 8270C	BG-3D-17'		ug/kg	TRUE	6.3				Indeno(1,2	PAHs	3.15
EPA 8270C	BG-3D-17'		ug/kg	TRUE	6.3				Phenanthre	PAHs	3.15
EPA 8270C	BG-3D-17'		ug/kg	TRUE	6.3				Pyrene	PAHs	3.15
EPA 600-R-	BG-3D-17'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-3D-17'	3900	mg/kg	FALSE	5.2				Aluminum	Metals	3900
SM4500-NI	BG-3D-17'	3.2	mg/kg	FALSE	5.2	J	(EPA) - Esti	Nitrogen, A	Ammonia	General Chemistry	3.2
EPA 6010B	BG-3D-17'		mg/kg	TRUE	1				Antimony	Metals	0.5
EPA 6010B	BG-3D-17'	0.078	mg/kg	FALSE	0.1	J	(EPA) - Esti		Beryllium	Metals	0.078
EPA 8270C	BG-3D-17'		ug/kg	TRUE	350			1,1-Biphen	Biphenyl	SVOC	175
EPA 6010B	BG-3D-17'	6.4	mg/kg	FALSE	10	J	(EPA) - Esti		Boron	Metals	6.4
EPA 6010B	BG-3D-17'	76000	mg/kg	FALSE	130				Calcium	Metals	76000
EPA 9056	BG-3D-17'	120	mg/kg	FALSE	10				Chloride	General Chemistry	120
EPA 6010B	BG-3D-17'	4.8	mg/kg	FALSE	0.52			Total chror	Chromium,	Metals	4.8
EPA 7199	BG-3D-17'		mg/kg	TRUE	2.1				Chromium,	Metals	1.05
EPA 6010B	BG-3D-17'	1.8	mg/kg	FALSE	0.52				Cobalt	Metals	1.8
EPA 6010B	BG-3D-17'	4.4	mg/kg	FALSE	1				Copper	Metals	4.4
EPA 300.0	BG-3D-17'	5.4	mg/kg	FALSE	1				Fluoride	General Chemistry	5.4
EPA 6010B	BG-3D-17'	4900	mg/kg	FALSE	5.2				Iron	Metals	4900
EPA 6010B	BG-3D-17'	1600	mg/kg	FALSE	5.2				Magnesiun	Metals	1600
EPA 6010B	BG-3D-17'	160	mg/kg	FALSE	0.52				Manganese	Metals	160
EPA 6010B	BG-3D-17'	1.7	mg/kg	FALSE	1.3				Molybdenu	Metals	1.7
EPA 6010B	BG-3D-17'	4.2	mg/kg	FALSE	5.2	J	(EPA) - Esti		Nickel	Metals	4.2
EPA 300.0	BG-3D-17'	0.36	mg/kg	FALSE	1	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.36
EPA 6010B	BG-3D-17'	1000	mg/kg	FALSE	26				Potassium	Metals	1000
EPA 6010B	BG-3D-17'	460	mg/kg	FALSE	110				Silica	Metals	460
EPA 6010B	BG-3D-17'	390	mg/kg	FALSE	26				Sodium	Metals	390
EPA 9056	BG-3D-17'	480	mg/kg	FALSE	52				Sulfate	General Chemistry	480
EPA 6010B	BG-3D-17'		mg/kg	TRUE	5.2	O	(ESC) Samp		Thallium	Metals	2.6
EPA 9056	BG-3D-17'	0.6	mg/kg	FALSE	1	J, P1	J-(EPA) - Es		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-3D-17'	9.9	mg/kg	FALSE	0.52				Vanadium	Metals	9.9
EPA 6010B	BG-3D-17'	15	mg/kg	FALSE	1.6				Zinc	Metals	15
EPA 8270C	BG-3D-17'		ug/kg	TRUE	6.3				Benzo(b)flu	PAHs	3.15
EPA 8270C	BG-3D-17'		ug/kg	TRUE	6.3				Benzo(k)flu	PAHs	3.15
EPA 6010B	BG-3D-17'	44	mg/kg	FALSE	0.52				Titanium	Metals	44
EPA 8270C	BG-3D-17'		ug/kg	TRUE	6.3				Naphthaler	PAHs	3.15
EPA 2540G	BG-3D-17'	95.3	%	FALSE	0.1				Total Solids	General Chemistry	95.3
EPA 6010B	BG-3D-22'	8.5	mg/kg	FALSE	10	J	(EPA) - Esti		Arsenic	Metals	8.5
EPA 6010B	BG-3D-22'	220	mg/kg	FALSE	0.25				Barium	Metals	220
EPA 6010B	BG-3D-22'	0.48	mg/kg	FALSE	0.25				Cadmium	Metals	0.48
EPA 6010B	BG-3D-22'	6.6	mg/kg	FALSE	2.5				Lead	Metals	6.6
EPA 7471A	BG-3D-22'	0.0048	mg/kg	FALSE	0.02	J	(EPA) - Esti		Mercury	Metals	0.0048
EPA 6010B	BG-3D-22'		mg/kg	TRUE	10	O	(ESC) Samp		Selenium	Metals	5
EPA 6010B	BG-3D-22'		mg/kg	TRUE	0.51				Silver	Metals	0.255
EPA 9045C	BG-3D-22'	8.8	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.8
EPA 8270C	BG-3D-22'		ug/kg	TRUE	6.1				Acenaphth	PAHs	3.05
EPA 8270C	BG-3D-22'		ug/kg	TRUE	6.1				Anthracene	PAHs	3.05
EPA 8270C	BG-3D-22'		ug/kg	TRUE	6.1				Benzo(a)an	PAHs	3.05
EPA 8270C	BG-3D-22'		ug/kg	TRUE	6.1				Benzo(g,h,i	PAHs	3.05
EPA 8270C	BG-3D-22'		ug/kg	TRUE	6.1				Benzo(a)py	PAHs	3.05
EPA 8270C	BG-3D-22'		ug/kg	TRUE	340				Bis(2-ethyll	SVOC	170
EPA 8270C	BG-3D-22'		ug/kg	TRUE	6.1				Chrysene	PAHs	3.05
EPA 8270C	BG-3D-22'		ug/kg	TRUE	6.1				Fluoranthe	PAHs	3.05
EPA 8270C	BG-3D-22'		ug/kg	TRUE	6.1				Indeno(1,2	PAHs	3.05
EPA 8270C	BG-3D-22'		ug/kg	TRUE	6.1				Phenanthre	PAHs	3.05
EPA 8270C	BG-3D-22'		ug/kg	TRUE	6.1				Pyrene	PAHs	3.05
EPA 600-R-	BG-3D-22'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-3D-22'	3300	mg/kg	FALSE	5.1				Aluminum	Metals	3300
SM4500-NI	BG-3D-22'	2.3	mg/kg	FALSE	5.1	J	(EPA) - Esti	Nitrogen, A	Ammonia	General Chemistry	2.3
EPA 6010B	BG-3D-22'		mg/kg	TRUE	1				Antimony	Metals	0.5
EPA 6010B	BG-3D-22'	0.032	mg/kg	FALSE	0.1	J	(EPA) - Esti		Beryllium	Metals	0.032
EPA 8270C	BG-3D-22'		ug/kg	TRUE	340			1,1-Biphen	Biphenyl	SVOC	170
EPA 6010B	BG-3D-22'	5.3	mg/kg	FALSE	10	J	(EPA) - Esti		Boron	Metals	5.3
EPA 6010B	BG-3D-22'	150000	mg/kg	FALSE	250				Calcium	Metals	150000
EPA 9056	BG-3D-22'	62	mg/kg	FALSE	10				Chloride	General Chemistry	62
EPA 6010B	BG-3D-22'	5	mg/kg	FALSE	0.51			Total chror	Chromium,	Metals	5
EPA 7199	BG-3D-22'	1.2	mg/kg	FALSE	2	J	(EPA) - Esti		Chromium,	Metals	1.2
EPA 6010B	BG-3D-22'	1.3	mg/kg	FALSE	0.51				Cobalt	Metals	1.3
EPA 6010B	BG-3D-22'	3	mg/kg	FALSE	1				Copper	Metals	3
EPA 300.0	BG-3D-22'	4.2	mg/kg	FALSE	1				Fluoride	General Chemistry	4.2
EPA 6010B	BG-3D-22'	3200	mg/kg	FALSE	5.1				Iron	Metals	3200
EPA 6010B	BG-3D-22'	1400	mg/kg	FALSE	5.1				Magnesiun	Metals	1400
EPA 6010B	BG-3D-22'	1200	mg/kg	FALSE	0.51				Manganese	Metals	1200
EPA 6010B	BG-3D-22'	2.6	mg/kg	FALSE	2.5				Molybdenu	Metals	2.6
EPA 6010B	BG-3D-22'		mg/kg	TRUE	10	O	(ESC) Samp		Nickel	Metals	5
EPA 300.0	BG-3D-22'	0.31	mg/kg	FALSE	1	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.31
EPA 6010B	BG-3D-22'	930	mg/kg	FALSE	25				Potassium	Metals	930
EPA 6010B	BG-3D-22'	520	mg/kg	FALSE	100				Silica	Metals	520
EPA 6010B	BG-3D-22'	250	mg/kg	FALSE	25				Sodium	Metals	250
EPA 9056	BG-3D-22'	650	mg/kg	FALSE	51	J3	The associa		Sulfate	General Chemistry	650
EPA 6010B	BG-3D-22'		mg/kg	TRUE	51	O	(ESC) Samp		Thallium	Metals	25.5
EPA 9056	BG-3D-22'		mg/kg	TRUE	1	B4	(ESC) - The		Phosphoro	General Chemistry	0.5
EPA 6010B	BG-3D-22'	6.6	mg/kg	FALSE	0.51				Vanadium	Metals	6.6
EPA 6010B	BG-3D-22'	9.8	mg/kg	FALSE	1.5				Zinc	Metals	9.8
EPA 8270C	BG-3D-22'		ug/kg	TRUE	6.1				Benzo(b)flu	PAHs	3.05
EPA 8270C	BG-3D-22'		ug/kg	TRUE	6.1				Benzo(k)flu	PAHs	3.05
EPA 6010B	BG-3D-22'	30	mg/kg	FALSE	0.51				Titanium	Metals	30
EPA 8270C	BG-3D-22'		ug/kg	TRUE	6.1				Naphthaler	PAHs	3.05
EPA 2540G	BG-3D-22'	98.8	%	FALSE	0.1				Total Solids	General Chemistry	98.8
EPA 6010B	BG-3D-29'	12	mg/kg	FALSE	1				Arsenic	Metals	12
EPA 6010B	BG-3D-29'	85	mg/kg	FALSE	0.25				Barium	Metals	85
EPA 6010B	BG-3D-29'		mg/kg	TRUE	0.25				Cadmium	Metals	0.125
EPA 6010B	BG-3D-29'	3.6	mg/kg	FALSE	0.25				Lead	Metals	3.6
EPA 7471A	BG-3D-29'	0.0039	mg/kg	FALSE	0.02	J	(EPA) - Esti		Mercury	Metals	0.0039
EPA 6010B	BG-3D-29'		mg/kg	TRUE	5.1	O	(ESC) Samp		Selenium	Metals	2.55
EPA 6010B	BG-3D-29'		mg/kg	TRUE	0.51				Silver	Metals	0.255
EPA 9045C	BG-3D-29'	9.1	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	9.1
EPA 8270C	BG-3D-29'		ug/kg	TRUE	6.1				Acenaphth	PAHs	3.05
EPA 8270C	BG-3D-29'		ug/kg	TRUE	6.1				Anthracene	PAHs	3.05
EPA 8270C	BG-3D-29'		ug/kg	TRUE	6.1				Benzo(a)an	PAHs	3.05
EPA 8270C	BG-3D-29'		ug/kg	TRUE	6.1				Benzo(g,h,i	PAHs	3.05
EPA 8270C	BG-3D-29'		ug/kg	TRUE	6.1				Benzo(a)py	PAHs	3.05
EPA 8270C	BG-3D-29'		ug/kg	TRUE	340				Bis(2-ethyll	SVOC	170
EPA 8270C	BG-3D-29'		ug/kg	TRUE	6.1				Chrysene	PAHs	3.05
EPA 8270C	BG-3D-29'		ug/kg	TRUE	6.1				Fluoranthe	PAHs	3.05

Lab	Backgroun	2/28/2012	BG-3D	Indeno(1,2,3-cd)pyrene	29
Lab	Backgroun	2/28/2012	BG-3D	Phenanthrene	29
Lab	Backgroun	2/28/2012	BG-3D	Pyrene	29
Lab	Backgroun	2/28/2012	BG-3D	Asbestos	29
Lab	Backgroun	2/28/2012	BG-3D	Aluminum	29
Lab	Backgroun	2/28/2012	BG-3D	Ammonia	29
Lab	Backgroun	2/28/2012	BG-3D	Antimony	29
Lab	Backgroun	2/28/2012	BG-3D	Beryllium	29
Lab	Backgroun	2/28/2012	BG-3D	Biphenyl	29
Lab	Backgroun	2/28/2012	BG-3D	Boron	29
Lab	Backgroun	2/28/2012	BG-3D	Calcium	29
Lab	Backgroun	2/28/2012	BG-3D	Chloride	29
Lab	Backgroun	2/28/2012	BG-3D	Chromium (total)	29
Lab	Backgroun	2/28/2012	BG-3D	Chromium (hexavalent)	29
Lab	Backgroun	2/28/2012	BG-3D	Cobalt	29
Lab	Backgroun	2/28/2012	BG-3D	Copper	29
Lab	Backgroun	2/28/2012	BG-3D	Fluoride	29
Lab	Backgroun	2/28/2012	BG-3D	Iron	29
Lab	Backgroun	2/28/2012	BG-3D	Magnesium	29
Lab	Backgroun	2/28/2012	BG-3D	Manganese	29
Lab	Backgroun	2/28/2012	BG-3D	Molybdenum	29
Lab	Backgroun	2/28/2012	BG-3D	Nickel	29
Lab	Backgroun	2/28/2012	BG-3D	Nitrate	29
Lab	Backgroun	2/28/2012	BG-3D	Potassium	29
Lab	Backgroun	2/28/2012	BG-3D	Silica	29
Lab	Backgroun	2/28/2012	BG-3D	Sodium	29
Lab	Backgroun	2/28/2012	BG-3D	Sulfate	29
Lab	Backgroun	2/28/2012	BG-3D	Thallium	29
Lab	Backgroun	2/28/2012	BG-3D	Phosphate as P	29
Lab	Backgroun	2/28/2012	BG-3D	Vanadium	29
Lab	Backgroun	2/28/2012	BG-3D	Zinc	29
Lab	Backgroun	2/28/2012	BG-3D	Benzo(b)fluoranthene	29
Lab	Backgroun	2/28/2012	BG-3D	Benzo(k)fluoranthene	29
Lab	Backgroun	2/28/2012	BG-3D	Titanium	29
Lab	Backgroun	2/28/2012	BG-3D	Naphthalene (PAH)	29
Lab	Backgroun	2/28/2012	BG-3D	Total Solids	29
Lab	Backgroun	2/28/2012	BG-3D	Arsenic	63
Lab	Backgroun	2/28/2012	BG-3D	Barium	63
Lab	Backgroun	2/28/2012	BG-3D	Cadmium	63
Lab	Backgroun	2/28/2012	BG-3D	Lead	63
Lab	Backgroun	2/28/2012	BG-3D	Mercury	63
Lab	Backgroun	2/28/2012	BG-3D	Selenium	63
Lab	Backgroun	2/28/2012	BG-3D	Silver	63
Lab	Backgroun	2/28/2012	BG-3D	pH	63
Lab	Backgroun	2/28/2012	BG-3D	Acenaphthene	63
Lab	Backgroun	2/28/2012	BG-3D	Anthracene	63
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)anthracene	63
Lab	Backgroun	2/28/2012	BG-3D	Benzo(g,h,i)perylene	63
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)pyrene	63
Lab	Backgroun	2/28/2012	BG-3D	Bis(2-ethylhexyl)phthalate	63
Lab	Backgroun	2/28/2012	BG-3D	Chrysene	63
Lab	Backgroun	2/28/2012	BG-3D	Fluoranthene	63
Lab	Backgroun	2/28/2012	BG-3D	Indeno(1,2,3-cd)pyrene	63
Lab	Backgroun	2/28/2012	BG-3D	Phenanthrene	63
Lab	Backgroun	2/28/2012	BG-3D	Pyrene	63
Lab	Backgroun	2/28/2012	BG-3D	Asbestos	63
Lab	Backgroun	2/28/2012	BG-3D	Aluminum	63
Lab	Backgroun	2/28/2012	BG-3D	Ammonia	63
Lab	Backgroun	2/28/2012	BG-3D	Antimony	63
Lab	Backgroun	2/28/2012	BG-3D	Beryllium	63
Lab	Backgroun	2/28/2012	BG-3D	Biphenyl	63
Lab	Backgroun	2/28/2012	BG-3D	Boron	63
Lab	Backgroun	2/28/2012	BG-3D	Calcium	63
Lab	Backgroun	2/28/2012	BG-3D	Chloride	63
Lab	Backgroun	2/28/2012	BG-3D	Chromium (total)	63
Lab	Backgroun	2/28/2012	BG-3D	Chromium (hexavalent)	63
Lab	Backgroun	2/28/2012	BG-3D	Cobalt	63
Lab	Backgroun	2/28/2012	BG-3D	Copper	63
Lab	Backgroun	2/28/2012	BG-3D	Fluoride	63
Lab	Backgroun	2/28/2012	BG-3D	Iron	63
Lab	Backgroun	2/28/2012	BG-3D	Magnesium	63
Lab	Backgroun	2/28/2012	BG-3D	Manganese	63
Lab	Backgroun	2/28/2012	BG-3D	Molybdenum	63
Lab	Backgroun	2/28/2012	BG-3D	Nickel	63
Lab	Backgroun	2/28/2012	BG-3D	Nitrate	63
Lab	Backgroun	2/28/2012	BG-3D	Potassium	63
Lab	Backgroun	2/28/2012	BG-3D	Silica	63
Lab	Backgroun	2/28/2012	BG-3D	Sodium	63
Lab	Backgroun	2/28/2012	BG-3D	Sulfate	63
Lab	Backgroun	2/28/2012	BG-3D	Thallium	63
Lab	Backgroun	2/28/2012	BG-3D	Phosphate as P	63
Lab	Backgroun	2/28/2012	BG-3D	Vanadium	63
Lab	Backgroun	2/28/2012	BG-3D	Zinc	63
Lab	Backgroun	2/28/2012	BG-3D	Benzo(b)fluoranthene	63
Lab	Backgroun	2/28/2012	BG-3D	Benzo(k)fluoranthene	63
Lab	Backgroun	2/28/2012	BG-3D	Titanium	63
Lab	Backgroun	2/28/2012	BG-3D	Naphthalene (PAH)	63
Lab	Backgroun	2/28/2012	BG-3D	Total Solids	63
Lab	Backgroun	2/28/2012	BG-3D	Arsenic	65
Lab	Backgroun	2/28/2012	BG-3D	Barium	65
Lab	Backgroun	2/28/2012	BG-3D	Cadmium	65
Lab	Backgroun	2/28/2012	BG-3D	Lead	65
Lab	Backgroun	2/28/2012	BG-3D	Mercury	65
Lab	Backgroun	2/28/2012	BG-3D	Selenium	65
Lab	Backgroun	2/28/2012	BG-3D	Silver	65
Lab	Backgroun	2/28/2012	BG-3D	pH	65
Lab	Backgroun	2/28/2012	BG-3D	Acenaphthene	65
Lab	Backgroun	2/28/2012	BG-3D	Anthracene	65
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)anthracene	65
Lab	Backgroun	2/28/2012	BG-3D	Benzo(g,h,i)perylene	65
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)pyrene	65
Lab	Backgroun	2/28/2012	BG-3D	Bis(2-ethylhexyl)phthalate	65
Lab	Backgroun	2/28/2012	BG-3D	Chrysene	65
Lab	Backgroun	2/28/2012	BG-3D	Fluoranthene	65
Lab	Backgroun	2/28/2012	BG-3D	Indeno(1,2,3-cd)pyrene	65
Lab	Backgroun	2/28/2012	BG-3D	Phenanthrene	65
Lab	Backgroun	2/28/2012	BG-3D	Pyrene	65
Lab	Backgroun	2/28/2012	BG-3D	Asbestos	65
Lab	Backgroun	2/28/2012	BG-3D	Aluminum	65
Lab	Backgroun	2/28/2012	BG-3D	Ammonia	65
Lab	Backgroun	2/28/2012	BG-3D	Antimony	65
Lab	Backgroun	2/28/2012	BG-3D	Beryllium	65
Lab	Backgroun	2/28/2012	BG-3D	Biphenyl	65
Lab	Backgroun	2/28/2012	BG-3D	Boron	65
Lab	Backgroun	2/28/2012	BG-3D	Calcium	65
Lab	Backgroun	2/28/2012	BG-3D	Chloride	65
Lab	Backgroun	2/28/2012	BG-3D	Chromium (total)	65
Lab	Backgroun	2/28/2012	BG-3D	Chromium (hexavalent)	65
Lab	Backgroun	2/28/2012	BG-3D	Cobalt	65
Lab	Backgroun	2/28/2012	BG-3D	Copper	65
Lab	Backgroun	2/28/2012	BG-3D	Fluoride	65
Lab	Backgroun	2/28/2012	BG-3D	Iron	65
Lab	Backgroun	2/28/2012	BG-3D	Magnesium	65
Lab	Backgroun	2/28/2012	BG-3D	Manganese	65
Lab	Backgroun	2/28/2012	BG-3D	Molybdenum	65
Lab	Backgroun	2/28/2012	BG-3D	Nickel	65
Lab	Backgroun	2/28/2012	BG-3D	Nitrate	65
Lab	Backgroun	2/28/2012	BG-3D	Potassium	65
Lab	Backgroun	2/28/2012	BG-3D	Silica	65
Lab	Backgroun	2/28/2012	BG-3D	Sodium	65
Lab	Backgroun	2/28/2012	BG-3D	Sulfate	65
Lab	Backgroun	2/28/2012	BG-3D	Thallium	65

EPA 8270C	BG-3D-29'		ug/kg	TRUE	6.1				Indeno(1,2	PAHs	3.05
EPA 8270C	BG-3D-29'		ug/kg	TRUE	6.1				Phenanthre	PAHs	3.05
EPA 8270C	BG-3D-29'		ug/kg	TRUE	6.1				Pyrene	PAHs	3.05
EPA 600-R-	BG-3D-29'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-3D-29'	3700	mg/kg	FALSE	5.1				Aluminum	Metals	3700
SM4500-NI	BG-3D-29'	2.4	mg/kg	FALSE	5.1	J	(EPA) - Esti	Nitrogen, A	Ammonia	General Chemistry	2.4
EPA 6010B	BG-3D-29'		mg/kg	TRUE	1				Antimony	Metals	0.5
EPA 6010B	BG-3D-29'	0.055	mg/kg	FALSE	0.1	J	(EPA) - Esti		Beryllium	Metals	0.055
EPA 8270C	BG-3D-29'		ug/kg	TRUE	340			1,1-Biphen	Biphenyl	SVOC	170
EPA 6010B	BG-3D-29'	3.5	mg/kg	FALSE	10	J	(EPA) - Esti		Boron	Metals	3.5
EPA 6010B	BG-3D-29'	36000	mg/kg	FALSE	25				Calcium	Metals	36000
EPA 9056	BG-3D-29'	120	mg/kg	FALSE	10				Chloride	General Chemistry	120
EPA 6010B	BG-3D-29'	4.5	mg/kg	FALSE	0.51			Total chror	Chromium,	Metals	4.5
EPA 7199	BG-3D-29'		mg/kg	TRUE	2				Chromium,	Metals	1
EPA 6010B	BG-3D-29'	1.6	mg/kg	FALSE	0.51				Cobalt	Metals	1.6
EPA 6010B	BG-3D-29'	3.5	mg/kg	FALSE	1				Copper	Metals	3.5
EPA 300.0	BG-3D-29'	3.7	mg/kg	FALSE	1				Fluoride	General Chemistry	3.7
EPA 6010B	BG-3D-29'	4700	mg/kg	FALSE	5.1				Iron	Metals	4700
EPA 6010B	BG-3D-29'	1300	mg/kg	FALSE	5.1				Magnesiun	Metals	1300
EPA 6010B	BG-3D-29'	75	mg/kg	FALSE	0.51				Manganese	Metals	75
EPA 6010B	BG-3D-29'	0.39	mg/kg	FALSE	0.25				Molybdenu	Metals	0.39
EPA 6010B	BG-3D-29'	3.4	mg/kg	FALSE	1				Nickel	Metals	3.4
EPA 300.0	BG-3D-29'	0.61	mg/kg	FALSE	1	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.61
EPA 6010B	BG-3D-29'	940	mg/kg	FALSE	25				Potassium	Metals	940
EPA 6010B	BG-3D-29'	470	mg/kg	FALSE	110				Silica	Metals	470
EPA 6010B	BG-3D-29'	320	mg/kg	FALSE	25				Sodium	Metals	320
EPA 9056	BG-3D-29'	160	mg/kg	FALSE	51				Sulfate	General Chemistry	160
EPA 6010B	BG-3D-29'		mg/kg	TRUE	5.1	O	(ESC) Samp		Thallium	Metals	2.55
EPA 9056	BG-3D-29'		mg/kg	TRUE	1	B4	(ESC) - The		Phosphoro	General Chemistry	0.5
EPA 6010B	BG-3D-29'	8.7	mg/kg	FALSE	0.51				Vanadium	Metals	8.7
EPA 6010B	BG-3D-29'	13	mg/kg	FALSE	1.5				Zinc	Metals	13
EPA 8270C	BG-3D-29'		ug/kg	TRUE	6.1				Benzo(b)flu	PAHs	3.05
EPA 8270C	BG-3D-29'		ug/kg	TRUE	6.1				Benzo(k)flu	PAHs	3.05
EPA 6010B	BG-3D-29'	42	mg/kg	FALSE	0.51				Titanium	Metals	42
EPA 8270C	BG-3D-29'		ug/kg	TRUE	6.1				Naphthaler	PAHs	3.05
EPA 2540G	BG-3D-29'	98.1	%	FALSE	0.1				Total Solids	General Chemistry	98.1
EPA 6010B	BG-3D-63'	15	mg/kg	FALSE	1.2				Arsenic	Metals	15
EPA 6010B	BG-3D-63'	84	mg/kg	FALSE	0.31				Barium	Metals	84
EPA 6010B	BG-3D-63'		mg/kg	TRUE	0.31				Cadmium	Metals	0.155
EPA 6010B	BG-3D-63'	3.8	mg/kg	FALSE	0.31				Lead	Metals	3.8
EPA 7471A	BG-3D-63'		mg/kg	TRUE	0.025				Mercury	Metals	0.0125
EPA 6010B	BG-3D-63'		mg/kg	TRUE	1.2				Selenium	Metals	0.6
EPA 6010B	BG-3D-63'		mg/kg	TRUE	0.63				Silver	Metals	0.315
EPA 9045C	BG-3D-63'	8.5	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.5
EPA 8270C	BG-3D-63'		ug/kg	TRUE	7.5				Acenaphth	PAHs	3.75
EPA 8270C	BG-3D-63'		ug/kg	TRUE	7.5				Anthracene	PAHs	3.75
EPA 8270C	BG-3D-63'		ug/kg	TRUE	7.5				Benzo(a)an	PAHs	3.75
EPA 8270C	BG-3D-63'		ug/kg	TRUE	7.5				Benzo(g,h,i	PAHs	3.75
EPA 8270C	BG-3D-63'		ug/kg	TRUE	7.5				Benzo(a)py	PAHs	3.75
EPA 8270C	BG-3D-63'		ug/kg	TRUE	420				Bis(2-ethyll	SVOC	210
EPA 8270C	BG-3D-63'		ug/kg	TRUE	7.5				Chrysene	PAHs	3.75
EPA 8270C	BG-3D-63'		ug/kg	TRUE	7.5				Fluoranthe	PAHs	3.75
EPA 8270C	BG-3D-63'		ug/kg	TRUE	7.5				Indeno(1,2	PAHs	3.75
EPA 8270C	BG-3D-63'		ug/kg	TRUE	7.5				Phenanthre	PAHs	3.75
EPA 8270C	BG-3D-63'		ug/kg	TRUE	7.5				Pyrene	PAHs	3.75
EPA 600-R-	BG-3D-63'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-3D-63'	4300	mg/kg	FALSE	6.3				Aluminum	Metals	4300
SM4500-NI	BG-3D-63'	2.8	mg/kg	FALSE	6.3	J	(EPA) - Esti	Nitrogen, A	Ammonia	General Chemistry	2.8
EPA 6010B	BG-3D-63'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
EPA 6010B	BG-3D-63'	0.19	mg/kg	FALSE	0.12				Beryllium	Metals	0.19
EPA 8270C	BG-3D-63'		ug/kg	TRUE	420			1,1-Biphen	Biphenyl	SVOC	210
EPA 6010B	BG-3D-63'	12	mg/kg	FALSE	12	J	(EPA) - Esti		Boron	Metals	12
EPA 6010B	BG-3D-63'	25000	mg/kg	FALSE	31				Calcium	Metals	25000
EPA 9056	BG-3D-63'	88	mg/kg	FALSE	12				Chloride	General Chemistry	88
EPA 6010B	BG-3D-63'	5	mg/kg	FALSE	0.63			Total chror	Chromium,	Metals	5
EPA 7199	BG-3D-63'		mg/kg	TRUE	2.5				Chromium,	Metals	1.25
EPA 6010B	BG-3D-63'	1.8	mg/kg	FALSE	0.63				Cobalt	Metals	1.8
EPA 6010B	BG-3D-63'	4.3	mg/kg	FALSE	1.2				Copper	Metals	4.3
EPA 300.0	BG-3D-63'	5	mg/kg	FALSE	1.2				Fluoride	General Chemistry	5
EPA 6010B	BG-3D-63'	5500	mg/kg	FALSE	6.3				Iron	Metals	5500
EPA 6010B	BG-3D-63'	1500	mg/kg	FALSE	6.3				Magnesiun	Metals	1500
EPA 6010B	BG-3D-63'	69	mg/kg	FALSE	0.63				Manganese	Metals	69
EPA 6010B	BG-3D-63'	0.62	mg/kg	FALSE	0.31				Molybdenu	Metals	0.62
EPA 6010B	BG-3D-63'	4	mg/kg	FALSE	1.2				Nickel	Metals	4
EPA 300.0	BG-3D-63'	0.28	mg/kg	FALSE	1.2	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.28
EPA 6010B	BG-3D-63'	1200	mg/kg	FALSE	31				Potassium	Metals	1200
EPA 6010B	BG-3D-63'	790	mg/kg	FALSE	130				Silica	Metals	790
EPA 6010B	BG-3D-63'	99	mg/kg	FALSE	31				Sodium	Metals	99
EPA 9056	BG-3D-63'	160	mg/kg	FALSE	63				Sulfate	General Chemistry	160
EPA 6010B	BG-3D-63'		mg/kg	TRUE	1.2				Thallium	Metals	0.6
EPA 9056	BG-3D-63'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-3D-63'	8.4	mg/kg	FALSE	0.63				Vanadium	Metals	8.4
EPA 6010B	BG-3D-63'	16	mg/kg	FALSE	1.9				Zinc	Metals	16
EPA 8270C	BG-3D-63'		ug/kg	TRUE	7.5				Benzo(b)flu	PAHs	3.75
EPA 8270C	BG-3D-63'		ug/kg	TRUE	7.5				Benzo(k)flu	PAHs	3.75
EPA 6010B	BG-3D-63'	34	mg/kg	FALSE	0.63				Titanium	Metals	34
EPA 8270C	BG-3D-63'		ug/kg	TRUE	7.5				Naphthaler	PAHs	3.75
EPA 2540G	BG-3D-63'	79.5	%	FALSE	0.1				Total Solids	General Chemistry	79.5
EPA 6010B	BG-3D-65'	27	mg/kg	FALSE	1.2				Arsenic	Metals	27
EPA 6010B	BG-3D-65'	76	mg/kg	FALSE	0.3				Barium	Metals	76
EPA 6010B	BG-3D-65'	0.052	mg/kg	FALSE	0.3	J	(EPA) - Esti		Cadmium	Metals	0.052
EPA 6010B	BG-3D-65'	5.5	mg/kg	FALSE	0.3				Lead	Metals	5.5
EPA 7471A	BG-3D-65'	0.0025	mg/kg	FALSE	0.024	J	(EPA) - Esti		Mercury	Metals	0.0025
EPA 6010B	BG-3D-65'		mg/kg	TRUE	2.4	O	(ESC) Samp		Selenium	Metals	1.2
EPA 6010B	BG-3D-65'		mg/kg	TRUE	0.59				Silver	Metals	0.295
EPA 9045C	BG-3D-65'	8.5	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.5
EPA 8270C	BG-3D-65'		ug/kg	TRUE	7.1				Acenaphth	PAHs	3.55
EPA 8270C	BG-3D-65'		ug/kg	TRUE	7.1				Anthracene	PAHs	3.55
EPA 8270C	BG-3D-65'		ug/kg	TRUE	7.1				Benzo(a)an	PAHs	3.55
EPA 8270C	BG-3D-65'		ug/kg	TRUE	7.1				Benzo(g,h,i	PAHs	3.55
EPA 8270C	BG-3D-65'		ug/kg	TRUE	7.1				Benzo(a)py	PAHs	3.55
EPA 8270C	BG-3D-65'		ug/kg	TRUE	400				Bis(2-ethyll	SVOC	200
EPA 8270C	BG-3D-65'		ug/kg	TRUE	7.1				Chrysene	PAHs	3.55
EPA 8270C	BG-3D-65'		ug/kg	TRUE	7.1				Fluoranthe	PAHs	3.55
EPA 8270C	BG-3D-65'		ug/kg	TRUE	7.1				Indeno(1,2	PAHs	3.55
EPA 8270C	BG-3D-65'		ug/kg	TRUE	7.1				Phenanthre	PAHs	3.55
EPA 8270C	BG-3D-65'		ug/kg	TRUE	7.1				Pyrene	PAHs	3.55
EPA 600-R-	BG-3D-65'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-3D-65'	6800	mg/kg	FALSE	5.9				Aluminum	Metals	6800
SM4500-NI	BG-3D-65'	3.8	mg/kg	FALSE	5.9	J	(EPA) - Esti	Nitrogen, A	Ammonia	General Chemistry	3.8
EPA 6010B	BG-3D-65'	0.58	mg/kg	FALSE	1.2	J	(EPA) - Esti		Antimony	Metals	0.58
EPA 6010B	BG-3D-65'	0.17	mg/kg	FALSE	0.12				Beryllium	Metals	0.17
EPA 8270C	BG-3D-65'		ug/kg	TRUE	400			1,1-Biphen	Biphenyl	SVOC	200
EPA 6010B	BG-3D-65'	11	mg/kg	FALSE	12	J	(EPA) - Esti		Boron	Metals	11
EPA 6010B	BG-3D-65'	38000	mg/kg	FALSE	30				Calcium	Metals	38000
EPA 9056	BG-3D-65'	69	mg/kg	FALSE	12				Chloride	General Chemistry	69
EPA 6010B	BG-3D-65'	8.4	mg/kg	FALSE	0.59			Total chror	Chromium,	Metals	8.4
EPA 7199	BG-3D-65'	1.8	mg/kg	FALSE	2.4	J	(EPA) - Esti		Chromium,	Metals	1.8
EPA 6010B	BG-3D-65'	3.9	mg/kg	FALSE	0.59				Cobalt	Metals	3.9
EPA 6010B	BG-3D-65'	7.1	mg/kg	FALSE	1.2				Copper	Metals	7.1
EPA 300.0	BG-3D-65'	5.3	mg/kg	FALSE	1.2				Fluoride	General Chemistry	5.3
EPA 6010B	BG-3D-65'	9400	mg/kg	FALSE	5.9				Iron	Metals	9400
EPA 6010B	BG-3D-65'	2800	mg/kg	FALSE	5.9				Magnesiun	Metals	2800
EPA 6010B	BG-3D-65'	130	mg/kg	FALSE	0.59				Manganese	Metals	130
EPA 6010B	BG-3D-65'	0.57	mg/kg	FALSE	0.3				Molybdenu	Metals	0.57
EPA 6010B	BG-3D-65'	8.3	mg/kg	FALSE	1.2				Nickel	Metals	8.3
EPA 300.0	BG-3D-65'		mg/kg	TRUE	1.2			Nitrogen, N	Nitrate	General Chemistry	0.6
EPA 6010B	BG-3D-65'	1700	mg/kg	FALSE	30				Potassium	Metals	1700
EPA 6010B	BG-3D-65'	820	mg/kg	FALSE	110				Silica	Metals	820
EPA 6010B	BG-3D-65'	150	mg/kg	FALSE	30				Sodium	Metals	150
EPA 9056	BG-3D-65'	120	mg/kg	FALSE	59				Sulfate	General Chemistry	120
EPA 6010B	BG-3D-65'		mg/kg	TRUE	2.4	O	(ESC) Samp		Thallium	Metals	1.2

Lab	Backgroun	2/28/2012	BG-3D	Phosphate as P	65
Lab	Backgroun	2/28/2012	BG-3D	Vanadium	65
Lab	Backgroun	2/28/2012	BG-3D	Zinc	65
Lab	Backgroun	2/28/2012	BG-3D	Benzo(b)fluoranthene	65
Lab	Backgroun	2/28/2012	BG-3D	Benzo(k)fluoranthene	65
Lab	Backgroun	2/28/2012	BG-3D	Titanium	65
Lab	Backgroun	2/28/2012	BG-3D	Naphthalene (PAH)	65
Lab	Backgroun	2/28/2012	BG-3D	Total Solids	65
Lab	Backgroun	2/28/2012	BG-3D	Arsenic	69
Lab	Backgroun	2/28/2012	BG-3D	Barium	69
Lab	Backgroun	2/28/2012	BG-3D	Cadmium	69
Lab	Backgroun	2/28/2012	BG-3D	Lead	69
Lab	Backgroun	2/28/2012	BG-3D	Mercury	69
Lab	Backgroun	2/28/2012	BG-3D	Selenium	69
Lab	Backgroun	2/28/2012	BG-3D	Silver	69
Lab	Backgroun	2/28/2012	BG-3D	pH	69
Lab	Backgroun	2/28/2012	BG-3D	Acenaphthene	69
Lab	Backgroun	2/28/2012	BG-3D	Anthracene	69
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)anthracene	69
Lab	Backgroun	2/28/2012	BG-3D	Benzo(g,h,i)perylene	69
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)pyrene	69
Lab	Backgroun	2/28/2012	BG-3D	Bis(2-ethylhexyl)phthalate	69
Lab	Backgroun	2/28/2012	BG-3D	Chrysene	69
Lab	Backgroun	2/28/2012	BG-3D	Fluoranthene	69
Lab	Backgroun	2/28/2012	BG-3D	Indeno(1,2,3-cd)pyrene	69
Lab	Backgroun	2/28/2012	BG-3D	Phenanthrene	69
Lab	Backgroun	2/28/2012	BG-3D	Pyrene	69
Lab	Backgroun	2/28/2012	BG-3D	Asbestos	69
Lab	Backgroun	2/28/2012	BG-3D	Aluminum	69
Lab	Backgroun	2/28/2012	BG-3D	Ammonia	69
Lab	Backgroun	2/28/2012	BG-3D	Antimony	69
Lab	Backgroun	2/28/2012	BG-3D	Beryllium	69
Lab	Backgroun	2/28/2012	BG-3D	Biphenyl	69
Lab	Backgroun	2/28/2012	BG-3D	Boron	69
Lab	Backgroun	2/28/2012	BG-3D	Calcium	69
Lab	Backgroun	2/28/2012	BG-3D	Chloride	69
Lab	Backgroun	2/28/2012	BG-3D	Chromium (total)	69
Lab	Backgroun	2/28/2012	BG-3D	Chromium (hexavalent)	69
Lab	Backgroun	2/28/2012	BG-3D	Cobalt	69
Lab	Backgroun	2/28/2012	BG-3D	Copper	69
Lab	Backgroun	2/28/2012	BG-3D	Fluoride	69
Lab	Backgroun	2/28/2012	BG-3D	Iron	69
Lab	Backgroun	2/28/2012	BG-3D	Magnesium	69
Lab	Backgroun	2/28/2012	BG-3D	Manganese	69
Lab	Backgroun	2/28/2012	BG-3D	Molybdenum	69
Lab	Backgroun	2/28/2012	BG-3D	Nickel	69
Lab	Backgroun	2/28/2012	BG-3D	Nitrate	69
Lab	Backgroun	2/28/2012	BG-3D	Potassium	69
Lab	Backgroun	2/28/2012	BG-3D	Silica	69
Lab	Backgroun	2/28/2012	BG-3D	Sodium	69
Lab	Backgroun	2/28/2012	BG-3D	Sulfate	69
Lab	Backgroun	2/28/2012	BG-3D	Thallium	69
Lab	Backgroun	2/28/2012	BG-3D	Phosphate as P	69
Lab	Backgroun	2/28/2012	BG-3D	Vanadium	69
Lab	Backgroun	2/28/2012	BG-3D	Zinc	69
Lab	Backgroun	2/28/2012	BG-3D	Benzo(b)fluoranthene	69
Lab	Backgroun	2/28/2012	BG-3D	Benzo(k)fluoranthene	69
Lab	Backgroun	2/28/2012	BG-3D	Titanium	69
Lab	Backgroun	2/28/2012	BG-3D	Naphthalene (PAH)	69
Lab	Backgroun	2/28/2012	BG-3D	Total Solids	69
Lab	Backgroun	2/28/2012	BG-3D	Arsenic	95
Lab	Backgroun	2/28/2012	BG-3D	Barium	95
Lab	Backgroun	2/28/2012	BG-3D	Cadmium	95
Lab	Backgroun	2/28/2012	BG-3D	Lead	95
Lab	Backgroun	2/28/2012	BG-3D	Mercury	95
Lab	Backgroun	2/28/2012	BG-3D	Selenium	95
Lab	Backgroun	2/28/2012	BG-3D	Silver	95
Lab	Backgroun	2/28/2012	BG-3D	pH	95
Lab	Backgroun	2/28/2012	BG-3D	Acenaphthene	95
Lab	Backgroun	2/28/2012	BG-3D	Anthracene	95
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)anthracene	95
Lab	Backgroun	2/28/2012	BG-3D	Benzo(g,h,i)perylene	95
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)pyrene	95
Lab	Backgroun	2/28/2012	BG-3D	Bis(2-ethylhexyl)phthalate	95
Lab	Backgroun	2/28/2012	BG-3D	Chrysene	95
Lab	Backgroun	2/28/2012	BG-3D	Fluoranthene	95
Lab	Backgroun	2/28/2012	BG-3D	Indeno(1,2,3-cd)pyrene	95
Lab	Backgroun	2/28/2012	BG-3D	Phenanthrene	95
Lab	Backgroun	2/28/2012	BG-3D	Pyrene	95
Lab	Backgroun	2/28/2012	BG-3D	Asbestos	95
Lab	Backgroun	2/28/2012	BG-3D	Aluminum	95
Lab	Backgroun	2/28/2012	BG-3D	Ammonia	95
Lab	Backgroun	2/28/2012	BG-3D	Antimony	95
Lab	Backgroun	2/28/2012	BG-3D	Beryllium	95
Lab	Backgroun	2/28/2012	BG-3D	Biphenyl	95
Lab	Backgroun	2/28/2012	BG-3D	Boron	95
Lab	Backgroun	2/28/2012	BG-3D	Calcium	95
Lab	Backgroun	2/28/2012	BG-3D	Chloride	95
Lab	Backgroun	2/28/2012	BG-3D	Chromium (total)	95
Lab	Backgroun	2/28/2012	BG-3D	Chromium (hexavalent)	95
Lab	Backgroun	2/28/2012	BG-3D	Cobalt	95
Lab	Backgroun	2/28/2012	BG-3D	Copper	95
Lab	Backgroun	2/28/2012	BG-3D	Fluoride	95
Lab	Backgroun	2/28/2012	BG-3D	Iron	95
Lab	Backgroun	2/28/2012	BG-3D	Magnesium	95
Lab	Backgroun	2/28/2012	BG-3D	Manganese	95
Lab	Backgroun	2/28/2012	BG-3D	Molybdenum	95
Lab	Backgroun	2/28/2012	BG-3D	Nickel	95
Lab	Backgroun	2/28/2012	BG-3D	Nitrate	95
Lab	Backgroun	2/28/2012	BG-3D	Potassium	95
Lab	Backgroun	2/28/2012	BG-3D	Silica	95
Lab	Backgroun	2/28/2012	BG-3D	Sodium	95
Lab	Backgroun	2/28/2012	BG-3D	Sulfate	95
Lab	Backgroun	2/28/2012	BG-3D	Thallium	95
Lab	Backgroun	2/28/2012	BG-3D	Phosphate as P	95
Lab	Backgroun	2/28/2012	BG-3D	Vanadium	95
Lab	Backgroun	2/28/2012	BG-3D	Zinc	95
Lab	Backgroun	2/28/2012	BG-3D	Benzo(b)fluoranthene	95
Lab	Backgroun	2/28/2012	BG-3D	Benzo(k)fluoranthene	95
Lab	Backgroun	2/28/2012	BG-3D	Titanium	95
Lab	Backgroun	2/28/2012	BG-3D	Naphthalene (PAH)	95
Lab	Backgroun	2/28/2012	BG-3D	Total Solids	95
Lab	Backgroun	2/28/2012	BG-3D	Arsenic	105
Lab	Backgroun	2/28/2012	BG-3D	Barium	105
Lab	Backgroun	2/28/2012	BG-3D	Cadmium	105
Lab	Backgroun	2/28/2012	BG-3D	Lead	105
Lab	Backgroun	2/28/2012	BG-3D	Mercury	105
Lab	Backgroun	2/28/2012	BG-3D	Selenium	105
Lab	Backgroun	2/28/2012	BG-3D	Silver	105
Lab	Backgroun	2/28/2012	BG-3D	pH	105
Lab	Backgroun	2/28/2012	BG-3D	Acenaphthene	105
Lab	Backgroun	2/28/2012	BG-3D	Anthracene	105
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)anthracene	105
Lab	Backgroun	2/28/2012	BG-3D	Benzo(g,h,i)perylene	105
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)pyrene	105
Lab	Backgroun	2/28/2012	BG-3D	Bis(2-ethylhexyl)phthalate	105
Lab	Backgroun	2/28/2012	BG-3D	Chrysene	105
Lab	Backgroun	2/28/2012	BG-3D	Fluoranthene	105
Lab	Backgroun	2/28/2012	BG-3D	Indeno(1,2,3-cd)pyrene	105
Lab	Backgroun	2/28/2012	BG-3D	Phenanthrene	105
Lab	Backgroun	2/28/2012	BG-3D	Pyrene	105
Lab	Backgroun	2/28/2012	BG-3D	Asbestos	105

EPA 9056	BG-3D-65'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-3D-65'	14	mg/kg	FALSE	0.59				Vanadium	Metals	14
EPA 6010B	BG-3D-65'	30	mg/kg	FALSE	1.8				Zinc	Metals	30
EPA 8270C	BG-3D-65'		ug/kg	TRUE	7.1				Benzo(b)flu	PAHs	3.55
EPA 8270C	BG-3D-65'		ug/kg	TRUE	7.1				Benzo(k)flu	PAHs	3.55
EPA 6010B	BG-3D-65'	75	mg/kg	FALSE	0.59				Titanium	Metals	75
EPA 8270C	BG-3D-65'		ug/kg	TRUE	7.1				Naphthaler	PAHs	3.55
EPA 2540G	BG-3D-65'	84.2	%	FALSE	0.1				Total Solids	General Chemistry	84.2
EPA 6010B	BG-3D-69'	41	mg/kg	FALSE	5.7	J3	The associa		Arsenic	Metals	41
EPA 6010B	BG-3D-69'	66	mg/kg	FALSE	0.28	J3	The associa		Barium	Metals	66
EPA 6010B	BG-3D-69'	0.11	mg/kg	FALSE	0.28	J, P1	J-(EPA) - Es		Cadmium	Metals	0.11
EPA 6010B	BG-3D-69'	8.1	mg/kg	FALSE	1.4				Lead	Metals	8.1
EPA 7471A	BG-3D-69'	0.0055	mg/kg	FALSE	0.023	J	(EPA) - Esti		Mercury	Metals	0.0055
EPA 6010B	BG-3D-69'		mg/kg	TRUE	5.7	O	(ESC) Samp		Selenium	Metals	2.85
EPA 6010B	BG-3D-69'		mg/kg	TRUE	0.57				Silver	Metals	0.285
EPA 9045C	BG-3D-69'	8.6	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.6
EPA 8270C	BG-3D-69'		ug/kg	TRUE	6.8				Acenaphth	PAHs	3.4
EPA 8270C	BG-3D-69'		ug/kg	TRUE	6.8				Anthracene	PAHs	3.4
EPA 8270C	BG-3D-69'		ug/kg	TRUE	6.8				Benzo(a)an	PAHs	3.4
EPA 8270C	BG-3D-69'		ug/kg	TRUE	6.8				Benzo(g,h,i	PAHs	3.4
EPA 8270C	BG-3D-69'		ug/kg	TRUE	6.8				Benzo(a)py	PAHs	3.4
EPA 8270C	BG-3D-69'	17	ug/kg	FALSE	380	J	(EPA) - Esti		Bis(2-ethyl	SVOC	17
EPA 8270C	BG-3D-69'		ug/kg	TRUE	6.8				Chrysene	PAHs	3.4
EPA 8270C	BG-3D-69'		ug/kg	TRUE	6.8				Fluoranthe	PAHs	3.4
EPA 8270C	BG-3D-69'		ug/kg	TRUE	6.8				Indeno(1,2	PAHs	3.4
EPA 8270C	BG-3D-69'		ug/kg	TRUE	6.8				Phenanthre	PAHs	3.4
EPA 8270C	BG-3D-69'		ug/kg	TRUE	6.8				Pyrene	PAHs	3.4
EPA 600-R-	BG-3D-69'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-3D-69'	11000	mg/kg	FALSE	5.7	V	Additional		Aluminum	Metals	11000
SM4500-NI	BG-3D-69'	4.1	mg/kg	FALSE	5.7	J, P1	J-(EPA) - Es	Nitrogen, A	Ammonia	General Chemistry	4.1
EPA 6010B	BG-3D-69'		mg/kg	TRUE	1.1	J6	The sample		Antimony	Metals	0.55
EPA 6010B	BG-3D-69'	0.59	mg/kg	FALSE	0.11				Beryllium	Metals	0.59
EPA 8270C	BG-3D-69'		ug/kg	TRUE	380			1,1-Biphen	Biphenyl	SVOC	190
EPA 6010B	BG-3D-69'	14	mg/kg	FALSE	11				Boron	Metals	14
EPA 6010B	BG-3D-69'	55000	mg/kg	FALSE	28	V	Additional		Calcium	Metals	55000
EPA 9056	BG-3D-69'	59	mg/kg	FALSE	11				Chloride	General Chemistry	59
EPA 6010B	BG-3D-69'	15	mg/kg	FALSE	0.57			Total chror	Chromium,	Metals	15
EPA 7199	BG-3D-69'		mg/kg	TRUE	2.3				Chromium,	Metals	1.15
EPA 6010B	BG-3D-69'	4.8	mg/kg	FALSE	0.57				Cobalt	Metals	4.8
EPA 6010B	BG-3D-69'	11	mg/kg	FALSE	1.1				Copper	Metals	11
EPA 300.0	BG-3D-69'	9.4	mg/kg	FALSE	1.1				Fluoride	General Chemistry	9.4
EPA 6010B	BG-3D-69'	14000	mg/kg	FALSE	28	V	Additional		Iron	Metals	14000
EPA 6010B	BG-3D-69'	4300	mg/kg	FALSE	5.7	V	Additional		Magnesiun	Metals	4300
EPA 6010B	BG-3D-69'	170	mg/kg	FALSE	0.57				Manganese	Metals	170
EPA 6010B	BG-3D-69'	2	mg/kg	FALSE	1.4				Molybdenu	Metals	2
EPA 6010B	BG-3D-69'	14	mg/kg	FALSE	5.7				Nickel	Metals	14
EPA 300.0	BG-3D-69'		mg/kg	TRUE	1.1			Nitrogen, N	Nitrate	General Chemistry	0.55
EPA 6010B	BG-3D-69'	2800	mg/kg	FALSE	28	V	Additional		Potassium	Metals	2800
EPA 6010B	BG-3D-69'	940	mg/kg	FALSE	120				Silica	Metals	940
EPA 6010B	BG-3D-69'	300	mg/kg	FALSE	28				Sodium	Metals	300
EPA 9056	BG-3D-69'	110	mg/kg	FALSE	57				Sulfate	General Chemistry	110
EPA 6010B	BG-3D-69'		mg/kg	TRUE	5.7	O	(ESC) Samp		Thallium	Metals	2.85
EPA 9056	BG-3D-69'	0.38	mg/kg	FALSE	1.1	J, P1	J-(EPA) - Es		Phosphoro	General Chemistry	0.38
EPA 6010B	BG-3D-69'	18	mg/kg	FALSE	0.57				Vanadium	Metals	18
EPA 6010B	BG-3D-69'	39	mg/kg	FALSE	1.7				Zinc	Metals	39
EPA 8270C	BG-3D-69'		ug/kg	TRUE	6.8				Benzo(b)flu	PAHs	3.4
EPA 8270C	BG-3D-69'		ug/kg	TRUE	6.8				Benzo(k)flu	PAHs	3.4
EPA 6010B	BG-3D-69'	63	mg/kg	FALSE	2.8	J5, J3	J5-The sam		Titanium	Metals	63
EPA 8270C	BG-3D-69'		ug/kg	TRUE	6.8				Naphthaler	PAHs	3.4
EPA 2540G	BG-3D-69'	87.5	%	FALSE	0.1				Total Solids	General Chemistry	87.5
EPA 6010B	BG-3D-95'	13	mg/kg	FALSE	1.1				Arsenic	Metals	13
EPA 6010B	BG-3D-95'	55	mg/kg	FALSE	0.29				Barium	Metals	55
EPA 6010B	BG-3D-95'		mg/kg	TRUE	0.29				Cadmium	Metals	0.145
EPA 6010B	BG-3D-95'	3.1	mg/kg	FALSE	0.29				Lead	Metals	3.1
EPA 7471A	BG-3D-95'	0.0017	mg/kg	FALSE	0.023	J	(EPA) - Esti		Mercury	Metals	0.0017
EPA 6010B	BG-3D-95'		mg/kg	TRUE	2.3	O	(ESC) Samp		Selenium	Metals	1.15
EPA 6010B	BG-3D-95'		mg/kg	TRUE	0.57				Silver	Metals	0.285
EPA 9045C	BG-3D-95'	8.5	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.5
EPA 8270C	BG-3D-95'		ug/kg	TRUE	6.9				Acenaphth	PAHs	3.45
EPA 8270C	BG-3D-95'		ug/kg	TRUE	6.9				Anthracene	PAHs	3.45
EPA 8270C	BG-3D-95'		ug/kg	TRUE	6.9				Benzo(a)an	PAHs	3.45
EPA 8270C	BG-3D-95'		ug/kg	TRUE	6.9				Benzo(g,h,i	PAHs	3.45
EPA 8270C	BG-3D-95'		ug/kg	TRUE	6.9				Benzo(a)py	PAHs	3.45
EPA 8270C	BG-3D-95'		ug/kg	TRUE	380				Bis(2-ethyl	SVOC	190
EPA 8270C	BG-3D-95'		ug/kg	TRUE	6.9				Chrysene	PAHs	3.45
EPA 8270C	BG-3D-95'		ug/kg	TRUE	6.9				Fluoranthe	PAHs	3.45
EPA 8270C	BG-3D-95'		ug/kg	TRUE	6.9				Indeno(1,2	PAHs	3.45
EPA 8270C	BG-3D-95'		ug/kg	TRUE	6.9				Phenanthre	PAHs	3.45
EPA 8270C	BG-3D-95'		ug/kg	TRUE	6.9				Pyrene	PAHs	3.45
EPA 600-R-	BG-3D-95'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-3D-95'	2900	mg/kg	FALSE	5.7				Aluminum	Metals	2900
SM4500-NI	BG-3D-95'	2.8	mg/kg	FALSE	5.7	J	(EPA) - Esti	Nitrogen, A	Ammonia	General Chemistry	2.8
EPA 6010B	BG-3D-95'		mg/kg	TRUE	1.1				Antimony	Metals	0.55
EPA 6010B	BG-3D-95'		mg/kg	TRUE	0.11				Beryllium	Metals	0.055
EPA 8270C	BG-3D-95'		ug/kg	TRUE	380			1,1-Biphen	Biphenyl	SVOC	190
EPA 6010B	BG-3D-95'	2.4	mg/kg	FALSE	11	J	(EPA) - Esti		Boron	Metals	2.4
EPA 6010B	BG-3D-95'	29000	mg/kg	FALSE	29				Calcium	Metals	29000
EPA 9056	BG-3D-95'	60	mg/kg	FALSE	11				Chloride	General Chemistry	60
EPA 6010B	BG-3D-95'	4.6	mg/kg	FALSE	0.57			Total chror	Chromium,	Metals	4.6
EPA 7199	BG-3D-95'		mg/kg	TRUE	2.3				Chromium,	Metals	1.15
EPA 6010B	BG-3D-95'	1.4	mg/kg	FALSE	0.57				Cobalt	Metals	1.4
EPA 6010B	BG-3D-95'	2.5	mg/kg	FALSE	1.1				Copper	Metals	2.5
EPA 300.0	BG-3D-95'	5.4	mg/kg	FALSE	1.1				Fluoride	General Chemistry	5.4
EPA 6010B	BG-3D-95'	4000	mg/kg	FALSE	5.7				Iron	Metals	4000
EPA 6010B	BG-3D-95'	950	mg/kg	FALSE	5.7				Magnesiun	Metals	950
EPA 6010B	BG-3D-95'	69	mg/kg	FALSE	0.57				Manganese	Metals	69
EPA 6010B	BG-3D-95'	0.48	mg/kg	FALSE	0.29				Molybdenu	Metals	0.48
EPA 6010B	BG-3D-95'	2.6	mg/kg	FALSE	1.1				Nickel	Metals	2.6
EPA 300.0	BG-3D-95'	0.47	mg/kg	FALSE	1.1	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.47
EPA 6010B	BG-3D-95'	770	mg/kg	FALSE	29				Potassium	Metals	770
EPA 6010B	BG-3D-95'	720	mg/kg	FALSE	120				Silica	Metals	720
EPA 6010B	BG-3D-95'	150	mg/kg	FALSE	29				Sodium	Metals	150
EPA 9056	BG-3D-95'	95	mg/kg	FALSE	57				Sulfate	General Chemistry	95
EPA 6010B	BG-3D-95'		mg/kg	TRUE	2.3	O	(ESC) Samp		Thallium	Metals	1.15
EPA 9056	BG-3D-95'		mg/kg	TRUE	1.1	B4	(ESC) - The		Phosphoro	General Chemistry	0.55
EPA 6010B	BG-3D-95'	6.6	mg/kg	FALSE	0.57				Vanadium	Metals	6.6
EPA 6010B	BG-3D-95'	9.6	mg/kg	FALSE	1.7				Zinc	Metals	9.6
EPA 8270C	BG-3D-95'		ug/kg	TRUE	6.9				Benzo(b)flu	PAHs	3.45
EPA 8270C	BG-3D-95'		ug/kg	TRUE	6.9				Benzo(k)flu	PAHs	3.45
EPA 6010B	BG-3D-95'	44	mg/kg	FALSE	0.57				Titanium	Metals	44
EPA 8270C	BG-3D-95'		ug/kg	TRUE	6.9				Naphthaler	PAHs	3.45
EPA 2540G	BG-3D-95'	87.1	%	FALSE	0.1				Total Solids	General Chemistry	87.1
EPA 6010B	BG-3D-105	35	mg/kg	FALSE	1.2				Arsenic	Metals	35
EPA 6010B	BG-3D-105	120	mg/kg	FALSE	0.3				Barium	Metals	120
EPA 6010B	BG-3D-105'		mg/kg	TRUE	0.3				Cadmium	Metals	0.15
EPA 6010B	BG-3D-105	5.4	mg/kg	FALSE	0.3				Lead	Metals	5.4
EPA 7471A	BG-3D-105	0.0032	mg/kg	FALSE	0.024	J	(EPA) - Esti		Mercury	Metals	0.0032
EPA 6010B	BG-3D-105'		mg/kg	TRUE	1.2				Selenium	Metals	0.6
EPA 6010B	BG-3D-105'		mg/kg	TRUE	0.59				Silver	Metals	0.295
EPA 9045C	BG-3D-105	8.6	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.6
EPA 8270C	BG-3D-105'		ug/kg	TRUE	7.1				Acenaphth	PAHs	3.55
EPA 8270C	BG-3D-105'		ug/kg	TRUE	7.1				Anthracene	PAHs	3.55
EPA 8270C	BG-3D-105'		ug/kg	TRUE	7.1				Benzo(a)an	PAHs	3.55
EPA 8270C	BG-3D-105'		ug/kg	TRUE	7.1				Benzo(g,h,i	PAHs	3.55
EPA 8270C	BG-3D-105'		ug/kg	TRUE	7.1				Benzo(a)py	PAHs	3.55
EPA 8270C	BG-3D-105'		ug/kg	TRUE	390				Bis(2-ethyl	SVOC	195
EPA 8270C	BG-3D-105'		ug/kg	TRUE	7.1				Chrysene	PAHs	3.55
EPA 8270C	BG-3D-105'		ug/kg	TRUE	7.1				Fluoranthe	PAHs	3.55
EPA 8270C	BG-3D-105'		ug/kg	TRUE	7.1				Indeno(1,2	PAHs	3.55
EPA 8270C	BG-3D-105'		ug/kg	TRUE	7.1				Phenanthre	PAHs	3.55
EPA 8270C	BG-3D-105'		ug/kg	TRUE	7.1				Pyrene	PAHs	3.55
EPA 600-R-	BG-3D-105'			TRUE	1				Asbestos	Asbestos	0.5

Lab	Backgroun	2/28/2012	BG-3D	Aluminum	105
Lab	Backgroun	2/28/2012	BG-3D	Ammonia	105
Lab	Backgroun	2/28/2012	BG-3D	Antimony	105
Lab	Backgroun	2/28/2012	BG-3D	Beryllium	105
Lab	Backgroun	2/28/2012	BG-3D	Biphenyl	105
Lab	Backgroun	2/28/2012	BG-3D	Boron	105
Lab	Backgroun	2/28/2012	BG-3D	Calcium	105
Lab	Backgroun	2/28/2012	BG-3D	Chloride	105
Lab	Backgroun	2/28/2012	BG-3D	Chromium (total)	105
Lab	Backgroun	2/28/2012	BG-3D	Chromium (hexavalent)	105
Lab	Backgroun	2/28/2012	BG-3D	Cobalt	105
Lab	Backgroun	2/28/2012	BG-3D	Copper	105
Lab	Backgroun	2/28/2012	BG-3D	Fluoride	105
Lab	Backgroun	2/28/2012	BG-3D	Iron	105
Lab	Backgroun	2/28/2012	BG-3D	Magnesium	105
Lab	Backgroun	2/28/2012	BG-3D	Manganese	105
Lab	Backgroun	2/28/2012	BG-3D	Molybdenum	105
Lab	Backgroun	2/28/2012	BG-3D	Nickel	105
Lab	Backgroun	2/28/2012	BG-3D	Nitrate	105
Lab	Backgroun	2/28/2012	BG-3D	Potassium	105
Lab	Backgroun	2/28/2012	BG-3D	Silica	105
Lab	Backgroun	2/28/2012	BG-3D	Sodium	105
Lab	Backgroun	2/28/2012	BG-3D	Sulfate	105
Lab	Backgroun	2/28/2012	BG-3D	Thallium	105
Lab	Backgroun	2/28/2012	BG-3D	Phosphate as P	105
Lab	Backgroun	2/28/2012	BG-3D	Vanadium	105
Lab	Backgroun	2/28/2012	BG-3D	Zinc	105
Lab	Backgroun	2/28/2012	BG-3D	Benzo(b)fluoranthene	105
Lab	Backgroun	2/28/2012	BG-3D	Benzo(k)fluoranthene	105
Lab	Backgroun	2/28/2012	BG-3D	Titanium	105
Lab	Backgroun	2/28/2012	BG-3D	Naphthalene (PAH)	105
Lab	Backgroun	2/28/2012	BG-3D	Total Solids	105
Lab	Backgroun	2/28/2012	BG-3D	Arsenic	131
Lab	Backgroun	2/28/2012	BG-3D	Barium	131
Lab	Backgroun	2/28/2012	BG-3D	Cadmium	131
Lab	Backgroun	2/28/2012	BG-3D	Lead	131
Lab	Backgroun	2/28/2012	BG-3D	Mercury	131
Lab	Backgroun	2/28/2012	BG-3D	Selenium	131
Lab	Backgroun	2/28/2012	BG-3D	Silver	131
Lab	Backgroun	2/28/2012	BG-3D	pH	131
Lab	Backgroun	2/28/2012	BG-3D	Acenaphthene	131
Lab	Backgroun	2/28/2012	BG-3D	Anthracene	131
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)anthracene	131
Lab	Backgroun	2/28/2012	BG-3D	Benzo(g,h,i)perylene	131
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)pyrene	131
Lab	Backgroun	2/28/2012	BG-3D	Bis(2-ethylhexyl)phthalate	131
Lab	Backgroun	2/28/2012	BG-3D	Chrysene	131
Lab	Backgroun	2/28/2012	BG-3D	Fluoranthene	131
Lab	Backgroun	2/28/2012	BG-3D	Indeno(1,2,3-cd)pyrene	131
Lab	Backgroun	2/28/2012	BG-3D	Phenanthrene	131
Lab	Backgroun	2/28/2012	BG-3D	Pyrene	131
Lab	Backgroun	2/28/2012	BG-3D	Asbestos	131
Lab	Backgroun	2/28/2012	BG-3D	Aluminum	131
Lab	Backgroun	2/28/2012	BG-3D	Ammonia	131
Lab	Backgroun	2/28/2012	BG-3D	Antimony	131
Lab	Backgroun	2/28/2012	BG-3D	Beryllium	131
Lab	Backgroun	2/28/2012	BG-3D	Biphenyl	131
Lab	Backgroun	2/28/2012	BG-3D	Boron	131
Lab	Backgroun	2/28/2012	BG-3D	Calcium	131
Lab	Backgroun	2/28/2012	BG-3D	Chloride	131
Lab	Backgroun	2/28/2012	BG-3D	Chromium (total)	131
Lab	Backgroun	2/28/2012	BG-3D	Chromium (hexavalent)	131
Lab	Backgroun	2/28/2012	BG-3D	Cobalt	131
Lab	Backgroun	2/28/2012	BG-3D	Copper	131
Lab	Backgroun	2/28/2012	BG-3D	Fluoride	131
Lab	Backgroun	2/28/2012	BG-3D	Iron	131
Lab	Backgroun	2/28/2012	BG-3D	Magnesium	131
Lab	Backgroun	2/28/2012	BG-3D	Manganese	131
Lab	Backgroun	2/28/2012	BG-3D	Molybdenum	131
Lab	Backgroun	2/28/2012	BG-3D	Nickel	131
Lab	Backgroun	2/28/2012	BG-3D	Nitrate	131
Lab	Backgroun	2/28/2012	BG-3D	Potassium	131
Lab	Backgroun	2/28/2012	BG-3D	Silica	131
Lab	Backgroun	2/28/2012	BG-3D	Sodium	131
Lab	Backgroun	2/28/2012	BG-3D	Sulfate	131
Lab	Backgroun	2/28/2012	BG-3D	Thallium	131
Lab	Backgroun	2/28/2012	BG-3D	Phosphate as P	131
Lab	Backgroun	2/28/2012	BG-3D	Vanadium	131
Lab	Backgroun	2/28/2012	BG-3D	Zinc	131
Lab	Backgroun	2/28/2012	BG-3D	Benzo(b)fluoranthene	131
Lab	Backgroun	2/28/2012	BG-3D	Benzo(k)fluoranthene	131
Lab	Backgroun	2/28/2012	BG-3D	Titanium	131
Lab	Backgroun	2/28/2012	BG-3D	Naphthalene (PAH)	131
Lab	Backgroun	2/28/2012	BG-3D	Total Solids	131
Lab	Backgroun	2/28/2012	BG-3D	Arsenic	136
Lab	Backgroun	2/28/2012	BG-3D	Barium	136
Lab	Backgroun	2/28/2012	BG-3D	Cadmium	136
Lab	Backgroun	2/28/2012	BG-3D	Lead	136
Lab	Backgroun	2/28/2012	BG-3D	Mercury	136
Lab	Backgroun	2/28/2012	BG-3D	Selenium	136
Lab	Backgroun	2/28/2012	BG-3D	Silver	136
Lab	Backgroun	2/28/2012	BG-3D	pH	136
Lab	Backgroun	2/28/2012	BG-3D	Acenaphthene	136
Lab	Backgroun	2/28/2012	BG-3D	Anthracene	136
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)anthracene	136
Lab	Backgroun	2/28/2012	BG-3D	Benzo(g,h,i)perylene	136
Lab	Backgroun	2/28/2012	BG-3D	Benzo(a)pyrene	136
Lab	Backgroun	2/28/2012	BG-3D	Bis(2-ethylhexyl)phthalate	136
Lab	Backgroun	2/28/2012	BG-3D	Chrysene	136
Lab	Backgroun	2/28/2012	BG-3D	Fluoranthene	136
Lab	Backgroun	2/28/2012	BG-3D	Indeno(1,2,3-cd)pyrene	136
Lab	Backgroun	2/28/2012	BG-3D	Phenanthrene	136
Lab	Backgroun	2/28/2012	BG-3D	Pyrene	136
Lab	Backgroun	2/28/2012	BG-3D	Asbestos	136
Lab	Backgroun	2/28/2012	BG-3D	Aluminum	136
Lab	Backgroun	2/28/2012	BG-3D	Ammonia	136
Lab	Backgroun	2/28/2012	BG-3D	Antimony	136
Lab	Backgroun	2/28/2012	BG-3D	Beryllium	136
Lab	Backgroun	2/28/2012	BG-3D	Biphenyl	136
Lab	Backgroun	2/28/2012	BG-3D	Boron	136
Lab	Backgroun	2/28/2012	BG-3D	Calcium	136
Lab	Backgroun	2/28/2012	BG-3D	Chloride	136
Lab	Backgroun	2/28/2012	BG-3D	Chromium (total)	136
Lab	Backgroun	2/28/2012	BG-3D	Chromium (hexavalent)	136
Lab	Backgroun	2/28/2012	BG-3D	Cobalt	136
Lab	Backgroun	2/28/2012	BG-3D	Copper	136
Lab	Backgroun	2/28/2012	BG-3D	Fluoride	136
Lab	Backgroun	2/28/2012	BG-3D	Iron	136
Lab	Backgroun	2/28/2012	BG-3D	Magnesium	136
Lab	Backgroun	2/28/2012	BG-3D	Manganese	136
Lab	Backgroun	2/28/2012	BG-3D	Molybdenum	136
Lab	Backgroun	2/28/2012	BG-3D	Nickel	136
Lab	Backgroun	2/28/2012	BG-3D	Nitrate	136
Lab	Backgroun	2/28/2012	BG-3D	Potassium	136
Lab	Backgroun	2/28/2012	BG-3D	Silica	136
Lab	Backgroun	2/28/2012	BG-3D	Sodium	136
Lab	Backgroun	2/28/2012	BG-3D	Sulfate	136
Lab	Backgroun	2/28/2012	BG-3D	Thallium	136
Lab	Backgroun	2/28/2012	BG-3D	Phosphate as P	136
Lab	Backgroun	2/28/2012	BG-3D	Vanadium	136
Lab	Backgroun	2/28/2012	BG-3D	Zinc	136
Lab	Backgroun	2/28/2012	BG-3D	Benzo(b)fluoranthene	136

EPA 6010B	BG-3D-105	9600	mg/kg	FALSE	5.9				Aluminum	Metals	9600
SM4500-NI	BG-3D-105	4.8	mg/kg	FALSE	5.9	J	(EPA) - Esti	Nitrogen, A	Ammonia	General Chemistry	4.8
EPA 6010B	BG-3D-105'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
EPA 6010B	BG-3D-105	0.2	mg/kg	FALSE	0.12				Beryllium	Metals	0.2
EPA 8270C	BG-3D-105'		ug/kg	TRUE	390			1,1-Biphen	Biphenyl	SVOC	195
EPA 6010B	BG-3D-105	6.8	mg/kg	FALSE	12	J	(EPA) - Esti		Boron	Metals	6.8
EPA 6010B	BG-3D-105	32000	mg/kg	FALSE	30				Calcium	Metals	32000
EPA 9056	BG-3D-105	66	mg/kg	FALSE	12				Chloride	General Chemistry	66
EPA 6010B	BG-3D-105	12	mg/kg	FALSE	0.59			Total chror	Chromium,	Metals	12
EPA 7199	BG-3D-105'		mg/kg	TRUE	2.4				Chromium,	Metals	1.2
EPA 6010B	BG-3D-105	4.1	mg/kg	FALSE	0.59				Cobalt	Metals	4.1
EPA 6010B	BG-3D-105	7.3	mg/kg	FALSE	1.2				Copper	Metals	7.3
EPA 300.0	BG-3D-105	10	mg/kg	FALSE	1.2				Fluoride	General Chemistry	10
EPA 6010B	BG-3D-105	11000	mg/kg	FALSE	5.9				Iron	Metals	11000
EPA 6010B	BG-3D-105	3100	mg/kg	FALSE	5.9				Magnesiun	Metals	3100
EPA 6010B	BG-3D-105	110	mg/kg	FALSE	0.59				Manganese	Metals	110
EPA 6010B	BG-3D-105	0.47	mg/kg	FALSE	0.3				Molybdenu	Metals	0.47
EPA 6010B	BG-3D-105	8.7	mg/kg	FALSE	1.2				Nickel	Metals	8.7
EPA 300.0	BG-3D-105	0.31	mg/kg	FALSE	1.2	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.31
EPA 6010B	BG-3D-105	2400	mg/kg	FALSE	30				Potassium	Metals	2400
EPA 6010B	BG-3D-105	840	mg/kg	FALSE	120				Silica	Metals	840
EPA 6010B	BG-3D-105	280	mg/kg	FALSE	30				Sodium	Metals	280
EPA 9056	BG-3D-105	110	mg/kg	FALSE	59				Sulfate	General Chemistry	110
EPA 6010B	BG-3D-105'		mg/kg	TRUE	2.4	O	(ESC) Samp		Thallium	Metals	1.2
EPA 9056	BG-3D-105'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-3D-105	18	mg/kg	FALSE	0.59				Vanadium	Metals	18
EPA 6010B	BG-3D-105	30	mg/kg	FALSE	1.8				Zinc	Metals	30
EPA 8270C	BG-3D-105'		ug/kg	TRUE	7.1				Benzo(b)flu	PAHs	3.55
EPA 8270C	BG-3D-105'		ug/kg	TRUE	7.1				Benzo(k)flu	PAHs	3.55
EPA 6010B	BG-3D-105	85	mg/kg	FALSE	0.59				Titanium	Metals	85
EPA 8270C	BG-3D-105'		ug/kg	TRUE	7.1				Naphthaler	PAHs	3.55
EPA 2540G	BG-3D-105	84.7	%	FALSE	0.1				Total Solids	General Chemistry	84.7
EPA 6010B	BG-3D-131	9.1	mg/kg	FALSE	11	J	(EPA) - Esti		Arsenic	Metals	9.1
EPA 6010B	BG-3D-131	97	mg/kg	FALSE	0.28				Barium	Metals	97
EPA 6010B	BG-3D-131	0.23	mg/kg	FALSE	0.28	J	(EPA) - Esti		Cadmium	Metals	0.23
EPA 6010B	BG-3D-131	5.3	mg/kg	FALSE	2.8				Lead	Metals	5.3
EPA 7471A	BG-3D-131	0.001	mg/kg	FALSE	0.022	J	(EPA) - Esti		Mercury	Metals	0.001
EPA 6010B	BG-3D-131'		mg/kg	TRUE	11	O	(ESC) Samp		Selenium	Metals	5.5
EPA 6010B	BG-3D-131'		mg/kg	TRUE	0.55				Silver	Metals	0.275
EPA 9045C	BG-3D-131	8.8	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.8
EPA 8270C	BG-3D-131'		ug/kg	TRUE	6.6				Acenaphth	PAHs	3.3
EPA 8270C	BG-3D-131'		ug/kg	TRUE	6.6				Anthracene	PAHs	3.3
EPA 8270C	BG-3D-131'		ug/kg	TRUE	6.6				Benzo(a)an	PAHs	3.3
EPA 8270C	BG-3D-131'		ug/kg	TRUE	6.6				Benzo(g,h,i	PAHs	3.3
EPA 8270C	BG-3D-131'		ug/kg	TRUE	6.6				Benzo(a)py	PAHs	3.3
EPA 8270C	BG-3D-131'		ug/kg	TRUE	370				Bis(2-ethyl	SVOC	185
EPA 8270C	BG-3D-131'		ug/kg	TRUE	6.6				Chrysene	PAHs	3.3
EPA 8270C	BG-3D-131'		ug/kg	TRUE	6.6				Fluoranthe	PAHs	3.3
EPA 8270C	BG-3D-131'		ug/kg	TRUE	6.6				Indeno(1,2	PAHs	3.3
EPA 8270C	BG-3D-131'		ug/kg	TRUE	6.6				Phenanthre	PAHs	3.3
EPA 8270C	BG-3D-131'		ug/kg	TRUE	6.6				Pyrene	PAHs	3.3
EPA 600-R-	BG-3D-131'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-3D-131	2300	mg/kg	FALSE	5.5				Aluminum	Metals	2300
SM4500-NI	BG-3D-131	2.8	mg/kg	FALSE	5.5	J	(EPA) - Esti	Nitrogen, A	Ammonia	General Chemistry	2.8
EPA 6010B	BG-3D-131'		mg/kg	TRUE	1.1				Antimony	Metals	0.55
EPA 6010B	BG-3D-131	0.046	mg/kg	FALSE	0.11	J	(EPA) - Esti		Beryllium	Metals	0.046
EPA 8270C	BG-3D-131'		ug/kg	TRUE	370			1,1-Biphen	Biphenyl	SVOC	185
EPA 6010B	BG-3D-131	3.4	mg/kg	FALSE	11	J	(EPA) - Esti		Boron	Metals	3.4
EPA 6010B	BG-3D-131	120000	mg/kg	FALSE	280				Calcium	Metals	120000
EPA 9056	BG-3D-131	55	mg/kg	FALSE	11				Chloride	General Chemistry	55
EPA 6010B	BG-3D-131	2.6	mg/kg	FALSE	0.55			Total chror	Chromium,	Metals	2.6
EPA 7199	BG-3D-131'		mg/kg	TRUE	2.2				Chromium,	Metals	1.1
EPA 6010B	BG-3D-131	1	mg/kg	FALSE	0.55				Cobalt	Metals	1
EPA 6010B	BG-3D-131	2.2	mg/kg	FALSE	1.1				Copper	Metals	2.2
EPA 300.0	BG-3D-131	3.8	mg/kg	FALSE	1.1				Fluoride	General Chemistry	3.8
EPA 6010B	BG-3D-131	3100	mg/kg	FALSE	5.5				Iron	Metals	3100
EPA 6010B	BG-3D-131	970	mg/kg	FALSE	5.5				Magnesiun	Metals	970
EPA 6010B	BG-3D-131	500	mg/kg	FALSE	0.55				Manganese	Metals	500
EPA 6010B	BG-3D-131	2.3	mg/kg	FALSE	2.8	J	(EPA) - Esti		Molybdenu	Metals	2.3
EPA 6010B	BG-3D-131'		mg/kg	TRUE	11	O	(ESC) Samp		Nickel	Metals	5.5
EPA 300.0	BG-3D-131	0.25	mg/kg	FALSE	1.1	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.25
EPA 6010B	BG-3D-131	740	mg/kg	FALSE	28				Potassium	Metals	740
EPA 6010B	BG-3D-131	520	mg/kg	FALSE	100				Silica	Metals	520
EPA 6010B	BG-3D-131	77	mg/kg	FALSE	28				Sodium	Metals	77
EPA 9056	BG-3D-131	63	mg/kg	FALSE	55				Sulfate	General Chemistry	63
EPA 6010B	BG-3D-131'		mg/kg	TRUE	11	O	(ESC) Samp		Thallium	Metals	5.5
EPA 9056	BG-3D-131'		mg/kg	TRUE	1.1	B4	(ESC) - The		Phosphoro	General Chemistry	0.55
EPA 6010B	BG-3D-131	5.1	mg/kg	FALSE	0.55				Vanadium	Metals	5.1
EPA 6010B	BG-3D-131	7.7	mg/kg	FALSE	1.6				Zinc	Metals	7.7
EPA 8270C	BG-3D-131'		ug/kg	TRUE	6.6				Benzo(b)flu	PAHs	3.3
EPA 8270C	BG-3D-131'		ug/kg	TRUE	6.6				Benzo(k)flu	PAHs	3.3
EPA 6010B	BG-3D-131	23	mg/kg	FALSE	0.55				Titanium	Metals	23
EPA 8270C	BG-3D-131'		ug/kg	TRUE	6.6				Naphthaler	PAHs	3.3
EPA 2540G	BG-3D-131	90.4	%	FALSE	0.1				Total Solids	General Chemistry	90.4
EPA 6010B	BG-3D-136	66	mg/kg	FALSE	1.2	J6	The sample		Arsenic	Metals	66
EPA 6010B	BG-3D-136	33	mg/kg	FALSE	0.3				Barium	Metals	33
EPA 6010B	BG-3D-136'		mg/kg	TRUE	0.3				Cadmium	Metals	0.15
EPA 6010B	BG-3D-136	11	mg/kg	FALSE	0.3				Lead	Metals	11
EPA 7471A	BG-3D-136	0.0048	mg/kg	FALSE	0.024	J	(EPA) - Esti		Mercury	Metals	0.0048
EPA 6010B	BG-3D-136'		mg/kg	TRUE	1.2				Selenium	Metals	0.6
EPA 6010B	BG-3D-136'		mg/kg	TRUE	0.6				Silver	Metals	0.3
EPA 9045C	BG-3D-136	8.8	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.8
EPA 8270C	BG-3D-136'		ug/kg	TRUE	7.2				Acenaphth	PAHs	3.6
EPA 8270C	BG-3D-136'		ug/kg	TRUE	7.2				Anthracene	PAHs	3.6
EPA 8270C	BG-3D-136'		ug/kg	TRUE	7.2				Benzo(a)an	PAHs	3.6
EPA 8270C	BG-3D-136'		ug/kg	TRUE	7.2				Benzo(g,h,i	PAHs	3.6
EPA 8270C	BG-3D-136'		ug/kg	TRUE	7.2				Benzo(a)py	PAHs	3.6
EPA 8270C	BG-3D-136'		ug/kg	TRUE	400				Bis(2-ethyl	SVOC	200
EPA 8270C	BG-3D-136'		ug/kg	TRUE	7.2				Chrysene	PAHs	3.6
EPA 8270C	BG-3D-136'		ug/kg	TRUE	7.2				Fluoranthe	PAHs	3.6
EPA 8270C	BG-3D-136'		ug/kg	TRUE	7.2				Indeno(1,2	PAHs	3.6
EPA 8270C	BG-3D-136'		ug/kg	TRUE	7.2				Phenanthre	PAHs	3.6
EPA 8270C	BG-3D-136'		ug/kg	TRUE	7.2				Pyrene	PAHs	3.6
EPA 600-R-	BG-3D-136'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-3D-136	19000	mg/kg	FALSE	6	V	Additional		Aluminum	Metals	19000
SM4500-NI	BG-3D-136	5	mg/kg	FALSE	6	J	(EPA) - Esti	Nitrogen, A	Ammonia	General Chemistry	5
EPA 6010B	BG-3D-136'		mg/kg	TRUE	1.2	J6	The sample		Antimony	Metals	0.6
EPA 6010B	BG-3D-136	0.58	mg/kg	FALSE	0.12				Beryllium	Metals	0.58
EPA 8270C	BG-3D-136'		ug/kg	TRUE	400			1,1-Biphen	Biphenyl	SVOC	200
EPA 6010B	BG-3D-136	12	mg/kg	FALSE	12				Boron	Metals	12
EPA 6010B	BG-3D-136	48000	mg/kg	FALSE	30	V	Additional		Calcium	Metals	48000
EPA 9056	BG-3D-136	69	mg/kg	FALSE	12				Chloride	General Chemistry	69
EPA 6010B	BG-3D-136	20	mg/kg	FALSE	0.6			Total chror	Chromium,	Metals	20
EPA 7199	BG-3D-136	1	mg/kg	FALSE	2.4	J, P1	J-(EPA) - Es		Chromium,	Metals	1
EPA 6010B	BG-3D-136	7.9	mg/kg	FALSE	0.6				Cobalt	Metals	7.9
EPA 6010B	BG-3D-136	17	mg/kg	FALSE	1.2				Copper	Metals	17
EPA 300.0	BG-3D-136	16	mg/kg	FALSE	1.2				Fluoride	General Chemistry	16
EPA 6010B	BG-3D-136	19000	mg/kg	FALSE	6	V	Additional		Iron	Metals	19000
EPA 6010B	BG-3D-136	6300	mg/kg	FALSE	6	V	Additional		Magnesiun	Metals	6300
EPA 6010B	BG-3D-136	180	mg/kg	FALSE	0.6	J6	The sample		Manganese	Metals	180
EPA 6010B	BG-3D-136	0.4	mg/kg	FALSE	0.3				Molybdenu	Metals	0.4
EPA 6010B	BG-3D-136	19	mg/kg	FALSE	1.2				Nickel	Metals	19
EPA 300.0	BG-3D-136'		mg/kg	TRUE	1.2			Nitrogen, N	Nitrate	General Chemistry	0.6
EPA 6010B	BG-3D-136	4500	mg/kg	FALSE	30	V	Additional		Potassium	Metals	4500
EPA 6010B	BG-3D-136	950	mg/kg	FALSE	120				Silica	Metals	950
EPA 6010B	BG-3D-136	290	mg/kg	FALSE	30				Sodium	Metals	290
EPA 9056	BG-3D-136	95	mg/kg	FALSE	60				Sulfate	General Chemistry	95
EPA 6010B	BG-3D-136'		mg/kg	TRUE	6	O	(ESC) Samp		Thallium	Metals	3
EPA 9056	BG-3D-136'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-3D-136	31	mg/kg	FALSE	0.6				Vanadium	Metals	31
EPA 6010B	BG-3D-136	57	mg/kg	FALSE	1.8				Zinc	Metals	57
EPA 8270C	BG-3D-136'		ug/kg	TRUE	7.2				Benzo(b)flu	PAHs	3.6

Lab	Backgroun	2/28/2012	BG-3D	Benzo(k)fluoranthene	136		EPA 8270C	BG-3D-136'		ug/kg	TRUE	7.2				Benzo(k)flu	PAHs	3.6
Lab	Backgroun	2/28/2012	BG-3D	Titanium	136		EPA 6010B	BG-3D-136	120	mg/kg	FALSE	0.6	J6, J3	J6-The sam		Titanium	Metals	120
Lab	Backgroun	2/28/2012	BG-3D	Naphthalene (PAH)	136		EPA 8270C	BG-3D-136'		ug/kg	TRUE	7.2				Naphthaler	PAHs	3.6
Lab	Backgroun	2/28/2012	BG-3D	Total Solids	136		EPA 2540G	BG-3D-136	83.8	%	FALSE	0.1				Total Solids	General Chemistry	83.8
Lab	Backgroun	2/10/2012	BG-6D	Arsenic	0	2	EPA 6010B	BG-6D-0-2'	9.3	mg/kg	FALSE	5.1				Arsenic	Metals	9.3
Lab	Backgroun	2/10/2012	BG-6D	Barium	0	2	EPA 6010B	BG-6D-0-2'	100	mg/kg	FALSE	0.26				Barium	Metals	100
Lab	Backgroun	2/10/2012	BG-6D	Cadmium	0	2	EPA 6010B	BG-6D-0-2'		mg/kg	TRUE	0.26				Cadmium	Metals	0.13
Lab	Backgroun	2/10/2012	BG-6D	Lead	0	2	EPA 6010B	BG-6D-0-2'	7.7	mg/kg	FALSE	1.3				Lead	Metals	7.7
Lab	Backgroun	2/10/2012	BG-6D	Mercury	0	2	EPA 7471A	BG-6D-0-2'		mg/kg	TRUE	0.02				Mercury	Metals	0.01
Lab	Backgroun	2/10/2012	BG-6D	Selenium	0	2	EPA 6010B	BG-6D-0-2'		mg/kg	TRUE	10	O	(ESC) Samp		Selenium	Metals	5
Lab	Backgroun	2/10/2012	BG-6D	Silver	0	2	EPA 6010B	BG-6D-0-2'		mg/kg	TRUE	0.51				Silver	Metals	0.255
Lab	Backgroun	2/10/2012	BG-6D	pH	0	2	EPA 9045C	BG-6D-0-2'	8.6	su	FALSE					pH	General Chemistry	8.6
Lab	Backgroun	2/10/2012	BG-6D	Acenaphthene	0	2	EPA 8270C	BG-6D-0-2'		ug/kg	TRUE	6.1				Acenaphth	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Anthracene	0	2	EPA 8270C	BG-6D-0-2'		ug/kg	TRUE	6.1				Anthracene	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)anthracene	0	2	EPA 8270C	BG-6D-0-2'		ug/kg	TRUE	6.1				Benzo(a)an	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Benzo(g,h,i)perylene	0	2	EPA 8270C	BG-6D-0-2'		ug/kg	TRUE	6.1				Benzo(g,h,i	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)pyrene	0	2	EPA 8270C	BG-6D-0-2'		ug/kg	TRUE	6.1				Benzo(a)py	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Bis(2-ethylhexyl)phthalate	0	2	EPA 8270C	BG-6D-0-2'		ug/kg	TRUE	340				Bis(2-ethyl	SVOC	170
Lab	Backgroun	2/10/2012	BG-6D	Chrysene	0	2	EPA 8270C	BG-6D-0-2'		ug/kg	TRUE	6.1				Chrysene	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Fluoranthene	0	2	EPA 8270C	BG-6D-0-2'		ug/kg	TRUE	6.1				Fluoranthe	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Indeno(1,2,3-cd)pyrene	0	2	EPA 8270C	BG-6D-0-2'		ug/kg	TRUE	6.1				Indeno(1,2	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Phenanthrene	0	2	EPA 8270C	BG-6D-0-2'		ug/kg	TRUE	6.1				Phenanthre	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Pyrene	0	2	EPA 8270C	BG-6D-0-2'		ug/kg	TRUE	6.1				Pyrene	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Asbestos	0	2	EPA 600-R-	BG-6D-0-2'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	2/10/2012	BG-6D	Aluminum	0	2	EPA 6010B	BG-6D-0-2'	7800	mg/kg	FALSE	5.1				Aluminum	Metals	7800
Lab	Backgroun	2/10/2012	BG-6D	Ammonia	0	2	SM4500-NI	BG-6D-0-2'		mg/kg	TRUE	5.1			Nitrogen, A	Ammonia	General Chemistry	2.55
Lab	Backgroun	2/10/2012	BG-6D	Antimony	0	2	EPA 6010B	BG-6D-0-2'		mg/kg	TRUE	1				Antimony	Metals	0.5
Lab	Backgroun	2/10/2012	BG-6D	Beryllium	0	2	EPA 6010B	BG-6D-0-2'		mg/kg	TRUE	0.51	O	(ESC) Samp		Beryllium	Metals	0.255
Lab	Backgroun	2/10/2012	BG-6D	Biphenyl	0	2	EPA 8270C	BG-6D-0-2'		ug/kg	TRUE	340			1,1-Biphen	Biphenyl	SVOC	170
Lab	Backgroun	2/10/2012	BG-6D	Boron	0	2	EPA 6010B	BG-6D-0-2'	8.8	mg/kg	FALSE	10	J	(EPA) - Esti		Boron	Metals	8.8
Lab	Backgroun	2/10/2012	BG-6D	Calcium	0	2	EPA 6010B	BG-6D-0-2'	96000	mg/kg	FALSE	130				Calcium	Metals	96000
Lab	Backgroun	2/10/2012	BG-6D	Chloride	0	2	EPA 9056	BG-6D-0-2'	190	mg/kg	FALSE	10				Chloride	General Chemistry	190
Lab	Backgroun	2/10/2012	BG-6D	Chromium (total)	0	2	EPA 6010B	BG-6D-0-2'	8.3	mg/kg	FALSE	0.51			Total chror	Chromium,	Metals	8.3
Lab	Backgroun	2/10/2012	BG-6D	Chromium (hexavalent)	0	2	EPA 7199	BG-6D-0-2'		mg/kg	TRUE	2				Chromium,	Metals	1
Lab	Backgroun	2/10/2012	BG-6D	Cobalt	0	2	EPA 6010B	BG-6D-0-2'	3.1	mg/kg	FALSE	0.51				Cobalt	Metals	3.1
Lab	Backgroun	2/10/2012	BG-6D	Copper	0	2	EPA 6010B	BG-6D-0-2'	4.8	mg/kg	FALSE	1				Copper	Metals	4.8
Lab	Backgroun	2/10/2012	BG-6D	Fluoride	0	2	EPA 300.0	BG-6D-0-2'	4.8	mg/kg	FALSE	1				Fluoride	General Chemistry	4.8
Lab	Backgroun	2/10/2012	BG-6D	Iron	0	2	EPA 6010B	BG-6D-0-2'	7300	mg/kg	FALSE	5.1				Iron	Metals	7300
Lab	Backgroun	2/10/2012	BG-6D	Magnesium	0	2	EPA 6010B	BG-6D-0-2'	8500	mg/kg	FALSE	5.1				Magnesiun	Metals	8500
Lab	Backgroun	2/10/2012	BG-6D	Manganese	0	2	EPA 6010B	BG-6D-0-2'	140	mg/kg	FALSE	0.51				Manganese	Metals	140
Lab	Backgroun	2/10/2012	BG-6D	Molybdenum	0	2	EPA 6010B	BG-6D-0-2'	0.7	mg/kg	FALSE	1.3	J	(EPA) - Esti		Molybdenu	Metals	0.7
Lab	Backgroun	2/10/2012	BG-6D	Nickel	0	2	EPA 6010B	BG-6D-0-2'	5.8	mg/kg	FALSE	5.1				Nickel	Metals	5.8
Lab	Backgroun	2/10/2012	BG-6D	Nitrate	0	2	EPA 300.0	BG-6D-0-2'	150	mg/kg	FALSE	5.1			Nitrogen, N	Nitrate	General Chemistry	150
Lab	Backgroun	2/10/2012	BG-6D	Potassium	0	2	EPA 6010B	BG-6D-0-2'	2400	mg/kg	FALSE	26				Potassium	Metals	2400
Lab	Backgroun	2/10/2012	BG-6D	Silica	0	2	EPA 6010B	BG-6D-0-2'	420	mg/kg	FALSE	110				Silica	Metals	420
Lab	Backgroun	2/10/2012	BG-6D	Sodium	0	2	EPA 6010B	BG-6D-0-2'	430	mg/kg	FALSE	26				Sodium	Metals	430
Lab	Backgroun	2/10/2012	BG-6D	Sulfate	0	2	EPA 9056	BG-6D-0-2'	820	mg/kg	FALSE	51				Sulfate	General Chemistry	820
Lab	Backgroun	2/10/2012	BG-6D	Thallium	0	2	EPA 6010B	BG-6D-0-2'		mg/kg	TRUE	5.1	O	(ESC) Samp		Thallium	Metals	2.55
Lab	Backgroun	2/10/2012	BG-6D	Phosphate as P	0	2	EPA 9056	BG-6D-0-2'		mg/kg	TRUE	1	B4	(ESC) - The		Phosphoro	General Chemistry	0.5
Lab	Backgroun	2/10/2012	BG-6D	Vanadium	0	2	EPA 6010B	BG-6D-0-2'	18	mg/kg	FALSE	0.51				Vanadium	Metals	18
Lab	Backgroun	2/10/2012	BG-6D	Zinc	0	2	EPA 6010B	BG-6D-0-2'	18	mg/kg	FALSE	1.5				Zinc	Metals	18
Lab	Backgroun	2/10/2012	BG-6D	Benzo(b)fluoranthene	0	2	EPA 8270C	BG-6D-0-2'		ug/kg	TRUE	6.1				Benzo(b)flu	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Benzo(k)fluoranthene	0	2	EPA 8270C	BG-6D-0-2'		ug/kg	TRUE	6.1				Benzo(k)flu	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Titanium	0	2	EPA 6010B	BG-6D-0-2'	240	mg/kg	FALSE	2.6				Titanium	Metals	240
Lab	Backgroun	2/10/2012	BG-6D	Naphthalene (PAH)	0	2	EPA 8270C	BG-6D-0-2'		ug/kg	TRUE	6.1				Naphthaler	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Total Solids	0	2	EPA 2540G	BG-6D-0-2'	97.6	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	97.6
Lab	Backgroun	2/10/2012	BG-6D	Arsenic	9		EPA 6010B	BG-6D-9'	6.1	mg/kg	FALSE	1				Arsenic	Metals	6.1
Lab	Backgroun	2/10/2012	BG-6D	Barium	9		EPA 6010B	BG-6D-9'	32	mg/kg	FALSE	0.25				Barium	Metals	32
Lab	Backgroun	2/10/2012	BG-6D	Cadmium	9		EPA 6010B	BG-6D-9'	0.052	mg/kg	FALSE	0.25	J	(EPA) - Esti		Cadmium	Metals	0.052
Lab	Backgroun	2/10/2012	BG-6D	Lead	9		EPA 6010B	BG-6D-9'	3.6	mg/kg	FALSE	0.25				Lead	Metals	3.6
Lab	Backgroun	2/10/2012	BG-6D	Mercury	9		EPA 7471A	BG-6D-9'		mg/kg	TRUE	0.02	J	(EPA) - Esti		Mercury	Metals	0.01
Lab	Backgroun	2/10/2012	BG-6D	Selenium	9		EPA 6010B	BG-6D-9'		mg/kg	TRUE	5.1	O	(ESC) Samp		Selenium	Metals	2.55
Lab	Backgroun	2/10/2012	BG-6D	Silver	9		EPA 6010B	BG-6D-9'		mg/kg	TRUE	0.51				Silver	Metals	0.255
Lab	Backgroun	2/10/2012	BG-6D	pH	9		EPA 9045C	BG-6D-9'	9.2	su	FALSE					pH	General Chemistry	9.2
Lab	Backgroun	2/10/2012	BG-6D	Acenaphthene	9		EPA 8270C	BG-6D-9'		ug/kg	TRUE	6.1				Acenaphth	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Anthracene	9		EPA 8270C	BG-6D-9'		ug/kg	TRUE	6.1				Anthracene	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)anthracene	9		EPA 8270C	BG-6D-9'		ug/kg	TRUE	6.1				Benzo(a)an	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Benzo(g,h,i)perylene	9		EPA 8270C	BG-6D-9'		ug/kg	TRUE	6.1				Benzo(g,h,i	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)pyrene	9		EPA 8270C	BG-6D-9'		ug/kg	TRUE	6.1				Benzo(a)py	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Bis(2-ethylhexyl)phthalate	9		EPA 8270C	BG-6D-9'		ug/kg	TRUE	330				Bis(2-ethyl	SVOC	165
Lab	Backgroun	2/10/2012	BG-6D	Chrysene	9		EPA 8270C	BG-6D-9'		ug/kg	TRUE	6.1				Chrysene	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Fluoranthene	9		EPA 8270C	BG-6D-9'		ug/kg	TRUE	6.1				Fluoranthe	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Indeno(1,2,3-cd)pyrene	9		EPA 8270C	BG-6D-9'		ug/kg	TRUE	6.1				Indeno(1,2	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Phenanthrene	9		EPA 8270C	BG-6D-9'		ug/kg	TRUE	6.1				Phenanthre	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Pyrene	9		EPA 8270C	BG-6D-9'		ug/kg	TRUE	6.1				Pyrene	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Asbestos	9		EPA 600-R-	BG-6D-9'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	2/10/2012	BG-6D	Aluminum	9		EPA 6010B	BG-6D-9'	5000	mg/kg	FALSE	5.1				Aluminum	Metals	5000
Lab	Backgroun	2/10/2012	BG-6D	Ammonia	9		SM4500-NI	BG-6D-9'		mg/kg	TRUE	5.1			Nitrogen, A	Ammonia	General Chemistry	2.55
Lab	Backgroun	2/10/2012	BG-6D	Antimony	9		EPA 6010B	BG-6D-9'		mg/kg	TRUE	1				Antimony	Metals	0.5
Lab	Backgroun	2/10/2012	BG-6D	Beryllium	9		EPA 6010B	BG-6D-9'		mg/kg	TRUE	0.51	O	(ESC) Samp		Beryllium	Metals	0.255
Lab	Backgroun	2/10/2012	BG-6D	Biphenyl	9		EPA 8270C	BG-6D-9'		ug/kg	TRUE	330			1,1-Biphen	Biphenyl	SVOC	165
Lab	Backgroun	2/10/2012	BG-6D	Boron	9		EPA 6010B	BG-6D-9'	5.5	mg/kg	FALSE	10	J	(EPA) - Esti		Boron	Metals	5.5
Lab	Backgroun	2/10/2012	BG-6D	Calcium	9		EPA 6010B	BG-6D-9'	38000	mg/kg	FALSE	25				Calcium	Metals	38000
Lab	Backgroun	2/10/2012	BG-6D	Chloride	9		EPA 9056	BG-6D-9'	240	mg/kg	FALSE	10				Chloride	General Chemistry	240
Lab	Backgroun	2/10/2012	BG-6D	Chromium (total)	9		EPA 6010B	BG-6D-9'	6	mg/kg	FALSE	0.51			Total chror	Chromium,	Metals	6
Lab	Backgroun	2/10/2012	BG-6D	Chromium (hexavalent)	9		EPA 7199	BG-6D-9'		mg/kg	TRUE	2				Chromium,	Metals	1
Lab	Backgroun	2/10/2012	BG-6D	Cobalt	9		EPA 6010B	BG-6D-9'	1.8	mg/kg	FALSE	0.51				Cobalt	Metals	1.8
Lab	Backgroun	2/10/2012	BG-6D	Copper	9		EPA 6010B	BG-6D-9'	2.6	mg/kg	FALSE	1				Copper	Metals	2.6
Lab	Backgroun	2/10/2012	BG-6D	Fluoride	9		EPA 300.0	BG-6D-9'	3.3	mg/kg	FALSE	1				Fluoride	General Chemistry	3.3
Lab	Backgroun	2/10/2012	BG-6D	Iron	9		EPA 6010B	BG-6D-9'	6400	mg/kg	FALSE	5.1				Iron	Metals	6400
Lab	Backgroun	2/10/2012	BG-6D	Magnesium	9		EPA 6010B	BG-6D-9'	9900	mg/kg	FALSE	5.1				Magnesiun	Metals	9900
Lab	Backgroun	2/10/2012	BG-6D	Manganese	9		EPA 6010B	BG-6D-9'	140	mg/kg	FALSE	0.51				Manganese	Metals	140
Lab	Backgroun	2/10/2012	BG-6D	Molybdenum	9		EPA 6010B	BG-6D-9'	0.22	mg/kg	FALSE	0.25	J	(EPA) - Esti		Molybdenu	Metals	0.22
Lab	Backgroun	2/10/2012	BG-6D	Nickel	9		EPA 6010B	BG-6D-9'	2.8	mg/kg	FALSE	1				Nickel	Metals	2.8
Lab	Backgroun	2/10/2012	BG-6D	Nitrate	9		EPA 300.0	BG-6D-9'	25	mg/kg	FALSE	1			Nitrogen, N	Nitrate	General Chemistry	25
Lab	Backgroun	2/10/2012	BG-6D	Potassium	9		EPA 6010B	BG-6D-9'	1300	mg/kg	FALSE	25				Potassium	Metals	1300
Lab	Backgroun	2/10/2012	BG-6D	Silica	9		EPA 6010B	BG-6D-9'	390	mg/kg	FALSE	110				Silica	Metals	390
Lab	Backgroun	2/10/2012	BG-6D	Sodium	9		EPA 6010B	BG-6D-9'	400	mg/kg	FALSE	25				Sodium	Metals	400
Lab	Backgroun	2/10/2012	BG-6D	Sulfate	9		EPA 9056	BG-6D-9'	83	mg/kg	FALSE	51				Sulfate	General Chemistry	83
Lab	Backgroun	2/10/2012	BG-6D	Thallium	9		EPA 6010B	BG-6D-9'		mg/kg	TRUE	5.1	O	(ESC) Samp		Thallium	Metals	2.55
Lab	Backgroun	2/10/2012	BG-6D	Phosphate as P	9		EPA 9056	BG-6D-9'		mg/kg	TRUE	1	B4	(ESC) - The		Phosphoro	General Chemistry	0.5
Lab	Backgroun	2/10/2012	BG-6D	Vanadium	9		EPA 6010B	BG-6D-9'	17	mg/kg	FALSE	0.51				Vanadium	Metals	17
Lab	Backgroun	2/10/2012	BG-6D	Zinc	9		EPA 6010B	BG-6D-9'	14	mg/kg	FALSE	1.5				Zinc	Metals	14
Lab	Backgroun	2/10/2012	BG-6D	Benzo(b)fluoranthene	9		EPA 8270C	BG-6D-9'		ug/kg	TRUE	6.1				Benzo(b)flu	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Benzo(k)fluoranthene	9		EPA 8270C	BG-6D-9'		ug/kg	TRUE	6.1				Benzo(k)flu	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Titanium	9		EPA 6010B	BG-6D-9'	180	mg/kg	FALSE	0.51				Titanium	Metals	180
Lab	Backgroun	2/10/2012	BG-6D	Naphthalene (PAH)	9		EPA 8270C	BG-6D-9'		ug/kg	TRUE	6.1				Naphthaler	PAHs	3.05
Lab	Backgroun	2/10/2012	BG-6D	Total Solids	9		EPA 2540G	BG-6D-9'	98.6	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	98.6
Lab	Backgroun	2/10/2012	BG-6D	Arsenic	28		EPA 6010B	BG-6D-28'	16	mg/kg	FALSE	1.2				Arsenic	Metals	16
Lab	Backgroun	2/10/2012	BG-6D	Barium	28		EPA 6010B	BG-6D-28'	41	mg/kg	FALSE	0.29				Barium	Metals	41
Lab	Backgroun	2/10/2012	BG-6D	Cadmium	28		EPA 6010B	BG-6D-28'	0.049	mg/kg	FALSE	0.29	J	(EPA) - Esti		Cadmium	Metals	0.049
Lab	Backgroun	2/10/2012	BG-6D	Lead	28		EPA 6010B	BG-6D-28'	10	mg/kg	FALSE	0.29				Lead	Metals	10
Lab	Backgroun	2/10/2012	BG-6D	Mercury	28		EPA 7471A	BG-6D-28'		mg/kg	TRUE	0.023	J	(EPA) - Esti		Mercury	Metals	0.0115
Lab	Backgroun	2/10/2012	BG-6D	Selenium	28		EPA 6010B	BG-6D-28'		mg/kg	TRUE	5.8	O	(ESC) Samp		Selenium	Metals	2.9
Lab	Backgroun	2/10/2012	BG-6D	Silver	28		EPA 6010B	BG-6D-28'		mg/kg	TRUE	0.58				Silver	Metals	0.29
Lab	Backgroun	2/10/2012	BG-6D	pH	28		EPA 9045C	BG-6D-28'	8.9	su	FALSE					pH	General Chemistry	8.9
Lab	Backgroun	2/10/2012	BG-6D	Acenaphthene	28		EPA 8270C	BG-6D-28'		ug/kg	TRUE	7				Acenaphth	PAHs	3.5
Lab	Backgroun	2/10/2012	BG-6D	Anthracene	28		EPA 8270C	BG-6D-28'		ug/kg	TRUE	7				Anthracene	PAHs	3.5
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)anthracene	28		EPA 8270C	BG-6D-28'		ug/kg	TRUE	7				Benzo(a)an	PAHs	3.5
Lab	Backgroun	2/10/2012	BG-6D	Benzo(g,h,i)perylene	28		EPA 8270C	BG-6D-28'		ug/kg	TRUE	7				Benzo(g,h,i	PAHs	3.5
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)pyrene	28		EPA 8270C	BG-6D-28'		ug/kg	TRUE	7				Benzo(a)py	PAHs	3.5
Lab	Backgroun	2/10/2012	BG-6D	Bis(2-ethylhexyl)phthalate	28		EPA 8270C	BG-6D-28'		ug/kg	TRUE	380				Bis(2-ethyl	SVOC	190
Lab	Backgroun	2/10/2012	BG-6D	Chrysene	28		EPA 8270C	BG-6D-28'		ug/kg	TRUE	7				Chrysene	PAHs	3.5
Lab	Backgroun	2/10/2012	BG-6D	Fluoranthene	28		EPA 8270C	BG-6D-28'		ug/kg	TRUE	7				Fluoranthe	PAHs	3.5
Lab	Backgroun	2/10/2012	BG-6D	Indeno(1,2,3-cd)pyrene	28		EPA 8270C	BG-6D-28'		ug/kg	TRUE	7				Indeno(1,2	PAHs	3.5
Lab	Backgroun	2/10/2012	BG-6D	Phenanthrene	28		EPA 8270C	BG-6D-28'		ug/kg	TRUE	7				Phenanthre	PAHs	3.5
Lab	Backgroun	2/10/2012	BG-6D	Pyrene	28		EPA 8270C	BG-6D-28'		ug/kg	TRUE	7				Pyrene	PAHs	3.5
Lab	Backgroun	2/10/2012	BG-6D	Asbestos	28		EPA 600-R-	BG-6D-28'			TRUE	1				Asbestos	Asbestos	0.5
Lab	Backgroun	2/10/2012	BG-6D	Aluminum	28		EPA 6010B	BG-6D-28'	17000	mg/kg	FALSE	5.8				Aluminum	Metals	17000
Lab	Backgroun	2/10/2012	BG-6D	Ammonia	28		SM4500-NI	BG-6D-28'	17	mg/kg	FALSE	5.8			Nitrogen, A	Ammonia	General Chemistry	17
Lab	Backgroun	2/10/2012	BG-6D	Antimony	28		EPA 6010B	BG-6D-28'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
Lab	Backgroun	2/10/2012	BG-6D	Beryllium	28		EPA 6010B	BG-6D-28'	0.81	mg/kg	FALSE	0.12				Beryllium	Metals	0.81

Lab	Backgroun	2/10/2012	BG-6D	Biphenyl	28
Lab	Backgroun	2/10/2012	BG-6D	Boron	28
Lab	Backgroun	2/10/2012	BG-6D	Calcium	28
Lab	Backgroun	2/10/2012	BG-6D	Chloride	28
Lab	Backgroun	2/10/2012	BG-6D	Chromium (total)	28
Lab	Backgroun	2/10/2012	BG-6D	Chromium (hexavalent)	28
Lab	Backgroun	2/10/2012	BG-6D	Cobalt	28
Lab	Backgroun	2/10/2012	BG-6D	Copper	28
Lab	Backgroun	2/10/2012	BG-6D	Fluoride	28
Lab	Backgroun	2/10/2012	BG-6D	Iron	28
Lab	Backgroun	2/10/2012	BG-6D	Magnesium	28
Lab	Backgroun	2/10/2012	BG-6D	Manganese	28
Lab	Backgroun	2/10/2012	BG-6D	Molybdenum	28
Lab	Backgroun	2/10/2012	BG-6D	Nickel	28
Lab	Backgroun	2/10/2012	BG-6D	Nitrate	28
Lab	Backgroun	2/10/2012	BG-6D	Potassium	28
Lab	Backgroun	2/10/2012	BG-6D	Silica	28
Lab	Backgroun	2/10/2012	BG-6D	Sodium	28
Lab	Backgroun	2/10/2012	BG-6D	Sulfate	28
Lab	Backgroun	2/10/2012	BG-6D	Thallium	28
Lab	Backgroun	2/10/2012	BG-6D	Phosphate as P	28
Lab	Backgroun	2/10/2012	BG-6D	Vanadium	28
Lab	Backgroun	2/10/2012	BG-6D	Zinc	28
Lab	Backgroun	2/10/2012	BG-6D	Benzo(b)fluoranthene	28
Lab	Backgroun	2/10/2012	BG-6D	Benzo(k)fluoranthene	28
Lab	Backgroun	2/10/2012	BG-6D	Titanium	28
Lab	Backgroun	2/10/2012	BG-6D	Naphthalene (PAH)	28
Lab	Backgroun	2/10/2012	BG-6D	Total Solids	28
Lab	Backgroun	2/10/2012	BG-6D	Arsenic	53
Lab	Backgroun	2/10/2012	BG-6D	Barium	53
Lab	Backgroun	2/10/2012	BG-6D	Cadmium	53
Lab	Backgroun	2/10/2012	BG-6D	Lead	53
Lab	Backgroun	2/10/2012	BG-6D	Mercury	53
Lab	Backgroun	2/10/2012	BG-6D	Selenium	53
Lab	Backgroun	2/10/2012	BG-6D	Silver	53
Lab	Backgroun	2/10/2012	BG-6D	pH	53
Lab	Backgroun	2/10/2012	BG-6D	Acenaphthene	53
Lab	Backgroun	2/10/2012	BG-6D	Anthracene	53
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)anthracene	53
Lab	Backgroun	2/10/2012	BG-6D	Benzo(g,h,i)perylene	53
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)pyrene	53
Lab	Backgroun	2/10/2012	BG-6D	Bis(2-ethylhexyl)phthalate	53
Lab	Backgroun	2/10/2012	BG-6D	Chrysene	53
Lab	Backgroun	2/10/2012	BG-6D	Fluoranthene	53
Lab	Backgroun	2/10/2012	BG-6D	Indeno(1,2,3-cd)pyrene	53
Lab	Backgroun	2/10/2012	BG-6D	Phenanthrene	53
Lab	Backgroun	2/10/2012	BG-6D	Pyrene	53
Lab	Backgroun	2/10/2012	BG-6D	Asbestos	53
Lab	Backgroun	2/10/2012	BG-6D	Aluminum	53
Lab	Backgroun	2/10/2012	BG-6D	Ammonia	53
Lab	Backgroun	2/10/2012	BG-6D	Antimony	53
Lab	Backgroun	2/10/2012	BG-6D	Beryllium	53
Lab	Backgroun	2/10/2012	BG-6D	Biphenyl	53
Lab	Backgroun	2/10/2012	BG-6D	Boron	53
Lab	Backgroun	2/10/2012	BG-6D	Calcium	53
Lab	Backgroun	2/10/2012	BG-6D	Chloride	53
Lab	Backgroun	2/10/2012	BG-6D	Chromium (total)	53
Lab	Backgroun	2/10/2012	BG-6D	Chromium (hexavalent)	53
Lab	Backgroun	2/10/2012	BG-6D	Cobalt	53
Lab	Backgroun	2/10/2012	BG-6D	Copper	53
Lab	Backgroun	2/10/2012	BG-6D	Fluoride	53
Lab	Backgroun	2/10/2012	BG-6D	Iron	53
Lab	Backgroun	2/10/2012	BG-6D	Magnesium	53
Lab	Backgroun	2/10/2012	BG-6D	Manganese	53
Lab	Backgroun	2/10/2012	BG-6D	Molybdenum	53
Lab	Backgroun	2/10/2012	BG-6D	Nickel	53
Lab	Backgroun	2/10/2012	BG-6D	Nitrate	53
Lab	Backgroun	2/10/2012	BG-6D	Potassium	53
Lab	Backgroun	2/10/2012	BG-6D	Silica	53
Lab	Backgroun	2/10/2012	BG-6D	Sodium	53
Lab	Backgroun	2/10/2012	BG-6D	Sulfate	53
Lab	Backgroun	2/10/2012	BG-6D	Thallium	53
Lab	Backgroun	2/10/2012	BG-6D	Phosphate as P	53
Lab	Backgroun	2/10/2012	BG-6D	Vanadium	53
Lab	Backgroun	2/10/2012	BG-6D	Zinc	53
Lab	Backgroun	2/10/2012	BG-6D	Benzo(b)fluoranthene	53
Lab	Backgroun	2/10/2012	BG-6D	Benzo(k)fluoranthene	53
Lab	Backgroun	2/10/2012	BG-6D	Titanium	53
Lab	Backgroun	2/10/2012	BG-6D	Naphthalene (PAH)	53
Lab	Backgroun	2/10/2012	BG-6D	Total Solids	53
Lab	Backgroun	2/10/2012	BG-6D	Arsenic	58
Lab	Backgroun	2/10/2012	BG-6D	Barium	58
Lab	Backgroun	2/10/2012	BG-6D	Cadmium	58
Lab	Backgroun	2/10/2012	BG-6D	Lead	58
Lab	Backgroun	2/10/2012	BG-6D	Mercury	58
Lab	Backgroun	2/10/2012	BG-6D	Selenium	58
Lab	Backgroun	2/10/2012	BG-6D	Silver	58
Lab	Backgroun	2/10/2012	BG-6D	pH	58
Lab	Backgroun	2/10/2012	BG-6D	Acenaphthene	58
Lab	Backgroun	2/10/2012	BG-6D	Anthracene	58
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)anthracene	58
Lab	Backgroun	2/10/2012	BG-6D	Benzo(g,h,i)perylene	58
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)pyrene	58
Lab	Backgroun	2/10/2012	BG-6D	Bis(2-ethylhexyl)phthalate	58
Lab	Backgroun	2/10/2012	BG-6D	Chrysene	58
Lab	Backgroun	2/10/2012	BG-6D	Fluoranthene	58
Lab	Backgroun	2/10/2012	BG-6D	Indeno(1,2,3-cd)pyrene	58
Lab	Backgroun	2/10/2012	BG-6D	Phenanthrene	58
Lab	Backgroun	2/10/2012	BG-6D	Pyrene	58
Lab	Backgroun	2/10/2012	BG-6D	Asbestos	58
Lab	Backgroun	2/10/2012	BG-6D	Aluminum	58
Lab	Backgroun	2/10/2012	BG-6D	Ammonia	58
Lab	Backgroun	2/10/2012	BG-6D	Antimony	58
Lab	Backgroun	2/10/2012	BG-6D	Beryllium	58
Lab	Backgroun	2/10/2012	BG-6D	Biphenyl	58
Lab	Backgroun	2/10/2012	BG-6D	Boron	58
Lab	Backgroun	2/10/2012	BG-6D	Calcium	58
Lab	Backgroun	2/10/2012	BG-6D	Chloride	58
Lab	Backgroun	2/10/2012	BG-6D	Chromium (total)	58
Lab	Backgroun	2/10/2012	BG-6D	Chromium (hexavalent)	58
Lab	Backgroun	2/10/2012	BG-6D	Cobalt	58
Lab	Backgroun	2/10/2012	BG-6D	Copper	58
Lab	Backgroun	2/10/2012	BG-6D	Fluoride	58
Lab	Backgroun	2/10/2012	BG-6D	Iron	58
Lab	Backgroun	2/10/2012	BG-6D	Magnesium	58
Lab	Backgroun	2/10/2012	BG-6D	Manganese	58
Lab	Backgroun	2/10/2012	BG-6D	Molybdenum	58
Lab	Backgroun	2/10/2012	BG-6D	Nickel	58
Lab	Backgroun	2/10/2012	BG-6D	Nitrate	58
Lab	Backgroun	2/10/2012	BG-6D	Potassium	58
Lab	Backgroun	2/10/2012	BG-6D	Silica	58
Lab	Backgroun	2/10/2012	BG-6D	Sodium	58
Lab	Backgroun	2/10/2012	BG-6D	Sulfate	58
Lab	Backgroun	2/10/2012	BG-6D	Thallium	58
Lab	Backgroun	2/10/2012	BG-6D	Phosphate as P	58
Lab	Backgroun	2/10/2012	BG-6D	Vanadium	58
Lab	Backgroun	2/10/2012	BG-6D	Zinc	58
Lab	Backgroun	2/10/2012	BG-6D	Benzo(b)fluoranthene	58
Lab	Backgroun	2/10/2012	BG-6D	Benzo(k)fluoranthene	58
Lab	Backgroun	2/10/2012	BG-6D	Titanium	58
Lab	Backgroun	2/10/2012	BG-6D	Naphthalene (PAH)	58
Lab	Backgroun	2/10/2012	BG-6D	Total Solids	58

EPA 8270C	BG-6D-28'		ug/kg	TRUE	380			1,1-Biphen	Biphenyl	SVOC	190
EPA 6010B	BG-6D-28'	20	mg/kg	FALSE	12				Boron	Metals	20
EPA 6010B	BG-6D-28'	44000	mg/kg	FALSE	29				Calcium	Metals	44000
EPA 9056	BG-6D-28'	170	mg/kg	FALSE	12				Chloride	General Chemistry	170
EPA 6010B	BG-6D-28'	21	mg/kg	FALSE	0.58			Total chror	Chromium,	Metals	21
EPA 7199	BG-6D-28'		mg/kg	TRUE	2.3				Chromium,	Metals	1.15
EPA 6010B	BG-6D-28'	6.5	mg/kg	FALSE	0.58				Cobalt	Metals	6.5
EPA 6010B	BG-6D-28'	13	mg/kg	FALSE	1.2				Copper	Metals	13
EPA 300.0	BG-6D-28'	12	mg/kg	FALSE	1.2				Fluoride	General Chemistry	12
EPA 6010B	BG-6D-28'	15000	mg/kg	FALSE	5.8				Iron	Metals	15000
EPA 6010B	BG-6D-28'	9700	mg/kg	FALSE	5.8				Magnesiun	Metals	9700
EPA 6010B	BG-6D-28'	210	mg/kg	FALSE	0.58				Manganese	Metals	210
EPA 6010B	BG-6D-28'	0.46	mg/kg	FALSE	0.29				Molybdenu	Metals	0.46
EPA 6010B	BG-6D-28'	15	mg/kg	FALSE	1.2				Nickel	Metals	15
EPA 300.0	BG-6D-28'	1.2	mg/kg	FALSE	1.2			Nitrogen, N	Nitrate	General Chemistry	1.2
EPA 6010B	BG-6D-28'	4600	mg/kg	FALSE	29				Potassium	Metals	4600
EPA 6010B	BG-6D-28'	630	mg/kg	FALSE	120				Silica	Metals	630
EPA 6010B	BG-6D-28'	750	mg/kg	FALSE	29				Sodium	Metals	750
EPA 9056	BG-6D-28'	750	mg/kg	FALSE	58				Sulfate	General Chemistry	750
EPA 6010B	BG-6D-28'		mg/kg	TRUE	5.8	O	(ESC) Samp		Thallium	Metals	2.9
EPA 9056	BG-6D-28'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-6D-28'	31	mg/kg	FALSE	0.58				Vanadium	Metals	31
EPA 6010B	BG-6D-28'	48	mg/kg	FALSE	1.7				Zinc	Metals	48
EPA 8270C	BG-6D-28'		ug/kg	TRUE	7				Benzo(b)flu	PAHs	3.5
EPA 8270C	BG-6D-28'		ug/kg	TRUE	7				Benzo(k)flu	PAHs	3.5
EPA 6010B	BG-6D-28'	56	mg/kg	FALSE	0.58				Titanium	Metals	56
EPA 8270C	BG-6D-28'		ug/kg	TRUE	7				Naphthaler	PAHs	3.5
EPA 2540G	BG-6D-28'	86.2	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	86.2
EPA 6010B	BG-6D-53'	13	mg/kg	FALSE	1.2				Arsenic	Metals	13
EPA 6010B	BG-6D-53'	24	mg/kg	FALSE	0.3				Barium	Metals	24
EPA 6010B	BG-6D-53'	0.098	mg/kg	FALSE	0.3	J	(EPA) - Esti		Cadmium	Metals	0.098
EPA 6010B	BG-6D-53'	8.2	mg/kg	FALSE	0.3				Lead	Metals	8.2
EPA 7471A	BG-6D-53'		mg/kg	TRUE	0.024	J	(EPA) - Esti		Mercury	Metals	0.012
EPA 6010B	BG-6D-53'		mg/kg	TRUE	6	O	(ESC) Samp		Selenium	Metals	3
EPA 6010B	BG-6D-53'		mg/kg	TRUE	0.6				Silver	Metals	0.3
EPA 9045C	BG-6D-53'	9.1	su	FALSE					pH	General Chemistry	9.1
EPA 8270C	BG-6D-53'		ug/kg	TRUE	7.2				Acenaphth	PAHs	3.6
EPA 8270C	BG-6D-53'		ug/kg	TRUE	7.2				Anthracene	PAHs	3.6
EPA 8270C	BG-6D-53'		ug/kg	TRUE	7.2				Benzo(a)an	PAHs	3.6
EPA 8270C	BG-6D-53'		ug/kg	TRUE	7.2				Benzo(g,h,i	PAHs	3.6
EPA 8270C	BG-6D-53'		ug/kg	TRUE	7.2				Benzo(a)py	PAHs	3.6
EPA 8270C	BG-6D-53'		ug/kg	TRUE	400				Bis(2-ethyl	SVOC	200
EPA 8270C	BG-6D-53'		ug/kg	TRUE	7.2				Chrysene	PAHs	3.6
EPA 8270C	BG-6D-53'		ug/kg	TRUE	7.2				Fluoranthe	PAHs	3.6
EPA 8270C	BG-6D-53'		ug/kg	TRUE	7.2				Indeno(1,2	PAHs	3.6
EPA 8270C	BG-6D-53'		ug/kg	TRUE	7.2				Phenanthre	PAHs	3.6
EPA 8270C	BG-6D-53'		ug/kg	TRUE	7.2				Pyrene	PAHs	3.6
EPA 600-R-	BG-6D-53'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-6D-53'	12000	mg/kg	FALSE	6				Aluminum	Metals	12000
SM4500-NI	BG-6D-53'	10	mg/kg	FALSE	6			Nitrogen, A	Ammonia	General Chemistry	10
EPA 6010B	BG-6D-53'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
EPA 6010B	BG-6D-53'	0.29	mg/kg	FALSE	0.12				Beryllium	Metals	0.29
EPA 8270C	BG-6D-53'		ug/kg	TRUE	400			1,1-Biphen	Biphenyl	SVOC	200
EPA 6010B	BG-6D-53'	10	mg/kg	FALSE	12	J	(EPA) - Esti		Boron	Metals	10
EPA 6010B	BG-6D-53'	49000	mg/kg	FALSE	30				Calcium	Metals	49000
EPA 9056	BG-6D-53'	110	mg/kg	FALSE	12				Chloride	General Chemistry	110
EPA 6010B	BG-6D-53'	14	mg/kg	FALSE	0.6			Total chror	Chromium,	Metals	14
EPA 7199	BG-6D-53'		mg/kg	TRUE	2.4				Chromium,	Metals	1.2
EPA 6010B	BG-6D-53'	4.7	mg/kg	FALSE	0.6				Cobalt	Metals	4.7
EPA 6010B	BG-6D-53'	10	mg/kg	FALSE	1.2				Copper	Metals	10
EPA 300.0	BG-6D-53'	6.6	mg/kg	FALSE	1.2				Fluoride	General Chemistry	6.6
EPA 6010B	BG-6D-53'	12000	mg/kg	FALSE	6				Iron	Metals	12000
EPA 6010B	BG-6D-53'	12000	mg/kg	FALSE	6				Magnesiun	Metals	12000
EPA 6010B	BG-6D-53'	190	mg/kg	FALSE	0.6				Manganese	Metals	190
EPA 6010B	BG-6D-53'	0.23	mg/kg	FALSE	0.3	J	(EPA) - Esti		Molybdenu	Metals	0.23
EPA 6010B	BG-6D-53'	11	mg/kg	FALSE	1.2				Nickel	Metals	11
EPA 300.0	BG-6D-53'		mg/kg	TRUE	1.2	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.6
EPA 6010B	BG-6D-53'	3200	mg/kg	FALSE	30				Potassium	Metals	3200
EPA 6010B	BG-6D-53'	630	mg/kg	FALSE	110				Silica	Metals	630
EPA 6010B	BG-6D-53'	340	mg/kg	FALSE	30				Sodium	Metals	340
EPA 9056	BG-6D-53'	290	mg/kg	FALSE	60				Sulfate	General Chemistry	290
EPA 6010B	BG-6D-53'		mg/kg	TRUE	6	O	(ESC) Samp		Thallium	Metals	3
EPA 9056	BG-6D-53'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-6D-53'	23	mg/kg	FALSE	0.6				Vanadium	Metals	23
EPA 6010B	BG-6D-53'	36	mg/kg	FALSE	1.8				Zinc	Metals	36
EPA 8270C	BG-6D-53'		ug/kg	TRUE	7.2				Benzo(b)flu	PAHs	3.6
EPA 8270C	BG-6D-53'		ug/kg	TRUE	7.2				Benzo(k)flu	PAHs	3.6
EPA 6010B	BG-6D-53'	100	mg/kg	FALSE	0.6				Titanium	Metals	100
EPA 8270C	BG-6D-53'		ug/kg	TRUE	7.2				Naphthaler	PAHs	3.6
EPA 2540G	BG-6D-53'	83.3	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	83.3
EPA 6010B	BG-6D-58'	6.3	mg/kg	FALSE	1.2				Arsenic	Metals	6.3
EPA 6010B	BG-6D-58'	17	mg/kg	FALSE	0.3				Barium	Metals	17
EPA 6010B	BG-6D-58'	0.07	mg/kg	FALSE	0.3	J	(EPA) - Esti		Cadmium	Metals	0.07
EPA 6010B	BG-6D-58'	3.6	mg/kg	FALSE	0.3				Lead	Metals	3.6
EPA 7471A	BG-6D-58'		mg/kg	TRUE	0.024	J	(EPA) - Esti		Mercury	Metals	0.012
EPA 6010B	BG-6D-58'		mg/kg	TRUE	6	O	(ESC) Samp		Selenium	Metals	3
EPA 6010B	BG-6D-58'		mg/kg	TRUE	0.6				Silver	Metals	0.3
EPA 9045C	BG-6D-58'	8.9	su	FALSE					pH	General Chemistry	8.9
EPA 8270C	BG-6D-58'		ug/kg	TRUE	7.1				Acenaphth	PAHs	3.55
EPA 8270C	BG-6D-58'		ug/kg	TRUE	7.1				Anthracene	PAHs	3.55
EPA 8270C	BG-6D-58'		ug/kg	TRUE	7.1				Benzo(a)an	PAHs	3.55
EPA 8270C	BG-6D-58'		ug/kg	TRUE	7.1				Benzo(g,h,i	PAHs	3.55
EPA 8270C	BG-6D-58'		ug/kg	TRUE	7.1				Benzo(a)py	PAHs	3.55
EPA 8270C	BG-6D-58'		ug/kg	TRUE	390				Bis(2-ethyl	SVOC	195
EPA 8270C	BG-6D-58'		ug/kg	TRUE	7.1				Chrysene	PAHs	3.55
EPA 8270C	BG-6D-58'		ug/kg	TRUE	7.1				Fluoranthe	PAHs	3.55
EPA 8270C	BG-6D-58'		ug/kg	TRUE	7.1				Indeno(1,2	PAHs	3.55
EPA 8270C	BG-6D-58'		ug/kg	TRUE	7.1				Phenanthre	PAHs	3.55
EPA 8270C	BG-6D-58'		ug/kg	TRUE	7.1				Pyrene	PAHs	3.55
EPA 600-R-	BG-6D-58'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-6D-58'	4500	mg/kg	FALSE	6				Aluminum	Metals	4500
SM4500-NI	BG-6D-58'		mg/kg	TRUE	6			Nitrogen, A	Ammonia	General Chemistry	3
EPA 6010B	BG-6D-58'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
EPA 6010B	BG-6D-58'	0.11	mg/kg	FALSE	0.12	J	(EPA) - Esti		Beryllium	Metals	0.11
EPA 8270C	BG-6D-58'		ug/kg	TRUE	390			1,1-Biphen	Biphenyl	SVOC	195
EPA 6010B	BG-6D-58'	5.1	mg/kg	FALSE	12	J	(EPA) - Esti		Boron	Metals	5.1
EPA 6010B	BG-6D-58'	25000	mg/kg	FALSE	30				Calcium	Metals	25000
EPA 9056	BG-6D-58'	120	mg/kg	FALSE	12				Chloride	General Chemistry	120
EPA 6010B	BG-6D-58'	6.4	mg/kg	FALSE	0.6			Total chror	Chromium,	Metals	6.4
EPA 7199	BG-6D-58'		mg/kg	TRUE	2.4	J	(EPA) - Esti		Chromium,	Metals	1.2
EPA 6010B	BG-6D-58'	1.7	mg/kg	FALSE	0.6				Cobalt	Metals	1.7
EPA 6010B	BG-6D-58'	3.8	mg/kg	FALSE	1.2				Copper	Metals	3.8
EPA 300.0	BG-6D-58'	5.2	mg/kg	FALSE	1.2				Fluoride	General Chemistry	5.2
EPA 6010B	BG-6D-58'	4800	mg/kg	FALSE	6				Iron	Metals	4800
EPA 6010B	BG-6D-58'	4000	mg/kg	FALSE	6				Magnesiun	Metals	4000
EPA 6010B	BG-6D-58'	99	mg/kg	FALSE	0.6				Manganese	Metals	99
EPA 6010B	BG-6D-58'	0.4	mg/kg	FALSE	0.3				Molybdenu	Metals	0.4
EPA 6010B	BG-6D-58'	3.9	mg/kg	FALSE	1.2				Nickel	Metals	3.9
EPA 300.0	BG-6D-58'		mg/kg	TRUE	1.2	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.6
EPA 6010B	BG-6D-58'	1300	mg/kg	FALSE	30				Potassium	Metals	1300
EPA 6010B	BG-6D-58'	620	mg/kg	FALSE	110				Silica	Metals	620
EPA 6010B	BG-6D-58'	180	mg/kg	FALSE	30				Sodium	Metals	180
EPA 9056	BG-6D-58'	300	mg/kg	FALSE	60				Sulfate	General Chemistry	300
EPA 6010B	BG-6D-58'		mg/kg	TRUE	6	O	(ESC) Samp		Thallium	Metals	3
EPA 9056	BG-6D-58'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-6D-58'	10	mg/kg	FALSE	0.6				Vanadium	Metals	10
EPA 6010B	BG-6D-58'	13	mg/kg	FALSE	1.8				Zinc	Metals	13
EPA 8270C	BG-6D-58'		ug/kg	TRUE	7.1				Benzo(b)flu	PAHs	3.55
EPA 8270C	BG-6D-58'		ug/kg	TRUE	7.1				Benzo(k)flu	PAHs	3.55
EPA 6010B	BG-6D-58'	45	mg/kg	FALSE	0.6				Titanium	Metals	45
EPA 8270C	BG-6D-58'		ug/kg	TRUE	7.1				Naphthaler	PAHs	3.55
EPA 2540G	BG-6D-58'	84	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	84

Lab	Backgroun	2/10/2012	BG-6D	Arsenic	75
Lab	Backgroun	2/10/2012	BG-6D	Barium	75
Lab	Backgroun	2/10/2012	BG-6D	Cadmium	75
Lab	Backgroun	2/10/2012	BG-6D	Lead	75
Lab	Backgroun	2/10/2012	BG-6D	Mercury	75
Lab	Backgroun	2/10/2012	BG-6D	Selenium	75
Lab	Backgroun	2/10/2012	BG-6D	Silver	75
Lab	Backgroun	2/10/2012	BG-6D	pH	75
Lab	Backgroun	2/10/2012	BG-6D	Acenaphthene	75
Lab	Backgroun	2/10/2012	BG-6D	Anthracene	75
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)anthracene	75
Lab	Backgroun	2/10/2012	BG-6D	Benzo(g,h,i)perylene	75
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)pyrene	75
Lab	Backgroun	2/10/2012	BG-6D	Bis(2-ethylhexyl)phthalate	75
Lab	Backgroun	2/10/2012	BG-6D	Chrysene	75
Lab	Backgroun	2/10/2012	BG-6D	Fluoranthene	75
Lab	Backgroun	2/10/2012	BG-6D	Indeno(1,2,3-cd)pyrene	75
Lab	Backgroun	2/10/2012	BG-6D	Phenanthrene	75
Lab	Backgroun	2/10/2012	BG-6D	Pyrene	75
Lab	Backgroun	2/10/2012	BG-6D	Asbestos	75
Lab	Backgroun	2/10/2012	BG-6D	Aluminum	75
Lab	Backgroun	2/10/2012	BG-6D	Ammonia	75
Lab	Backgroun	2/10/2012	BG-6D	Antimony	75
Lab	Backgroun	2/10/2012	BG-6D	Beryllium	75
Lab	Backgroun	2/10/2012	BG-6D	Biphenyl	75
Lab	Backgroun	2/10/2012	BG-6D	Boron	75
Lab	Backgroun	2/10/2012	BG-6D	Calcium	75
Lab	Backgroun	2/10/2012	BG-6D	Chloride	75
Lab	Backgroun	2/10/2012	BG-6D	Chromium (total)	75
Lab	Backgroun	2/10/2012	BG-6D	Chromium (hexavalent)	75
Lab	Backgroun	2/10/2012	BG-6D	Cobalt	75
Lab	Backgroun	2/10/2012	BG-6D	Copper	75
Lab	Backgroun	2/10/2012	BG-6D	Fluoride	75
Lab	Backgroun	2/10/2012	BG-6D	Iron	75
Lab	Backgroun	2/10/2012	BG-6D	Magnesium	75
Lab	Backgroun	2/10/2012	BG-6D	Manganese	75
Lab	Backgroun	2/10/2012	BG-6D	Molybdenum	75
Lab	Backgroun	2/10/2012	BG-6D	Nickel	75
Lab	Backgroun	2/10/2012	BG-6D	Nitrate	75
Lab	Backgroun	2/10/2012	BG-6D	Potassium	75
Lab	Backgroun	2/10/2012	BG-6D	Silica	75
Lab	Backgroun	2/10/2012	BG-6D	Sodium	75
Lab	Backgroun	2/10/2012	BG-6D	Sulfate	75
Lab	Backgroun	2/10/2012	BG-6D	Thallium	75
Lab	Backgroun	2/10/2012	BG-6D	Phosphate as P	75
Lab	Backgroun	2/10/2012	BG-6D	Vanadium	75
Lab	Backgroun	2/10/2012	BG-6D	Zinc	75
Lab	Backgroun	2/10/2012	BG-6D	Benzo(b)fluoranthene	75
Lab	Backgroun	2/10/2012	BG-6D	Benzo(k)fluoranthene	75
Lab	Backgroun	2/10/2012	BG-6D	Titanium	75
Lab	Backgroun	2/10/2012	BG-6D	Naphthalene (PAH)	75
Lab	Backgroun	2/10/2012	BG-6D	Total Solids	75
Lab	Backgroun	2/10/2012	BG-6D	Arsenic	87
Lab	Backgroun	2/10/2012	BG-6D	Barium	87
Lab	Backgroun	2/10/2012	BG-6D	Cadmium	87
Lab	Backgroun	2/10/2012	BG-6D	Lead	87
Lab	Backgroun	2/10/2012	BG-6D	Mercury	87
Lab	Backgroun	2/10/2012	BG-6D	Selenium	87
Lab	Backgroun	2/10/2012	BG-6D	Silver	87
Lab	Backgroun	2/10/2012	BG-6D	pH	87
Lab	Backgroun	2/10/2012	BG-6D	Acenaphthene	87
Lab	Backgroun	2/10/2012	BG-6D	Anthracene	87
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)anthracene	87
Lab	Backgroun	2/10/2012	BG-6D	Benzo(g,h,i)perylene	87
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)pyrene	87
Lab	Backgroun	2/10/2012	BG-6D	Bis(2-ethylhexyl)phthalate	87
Lab	Backgroun	2/10/2012	BG-6D	Chrysene	87
Lab	Backgroun	2/10/2012	BG-6D	Fluoranthene	87
Lab	Backgroun	2/10/2012	BG-6D	Indeno(1,2,3-cd)pyrene	87
Lab	Backgroun	2/10/2012	BG-6D	Phenanthrene	87
Lab	Backgroun	2/10/2012	BG-6D	Pyrene	87
Lab	Backgroun	2/10/2012	BG-6D	Asbestos	87
Lab	Backgroun	2/10/2012	BG-6D	Aluminum	87
Lab	Backgroun	2/10/2012	BG-6D	Ammonia	87
Lab	Backgroun	2/10/2012	BG-6D	Antimony	87
Lab	Backgroun	2/10/2012	BG-6D	Beryllium	87
Lab	Backgroun	2/10/2012	BG-6D	Biphenyl	87
Lab	Backgroun	2/10/2012	BG-6D	Boron	87
Lab	Backgroun	2/10/2012	BG-6D	Calcium	87
Lab	Backgroun	2/10/2012	BG-6D	Chloride	87
Lab	Backgroun	2/10/2012	BG-6D	Chromium (total)	87
Lab	Backgroun	2/10/2012	BG-6D	Chromium (hexavalent)	87
Lab	Backgroun	2/10/2012	BG-6D	Cobalt	87
Lab	Backgroun	2/10/2012	BG-6D	Copper	87
Lab	Backgroun	2/10/2012	BG-6D	Fluoride	87
Lab	Backgroun	2/10/2012	BG-6D	Iron	87
Lab	Backgroun	2/10/2012	BG-6D	Magnesium	87
Lab	Backgroun	2/10/2012	BG-6D	Manganese	87
Lab	Backgroun	2/10/2012	BG-6D	Molybdenum	87
Lab	Backgroun	2/10/2012	BG-6D	Nickel	87
Lab	Backgroun	2/10/2012	BG-6D	Nitrate	87
Lab	Backgroun	2/10/2012	BG-6D	Potassium	87
Lab	Backgroun	2/10/2012	BG-6D	Silica	87
Lab	Backgroun	2/10/2012	BG-6D	Sodium	87
Lab	Backgroun	2/10/2012	BG-6D	Sulfate	87
Lab	Backgroun	2/10/2012	BG-6D	Thallium	87
Lab	Backgroun	2/10/2012	BG-6D	Phosphate as P	87
Lab	Backgroun	2/10/2012	BG-6D	Vanadium	87
Lab	Backgroun	2/10/2012	BG-6D	Zinc	87
Lab	Backgroun	2/10/2012	BG-6D	Benzo(b)fluoranthene	87
Lab	Backgroun	2/10/2012	BG-6D	Benzo(k)fluoranthene	87
Lab	Backgroun	2/10/2012	BG-6D	Titanium	87
Lab	Backgroun	2/10/2012	BG-6D	Naphthalene (PAH)	87
Lab	Backgroun	2/10/2012	BG-6D	Total Solids	87
Lab	Backgroun	2/10/2012	BG-6D	Arsenic	98
Lab	Backgroun	2/10/2012	BG-6D	Barium	98
Lab	Backgroun	2/10/2012	BG-6D	Cadmium	98
Lab	Backgroun	2/10/2012	BG-6D	Lead	98
Lab	Backgroun	2/10/2012	BG-6D	Mercury	98
Lab	Backgroun	2/10/2012	BG-6D	Selenium	98
Lab	Backgroun	2/10/2012	BG-6D	Silver	98
Lab	Backgroun	2/10/2012	BG-6D	pH	98
Lab	Backgroun	2/10/2012	BG-6D	Acenaphthene	98
Lab	Backgroun	2/10/2012	BG-6D	Anthracene	98
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)anthracene	98
Lab	Backgroun	2/10/2012	BG-6D	Benzo(g,h,i)perylene	98
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)pyrene	98
Lab	Backgroun	2/10/2012	BG-6D	Bis(2-ethylhexyl)phthalate	98
Lab	Backgroun	2/10/2012	BG-6D	Chrysene	98
Lab	Backgroun	2/10/2012	BG-6D	Fluoranthene	98
Lab	Backgroun	2/10/2012	BG-6D	Indeno(1,2,3-cd)pyrene	98
Lab	Backgroun	2/10/2012	BG-6D	Phenanthrene	98
Lab	Backgroun	2/10/2012	BG-6D	Pyrene	98
Lab	Backgroun	2/10/2012	BG-6D	Asbestos	98
Lab	Backgroun	2/10/2012	BG-6D	Aluminum	98
Lab	Backgroun	2/10/2012	BG-6D	Ammonia	98
Lab	Backgroun	2/10/2012	BG-6D	Antimony	98
Lab	Backgroun	2/10/2012	BG-6D	Beryllium	98
Lab	Backgroun	2/10/2012	BG-6D	Biphenyl	98
Lab	Backgroun	2/10/2012	BG-6D	Boron	98
Lab	Backgroun	2/10/2012	BG-6D	Calcium	98
Lab	Backgroun	2/10/2012	BG-6D	Chloride	98

EPA 6010B	BG-6D-75'	8.4	mg/kg	FALSE	1.2				Arsenic	Metals	8.4
EPA 6010B	BG-6D-75'	150	mg/kg	FALSE	0.3				Barium	Metals	150
EPA 6010B	BG-6D-75'	0.15	mg/kg	FALSE	0.3	J	(EPA) - Esti		Cadmium	Metals	0.15
EPA 6010B	BG-6D-75'	5.7	mg/kg	FALSE	0.3				Lead	Metals	5.7
EPA 7471A	BG-6D-75'		mg/kg	TRUE	0.024	J	(EPA) - Esti		Mercury	Metals	0.012
EPA 6010B	BG-6D-75'		mg/kg	TRUE	12	O	(ESC) Samp		Selenium	Metals	6
EPA 6010B	BG-6D-75'		mg/kg	TRUE	0.59				Silver	Metals	0.295
EPA 9045C	BG-6D-75'	8.5	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.5
EPA 8270C	BG-6D-75'		ug/kg	TRUE	7.1				Acenaphth	PAHs	3.55
EPA 8270C	BG-6D-75'		ug/kg	TRUE	7.1				Anthracene	PAHs	3.55
EPA 8270C	BG-6D-75'		ug/kg	TRUE	7.1				Benzo(a)an	PAHs	3.55
EPA 8270C	BG-6D-75'		ug/kg	TRUE	7.1				Benzo(g,h,i	PAHs	3.55
EPA 8270C	BG-6D-75'		ug/kg	TRUE	7.1				Benzo(a)py	PAHs	3.55
EPA 8270C	BG-6D-75'		ug/kg	TRUE	390				Bis(2-ethyl	SVOC	195
EPA 8270C	BG-6D-75'		ug/kg	TRUE	7.1				Chrysene	PAHs	3.55
EPA 8270C	BG-6D-75'		ug/kg	TRUE	7.1				Fluoranthe	PAHs	3.55
EPA 8270C	BG-6D-75'		ug/kg	TRUE	7.1				Indeno(1,2	PAHs	3.55
EPA 8270C	BG-6D-75'		ug/kg	TRUE	7.1				Phenanthre	PAHs	3.55
EPA 8270C	BG-6D-75'		ug/kg	TRUE	7.1				Pyrene	PAHs	3.55
EPA 600-R-	BG-6D-75'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-6D-75'	4500	mg/kg	FALSE	5.9				Aluminum	Metals	4500
SM4500-NI	BG-6D-75'		mg/kg	TRUE	5.9			Nitrogen, A	Ammonia	General Chemistry	2.95
EPA 6010B	BG-6D-75'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
EPA 6010B	BG-6D-75'	0.046	mg/kg	FALSE	0.12	J	(EPA) - Esti		Beryllium	Metals	0.046
EPA 8270C	BG-6D-75'		ug/kg	TRUE	390			1,1-Biphen	Biphenyl	SVOC	195
EPA 6010B	BG-6D-75'	2.6	mg/kg	FALSE	12	J	(EPA) - Esti		Boron	Metals	2.6
EPA 6010B	BG-6D-75'	54000	mg/kg	FALSE	30				Calcium	Metals	54000
EPA 9056	BG-6D-75'	110	mg/kg	FALSE	12				Chloride	General Chemistry	110
EPA 6010B	BG-6D-75'	6.1	mg/kg	FALSE	0.59			Total chror	Chromium,	Metals	6.1
EPA 7199	BG-6D-75'		mg/kg	TRUE	2.4				Chromium,	Metals	1.2
EPA 6010B	BG-6D-75'	2	mg/kg	FALSE	0.59				Cobalt	Metals	2
EPA 6010B	BG-6D-75'	4.6	mg/kg	FALSE	1.2				Copper	Metals	4.6
EPA 300.0	BG-6D-75'	3.8	mg/kg	FALSE	1.2				Fluoride	General Chemistry	3.8
EPA 6010B	BG-6D-75'	5900	mg/kg	FALSE	5.9				Iron	Metals	5900
EPA 6010B	BG-6D-75'	6800	mg/kg	FALSE	5.9				Magnesiun	Metals	6800
EPA 6010B	BG-6D-75'	270	mg/kg	FALSE	0.59				Manganese	Metals	270
EPA 6010B	BG-6D-75'	0.35	mg/kg	FALSE	0.3				Molybdenu	Metals	0.35
EPA 6010B	BG-6D-75'	4	mg/kg	FALSE	1.2				Nickel	Metals	4
EPA 300.0	BG-6D-75'		mg/kg	TRUE	1.2	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.6
EPA 6010B	BG-6D-75'	1200	mg/kg	FALSE	30				Potassium	Metals	1200
EPA 6010B	BG-6D-75'	520	mg/kg	FALSE	120				Silica	Metals	520
EPA 6010B	BG-6D-75'	190	mg/kg	FALSE	30				Sodium	Metals	190
EPA 9056	BG-6D-75'	270	mg/kg	FALSE	59				Sulfate	General Chemistry	270
EPA 6010B	BG-6D-75'		mg/kg	TRUE	5.9	O	(ESC) Samp		Thallium	Metals	2.95
EPA 9056	BG-6D-75'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-6D-75'	12	mg/kg	FALSE	0.59				Vanadium	Metals	12
EPA 6010B	BG-6D-75'	16	mg/kg	FALSE	1.8				Zinc	Metals	16
EPA 8270C	BG-6D-75'		ug/kg	TRUE	7.1				Benzo(b)flu	PAHs	3.55
EPA 8270C	BG-6D-75'		ug/kg	TRUE	7.1				Benzo(k)flu	PAHs	3.55
EPA 6010B	BG-6D-75'	61	mg/kg	FALSE	0.59				Titanium	Metals	61
EPA 8270C	BG-6D-75'		ug/kg	TRUE	7.1				Naphthaler	PAHs	3.55
EPA 2540G	BG-6D-75'	84.6	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	84.6
EPA 6010B	BG-6D-87'	16	mg/kg	FALSE	1.2				Arsenic	Metals	16
EPA 6010B	BG-6D-87'	39	mg/kg	FALSE	0.31				Barium	Metals	39
EPA 6010B	BG-6D-87'	0.31	mg/kg	FALSE	0.31	J	(EPA) - Esti		Cadmium	Metals	0.31
EPA 6010B	BG-6D-87'	18	mg/kg	FALSE	0.31				Lead	Metals	18
EPA 7471A	BG-6D-87'		mg/kg	TRUE	0.025	J	(EPA) - Esti		Mercury	Metals	0.0125
EPA 6010B	BG-6D-87'	1.2	mg/kg	FALSE	1.2				Selenium	Metals	1.2
EPA 6010B	BG-6D-87'		mg/kg	TRUE	0.62				Silver	Metals	0.31
EPA 9045C	BG-6D-87'	8.3	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.3
EPA 8270C	BG-6D-87'		ug/kg	TRUE	7.5				Acenaphth	PAHs	3.75
EPA 8270C	BG-6D-87'		ug/kg	TRUE	7.5				Anthracene	PAHs	3.75
EPA 8270C	BG-6D-87'		ug/kg	TRUE	7.5				Benzo(a)an	PAHs	3.75
EPA 8270C	BG-6D-87'		ug/kg	TRUE	7.5				Benzo(g,h,i	PAHs	3.75
EPA 8270C	BG-6D-87'		ug/kg	TRUE	7.5				Benzo(a)py	PAHs	3.75
EPA 8270C	BG-6D-87'		ug/kg	TRUE	410				Bis(2-ethyl	SVOC	205
EPA 8270C	BG-6D-87'		ug/kg	TRUE	7.5				Chrysene	PAHs	3.75
EPA 8270C	BG-6D-87'		ug/kg	TRUE	7.5				Fluoranthe	PAHs	3.75
EPA 8270C	BG-6D-87'		ug/kg	TRUE	7.5				Indeno(1,2	PAHs	3.75
EPA 8270C	BG-6D-87'		ug/kg	TRUE	7.5				Phenanthre	PAHs	3.75
EPA 8270C	BG-6D-87'		ug/kg	TRUE	7.5				Pyrene	PAHs	3.75
EPA 600-R-	BG-6D-87'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-6D-87'	32000	mg/kg	FALSE	6.2				Aluminum	Metals	32000
SM4500-NI	BG-6D-87'		mg/kg	TRUE	6.2			Nitrogen, A	Ammonia	General Chemistry	3.1
EPA 6010B	BG-6D-87'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
EPA 6010B	BG-6D-87'	1.6	mg/kg	FALSE	0.12				Beryllium	Metals	1.6
EPA 8270C	BG-6D-87'		ug/kg	TRUE	410			1,1-Biphen	Biphenyl	SVOC	205
EPA 6010B	BG-6D-87'	8.2	mg/kg	FALSE	12	J	(EPA) - Esti		Boron	Metals	8.2
EPA 6010B	BG-6D-87'	51000	mg/kg	FALSE	31				Calcium	Metals	51000
EPA 9056	BG-6D-87'	110	mg/kg	FALSE	12				Chloride	General Chemistry	110
EPA 6010B	BG-6D-87'	38	mg/kg	FALSE	0.62			Total chror	Chromium,	Metals	38
EPA 7199	BG-6D-87'		mg/kg	TRUE	2.5				Chromium,	Metals	1.25
EPA 6010B	BG-6D-87'	9.4	mg/kg	FALSE	0.62				Cobalt	Metals	9.4
EPA 6010B	BG-6D-87'	26	mg/kg	FALSE	1.2				Copper	Metals	26
EPA 300.0	BG-6D-87'	10	mg/kg	FALSE	1.2				Fluoride	General Chemistry	10
EPA 6010B	BG-6D-87'	26000	mg/kg	FALSE	6.2				Iron	Metals	26000
EPA 6010B	BG-6D-87'	12000	mg/kg	FALSE	6.2				Magnesiun	Metals	12000
EPA 6010B	BG-6D-87'	260	mg/kg	FALSE	0.62				Manganese	Metals	260
EPA 6010B	BG-6D-87'	0.14	mg/kg	FALSE	0.31	J	(EPA) - Esti		Molybdenu	Metals	0.14
EPA 6010B	BG-6D-87'	28	mg/kg	FALSE	1.2				Nickel	Metals	28
EPA 300.0	BG-6D-87'		mg/kg	TRUE	1.2	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.6
EPA 6010B	BG-6D-87'	6600	mg/kg	FALSE	31				Potassium	Metals	6600
EPA 6010B	BG-6D-87'	840	mg/kg	FALSE	120				Silica	Metals	840
EPA 6010B	BG-6D-87'	650	mg/kg	FALSE	31				Sodium	Metals	650
EPA 9056	BG-6D-87'	190	mg/kg	FALSE	62				Sulfate	General Chemistry	190
EPA 6010B	BG-6D-87'		mg/kg	TRUE	6.2	O	(ESC) Samp		Thallium	Metals	3.1
EPA 9056	BG-6D-87'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-6D-87'	54	mg/kg	FALSE	0.62				Vanadium	Metals	54
EPA 6010B	BG-6D-87'	81	mg/kg	FALSE	1.9				Zinc	Metals	81
EPA 8270C	BG-6D-87'		ug/kg	TRUE	7.5				Benzo(b)flu	PAHs	3.75
EPA 8270C	BG-6D-87'		ug/kg	TRUE	7.5				Benzo(k)flu	PAHs	3.75
EPA 6010B	BG-6D-87'	38	mg/kg	FALSE	0.62				Titanium	Metals	38
EPA 8270C	BG-6D-87'		ug/kg	TRUE	7.5				Naphthaler	PAHs	3.75
EPA 2540G	BG-6D-87'	80	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	80
EPA 6010B	BG-6D-98'	13	mg/kg	FALSE	1.2				Arsenic	Metals	13
EPA 6010B	BG-6D-98'	59	mg/kg	FALSE	0.3				Barium	Metals	59
EPA 6010B	BG-6D-98'	0.099	mg/kg	FALSE	0.3	J	(EPA) - Esti		Cadmium	Metals	0.099
EPA 6010B	BG-6D-98'	6.5	mg/kg	FALSE	0.3				Lead	Metals	6.5
EPA 7471A	BG-6D-98'	0.026	mg/kg	FALSE	0.024				Mercury	Metals	0.026
EPA 6010B	BG-6D-98'		mg/kg	TRUE	5.9	O	(ESC) Samp		Selenium	Metals	2.95
EPA 6010B	BG-6D-98'		mg/kg	TRUE	0.59				Silver	Metals	0.295
EPA 9045C	BG-6D-98'	8.5	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.5
EPA 8270C	BG-6D-98'		ug/kg	TRUE	7.1				Acenaphth	PAHs	3.55
EPA 8270C	BG-6D-98'		ug/kg	TRUE	7.1				Anthracene	PAHs	3.55
EPA 8270C	BG-6D-98'		ug/kg	TRUE	7.1				Benzo(a)an	PAHs	3.55
EPA 8270C	BG-6D-98'		ug/kg	TRUE	7.1				Benzo(g,h,i	PAHs	3.55
EPA 8270C	BG-6D-98'		ug/kg	TRUE	7.1				Benzo(a)py	PAHs	3.55
EPA 8270C	BG-6D-98'		ug/kg	TRUE	390	J	(EPA) - Esti		Bis(2-ethyl	SVOC	195
EPA 8270C	BG-6D-98'		ug/kg	TRUE	7.1				Chrysene	PAHs	3.55
EPA 8270C	BG-6D-98'		ug/kg	TRUE	7.1				Fluoranthe	PAHs	3.55
EPA 8270C	BG-6D-98'		ug/kg	TRUE	7.1				Indeno(1,2	PAHs	3.55
EPA 8270C	BG-6D-98'		ug/kg	TRUE	7.1				Phenanthre	PAHs	3.55
EPA 8270C	BG-6D-98'		ug/kg	TRUE	7.1				Pyrene	PAHs	3.55
EPA 600-R-	BG-6D-98'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-6D-98'	11000	mg/kg	FALSE	5.9				Aluminum	Metals	11000
SM4500-NI	BG-6D-98'		mg/kg	TRUE	5.9			Nitrogen, A	Ammonia	General Chemistry	2.95
EPA 6010B	BG-6D-98'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
EPA 6010B	BG-6D-98'	0.28	mg/kg	FALSE	0.12				Beryllium	Metals	0.28
EPA 8270C	BG-6D-98'		ug/kg	TRUE	390			1,1-Biphen	Biphenyl	SVOC	195
EPA 6010B	BG-6D-98'	9.9	mg/kg	FALSE	12	J	(EPA) - Esti		Boron	Metals	9.9
EPA 6010B	BG-6D-98'	39000	mg/kg	FALSE	30				Calcium	Metals	39000
EPA 9056	BG-6D-98'	93	mg/kg	FALSE	12				Chloride	General Chemistry	93

Lab	Backgroun	2/10/2012	BG-6D	Chromium (total)	98
Lab	Backgroun	2/10/2012	BG-6D	Chromium (hexavalent)	98
Lab	Backgroun	2/10/2012	BG-6D	Cobalt	98
Lab	Backgroun	2/10/2012	BG-6D	Copper	98
Lab	Backgroun	2/10/2012	BG-6D	Fluoride	98
Lab	Backgroun	2/10/2012	BG-6D	Iron	98
Lab	Backgroun	2/10/2012	BG-6D	Magnesium	98
Lab	Backgroun	2/10/2012	BG-6D	Manganese	98
Lab	Backgroun	2/10/2012	BG-6D	Molybdenum	98
Lab	Backgroun	2/10/2012	BG-6D	Nickel	98
Lab	Backgroun	2/10/2012	BG-6D	Nitrate	98
Lab	Backgroun	2/10/2012	BG-6D	Potassium	98
Lab	Backgroun	2/10/2012	BG-6D	Silica	98
Lab	Backgroun	2/10/2012	BG-6D	Sodium	98
Lab	Backgroun	2/10/2012	BG-6D	Sulfate	98
Lab	Backgroun	2/10/2012	BG-6D	Thallium	98
Lab	Backgroun	2/10/2012	BG-6D	Phosphate as P	98
Lab	Backgroun	2/10/2012	BG-6D	Vanadium	98
Lab	Backgroun	2/10/2012	BG-6D	Zinc	98
Lab	Backgroun	2/10/2012	BG-6D	Benzo(b)fluoranthene	98
Lab	Backgroun	2/10/2012	BG-6D	Benzo(k)fluoranthene	98
Lab	Backgroun	2/10/2012	BG-6D	Titanium	98
Lab	Backgroun	2/10/2012	BG-6D	Naphthalene (PAH)	98
Lab	Backgroun	2/10/2012	BG-6D	Total Solids	98
Lab	Backgroun	2/10/2012	BG-6D	Arsenic	114
Lab	Backgroun	2/10/2012	BG-6D	Barium	114
Lab	Backgroun	2/10/2012	BG-6D	Cadmium	114
Lab	Backgroun	2/10/2012	BG-6D	Lead	114
Lab	Backgroun	2/10/2012	BG-6D	Mercury	114
Lab	Backgroun	2/10/2012	BG-6D	Selenium	114
Lab	Backgroun	2/10/2012	BG-6D	Silver	114
Lab	Backgroun	2/10/2012	BG-6D	pH	114
Lab	Backgroun	2/10/2012	BG-6D	Acenaphthene	114
Lab	Backgroun	2/10/2012	BG-6D	Anthracene	114
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)anthracene	114
Lab	Backgroun	2/10/2012	BG-6D	Benzo(g,h,i)perylene	114
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)pyrene	114
Lab	Backgroun	2/10/2012	BG-6D	Bis(2-ethylhexyl)phthalate	114
Lab	Backgroun	2/10/2012	BG-6D	Chrysene	114
Lab	Backgroun	2/10/2012	BG-6D	Fluoranthene	114
Lab	Backgroun	2/10/2012	BG-6D	Indeno(1,2,3-cd)pyrene	114
Lab	Backgroun	2/10/2012	BG-6D	Phenanthrene	114
Lab	Backgroun	2/10/2012	BG-6D	Pyrene	114
Lab	Backgroun	2/10/2012	BG-6D	Asbestos	114
Lab	Backgroun	2/10/2012	BG-6D	Aluminum	114
Lab	Backgroun	2/10/2012	BG-6D	Ammonia	114
Lab	Backgroun	2/10/2012	BG-6D	Antimony	114
Lab	Backgroun	2/10/2012	BG-6D	Beryllium	114
Lab	Backgroun	2/10/2012	BG-6D	Biphenyl	114
Lab	Backgroun	2/10/2012	BG-6D	Boron	114
Lab	Backgroun	2/10/2012	BG-6D	Calcium	114
Lab	Backgroun	2/10/2012	BG-6D	Chloride	114
Lab	Backgroun	2/10/2012	BG-6D	Chromium (total)	114
Lab	Backgroun	2/10/2012	BG-6D	Chromium (hexavalent)	114
Lab	Backgroun	2/10/2012	BG-6D	Cobalt	114
Lab	Backgroun	2/10/2012	BG-6D	Copper	114
Lab	Backgroun	2/10/2012	BG-6D	Fluoride	114
Lab	Backgroun	2/10/2012	BG-6D	Iron	114
Lab	Backgroun	2/10/2012	BG-6D	Magnesium	114
Lab	Backgroun	2/10/2012	BG-6D	Manganese	114
Lab	Backgroun	2/10/2012	BG-6D	Molybdenum	114
Lab	Backgroun	2/10/2012	BG-6D	Nickel	114
Lab	Backgroun	2/10/2012	BG-6D	Nitrate	114
Lab	Backgroun	2/10/2012	BG-6D	Potassium	114
Lab	Backgroun	2/10/2012	BG-6D	Silica	114
Lab	Backgroun	2/10/2012	BG-6D	Sodium	114
Lab	Backgroun	2/10/2012	BG-6D	Sulfate	114
Lab	Backgroun	2/10/2012	BG-6D	Thallium	114
Lab	Backgroun	2/10/2012	BG-6D	Phosphate as P	114
Lab	Backgroun	2/10/2012	BG-6D	Vanadium	114
Lab	Backgroun	2/10/2012	BG-6D	Zinc	114
Lab	Backgroun	2/10/2012	BG-6D	Benzo(b)fluoranthene	114
Lab	Backgroun	2/10/2012	BG-6D	Benzo(k)fluoranthene	114
Lab	Backgroun	2/10/2012	BG-6D	Titanium	114
Lab	Backgroun	2/10/2012	BG-6D	Naphthalene (PAH)	114
Lab	Backgroun	2/10/2012	BG-6D	Total Solids	114
Lab	Backgroun	2/10/2012	BG-6D	Arsenic	127
Lab	Backgroun	2/10/2012	BG-6D	Barium	127
Lab	Backgroun	2/10/2012	BG-6D	Cadmium	127
Lab	Backgroun	2/10/2012	BG-6D	Lead	127
Lab	Backgroun	2/10/2012	BG-6D	Mercury	127
Lab	Backgroun	2/10/2012	BG-6D	Selenium	127
Lab	Backgroun	2/10/2012	BG-6D	Silver	127
Lab	Backgroun	2/10/2012	BG-6D	pH	127
Lab	Backgroun	2/10/2012	BG-6D	Acenaphthene	127
Lab	Backgroun	2/10/2012	BG-6D	Anthracene	127
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)anthracene	127
Lab	Backgroun	2/10/2012	BG-6D	Benzo(g,h,i)perylene	127
Lab	Backgroun	2/10/2012	BG-6D	Benzo(a)pyrene	127
Lab	Backgroun	2/10/2012	BG-6D	Bis(2-ethylhexyl)phthalate	127
Lab	Backgroun	2/10/2012	BG-6D	Chrysene	127
Lab	Backgroun	2/10/2012	BG-6D	Fluoranthene	127
Lab	Backgroun	2/10/2012	BG-6D	Indeno(1,2,3-cd)pyrene	127
Lab	Backgroun	2/10/2012	BG-6D	Phenanthrene	127
Lab	Backgroun	2/10/2012	BG-6D	Pyrene	127
Lab	Backgroun	2/10/2012	BG-6D	Asbestos	127
Lab	Backgroun	2/10/2012	BG-6D	Aluminum	127
Lab	Backgroun	2/10/2012	BG-6D	Ammonia	127
Lab	Backgroun	2/10/2012	BG-6D	Antimony	127
Lab	Backgroun	2/10/2012	BG-6D	Beryllium	127
Lab	Backgroun	2/10/2012	BG-6D	Biphenyl	127
Lab	Backgroun	2/10/2012	BG-6D	Boron	127
Lab	Backgroun	2/10/2012	BG-6D	Calcium	127
Lab	Backgroun	2/10/2012	BG-6D	Chloride	127
Lab	Backgroun	2/10/2012	BG-6D	Chromium (total)	127
Lab	Backgroun	2/10/2012	BG-6D	Chromium (hexavalent)	127
Lab	Backgroun	2/10/2012	BG-6D	Cobalt	127
Lab	Backgroun	2/10/2012	BG-6D	Copper	127
Lab	Backgroun	2/10/2012	BG-6D	Fluoride	127
Lab	Backgroun	2/10/2012	BG-6D	Iron	127
Lab	Backgroun	2/10/2012	BG-6D	Magnesium	127
Lab	Backgroun	2/10/2012	BG-6D	Manganese	127
Lab	Backgroun	2/10/2012	BG-6D	Molybdenum	127
Lab	Backgroun	2/10/2012	BG-6D	Nickel	127
Lab	Backgroun	2/10/2012	BG-6D	Nitrate	127
Lab	Backgroun	2/10/2012	BG-6D	Potassium	127
Lab	Backgroun	2/10/2012	BG-6D	Silica	127
Lab	Backgroun	2/10/2012	BG-6D	Sodium	127
Lab	Backgroun	2/10/2012	BG-6D	Sulfate	127
Lab	Backgroun	2/10/2012	BG-6D	Thallium	127
Lab	Backgroun	2/10/2012	BG-6D	Phosphate as P	127
Lab	Backgroun	2/10/2012	BG-6D	Vanadium	127
Lab	Backgroun	2/10/2012	BG-6D	Zinc	127
Lab	Backgroun	2/10/2012	BG-6D	Benzo(b)fluoranthene	127
Lab	Backgroun	2/10/2012	BG-6D	Benzo(k)fluoranthene	127
Lab	Backgroun	2/10/2012	BG-6D	Titanium	127
Lab	Backgroun	2/10/2012	BG-6D	Naphthalene (PAH)	127
Lab	Backgroun	2/10/2012	BG-6D	Total Solids	127

EPA 6010B	BG-6D-98'	13	mg/kg	FALSE	0.59			Total chror	Chromium,	Metals	13
EPA 7199	BG-6D-98'		mg/kg	TRUE	2.4				Chromium,	Metals	1.2
EPA 6010B	BG-6D-98'	3.6	mg/kg	FALSE	0.59				Cobalt	Metals	3.6
EPA 6010B	BG-6D-98'	8.8	mg/kg	FALSE	1.2				Copper	Metals	8.8
EPA 300.0	BG-6D-98'	4	mg/kg	FALSE	1.2				Fluoride	General Chemistry	4
EPA 6010B	BG-6D-98'	10000	mg/kg	FALSE	5.9				Iron	Metals	10000
EPA 6010B	BG-6D-98'	6800	mg/kg	FALSE	5.9				Magnesiun	Metals	6800
EPA 6010B	BG-6D-98'	150	mg/kg	FALSE	0.59				Manganese	Metals	150
EPA 6010B	BG-6D-98'	0.35	mg/kg	FALSE	0.3				Molybdenu	Metals	0.35
EPA 6010B	BG-6D-98'	9.2	mg/kg	FALSE	1.2				Nickel	Metals	9.2
EPA 300.0	BG-6D-98'		mg/kg	TRUE	1.2	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.6
EPA 6010B	BG-6D-98'	3300	mg/kg	FALSE	30				Potassium	Metals	3300
EPA 6010B	BG-6D-98'	470	mg/kg	FALSE	130				Silica	Metals	470
EPA 6010B	BG-6D-98'	180	mg/kg	FALSE	30				Sodium	Metals	180
EPA 9056	BG-6D-98'	190	mg/kg	FALSE	59				Sulfate	General Chemistry	190
EPA 6010B	BG-6D-98'		mg/kg	TRUE	5.9	O	(ESC) Samp		Thallium	Metals	2.95
EPA 9056	BG-6D-98'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-6D-98'	21	mg/kg	FALSE	0.59				Vanadium	Metals	21
EPA 6010B	BG-6D-98'	30	mg/kg	FALSE	1.8				Zinc	Metals	30
EPA 8270C	BG-6D-98'		ug/kg	TRUE	7.1				Benzo(b)flu	PAHs	3.55
EPA 8270C	BG-6D-98'		ug/kg	TRUE	7.1				Benzo(k)flu	PAHs	3.55
EPA 6010B	BG-6D-98'	86	mg/kg	FALSE	0.59				Titanium	Metals	86
EPA 8270C	BG-6D-98'		ug/kg	TRUE	7.1				Naphthaler	PAHs	3.55
EPA 2540G	BG-6D-98'	84.7	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	84.7
EPA 6010B	BG-6D-114	17	mg/kg	FALSE	1.2				Arsenic	Metals	17
EPA 6010B	BG-6D-114	22	mg/kg	FALSE	0.3				Barium	Metals	22
EPA 6010B	BG-6D-114	0.12	mg/kg	FALSE	0.3	J	(EPA) - Esti		Cadmium	Metals	0.12
EPA 6010B	BG-6D-114	8.1	mg/kg	FALSE	0.3				Lead	Metals	8.1
EPA 7471A	BG-6D-114'		mg/kg	TRUE	0.024	J	(EPA) - Esti		Mercury	Metals	0.012
EPA 6010B	BG-6D-114'		mg/kg	TRUE	12	O	(ESC) Samp		Selenium	Metals	6
EPA 6010B	BG-6D-114'		mg/kg	TRUE	0.59				Silver	Metals	0.295
EPA 9045C	BG-6D-114	8.3	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.3
EPA 8270C	BG-6D-114'		ug/kg	TRUE	7.1				Acenaphth	PAHs	3.55
EPA 8270C	BG-6D-114'		ug/kg	TRUE	7.1				Anthracene	PAHs	3.55
EPA 8270C	BG-6D-114'		ug/kg	TRUE	7.1				Benzo(a)an	PAHs	3.55
EPA 8270C	BG-6D-114'		ug/kg	TRUE	7.1				Benzo(g,h,i	PAHs	3.55
EPA 8270C	BG-6D-114'		ug/kg	TRUE	7.1				Benzo(a)py	PAHs	3.55
EPA 8270C	BG-6D-114'		ug/kg	TRUE	390				Bis(2-ethyl	SVOC	195
EPA 8270C	BG-6D-114'		ug/kg	TRUE	7.1				Chrysene	PAHs	3.55
EPA 8270C	BG-6D-114'		ug/kg	TRUE	7.1				Fluoranthe	PAHs	3.55
EPA 8270C	BG-6D-114'		ug/kg	TRUE	7.1				Indeno(1,2	PAHs	3.55
EPA 8270C	BG-6D-114'		ug/kg	TRUE	7.1				Phenanthre	PAHs	3.55
EPA 8270C	BG-6D-114'		ug/kg	TRUE	7.1				Pyrene	PAHs	3.55
EPA 600-R-	BG-6D-114'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-6D-114	10000	mg/kg	FALSE	5.9				Aluminum	Metals	10000
SM4500-NI	BG-6D-114'		mg/kg	TRUE	5.9			Nitrogen, A	Ammonia	General Chemistry	2.95
EPA 6010B	BG-6D-114'		mg/kg	TRUE	1.2				Antimony	Metals	0.6
EPA 6010B	BG-6D-114	0.14	mg/kg	FALSE	0.12				Beryllium	Metals	0.14
EPA 8270C	BG-6D-114'		ug/kg	TRUE	390			1,1-Biphen	Biphenyl	SVOC	195
EPA 6010B	BG-6D-114	7	mg/kg	FALSE	12	J	(EPA) - Esti		Boron	Metals	7
EPA 6010B	BG-6D-114	52000	mg/kg	FALSE	30				Calcium	Metals	52000
EPA 9056	BG-6D-114	100	mg/kg	FALSE	12				Chloride	General Chemistry	100
EPA 6010B	BG-6D-114	12	mg/kg	FALSE	0.59			Total chror	Chromium,	Metals	12
EPA 7199	BG-6D-114'		mg/kg	TRUE	2.4				Chromium,	Metals	1.2
EPA 6010B	BG-6D-114	4.5	mg/kg	FALSE	0.59				Cobalt	Metals	4.5
EPA 6010B	BG-6D-114	9.8	mg/kg	FALSE	1.2				Copper	Metals	9.8
EPA 300.0	BG-6D-114	5.3	mg/kg	FALSE	1.2				Fluoride	General Chemistry	5.3
EPA 6010B	BG-6D-114	12000	mg/kg	FALSE	5.9				Iron	Metals	12000
EPA 6010B	BG-6D-114	13000	mg/kg	FALSE	5.9				Magnesiun	Metals	13000
EPA 6010B	BG-6D-114	190	mg/kg	FALSE	0.59				Manganese	Metals	190
EPA 6010B	BG-6D-114	0.34	mg/kg	FALSE	0.3				Molybdenu	Metals	0.34
EPA 6010B	BG-6D-114	10	mg/kg	FALSE	1.2				Nickel	Metals	10
EPA 300.0	BG-6D-114'		mg/kg	TRUE	1.2	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.6
EPA 6010B	BG-6D-114	2600	mg/kg	FALSE	30				Potassium	Metals	2600
EPA 6010B	BG-6D-114	650	mg/kg	FALSE	110				Silica	Metals	650
EPA 6010B	BG-6D-114	180	mg/kg	FALSE	30				Sodium	Metals	180
EPA 9056	BG-6D-114	250	mg/kg	FALSE	59				Sulfate	General Chemistry	250
EPA 6010B	BG-6D-114'		mg/kg	TRUE	5.9	O	(ESC) Samp		Thallium	Metals	2.95
EPA 9056	BG-6D-114'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-6D-114	22	mg/kg	FALSE	0.59				Vanadium	Metals	22
EPA 6010B	BG-6D-114	34	mg/kg	FALSE	1.8				Zinc	Metals	34
EPA 8270C	BG-6D-114'		ug/kg	TRUE	7.1				Benzo(b)flu	PAHs	3.55
EPA 8270C	BG-6D-114'		ug/kg	TRUE	7.1				Benzo(k)flu	PAHs	3.55
EPA 6010B	BG-6D-114	110	mg/kg	FALSE	0.59				Titanium	Metals	110
EPA 8270C	BG-6D-114'		ug/kg	TRUE	7.1				Naphthaler	PAHs	3.55
EPA 2540G	BG-6D-114	84.2	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	84.2
EPA 6010B	BG-6D-127	20	mg/kg	FALSE	1.2				Arsenic	Metals	20
EPA 6010B	BG-6D-127	32	mg/kg	FALSE	0.3				Barium	Metals	32
EPA 6010B	BG-6D-127	0.21	mg/kg	FALSE	0.3	J, P1	J-(EPA) - Es		Cadmium	Metals	0.21
EPA 6010B	BG-6D-127	13	mg/kg	FALSE	0.3				Lead	Metals	13
EPA 7471A	BG-6D-127'		mg/kg	TRUE	0.024	J	(EPA) - Esti		Mercury	Metals	0.012
EPA 6010B	BG-6D-127'		mg/kg	TRUE	1.2				Selenium	Metals	0.6
EPA 6010B	BG-6D-127'		mg/kg	TRUE	0.59				Silver	Metals	0.295
EPA 9045C	BG-6D-127	8.1	su	FALSE		T8	(ESC) - Add		pH	General Chemistry	8.1
EPA 8270C	BG-6D-127'		ug/kg	TRUE	7.1				Acenaphth	PAHs	3.55
EPA 8270C	BG-6D-127'		ug/kg	TRUE	7.1				Anthracene	PAHs	3.55
EPA 8270C	BG-6D-127'		ug/kg	TRUE	7.1				Benzo(a)an	PAHs	3.55
EPA 8270C	BG-6D-127'		ug/kg	TRUE	7.1				Benzo(g,h,i	PAHs	3.55
EPA 8270C	BG-6D-127'		ug/kg	TRUE	7.1				Benzo(a)py	PAHs	3.55
EPA 8270C	BG-6D-127'		ug/kg	TRUE	390				Bis(2-ethyl	SVOC	195
EPA 8270C	BG-6D-127'		ug/kg	TRUE	7.1				Chrysene	PAHs	3.55
EPA 8270C	BG-6D-127'		ug/kg	TRUE	7.1				Fluoranthe	PAHs	3.55
EPA 8270C	BG-6D-127'		ug/kg	TRUE	7.1				Indeno(1,2	PAHs	3.55
EPA 8270C	BG-6D-127'		ug/kg	TRUE	7.1				Phenanthre	PAHs	3.55
EPA 8270C	BG-6D-127'		ug/kg	TRUE	7.1				Pyrene	PAHs	3.55
EPA 600-R-	BG-6D-127'			TRUE	1				Asbestos	Asbestos	0.5
EPA 6010B	BG-6D-127	24000	mg/kg	FALSE	5.9	V	Additional		Aluminum	Metals	24000
SM4500-NI	BG-6D-127'		mg/kg	TRUE	5.9	J6	The sample	Nitrogen, A	Ammonia	General Chemistry	2.95
EPA 6010B	BG-6D-127'		mg/kg	TRUE	1.2	J6	The sample		Antimony	Metals	0.6
EPA 6010B	BG-6D-127	1.1	mg/kg	FALSE	0.12				Beryllium	Metals	1.1
EPA 8270C	BG-6D-127'		ug/kg	TRUE	390			1,1-Biphen	Biphenyl	SVOC	195
EPA 6010B	BG-6D-127	8.5	mg/kg	FALSE	12	J, P1	J-(EPA) - Es		Boron	Metals	8.5
EPA 6010B	BG-6D-127	46000	mg/kg	FALSE	30	V	Additional		Calcium	Metals	46000
EPA 9056	BG-6D-127	82	mg/kg	FALSE	12				Chloride	General Chemistry	82
EPA 6010B	BG-6D-127	26	mg/kg	FALSE	0.59			Total chror	Chromium,	Metals	26
EPA 7199	BG-6D-127'		mg/kg	TRUE	2.4				Chromium,	Metals	1.2
EPA 6010B	BG-6D-127	7.2	mg/kg	FALSE	0.59				Cobalt	Metals	7.2
EPA 6010B	BG-6D-127	18	mg/kg	FALSE	1.2				Copper	Metals	18
EPA 300.0	BG-6D-127	6.6	mg/kg	FALSE	1.2				Fluoride	General Chemistry	6.6
EPA 6010B	BG-6D-127	20000	mg/kg	FALSE	5.9	V	Additional		Iron	Metals	20000
EPA 6010B	BG-6D-127	11000	mg/kg	FALSE	5.9	V	Additional		Magnesiun	Metals	11000
EPA 6010B	BG-6D-127	210	mg/kg	FALSE	0.59	J6	The sample		Manganese	Metals	210
EPA 6010B	BG-6D-127	0.32	mg/kg	FALSE	0.3				Molybdenu	Metals	0.32
EPA 6010B	BG-6D-127	18	mg/kg	FALSE	1.2				Nickel	Metals	18
EPA 300.0	BG-6D-127'		mg/kg	TRUE	1.2	J	(EPA) - Esti	Nitrogen, N	Nitrate	General Chemistry	0.6
EPA 6010B	BG-6D-127	5400	mg/kg	FALSE	30	V	Additional		Potassium	Metals	5400
EPA 6010B	BG-6D-127	710	mg/kg	FALSE	120				Silica	Metals	710
EPA 6010B	BG-6D-127	300	mg/kg	FALSE	30				Sodium	Metals	300
EPA 9056	BG-6D-127	160	mg/kg	FALSE	59				Sulfate	General Chemistry	160
EPA 6010B	BG-6D-127'		mg/kg	TRUE	5.9	O	(ESC) Samp		Thallium	Metals	2.95
EPA 9056	BG-6D-127'		mg/kg	TRUE	1.2	B4	(ESC) - The		Phosphoro	General Chemistry	0.6
EPA 6010B	BG-6D-127	41	mg/kg	FALSE	0.59				Vanadium	Metals	41
EPA 6010B	BG-6D-127	64	mg/kg	FALSE	1.8				Zinc	Metals	64
EPA 8270C	BG-6D-127'		ug/kg	TRUE	7.1				Benzo(b)flu	PAHs	3.55
EPA 8270C	BG-6D-127'		ug/kg	TRUE	7.1				Benzo(k)flu	PAHs	3.55
EPA 6010B	BG-6D-127	44	mg/kg	FALSE	0.59	J6	The sample		Titanium	Metals	44
EPA 8270C	BG-6D-127'		ug/kg	TRUE	7.1				Naphthaler	PAHs	3.55
EPA 2540G	BG-6D-127	84.6	%	FALSE	0.1	T8	(ESC) - Add		Total Solids	General Chemistry	84.6

Table D-1 - Soil Chemical Analytical Results Summary

Soil Boring	BG-1D		BG-1D		BG-1D		BG-1D		BG-1D		BG-1D		BG-1D		BG-1D		BG-1D		BG-2D		BG-2D		BG-2D	
Date	1/9/2012		1/9/2012		1/9/2012		1/9/2012		1/9/2012		1/9/2012		1/9/2012		1/9/2012		1/9/2012		12/27/2011		12/27/2011		12/27/2011	
Sample Depth	0 - 2 ft		10 ft		29 ft		40 ft		43 ft		46 ft		55 ft		78 ft		92 ft		0 - 2 ft		10 ft		19 ft	
Parameter Name	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier
Asbestos																								
Asbestos	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-
General Chemistry (units listed below)																								
Nitrogen, Ammonia (as N) (mg/kg)	5.2	-	< 5	J6	< 5	-	< 5	-	10	-	< 5	-	< 5	-	< 5	-	< 5	-	< 5	-	< 5	-	< 5	-
Chloride (mg/kg)	2200	-	490	-	89	-	65	-	210	-	67	-	81	-	66	-	77	-	8.2	J	25	-	7.6	J
Fluoride (mg/kg)	6.1	-	4.4	-	11	-	4.2	-	14	-	4.9	-	3.0	-	7.0	-	3.5	-	2.1	-	4.1	-	2.7	-
Nitrogen, Nitrate (as N) (mg/kg)	0.40	J	0.30	J	0.33	J	0.32	J	0.55	J	< 1	-	< 1	-	< 1	-	< 1	-	1.3	-	0.54	J	< 1	-
pH	8.7	T8	8.6	T8	8.2	T8	9.1	T8	8.2	T8	8.6	T8	8.7	T8	8.2	T8	8.1	T8	8.4	T8	8.2	T8	8.0	T8
Phosphate as P (mg/kg)	< 1	-	0.40	J	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	0.72	J	0.41	J	< 1	-
Sulfate (mg/kg)	6400	-	1700	-	170	-	58	-	140	-	88	-	120	-	120	-	110	-	62	-	220	-	16,000	-
Metals (mg/kg)																								
Aluminum	**17,000**	-	**6400**	V	**8600**	-	**2800**	-	**22,000**	-	**5600**	-	**1900**	-	**15,000**	-	**3100**	-	**4600**	-	**3500**	-	**5400**	-
Antimony	< 1	-	< 1	J6	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 10	O
Arsenic	**3.6**	-	**1.0**	P1	< 1	-	**0.97**	J	**9.1**	-	**1.8**	-	**4.0**	-	**2.6**	-	**3.4**	-	**6.5**	-	**6.0**	-	**56**	-
Barium	37	-	37	J3	34	-	22	-	23	-	**140**	-	7.8	-	**200**	-	**92**	-	44	-	40	-	**190**	-
Beryllium	0.050	J	< 0.5	O	< 0.5	O	< 0.5	O	1.1	-	0.13	-	< 0.1	-	0.59	-	0.058	J	< 0.5	O	< 0.5	O	< 1	O
Boron	**30**	-	6.5	J, P1	3.3	J	< 10	-	**16**	-	**11**	-	1.2	J	**16**	J	3.1	J	9.3	J	8.5	J	**13**	-
Cadmium	< 0.25	-	< 0.25	-	< 0.25	-	< 0.25	-	< 0.25	-	< 0.25	-	< 0.25	-	< 0.25	-	< 0.25	-	< 0.25	-	< 0.25	-	0.11	J
Calcium	100,000	-	79,000	V	48,000	-	140,000	-	31,000	-	46,000	-	38,000	-	71,000	-	26,000	-	23,000	-	19,000	-	160,000	-
Chromium (hexavalent)	< 2	-	**1.1**	J	**0.92**	J	< 2	-	< 2	-	< 2	-	< 2	-	< 2	-	**1.4**	J	< 2	-	< 2	-	< 2	-
Chromium (total)	13	-	5.5	-	7.5	-	3.2	-	20	-	5.3	-	2.8	-	15	-	5.3	-	5.3	-	4.6	-	8.8	-
Cobalt	**4.9**	-	**2.6**	-	**2.7**	-	**0.89**	-	**5.9**	-	**1.8**	-	**1.2**	-	**4.7**	-	**1.2**	-	**2.0**	-	**1.9**	-	**1.6**	-
Copper	11	-	4.2	-	5.8	-	2.9	-	12	-	3.3	-	2.1	-	20	-	2.7	-	2.5	-	1.9	-	3.2	-
Iron	**12,000**	-	**6500**	V	**8000**	-	**3800**	-	**17,000**	-	**4500**	-	**3600**	-	**10,000**	-	**3800**	-	**5800**	-	**5300**	-	**5400**	-
Lead	6.8	-	3.8	-	4.3	-	0.76	-	11	-	3.1	-	2.7	-	7.8	-	2.4	-	3.9	-	3.4	-	8.7	-
Magnesium	**19,000**	-	**13,000**	V	**11,000**	-	**30,000**	-	**10,000**	-	**5500**	-	**6000**	-	**11,000**	-	**3600**	-	**4000**	-	**3100**	-	**9200**	-
Manganese	**270**	-	**140**	J6	**110**	-	**68**	-	**160**	-	**300**	-	**240**	-	**450**	-	**130**	-	**100**	-	**85**	-	**90**	-
Mercury	0.012	J	0.0050	J	0.0093	J	0.0068	J	0.0091	J	0.0018	J	< 0.02	-	**0.036**	-	< 0.02	-	0.0028	J	< 0.02	-	0.0047	J
Molybdenum	0.39	-	0.41	P1	< 0.25	-	0.61	-	< 1.3	O	< 0.25	-	0.18	J	< 0.25	J	0.24	J	0.62	-	0.63	-	**8.7**	-
Nickel	**14**	-	5.9	P1	6.5	-	< 5	O	**20**	-	4.1	-	2.7	-	**12**	-	3.3	-	2.6	-	2.2	-	4.7	J
Potassium	5100	-	2000	V	2400	-	670	-	6700	-	2100	-	620	-	4400	-	1000	-	1800	-	1300	-	2100	-
Selenium	**0.71**	J	**0.66**	J, P1	< 1	-	< 1	-	**1.4**	-	< 1	-	< 1	-	**1.0**	-	< 1	-	< 1	-	< 1	-	< 10	O
Silica	830	-	740	-	720	-	550	-	1300	-	760	-	750	-	940	-	850	-	600	-	530	-	570	-
Silver	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	0.25	J	0.20	J	< 0.5	-
Sodium	6100	-	2300	V	370	-	350	-	440	-	130	-	110	-	250	-	100	-	160	-	220	-	260	-
Thallium	< 5	O	< 5	O	< 5	O	**1.6**	-	< 5	O	< 5	O	< 5	O	< 5	O	< 1	-	< 1	-	< 1	-	< 10	O
Titanium	260	-	300	-	280	-	160	-	21	-	34	-	36	-	59	-	26	-	180	-	170	-	190	-
Vanadium	23	-	13	-	18	-	8.1	-	27	-	8.5	-	7.4	-	27	-	6.7	-	12	-	12	-	14	-
Zinc	78	-	52	-	41	-	63	-	64	-	31	-	23	-	69	-	19	-	13	-	11	-	16	-
PAHs (ug/kg)																								
Acenaphthene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-
Anthracene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-
Benzo(a)anthracene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-
Benzo(a)pyrene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-
Benzo(b)fluoranthene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-
Benzo(g,h,i)perylene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-
Benzo(k)fluoranthene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-
Chrysene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-
Fluoranthene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-
Indeno(1,2,3-cd)pyrene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-
Naphthalene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-
Phenanthrene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-
Pyrene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-
SVOC (ug/kg)																								
Biphenyl	< 330	-	< 330	-	< 330	-	< 330	-	< 330	-	< 330	-	< 330	-	< 330	-	< 330	-	< 330	-	< 330	-	< 330	-
Bis(2-ethylhexyl)phthalate	**21**	J	< 330	-	< 330	-	< 330	-	< 330	-	< 330	-	540	-	< 330	-	< 330	-	< 330	-	< 330	-	< 330	-

Notes:

NA - Not Applicable, ND - Non-detect

Results that exceed a screening level are in **bold**.

Laboratory Qualifiers

B4 = The indicated compound was found in the associated instrument blank, but all reported samples were non-detect

J = Estimated value below the lowest calibration point.

J3 = The associatedbatch QC was outside the established quality control range for precision

J6 = The sample matrix interfered with the ability to make any accurate getermination; spike value is low

O = Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution.

P1 = RPD value not applicable for sample concentrations less than 5 times the reporting limit

T8 = Additional method/sample information - samples received past/ too close to holding time.

Table D-1 - Soil Chemical Analytical Results Summary

Soil Boring	BG-2D		BG-2D		BG-2D		BG-2D		BG-2D		BG-3D		BG-3D		BG-3D		BG-3D		BG-3D		BG-3D		BG-3D	
Date	12/27/2011		12/27/2011		12/27/2011		12/27/2011		12/27/2011		2/28/2012		2/28/2012		2/28/2012		2/28/2012		2/28/2012		2/28/2012		2/28/2012	
Sample Depth	21 ft		30 ft		32 ft		75 ft		81 ft		0 - 2 ft		10 ft		17 ft		22 ft		29 ft		63 ft		65 ft	
Parameter Name	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier
Asbestos																								
Asbestos	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-
General Chemistry (units listed below)																								
Nitrogen, Ammonia (as N) (mg/kg)	< 5	-	7.1	-	< 5	-	< 5	-	7.2	P1	2.6	J	3.0	J	3.2	J	2.3	J	2.4	J	2.8	J	3.8	J
Chloride (mg/kg)	18	-	9.4	J	14	-	< 10	-	75	-	110	-	1900	-	120	-	62	-	120	-	88	-	69	-
Fluoride (mg/kg)	4.4	-	13	-	6.2	-	7.6	-	18	-	7.6	-	12	-	5.4	-	4.2	-	3.7	-	5.0	-	5.3	-
Nitrogen, Nitrate (as N) (mg/kg)	< 1	-	< 1	-	< 1	-	< 1	-	0.56	J	4.8	-	0.71	J	0.36	J	0.31	J	0.61	J	0.28	J	< 1.2	-
pH	7.8	T8	9.0	T8	8.0	T8	8.2	-	8.9	J3	8.0	T8	8.0	T8	9.1	T8	8.8	T8	9.1	T8	8.5	T8	8.5	T8
Phosphate as P (mg/kg)	< 1	-	0.72	J	< 1	-	< 1	-	< 1	-	< 1	B4	0.69	J	0.60	J, P1	< 1	B4	< 1	B4	< 1.2	B4	< 1.2	B4
Sulfate (mg/kg)	16,000	-	350	-	410	-	320	-	190	-	10,000	-	2300	-	480	-	650	J3	160	-	160	-	120	-
Metals (mg/kg)																								
Aluminum	**4800**	-	**18,000**	-	**5700**	-	**3600**	-	**18,000**	-	**4500**	-	**10,000**	-	**3900**	-	**3300**	-	**3700**	-	**4300**	-	**6800**	-
Antimony	< 1	-	< 1	-	< 1	-	< 1	-	< 5	O	< 1	-	< 1.1	-	< 1	-	< 1	-	< 1	-	< 1.2	-	**0.58**	J
Arsenic	**140**	-	**10**	-	**8.9**	-	**68**	-	**6.7**	-	**20**	-	**40**	-	**15**	-	**8.5**	J	**12**	-	**15**	-	**27**	-
Barium	35	-	34	-	12	-	6.9	-	26	-	**140**	-	67	-	**200**	-	**220**	-	**85**	-	**84**	-	76	-
Beryllium	< 0.5	O	0.33	-	< 0.5	O	0.13	-	0.87	-	0.022	J	0.28	-	0.078	J	0.032	J	0.055	J	0.19	-	0.17	-
Boron	**13**	-	**25**	-	**10**	-	9.3	J	**29**	-	6.6	J	8.1	J	6.4	J	5.3	J	3.5	J	**12**	J	**11**	J
Cadmium	< 0.25	-	< 0.25	-	< 0.25	-	< 0.25	-	**0.46**	-	0.16	J	0.070	J	0.057	J	**0.48**	-	< 0.25	-	< 0.31	-	0.052	J
Calcium	42,000	-	17,000	-	4000	-	19,000	-	57,000	-	100,000	-	70,000	-	76,000	-	150,000	-	36,000	-	25,000	-	38,000	-
Chromium (hexavalent)	< 2	-	< 2	-	< 2	-	< 2	-	< 2	-	**1.3**	J	**1.4**	J, P1	< 2.1	-	**1.2**	J	< 2	-	< 2.5	-	**1.8**	J
Chromium (total)	5.1	-	15	-	6.1	-	4.4	-	17	-	5.1	-	14	-	4.8	-	5.0	-	4.5	-	5.0	-	8.4	-
Cobalt	**1.4**	-	**6.9**	-	**2.2**	-	**1.6**	-	**4.3**	-	**1.6**	-	**3.9**	-	**1.8**	-	**1.3**	-	**1.6**	-	**1.8**	-	**3.9**	-
Copper	1.2	-	16	-	2.9	-	3.0	-	22	-	3.0	-	9.3	-	4.4	-	3.0	-	3.5	-	4.3	-	7.1	-
Iron	**10,000**	-	**17,000**	-	**6300**	-	**6800**	-	**18,000**	-	**4400**	-	**11,000**	-	**4900**	-	**3200**	-	**4700**	-	**5500**	-	**9400**	-
Lead	4.3	-	11	-	3.5	-	3.2	-	**16**	-	5.9	-	5.5	-	4.0	-	6.6	-	3.6	-	3.8	-	5.5	-
Magnesium	**6200**	-	**15,000**	-	**3900**	-	**4400**	-	**14,000**	-	**2600**	-	**3700**	-	**1600**	-	**1400**	-	**1300**	-	**1500**	-	**2800**	-
Manganese	**520**	-	**270**	-	**63**	-	**69**	-	**250**	-	**200**	-	**180**	-	**160**	-	**1200**	-	**75**	-	**69**	-	**130**	-
Mercury	0.0021	J	0.020	-	0.0017	J	< 0.02	-	**0.36**	-	0.0026	J	0.0041	J	0.0034	J	0.0048	J	0.0039	J	< 0.025	-	0.0025	J
Molybdenum	**12**	-	**10**	-	1.5	-	**3.7**	-	**3.8**	-	1.6	-	**2.6**	-	**1.7**	-	**2.6**	-	0.39	-	0.62	-	0.57	-
Nickel	2.0	-	**24**	-	3.2	-	3.6	-	**16**	-	4.0	J	**11**	-	4.2	J	< 10	O	3.4	-	4.0	-	**8.3**	-
Potassium	2000	-	6800	-	2200	-	1400	-	6600	-	1100	-	2200	-	1000	-	930	-	940	-	1200	-	1700	-
Selenium	< 5	O	< 5	O	< 1	-	< 1	-	**11**	-	< 10	O	< 5.4	O	< 5.2	O	< 10	O	< 5.1	O	< 1.2	-	< 2.4	O
Silica	520	-	1100	-	630	-	700	-	1100	-	520	-	730	-	460	-	520	-	470	-	790	-	820	-
Silver	0.48	J	**0.79**	-	0.31	J	0.43	J	< 0.5	-	< 0.51	-	< 0.54	-	< 0.52	-	< 0.51	-	< 0.51	-	< 0.63	-	< 0.59	-
Sodium	330	-	520	-	180	-	72	-	230	-	240	-	980	-	390	-	250	-	320	-	99	-	150	-
Thallium	< 5	O	< 5	O	< 1	-	< 1	-	< 5	O	< 5.1	O	< 5.4	O	< 5.2	O	< 51	O	< 5.1	O	< 1.2	-	< 2.4	O
Titanium	160	-	150	-	210	-	35	-	84	-	56	-	85	-	44	-	30	-	42	-	34	-	75	-
Vanadium	12	-	25	-	14	-	7.4	-	27	-	9.4	-	19	-	9.9	-	6.6	-	8.7	-	8.4	-	14	-
Zinc	13	-	49	-	16	-	13	-	62	-	12	-	31	-	15	-	9.8	-	13	-	16	-	30	-
PAHs (ug/kg)																								
Acenaphthene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6.1	-	< 6.5	-	< 6.3	-	< 6.1	-	< 6.1	-	< 7.5	-	< 7.1	-
Anthracene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6.1	-	< 6.5	-	< 6.3	-	< 6.1	-	< 6.1	-	< 7.5	-	< 7.1	-
Benzo(a)anthracene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6.1	-	< 6.5	-	< 6.3	-	< 6.1	-	< 6.1	-	< 7.5	-	< 7.1	-
Benzo(a)pyrene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6.1	-	< 6.5	-	< 6.3	-	< 6.1	-	< 6.1	-	< 7.5	-	< 7.1	-
Benzo(b)fluoranthene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6.1	-	< 6.5	-	< 6.3	-	< 6.1	-	< 6.1	-	< 7.5	-	< 7.1	-
Benzo(g,h,i)perylene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6.1	-	< 6.5	-	< 6.3	-	< 6.1	-	< 6.1	-	< 7.5	-	< 7.1	-
Benzo(k)fluoranthene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6.1	-	< 6.5	-	< 6.3	-	< 6.1	-	< 6.1	-	< 7.5	-	< 7.1	-
Chrysene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6.1	-	< 6.5	-	< 6.3	-	< 6.1	-	< 6.1	-	< 7.5	-	< 7.1	-
Fluoranthene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6.1	-	< 6.5	-	< 6.3	-	< 6.1	-	< 6.1	-	< 7.5	-	< 7.1	-
Indeno(1,2,3-cd)pyrene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6.1	-	< 6.5	-	< 6.3	-	< 6.1	-	< 6.1	-	< 7.5	-	< 7.1	-
Naphthalene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6.1	-	< 6.5	-	< 6.3	-	< 6.1	-	< 6.1	-	< 7.5	-	< 7.1	-
Phenanthrene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6.1	-	< 6.5	-	< 6.3	-	< 6.1	-	< 6.1	-	< 7.5	-	< 7.1	-
Pyrene	< 6	-	< 6	-	< 6	-	< 6	-	< 6	-	< 6.1	-	< 6.5	-	< 6.3	-	< 6.1	-	< 6.1	-	< 7.5	-	< 7.1	-
SVOC (ug/kg)																								
Biphenyl	< 330	-	< 330	-	< 330	-	< 330	-	< 330	J3	< 340	-	< 360	-	< 350	-	< 340	-	< 340	-	< 420	-	< 400	-
Bis(2-ethylhexyl)phthalate	< 330	-	< 330	-	< 330	-	< 330	-	< 330	J3	< 340	-	< 360	-	< 350	-	< 340	-	< 340	-	< 420	-	< 400	-

Table D-1 - Soil Chemical Analytical Results Summary

Soil Boring	BG-3D		BG-3D		BG-3D		BG-3D		BG-3D		BG-4D		BG-4D		BG-4D		BG-4D		BG-4D		BG-4D		BG-4D	
Date	2/28/2012		2/28/2012		2/28/2012		2/28/2012		2/28/2012		1/26/2012		1/26/2012		1/26/2012		1/26/2012		1/26/2012		1/26/2012		1/26/2012	
Sample Depth	69 ft		95 ft		105 ft		131 ft		136 ft		0 - 2 ft		10 ft		19 ft		40 ft		65 ft		79 ft		82 ft	
Parameter Name	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier
Asbestos																								
Asbestos	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-
General Chemistry (units listed below)																								
Nitrogen, Ammonia (as N) (mg/kg)	4.1	J, P1	2.8	J	4.8	J	2.8	J	5.0	J	< 5.3	-	< 5.4	J6	< 5.9	-	< 5.8	-	< 5.1	-	< 5.9	-	< 6	-
Chloride (mg/kg)	59	-	60	-	66	-	55	-	69	-	3800	-	310	-	340	-	180	-	52	-	120	-	110	-
Fluoride (mg/kg)	9.4	-	5.4	-	10	-	3.8	-	16	-	3.7	-	7.0	-	7.6	-	9.5	-	2.9	-	6.3	-	4.6	-
Nitrogen, Nitrate (as N) (mg/kg)	< 1.1	-	0.47	J	0.31	J	0.25	J	< 1.2	-	**25**	-	< 1.1	J	< 1.2	J	< 1.2	J	< 1	J	< 1	J	< 1.2	J
pH	8.6	T8	8.5	T8	8.6	T8	8.8	T8	8.8	T8	8.6	-	8.7	-	8.2	-	8.4	-	8.8	-	8.4	-	8.4	-
Phosphate as P (mg/kg)	0.38	J, P1	< 1.1	B4	< 1.2	B4	< 1.1	B4	< 1.2	B4	< 1	-	< 1.1	B4	< 1.2	B4	< 1.2	B4	< 1	B4	< 1.2	B4	< 1.2	B4
Sulfate (mg/kg)	110	-	95	-	110	-	63	-	95	-	8100	-	230	-	250	-	72	-	< 51	J	140	J	200	-
Metals (mg/kg)																								
Aluminum	**11,000**	V	**2900**	-	**9600**	-	**2300**	-	**19,000**	V	**10,000**	-	**12,000**	-	**28,000**	-	**21,000**	-	**3900**	V,J3	**16,000**	-	**8200**	-
Antimony	< 1.1	J6	< 1.1	-	< 1.2	-	< 1.1	-	< 1.2	J6	< 1	-	< 1.1	-	< 1.2	-	< 1.2	-	< 1	J6	< 1.2	-	< 1.2	-
Arsenic	**41**	J3	**13**	-	**35**	-	**9.1**	J	**66**	J6	**12**	-	**15**	-	**24**	-	**12**	-	**6.7**	-	**18**	-	**17**	-
Barium	66	J3	55	-	**120**	-	**97**	-	33	-	16	-	24	-	36	-	**93**	-	9.9	-	29	-	18	-
Beryllium	0.59	-	< 0.11	-	0.20	-	0.046	J	0.58	-	0.46	-	0.46	-	1.6	-	1.0	-	0.11	P1	0.69	-	< 0.12	-
Boron	**14**	-	2.4	J	6.8	J	3.4	J	**12**	-	**24**	-	**13**	-	**28**	-	**28**	-	7.0	J,P1	**19**	-	**12**	J
Cadmium	0.11	J, P1	< 0.29	-	< 0.3	-	0.23	J	< 0.3	-	0.061	J	0.080	J	0.18	J	0.13	J	0.043	J,P1	0.22	J	0.092	J
Calcium	55,000	V	29,000	-	32,000	-	120,000	-	48,000	V	35,000	-	46,000	-	47,000	-	57,000	-	30,000	V	70,000	-	50,000	-
Chromium (hexavalent)	< 2.3	-	< 2.3	-	< 2.4	-	< 2.2	-	**1.0**	J, P1	< 2.1	-	< 2.2	-	< 2.4	J	< 2.3	-	< 2	-	< 2.3	-	< 2.4	-
Chromium (total)	15	-	4.6	-	12	-	2.6	-	20	-	12	-	14	-	32	-	23	-	5.5	-	19	-	10	-
Cobalt	**4.8**	-	**1.4**	-	**4.1**	-	**1.0**	-	**7.9**	-	**3.8**	-	**5.3**	-	**8.4**	-	**6.1**	-	**1.6**	-	**6.6**	-	**4.0**	-
Copper	11	-	2.5	-	7.3	-	2.2	-	17	-	8.3	-	11	-	20	-	14	-	3.2	-	14	-	8.4	-
Iron	**14,000**	V	**4000**	-	**11,000**	-	**3100**	-	**19,000**	V	**9900**	-	**13,000**	-	**24,000**	-	**17,000**	-	**4800**	V	**15,000**	V	**10,000**	-
Lead	8.1	-	3.1	-	5.4	-	5.3	-	11	-	6.4	-	9.4	-	14	-	12	-	4.0	-	11	-	7.3	-
Magnesium	**4300**	V	950	-	**3100**	-	970	-	**6300**	V	**8100**	-	**12,000**	-	**13,000**	-	**11,000**	-	**5300**	V	**13,000**	-	**12,000**	-
Manganese	**170**	-	**69**	-	**110**	-	**500**	-	**180**	J6	**130**	-	**200**	-	**260**	-	**260**	-	**90**	-	**360**	-	**190**	-
Mercury	0.0055	J	0.0017	J	0.0032	J	0.0010	J	0.0048	J	< 0.021	-	< 0.022	J	< 0.024	J	< 0.023	J	< 0.02	J	< 0.02	J	< 0.024	J
Molybdenum	**2.0**	-	0.48	-	0.47	-	**2.3**	J	0.40	-	0.44	-	0.38	-	0.24	J	0.34	J	0.32	J	0.27	J	0.43	-
Nickel	**14**	-	2.6	-	**8.7**	-	< 11	O	**19**	-	**9.0**	-	**11**	-	**22**	-	**17**	-	3.4	-	**15**	-	**8.0**	-
Potassium	2800	V	770	-	2400	-	740	-	4500	V	3100	-	3100	-	7500	-	6300	-	1200	V	4900	-	2800	-
Selenium	< 5.7	O	< 2.3	O	< 1.2	-	< 11	O	< 1.2	-	< 5.3	O	< 5.4	O	< 5.9	O	< 5.8	O	< 5.1	O,J6	< 5.9	O	< 12	O
Silica	940	-	720	-	840	-	520	-	950	-	670	-	810	-	840	-	830	-	480	-	730	-	770	-
Silver	< 0.57	-	< 0.57	-	< 0.59	-	< 0.55	-	< 0.6	-	< 0.53	-	< 0.54	-	< 0.59	-	< 0.58	-	< 0.51	-	< 0.59	-	< 0.6	-
Sodium	300	-	150	-	280	-	77	-	290	-	5400	-	1200	-	740	-	390	-	60	-	220	-	170	-
Thallium	< 5.7	O	< 2.3	O	< 2.4	O	< 11	O	< 6	O	< 5.3	O	< 5.4	O	< 5.9	O	< 5.8	O	< 5.1	O	< 5.9	O	< 6	O
Titanium	63	J5, J3	44	-	85	-	23	-	120	J6, J3	62	-	84	-	56	-	88	-	40	-	110	-	140	-
Vanadium	18	-	6.6	-	18	-	5.1	-	31	-	19	-	25	-	46	-	35	-	9.6	-	32	-	20	-
Zinc	39	-	9.6	-	30	-	7.7	-	57	-	30	-	39	-	73	-	52	-	13	-	52	-	29	-
PAHs (ug/kg)																								
Acenaphthene	< 6.8	-	< 6.9	-	< 7.1	-	< 6.6	-	< 7.2	-	< 6.3	Q	< 6.5	Q	< 7.1	Q	< 7	Q	< 6.2	Q	< 7	-	< 7.2	-
Anthracene	< 6.8	-	< 6.9	-	< 7.1	-	< 6.6	-	< 7.2	-	< 6.3	Q	< 6.5	Q	< 7.1	Q	< 7	Q	< 6.2	Q	< 7	-	< 7.2	-
Benzo(a)anthracene	< 6.8	-	< 6.9	-	< 7.1	-	< 6.6	-	< 7.2	-	< 6.3	Q	< 6.5	Q	< 7.1	Q	< 7	Q	< 6.2	Q	< 7	-	< 7.2	-
Benzo(a)pyrene	< 6.8	-	< 6.9	-	< 7.1	-	< 6.6	-	< 7.2	-	< 6.3	Q	< 6.5	Q	< 7.1	Q	< 7	Q	< 6.2	Q	< 7	-	< 7.2	-
Benzo(b)fluoranthene	< 6.8	-	< 6.9	-	< 7.1	-	< 6.6	-	< 7.2	-	< 6.3	Q	< 6.5	Q	< 7.1	Q	< 7	Q	< 6.2	Q	< 7	-	< 7.2	-
Benzo(g,h,i)perylene	< 6.8	-	< 6.9	-	< 7.1	-	< 6.6	-	< 7.2	-	< 6.3	Q	< 6.5	Q	< 7.1	Q	< 7	Q	< 6.2	Q	< 7	-	< 7.2	-
Benzo(k)fluoranthene	< 6.8	-	< 6.9	-	< 7.1	-	< 6.6	-	< 7.2	-	< 6.3	Q	< 6.5	Q	< 7.1	Q	< 7	Q	< 6.2	Q	< 7	-	< 7.2	-
Chrysene	< 6.8	-	< 6.9	-	< 7.1	-	< 6.6	-	< 7.2	-	< 6.3	Q	< 6.5	Q	< 7.1	Q	< 7	Q	< 6.2	Q	< 7	-	< 7.2	-
Fluoranthene	< 6.8	-	< 6.9	-	< 7.1	-	< 6.6	-	< 7.2	-	< 6.3	Q	< 6.5	Q	< 7.1	Q	< 7	Q	< 6.2	Q	< 7	-	< 7.2	-
Indeno(1,2,3-cd)pyrene	< 6.8	-	< 6.9	-	< 7.1	-	< 6.6	-	< 7.2	-	< 6.3	Q	< 6.5	Q	< 7.1	Q	< 7	Q	< 6.2	Q	< 7	-	< 7.2	-
Naphthalene	< 6.8	-	< 6.9	-	< 7.1	-	< 6.6	-	< 7.2	-	< 6.3	Q	< 6.5	Q	< 7.1	Q	< 7	Q	< 6.2	Q	< 7	-	< 7.2	-
Phenanthrene	< 6.8	-	< 6.9	-	< 7.1	-	< 6.6	-	< 7.2	-	< 6.3	Q	< 6.5	Q	< 7.1	Q	< 7	Q	< 6.2	Q	< 7	-	< 7.2	-
Pyrene	< 6.8	-	< 6.9	-	< 7.1	-	< 6.6	-	< 7.2	-	< 6.3	Q	< 6.5	Q	< 7.1	Q	< 7	Q	< 6.2	Q	< 7	-	< 7.2	-
SVOC (ug/kg)																								
Biphenyl	< 380	-	< 380	-	< 390	-	< 370	-	< 400	-	< 350	-	< 360	-	< 390	-	< 380	-	< 340	-	< 390	-	< 400	-
Bis(2-ethylhexyl)phthalate	17	J	< 380	-	< 390	-	< 370	-	< 400	-	< 350	-	< 360	-	< 390	-	< 380	-	< 340	-	< 390	-	< 400	-

Table D-1 - Soil Chemical Analytical Results Summary

Soil Boring	BG-4D		BG-4D		BG-4D		BG-4D		BG-4D		BG-6D		BG-6D		BG-6D		BG-6D		BG-6D		BG-6D		BG-6D	
Date	1/26/2012		1/26/2012		1/26/2012		1/26/2012		1/26/2012		2/10/2012		2/10/2012		2/10/2012		2/10/2012		2/10/2012		2/10/2012		2/10/2012	
Sample Depth	95 ft		117 ft		120 ft		161 ft		163 ft		0 - 2 ft		9 ft		28 ft		53 ft		58 ft		75 ft		87 ft	
Parameter Name	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier
Asbestos																								
Asbestos	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-	< 1	-
General Chemistry (units listed below)																								
Nitrogen, Ammonia (as N) (mg/kg)	< 6.1	-	< 5.9	-	< 6	-	< 6	-	< 5.9	-	< 5.1	-	< 5.1	-	17	-	10	-	< 6	-	< 5.9	-	< 6.2	-
Chloride (mg/kg)	110	-	140	-	140	-	98	-	80	-	190	-	240	-	170	-	110	-	120	-	110	-	110	-
Fluoride (mg/kg)	2.6	-	2.5	-	9.4	-	4.3	-	9.4	-	4.8	-	3.3	-	12	-	6.6	-	5.2	-	3.8	-	10	-
Nitrogen, Nitrate (as N) (mg/kg)	< 1.2	J	< 1.2	-	< 1.2	J	< 1.2	J	< 1.2	J	**150**	-	**25**	-	1.2	-	< 1.2	J	< 1.2	J	< 1.2	J	< 1.2	J
pH	8.7	-	8.4	-	8.6	-	8.5	-	8.5	-	8.6	-	9.2	-	8.9	-	9.1	-	8.9	-	8.5	T8	8.3	T8
Phosphate as P (mg/kg)	< 1.2	B4	< 1.2	B4	< 1.2	B4	< 1.2	B4	< 1.2	B4	< 1	B4	< 1	B4	< 1.2	B4	< 1.2	B4	< 1.2	B4	< 1.2	B4	< 1.2	B4
Sulfate (mg/kg)	200	-	300	-	210	-	160	-	130	-	820	-	83	-	750	-	290	-	300	-	270	-	190	-
Metals (mg/kg)																								
Aluminum	**3300**	-	**1500**	-	**15,000**	-	**8300**	-	**13,000**	-	**7800**	-	**5000**	-	**17,000**	-	**12,000**	-	**4500**	-	**4500**	-	**32,000**	-
Antimony	< 1.2	-	**1.3**	-	< 1.2	-	< 1.2	-	< 1.2	-	< 1	-	< 1	-	< 1.2	-	< 1.2	-	< 1.2	-	< 1.2	-	< 1.2	-
Arsenic	**6.4**	-	**5.7**	-	**19**	-	**11**	-	**16**	-	**9.3**	-	**6.1**	-	**16**	-	**13**	-	**6.3**	-	**8.4**	-	**16**	-
Barium	20	-	58	-	21	-	**250**	-	26	-	**100**	-	32	-	41	-	24	-	17	-	**150**	-	39	-
Beryllium	0.057	J	< 0.12	-	0.79	-	0.29	-	0.48	-	< 0.51	O	< 0.51	O	0.81	-	0.29	-	0.11	J	0.046	J	1.6	-
Boron	5.5	J	2.8	J	**12**	-	8.3	J	**10**	J	8.8	J	5.5	J	**20**	-	**10**	J	5.1	J	2.6	J	8.2	J
Cadmium	< 0.3	-	0.057	J	0.083	J	0.14	J	0.32	-	< 0.26	-	0.052	J	0.049	J	0.098	J	0.070	J	0.15	J	0.31	J
Calcium	30,000	-	25,000	-	39,000	-	52,000	-	90,000	-	96,000	-	38,000	-	44,000	-	49,000	-	25,000	-	54,000	-	51,000	-
Chromium (hexavalent)	< 2.4	-	< 2.4	-	< 2.4	J	< 2.4	-	< 2.3	-	< 2	-	< 2	-	< 2.3	-	< 2.4	-	< 2.4	J	< 2.4	-	< 2.5	-
Chromium (total)	4.2	-	2.8	-	18	-	10	-	16	-	8.3	-	6.0	-	21	-	14	-	6.4	-	6.1	-	38	-
Cobalt	**1.2**	-	**0.89**	-	**5.2**	-	**2.9**	-	**4.8**	-	**3.1**	-	**1.8**	-	**6.5**	-	**4.7**	-	**1.7**	-	**2.0**	-	**9.4**	-
Copper	2.6	-	1.9	-	12	-	7.0	-	13	-	4.8	-	2.6	-	13	-	10	-	3.8	-	4.6	-	**26**	-
Iron	**3800**	-	**2800**	-	**13,000**	-	**8200**	-	**12,000**	-	**7300**	-	**6400**	-	**15,000**	-	**12,000**	-	**4800**	-	**5900**	-	**26,000**	-
Lead	3.3	-	2.7	-	8.6	-	6.7	-	11	-	7.7	-	3.6	-	10	-	8.2	-	3.6	-	5.7	-	**18**	-
Magnesium	**5500**	-	**4500**	-	**9500**	-	**7800**	-	**13,000**	-	**8500**	-	**9900**	-	**9700**	-	**12,000**	-	**4000**	-	**6800**	-	**12,000**	-
Manganese	**79**	-	**73**	-	**170**	-	**290**	-	**360**	-	**140**	-	**140**	-	**210**	-	**190**	-	**99**	-	**270**	-	**260**	-
Mercury	< 0.024	J	< 0.024	J	< 0.024	J	< 0.024	J	< 0.023	J	< 0.02	-	< 0.02	J	< 0.023	J	< 0.024	J	< 0.024	J	< 0.024	J	< 0.025	J
Molybdenum	0.34	-	0.38	-	0.27	J	0.34	-	0.34	J	0.70	J	0.22	J	0.46	-	0.23	J	0.40	-	0.35	-	0.14	J
Nickel	2.4	-	1.8	-	**14**	-	7.0	-	**13**	-	5.8	-	2.8	-	**15**	-	**11**	-	3.9	-	4.0	-	**28**	-
Potassium	1100	-	590	-	4400	-	2400	-	3800	-	2400	-	1300	-	4600	-	3200	-	1300	-	1200	-	6600	-
Selenium	< 6.1	O	< 5.9	O	< 6	O	< 6	O	< 12	O	< 10	O	< 5.1	O	< 5.8	O	< 6	O	< 6	O	< 12	O	**1.2**	-
Silica	600	-	480	-	1100	-	810	-	780	-	420	-	390	-	630	-	630	-	620	-	520	-	840	-
Silver	< 0.61	-	< 0.59	-	< 0.6	-	< 0.6	-	< 0.59	-	< 0.51	-	< 0.51	-	< 0.58	-	< 0.6	-	< 0.6	-	< 0.59	-	< 0.62	-
Sodium	130	-	110	-	330	-	130	-	290	-	430	-	400	-	750	-	340	-	180	-	190	-	650	-
Thallium	< 1.2	-	< 1.2	-	< 6	O	< 6	O	< 12	O	< 5.1	O	< 5.1	O	< 5.8	O	< 6	O	< 6	O	< 5.9	O	< 6.2	O
Titanium	43	-	30	-	43	-	59	-	110	-	240	-	180	-	56	-	100	-	45	-	61	-	38	-
Vanadium	7.3	-	6.0	-	25	-	17	-	30	-	18	-	17	-	31	-	23	-	10	-	12	-	54	-
Zinc	11	-	7.3	-	43	-	24	-	41	-	18	-	14	-	48	-	36	-	13	-	16	-	81	-
PAHs (ug/kg)																								
Acenaphthene	< 7.3	-	< 7.1	-	< 7.2	-	< 7.2	-	< 7	J3	< 6.1	-	< 6.1	-	< 7	-	< 7.2	-	< 7.1	-	< 7.1	-	< 7.5	-
Anthracene	< 7.3	-	< 7.1	-	< 7.2	-	< 7.2	-	< 7	J3	< 6.1	-	< 6.1	-	< 7	-	< 7.2	-	< 7.1	-	< 7.1	-	< 7.5	-
Benzo(a)anthracene	< 7.3	-	< 7.1	-	< 7.2	-	< 7.2	-	< 7	-	< 6.1	-	< 6.1	-	< 7	-	< 7.2	-	< 7.1	-	< 7.1	-	< 7.5	-
Benzo(a)pyrene	< 7.3	-	< 7.1	-	< 7.2	-	< 7.2	-	< 7	-	< 6.1	-	< 6.1	-	< 7	-	< 7.2	-	< 7.1	-	< 7.1	-	< 7.5	-
Benzo(b)fluoranthene	< 7.3	-	< 7.1	-	< 7.2	-	< 7.2	-	< 7	-	< 6.1	-	< 6.1	-	< 7	-	< 7.2	-	< 7.1	-	< 7.1	-	< 7.5	-
Benzo(g,h,i)perylene	< 7.3	-	< 7.1	-	< 7.2	-	< 7.2	-	< 7	-	< 6.1	-	< 6.1	-	< 7	-	< 7.2	-	< 7.1	-	< 7.1	-	< 7.5	-
Benzo(k)fluoranthene	< 7.3	-	< 7.1	-	< 7.2	-	< 7.2	-	< 7	J3	< 6.1	-	< 6.1	-	< 7	-	< 7.2	-	< 7.1	-	< 7.1	-	< 7.5	-
Chrysene	< 7.3	-	< 7.1	-	< 7.2	-	< 7.2	-	< 7	-	< 6.1	-	< 6.1	-	< 7	-	< 7.2	-	< 7.1	-	< 7.1	-	< 7.5	-
Fluoranthene	< 7.3	-	< 7.1	-	< 7.2	-	< 7.2	-	< 7	J3	< 6.1	-	< 6.1	-	< 7	-	< 7.2	-	< 7.1	-	< 7.1	-	< 7.5	-
Indeno(1,2,3-cd)pyrene	< 7.3	-	< 7.1	-	< 7.2	-	< 7.2	-	< 7	-	< 6.1	-	< 6.1	-	< 7	-	< 7.2	-	< 7.1	-	< 7.1	-	< 7.5	-
Naphthalene	< 7.3	-	< 7.1	-	< 7.2	-	< 7.2	-	< 7	-	< 6.1	-	< 6.1	-	< 7	-	< 7.2	-	< 7.1	-	< 7.1	-	< 7.5	-
Phenanthrene	< 7.3	-	< 7.1	-	< 7.2	-	< 7.2	-	< 7	J3	< 6.1	-	< 6.1	-	< 7	-	< 7.2	-	< 7.1	-	< 7.1	-	< 7.5	-
Pyrene	< 7.3	-	< 7.1	-	< 7.2	-	< 7.2	-	< 7	J3	< 6.1	-	< 6.1	-	< 7	-	< 7.2	-	< 7.1	-	< 7.1	-	< 7.5	-
SVOC (ug/kg)																								
Biphenyl	< 400	-	< 390	-	< 390	-	< 400	-	< 390	-	< 340	-	< 330	-	< 380	-	< 400	-	< 390	-	< 390	-	< 410	-
Bis(2-ethylhexyl)phthalate	920	-	< 390	-	< 390	-	< 400	-	< 390	-	< 340	-	< 330	-	< 380	-	< 400	-	< 390	-	< 390	-	< 410	-

Table D-1 - Soil Chemical Analytical Results Summary

Soil Boring / Date / Sample Depth	BG-6D 2/10/2012 98 ft		BG-6D 2/10/2012 114 ft		BG-6D 2/10/2012 127 ft		EPA MCL-based SSL - November 2012[1]	EPA Risk-based SSL - November 2012[2]	EPA RSL Industrial Soil - November 2012[3]	NDEP BCL Outdoor Worker - January 2013[4]	NDEP LBCL (DAF 1) - January 2013[5]	NDEP LBCL (DAF 20) - January 2013[6]	USGS - Nevada[7]
Parameter Name	**Result**	**Lab Qualifier**	**Result**	**Lab Qualifier**	**Result**	**Lab Qualifier**							
Asbestos													
Asbestos	< 1	-	< 1	-	< 1	-	NA	NA	NA	NA	NA	NA	NA
General Chemistry (units listed below)													
Nitrogen, Ammonia (as N) (mg/kg)	< 5.9	-	< 5.9	-	< 5.9	J6	NA	NA	NA	100,000	NA	NA	NA
Chloride (mg/kg)	93	-	100	-	82	-	NA	NA	NA	NA	NA	NA	NA
Fluoride (mg/kg)	4.0	-	5.3	-	6.6	-	NA	93	41,000	41,000	NA	NA	NA
Nitrogen, Nitrate (as N) (mg/kg)	< 1.2	J	< 1.2	J	< 1.2	J	NA	NA	1,600,000	100,000	7.0	140	NA
pH	8.5	T8	8.3	T8	8.1	T8	NA	NA	NA	NA	NA	NA	NA
Phosphate as P (mg/kg)	< 1.2	B4	< 1.2	B4	< 1.2	B4	NA	NA	NA	NA	NA	NA	NA
Sulfate (mg/kg)	190	-	250	-	160	-	NA	NA	NA	NA	NA	NA	NA
Metals (mg/kg)													
Aluminum	**11,000**	-	**10,000**	-	**24,000**	V	NA	23,000	990,000	100,000	75	1500	700 - >1,000
Antimony	< 1.2	-	< 1.2	-	< 1.2	J6	0.27	0.27	410	454	0.3	6	< 1 - 10
Arsenic	**13**	-	**17**	-	**20**	-	0.29	0.0013	1.6	1.77	1	20	< 0.1 - 100
Barium	59	-	22	-	32	-	82	120	190,000	100,000	82	1640	10 - 5,000
Beryllium	0.28	-	0.14	-	1.1	-	3.2	13	2000	2230	3	60	< 1 - 15
Boron	9.9	J	7.0	J	8.5	J, P1	NA	9.9	200,000	100,000	23.4	467	< 20 - 300
Cadmium	0.099	J	0.12	J	0.21	J, P1	0.38	0.52	800	1,110	0.4	8	NA
Calcium	39,000	-	52,000	-	46,000	V	NA	NA	NA	NA	NA	NA	130 - 330,000
Chromium (hexavalent)	< 2.4	-	< 2.4	-	< 2.4	-	NA	0.00059	5.6	1360	2	40	NA
Chromium (total)	13	-	12	-	26	-	180,000	NA	NA	NA	NA	NA	1 - 2,000
Cobalt	**3.6**	-	**4.5**	-	**7.2**	-	NA	0.21	300	337	0.495	9.9	< 3 - 70
Copper	8.8	-	9.8	-	18	-	46	22	41,000	42,200	45.8	915	< 1 - 700
Iron	**10,000**	-	**12,000**	-	**20,000**	V	NA	270	720,000	100,000	7.56	151	100 - >100,000
Lead	6.5	-	8.1	-	13	-	14	NA	800	800	NA	NA	< 10 - 700
Magnesium	**6800**	-	**13,000**	-	**11,000**	V	NA	NA	NA	100,000	973	19,500	200 - >100,000
Manganese	**150**	-	**190**	-	**210**	J6	NA	21	23,000	24,900	1.3	26.1	< 2 - 7,000
Mercury	0.026	-	< 0.024	J	< 0.024	J	0.1	0.033	43	341	0.104	2.09	< 0.01 - 5.1
Molybdenum	0.35	-	0.34	-	0.32	-	NA	1.6	5100	5680	3.69	73.7	< 3 - 15
Nickel	**9.2**	-	**10**	-	**18**	-	NA	20	20,000	21,800	7	140	< 5 - 700
Potassium	3300	-	2600	-	5400	V	NA	NA	NA	NA	NA	NA	2,200 - 65,000
Selenium	< 5.9	O	< 12	O	< 1.2	-	0.26	0.4	5100	5680	0.3	6	< 0.1 - 5
Silica	470	-	650	-	710	-	NA	NA	18,000,000	NA	NA	NA	NA
Silver	< 0.59	-	< 0.59	-	< 0.59	-	NA	0.6	5100	5680	0.85	17	NA
Sodium	180	-	180	-	300	-	NA	NA	NA	NA	NA	NA	3,000 - 100,000
Thallium	< 5.9	O	< 5.9	O	< 5.9	O	0.14	0.011	10	74.9	0.4	8	NA
Titanium	86	-	110	-	44	J6	NA	NA	NA	100,000	146,000	2,920,000	70 - 20,000
Vanadium	21	-	22	-	41	-	NA	78	5200	5680	300	6000	30 - 500
Zinc	30	-	34	-	64	-	NA	290	310,000	100,000	620	12,400	28 - 3,500
PAHs (ug/kg)													
Acenaphthene	< 7.1	-	< 7.1	-	< 7.1	-	NA	4100	33,000,000	2,560,000	29,000	580,000	NA
Anthracene	< 7.1	-	< 7.1	-	< 7.1	-	NA	42,000	170,000,000	9,920,000	590,000	11,800,000	NA
Benzo(a)anthracene	< 7.1	-	< 7.1	-	< 7.1	-	NA	10	2100	2340	80	1600	NA
Benzo(a)pyrene	< 7.1	-	< 7.1	-	< 7.1	-	240	3.5	210	234	400	8000	NA
Benzo(b)fluoranthene	< 7.1	-	< 7.1	-	< 7.1	-	NA	35	2100	2340	200	4000	NA
Benzo(g,h,i)perylene	< 7.1	-	< 7.1	-	< 7.1	-	NA	NA	NA	34,100,000	NA	NA	NA
Benzo(k)fluoranthene	< 7.1	-	< 7.1	-	< 7.1	-	NA	350	21,000	23,400	2000	40,000	NA
Chrysene	< 7.1	-	< 7.1	-	< 7.1	-	NA	1100	210,000	234,000	8000	160,000	NA
Fluoranthene	< 7.1	-	< 7.1	-	< 7.1	-	NA	70,000	22,000,000	24,400,000	210,000	4,200,000	NA
Indeno(1,2,3-cd)pyrene	< 7.1	-	< 7.1	-	< 7.1	-	NA	200	2100	2340	700	14,000	NA
Naphthalene	< 7.1	-	< 7.1	-	< 7.1	-	NA	0.47	18,000	17,400	4000	80,000	NA
Phenanthrene	< 7.1	-	< 7.1	-	< 7.1	-	NA	NA	NA	24,500	NA	NA	NA
Pyrene	< 7.1	-	< 7.1	-	< 7.1	-	NA	9500	17,000,000	19,300,000	210,000	4,200,000	NA
SVOC (ug/kg)													
Biphenyl	< 390	-	< 390	-	< 390	-	NA	8.7	210,000	56,800,000	NA	NA	NA
Bis(2-ethylhexyl)phthalate	< 390	J	< 390	-	< 390	-	1400	1,100	120,000	137,000	180,000	3,600,000	NA

Footnotes:

[1]**EPA MCL-based SSL:** EPA Soil Screening Level (SSL) (MCL-Based)—Maximum Contaminant Level (MCL) based soil contaminant concentrations below which no further action or study regarding the soil at a site is warranted under the Comprehensive Environmental Response, Compensations, and Liability Act (CERCLA). This soil screening level was determined by EPA to be protective of g The soil leaching to groundwater SSL (Risk-Based) may be used when NDEP has not determined a Leaching Basic Comparison Level (LBCL) for a particular parameter (November, 2012).

[2]**EPA Risk-based SSL:** EPA SSL (Risk-Based)-- Soil concentrations derived for individual chemicals of concern from standardized sets of equations. These equations combine EPA chemical toxicity data with parameters defined by assumed future land uses and exposure scenarios, including receptor characteristics and potential exposure pathways. The soil leaching to groundwater SSL (Risl NDEP has not determined a LBCL for a particular parameter (November, 2012).

[3]**EPA RSL Industrial Soil:** EPA Regional Screening Level (RSL) (Industrial Soil)-- Generic screening levels based on default exposure parameters and factors that represent Reasonable Maximum Exposure (RME) conditions for human long-term/chronic exposures and are based on the methods outlined in EPA's Risk Assessment Guidance for Superfund, Part B Manual (1991) and Soil Screeni documents (1996 and 2002). The Industrial Soil RSL is protective of the human health of outdoor workers (November 2012).

[4]**NDEP BCL Outdoor Worker:** NDEP Basic Comparison Level (BCL) (Outdoor Industrial/Commercial Worker)-- Screening level determined by NDEP for the BMI Complex to be protective of the human health of outdoor workers from the Updated User's Guide and Tables (January, 2013).

[5]**NDEP LBCL (DAF1):** NDEP Leaching BCL Dilution Attenuation Factor of 1 (LBCL DAF1)-- Developed by NDEP for use at the BMI Complex and Common Areas in Henderson Nevada specifically for the soil leaching to groundwater migration pathway, and for certain constituents (January 2013).

[6]**NDEP LBCL (DAF20):** NDEP Leaching BCL Dilution Attenuation Factor of 20 (LBCL DAF20)-- Developed by NDEP for use at the BMI Complex and Common Areas in Henderson Nevada specifically for the soil leaching to groundwater migration pathway, and for certain constituents (January 2013).

[7]**USGS-Nevada:** Shacklette and Boerngen, 1984. *Element Concentrations in Soils and Other Surficial Materials in Conterminous United States*, Geological Survey Professional Paper 1270, U. S. Geological Survey, 1984

Table D-3 - Groundwater Chemical Analytical Results Summary

Monitoring Well	BG-1D		BG-1D		BG-1D		BG-1D		BG-1M		BG-1M		BG-1M		BG-1M		BG-1S		BG-1S		BG-1S		BG-1S	
Date	3/20/2012		5/24/2012		8/23/2012		11/26/2012		3/20/2012		5/24/2012		8/23/2012		11/26/2012		3/20/2012		5/24/2012		8/23/2012		11/26/2012	
Parameter Name	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier
Asbestos (MFL>10um)																								
Asbestos	< 1	-	< 0.7	-	< 0.5	-	< 0.2	-	< 1	-	< 0.2	-	< 5	-	< 1	-	< 1	-	< 0.7	-	< 9.9	-	< 5	-
General Chemistry (units listed below)																								
Alkalinity - Bicarbonate (mg/L)	180	-	170	-	180	-	170	-	230	-	230	-	200	-	230	-	300	-	310	-	340	-	300	-
Alkalinity - Carbonate (mg/L)	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-
Chloride (mg/L)	220	-	200	-	200	-	210	-	210	-	200	-	220	-	200	-	320	-	280	-	260	-	280	-
Nitrogen, Ammonia(As N) (mg/L)	< 0.1	-	0.10	J, T2	0.13	T2	< 0.1	T2	< 0.1	T2	0.069	J, T2	0.11	T2	< 0.1	T2	< 0.1	T2	0.090	J, T2	0.12	T2	< 0.1	T2
Nitrogen, Nitrate(As N) (mg/L)	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	0.48	-	0.27	-	0.44	-	0.35	-
Nitrogen, Nitrite(As N) (mg/L)	0.015	J	< 0.1	-	< 0.1	-	< 0.1	-	0.016	J	< 0.1	-	< 0.1	-	< 0.1	-	0.016	J	< 0.1	-	< 0.1	-	< 0.1	-
pH (field)	7.29	-	7.42	-	7.38	-	7.29	-	7.28	-	7.13	-	7.36	-	7.11	-	7.24	-	7.05	-	7.22	-	6.98	-
pH (lab)	7.6	T8	NA	-	NA	-	NA	-	7.4	T8	NA	-	NA	-	NA	-	7.5	T8	NA	-	NA	-	NA	-
Phosphorus, Total (As P)(mg/L)	0.042	J	0.045	J, P1	< 0.1	-	< 0.1	T2	0.046	J	0.058	J	0.053	J	0.042	J, T2	0.077	J	0.092	J	0.064	J	0.052	J, T2
Specific Conductance (field) (µmhos/cm)	2190	-	1974	-	1960	-	2110	-	2240	-	2180	-	2170	-	2180	-	3050	-	2920	-	2810	-	2930	-
Specific Conductance (µmhos/cm)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Sulfate (mg/L)	**710**	-	**660**	-	**650**	-	**670**	-	**670**	-	**630**	-	**700**	-	**630**	-	**950**	-	**880**	-	**790**	-	**850**	-
Total Dissolved Solids(residue, filterable) (mg/L)	**1400**	-	**1400**	-	**1600**	-	**1300**	-	**1500**	-	**1400**	-	**1800**	-	**1400**	-	**2100**	-	**2100**	-	**1900**	-	**1500**	-
Metals (mg/L)																								
Aluminum, Dissolved	0.039	J	< 0.1	-	< 0.1	-	**0.068**	J	< 0.1	-	< 0.1	-	< 0.1	-	**0.071**	J	< 0.1	-	0.031	J	< 0.1	-	**0.082**	J
Antimony, Dissolved	**0.0068**	J	< 0.02	-	**0.028**	-	**0.020**	-	< 0.02	-	< 0.02	-	**0.027**	-	< 0.02	-	< 0.02	-	< 0.02	-	**0.028**	-	**0.028**	-
Arsenic, Dissolved	**0.019**	J	**0.0070**	J	< 0.02	-	< 0.02	-	**0.015**	J	**0.010**	J	< 0.02	-	**0.016**	J	**0.033**	-	**0.014**	J	< 0.02	-	**0.030**	-
Barium, Dissolved	0.021	-	0.018	-	0.020	-	0.019	-	0.029	-	0.028	-	0.030	-	0.029	-	0.025	-	0.022	-	0.021	-	0.026	-
Beryllium, Dissolved	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-
Boron, Dissolved	0.45	-	0.47	-	0.52	-	0.60	-	0.58	-	0.58	-	0.61	-	0.71	-	0.89	-	0.94	-	0.96	-	1.1	-
Cadmium, Dissolved	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	0.0020	J	< 0.005	-	< 0.005	-	< 0.005	-	0.0022	J	< 0.005	-	< 0.005	-	< 0.005	-
Calcium, Dissolved	120	-	120	-	130	-	160	-	120	-	120	-	120	-	150	-	150	-	140	-	140	-	180	-
Chromium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Chromium, hexavalent	< 0.01	-	< 0.01	-	**0.0050**	J	< 0.01	-	< 0.01	-	< 0.01	-	**0.0040**	J	< 0.01	-	< 0.01	-	< 0.01	-	**0.0070**	J	< 0.01	-
Cobalt, Dissolved	< 0.01	-	< 0.01	-	0.0040	J	**0.012**	-	0.0025	J	< 0.01	-	0.0037	J	**0.012**	-	< 0.01	-	< 0.01	-	0.0040	J	**0.011**	-
Copper, Dissolved	< 0.02	-	< 0.02	-	0.0033	J	< 0.02	-	< 0.02	-	< 0.02	-	0.0022	J	< 0.02	-	< 0.02	-	< 0.02	-	0.0033	J	< 0.02	-
Fluoride, Dissolved	**0.62**	-	0.57	-	0.60	-	0.53	-	0.58	-	0.54	-	0.59	-	0.50	-	**3.2**	-	**2.9**	-	**2.8**	-	**2.7**	-
Iron, Dissolved	< 0.1	-	< 0.1	-	< 0.1	-	0.094	J	0.047	J	< 0.1	-	< 0.1	-	**0.34**	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-
Lead, Dissolved	0.0058	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	0.0033	J	< 0.005	-	< 0.005	-	< 0.005	-
Magnesium, Dissolved	76	-	74	-	82	-	97	-	74	-	71	-	77	-	90	-	110	-	100	-	110	-	140	-
Manganese, Dissolved	**0.13**	-	**0.086**	-	**0.073**	-	**0.077**	-	**0.22**	-	**0.21**	-	**0.13**	-	**0.17**	-	0.0065	J	< 0.01	-	< 0.01	-	0.011	-
Mercury, Dissolved	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-
Molybdenum, Dissolved	0.0085	-	< 0.005	-	0.0032	J	0.010	-	0.0056	-	< 0.005	-	0.0052	-	0.012	-	0.026	-	0.014	-	0.026	-	0.037	-
Nickel, Dissolved	0.0065	J	0.0073	J	< 0.02	-	< 0.02	-	0.0086	J	0.0071	J	< 0.02	-	< 0.02	-	0.0099	J	0.0070	J	< 0.02	-	< 0.02	-
Potassium, Dissolved	17	-	17	-	19	-	22	-	16	-	16	-	18	-	20	-	20	-	22	-	22	-	26	-
Selenium, Dissolved	< 0.1	O	< 0.04	O	**0.16**	-	< 0.02	-	< 0.1	O	< 0.02	-	**0.15**	-	0.0074	J	< 0.1	O	< 0.1	O	**0.18**	-	0.011	J
Silica, Dissolved	17	-	18	-	16	-	16	-	19	-	19	-	19	-	18	-	46	-	46	-	42	-	43	-
Silver, Dissolved	< 0.01	-	< 0.01	-	0.0063	J	0.0079	J	0.011	-	< 0.01	-	0.0070	J	0.0073	J	< 0.01	-	< 0.01	-	0.0088	J	0.010	J
Sodium, Dissolved	210	-	200	-	220	-	270	-	240	-	250	-	240	-	280	-	330	-	360	-	340	-	410	-
Thallium, Dissolved	< 0.02	-	< 0.02	-	**0.044**	-	**0.070**	-	< 0.02	-	< 0.02	-	**0.047**	-	**0.065**	-	< 0.02	-	< 0.02	-	**0.050**	-	**0.072**	-
Titanium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Vanadium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	0.0064	J	0.0068	J	0.0079	J	0.0066	J
Zinc, Dissolved	0.019	J	< 0.03	-	0.39	-	0.057	-	< 0.03	-	< 0.03	-	0.031	-	0.058	-	< 0.03	-	< 0.03	-	0.014	J	0.065	-
PAH (µg/L)																								
Acenaphthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Anthracene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(a)anthracene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(a)pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(b)fluoranthene	0.010	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(g,h,i)perylene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(k)fluoroanthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Chrysene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Fluoranthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Indeno(1,2,3-cd)pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Naphthalene	0.019	J	< 0.25	-	< 0.25	-	< 0.25	-	0.018	J	0.021	J	0.032	J	< 0.25	-	0.018	J	< 0.25	-	0.034	J	< 0.25	-
Phenanthrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	0.014	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
SVOC (µg/L)																								
1,1-Biphenyl	< 10	-	< 10	-	< 8	-	< 10	-	< 10	-	< 10	-	< 8	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-
Bis(2-ethylhexyl)phthalate	< 1	-	0.65	J	1.1	J	< 3	-	< 1	-	< 1	-	0.95	J	1.1	J	1.2	-	0.54	J	0.63	J	< 3	-

Notes:

NA - Not Applicable; Results that exceed a screening level are in bold.

Laboratory Qualifiers

J = Estimated value below the lowest calibration point.

J3 = The associated batch QC was outside the established quality control range for precision.

J4 = The associated batch QC was outside the established quality control range for accuracy.

J5 = The sample matrix interfered with the ability to make an accurate determination; spike value is high.

J6 = The sample matrix interfered with the ability to make an accurate getermination; spike value is low.

O = Sample diluted due to matrix interferences that impaired the ability to make an accurate analytical determination. The detection limit is elevated in order to reflect the necessary dilution.

P1 = RPD value not applicable for sample concentrations less than 5 times the reporting limit.

T2 = Additional method/sample information - laboratory analysis was from an unpreserved or improperly preserved sample.

T8 = Additional method/sample information - samples received past/ too close to holding time.

V= The sample concentration is too high to evaluate accurate spike recoveries.

* Duplicate sample value, laboratory compromised sample during handling.

Table D-3 - Groundwater Chemical Analytical Results Summary

Monitoring Well	BG-2D		BG-2D		BG-2D		BG-2D		BG-2M		BG-2M		BG-2M		BG-2M		BG-2S		BG-2S		BG-2S		BG-2S	
Date	3/21/2012		5/24/2012		8/23/2012		11/26/2012		3/21/2012		5/24/2012		8/23/2012		11/26/2012		3/21/2012		5/24/2012		8/23/2012		11/26/2012	
Parameter Name	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier
Asbestos (MFL>10um)																								
Asbestos	< 0.7	-	< 0.7	-	< 5	-	< 0.2	-	< 2.5	-	< 1.7	-	< 5	-	< 1	-	< 5	-	< 1.7	-	< 9.9	-	< 9.9	-
General Chemistry (units listed below)																								
Alkalinity - Bicarbonate (mg/L)	130	-	120	-	130	-	120	-	210	-	210	-	190	-	210	-	260	-	250	-	250	-	230	-
Alkalinity - Carbonate (mg/L)	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-
Chloride (mg/L)	41	-	40	-	40	-	41	-	34	-	35	-	36	-	38	-	72	-	62	-	71	-	69	-
Nitrogen, Ammonia(As N) (mg/L)	< 0.1	-	< 0.1	T2	0.10	T2	< 0.1	T2	< 0.1	-	0.076	J, T2	0.11	T2	< 0.1	T2	< 0.1	T2	0.049	J, T2, P1	0.16	T2	< 0.1	T2
Nitrogen, Nitrate(As N) (mg/L)	< 0.1	-	< 0.1	-	< 0.1	-	0.060	J	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-
Nitrogen, Nitrite(As N) (mg/L)	< 0.1	-	< 0.1	-	< 0.1	-	0.16	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	0.011	J	< 0.1	-	< 0.1	-	< 0.1	-
pH (field)	7.3	-	7.48	-	7.36	-	7.35	-	7.26	-	7.13	-	7.25	-	7.12	-	7.11	-	7.02	-	7.12	-	6.89	-
pH (lab)	7.7	T8	NA	-	NA	-	NA	-	7.7	T8	NA	-	NA	-	NA	-	7.5	T8	NA	-	NA	-	NA	-
Phosphorus, Total (As P)(mg/L)	0.045	J	0.046	J	< 0.1	-	0.022	J, T2	0.062	J	0.034	J, P1	< 0.1	-	0.020	J, T2, P1	0.11	T2	0.064	J	0.12	-	0.082	J, T2
Specific Conductance (field) (µmhos/cm)	1951	-	1867	-	1810	-	2010	-	2320	-	2300	-	2240	-	2330	-	4730	-	4300	-	4230	-	4430	-
Specific Conductance (µmhos/cm)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Sulfate (mg/L)	**1100**	-	**1000**	-	**990**	-	**1000**	-	**1100**	-	**1100**	-	**1000**	-	**1200**	-	**2900**	-	**2600**	-	**2600**	-	**2600**	-
Total Dissolved Solids(residue, filterable) (mg/L)	**1600**	-	**1700**	-	**1800**	-	**1600**	-	**1800**	-	**1900**	-	**1900**	-	**1900**	-	**4300**	-	**3800**	-	**4500**	-	**4000**	-
Metals (mg/L)																								
Aluminum, Dissolved	0.038	J	< 0.1	-	< 0.1	-	**0.054**	J	0.048	J	< 0.1	-	< 0.1	-	**0.061**	J	< 0.1	-	0.035	J	< 0.1	-	**0.058**	J
Antimony, Dissolved	< 0.02	-	< 0.02	-	**0.045**	-	< 0.02	-	< 0.02	-	< 0.02	-	**0.032**	-	**0.020**	-	**0.061**	-	< 0.02	-	**0.042**	-	**0.017**	J
Arsenic, Dissolved	**0.017**	J	< 0.02	-	< 0.02	-	**0.012**	J	**0.018**	J	< 0.02	-	< 0.02	-	**0.036**	-	**0.028**	-	< 0.02	-	< 0.02	-	**0.036**	-
Barium, Dissolved	0.014	-	0.015	-	0.015	-	0.014	-	0.022	-	0.024	-	0.016	-	0.018	-	0.028	-	0.038	-	0.036	-	0.046	-
Beryllium, Dissolved	< 0.002	-	< 0.002	-	0.00061	J	< 0.002	-	< 0.002	-	0.00083	J	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-
Boron, Dissolved	0.84	-	0.83	-	0.83	-	1.0	-	0.92	-	0.87	-	0.87	-	1.1	-	1.6	-	1.7	-	1.7	-	1.8	-
Cadmium, Dissolved	< 0.005	-	< 0.005	-	< 0.005	-	0.00070	J	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	0.0019	J	< 0.005	-	< 0.005	-	< 0.005	-
Calcium, Dissolved	210	-	200	-	200	-	240	-	200	-	190	-	200	-	240	-	420	-	420	-	410	-	440	-
Chromium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Chromium, hexavalent	< 0.01	-	< 0.01	-	**0.0030**	J	< 0.01	-	< 0.01	-	< 0.01	-	**0.0040**	J	< 0.01	-	< 0.01	-	< 0.01	-	**0.0060**	J	< 0.01	J6
Cobalt, Dissolved	< 0.01	-	< 0.01	-	0.0031	J	**0.011**	-	< 0.01	-	< 0.01	-	0.0033	J	**0.013**	-	< 0.01	-	< 0.01	-	0.0025	J	**0.014**	-
Copper, Dissolved	< 0.02	-	< 0.02	-	0.0042	J	< 0.02	-	< 0.02	-	< 0.02	-	0.0037	J	< 0.02	-	0.0035	J	< 0.02	-	0.0054	J	< 0.02	-
Fluoride, Dissolved	**2.8**	-	**2.7**	-	**2.8**	-	**2.4**	-	**2.4**	-	**2.3**	-	**2.5**	-	**2.0**	-	**4.1**	-	**3.4**	-	**3.9**	-	**3.5**	-
Iron, Dissolved	0.042	J	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	0.028	J	**1.0**	-	< 0.1	-	< 0.1	-	0.085	J	**0.48**	-
Lead, Dissolved	0.0036	J	< 0.005	-	< 0.005	-	< 0.005	-	0.0045	J	< 0.005	-	< 0.005	-	< 0.005	-	**0.034**	-	< 0.005	-	< 0.005	-	< 0.005	-
Magnesium, Dissolved	110	-	100	-	110	-	130	-	120	-	120	-	120	-	**160**	-	**270**	-	**270**	-	**280**	-	**290**	-
Manganese, Dissolved	**0.11**	-	**0.097**	-	**0.091**	-	**0.11**	-	**0.11**	-	**0.066**	-	**0.074**	-	**0.074**	-	**0.28**	-	**0.24**	-	**0.27**	-	**0.26**	-
Mercury, Dissolved	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-
Molybdenum, Dissolved	**0.25**	-	**0.23**	-	**0.23**	-	**0.29**	-	**0.086**	-	0.067	-	**0.13**	-	**0.098**	-	**0.37**	-	**0.37**	-	**0.39**	-	**0.41**	-
Nickel, Dissolved	< 0.02	-	0.0079	J	< 0.02	-	< 0.02	-	0.0073	J	0.0086	J	< 0.02	-	< 0.02	-	0.011	J	0.014	J	< 0.02	-	< 0.02	-
Potassium, Dissolved	26	-	25	-	25	-	30	-	44	-	40	-	36	-	51	-	84	-	84	-	86	-	86	-
Selenium, Dissolved	< 0.1	O	< 0.04	O	**0.18**	-	< 0.02	-	< 0.1	O	< 0.1	O	**0.18**	-	< 0.02	-	0.030	-	< 0.2	O	**0.24**	-	0.016	J
Silica, Dissolved	21	-	22	-	20	-	21	-	17	-	17	-	16	-	16	-	36	-	38	-	35	-	35	-
Silver, Dissolved	< 0.01	-	< 0.01	-	0.013	-	0.013	-	< 0.01	-	< 0.01	-	0.013	-	0.011	-	< 0.01	-	< 0.01	-	0.020	-	0.022	-
Sodium, Dissolved	100	-	100	-	100	-	120	-	160	-	170	-	140	-	200	-	420	-	400	-	400	-	400	-
Thallium, Dissolved	< 0.02	-	< 0.02	-	**0.050**	-	**0.073**	-	< 0.02	-	< 0.02	-	**0.054**	-	**0.077**	-	**0.0097**	J	< 0.02	-	**0.066**	-	**0.084**	-
Titanium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Vanadium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Zinc, Dissolved	0.014	J	< 0.03	-	0.015	J	0.068	-	0.015	J	0.011	J	0.014	J	0.066	-	< 0.03	-	< 0.03	-	0.024	J	0.081	-
PAH (µg/L)																								
Acenaphthene	0.012	J	< 0.05	-	< 0.05	-	< 0.05	-	0.010	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	Q	< 0.05	-	< 0.05	-	0.019	J
Anthracene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	Q	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(a)anthracene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	Q	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(a)pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	Q	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(b)fluoranthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	Q	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(g,h,i)perylene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	Q	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(k)fluoroanthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	Q	< 0.05	-	< 0.05	-	< 0.05	-
Chrysene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	Q	< 0.05	-	< 0.05	-	< 0.05	-
Fluoranthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	Q	< 0.05	-	< 0.05	-	< 0.05	-
Indeno(1,2,3-cd)pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	Q	< 0.05	-	< 0.05	-	< 0.05	-
Naphthalene	< 0.25	-	< 0.25	-	0.024	J	< 0.25	-	< 0.25	-	< 0.25	-	0.031	J	0.028	J	< 0.25	Q	0.091	J	0.021	J	0.042	J
Phenanthrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	Q	< 0.05	-	< 0.05	-	0.012	J
Pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	Q	< 0.05	-	< 0.05	-	0.054	-
SVOC (µg/L)																								
1,1-Biphenyl	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	T8	< 10	-	< 10	-	< 10	-
Bis(2-ethylhexyl)phthalate	< 1	-	0.90	J	0.58	J	1.0	J	< 1	-	< 1	-	0.55	J	0.86	J	< 1	T8	< 1	-	0.73	J	< 3	-

Table D-3 - Groundwater Chemical Analytical Results Summary

Monitoring Well	BG-3D		BG-3D		BG-3D		BG-3D		BG-3M		BG-3M		BG-3M		BG-3M		BG-3S		BG-3S		BG-3S		BG-3S	
Date	3/21/2012		5/23/2012		8/21/2012		11/27/2012		3/21/2012		5/24/2012		8/22/2012		11/27/2012		3/21/2012		5/23/2012		8/22/2012		11/27/2012	
Parameter Name	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier
Asbestos (MFL>10um)																								
Asbestos	< 0.7	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.2	-	< 0.7	-	< 5	-	< 1	-	< 9.9	-	< 1	-	< 0.5	-	< 5	-
General Chemistry (units listed below)																								
Alkalinity - Bicarbonate (mg/L)	190	-	220	-	220	-	190	-	190	-	200	-	220	-	190	-	130	-	160	-	150	-	140	-
Alkalinity - Carbonate (mg/L)	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-
Chloride (mg/L)	180	-	180	-	170	-	180	-	150	-	150	-	150	-	160	-	190	-	200	-	200	-	200	-
Nitrogen, Ammonia(As N) (mg/L)	< 0.1	-	0.073	J, T2	0.093	J	< 0.1	T2	< 0.1	-	0.073	J, T2	0.11	-	0.079	J, T2	< 0.1	-	0.047	J, T2	0.056	J	< 0.1	T2
Nitrogen, Nitrate(As N) (mg/L)	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	J6	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-
Nitrogen, Nitrite(As N) (mg/L)	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-
pH (field)	7.44	-	7.54	-	7.52	-	7.47	-	7.49	-	7.52	-	7.49	-	7.41	-	7.63	-	7.31	-	7.54	-	7.44	-
pH (lab)	8.1	T8	NA	-	NA	-	NA	-	8.0	T8	NA	-	NA	-	NA	-	7.9	T8	NA	-	NA	-	NA	-
Phosphorus, Total (As P)(mg/L)	0.15	-	0.13	T2	0.053	J	0.075	J	0.10	J	0.078	J	0.069	J, P1	0.035	J	0.15	-	0.19	-	0.081	J	0.090	J
Specific Conductance (field) (µmhos/cm)	1660	-	1637	-	1690	-	1770	-	1820	-	1731	-	1740	-	1830	-	1770	-	1770	-	1780	-	1770	-
Specific Conductance (µmhos/cm)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Sulfate (mg/L)	430	-	400	-	390	-	480	-	**520**	-	**500**	-	470	-	**600**	-	**500**	-	**520**	-	**510**	-	**580**	-
Total Dissolved Solids(residue, filterable) (mg/L)	**1100**	-	**1000**	-	**1100**	-	**1100**	-	**1200**	-	**1100**	-	**1200**	-	**1200**	-	**1100**	-	**1200**	-	**1200**	-	**1200**	-
Metals (mg/L)																								
Aluminum, Dissolved	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	0.036	J	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-
Antimony, Dissolved	< 0.02	-	< 0.02	-	< 0.02	-	**0.015**	J	< 0.02	-	< 0.02	-	**0.024**	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	**0.017**	J
Arsenic, Dissolved	**0.046**	-	**0.036**	-	**0.22**	-	**0.22**	-	**0.024**	-	**0.068**	-	< 0.02	-	**0.050**	-	**0.029**	-	**0.087**	-	**0.043**	-	**0.010**	J
Barium, Dissolved	0.066	-	0.067	-	0.026	-	0.023	-	0.038	-	0.020	-	0.036	-	0.016	-	0.064	-	0.041	-	0.035	-	0.036	-
Beryllium, Dissolved	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	0.00071	J	< 0.002	-	< 0.002	-
Boron, Dissolved	0.50	-	0.51	-	1.0	-	0.98	-	0.55	-	0.85	-	0.78	-	0.91	-	0.58	-	0.62	-	0.71	-	0.66	-
Cadmium, Dissolved	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	0.0016	J	< 0.005	-	< 0.005	-
Calcium, Dissolved	71	-	69	-	70	-	68	-	70	-	79	-	71	-	83	-	110	-	110	-	120	-	110	-
Chromium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Chromium, hexavalent	< 0.01	-	**0.0040**	J	**0.0040**	J	< 0.01	-	< 0.01	-	**0.0060**	J	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	**0.0050**	J	< 0.01	-
Cobalt, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Copper, Dissolved	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	0.0050	J	< 0.02	-	< 0.02	-	< 0.02	-	0.0033	J	< 0.02	-	< 0.02	-	< 0.02	-
Fluoride, Dissolved	**2.5**	-	**2.3**	-	**2.4**	-	**2.4**	-	**3.5**	-	**3.3**	-	**3.3**	-	**3.7**	-	**1.9**	-	**1.3**	-	**1.5**	-	**1.9**	-
Iron, Dissolved	< 0.1	-	< 0.1	-	< 0.1	-	0.068	J	< 0.1	-	< 0.1	-	< 0.1	-	0.037	J	< 0.1	-	< 0.1	-	< 0.1	-	0.016	J
Lead, Dissolved	0.0018	J	< 0.005	-	0.011	-	< 0.005	-	0.0048	J	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	0.0097	-	0.0021	J
Magnesium, Dissolved	28	-	28	-	39	-	38	-	27	-	34	-	32	-	35	-	46	-	56	-	62	-	60	-
Manganese, Dissolved	**0.19**	-	**0.18**	-	**0.022**	-	0.018	-	**0.030**	-	0.019	-	**0.028**	-	0.017	-	**0.054**	-	**0.098**	-	**0.051**	-	**0.022**	-
Mercury, Dissolved	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	0.000020	J	< 0.0002	-	< 0.0002	-
Molybdenum, Dissolved	0.045	-	0.026	-	**0.078**	-	**0.078**	-	0.030	-	0.020	-	0.026	-	0.036	-	0.029	-	0.0068	-	0.019	-	0.022	-
Nickel, Dissolved	0.0082	J	0.0058	J	0.012	J	< 0.02	-	< 0.02	-	0.0055	J	< 0.02	-	< 0.02	-	0.0061	J	0.0061	J	0.0091	J	< 0.02	-
Potassium, Dissolved	12	-	13	-	16	-	17	-	14	-	15	-	16	-	17	-	16	-	19	-	22	-	23	-
Selenium, Dissolved	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	**0.10**	-	0.012	J	< 0.02	-	< 0.04	O	< 0.02	-	< 0.02	-
Silica, Dissolved	17	-	21	-	17	-	16	-	18	-	17	-	18	-	17	-	18	-	19	-	18	-	17	-
Silver, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	0.0051	J	< 0.01	-	< 0.01	-	< 0.01	-	0.0041	J
Sodium, Dissolved	140	-	150	-	250	-	250	-	170	-	240	-	200	-	260	-	190	-	180	-	190	-	190	-
Thallium, Dissolved	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	**0.035**	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-
Titanium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Vanadium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Zinc, Dissolved	< 0.03	-	< 0.03	-	< 0.03	-	0.017	J	0.032	-	< 0.03	-	0.014	J	0.024	J	0.011	J	< 0.03	-	0.013	J	0.028	J
PAH (µg/L)																								
Acenaphthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	0.017	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Anthracene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	0.015	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(a)anthracene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(a)pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(b)fluoranthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(g,h,i)perylene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(k)fluoroanthene	< 0.05	-	< 0.05	-	< 0.05	J4	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	J4	< 0.05	-
Chrysene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Fluoranthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Indeno(1,2,3-cd)pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Naphthalene	0.025	J	< 0.25	-	< 0.25	-	< 0.25	-	**1.1**	-	< 0.25	-	0.022	J	0.021	J	0.026	J	< 0.25	-	< 0.25	-	0.022	J
Phenanthrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	0.013	J	< 0.05	-	0.044	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	0.032	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
SVOC (µg/L)																								
1,1-Biphenyl	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 8	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-
Bis(2-ethylhexyl)phthalate	< 1	-	0.87	J	1.4	J	0.65	J	< 1	-	0.58	J	1.3	J	0.65	J	0.84	J	0.91	J	0.83	J	0.69	J

Table D-3 - Groundwater Chemical Analytical Results Summary

Monitoring Well	BG-4D		BG-4D		BG-4D		BG-4D		BG-4M		BG-4M		BG-4M		BG-4M		BG-4S		BG-4S		BG-4S		BG-4S	
Date	3/20/2012		5/30/2012		8/30/2012		11/27/2012		3/20/2012		5/30/2012		8/30/2012		11/27/2012		3/20/2012		5/30/2012		8/30/2012		11/27/2012	
Parameter Name	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier
Asbestos (MFL>10um)																								
Asbestos	< 1	-	< 0.2	-	< 0.2	-	< 0.2	-	< 1	-	< 0.2	-	< 0.2	-	< 9.9	-	< 1	-	< 5	-	< 49.6	-	< 5	-
General Chemistry (units listed below)																								
Alkalinity - Bicarbonate (mg/L)	95	-	89	-	93	-	93	-	120	-	100	-	110	-	120	-	140	-	140	-	140	-	140	-
Alkalinity - Carbonate (mg/L)	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-
Chloride (mg/L)	290	-	270	-	250	-	270	-	290	-	280	-	260	-	280	-	300	-	280	-	270	-	290	-
Nitrogen, Ammonia(As N) (mg/L)	< 0.1	T2	0.10	T2, P1	0.11	T2	0.12	T2	< 0.1	T2	0.082	J, T2	0.091	J, T2	< 0.1	T2	< 0.1	T2	0.14	T2	0.067	J, T2	< 0.1	T2
Nitrogen, Nitrate(As N) (mg/L)	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	0.056	J	0.052	J	0.42	-	0.25	-
Nitrogen, Nitrite(As N) (mg/L)	0.014	J	< 0.1	-	< 0.1	-	< 0.1	-	0.045	J	0.029	J	0.091	J	0.057	J	0.016	J	< 0.1	-	< 0.1	-	< 0.1	-
pH (field)	7.56	-	7.64	-	7.77	-	7.58	-	7.46	-	7.53	-	7.62	-	7.37	-	7.42	-	7.5	-	7.53	-	7.29	-
pH (lab)	7.7	T8	NA	-	NA	-	NA	-	7.4	T8	NA	-	NA	-	NA	-	7.6	T8	NA	-	NA	-	NA	-
Phosphorus, Total (As P)(mg/L)	0.046	J	0.028	J	0.033	J	0.046	J	0.047	J	0.019	J	0.034	J	0.11	-	0.065	J	0.064	J	0.33	-	0.060	J
Specific Conductance (field) (µmhos/cm)	2270	-	2270	-	1930	-	2240	-	2490	-	2490	-	2330	-	2410	-	2610	-	2610	-	2460	-	2560	-
Specific Conductance (µmhos/cm)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Sulfate (mg/L)	**720**	-	**670**	-	**670**	-	**720**	J6	**820**	-	**800**	-	**750**	-	**870**	-	**870**	-	**820**	-	**800**	-	**920**	-
Total Dissolved Solids(residue, filterable) (mg/L)	**1500**	-	**1500**	-	**1500**	-	**1400**	-	**1700**	-	**1700**	-	**1600**	-	**1700**	-	**1800**	-	**1700**	-	**1700**	-	**1800**	-
Metals (mg/L)																								
Aluminum, Dissolved	< 0.1	-	0.049	J	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	**0.12**	-	< 0.1	-	< 0.1	-
Antimony, Dissolved	**0.0076**	J, P1	**0.021**	-	< 0.02	-	**0.028**	P1	**0.0066**	J	**0.022**	-	< 0.02	-	**0.017**	J	< 0.02	-	**0.026**	-	< 0.02	-	**0.0076**	J
Arsenic, Dissolved	**0.020**	P1	**0.032**	-	< 0.02	-	< 0.02	-	**0.019**	J	**0.033**	-	< 0.02	-	< 0.02	-	**0.019**	J	**0.035**	-	< 0.02	-	< 0.02	-
Barium, Dissolved	0.021	-	0.018	-	0.020	-	0.017	-	0.025	-	0.018	-	0.019	-	0.031	-	0.039	-	0.029	-	0.024	-	0.018	-
Beryllium, Dissolved	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	0.0013	J	< 0.002	-
Boron, Dissolved	0.72	-	0.76	-	0.77	-	0.78	-	0.72	-	0.73	-	0.76	-	0.75	-	0.64	-	0.68	-	0.71	-	0.70	-
Cadmium, Dissolved	< 0.005	-	0.0031	J	< 0.005	-	< 0.005	-	0.0021	J	0.0031	J	< 0.005	-	< 0.005	-	0.0030	J	0.0031	J	< 0.005	-	< 0.005	-
Calcium, Dissolved	130	V	140	-	130	-	130	V	160	-	150	-	140	-	150	-	170	-	170	-	160	-	160	-
Chromium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Chromium, hexavalent	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	**0.0050**	J	< 0.01	-	< 0.01	-
Cobalt, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Copper, Dissolved	< 0.02	-	0.0072	J	0.0023	J	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	0.0061	J	0.0066	J	< 0.02	-
Fluoride, Dissolved	**0.88**	-	**1.0**	-	**1.0**	-	**1.0**	-	**0.66**	-	0.58	-	**0.66**	-	**0.90**	-	0.54	-	0.52	-	0.56	-	**0.82**	-
Iron, Dissolved	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-
Lead, Dissolved	< 0.005	-	0.013	-	0.0036	J	< 0.005	-	0.0027	J	0.014	-	0.0031	J	< 0.005	-	< 0.005	-	**0.017**	-	0.0044	J	< 0.005	-
Magnesium, Dissolved	83	-	81	-	78	-	82	-	97	-	92	-	91	-	91	-	100	-	99	-	96	-	98	-
Manganese, Dissolved	**0.045**	-	**0.028**	-	0.0072	J	**0.025**	-	**0.052**	-	0.015	-	0.014	-	**0.031**	-	**0.039**	-	**0.021**	-	0.0046	J	0.0077	J
Mercury, Dissolved	< 0.0002	-	0.000020	J	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-
Molybdenum, Dissolved	0.011	-	< 0.005	-	0.0054	-	0.017	-	0.0069	-	< 0.005	-	0.0017	J	0.016	-	0.0045	J	< 0.005	-	0.0016	J	0.014	-
Nickel, Dissolved	0.0070	J, P1	< 0.02	-	< 0.02	-	< 0.02	-	0.0078	J	< 0.02	-	< 0.02	-	< 0.02	-	0.0089	J	< 0.02	-	< 0.02	-	< 0.02	-
Potassium, Dissolved	40	-	40	-	43	-	43	-	52	-	48	-	52	-	51	-	42	-	44	-	45	-	46	-
Selenium, Dissolved	< 0.1	O	0.0080	J	0.018	J	< 0.02	-	< 0.1	O	0.035	-	0.017	J	< 0.02	-	< 0.1	O	0.047	-	0.037	-	0.021	-
Silica, Dissolved	15	-	13	-	14	-	14	-	15	-	14	-	16	-	15	-	16	-	15	-	16	-	15	-
Silver, Dissolved	< 0.01	J6	0.0053	J	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	0.0038	J	0.0046	J	0.0055	J	< 0.01	-
Sodium, Dissolved	190	V	190	-	190	-	200	V	200	-	190	-	200	-	190	-	220	-	230	-	230	-	220	-
Thallium, Dissolved	< 0.02	-	**0.013**	J	**0.015**	J	< 0.02	-	< 0.02	-	**0.016**	J	**0.012**	J	< 0.02	-	< 0.02	-	**0.0091**	J	**0.014**	J	< 0.02	-
Titanium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Vanadium, Dissolved	< 0.01	-	< 0.01	-	0.0037	J	0.0025	J, P1	< 0.01	-	0.0030	J	0.0041	J	0.0028	J	< 0.01	-	< 0.01	-	0.0026	J	< 0.01	-
Zinc, Dissolved	< 0.03	-	< 0.03	-	< 0.03	-	0.028	J, P1	< 0.03	-	0.011	J	< 0.03	-	0.033	-	0.010	J	0.013	J	< 0.03	-	0.036	-
PAH (µg/L)																								
Acenaphthene	< 0.05	-	0.0086	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Anthracene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(a)anthracene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(a)pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(b)fluoranthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(g,h,i)perylene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	0.011	J	< 0.05	-
Benzo(k)fluoroanthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Chrysene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Fluoranthene	0.012	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Indeno(1,2,3-cd)pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.005	-	< 0.05	-	< 0.05	-	< 0.05	-
Naphthalene	**0.80**	-	< 0.25	-	< 0.25	-	0.025	J	**0.82**	-	< 0.25	-	< 0.25	-	0.025	J	0.020	J	< 0.25	-	0.023	J	0.021	J
Phenanthrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	0.015	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Pyrene	0.014	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
SVOC (µg/L)																								
1,1-Biphenyl	< 10	-	< 10	-	< 10	-	< 10	-	< 1	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-
Bis(2-ethylhexyl)phthalate	< 1	-	0.96	J	< 3	-	0.92	J	< 1	-	0.74	J	0.52	J	0.59	J	< 1	-	0.78	J	0.52	J	0.59	J

Table D-3 - Groundwater Chemical Analytical Results Summary

Monitoring Well	BG-6D		BG-6D		BG-6D		BG-6D		BG-6M		BG-6M		BG-6M		BG-6M		BG-6S		BG-6S		BG-6S		BG-6S	
Date	3/21/2012		5/25/2012		8/22/2012		11/27/2012		3/21/2012		5/25/2012		8/22/2012		11/27/2012		3/21/2012		5/25/2012		8/23/2012		11/27/2012	
Parameter Name	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier
Asbestos (MFL>10um)																								
Asbestos	< 5	-	< 0.2	-	< 0.5	-	< 0.2	-	< 0.7	-	< 0.2	-	< 0.5	-	< 0.2	-	< 0.7	-	< 1.7	-	< 0.5	-	< 9.9	-
General Chemistry (units listed below)																								
Alkalinity - Bicarbonate (mg/L)	130	-	130	-	150	-	130	-	120	-	130	-	140	-	120	-	130	-	160	-	140	-	130	-
Alkalinity - Carbonate (mg/L)	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-
Chloride (mg/L)	290	-	280	-	280	-	290	-	300	-	300	-	290	-	320	-	360	-	360	-	350	-	370	-
Nitrogen, Ammonia(As N) (mg/L)	< 0.1	-	0.060	J, T2	0.12	-	< 0.1	T2	< 0.1	-	0.095	J, T2	0.099	J	0.056	J, T2	< 0.1	T2	< 0.1	T2	0.12	T2	0.066	J, P1, T2
Nitrogen, Nitrate(As N) (mg/L)	< 0.1	-	0.13	-	0.24	-	0.31	-	0.053	J	0.099	J	0.26	-	0.25	-	< 0.1	-	< 0.1	-	0.17	-	0.11	-
Nitrogen, Nitrite(As N) (mg/L)	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-
pH (field)	7.31	-	7.45	-	7.4	-	7.31	-	7.45	-	7.47	-	7.45	-	7.49	-	7.52	-	7.35	-	7.58	-	7.46	-
pH (lab)	7.9	T8	NA	-	NA	-	NA	-	7.6	T8	NA	-	NA	-	NA	-	7.7	T8	NA	-	NA	-	NA	-
Phosphorus, Total (As P)(mg/L)	0.053	J	< 0.1	-	0.023	J	< 0.1	-	0.075	J	0.053	J	0.033	J	0.020	J	0.098	J	0.15	-	0.061	J	0.12	-
Specific Conductance (field) (µmhos/cm)	2600	-	2590	-	2530	-	2580	-	2530	-	2560	-	2480	-	2620	-	3370	-	3320	-	3370	-	3480	-
Specific Conductance (µmhos/cm)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Sulfate (mg/L)	**890**	-	**860**	-	**830**	-	**940**	-	**820**	-	**810**	-	**750**	-	**920**	-	**1200**	-	**1200**	-	**1200**	-	**1300**	-
Total Dissolved Solids(residue, filterable) (mg/L)	**1800**	-	**1800**	-	**1900**	-	**1900**	-	**1800**	-	**1800**	-	**1800**	-	**1900**	-	**2400**	-	**2400**	-	**2600**	-	**2500**	-
Metals (mg/L)																								
Aluminum, Dissolved	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	**0.052**	J	< 0.1	-	< 0.1	-	0.046	J	**0.10**	-	0.039	J	< 0.1	-	< 0.1	-
Antimony, Dissolved	< 0.02	-	**0.0072**	J	**0.034**	-	**0.022**	-	< 0.02	-	< 0.02	-	**0.041**	-	**0.025**	-	< 0.02	-	< 0.02	-	**0.038**	-	**0.025**	-
Arsenic, Dissolved	**0.016**	J	< 0.02	-	< 0.02	-	< 0.02	-	**0.018**	J	< 0.02	-	< 0.02	-	< 0.02	-	**0.015**	J	**0.016**	J	< 0.02	-	< 0.02	-
Barium, Dissolved	0.037	-	0.038	-	0.014	-	0.014	-	0.031	-	0.033	-	0.024	-	0.018	-	0.048	-	0.054	-	0.042	-	0.041	-
Beryllium, Dissolved	< 0.002	-	0.00082	J	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-
Boron, Dissolved	0.40	-	0.44	-	0.71	-	0.70	-	0.56	-	0.41	-	0.60	-	0.58	-	0.91	-	0.72	-	0.79	-	0.92	-
Cadmium, Dissolved	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-
Calcium, Dissolved	92	-	94	-	180	-	190	-	180	-	120	-	180	-	180	-	190	-	180	-	190	-	190	-
Chromium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Chromium, hexavalent	**0.0040**	J, P1	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	**0.0050**	J	< 0.01	-
Cobalt, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	0.0026	J	< 0.01	-	< 0.01	-	< 0.01	-	0.0035	J	< 0.01	-
Copper, Dissolved	0.0016	J	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	0.0041	J	< 0.02	-
Fluoride, Dissolved	**0.75**	-	**0.72**	-	**0.76**	-	**0.70**	-	**0.67**	-	**0.64**	-	**0.67**	-	**0.64**	-	**0.67**	-	**0.66**	-	**0.66**	-	**0.63**	-
Iron, Dissolved	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	0.098	J	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-
Lead, Dissolved	0.0048	J	< 0.005	-	< 0.005	-	< 0.005	-	0.0048	J	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-
Magnesium, Dissolved	46	-	48	-	110	-	110	-	110	-	67	-	110	-	110	-	97	-	86	-	99	-	98	-
Manganese, Dissolved	**0.089**	-	**0.095**	-	< 0.01	-	< 0.01	-	**0.096**	-	**0.20**	-	**0.026**	-	**0.026**	-	**0.11**	-	**0.20**	-	**0.11**	-	**0.058**	-
Mercury, Dissolved	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	0.000020	J	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-
Molybdenum, Dissolved	0.014	-	0.0051	-	< 0.005	-	0.016	-	0.012	-	0.0095	-	0.0053	-	0.017	-	0.018	-	0.0073	-	0.016	-	0.023	-
Nickel, Dissolved	< 0.02	-	0.011	J	< 0.02	-	< 0.02	-	< 0.02	-	0.0089	J	< 0.02	-	< 0.02	-	0.0052	J	0.0069	J	< 0.02	-	< 0.02	-
Potassium, Dissolved	15	-	16	-	29	-	30	-	27	-	18	-	27	-	28	-	20	-	17	-	20	-	23	-
Selenium, Dissolved	< 0.04	O	< 0.02	-	**0.18**	-	0.015	J	< 0.1	O	< 0.04	O	**0.19**	-	0.020	-	< 0.1	O	< 0.04	O	**0.18**	-	0.011	J
Silica, Dissolved	18	-	24	-	18	-	18	-	17	-	16	-	18	-	17	-	18	-	21	-	20	-	18	-
Silver, Dissolved	< 0.01	-	< 0.01	-	0.010	-	< 0.01	-	< 0.01	-	< 0.01	-	0.0077	J	< 0.01	-	< 0.01	-	< 0.01	-	0.0099	J	0.0029	J
Sodium, Dissolved	120	-	130	-	200	-	200	-	200	-	150	-	200	-	190	-	450	-	410	-	420	-	450	-
Thallium, Dissolved	< 0.02	-	< 0.02	-	**0.048**	-	< 0.02	-	< 0.02	-	< 0.02	-	**0.049**	-	< 0.02	-	< 0.02	-	< 0.02	-	**0.057**	-	< 0.02	-
Titanium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Vanadium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	0.0036	J	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	0.0029	J	< 0.01	-	0.0035	J	< 0.01	-
Zinc, Dissolved	0.028	J	0.016	J	0.018	J	0.045	-	0.014	J	< 0.03	-	0.018	J	0.039	-	0.014	J	< 0.03	-	0.015	J	0.047	-
PAH (µg/L)																								
Acenaphthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	0.0090	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Anthracene	0.017	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(a)anthracene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(a)pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(b)fluoranthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(g,h,i)perylene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(k)fluoroanthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Chrysene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Fluoranthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Indeno(1,2,3-cd)pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Naphthalene	0.015	J	0.020	J	< 0.25	-	< 0.25	-	**1.1**	-	0.021	J	0.035	J	0.025	J	0.023	J	0.020	J	0.027	J	0.031	J
Phenanthrene	< 0.05	-	< 0.05	-	0.015	J	< 0.05	-	0.012	J	< 0.05	-	0.015	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	0.034	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
SVOC (µg/L)																								
1,1-Biphenyl	0.22	J	< 10	-	< 8	-	< 10	-	< 10	-	< 10	-	< 8	-	< 10	-	< 10	-	< 10	-	< 8	-	< 10	-
Bis(2-ethylhexyl)phthalate	< 1	-	< 1	-	2.1	J	< 3	-	< 1	-	< 1	-	1.2	J	0.62	J	0.69	J	< 1	-	0.90	J	0.51	J

Table D-3 - Groundwater Chemical Analytical Results Summary

Monitoring Well	IMW-2.5D		IMW-2.5D		IMW-2.5D		IMW-2.5D		IMW-2.5S		IMW-2.5S		IMW-2.5S		IMW-2.5S		IMW-3D		IMW-3D		IMW-3S		IMW-3S	
Date	3/21/2012		5/21/2012		8/24/2012		11/26/2012		3/21/2012		5/21/2012		8/24/2012		11/26/2012		3/22/2012		5/25/2012		3/20/2012		5/21/2012	
Parameter Name	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier
Asbestos (MFL>10um)																								
Asbestos	< 1.7	-	< 1	-	< 1.7	-	< 1	-	< 9.9	-	< 5	-	< 1	-	< 5	-	< 5	-	< 1.7	-	< 1	-	< 0.2	-
General Chemistry (units listed below)																								
Alkalinity - Bicarbonate (mg/L)	450	-	460	-	480	-	440	-	440	-	500	-	470	-	440	-	240	-	240	-	330	-	360	-
Alkalinity - Carbonate (mg/L)	< 20	-	< 20	-	< 200	-	< 100	-	< 20	-	< 20	-	< 200	-	< 100	-	< 20	-	< 20	-	< 20	-	< 20	-
Chloride (mg/L)	310	-	330	-	310	-	320	-	350	-	370	-	340	-	360	-	230	-	230	-	250	-	230	-
Nitrogen, Ammonia(As N) (mg/L)	**0.30**	-	**0.54**	T2	**0.46**	T2	**0.35**	T2	0.16	T2	**0.39**	T2	**0.45**	T2	0.20	T2	0.082	J	0.080	J, T2	< 0.1	T2	< 0.1	T2
Nitrogen, Nitrate(As N) (mg/L)	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	0.027	J	0.22	-	0.074	J	0.71	-	0.38	-
Nitrogen, Nitrite(As N) (mg/L)	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	0.019	J	< 0.1	-	0.011	J	< 0.1	-	0.014	J	< 0.1	-
pH (field)	7.43	-	7.26	-	NA	-	7.36	-	7.67	-	7.46	-	NA	-	7.35	-	7.3	-	7.05	-	7.19	-	7.09	-
pH (lab)	7.6	T8	NA	-	NA	-	NA	-	7.6	T8	NA	-	NA	-	NA	-	8.1	T8	NA	-	7.4	T8	NA	-
Phosphorus, Total (As P)(mg/L)	0.12	-	0.099	J	0.13	T2	0.18	T2	0.28	-	0.18	-	0.27	T2	0.25	T2	0.066	J, T2	0.020	J	0.042	J	0.043	J, P1
Specific Conductance (field) (µmhos/cm)	3640	-	3620	-	NA	-	3670	-	3950	-	3940	-	NA	-	3880	-	2480	-	2330	-	2720	-	2710	-
Specific Conductance (µmhos/cm)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Sulfate (mg/L)	**1000**	-	**1100**	-	**1000**	-	**1100**	-	**1200**	-	**1200**	-	**1200**	-	**1200**	-	**720**	-	**720**	-	**800**	-	**740**	-
Total Dissolved Solids(residue, filterable) (mg/L)	**2400**	-	**2500**	-	**2600**	-	**2500**	-	**2700**	-	**2700**	-	**2700**	-	**2700**	-	**1700**	-	**1700**	-	**1600**	-	**1800**	-
Metals (mg/L)																								
Aluminum, Dissolved	**0.058**	J, P1	< 0.1	-	0.045	J	**0.078**	J	**0.056**	J	< 0.1	-	0.048	J	**0.090**	J	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-
Antimony, Dissolved	< 0.02	-	< 0.02	-	< 0.02	-	**0.016**	J	< 0.02	-	< 0.02	-	**0.014**	J, P1	**0.021**	-	**0.023**	-	< 0.02	-	**0.0079**	J	< 0.02	-
Arsenic, Dissolved	**0.16**	-	**0.14**	-	**0.13**	-	**0.19**	-	**0.17**	-	**0.16**	-	**0.14**	-	**0.24**	-	< 0.02	-	**0.0070**	J	**0.038**	-	**0.036**	-
Barium, Dissolved	0.015	-	0.019	-	0.015	-	0.018	-	0.025	-	0.025	-	0.025	-	0.029	-	0.013	-	0.017	-	0.017	-	0.018	-
Beryllium, Dissolved	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	0.00062	J
Boron, Dissolved	1.4	-	1.3	-	1.3	-	1.6	-	1.4	-	1.4	-	1.4	-	1.7	-	0.79	-	0.75	-	0.98	-	1.0	-
Cadmium, Dissolved	< 0.005	-	0.0017	J	< 0.005	-	< 0.005	-	< 0.005	-	0.0020	J	0.0015	J	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	0.0020	J
Calcium, Dissolved	110	-	110	-	110	-	130	-	87	-	90	-	93	-	110	-	130	-	130	-	110	-	110	-
Chromium, Dissolved	0.0046	J, P1	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Chromium, hexavalent	< 0.01	-	< 0.01	-	**0.0040**	J, T8	< 0.01	-	< 0.01	-	< 0.01	-	**0.0030**	J, T8, P1	< 0.01	-	< 0.01	T8	< 0.01	-	< 0.01	-	< 0.01	-
Cobalt, Dissolved	< 0.01	-	< 0.01	-	0.0041	J	**0.012**	-	< 0.01	-	< 0.01	-	0.0045	J	**0.012**	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Copper, Dissolved	0.0022	J, P1	< 0.02	-	0.0031	J	< 0.02	-	< 0.02	-	< 0.02	-	0.0045	J	< 0.02	-	0.0016	J	0.0061	J	< 0.02	-	< 0.02	-
Fluoride, Dissolved	**3.9**	-	**3.8**	-	**3.9**	-	**3.1**	-	**4.6**	-	**4.3**	-	**4.3**	-	**3.6**	-	**0.96**	-	**0.86**	-	**3.9**	-	**3.6**	-
Iron, Dissolved	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	0.019	J	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-
Lead, Dissolved	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	**0.016**	-	< 0.005	-	0.0040	J	< 0.005	-
Magnesium, Dissolved	140	-	140	-	140	-	**170**	-	130	-	140	-	140	-	**180**	-	83	-	84	-	98	-	98	-
Manganese, Dissolved	**0.23**	-	**0.22**	-	**0.24**	-	**0.28**	-	**0.22**	-	**0.30**	-	**0.28**	-	**0.36**	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Mercury, Dissolved	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-	< 0.0002	-
Molybdenum, Dissolved	0.046	-	0.025	-	0.042	-	0.051	-	0.042	-	0.025	-	0.044	-	0.052	-	0.019	-	0.0029	J	0.033	-	0.018	-
Nickel, Dissolved	0.0053	J, P1	0.0067	J	< 0.02	-	< 0.02	-	0.0077	J	0.0099	J	< 0.02	-	< 0.02	-	< 0.02	-	0.0084	J	0.0077	J	0.0074	J
Potassium, Dissolved	30	-	27	-	32	-	34	-	35	-	32	-	36	-	38	-	23	-	23	-	23	-	23	-
Selenium, Dissolved	< 0.1	O	< 0.1	O	**0.19**	-	0.024	-	< 0.1	O	< 0.1	O	**0.18**	-	0.039	-	0.015	J	< 0.04	O	< 0.1	O	< 0.1	O
Silica, Dissolved	59	-	59	-	54	-	56	-	55	-	58	-	54	-	54	-	22	-	21	-	48	-	50	-
Silver, Dissolved	< 0.01	J6	< 0.01	-	0.0047	J	0.0078	J	< 0.01	-	< 0.01	-	0.0059	J	0.0065	J	< 0.01	-	< 0.01	-	0.0048	J	< 0.01	-
Sodium, Dissolved	510	V	470	-	470	-	540	-	660	-	570	-	540	-	640	-	250	-	260	-	330	-	330	-
Thallium, Dissolved	< 0.02	-	< 0.02	-	**0.038**	-	**0.061**	-	< 0.02	-	< 0.02	-	**0.031**	-	**0.049**	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-
Titanium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Vanadium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	0.0032	J	0.0032	J	0.0058	J	0.0066	J
Zinc, Dissolved	0.016	J, P1	< 0.03	-	0.018	J	0.060	-	0.011	J	< 0.03	-	0.020	J	0.054	-	< 0.03	-	< 0.03	-	< 0.03	-	< 0.03	-
PAH (µg/L)																								
Acenaphthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	0.020	-	< 0.05	-	< 0.05	-	< 0.05	-
Anthracene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	0.013	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(a)anthracene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(a)pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(b)fluoranthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(g,h,i)perylene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(k)fluoroanthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Chrysene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Fluoranthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Indeno(1,2,3-cd)pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Naphthalene	0.040	J	0.022	J	< 0.25	-	< 0.25	-	< 0.25	-	< 0.25	-	< 0.25	-	< 0.25	-	< 0.25	-	0.021	J	0.024	J	< 0.25	-
Phenanthrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	0.025	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
SVOC (µg/L)																								
1,1-Biphenyl	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-
Bis(2-ethylhexyl)phthalate	< 1	-	1.7	-	1.1	J	0.54	J	0.66	J	2.7	-	1.1	J	2.2	J	3.3	-	< 1	-	< 1	-	2.0	-

Table D-3 - Groundwater Chemical Analytical Results Summary

Monitoring Well	KMW-2D		KMW-2D		KMW-2D		KMW-2D		KMW-2M		KMW-2M		KMW-2M		KMW-2M		KMW-2S		KMW-2S		KMW-2S		KMW-2S	
Date	3/23/2012		5/21/2012		8/24/2012		11/26/2012		3/23/2012		5/21/2012		8/24/2012		11/26/2012		3/23/2012		5/21/2012		8/24/2012		11/26/2012	
Parameter Name	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier
Asbestos (MFL>10um)																								
Asbestos	< 0.7	-	< 1	-	< 5	-	< 5	-	< 2.5	-	< 9.9	-	< 5	-	< 5	-	< 16.5	-	< 9.9	-	< 1	-	< 124.1	-
General Chemistry (units listed below)																								
Alkalinity - Bicarbonate (mg/L)	440	-	460	-	470	-	440	-	410	-	430	-	440	-	410	-	400	-	420	-	440	-	1200	-
Alkalinity - Carbonate (mg/L)	< 20	-	< 20	-	< 200	-	< 100	-	< 20	-	< 20	-	< 200	-	< 100	-	< 20	-	< 20	-	< 200	-	< 100	-
Chloride (mg/L)	370	-	360	-	340	-	350	-	**420**	-	370	-	370	-	380	-	390	-	390	-	360	-	380	-
Nitrogen, Ammonia(As N) (mg/L)	< 0.1	-	**0.31**	T2	**0.44**	T2	**0.25**	T2	< 0.1	-	**0.37**	T2	**0.48**	T2	**0.33**	T2	< 0.1	-	**0.83**	J6, T2	**0.55**	T2	**0.40**	T2
Nitrogen, Nitrate(As N) (mg/L)	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-
Nitrogen, Nitrite(As N) (mg/L)	< 0.1	-	< 0.1	-	0.018	J, P1	< 0.1	-	< 0.1	-	< 0.1	-	0.018	J	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-
pH (field)	7.18	-	7.18	-	NA	-	7.33	-	7.14	-	7.18	-	NA	-	7.27	-	7.22	-	7.2	-	NA	-	7.26	-
pH (lab)	7.7	T8	NA	-	NA	-	NA	-	7.5	T8	NA	-	NA	-	NA	-	7.5	T8	NA	-	NA	-	NA	-
Phosphorus, Total (As P)(mg/L)	0.083	J, T2	0.086	J	0.12	T2	0.072	J, T2	0.12	T2	0.12	-	0.10	T2	0.12	T2	0.22	T2	0.48	-	0.091	J, T2	2.4	T2
Specific Conductance (field) (µmhos/cm)	3780	-	3810	-	NA	-	3830	-	3960	-	3990	-	NA	-	3990	-	3930	-	3940	-	NA	-	4000	-
Specific Conductance (µmhos/cm)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Sulfate (mg/L)	**1200**	-	**1200**	-	**1200**	-	**1200**	-	**1400**	-	**1300**	-	**1200**	-	**1300**	-	**1300**	-	**1300**	-	**1200**	-	**1300**	-
Total Dissolved Solids(residue, filterable) (mg/L)	**2600**	-	**2800**	-	**2800**	-	**2600**	-	**2800**	-	**3100**	-	**3000**	-	**2900**	-	**2800**	-	**3000**	-	**2900**	-	**3000**	-
Metals (mg/L)																								
Aluminum, Dissolved	< 0.1	-	< 0.1	-	**0.058**	J	**0.093**	J	< 0.1	-	< 0.1	-	**0.053**	J	**0.081**	J	0.038	J	< 0.1	-	0.035	J	**0.074**	J
Antimony, Dissolved	< 0.02	-	< 0.02	-	< 0.02	-	**0.022**	-	< 0.02	-	< 0.02	-	< 0.02	-	**0.022**	-	< 0.02	-	< 0.02	-	< 0.02	-	**0.024**	-
Arsenic, Dissolved	**0.093**	-	**0.098**	-	**0.070**	-	**0.16**	-	**0.094**	-	**0.10**	-	**0.077**	-	**0.18**	-	**0.21**	-	**0.19**	-	**0.16**	-	**0.29**	-
Barium, Dissolved	0.017	-	0.018	-	0.016	-	0.021	-	0.019	-	0.019	-	0.018	-	0.022	-	0.017	-	0.019	-	0.017	-	0.028	-
Beryllium, Dissolved	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-
Boron, Dissolved	1.3	-	1.3	-	1.3	-	1.7	-	1.2	-	1.2	-	1.2	-	1.5	-	1.1	-	1.1	-	1.1	-	1.5	-
Cadmium, Dissolved	< 0.005	-	0.0015	J	< 0.005	-	< 0.005	-	< 0.005	-	0.0020	J	< 0.005	-	< 0.005	-	< 0.005	-	0.0024	J	< 0.005	-	0.00080	J
Calcium, Dissolved	140	-	130	-	130	-	170	-	160	-	170	-	160	-	200	-	140	-	140	-	140	-	170	-
Chromium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Chromium, hexavalent	**0.0050**	J	< 0.01	-	**0.0040**	J, T8	< 0.01	-	**0.0040**	J	< 0.01	-	**0.0060**	J, T8	< 0.01	-	**0.0040**	J	< 0.01	-	**0.0030**	J, T8	< 0.01	-
Cobalt, Dissolved	< 0.01	-	< 0.01	-	0.0031	J	**0.011**	-	< 0.01	-	< 0.01	-	0.0033	J	**0.012**	-	< 0.01	-	< 0.01	-	0.0035	J	**0.014**	-
Copper, Dissolved	< 0.02	-	< 0.02	-	0.0036	J	< 0.02	-	< 0.02	-	< 0.02	-	0.0033	J	< 0.02	-	< 0.02	-	< 0.02	-	0.0026	J	< 0.02	-
Fluoride, Dissolved	**3.6**	-	**3.4**	-	**3.5**	-	**3.3**	-	**3.6**	-	**3.4**	-	**3.5**	-	**3.3**	-	**3.8**	-	**3.9**	-	**3.8**	-	**3.7**	-
Iron, Dissolved	< 0.1	-	< 0.1	-	0.033	J	0.27	-	0.036	J	< 0.1	-	0.16	-	**0.51**	-	< 0.1	-	< 0.1	-	0.10	J	0.055	J
Lead, Dissolved	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-
Magnesium, Dissolved	**150**	-	**150**	-	**150**	-	**190**	-	**160**	-	**170**	-	**160**	-	**200**	-	**170**	-	**170**	-	**170**	-	**210**	-
Manganese, Dissolved	**0.26**	-	**0.26**	-	**0.26**	-	**0.33**	-	**0.26**	-	**0.27**	-	**0.27**	-	**0.33**	-	**0.18**	-	**0.20**	-	**0.20**	-	**0.27**	-
Mercury, Dissolved	0.000010	J	< 0.0002	-	< 0.0002	-	< 0.0002	-	0.000010	J	< 0.0002	-	< 0.0002	-	< 0.0002	-	0.000010	J	< 0.0002	-	< 0.0002	-	< 0.0002	-
Molybdenum, Dissolved	0.037	-	0.022	-	0.039	-	0.052	-	0.034	-	0.021	-	0.034	-	0.044	-	0.036	-	0.023	-	0.028	-	0.041	-
Nickel, Dissolved	< 0.02	-	0.016	J	< 0.02	-	< 0.02	-	0.0058	J	0.012	J	< 0.02	-	< 0.02	-	< 0.02	-	0.010	J	< 0.02	-	< 0.02	-
Potassium, Dissolved	29	-	28	-	30	-	34	-	39	-	37	-	40	-	44	-	43	-	39	-	46	-	50	-
Selenium, Dissolved	< 0.1	O	< 0.1	O	**0.19**	-	**0.050**	-	< 0.2	O	< 0.1	O	**0.20**	-	0.009	J	< 0.1	O	< 0.1	O	**0.19**	-	0.028	-
Silica, Dissolved	58	-	60	-	54	-	56	-	60	-	61	-	55	-	58	-	63	-	64	-	57	-	60	-
Silver, Dissolved	< 0.01	-	< 0.01	-	0.0066	J	0.0076	J	< 0.01	-	< 0.01	-	0.0080	J	0.010	J	< 0.01	-	< 0.01	-	0.0054	J	0.010	J
Sodium, Dissolved	520	-	510	-	480	-	580	-	520	-	500	-	470	-	560	-	480	-	450	-	450	-	570	-
Thallium, Dissolved	< 0.02	-	< 0.02	-	**0.044**	-	**0.068**	-	< 0.02	-	< 0.02	-	**0.047**	-	**0.063**	-	< 0.02	-	< 0.02	-	**0.045**	-	**0.060**	-
Titanium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Vanadium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Zinc, Dissolved	< 0.03	-	0.016	J	0.019	J	0.061	-	< 0.03	-	< 0.03	-	0.019	J	0.063	-	< 0.03	-	< 0.03	-	0.022	J	0.062	-
PAH (µg/L)																								
Acenaphthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	0.013	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Anthracene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(a)anthracene	< 0.05	-	< 0.05	-	< 0.05	-	0.015	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(a)pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(b)fluoranthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(g,h,i)perylene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(k)fluoroanthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Chrysene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Fluoranthene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Indeno(1,2,3-cd)pyrene	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Naphthalene	< 0.25	-	0.038	J	0.020	J	< 0.25	-	< 0.25	-	0.029	J	< 0.25	-	< 0.25	-	< 0.25	-	< 0.25	-	< 0.25	-	< 0.25	-
Phenanthrene	< 0.05	-	< 0.05	-	0.0094	J	0.0092	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Pyrene	< 0.05	-	< 0.05	-	0.039	J	0.019	J	< 0.05	-	< 0.05	-	< 0.05	-	0.013	J	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
SVOC (µg/L)																								
1,1-Biphenyl	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-
Bis(2-ethylhexyl)phthalate	< 1	-	0.90	J	0.81	J	0.67	J	< 1	-	2.0	-	0.96	J	0.71	J	< 1	-	1.1	-	0.65	J	0.73	J

Table D-3 - Groundwater Chemical Analytical Results Summary

Monitoring Well	LMW-10		LMW-10		LMW-10		LMW-10		LMW-11		LMW-11R		LMW-11R		LMW-11R		LMW-11R		LMW-12R		LMW-12R		LMW-12R	
Date	3/22/2012		5/30/2012		8/27/2012		11/28/2012		2/22/2012		3/23/2012		5/29/2012		8/21/2012		11/26/2012		5/30/2012		8/21/2012		10/22/2012	
Parameter Name	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier
Asbestos (MFL>10um)																								
Asbestos	< 198.6	-	< 9.9	-	< 49.6	-	< 49.6	-	NA	-	< 0.7	-	< 1	-	< 0.5	-	< 1	-	NA	-	NA	-	NA	-
General Chemistry (units listed below)																								
Alkalinity - Bicarbonate (mg/L)	93	-	89	-	94	-	110	-	NA	-	84	-	71	-	90	-	82	-	NA	-	NA	-	NA	-
Alkalinity - Carbonate (mg/L)	< 20	-	< 20	-	< 20	-	< 20	-	NA	-	< 20	-	< 20	-	< 20	-	< 20	-	NA	-	NA	-	NA	-
Chloride (mg/L)	**500**	-	**520**	-	**460**	-	**480**	-	**450**	-	**470**	-	**460**	-	**420**	-	**430**	-	380	-	380	-	350	-
Nitrogen, Ammonia(As N) (mg/L)	< 0.1	-	0.060	J, T2	0.062	J, T2	< 0.1	T2	NA	-	< 0.1	-	0.15	T2	0.053	J	< 0.1	T2	NA	-	NA	-	NA	-
Nitrogen, Nitrate(As N) (mg/L)	9.0	-	5.2	-	9.4	-	**10**	-	< 5	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	1.5	-	1.6	-	1.5	-
Nitrogen, Nitrite(As N) (mg/L)	0.010	J	< 0.1	-	0.083	J	< 0.1	-	NA	-	< 0.1	-	< 0.1	-	0.017	J	< 0.1	-	NA	-	NA	-	NA	-
pH (field)	7.49	-	NA	-	NA	-	NA	-	7.5	-	7.25	-	NA	-	NA	-	NA	-	7.44	-	7.39	-	7.56	-
pH (lab)	7.7	T8	NA	-	NA	-	NA	-	NA	-	7.6	T8	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Phosphorus, Total (As P)(mg/L)	0.80	T2	1.9	-	1.3	T2	0.88	-	NA	-	0.038	J, T2	0.038	J	0.036	J	< 0.1	T2	NA	-	NA	-	NA	-
Specific Conductance (field) (µmhos/cm)	5100	-	NA	-	NA	-	NA	-	NA	-	4980	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Specific Conductance (µmhos/cm)	NA	-	NA	-	NA	-	NA	-	5307	-	NA	-	NA	-	NA	-	NA	-	3490	-	3700	-	3640	-
Sulfate (mg/L)	**2200**	-	**2300**	-	**2200**	-	**2200**	-	**2500**	-	**2800**	-	**2800**	-	**2600**	-	**2600**	-	**1300**	-	**1400**	-	**1400**	-
Total Dissolved Solids(residue, filterable) (mg/L)	**4200**	-	**4400**	-	**4200**	-	**4800**	-	**4336**	-	**4100**	-	**4300**	-	**4400**	-	**4500**	-	**2784**	-	**2786**	-	**2778**	-
Metals (mg/L)																								
Aluminum, Dissolved	< 0.1	-	< 0.1	-	**0.072**	J	< 0.1	-	NA	-	0.048	J	0.047	J	0.044	J	**0.054**	J, P1, J5	NA	-	NA	-	NA	-
Antimony, Dissolved	**0.037**	-	**0.034**	-	< 0.02	-	**0.017**	J	NA	-	< 0.02	-	**0.016**	-	**0.018**	J	**0.023**	P1	NA	-	NA	-	NA	-
Arsenic, Dissolved	**0.017**	J	< 0.02	-	**0.046**	-	< 0.02	-	**0.054**	-	< 0.02	-	**0.030**	-	**0.053**	-	< 0.02	P1	**0.13**	-	**0.084**	-	**0.081**	-
Barium, Dissolved	0.012	-	0.0023	J	0.015	-	0.011	-	NA	-	0.018	-	0.011	-	0.014	-	0.012	-	NA	-	NA	-	NA	-
Beryllium, Dissolved	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.003	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.003	-	< 0.003	-	< 0.003	-
Boron, Dissolved	**8.0**	-	5.4	-	**9.0**	-	**9.2**	-	3.6	-	3.6	-	3.7	-	3.8	-	4.5	-	2.5	-	2.5	-	2.7	-
Cadmium, Dissolved	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.003	-	< 0.005	-	**0.0051**	-	< 0.005	-	< 0.005	-	< 0.003	-	< 0.003	-	< 0.003	-
Calcium, Dissolved	300	-	190	-	330	-	340	-	490	-	440	-	450	-	460	-	530	V	260	-	250	-	270	-
Chromium, Dissolved	0.0051	J	< 0.01	-	0.0065	J	< 0.01	-	< 0.005	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.005	-	< 0.005	-	< 0.005	-
Chromium, hexavalent	**0.0090**	J	**0.0040**	J	**0.0080**	J	**0.0040**	J	NA	-	< 0.01	-	**0.0040**	J	**0.0030**	J, T8	< 0.01	-	NA	-	NA	-	NA	-
Cobalt, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	**0.010**	-	NA	-	< 0.01	-	< 0.01	-	< 0.01	-	**0.013**	-	NA	-	NA	-	NA	-
Copper, Dissolved	0.0027	J	0.0057	J	0.0047	J	< 0.02	-	NA	-	< 0.02	-	< 0.02	-	< 0.02	-	0.0067	J, P1	NA	-	NA	-	NA	-
Fluoride, Dissolved	**1.6**	-	**1.6**	-	**1.6**	-	**1.4**	-	NA	-	**2.1**	-	**1.9**	-	**2.1**	-	**1.7**	-	NA	-	NA	-	NA	-
Iron, Dissolved	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	NA	-	0.031	J	< 0.1	-	< 0.1	-	< 0.1	-	NA	-	NA	-	NA	-
Lead, Dissolved	**0.025**	-	**0.015**	-	0.0071	-	< 0.025	O	NA	-	< 0.005	-	**0.034**	-	**0.017**	-	< 0.005	-	NA	-	NA	-	NA	-
Magnesium, Dissolved	140	-	83	-	140	-	**150**	-	**200**	-	**220**	-	**220**	-	**230**	-	**260**	-	120	-	120	-	130	-
Manganese, Dissolved	< 0.01	-	< 0.01	-	0.0085	J	< 0.01	-	**0.28**	-	0.016	-	< 0.01	-	0.0032	J	< 0.01	-	< 0.005	-	< 0.005	-	< 0.005	-
Mercury, Dissolved	< 0.0002	-	0.000020	J	< 0.0002	-	< 0.0002	-	NA	-	0.000010	J	0.000020	J	< 0.0002	-	< 0.0002	-	NA	-	NA	-	NA	-
Molybdenum, Dissolved	**0.12**	-	0.046	-	**0.13**	-	**0.12**	-	0.057	-	**0.13**	-	**0.11**	-	**0.15**	-	**0.16**	-	**0.095**	-	**0.10**	-	**0.10**	-
Nickel, Dissolved	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.005	-	0.0076	J	< 0.02	-	0.024	-	< 0.02	-	< 0.005	-	< 0.005	-	< 0.005	-
Potassium, Dissolved	76	-	82	-	86	-	81	-	54	-	56	-	56	-	57	-	64	-	36	-	32	-	40	-
Selenium, Dissolved	**0.084**	-	**0.051**	-	**0.086**	-	**0.16**	-	< 0.02	-	< 0.1	O	0.022	-	< 0.02	-	< 0.02	-	0.041	-	**0.18**	-	**0.055**	-
Silica, Dissolved	13	-	14	-	14	-	13	-	NA	-	15	-	14	-	16	-	14	-	NA	-	NA	-	NA	-
Silver, Dissolved	< 0.01	-	< 0.01	-	0.0084	J	0.019	-	NA	-	< 0.01	-	< 0.01	-	0.0057	J	0.027	-	NA	-	NA	-	NA	-
Sodium, Dissolved	780	-	790	-	770	-	720	-	520	-	480	-	480	-	480	-	560	V	360	-	380	-	390	-
Thallium, Dissolved	< 0.02	-	< 0.02	-	**0.017**	J	**0.094**	-	NA	-	< 0.02	-	**0.022**	-	**0.015**	J	**0.10**	J3	NA	-	NA	-	NA	-
Titanium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.005	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.005	-	< 0.005	-	< 0.005	-
Vanadium, Dissolved	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	0.0056	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	0.0041	-	< 0.003	-	0.013	-
Zinc, Dissolved	< 0.03	-	0.015	J	0.016	J	0.071	-	NA	-	0.041	-	0.015	J	0.019	J	0.088	-	NA	-	NA	-	NA	-
PAH (µg/L)																								
Acenaphthene	< 0.05	Q	< 0.05	-	< 0.05	-	0.034	J	NA	-	0.019	J	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	NA	-	NA	-
Anthracene	< 0.05	Q	< 0.05	-	< 0.05	-	0.013	J	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	NA	-	NA	-
Benzo(a)anthracene	< 0.05	Q	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	NA	-	NA	-
Benzo(a)pyrene	< 0.05	Q	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	NA	-	NA	-
Benzo(b)fluoranthene	< 0.05	Q	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	NA	-	NA	-
Benzo(g,h,i)perylene	< 0.05	Q	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	NA	-	NA	-
Benzo(k)fluoroanthene	< 0.05	Q	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	J4	< 0.05	-	NA	-	NA	-	NA	-
Chrysene	< 0.05	Q	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	NA	-	NA	-
Fluoranthene	50	Q	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	NA	-	NA	-
Indeno(1,2,3-cd)pyrene	**50**	Q	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	NA	-	NA	-
Naphthalene	< 0.25	Q	< 0.25	-	0.030	J	**0.18**	J	NA	-	< 0.25	-	0.028	J	< 0.25	-	< 0.25	-	NA	-	NA	-	NA	-
Phenanthrene	< 0.05	Q	< 0.05	-	< 0.05	-	0.10	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	NA	-	NA	-
Pyrene	< 0.05	Q	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	NA	-	NA	-	NA	-
SVOC (µg/L)																								
1,1-Biphenyl	< 10	T8	< 10	-	< 10	-	< 10	-	NA	-	< 10	-	< 10	-	< 10	-	< 10	-	NA	-	NA	-	NA	-
Bis(2-ethylhexyl)phthalate	< 1	T8	0.66	J	0.96	J	0.92	J	NA	-	< 1	-	< 1	-	0.82	J	0.59	J	NA	-	NA	-	NA	-

Table D-3 - Groundwater Chemical Analytical Results Summary

Monitoring Well	LMW-12R		LMW-13R		LMW-13R		LMW-13R		LMW-13R		LMW-14R		LMW-14R		LMW-14R		LMW-14R		LMW-15		LMW-15		LMW-15	
Date	11/30/2012		5/29/2012		8/20/2012		10/22/2012		11/28/2012		5/29/2012		8/20/2012		10/22/2012		11/30/2012		5/29/2012		8/20/2012		10/22/2012	
Parameter Name	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier
Asbestos (MFL>10um)																								
Asbestos	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
General Chemistry (units listed below)																								
Alkalinity - Bicarbonate (mg/L)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Alkalinity - Carbonate (mg/L)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Chloride (mg/L)	**400**	-	250	-	250	-	250	-	270	-	260	-	260	-	250	-	270	-	270	-	250	-	250	-
Nitrogen, Ammonia(As N) (mg/L)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Nitrogen, Nitrate(As N) (mg/L)	1.5	-	0.74	-	0.59	-	0.58	-	0.50	-	< 0.5	-	0.63	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-	< 0.5	-
Nitrogen, Nitrite(As N) (mg/L)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
pH (field)	7.36	-	7.28	-	7.2	-	7.31	-	7.36	-	7.19	-	7.13	-	7.28	-	7.07	-	7.28	-	7.23	-	7.34	-
pH (lab)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Phosphorus, Total (As P)(mg/L)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Specific Conductance (field) (µmhos/cm)	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Specific Conductance (µmhos/cm)	3680	-	3490	-	3500	-	3520	-	3520	-	3670	-	3730	-	3620	-	3720	-	3710	-	3690	-	3620	-
Sulfate (mg/L)	**1300**	-	**1700**	-	**1600**	-	**1700**	-	**1600**	-	**1700**	-	**1700**	-	**1800**	-	**1700**	-	**1900**	-	**1700**	-	**1700**	-
Total Dissolved Solids(residue, filterable) (mg/L)	**2746**	-	**2862**	-	**2950**	-	**2930**	-	**2968**	-	**3052**	-	**3138**	-	**3082**	-	**3066**	-	**2946**	-	**3070**	-	**3070**	-
Metals (mg/L)																								
Aluminum, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Antimony, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Arsenic, Dissolved	**0.12**	-	**0.077**	-	**0.034**	-	**0.028**	-	**0.041**	-	**0.025**	-	< 0.02	-	< 0.02	-	< 0.02	-	**0.034**	-	< 0.02	-	< 0.02	-
Barium, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Beryllium, Dissolved	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-
Boron, Dissolved	2.7	-	1.2	-	1.0	-	1.2	-	1.1	-	1.1	-	1.0	-	1.1	-	1.1	-	1.3	-	1.2	-	1.3	-
Cadmium, Dissolved	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-
Calcium, Dissolved	270	-	350	-	340	-	380	-	380	-	390	-	380	-	420	-	420	-	360	-	350	-	400	-
Chromium, Dissolved	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-
Chromium, hexavalent	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Cobalt, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Copper, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Fluoride, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Iron, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Lead, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Magnesium, Dissolved	130	-	140	-	130	-	**150**	-	**160**	-	140	-	130	-	**150**	-	**150**	-	**150**	-	140	-	**160**	-
Manganese, Dissolved	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	**0.15**	-	**0.070**	-	**0.049**	-	**0.032**	-	**0.17**	-	0.0085	-	0.0058	-
Mercury, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Molybdenum, Dissolved	**0.11**	-	0.073	-	0.072	-	0.072	-	0.068	-	0.040	-	0.050	-	0.050	-	0.050	-	0.056	-	0.062	-	0.060	-
Nickel, Dissolved	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-
Potassium, Dissolved	35	-	31	-	30	-	37	-	33	-	34	-	34	-	41	-	35	-	32	-	31	-	39	-
Selenium, Dissolved	0.033	-	0.033	-	**0.20**	-	**0.057**	-	0.046	-	0.033	-	**0.21**	-	**0.062**	-	0.044	-	0.040	-	**0.20**	-	**0.062**	-
Silica, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Silver, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Sodium, Dissolved	410	-	230	-	230	-	260	-	270	-	240	-	240	-	260	-	260	-	250	-	250	-	270	-
Thallium, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Titanium, Dissolved	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-
Vanadium, Dissolved	0.025	-	< 0.003	-	< 0.003	-	0.0053	-	0.0037	-	< 0.003	-	< 0.003	-	0.0047	-	0.015	-	< 0.003	-	< 0.003	-	0.0031	-
Zinc, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
PAH (µg/L)																								
Acenaphthene	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Anthracene	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Benzo(a)anthracene	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Benzo(a)pyrene	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Benzo(b)fluoranthene	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Benzo(g,h,i)perylene	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Benzo(k)fluoroanthene	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Chrysene	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Fluoranthene	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Indeno(1,2,3-cd)pyrene	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Naphthalene	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Phenanthrene	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Pyrene	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
SVOC (µg/L)																								
1,1-Biphenyl	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Bis(2-ethylhexyl)phthalate	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-

Table D-3 - Groundwater Chemical Analytical Results Summary

Monitoring Well	LMW-15		LMW-16		LMW-16		LMW-16		LMW-16		LMW-7		LMW-7		LMW-7		LMW-7		LMW-9		LMW-9		LMW-9	
Date	11/28/2012		5/29/2012		8/20/2012		10/22/2012		11/28/2012		3/23/2012		5/31/2012		8/27/2012		11/28/2012		3/23/2012		5/31/2012		8/27/2012	
Parameter Name	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier	Result	Lab Qualifier
Asbestos (MFL>10um)																								
Asbestos	NA	-	NA	-	NA	-	NA	-	NA	-	< 992.8	-	< 99.3	-	< 49.6	-	< 49.6	-	< 16.5	-	< 19.9	-	< 49.6	-
General Chemistry (units listed below)																								
Alkalinity - Bicarbonate (mg/L)	NA	-	NA	-	NA	-	NA	-	NA	-	100	-	110	-	94	-	180	-	75	-	71	-	66	-
Alkalinity - Carbonate (mg/L)	NA	-	NA	-	NA	-	NA	-	NA	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-	< 20	-
Chloride (mg/L)	270	-	320	-	310	-	300	-	330	-	300	-	290	-	290	-	290	-	360	-	350	-	310	-
Nitrogen, Ammonia(As N) (mg/L)	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.1	-	< 0.1	T2	< 0.1	-	< 0.1	T2	< 0.1	-	< 0.1	T2	< 0.1	-
Nitrogen, Nitrate(As N) (mg/L)	< 0.5	-	2.6	-	2.5	-	2.6	-	7.8	-	3.8	-	1.3	-	5.4	-	5.7	-	2.5	-	0.78	-	4.8	-
Nitrogen, Nitrite(As N) (mg/L)	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-
pH (field)	7.1	-	7.52	-	7.49	-	7.61	-	7.56	-	7.27	-	NA	-	NA	-	NA	-	7.39	-	NA	-	NA	-
pH (lab)	NA	-	NA	-	NA	-	NA	-	NA	-	7.9	T8	NA	-	NA	-	NA	-	7.5	T8	NA	-	NA	-
Phosphorus, Total (As P)(mg/L)	NA	-	NA	-	NA	-	NA	-	NA	-	2.6	T2	2.2	T2	1.0	T2	0.96	-	0.12	T2	0.35	T2	0.090	J, T2
Specific Conductance (field) (µmhos/cm)	NA	-	NA	-	NA	-	NA	-	NA	-	3220	-	NA	-	NA	-	NA	-	4080	-	NA	-	NA	-
Specific Conductance (µmhos/cm)	3620	-	3470	-	3550	-	3400	-	3470	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
Sulfate (mg/L)	**1700**	-	**1400**	-	**1300**	-	**1400**	-	**1300**	-	**1300**	-	**1300**	-	**1300**	-	**1300**	-	**1900**	-	**1900**	-	**1800**	-
Total Dissolved Solids(residue, filterable) (mg/L)	**3070**	-	**2582**	-	**2610**	-	**2598**	-	**2562**	-	**2400**	-	**2500**	-	**2600**	-	**2100**	-	**3200**	-	**3300**	-	**3300**	-
Metals (mg/L)																								
Aluminum, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	0.034	J	0.033	J	0.041	J	< 0.1	-	**0.059**	J	**0.067**	J	0.048	J, P1
Antimony, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.02	-	< 0.02	-	< 0.02	-	**0.021**	-	< 0.02	-	< 0.02	-	**0.0097**	J, P1
Arsenic, Dissolved	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	< 0.02	-	**0.037**	-	< 0.02	-	**0.0075**	J	**0.014**	J	**0.063**	-
Barium, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	0.024	-	0.026	-	0.026	-	0.026	-	0.011	-	0.013	-	0.016	-
Beryllium, Dissolved	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-	< 0.002	-
Boron, Dissolved	1.2	-	3.3	-	3.3	-	3.5	-	3.4	-	2.1	-	2.2	-	2.6	-	2.5	-	2.2	-	2.2	-	2.4	-
Cadmium, Dissolved	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.003	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-
Calcium, Dissolved	400	-	220	-	220	-	230	-	240	-	230	-	250	-	240	-	280	-	340	-	330	-	340	V
Chromium, Dissolved	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	0.017	-	0.016	-	0.015	-	0.013	-	**0.11**	-	**0.11**	-	**0.11**	-
Chromium, hexavalent	NA	-	NA	-	NA	-	NA	-	NA	-	**0.020**	-	**0.018**	-	**0.018**	-	**0.015**	-	**0.11**	-	**0.11**	-	**0.11**	-
Cobalt, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.01	-	< 0.01	-	< 0.01	-	**0.011**	-	< 0.01	-	< 0.01	-	< 0.01	-
Copper, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.02	-	< 0.02	-	0.0029	J	< 0.02	-	< 0.02	-	< 0.02	-	0.0044	J, P1
Fluoride, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	**1.2**	-	**1.2**	-	**1.2**	-	< 0.1	-	**2.6**	-	**2.6**	-	**2.6**	-
Iron, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-	< 0.1	-
Lead, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.005	-	< 0.005	-	0.0098	-	< 0.01	O	< 0.005	-	< 0.005	-	0.014	P1
Magnesium, Dissolved	**160**	-	110	-	100	-	110	-	110	-	110	-	120	-	110	-	130	-	**150**	-	**160**	-	**160**	V
Manganese, Dissolved	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.01	-	< 0.01	-	0.0039	J	< 0.01	-	< 0.01	-	< 0.01	-	0.0092	J, P1
Mercury, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.0002	-	0.000040	J	< 0.0002	-	< 0.0002	-	0.000010	J	0.000040	J	< 0.0002	-
Molybdenum, Dissolved	0.055	-	0.060	-	0.075	-	0.073	-	0.069	-	0.021	-	0.0052	-	0.030	-	0.026	-	**0.20**	-	**0.18**	-	**0.22**	-
Nickel, Dissolved	< 0.005	-	< 0.005	-	0.0075	-	< 0.005	-	< 0.005	-	< 0.02	-	0.016	J	< 0.02	-	< 0.02	-	0.0052	J	0.0082	J	< 0.02	-
Potassium, Dissolved	35	-	47	-	49	-	58	-	50	-	61	-	60	-	63	-	64	-	44	-	43	-	46	-
Selenium, Dissolved	0.049	-	0.034	-	**0.18**	-	**0.064**	-	< 0.02	-	< 0.1	O	< 0.1	O	0.032	-	**0.12**	-	< 0.2	O	< 0.1	O	0.034	-
Silica, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	15	-	14	-	15	-	15	-	18	-	17	-	18	-
Silver, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.01	-	0.0038	J	0.0068	J	0.016	-	< 0.01	-	0.0042	J	0.0053	J, P1, J6
Sodium, Dissolved	280	-	410	-	340	-	370	-	390	-	330	-	330	-	340	-	340	-	390	-	370	-	400	V
Thallium, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.02	-	< 0.02	-	**0.0077**	J	**0.087**	-	< 0.02	-	< 0.02	-	**0.012**	J, P1
Titanium, Dissolved	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.005	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Vanadium, Dissolved	< 0.003	-	< 0.003	-	0.021	-	< 0.003	-	0.0031	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-	< 0.01	-
Zinc, Dissolved	NA	-	NA	-	NA	-	NA	-	NA	-	0.012	J	< 0.03	-	0.013	J	0.067	-	0.020	J	0.013	J	0.016	J, P1
PAH (µg/L)																								
Acenaphthene	NA	-	NA	-	NA	-	NA	-	NA	-	0.019	J	< 0.05	-	< 0.05	-	< 0.05	-	0.021	J	< 0.05	-	< 0.05	-
Anthracene	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(a)anthracene	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(a)pyrene	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(b)fluoranthene	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(g,h,i)perylene	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Benzo(k)fluoroanthene	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Chrysene	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Fluoranthene	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Indeno(1,2,3-cd)pyrene	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-
Naphthalene	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.25	-	0.026	J	< 0.25	-	0.038	J	< 0.25	-	0.028	J	< 0.25	-
Phenanthrene	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	0.0096	J
Pyrene	NA	-	NA	-	NA	-	NA	-	NA	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	< 0.05	-	0.026	J
SVOC (µg/L)																								
1,1-Biphenyl	NA	-	NA	-	NA	-	NA	-	NA	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-	< 10	-
Bis(2-ethylhexyl)phthalate	NA	-	NA	-	NA	-	NA	-	NA	-	< 1	-	0.52	J	0.85	J	0.82	J	< 1	-	**18**	-	0.79	J

Table D-3 - Groundwater Chemical Analytical Results Summary

Monitoring Well Date	LMW-9 11/28/2012		Current Screening Levels				
Parameter Name	**Result**	**Lab Qualifier**	**Federal/ Nevada Primary MCL[1]**	**Nevada Secondary MCL[2]**	**NDEP BCL - Residential Water - January 2013[3]**	**EPA RSL - Tap Water - November 2012[4]**	**Southeastern Nevada Alluvial Aquifer Ranges[5]**
Asbestos (MFL>10um)							
Asbestos	< 5	-	7	NA	NA	NA	NA
General Chemistry (units listed below)							
Alkalinity - Bicarbonate (mg/L)	72	-	NA	NA	NA	NA	160-361
Alkalinity - Carbonate (mg/L)	< 20	-	NA	NA	NA	NA	NA
Chloride (mg/L)	340	-	NA	400	NA	NA	26-219
Nitrogen, Ammonia(As N) (mg/L)	< 0.1	T2	NA	NA	0.209	NA	0.06-0.47
Nitrogen, Nitrate(As N) (mg/L)	5.0	-	10	NA	10	25	NA
Nitrogen, Nitrite(As N) (mg/L)	< 0.1	-	1	NA	1	1.6	NA
pH (field)	NA	-	6.5 - 8.5	6.5 - 8.5	NA	NA	7.0-8.4
pH (lab)	NA	-	NA	NA	NA	NA	NA
Phosphorus, Total (As P)(mg/L)	0.12	-	NA	NA	NA	NA	0.01-0.04
Specific Conductance (field) (µmhos/cm)	NA	-	NA	NA	NA	NA	460-820
Specific Conductance (µmhos/cm)	NA	-	NA	NA	NA	NA	NA
Sulfate (mg/L)	**1800**	-	NA	500	NA	NA	20-670
Total Dissolved Solids(residue, filterable) (mg/L)	**3100**	-	NA	1000	NA	NA	499-1620
Metals (mg/L)							
Aluminum, Dissolved	< 0.1	J5	NA	0.2	0.05	16	NA
Antimony, Dissolved	**0.024**	P1	0.006	NA	0.006	0.006	NA
Arsenic, Dissolved	**0.010**	J, P1	0.01	NA	0.01	0.000045	NA
Barium, Dissolved	0.011	-	2	NA	2	2.9	0.049-0.34
Beryllium, Dissolved	< 0.002	-	0.004	NA	0.004	0.016	<0.0005
Boron, Dissolved	2.4	-	NA	NA	7.3	3.1	NA
Cadmium, Dissolved	< 0.005	-	0.005	NA	0.005	0.0069	<0.001
Calcium, Dissolved	350	V	NA	NA	NA	NA	33-137
Chromium, Dissolved	**0.12**	-	0.1	NA	NA	NA	NA
Chromium, hexavalent	**0.11**	-	NA	NA	0.1	0.000031	NA
Cobalt, Dissolved	**0.013**	-	NA	NA	0.011	0.0047	<0.003
Copper, Dissolved	< 0.02	-	1.3	1	1.3	0.62	<0.010
Fluoride, Dissolved	**2.1**	J6	4	2	4	0.62	0.5-1.2
Iron, Dissolved	< 0.1	-	NA	0.6	0.3	11	0.01-0.77
Lead, Dissolved	< 0.025	O	0.015	NA	0.015	NA	<0.010
Magnesium, Dissolved	**170**	V	NA	150	207	NA	7.5-70.4
Manganese, Dissolved	< 0.01	-	NA	0.1	0.02	0.32	0.08 – 0.3
Mercury, Dissolved	< 0.0002	-	0.002	NA	0.002	0.00063	NA
Molybdenum, Dissolved	**0.20**	-	NA	NA	0.183	0.078	<0.010- 0.02
Nickel, Dissolved	< 0.02	-	NA	NA	0.73	0.3	NA
Potassium, Dissolved	45	-	NA	NA	NA	NA	1.2-19.9
Selenium, Dissolved	**0.13**	-	0.05	NA	0.05	0.078	NA
Silica, Dissolved	17	-	NA	NA	NA	NA	14-65
Silver, Dissolved	0.019	-	NA	0.1	0.1	0.071	NA
Sodium, Dissolved	390	V	NA	NA	NA	NA	34-306
Thallium, Dissolved	**0.082**	-	0.002	NA	0.002	0.00016	NA
Titanium, Dissolved	< 0.01	-	NA	NA	146	NA	NA
Vanadium, Dissolved	< 0.01	-	NA	NA	0.183	0.078	<0.006
Zinc, Dissolved	0.072	-	NA	5	11	4.7	0.006-0.55
PAH (µg/L)							
Acenaphthene	0.18	*	NA	NA	6.24	400	NA
Anthracene	0.0080	*	NA	NA	6.25	1300	NA
Benzo(a)anthracene	< 0.05	*	NA	NA	0.0921	0.029	NA
Benzo(a)pyrene	< 0.05	*	0.2	NA	0.2	0.0029	NA
Benzo(b)fluoranthene	< 0.05	*	NA	NA	0.0921	0.029	NA
Benzo(g,h,i)perylene	< 0.05	*	NA	NA	1100	NA	NA
Benzo(k)fluoroanthene	< 0.05	*	NA	NA	0.921	0.29	NA
Chrysene	< 0.05	*	NA	NA	9.21	2.9	NA
Fluoranthene	< 0.05	*	NA	NA	1460	630	NA
Indeno(1,2,3-cd)pyrene	< 0.05	*	NA	NA	0.0921	0.029	NA
Naphthalene	0.058	*	NA	NA	0.143	0.14	NA
Phenanthrene	< 0.05	*	NA	NA	6.22	NA	NA
Pyrene	< 0.05	*	NA	NA	6.22	87	NA
SVOC (µg/L)							
1,1-Biphenyl	< 10	*	NA	NA	1830	0.83	NA
Bis(2-ethylhexyl)phthalate	0.75	*, J	6	NA	6	4.8	NA

Footnotes:

[1]**Federal/Nevada Primary MCL:** Primary Maximum Contaminant Level (MCL)**--** Federal standards adopted by Nevada that apply to public water systems. Primary standards protect public health by limiting the levels of contaminants in drinking water (December 2009).

[2]**Nevada Secondary MCL:** Nevada Secondary MCL-- Secondary standards are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water as defined by NAC 445A.455.

[3]**NDEP BCL - Residential Water:** NDEP Basic Comparison Level (Residential Water)—Screening level determined by NDEP for the BMI Complex to be protective of exposure through residential water use. Residential water takes into account human exposure through ingestion of water and inhalation from exposure to vapors during showering or other activities. Source: *Updated User's Guide and Tables* (January 2013).

[4]**EPA Tap Water:** EPA Regional Screening Level (RSL) (Tap Water)-- Generic screening levels based on default exposure parameters and factors that represent Reasonable Maximum Exposure (RME) conditions for human long-term/chronic exposures and are based on the methods outlined in EPA's *Risk Assessment Guidance for Superfund, Part B Manual* (1991). The Tapwater RSL takes into account human exposure from direct ingestion of water and inhalation from exposure to vapors during showering or other activities (November 2012).

[5]**Southern Nevada Alluvial Aquifer Ranges:** Thomas, et. al, 1991, and Schroth, 1987.

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Aluminum.wst
Full Precision	OFF
Confidence Coefficient	0.95

Al All Data

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	40
Minimum	1500
Maximum	32000
Mean of Raw Data	9712
Standard Deviation of Raw Data	7226
Kstar	1.911
Mean of Log Transformed Data	8.913
Standard Deviation of Log Transformed Data	0.754

Normal Distribution Test Results	
Correlation Coefficient R	0.937
Approximate Shapiro Wilk Test Statistic	0.871
Approximate Shapiro Wilk P Value	8.9175E-6
Lilliefors Test Statistic	0.162
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.993
A-D Test Statistic	0.72
A-D Critical (0.95) Value	0.763
K-S Test Statistic	0.124
K-S Critical(0.95) Value	0.126

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.99
Approximate Shapiro Wilk Test Statistic	0.966
Approximate Shapiro Wilk P Value	0.269
Lilliefors Test Statistic	0.0925
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Aluminum.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Al All Data

General Statistics

Total Number of Observations	51	Number of Distinct Observations	40

Raw Statistics		Log-Transformed Statistics	
Minimum	1500	Minimum	7.313
Maximum	32000	Maximum	10.37
Second Largest	28000	Second Largest	10.24
First Quartile	4100	First Quartile	8.318
Median	7800	Median	8.962
Third Quartile	14000	Third Quartile	9.544
Mean	9712	Mean	8.913
SD	7226	SD	0.754
Coefficient of Variation	0.744		
Skewness	1.187		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.162	Lilliefors Test Statistic	0.0925
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	24551	95% UTL with 95% Coverage	34933
95% UPL (t)	21940	95% UPL (t)	26602
90% Percentile (z)	18972	90% Percentile (z)	19519
95% Percentile (z)	21597	95% Percentile (z)	25668
99% Percentile (z)	26522	99% Percentile (z)	42904

Gamma Distribution Test		Data Distribution Test
k star	1.911	Data appear Gamma Distributed at 5% Significance Level
Theta Star	5082	
MLE of Mean	9712	
MLE of Standard Deviation	7025	
nu star	194.9	
A-D Test Statistic	0.72	Nonparametric Statistics
5% A-D Critical Value	0.763	90% Percentile 19000
K-S Test Statistic	0.124	95% Percentile 23000
5% K-S Critical Value	0.126	99% Percentile 30000
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	28000
90% Percentile	19092	95% Percentile Bootstrap UTL with 95% Coverage	30000
95% Percentile	23371	95% BCA Bootstrap UTL with 95% Coverage	28000
99% Percentile	32888	95% UPL	25600
		95% Chebyshev UPL	41516
95% WH Approx. Gamma UPL	23589	Upper Threshold Limit Based upon IQR	28850
95% HW Approx. Gamma UPL	24104		
95% WH Approx. Gamma UTL with 95% Coverage	28391		
95% HW Approx. Gamma UTL with 95% Coverage	29485		

Outlier Tests for Selected Variables

User Selected Options	
From File	Aluminum.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

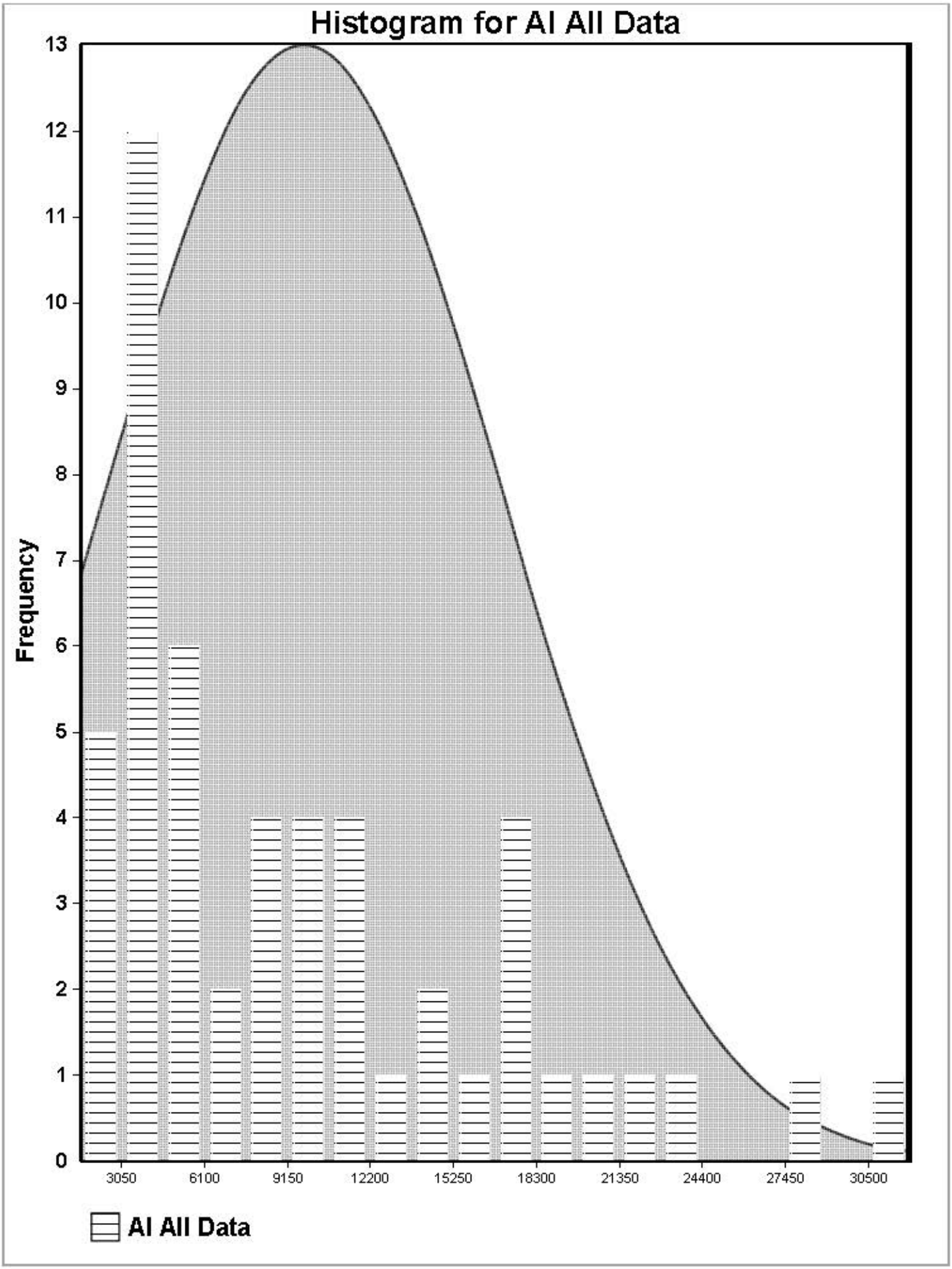
Rosner's Outlier Test for Al All Data

Mean	9712
Standard Deviation	7226
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	9712	7155	32000	48	3.115	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier


Histogram for Al All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
3050
6100
9150
12200
15250
18300
21350
24400
27450
30500
Al All Data

ALUMINUM							
Location	Depth	Al All Data		Location	Depth	Al All Data	
BG-1	2	17000		BG-6	53	12000	
BG-2	2	4600		BG-6	58	4500	
BG-3	2	4500		BG-6	75	4500	
BG-6	2	7800		BG-6	87	32000	
BG-4	2	10000		BG-6	98	11000	
BG-1	10	6400		BG-6	114	10000	
BG-2	10	3500		BG-6	127	24000	
BG-2	19	5400					
BG-3	10	10000					
BG-6	9	5000					
BG-3	17	3900					
BG-4	10	12000					
BG-4	19	28000					
BG-1	29	8600					
BG-1	40	2800					
BG-2	21	4800					
BG-1	43	22000					
BG-1	46	5600					
BG-2	30	18000					
BG-2	32	5700					
BG-3	22	3300					
BG-3	29	3700					
BG-4	40	21000					
BG-6	28	17000					
BG-1	55	1900					
BG-1	78	15000					
BG-1	92	3100					
BG-2	75	3600					
BG-2	81	18000					
BG-3	63	4300					
BG-3	65	6800					
BG-3	69	11000					
BG-3	95	2900					
BG-3	105	9600					
BG-3	131	2300					
BG-3	136	19000					
BG-4	65	3900					
BG-4	79	16000					
BG-4	82	8200					
BG-4	95	3300					
BG-4	117	1500					
BG-4	120	15000					
BG-4	161	8300					
BG-4	163	13000					

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Aluminum.wst
Full Precision	OFF
Confidence Coefficient	0.95

AI 0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	12
Minimum	3500
Maximum	28000
Mean of Raw Data	9085
Standard Deviation of Raw Data	6886
Kstar	2.108
Mean of Log Transformed Data	8.916
Standard Deviation of Log Transformed Data	0.619

Normal Distribution Test Results	
Correlation Coefficient R	0.869
Shapiro Wilk Test Statistic	0.767
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.00194
Lilliefors Test Statistic	0.216
Lilliefors Critical (0.95) Value	0.246

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.963
A-D Test Statistic	0.558
A-D Critical (0.95) Value	0.74
K-S Test Statistic	0.177
K-S Critical(0.95) Value	0.239

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.967
Shapiro Wilk Test Statistic	0.931
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.367
Lilliefors Test Statistic	0.16
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

AI >20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	33
Minimum	1500
Maximum	32000
Mean of Raw Data	9926
Standard Deviation of Raw Data	7416
Kstar	1.739
Mean of Log Transformed Data	8.912
Standard Deviation of Log Transformed Data	0.802

Normal Distribution Test Results

Correlation Coefficient R	0.946
Shapiro Wilk Test Statistic	0.889
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.00102
Lilliefors Test Statistic	0.163
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.99
A-D Test Statistic	0.585
A-D Critical (0.95) Value	0.761
K-S Test Statistic	0.13
K-S Critical(0.95) Value	0.145

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.986
Shapiro Wilk Test Statistic	0.958
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.23
Lilliefors Test Statistic	0.102
Lilliefors Critical (0.95) Value	0.144

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Aluminum.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Al 0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	12

Raw Statistics		Log-Transformed Statistics	
Minimum	3500	Minimum	8.161
Maximum	28000	Maximum	10.24
Second Largest	17000	Second Largest	9.741
First Quartile	4600	First Quartile	8.434
Median	6400	Median	8.764
Third Quartile	10000	Third Quartile	9.21
Mean	9085	Mean	8.916
SD	6886	SD	0.619
Coefficient of Variation	0.758		
Skewness	2.006		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.767	Shapiro Wilk Test Statistic	0.931
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	27476	95% UTL with 95% Coverage	38920
95% UPL (t)	21820	95% UPL (t)	23407
90% Percentile (z)	17909	90% Percentile (z)	16468
95% Percentile (z)	20410	95% Percentile (z)	20621
99% Percentile (z)	25103	99% Percentile (z)	31443

Gamma Distribution Test		Data Distribution Test
k star	2.108	Data appear Gamma Distributed at 5% Significance Level
Theta Star	4309	
MLE of Mean	9085	
MLE of Standard Deviation	6256	
nu star	54.82	
A-D Test Statistic	0.558	Nonparametric Statistics
5% A-D Critical Value	0.74	90% Percentile 16000
K-S Test Statistic	0.177	95% Percentile 21400
5% K-S Critical Value	0.239	99% Percentile 26680
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	28000
90% Percentile	17451	95% Percentile Bootstrap UTL with 95% Coverage	28000
95% Percentile	21193	95% BCA Bootstrap UTL with 95% Coverage	28000
99% Percentile	29466	95% UPL	28000
		95% Chebyshev UPL	40231
95% WH Approx. Gamma UPL	22221	Upper Threshold Limit Based upon IQR	18100
95% HW Approx. Gamma UPL	22423		
95% WH Approx. Gamma UTL with 95% Coverage	31993		
95% HW Approx. Gamma UTL with 95% Coverage	33197		

Al >20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	33

Raw Statistics		Log-Transformed Statistics	
Minimum	1500	Minimum	7.313
Maximum	32000	Maximum	10.37
Second Largest	24000	Second Largest	10.09
First Quartile	3750	First Quartile	8.229
Median	8250	Median	9.018
Third Quartile	15000	Third Quartile	9.616
Mean	9926	Mean	8.912
SD	7416	SD	0.802
Coefficient of Variation	0.747		
Skewness	1.023		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.889	Shapiro Wilk Test Statistic	0.958
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	25738	95% UTL with 95% Coverage	41052
95% UPL (t)	22601	95% UPL (t)	29240
90% Percentile (z)	19430	90% Percentile (z)	20750
95% Percentile (z)	22124	95% Percentile (z)	27771
99% Percentile (z)	27178	99% Percentile (z)	47975
Gamma Distribution Test		Data Distribution Test	
k star	1.739	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	5708		
MLE of Mean	9926		
MLE of Standard Deviation	7527		
nu star	132.2		
A-D Test Statistic	0.585	Nonparametric Statistics	
5% A-D Critical Value	0.761	90% Percentile	19600
K-S Test Statistic	0.13	95% Percentile	22300
5% K-S Critical Value	0.145	99% Percentile	29040

Data appear Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 95% Coverage	32000
90% Percentile	19957	95% Percentile Bootstrap UTL with 95% Coverage	32000
95% Percentile	24625	95% BCA Bootstrap UTL with 95% Coverage	32000
99% Percentile	35068	95% UPL	24400
		95% Chebyshev UPL	42674
95% WH Approx. Gamma UPL	25055	Upper Threshold Limit Based upon IQR	31875
95% HW Approx. Gamma UPL	25770		
95% WH Approx. Gamma UTL with 95% Coverage	31277		
95% HW Approx. Gamma UTL with 95% Coverage	32858		

Outlier Tests for Selected Variables

User Selected Options	
From File	Aluminum.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Al 0-20

Number of data = 13

10% critical value: 0.467

5% critical value: 0.521

1% critical value: 0.615

1. Data Value 28000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.664

For 10% significance level, 28000 is an outlier.

For 5% significance level, 28000 is an outlier.

For 1% significance level, 28000 is an outlier.

2. Data Value 3500 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.074

For 10% significance level, 3500 is not an outlier.

For 5% significance level, 3500 is not an outlier.

For 1% significance level, 3500 is not an outlier.

Rosner's Outlier Test for Al >20

Mean	9926
Standard Deviation	7416
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	9926	7318	32000	35	3.017	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 32000 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Aluminum.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Al >20

Background Data: Al 0-20

Raw Statistics

	Site	Background
Number of Valid Observations	38	13
Number of Distinct Observations	33	12
Minimum	1500	3500
Maximum	32000	28000
Mean	9926	9085
Median	8250	6400
SD	7416	6886
SE of Mean	1203	1910

Wilcoxon-Mann-Whitney (WMW) Test

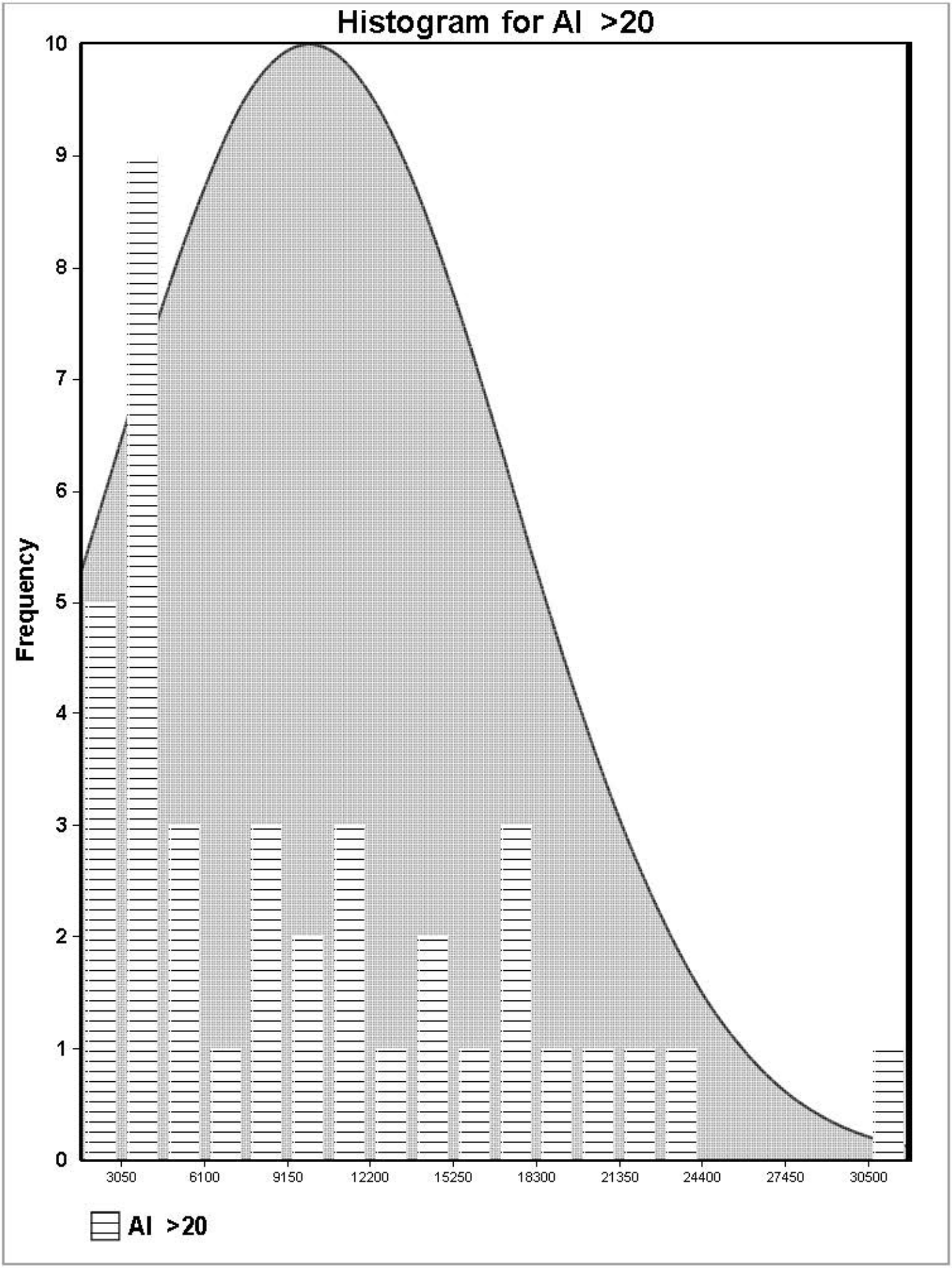
H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	986.5
WMW Test U-Stat	0.0216
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.966

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for AI >20
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1
2
3
4
5
6
7
8
9
10
3050
6100
9150
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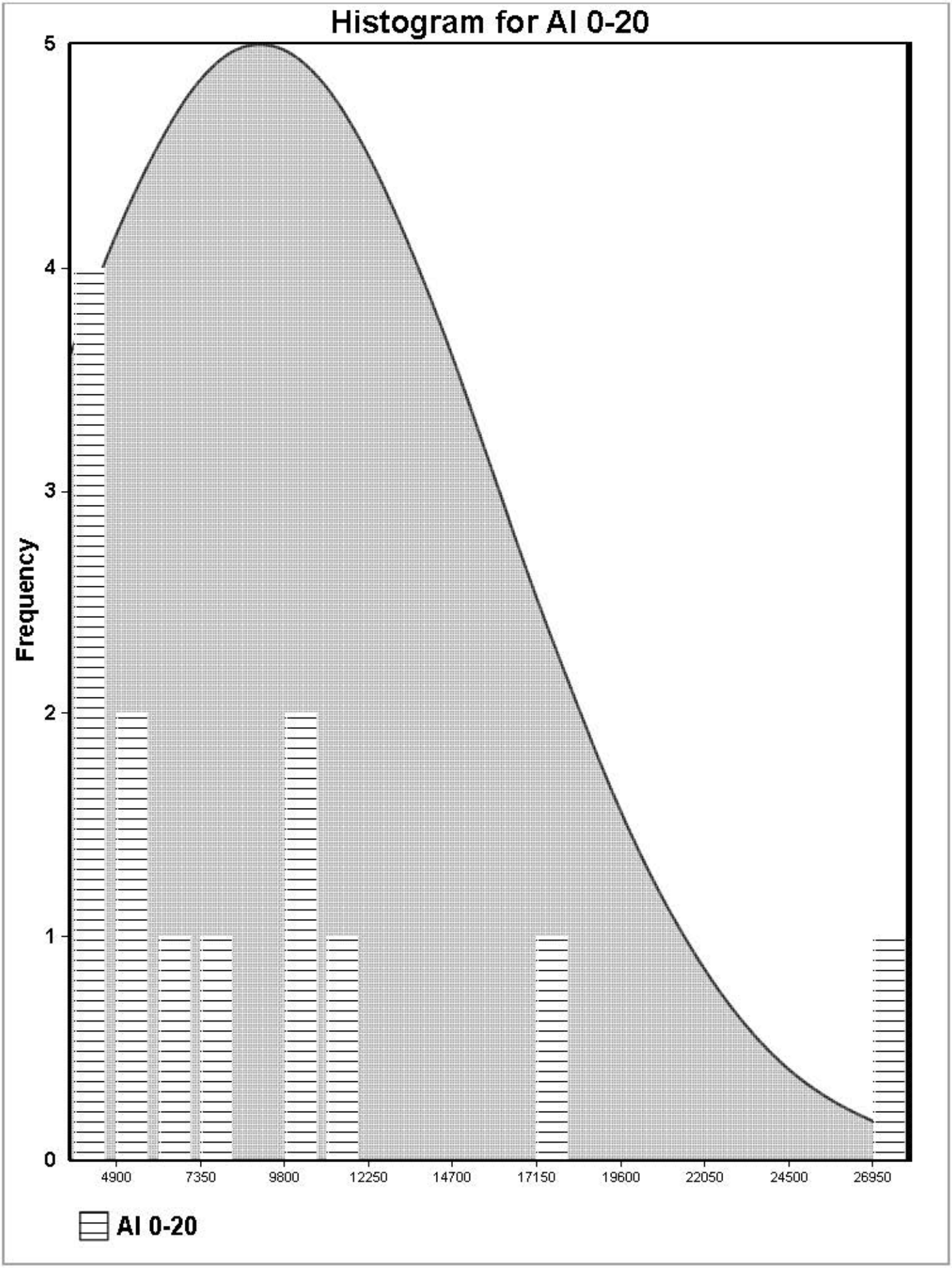
18300
21350
24400
27450
30500
AI >20


Histogram for AI 0-20
Frequency
0
1
2
3
4
5
4900
7350
9800
12250
14700
17150
19600
22050
24500
26950
AI 0-20

Location	Depth	Al 0-20	Location	Depth	Al >20
BG-1	2	17000	BG-1	29	8600
BG-2	2	4600	BG-1	40	2800
BG-3	2	4500	BG-2	21	4800
BG-6	2	7800	BG-1	43	22000
BG-4	2	10000	BG-1	46	5600
BG-1	10	6400	BG-2	30	18000
BG-2	10	3500	BG-2	32	5700
BG-2	19	5400	BG-3	22	3300
BG-3	10	10000	BG-3	29	3700
BG-6	9	5000	BG-4	40	21000
BG-3	17	3900	BG-6	28	17000
BG-4	10	12000	BG-1	55	1900
BG-4	19	28000	BG-1	78	15000
			BG-1	92	3100
			BG-2	75	3600
			BG-2	81	18000
			BG-3	63	4300
			BG-3	65	6800
			BG-3	69	11000
			BG-3	95	2900
			BG-3	105	9600
			BG-3	131	2300
			BG-3	136	19000
			BG-4	65	3900
			BG-4	79	16000
			BG-4	82	8200
			BG-4	95	3300
			BG-4	117	1500
			BG-4	120	15000
			BG-4	161	8300
			BG-4	163	13000
			BG-6	53	12000
			BG-6	58	4500
			BG-6	75	4500
			BG-6	87	32000
			BG-6	98	11000
			BG-6	114	10000
			BG-6	127	24000

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Aluminum.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	16
Minimum	1900
Maximum	32000
Mean of Raw Data	14856
Standard Deviation of Raw Data	8045
Kstar	2.223
Mean of Log Transformed Data	9.404
Standard Deviation of Log Transformed Data	0.75

Normal Distribution Test Results	
Correlation Coefficient R	0.986
Shapiro Wilk Test Statistic	0.971
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.8
Lilliefors Test Statistic	0.126
Lilliefors Critical (0.95) Value	0.209

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.973
A-D Test Statistic	0.524
A-D Critical (0.95) Value	0.748
K-S Test Statistic	0.144
K-S Critical(0.95) Value	0.206

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.936
Shapiro Wilk Test Statistic	0.879
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.0235
Lilliefors Test Statistic	0.176
Lilliefors Critical (0.95) Value	0.209

Data not Lognormal at (0.05) Significance Level

Non-Clay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	30
Minimum	1500
Maximum	24000
Mean of Raw Data	6906
Standard Deviation of Raw Data	4919
Kstar	2.498
Mean of Log Transformed Data	8.646
Standard Deviation of Log Transformed Data	0.616

Normal Distribution Test Results

Correlation Coefficient R	0.892
Shapiro Wilk Test Statistic	0.806
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	1.5527E-5
Lilliefors Test Statistic	0.203
Lilliefors Critical (0.95) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.975
A-D Test Statistic	0.677
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.146
K-S Critical(0.95) Value	0.155

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.99
Shapiro Wilk Test Statistic	0.981
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.859
Lilliefors Test Statistic	0.104
Lilliefors Critical (0.95) Value	0.154

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Aluminum.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

GW GM SW SP SM SC ML

General Statistics

Total Number of Observations	32	Number of Distinct Observations	29

Raw Statistics		Log-Transformed Statistics	
Minimum	1500	Minimum	7.313
Maximum	24000	Maximum	10.09
Second Largest	19000	Second Largest	9.852
First Quartile	3850	First Quartile	8.256
Median	5200	Median	8.556
Third Quartile	8850	Third Quartile	9.087
Mean	7031	Mean	8.667
SD	4944	SD	0.614
Coefficient of Variation	0.703		
Skewness	1.89		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.811	Shapiro Wilk Test Statistic	0.983
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	17841	95% UTL with 95% Coverage	22217
95% UPL (t)	15544	95% UPL (t)	16706
90% Percentile (z)	13368	90% Percentile (z)	12750
95% Percentile (z)	15164	95% Percentile (z)	15935
99% Percentile (z)	18533	99% Percentile (z)	24211

Gamma Distribution Test		Data Distribution Test
k star	2.528	Data appear Gamma Distributed at 5% Significance Level
Theta Star	2781	
MLE of Mean	7031	
MLE of Standard Deviation	4422	
nu star	161.8	
A-D Test Statistic	0.639	Nonparametric Statistics
5% A-D Critical Value	0.754	90% Percentile 11900
K-S Test Statistic	0.146	95% Percentile 16800
5% K-S Critical Value	0.157	99% Percentile 22450
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	24000
90% Percentile	12956	95% Percentile Bootstrap UTL with 95% Coverage	24000
95% Percentile	15516	95% BCA Bootstrap UTL with 95% Coverage	24000
99% Percentile	21117	95% UPL	20750
		95% Chebyshev UPL	28917
95% WH Approx. Gamma UPL	15721	Upper Threshold Limit Based upon IQR	16350
95% HW Approx. Gamma UPL	15877		
95% WH Approx. Gamma UTL with 95% Coverage	19376		
95% HW Approx. Gamma UTL with 95% Coverage	19859		

CL CH

General Statistics			
Total Number of Observations	26	Number of Distinct Observations	21
Raw Statistics		**Log-Transformed Statistics**	
Minimum	1900	Minimum	7.55
Maximum	32000	Maximum	10.37
Second Largest	28000	Second Largest	10.24
First Quartile	8225	First Quartile	9.015
Median	12500	Median	9.433
Third Quartile	17750	Third Quartile	9.784
Mean	13331	Mean	9.284
SD	7891	SD	0.729
Coefficient of Variation	0.592		
Skewness	0.56		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Test Statistic	0.941
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	31284	95% UTL with 95% Coverage	56586
95% UPL (t)	27067	95% UPL (t)	38324
90% Percentile (z)	23444	90% Percentile (z)	27418
95% Percentile (z)	26311	95% Percentile (z)	35737
99% Percentile (z)	31689	99% Percentile (z)	58745
Gamma Distribution Test		**Data Distribution Test**	
k star	2.233	Data appear Normal at 5% Significance Level	
Theta Star	5969		
MLE of Mean	13331		
MLE of Standard Deviation	8920		
nu star	116.1		
A-D Test Statistic	0.295	**Nonparametric Statistics**	
5% A-D Critical Value	0.754	90% Percentile	23000
K-S Test Statistic	0.117	95% Percentile	27000
5% K-S Critical Value	0.173	99% Percentile	31000

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	32000
90% Percentile	25268	95% Percentile Bootstrap UTL with 95% Coverage	32000
95% Percentile	30548	95% BCA Bootstrap UTL with 95% Coverage	32000
99% Percentile	42182	95% UPL	30600
		95% Chebyshev UPL	48384
95% WH Approx. Gamma UPL	31385	Upper Threshold Limit Based upon IQR	32038
95% HW Approx. Gamma UPL	32564		
95% WH Approx. Gamma UTL with 95% Coverage	40224		
95% HW Approx. Gamma UTL with 95% Coverage	42781		

Outlier Tests for Selected Variables

User Selected Options	
From File	Aluminum.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 32000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.356

For 10% significance level, 32000 is not an outlier.

For 5% significance level, 32000 is not an outlier.

For 1% significance level, 32000 is not an outlier.

2. Data Value 1900 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.100

For 10% significance level, 1900 is not an outlier.

For 5% significance level, 1900 is not an outlier.

For 1% significance level, 1900 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	6906
Standard Deviation	4919
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	6906	4844	24000	33	3.529	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 24000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 24000 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Aluminum.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Observations	33	18
Number of Distinct Observations	30	16
Minimum	1500	1900
Maximum	24000	32000
Mean	6906	14856
Median	5000	15500
SD	4919	8045
SE of Mean	856.3	1896

Wilcoxon-Mann-Whitney (WMW) Test

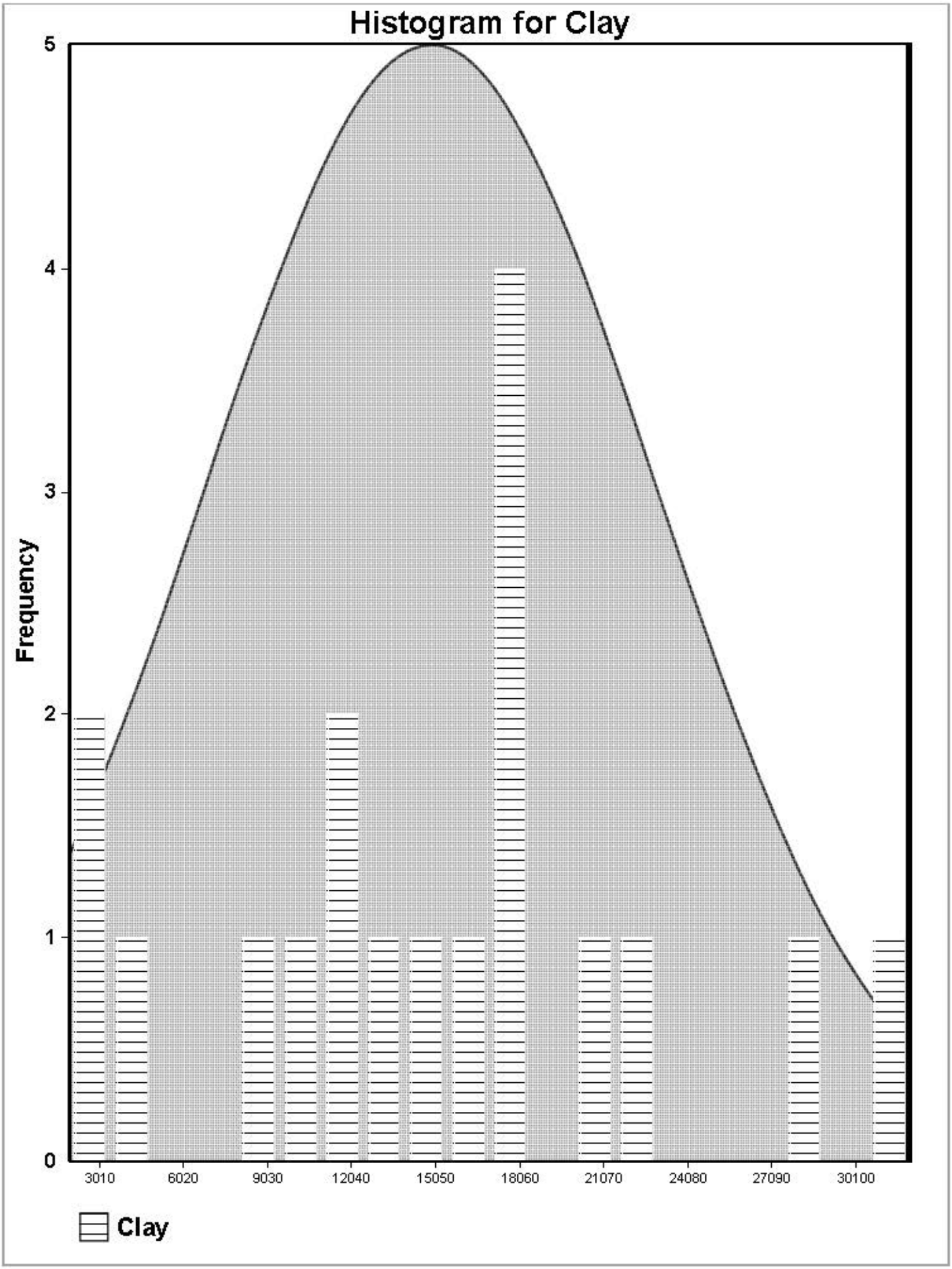
H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	684.5
WMW Test U-Stat	3.41
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	6.0445E-4

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Clay
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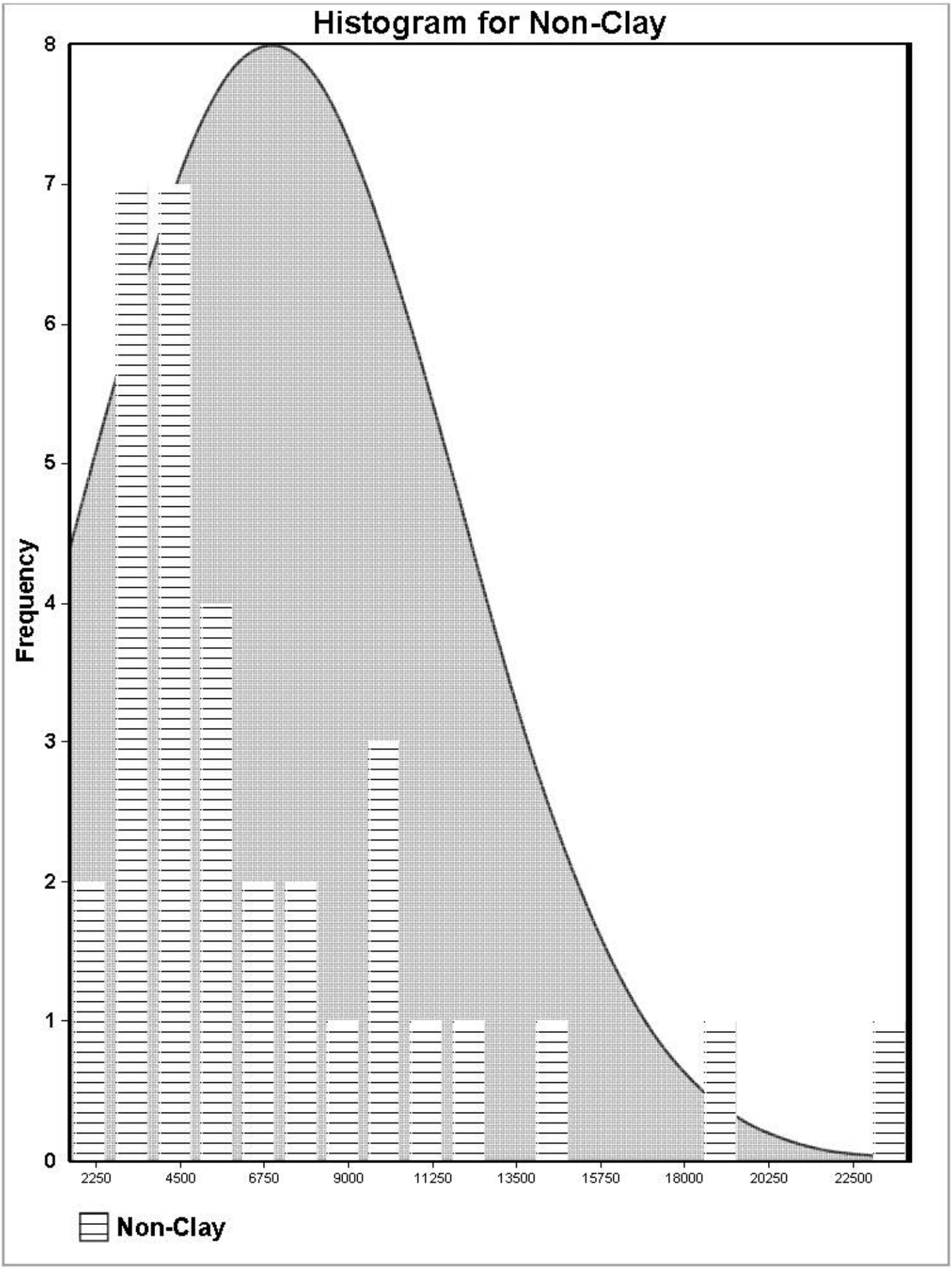
24080
27090
30100
Clay


Histogram for Non-Clay
Frequency
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2
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4
5
6
7
8
2250
4500
6750
9000
11250
13500
15750
18000
20250
22500
Non-Clay

Location	Clay
BG-1-2	17000
BG-1-43	22000
BG-1-55	1900
BG-1-78	15000
BG-2-30	18000
BG-2-81	18000
BG-3-17	3900
BG-3-22	3300
BG-3-69	11000
BG-4-2	10000
BG-4-19	28000
BG-4-40	21000
BG-4-79	16000
BG-4-161	8300
BG-4-163	13000
BG-6-28	17000
BG-6-53	12000
BG-6-87	32000

Location	Non-Clay
BG-1-10	6400
BG-1-29	8600
BG-1-40	2800
BG-1-46	5600
BG-1-92	3100
BG-2-2	4600
BG-2-10	3500
BG-2-19	5400
BG-2-21	4800
BG-2-32	5700
BG-2-75	3600
BG-3-2	4500
BG-3-10	10000
BG-3-29	3700
BG-3-63	4300
BG-3-65	6800
BG-3-95	2900
BG-3-105	9600
BG-3-131	2300
BG-3-136	19000
BG-4-10	12000
BG-4-65	3900
BG-4-82	8200
BG-4-95	3300
BG-4-117	1500
BG-4-120	15000
BG-6-2	7800
BG-6-9	5000
BG-6-58	4500
BG-6-75	4500
BG-6-98	11000
BG-6-114	10000
BG-6-127	24000

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Aluminum.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	12
Minimum	2800
Maximum	17000
Mean of Raw Data	6700
Standard Deviation of Raw Data	3870
Kstar	3.278
Mean of Log Transformed Data	8.689
Standard Deviation of Log Transformed Data	0.492

Normal Distribution Test Results	
Correlation Coefficient R	0.892
Shapiro Wilk Test Statistic	0.812
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.00847
Lilliefors Test Statistic	0.215
Lilliefors Critical (0.95) Value	0.256

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.959
A-D Test Statistic	0.409
A-D Critical (0.95) Value	0.735
K-S Test Statistic	0.189
K-S Critical(0.95) Value	0.246

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.977
Shapiro Wilk Test Statistic	0.962
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.704
Lilliefors Test Statistic	0.16
Lilliefors Critical (0.95) Value	0.256

Data appear Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	30
Minimum	1500
Maximum	32000
Mean of Raw Data	10715
Standard Deviation of Raw Data	7824
Kstar	1.735
Mean of Log Transformed Data	8.987
Standard Deviation of Log Transformed Data	0.814

Normal Distribution Test Results

Correlation Coefficient R	0.954
Shapiro Wilk Test Statistic	0.9
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.0019
Lilliefors Test Statistic	0.149
Lilliefors Critical (0.95) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.989
A-D Test Statistic	0.579
A-D Critical (0.95) Value	0.761
K-S Test Statistic	0.14
K-S Critical(0.95) Value	0.143

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.984
Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.138
Lilliefors Test Statistic	0.119
Lilliefors Critical (0.95) Value	0.142

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Aluminum.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-Transformed Statistics	
Minimum	2800	Minimum	7.937
Maximum	17000	Maximum	9.741
Second Largest	10000	Second Largest	9.21
First Quartile	4575	First Quartile	8.428
Median	5200	Median	8.556
Third Quartile	8000	Third Quartile	8.986
Mean	6700	Mean	8.689
SD	3870	SD	0.492
Coefficient of Variation	0.578		
Skewness	1.902		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.812	Shapiro Wilk Test Statistic	0.962
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	17289	95% UTL with 95% Coverage	22831
95% UPL (t)	13935	95% UPL (t)	14901
90% Percentile (z)	11660	90% Percentile (z)	11158
95% Percentile (z)	13066	95% Percentile (z)	13343
99% Percentile (z)	15704	99% Percentile (z)	18661

Gamma Distribution Test		Data Distribution Test	
k star	3.278	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2044		
MLE of Mean	6700		
MLE of Standard Deviation	3701		
nu star	78.67		
A-D Test Statistic	0.409	Nonparametric Statistics	
5% A-D Critical Value	0.735	90% Percentile	9860
K-S Test Statistic	0.189	95% Percentile	13150
5% K-S Critical Value	0.246	99% Percentile	16230
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	17000
90% Percentile	11662	95% Percentile Bootstrap UTL with 95% Coverage	17000
95% Percentile	13712	95% BCA Bootstrap UTL with 95% Coverage	17000
99% Percentile	18133	95% UPL	17000
		95% Chebyshev UPL	24260
95% WH Approx. Gamma UPL	14267	Upper Threshold Limit Based upon IQR	13138
95% HW Approx. Gamma UPL	14382		
95% WH Approx. Gamma UTL with 95% Coverage	19674		
95% HW Approx. Gamma UTL with 95% Coverage	20254		

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	30

Raw Statistics		Log-Transformed Statistics	
Minimum	1500	Minimum	7.313
Maximum	32000	Maximum	10.37
Second Largest	28000	Second Largest	10.24
First Quartile	3900	First Quartile	8.269
Median	9600	Median	9.17
Third Quartile	16000	Third Quartile	9.68
Mean	10715	Mean	8.987
SD	7824	SD	0.814
Coefficient of Variation	0.73		
Skewness	0.897		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.9	Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	27338	95% UTL with 95% Coverage	45141
95% UPL (t)	24075	95% UPL (t)	32142
90% Percentile (z)	20743	90% Percentile (z)	22722
95% Percentile (z)	23585	95% Percentile (z)	30545
99% Percentile (z)	28918	99% Percentile (z)	53207
Gamma Distribution Test		Data Distribution Test	
k star	1.735	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	6175		
MLE of Mean	10715		
MLE of Standard Deviation	8134		
nu star	135.4		
A-D Test Statistic	0.579	Nonparametric Statistics	
5% A-D Critical Value	0.761	90% Percentile	21200
K-S Test Statistic	0.14	95% Percentile	24400
5% K-S Critical Value	0.143	99% Percentile	30480

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	32000
90% Percentile	21555	95% Percentile Bootstrap UTL with 95% Coverage	32000
95% Percentile	26601	95% BCA Bootstrap UTL with 95% Coverage	32000
99% Percentile	37891	95% UPL	28000
		95% Chebyshev UPL	45256
95% WH Approx. Gamma UPL	27076	Upper Threshold Limit Based upon IQR	34150
95% HW Approx. Gamma UPL	27936		
95% WH Approx. Gamma UTL with 95% Coverage	33707		
95% HW Approx. Gamma UTL with 95% Coverage	35532		

Outlier Tests for Selected Variables

User Selected Options	
From File	Aluminum.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12

10% critical value: 0.49

5% critical value: 0.546

1% critical value: 0.642

1. Data Value 17000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.622

For 10% significance level, 17000 is an outlier.

For 5% significance level, 17000 is an outlier.

For 1% significance level, 17000 is not an outlier.

2. Data Value 2800 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.236

For 10% significance level, 2800 is not an outlier.

For 5% significance level, 2800 is not an outlier.

For 1% significance level, 2800 is not an outlier.

Rosner's Outlier Test for MC

Mean	10715
Standard Deviation	7824
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	10715	7723	32000	36	2.756	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Aluminum.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Observations	39	12
Number of Distinct Observations	30	12
Minimum	1500	2800
Maximum	32000	17000
Mean	10715	6700
Median	9600	5200
SD	7824	3870
SE of Mean	1253	1117

Wilcoxon-Mann-Whitney (WMW) Test

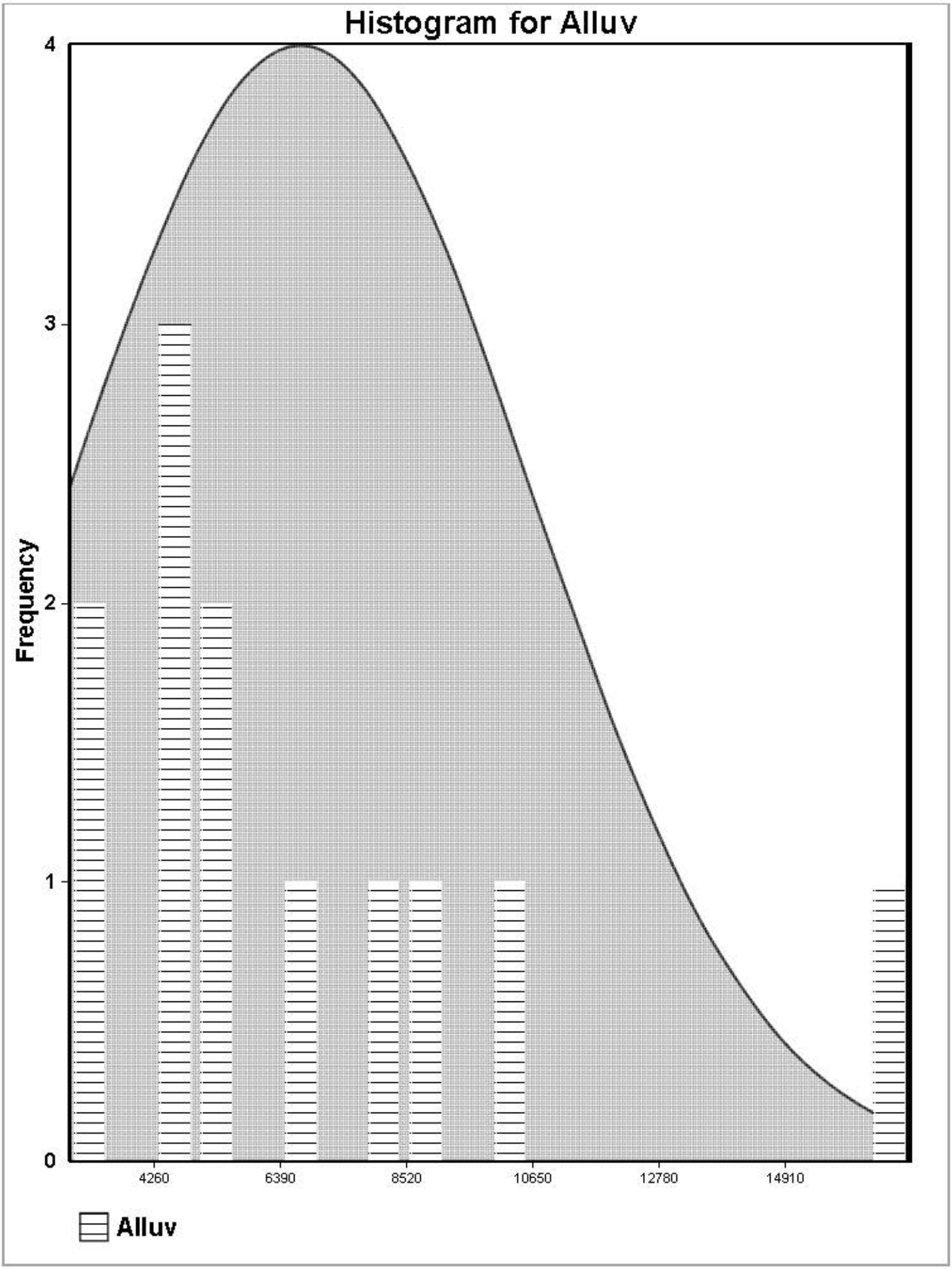
H0: Mean/Median of Site or AOC = Mean/Median of Background

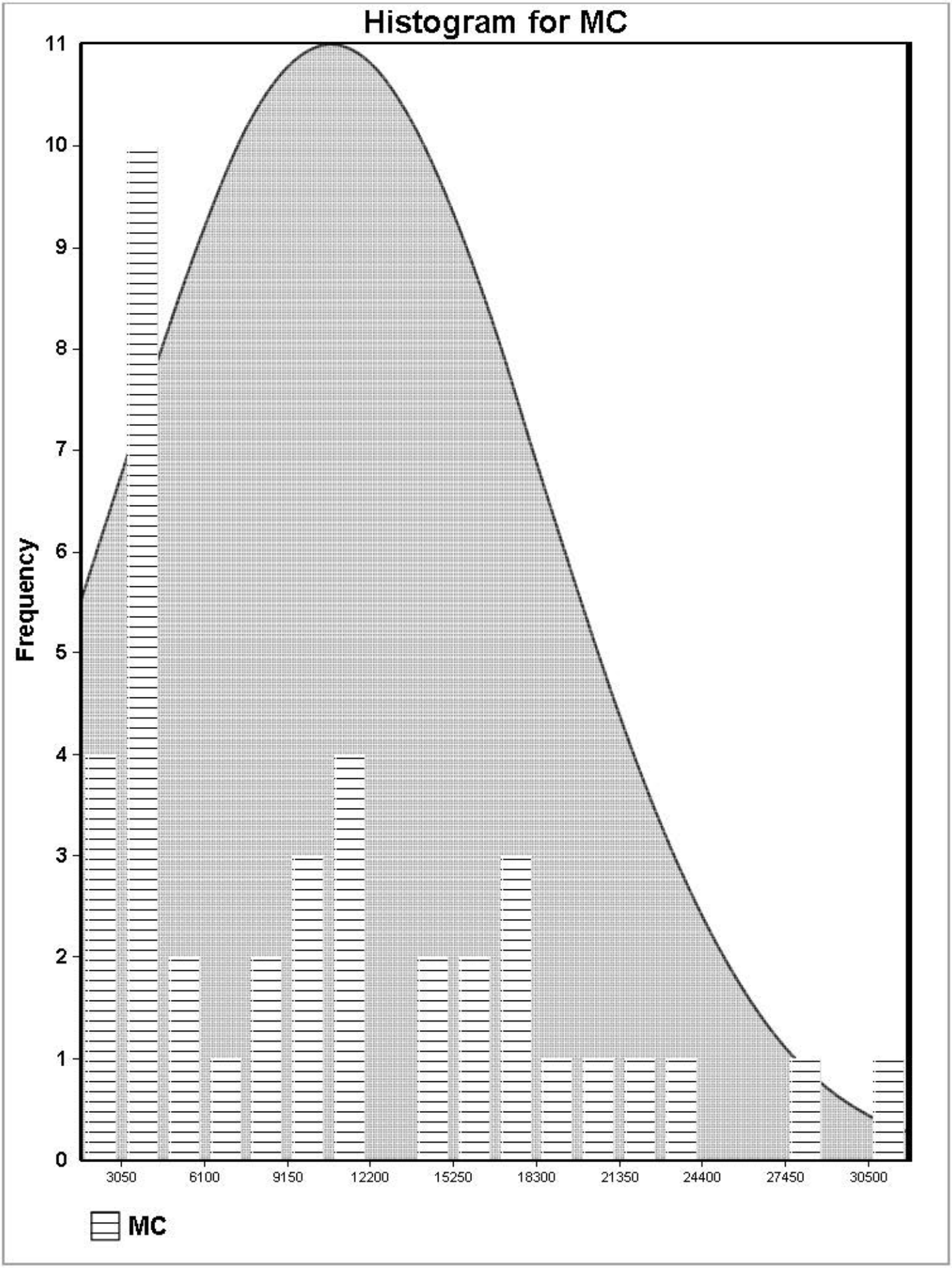
Site Rank Sum W-Stat	1066
WMW Test U-Stat	1.132
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.257

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
4260
6390
8520
10650
12780
14910
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
3050
6100
9150
12200
15250
18300
21350
24400
27450
30500
MC

Location	Alluvial	Location	Muddy Creek
BG-1-2	17000	BG-1-43	22000
BG-1-10	6400	BG-1-46	5600
BG-1-29	8600	BG-1-55	1900
BG-1-40	2800	BG-1-78	15000
BG-2-2	4600	BG-1-92	3100
BG-2-10	3500	BG-2-30	18000
BG-2-19	5400	BG-2-32	5700
BG-2-21	4800	BG-2-75	3600
BG-3-2	4500	BG-2-81	18000
BG-3-10	10000	BG-3-17	3900
BG-6-2	7800	BG-3-22	3300
BG-6-9	5000	BG-3-29	3700
		BG-3-63	4300
		BG-3-65	6800
		BG-3-69	11000
		BG-3-95	2900
		BG-3-105	9600
		BG-3-131	2300
		BG-3-136	19000
		BG-4-1	10000
		BG-4-10	12000
		BG-4-19	28000
		BG-4-40	21000
		BG-4-65	3900
		BG-4-79	16000
		BG-4-82	8200
		BG-4-95	3300
		BG-4-117	1500
		BG-4-120	15000
		BG-4-161	8300
		BG-4-163	13000
		BG-6-28	17000
		BG-6-53	12000
		BG-6-58	4500
		BG-6-75	4500
		BG-6-87	32000
		BG-6-98	11000
		BG-6-114	10000
		BG-1-127	24000

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Ammonia.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Ammonia All Data

General Statistics

Number of Valid Data	51	Number of Detected Data	18
Number of Distinct Detected Data	15	Number of Non-Detect Data	33
		Percent Non-Detects	64.71%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	2.3	Minimum Detected	0.833
Maximum Detected	17	Maximum Detected	2.833
Mean of Detected	5.339	Mean of Detected	1.498
SD of Detected	3.797	SD of Detected	0.576
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	6.2	Maximum Non-Detect	1.825

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	46
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	5
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	90.20%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.761	Shapiro Wilk Test Statistic	0.907
5% Shapiro Wilk Critical Value	0.897	5% Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	3.652	Mean (Log Scale)	1.177
SD	2.553	SD (Log Scale)	0.418
95% UTL 95% Coverage	8.896	95% UTL 95% Coverage	7.656
95% UPL (t)	7.973	95% UPL (t)	6.582
90% Percentile (z)	6.924	90% Percentile (z)	5.543
95% Percentile (z)	7.852	95% Percentile (z)	6.453
99% Percentile (z)	9.592	99% Percentile (z)	8.581
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	11.64	Mean in Original Scale	4.072
SD	3.603	SD in Original Scale	2.533
95% UTL with 95% Coverage	19.04	95% UTL with 95% Coverage	9.013
		95% BCA UTL with 95% Coverage	13.5
		95% Bootstrap (%) UTL with 95% Coverage	13.5
95% UPL (t)	17.74	95% UPL (t)	7.679

90% Percentile (z)	16.26	90% Percentile (z)	6.402
95% Percentile (z)	17.56	95% Percentile (z)	7.519
99% Percentile (z)	20.02	99% Percentile (z)	10.17
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.518	Data follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	2.12		
nu star	90.65		
A-D Test Statistic	0.856	Nonparametric Statistics	
5% A-D Critical Value	0.746	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.174	Mean	3.971
5% K-S Critical Value	0.205	SD	2.502
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	0.401
		95% KM UTL with 95% Coverage	9.111
Assuming Gamma Distribution		95% KM Chebyshev UPL	14.99
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	8.206
Mean	5.412	90% Percentile (z)	7.178
Median	5.446	95% Percentile (z)	8.088
SD	2.223	99% Percentile (z)	9.793
k star	7.607		
Theta star	0.711	Gamma ROS Limits with Extrapolated Data	
Nu star	775.9	95% Wilson Hilferty (WH) Approx. Gamma UPL	9.019
95% Percentile of Chisquare (2k)	25.27	95% Hawkins Wixley (HW) Approx. Gamma UPL	9.044
		95% WH Approx. Gamma UTL with 95% Coverage	10.03
90% Percentile	8.029	95% HW Approx. Gamma UTL with 95% Coverage	10.1
95% Percentile	8.991		
99% Percentile	10.99		

Note: DL/2 is not a recommended method.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Ammonia.wst
Full Precision	OFF
Confidence Coefficient	0.95

Ammonia All Data

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	18	33	64.71%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	33	5	6.2	5.464	5.3	0.466
Statistics (Detects Only)	18	2.3	17	5.339	3.95	3.797
Statistics (All: NDs treated as DL value)	51	2.3	17	5.42	5.1	2.246
Statistics (All: NDs treated as DL/2 value)	51	2.3	17	3.652	2.95	2.553
Statistics (Normal ROS Estimated Data)	51	-0.516	17	4.134	3.688	2.77
Statistics (Gamma ROS Estimated Data)	51	2.3	17	5.412	5.446	2.223
Statistics (Lognormal ROS Estimated Data)	51	1.62	17	4.072	3.358	2.533

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.977	2.815	1.793	1.498	0.576	0.385
Statistics (NDs = DL)	7.868	7.418	0.689	1.625	0.356	0.219
Statistics (NDs = DL/2)	4.374	4.13	0.835	1.177	0.418	0.355
Statistics (Gamma ROS Estimates)	8.068	7.607	0.671	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.289	0.443	0.344

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.866	0.827	0.692	0.899

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.761	0.897	Data Not Normal
Lilliefors (Detects Only)	0.237	0.209	Data Not Normal
Lilliefors (NDs = DL)	0.266	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.374	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.15	0.124	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.958	0.871	0.812	0.957

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.856	0.746	
Kolmogorov-Smirnov (Detects Only)	0.174	0.205	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	2.954	0.751	
Kolmogorov-Smirnov (NDs = DL)	0.243	0.124	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.631	0.754	
Kolmogorov-Smirnov (NDs = DL/2)	0.352	0.125	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.113	0.751	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.275	0.124	Data Not Gamma Distributed	

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.956	0.926	0.81	0.961

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.907	0.897	Data Appear Lognormal
Lilliefors (Detects Only)	0.164	0.209	Data Appear Lognormal
Lilliefors (NDs = DL)	0.267	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.327	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.118	0.124	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Outlier Tests for Selected Variables

User Selected Options	
From File	Ammonia.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Ammonia All Data

Mean	3.652
Standard Deviation	2.553
Number of data	51
Number of suspected outliers	1

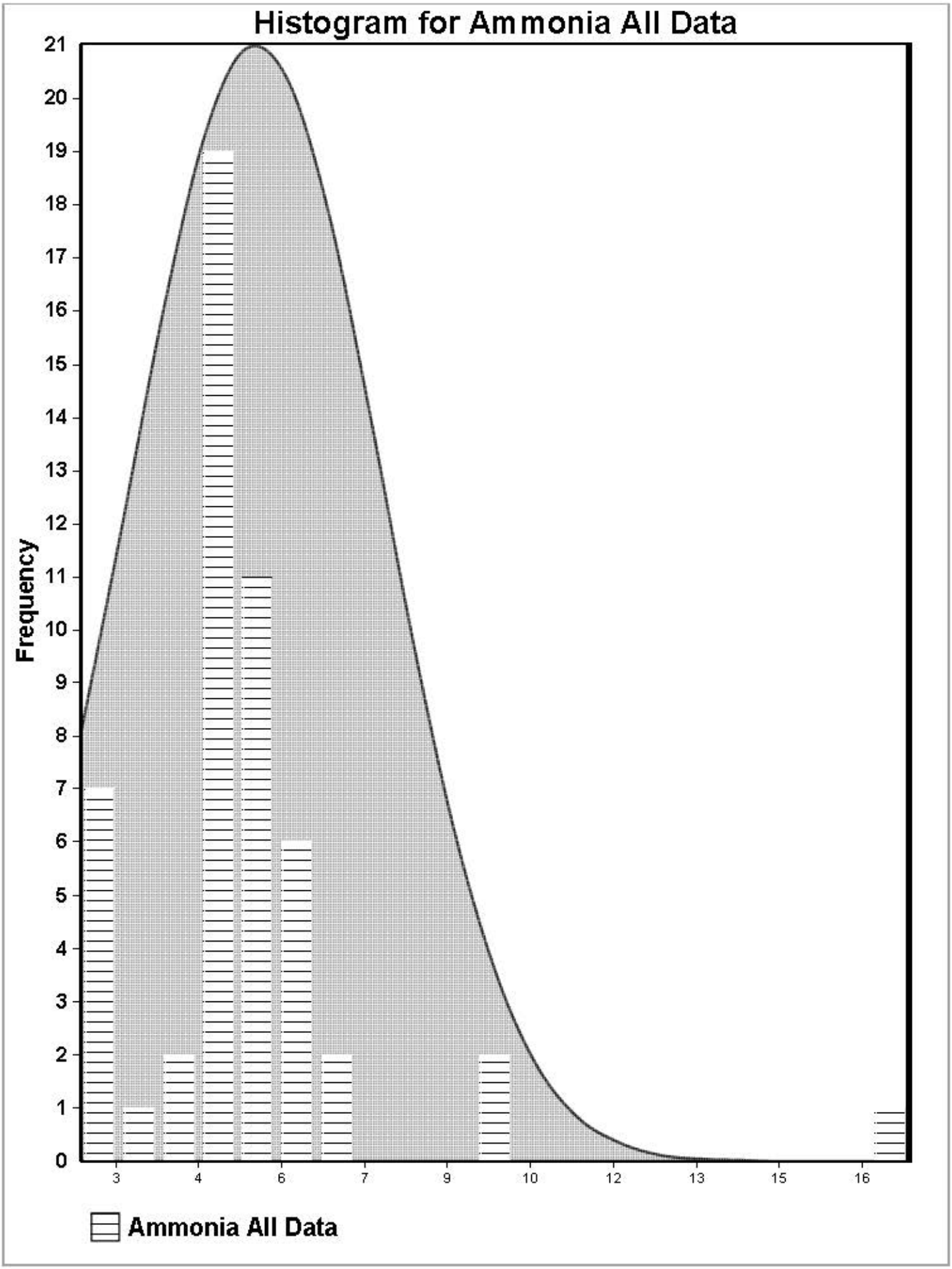
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3.652	2.528	17	44	5.28	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 17 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 17 is a Potential Statistical Outlier


Histogram for Ammonia All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
3
4
6
7
9
10
12
13
15
16
Ammonia All Data

Location	Ammonia All Data	D_Ammonia All Data
BG-1-2	5.2	1
BG-1-10	5	0
BG-2-2	5	0
BG-2-10	5	0
BG-2-19	5	0
BG-3-2	2.6	1
BG-3-10	3	1
BG-3-17	3.2	1
BG-4-2	5.3	0
BG-4-10	5.4	0
BG-4-19	5.9	0
BG-6-2	5.1	0
BG-6-9	5.1	0
BG-1-29	5	0
BG-1-40	5	0
BG-1-43	10	1
BG-1-46	5	0
BG-1-55	5	0
BG-1-78	5	0
BG-1-92	5	0
BG-2-21	5	0
BG-2-30	7.1	1
BG-2-32	5	0
BG-2-75	5	0
BG-2-81	7.2	1
BG-3-22	2.3	1
BG-3-29	2.4	1
BG-3-63	2.8	1
BG-3-65	3.8	1
BG-3-69	4.1	1
BG-3-95	2.8	1
BG-3-105	4.8	1
BG-3-131	2.8	1
BG-3-136	5	1
BG-4-40	5.8	0
BG-4-65	5.1	0
BG-4-79	5.9	0
BG-4-82	6	0
BG-4-95	6.1	0
BG-4-117	5.9	0
BG-4-120	6	0
BG-4-161	6	0
BG-4-163	5.9	0

Location	Ammonia All Data	D_Ammonia All Data
BG-6-28	17	1
BG-6-53	10	1
BG-6-58	6	0
BG-6-75	5.9	0
BG-6-87	6.2	0
BG-6-98	5.9	0
BG-6-114	5.9	0
BG-6-127	5.9	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Ammonia.wst
Full Precision	OFF
Confidence Coefficient	0.95

Ammonia 0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	4	9	69.23%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	9	5	5.9	5.2	5.1	0.3
Statistics (Detects Only)	4	2.6	5.2	3.5	3.1	1.16
Statistics (All: NDs treated as DL value)	13	2.6	5.9	4.677	5	1.031
Statistics (All: NDs treated as DL/2 value)	13	2.5	5.2	2.877	2.6	0.734
Statistics (Normal ROS Estimated Data)	13	2.173	5.2	3.199	3.169	0.732
Statistics (Gamma ROS Estimated Data)	13	2.6	5.2	3.348	3.178	0.663
Statistics (Lognormal ROS Estimated Data)	13	2.377	5.2	3.175	3.093	0.694

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	13.95	10.78	0.251	1.216	0.301	0.247
Statistics (NDs = DL)	18.07	13.95	0.259	1.515	0.26	0.172
Statistics (NDs = DL/2)	23.01	17.75	0.125	1.035	0.201	0.195
Statistics (Gamma ROS Estimates)	32.65	25.17	0.103	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.137	0.191	0.168

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.899	0.873	0.729	0.906

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.82	0.748	Data Appear Normal
Lilliefors (Detects Only)	0.352	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.764	0.866	Data Not Normal
Lilliefors (NDs = DL)	0.392	0.246	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.558	0.866	Data Not Normal
Lilliefors (NDs = DL/2)	0.304	0.246	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.847	0.866	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.226	0.246	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.945	0.839	0.782	0.97

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.47	0.657	
Kolmogorov-Smirnov (Detects Only)	0.345	0.395	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.815	0.733	
Kolmogorov-Smirnov (NDs = DL)	0.412	0.236	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	1.925	0.733	
Kolmogorov-Smirnov (NDs = DL/2)	0.284	0.236	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.796	0.733	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.271	0.236	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.928	0.85	0.782	0.918

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.874	0.748	Data Appear Lognormal
Lilliefors (Detects Only)	0.32	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.725	0.866	Data Not Lognormal
Lilliefors (NDs = DL)	0.412	0.246	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.633	0.866	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.278	0.246	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.868	0.866	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.215	0.246	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Ammonia >20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	38	0	38	14	24	63.16%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	24	5	6.2	5.563	5.9	0.483
Statistics (Detects Only)	14	2.3	17	5.864	4.45	4.148
Statistics (All: NDs treated as DL value)	38	2.3	17	5.674	5.45	2.492
Statistics (All: NDs treated as DL/2 value)	38	2.3	17	3.917	2.95	2.89
Statistics (Normal ROS Estimated Data)	38	-0.451	17	4.374	3.704	3.112
Statistics (Gamma ROS Estimated Data)	38	2.3	17	6.032	6.208	2.53
Statistics (Lognormal ROS Estimated Data)	38	1.681	17	4.323	3.374	2.858

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.777	2.575	2.112	1.578	0.618	0.392
Statistics (NDs = DL)	7.018	6.482	0.808	1.663	0.379	0.228
Statistics (NDs = DL/2)	3.724	3.448	1.052	1.225	0.462	0.377
Statistics (Gamma ROS Estimates)	6.814	6.293	0.885	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.328	0.486	0.366

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.895	0.836	0.722	0.911

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.808	0.874	Data Not Normal
Lilliefors (Detects Only)	0.225	0.237	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.732	0.938	Data Not Normal
Lilliefors (NDs = DL)	0.285	0.144	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.546	0.938	Data Not Normal

Lilliefors (NDs = DL/2)	0.374	0.144	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.855	0.938	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.157	0.144	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.973	0.884	0.846	0.955

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.54	0.743	
Kolmogorov-Smirnov (Detects Only)	0.169	0.231	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.128	0.75	
Kolmogorov-Smirnov (NDs = DL)	0.226	0.143	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.405	0.753	
Kolmogorov-Smirnov (NDs = DL/2)	0.365	0.144	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.32	0.75	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.193	0.143	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.969	0.931	0.832	0.966

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.927	0.874	Data Appear Lognormal
Lilliefors (Detects Only)	0.17	0.237	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.885	0.938	Data Not Lognormal
Lilliefors (NDs = DL)	0.233	0.144	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.699	0.938	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.343	0.144	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.939	0.938	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.118	0.144	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Ammonia.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Ammonia 0-20

General Statistics

Number of Valid Data	13	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	9
		Percent Non-Detects	69.23%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	2.6	Minimum Detected	0.956
Maximum Detected	5.2	Maximum Detected	1.649
Mean of Detected	3.5	Mean of Detected	1.216
SD of Detected	1.16	SD of Detected	0.301
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	5.9	Maximum Non-Detect	1.775

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	13
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.82	Shapiro Wilk Test Statistic	0.874
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.877	Mean (Log Scale)	1.035
SD	0.734	SD (Log Scale)	0.201
95% UTL 95% Coverage	4.837	95% UTL 95% Coverage	4.82
95% UPL (t)	4.234	95% UPL (t)	4.085
90% Percentile (z)	3.817	90% Percentile (z)	3.644
95% Percentile (z)	4.084	95% Percentile (z)	3.92
99% Percentile (z)	4.584	99% Percentile (z)	4.497

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	3.175
		SD in Original Scale	0.694
		Mean in Log Scale	1.137
		SD in Log Scale	0.191
		95% UTL 95% Coverage	5.193
		95% UPL (t)	4.438
		90% Percentile (z)	3.982
		95% Percentile (z)	4.268
		99% Percentile (z)	4.862
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.653	Data appear Normal at 5% Significance Level	
Theta Star	0.958		
nu star	29.23		
A-D Test Statistic	0.47	Nonparametric Statistics	
5% A-D Critical Value	0.657	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.345	Mean	3.16
5% K-S Critical Value	0.395	SD	0.72
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.29
		95% KM UTL with 95% Coverage	5.083
Assuming Gamma Distribution		95% KM Chebyshev UPL	6.417
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	4.492
Mean	3.348	90% Percentile (z)	4.083
Median	3.178	95% Percentile (z)	4.344
SD	0.663	99% Percentile (z)	4.835
k star	25.17		
Theta star	0.133	Gamma ROS Limits with Extrapolated Data	
Nu star	654.4	95% Wilson Hilferty (WH) Approx. Gamma UPL	4.564
95% Percentile of Chisquare (2k)	67.9	95% Hawkins Wixley (HW) Approx. Gamma UPL	4.564
		95% WH Approx. Gamma UTL with 95% Coverage	5.207
90% Percentile	4.227	95% HW Approx. Gamma UTL with 95% Coverage	5.223
95% Percentile	4.516		
99% Percentile	5.093		

Note: DL/2 is not a recommended method.

Ammonia >20

General Statistics			
Number of Valid Data	38	Number of Detected Data	14
Number of Distinct Detected Data	11	Number of Non-Detect Data	24
		Percent Non-Detects	63.16%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	2.3	Minimum Detected	0.833
Maximum Detected	17	Maximum Detected	2.833
Mean of Detected	5.864	Mean of Detected	1.578
SD of Detected	4.148	SD of Detected	0.618
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	6.2	Maximum Non-Detect	1.825

Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	33
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	5
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	86.84%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.808	Shapiro Wilk Test Statistic	0.927
5% Shapiro Wilk Critical Value	0.874	5% Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	3.917	Mean (Log Scale)	1.225
SD	2.89	SD (Log Scale)	0.462
95% UTL 95% Coverage	10.08	95% UTL 95% Coverage	9.123
95% UPL (t)	8.857	95% UPL (t)	7.503
90% Percentile (z)	7.621	90% Percentile (z)	6.157
95% Percentile (z)	8.671	95% Percentile (z)	7.283
99% Percentile (z)	10.64	99% Percentile (z)	9.981
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	11.52	Mean in Original Scale	4.323
SD	3.603	SD in Original Scale	2.858
95% UTL with 95% Coverage	19.2	95% UTL with 95% Coverage	10.65
		95% BCA UTL with 95% Coverage	11.05
		95% Bootstrap (%) UTL with 95% Coverage	17
95% UPL (t)	17.68	95% UPL (t)	8.668
90% Percentile (z)	16.14	90% Percentile (z)	7.04
95% Percentile (z)	17.45	95% Percentile (z)	8.401
99% Percentile (z)	19.9	99% Percentile (z)	11.7
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.229	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2.631		
nu star	62.42		
A-D Test Statistic	0.54	Nonparametric Statistics	
5% A-D Critical Value	0.743	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.169	Mean	4.236
5% K-S Critical Value	0.231	SD	2.816
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.525
		95% KM UTL with 95% Coverage	10.24
Assuming Gamma Distribution		95% KM Chebyshev UPL	16.67
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	9.049
Mean	6.032	90% Percentile (z)	7.845
Median	6.208	95% Percentile (z)	8.868
SD	2.53	99% Percentile (z)	10.79
k star	6.293		
Theta star	0.958	Gamma ROS Limits with Extrapolated Data	
Nu star	478.3	95% Wilson Hilferty (WH) Approx. Gamma UPL	10.53
95% Percentile of Chisquare (2k)	21.81	95% Hawkins Wixley (HW) Approx. Gamma UPL	10.61

						95% WH Approx. Gamma UTL with				95% Coverage	12.03
				90% Percentile	9.245	95% HW Approx. Gamma UTL with				95% Coverage	12.21
				95% Percentile	10.45						
				99% Percentile	12.98						

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Ammonia.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Ammonia 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 5.2 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.815

For 10% significance level, 5.2 is an outlier.
For 5% significance level, 5.2 is an outlier.
For 1% significance level, 5.2 is an outlier.

2. Data Value 2.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.000

For 10% significance level, 2.5 is not an outlier.
For 5% significance level, 2.5 is not an outlier.
For 1% significance level, 2.5 is not an outlier.

Rosner's Outlier Test for Ammonia >20

Mean	3.917
Standard Deviation	2.89
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3.917	2.852	17	31	4.588	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 17 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 17 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Ammonia.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Ammonia >20

Background Data: Ammonia 0-20

Raw Statistics

	Site	Background
Number of Valid Data	38	13
Number of Non-Detect Data	24	9
Number of Detect Data	14	4
Minimum Non-Detect	5	5
Maximum Non-Detect	6.2	5.9
Percent Non detects	63.16%	69.23%
Minimum Detected	2.3	2.6
Maximum Detected	17	5.2
Mean of Detected Data	5.864	3.5
Median of Detected Data	4.45	3.1
SD of Detected Data	4.148	1.16

Site vs Background Gehan Test

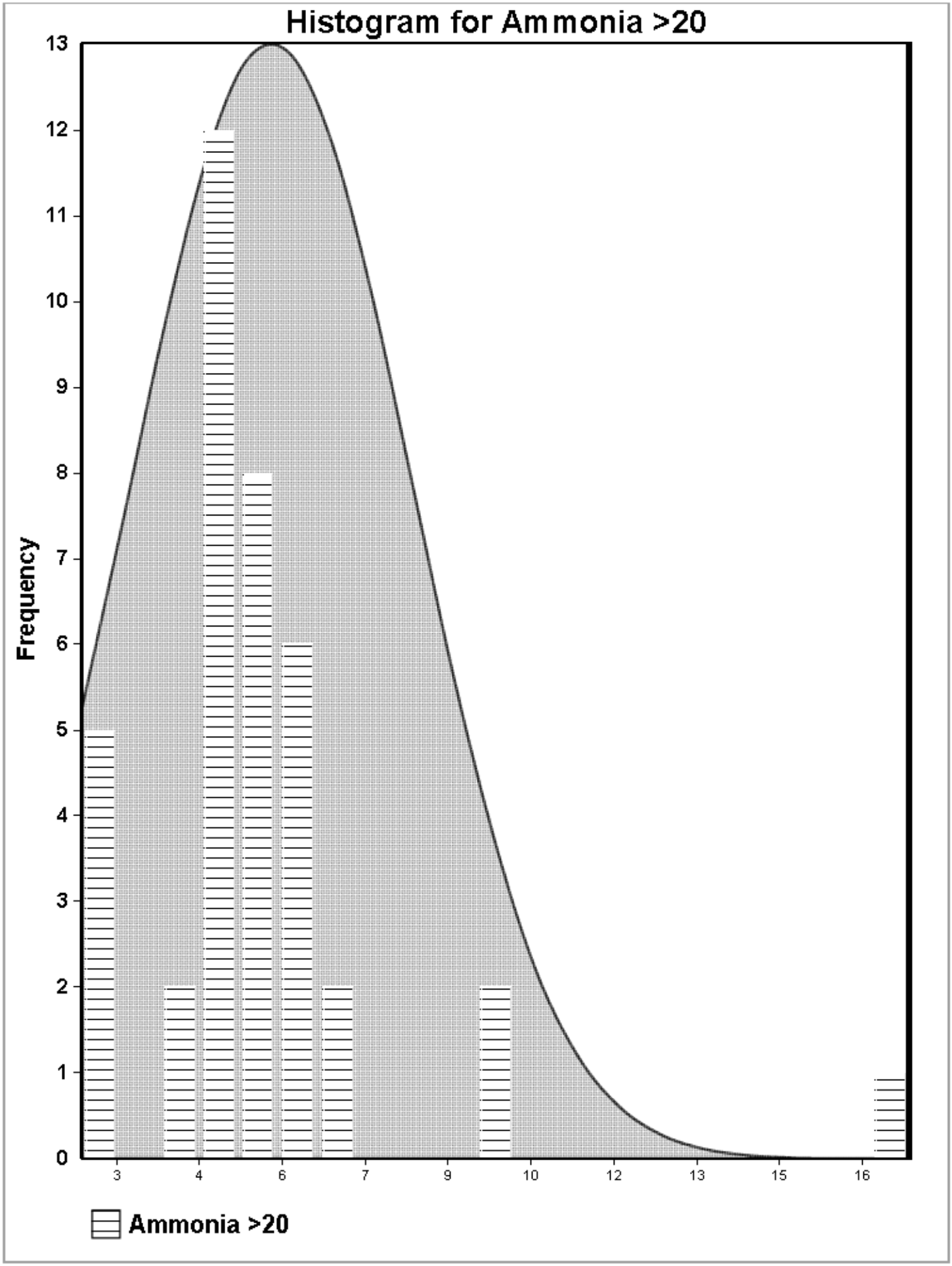
H0: Mu of Site or AOC = Mu of background

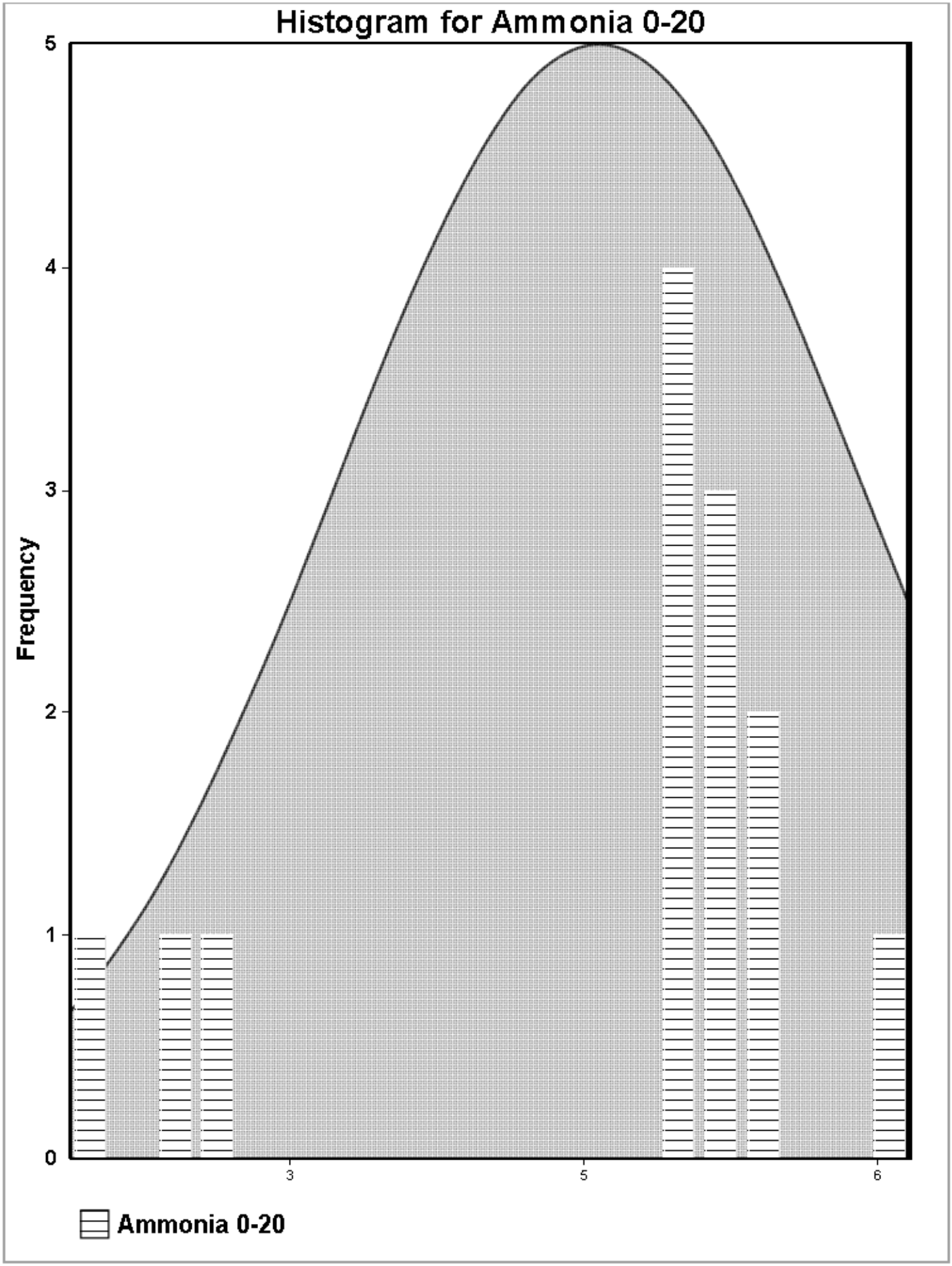
Gehan z Test Value	1.032
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.302

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Ammonia >20
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
3
4
6
7
9
10
12
13
15
16
Ammonia >20


Histogram for Ammonia 0-20
Frequency
0
1
2
3
4
5
3
5
6
Ammonia 0-20

Location	Ammonia 0-20	D_Ammonia 0-20
BG-1-2	5.2	1
BG-1-10	5	0
BG-2-2	5	0
BG-2-10	5	0
BG-2-19	5	0
BG-3-2	2.6	1
BG-3-10	3	1
BG-3-17	3.2	1
BG-4-2	5.3	0
BG-4-10	5.4	0
BG-4-19	5.9	0
BG-6-2	5.1	0
BG-6-9	5.1	0

Location	Ammonia >20	D_Ammonia >20
BG-1-29	5	0
BG-1-40	5	0
BG-1-43	10	1
BG-1-46	5	0
BG-1-55	5	0
BG-1-78	5	0
BG-1-92	5	0
BG-2-21	5	0
BG-2-30	7.1	1
BG-2-32	5	0
BG-2-75	5	0
BG-2-81	7.2	1
BG-3-22	2.3	1
BG-3-29	2.4	1
BG-3-63	2.8	1
BG-3-65	3.8	1
BG-3-69	4.1	1
BG-3-95	2.8	1
BG-3-105	4.8	1
BG-3-131	2.8	1
BG-3-136	5	1
BG-4-40	5.8	0
BG-4-65	5.1	0
BG-4-79	5.9	0
BG-4-82	6	0
BG-4-95	6.1	0
BG-4-117	5.9	0
BG-4-120	6	0
BG-4-161	6	0
BG-4-163	5.9	0
BG-6-28	17	1
BG-6-53	10	1
BG-6-58	6	0
BG-6-75	5.9	0
BG-6-87	6.2	0
BG-6-98	5.9	0
BG-6-114	5.9	0
BG-6-127	5.9	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Ammonia.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	9	9	50.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	9	5	6.2	5.667	5.9	0.447
Statistics (Detects Only)	9	2.3	17	7.344	7.1	4.544
Statistics (All: NDs treated as DL value)	18	2.3	17	6.506	5.9	3.249
Statistics (All: NDs treated as DL/2 value)	18	2.3	17	5.089	3.05	3.889
Statistics (Normal ROS Estimated Data)	18	0.937	17	5.289	3.713	3.885
Statistics (Gamma ROS Estimated Data)	18	2.3	17	7.33	7.273	3.121
Statistics (Lognormal ROS Estimated Data)	18	2.3	17	5.368	3.581	3.752

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.123	2.639	2.352	1.825	0.626	0.343
Statistics (NDs = DL)	5.474	4.599	1.188	1.779	0.436	0.245
Statistics (NDs = DL/2)	2.718	2.302	1.872	1.432	0.593	0.414
Statistics (Gamma ROS Estimates)	6.079	5.103	1.206	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.514	0.555	0.367

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.947	0.872	0.836	0.896

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.904	0.829	Data Appear Normal
Lilliefors (Detects Only)	0.179	0.295	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.784	0.897	Data Not Normal
Lilliefors (NDs = DL)	0.26	0.209	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.709	0.897	Data Not Normal
Lilliefors (NDs = DL/2)	0.298	0.209	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.816	0.897	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.231	0.209	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.986	0.928	0.942	0.97

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.187	0.727	
Kolmogorov-Smirnov (Detects Only)	0.113	0.281	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.787	0.743	
Kolmogorov-Smirnov (NDs = DL)	0.209	0.204	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	1.591	0.748	
Kolmogorov-Smirnov (NDs = DL/2)	0.302	0.205	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.324	0.742	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.279	0.204	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.992	0.956	0.914	0.949

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.981	0.829	Data Appear Lognormal
Lilliefors (Detects Only)	0.141	0.295	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.935	0.897	Data Appear Lognormal
Lilliefors (NDs = DL)	0.182	0.209	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.83	0.897	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.286	0.209	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.899	0.897	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.198	0.209	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	9	24	72.73%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	24	5	6.1	5.388	5.1	0.459
Statistics (Detects Only)	9	2.4	5	3.333	2.8	0.97
Statistics (All: NDs treated as DL value)	33	2.4	6.1	4.827	5	1.118
Statistics (All: NDs treated as DL/2 value)	33	2.4	5	2.868	2.7	0.597
Statistics (Normal ROS Estimated Data)	33	1.914	5	3.211	3.202	0.712
Statistics (Gamma ROS Estimated Data)	33	2.4	5	3.35	3.371	0.488
Statistics (Lognormal ROS Estimated Data)	33	2.163	5	3.176	3.106	0.667

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	14.96	13.62	0.223	1.17	0.268	0.229
Statistics (NDs = DL)	15.39	14.01	0.314	1.541	0.276	0.179
Statistics (NDs = DL/2)	30.77	27.99	0.0932	1.037	0.173	0.167
Statistics (Gamma ROS Estimates)	53.6	48.75	0.0625	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.136	0.199	0.175

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.904	0.901	0.789	0.981

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.805	0.829	Data Not Normal
Lilliefors (Detects Only)	0.301	0.295	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.8	0.931	Data Not Normal
Lilliefors (NDs = DL)	0.319	0.154	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.636	0.931	Data Not Normal

Lilliefors (NDs = DL/2)	0.291	0.154	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.961	0.931	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.142	0.154	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.931	0.865	0.829	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.793	0.721	
Kolmogorov-Smirnov (Detects Only)	0.29	0.279	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.394	0.746	
Kolmogorov-Smirnov (NDs = DL)	0.346	0.153	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.348	0.745	
Kolmogorov-Smirnov (NDs = DL/2)	0.257	0.153	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.128	0.745	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.313	0.153	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.927	0.869	0.84	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.845	0.829	Data Appear Lognormal
Lilliefors (Detects Only)	0.272	0.295	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.747	0.931	Data Not Lognormal
Lilliefors (NDs = DL)	0.355	0.154	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.714	0.931	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.24	0.154	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.966	0.931	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.142	0.154	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Ammonia.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Number of Valid Data	18	Number of Detected Data	9
Number of Distinct Detected Data	8	Number of Non-Detect Data	9
		Percent Non-Detects	50.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	2.3	Minimum Detected	0.833
Maximum Detected	17	Maximum Detected	2.833
Mean of Detected	7.344	Mean of Detected	1.825
SD of Detected	4.544	SD of Detected	0.626
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	6.2	Maximum Non-Detect	1.825

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	13
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	5
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	72.22%

Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.904	Shapiro Wilk Test Statistic	0.981
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.089	Mean (Log Scale)	1.432
SD	3.889	SD (Log Scale)	0.593
95% UTL 95% Coverage	14.63	95% UTL 95% Coverage	17.93
95% UPL (t)	12.04	95% UPL (t)	12.08
90% Percentile (z)	10.07	90% Percentile (z)	8.951
95% Percentile (z)	11.49	95% Percentile (z)	11.1
99% Percentile (z)	14.14	99% Percentile (z)	16.63

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	2.151	Mean in Original Scale	5.368
SD	6.775	SD in Original Scale	3.752
95% UTL with 95% Coverage	18.77	95% UTL with 95% Coverage	17.73
		95% BCA UTL with 95% Coverage	17
		95% Bootstrap (%) UTL with 95% Coverage	17
95% UPL (t)	14.26	95% UPL (t)	12.25
90% Percentile (z)	10.83	90% Percentile (z)	9.255
95% Percentile (z)	13.3	95% Percentile (z)	11.32
99% Percentile (z)	17.91	99% Percentile (z)	16.53
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.156	Data appear Normal at 5% Significance Level	
Theta Star	3.407		
nu star	38.81		
A-D Test Statistic	0.187	Nonparametric Statistics	
5% A-D Critical Value	0.727	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.113	Mean	5.402
5% K-S Critical Value	0.281	SD	3.662
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.959
		95% KM UTL with 95% Coverage	14.38
Assuming Gamma Distribution		95% KM Chebyshev UPL	21.8
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	11.95
Mean	7.33	90% Percentile (z)	10.09
Median	7.273	95% Percentile (z)	11.43
SD	3.121	99% Percentile (z)	13.92
k star	5.103		
Theta star	1.436	Gamma ROS Limits with Extrapolated Data	
Nu star	183.7	95% Wilson Hilferty (WH) Approx. Gamma UPL	13.63
95% Percentile of Chisquare (2k)	18.59	95% Hawkins Wixley (HW) Approx. Gamma UPL	13.84
		95% WH Approx. Gamma UTL with 95% Coverage	16.94
90% Percentile	11.67	95% HW Approx. Gamma UTL with 95% Coverage	17.45
95% Percentile	13.35		
99% Percentile	16.89		

Note: DL/2 is not a recommended method.

Non-Clay

General Statistics			
Number of Valid Data	33	Number of Detected Data	9
Number of Distinct Detected Data	7	Number of Non-Detect Data	24
		Percent Non-Detects	72.73%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	2.4	Minimum Detected	0.875
Maximum Detected	5	Maximum Detected	1.609
Mean of Detected	3.333	Mean of Detected	1.17
SD of Detected	0.97	SD of Detected	0.268
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	6.1	Maximum Non-Detect	1.808

Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	33
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.805	Shapiro Wilk Test Statistic	0.845
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.868	Mean (Log Scale)	1.037
SD	0.597	SD (Log Scale)	0.173
95% UTL 95% Coverage	4.168	95% UTL 95% Coverage	4.11
95% UPL (t)	3.895	95% UPL (t)	3.798
90% Percentile (z)	3.633	90% Percentile (z)	3.521
95% Percentile (z)	3.85	95% Percentile (z)	3.75
99% Percentile (z)	4.257	99% Percentile (z)	4.218
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	3.176
		SD in Original Scale	0.667
		Mean in Log Scale	1.136
		SD in Log Scale	0.199
		95% UTL 95% Coverage	4.798
		95% UPL (t)	4.382
		90% Percentile (z)	4.017
		95% Percentile (z)	4.317
		99% Percentile (z)	4.943
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	10.04	Data appear Lognormal at 5% Significance Level	
Theta Star	0.332		
nu star	180.8		
A-D Test Statistic	0.793	Nonparametric Statistics	
5% A-D Critical Value	0.721	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.29	Mean	3.219
5% K-S Critical Value	0.279	SD	0.83
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.281
		95% KM UTL with 95% Coverage	5.025
Assuming Gamma Distribution		95% KM Chebyshev UPL	6.891
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	4.646

Mean	3.35	90% Percentile (z)	4.282
Median	3.371	95% Percentile (z)	4.584
SD	0.488	99% Percentile (z)	5.15
k star	48.75		
Theta star	0.0687	Gamma ROS Limits with Extrapolated Data	
Nu star	3218	95% Wilson Hilferty (WH) Approx. Gamma UPL	4.189
95% Percentile of Chisquare (2k)	121.6	95% Hawkins Wixley (HW) Approx. Gamma UPL	4.191
		95% WH Approx. Gamma UTL with 95% Coverage	4.44
90% Percentile	3.978	95% HW Approx. Gamma UTL with 95% Coverage	4.446
95% Percentile	4.177		
99% Percentile	4.566		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Ammonia.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 17 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.483

For 10% significance level, 17 is an outlier.

For 5% significance level, 17 is an outlier.

For 1% significance level, 17 is not an outlier.

2. Data Value 2.3 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.026

For 10% significance level, 2.3 is not an outlier.

For 5% significance level, 2.3 is not an outlier.

For 1% significance level, 2.3 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	2.868
Standard Deviation	0.597
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2.868	0.588	5	20	3.626	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 5 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 5 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Ammonia.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Data	33	18
Number of Non-Detect Data	24	9
Number of Detect Data	9	9
Minimum Non-Detect	5	5
Maximum Non-Detect	6.1	6.2
Percent Non detects	72.73%	50.00%
Minimum Detected	2.4	2.3
Maximum Detected	5	17
Mean of Detected Data	3.333	7.344
Median of Detected Data	2.8	7.1
SD of Detected Data	0.97	4.544

Site vs Background Gehan Test

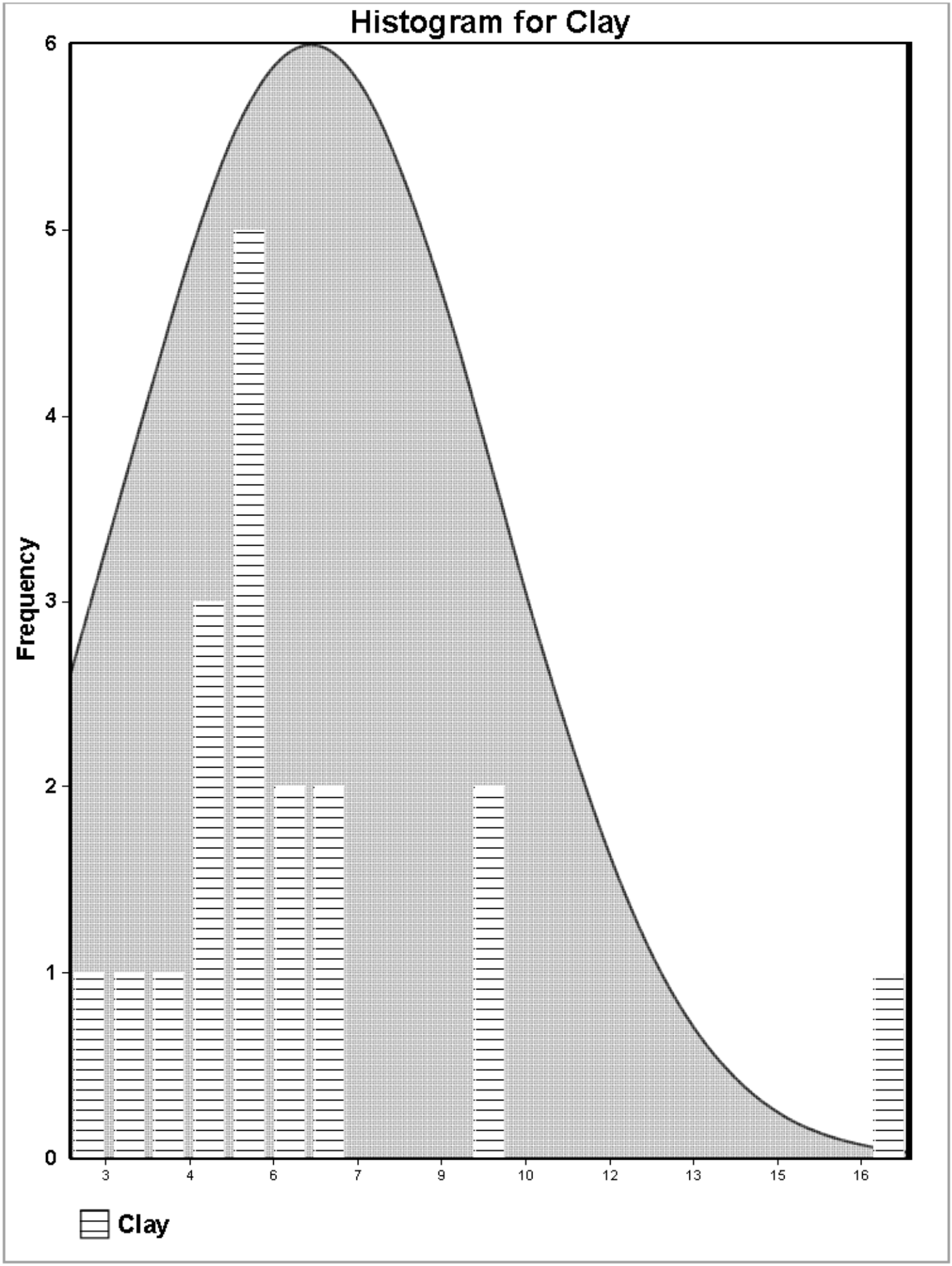
H0: Mu of Site or AOC = Mu of background

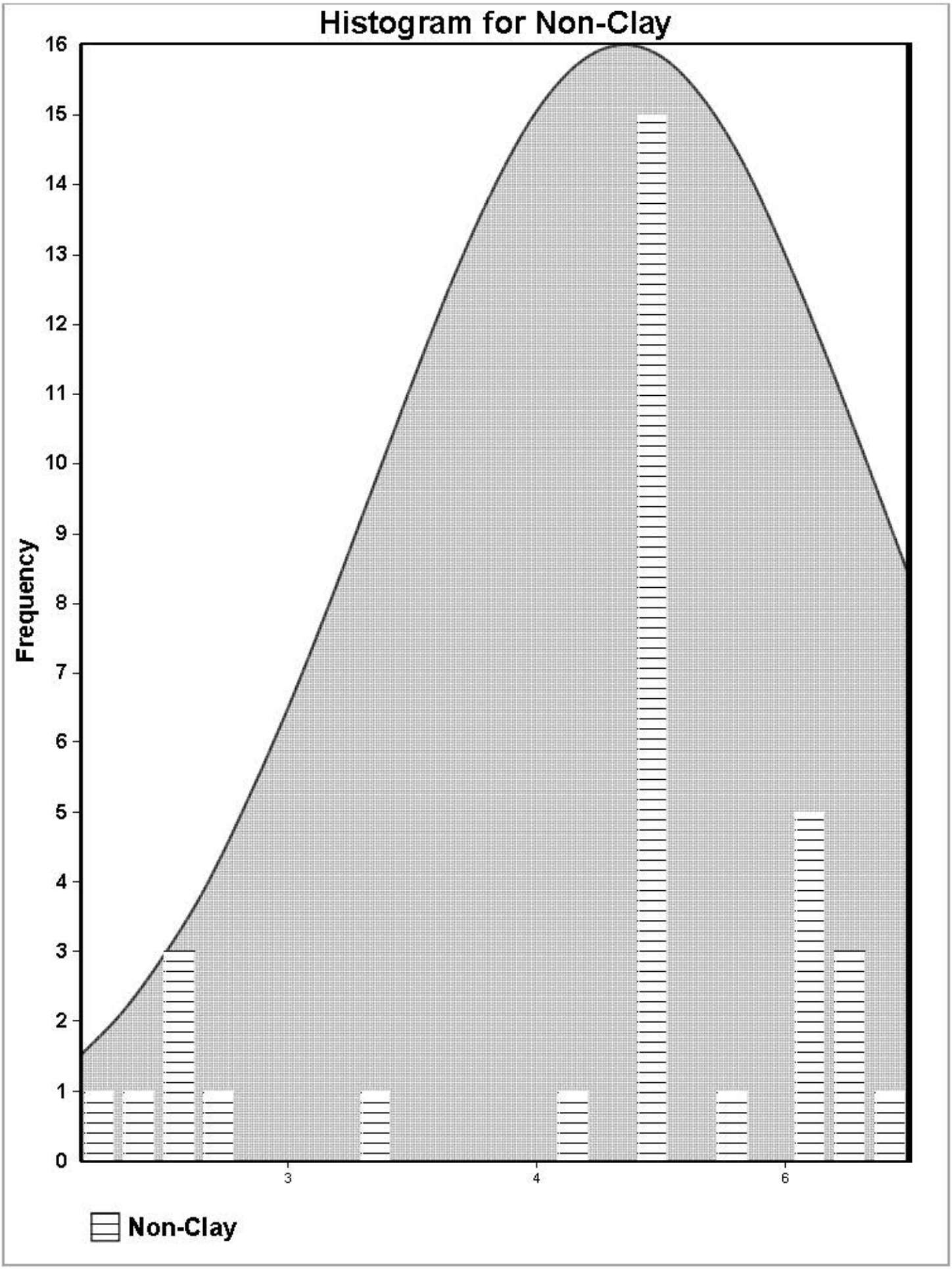
Gehan z Test Value	-3.284
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.00102

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
5
6
3
4
6
7
9
10
12
13
15
16
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
3
4
6
Non-Clay

Location	Clay	D_Clay
BG-1-2	5.2	1
BG-1-43	10	1
BG-1-55	5	0
BG-1-78	5	0
BG-2-30	7.1	1
BG-2-81	7.2	1
BG-3-17	3.2	1
BG-3-22	2.3	1
BG-3-69	4.1	1
BG-4-2	5.3	0
BG-4-19	5.9	0
BG-4-40	5.8	0
BG-4-79	5.9	0
BG-4-161	6	0
BG-4-163	5.9	0
BG-6-28	17	1
BG-6-53	10	1
BG-6-87	6.2	0

Location	Non-Clay	D_Non-Clay
BG-1-10	5	0
BG-1-29	5	0
BG-1-40	5	0
BG-1-46	5	0
BG-1-92	5	0
BG-2-2	5	0
BG-2-10	5	0
BG-2-19	5	0
BG-2-21	5	0
BG-2-32	5	0
BG-2-75	5	0
BG-3-2	2.6	1
BG-3-10	3	1
BG-3-29	2.4	1
BG-3-63	2.8	1
BG-3-65	3.8	1
BG-3-95	2.8	1
BG-3-105	4.8	1
BG-3-131	2.8	1
BG-3-136	5	1
BG-4-10	5.4	0
BG-4-65	5.1	0
BG-4-82	6	0
BG-4-95	6.1	0
BG-4-117	5.9	0
BG-4-120	6	0
BG-6-2	5.1	0
BG-6-9	5.1	0
BG-6-58	6	0
BG-6-75	5.9	0
BG-6-98	5.9	0
BG-6-114	5.9	0
BG-6-127	5.9	0
Average	**4.827272727**	

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Ammonia.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	3	9	75.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	9	5	5.1	5.022	5	0.0441
Statistics (Detects Only)	3	2.6	5.2	3.6	3	1.4
Statistics (All: NDs treated as DL value)	12	2.6	5.2	4.667	5	0.878
Statistics (All: NDs treated as DL/2 value)	12	2.5	5.2	2.783	2.5	0.774
Statistics (Normal ROS Estimated Data)	12	1.547	5.2	3.031	2.935	0.957
Statistics (Gamma ROS Estimated Data)	12	1.000E-12	5.2	0.9	1.000E-12	1.734
Statistics (Lognormal ROS Estimated Data)	12	1.998	5.2	3.048	2.917	0.844

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	10.88	8.213	0.331	1.234	0.366	0.296
Statistics (NDs = DL)	23.42	17.62	0.199	1.519	0.232	0.153
Statistics (NDs = DL/2)	20.52	15.44	0.136	0.999	0.211	0.211
Statistics (Gamma ROS Estimates)	0.0436	0.0883	20.64	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.084	0.252	0.232

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.929	0.729	0.631	0.973

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.862	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.333	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.542	0.859	Data Not Normal
Lilliefors (NDs = DL)	0.481	0.256	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.428	0.859	Data Not Normal
Lilliefors (NDs = DL/2)	0.427	0.256	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.96	0.859	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.125	0.256	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.684	0.694	0.895

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	2.934	0.732	
Kolmogorov-Smirnov (NDs = DL)	0.491	0.245	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	3.021	0.732	
Kolmogorov-Smirnov (NDs = DL/2)	0.425	0.245	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.764	1.041	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.481	0.294	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.947	0.719	0.659	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.897	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.311	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.53	0.859	Data Not Lognormal
Lilliefors (NDs = DL)	0.485	0.256	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.462	0.859	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.415	0.256	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.962	0.859	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.125	0.256	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	39	0	39	15	24	61.54%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	24	5	6.2	5.629	5.9	0.444
Statistics (Detects Only)	15	2.3	17	5.687	4.1	4.056
Statistics (All: NDs treated as DL value)	39	2.3	17	5.651	5.8	2.486
Statistics (All: NDs treated as DL/2 value)	39	2.3	17	3.919	2.95	2.845
Statistics (Normal ROS Estimated Data)	39	0.034	17	4.414	3.771	2.99
Statistics (Gamma ROS Estimated Data)	39	2.3	17	5.829	6.144	2.737
Statistics (Lognormal ROS Estimated Data)	39	1.822	17	4.319	3.415	2.801

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.82	2.62	2.017	1.55	0.605	0.39
Statistics (NDs = DL)	6.912	6.397	0.818	1.658	0.382	0.231
Statistics (NDs = DL/2)	3.872	3.592	1.012	1.231	0.452	0.367
Statistics (Gamma ROS Estimates)	5.352	4.958	1.089	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.336	0.465	0.348

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.885	0.842	0.718	0.893

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.79	0.881	Data Not Normal
Lilliefors (Detects Only)	0.234	0.229	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.742	0.939	Data Not Normal
Lilliefors (NDs = DL)	0.284	0.142	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.541	0.939	Data Not Normal

Lilliefors (NDs = DL/2)	0.369	0.142	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.824	0.939	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.192	0.142	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.968	0.888	0.84	0.967

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.642	0.745	
Kolmogorov-Smirnov (Detects Only)	0.171	0.223	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.026	0.75	
Kolmogorov-Smirnov (NDs = DL)	0.226	0.142	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.643	0.753	
Kolmogorov-Smirnov (NDs = DL/2)	0.354	0.142	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.535	0.751	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.118	0.142	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.964	0.936	0.829	0.955

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.92	0.881	Data Appear Lognormal
Lilliefors (Detects Only)	0.139	0.229	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.893	0.939	Data Not Lognormal
Lilliefors (NDs = DL)	0.219	0.142	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.697	0.939	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.331	0.142	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.919	0.939	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.135	0.142	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Ammonia.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Number of Valid Data	12	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	9
		Percent Non-Detects	75.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	2.6	Minimum Detected	0.956
Maximum Detected	5.2	Maximum Detected	1.649
Mean of Detected	3.6	Mean of Detected	1.234
SD of Detected	1.4	SD of Detected	0.366
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	5.1	Maximum Non-Detect	1.629

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	11
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	91.67%

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.862	Shapiro Wilk Test Statistic	0.897
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.783	Mean (Log Scale)	0.999
SD	0.774	SD (Log Scale)	0.211
95% UTL 95% Coverage	4.901	95% UTL 95% Coverage	4.837
95% UPL (t)	4.23	95% UPL (t)	4.029
90% Percentile (z)	3.775	90% Percentile (z)	3.559
95% Percentile (z)	4.057	95% Percentile (z)	3.843

99% Percentile (z)	4.584	99% Percentile (z)	4.437
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	3.048
		SD in Original Scale	0.844
		Mean in Log Scale	1.084
		SD in Log Scale	0.252
		95% UTL 95% Coverage	5.887
		95% UPL (t)	4.733
		90% Percentile (z)	4.082
		95% Percentile (z)	4.473
		99% Percentile (z)	5.31
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	3
5% K-S Critical Value	N/A	SD	0.69
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.283
		95% KM UTL with 95% Coverage	4.889
Assuming Gamma Distribution		95% KM Chebyshev UPL	6.132
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	4.291
Mean	N/A	90% Percentile (z)	3.885
Median	N/A	95% Percentile (z)	4.136
SD	N/A	99% Percentile (z)	4.606
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

MC

General Statistics			
Number of Valid Data	39	Number of Detected Data	15
Number of Distinct Detected Data	12	Number of Non-Detect Data	24
		Percent Non-Detects	61.54%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	2.3	Minimum Detected	0.833
Maximum Detected	17	Maximum Detected	2.833
Mean of Detected	5.687	Mean of Detected	1.55
SD of Detected	4.056	SD of Detected	0.605

Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	6.2	Maximum Non-Detect	1.825
Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	5
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	87.18%
Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.79	Shapiro Wilk Test Statistic	0.92
5% Shapiro Wilk Critical Value	0.881	5% Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	3.919	Mean (Log Scale)	1.231
SD	2.845	SD (Log Scale)	0.452
95% UTL 95% Coverage	9.963	95% UTL 95% Coverage	8.948
95% UPL (t)	8.777	95% UPL (t)	7.411
90% Percentile (z)	7.565	90% Percentile (z)	6.113
95% Percentile (z)	8.599	95% Percentile (z)	7.204
99% Percentile (z)	10.54	99% Percentile (z)	9.802
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	11.53	Mean in Original Scale	4.319
SD	3.603	SD in Original Scale	2.801
95% UTL with 95% Coverage	19.19	95% UTL with 95% Coverage	10.22
		95% BCA UTL with 95% Coverage	10.7
		95% Bootstrap (%) UTL with 95% Coverage	17
95% UPL (t)	17.68	95% UPL (t)	8.421
90% Percentile (z)	16.15	90% Percentile (z)	6.908
95% Percentile (z)	17.46	95% Percentile (z)	8.18
99% Percentile (z)	19.91	99% Percentile (z)	11.23
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.3	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2.472		
nu star	69.01		
A-D Test Statistic	0.642	Nonparametric Statistics	
5% A-D Critical Value	0.745	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.171	Mean	4.221
5% K-S Critical Value	0.223	SD	2.775
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.502
		95% KM UTL with 95% Coverage	10.12
Assuming Gamma Distribution		95% KM Chebyshev UPL	16.47
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	8.96
Mean	5.829	90% Percentile (z)	7.778
Median	6.144	95% Percentile (z)	8.786
SD	2.737	99% Percentile (z)	10.68
k star	4.958		
Theta star	1.176	Gamma ROS Limits with Extrapolated Data	

				Nu star	386.7					95% Wilson Hilferty (WH) Approx. Gamma UPL	10.79
				95% Percentile of Chisquare (2k)	18.19					95% Hawkins Wixley (HW) Approx. Gamma UPL	10.89
										95% WH Approx. Gamma UTL with 95% Coverage	12.47
				90% Percentile	9.333					95% HW Approx. Gamma UTL with 95% Coverage	12.69
				95% Percentile	10.69						
				99% Percentile	13.57						

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Ammonia.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12

10% critical value: 0.49

5% critical value: 0.546

1% critical value: 0.642

1. Data Value 5.2 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.963

For 10% significance level, 5.2 is an outlier.

For 5% significance level, 5.2 is an outlier.

For 1% significance level, 5.2 is an outlier.

2. Data Value 2.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.000

For 10% significance level, 2.5 is not an outlier.

For 5% significance level, 2.5 is not an outlier.

For 1% significance level, 2.5 is not an outlier.

Rosner's Outlier Test for MC

Mean	3.919
Standard Deviation	2.845
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3.919	2.808	17	32	4.658	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 17 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 17 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Ammonia.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Data	39	12
Number of Non-Detect Data	24	9
Number of Detect Data	15	3
Minimum Non-Detect	5	5
Maximum Non-Detect	6.2	5.1
Percent Non detects	61.54%	75.00%
Minimum Detected	2.3	2.6
Maximum Detected	17	5.2
Mean of Detected Data	5.687	3.6
Median of Detected Data	4.1	3
SD of Detected Data	4.056	1.4

Site vs Background Gehan Test

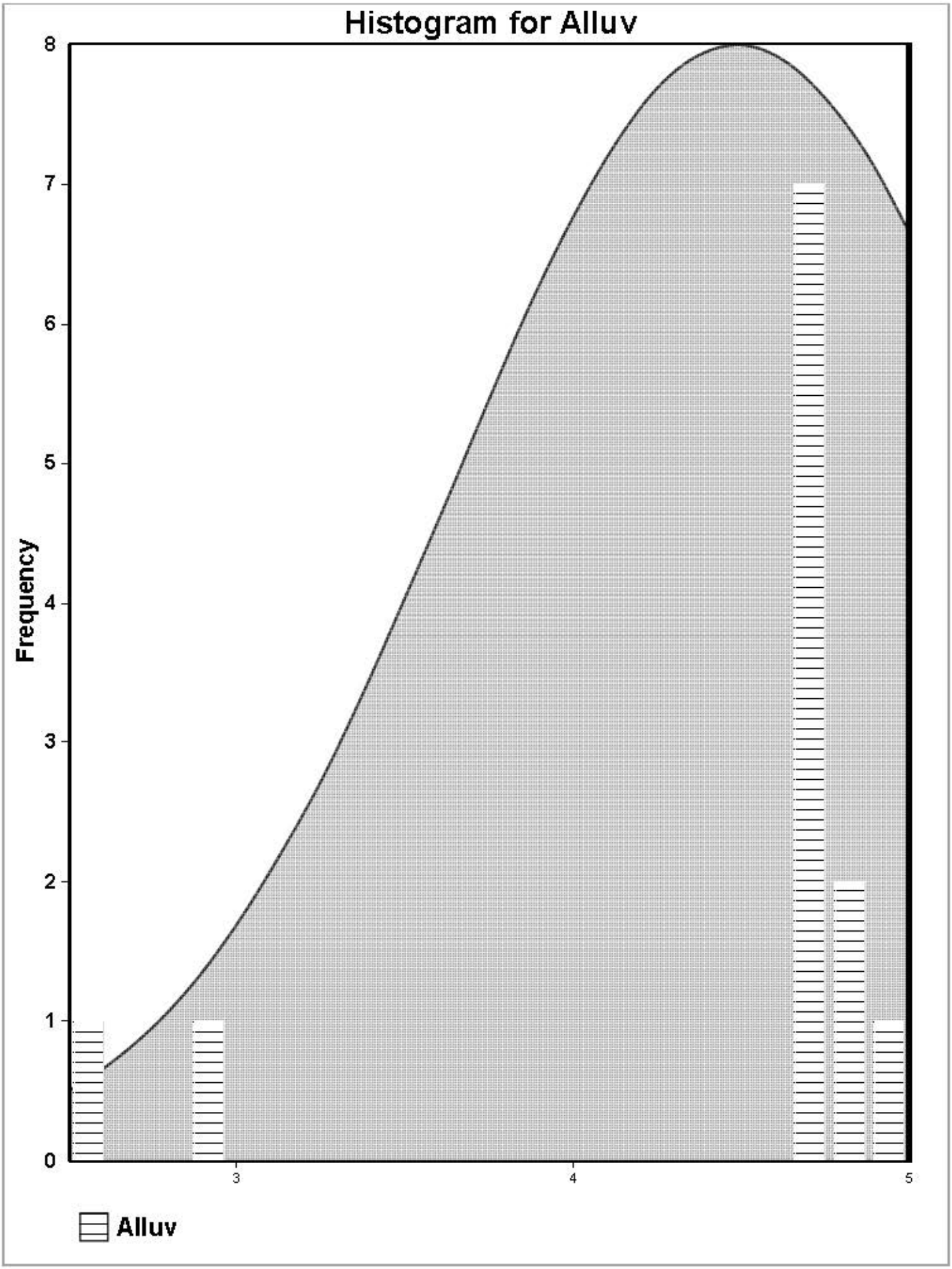
H0: Mu of Site or AOC = Mu of background

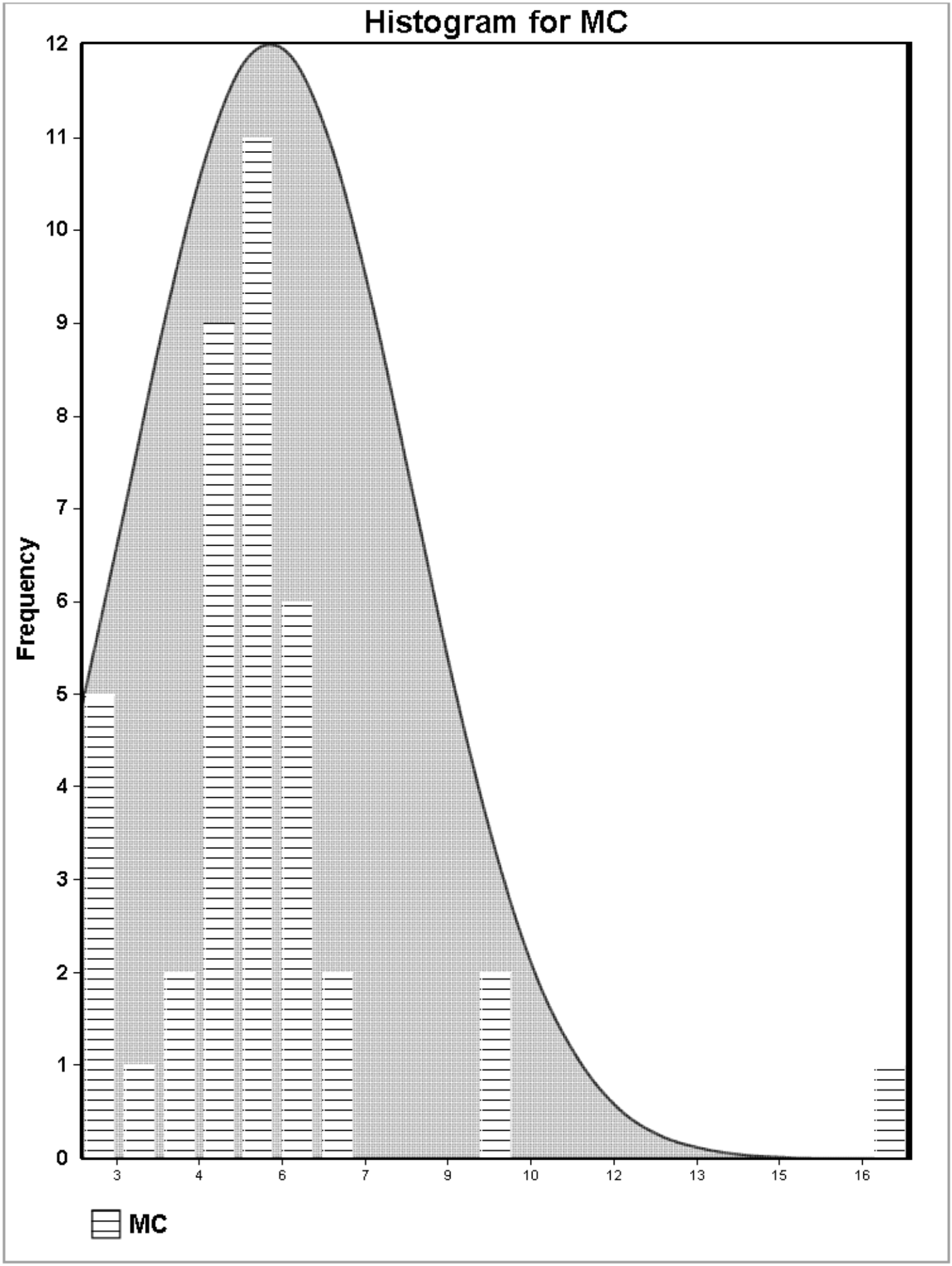
Gehan z Test Value	1.12
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.263

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
7
8
3
4
5
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
3
4
6
7
9
10
12
13
15
16
MC

Location	Alluv	D_Alluv
BG-1-2	5.2	1
BG-1-10	5	0
BG-1-29	5	0
BG-1-40	5	0
BG-2-2	5	0
BG-2-10	5	0
BG-2-19	5	0
BG-2-21	5	0
BG-3-2	2.6	1
BG-3-10	3	1
BG-6-2	5.1	0
BG-6-9	5.1	0

Location	MC	D_MC
BG-1-43	10	1
BG-1-46	5	0
BG-1-55	5	0
BG-1-78	5	0
BG-1-92	5	0
BG-2-30	7.1	1
BG-2-32	5	0
BG-2-75	5	0
BG-2-81	7.2	1
BG-3-17	3.2	1
BG-3-22	2.3	1
BG-3-29	2.4	1
BG-3-63	2.8	1
BG-3-65	3.8	1
BG-3-69	4.1	1
BG-3-95	2.8	1
BG-3-105	4.8	1
BG-3-131	2.8	1
BG-3-136	5	1
BG-4-1	5.3	0
BG-4-10	5.4	0
BG-4-19	5.9	0
BG-4-40	5.8	0
BG-4-65	5.1	0
BG-4-79	5.9	0
BG-4-82	6	0
BG-4-95	6.1	0
BG-4-117	5.9	0
BG-4-120	6	0
BG-4-161	6	0
BG-4-163	5.9	0
BG-6-28	17	1
BG-6-53	10	1
BG-6-58	6	0
BG-6-75	5.9	0
BG-6-87	6.2	0
BG-6-98	5.9	0
BG-6-114	5.9	0
BG-1-127	5.9	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Antimony.wst
Full Precision	OFF
Confidence Coefficient	0.95

All

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	2	49	96.08%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	49	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	51	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	51	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	51	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL/2)	N/A	N/A	
Lilliefors (Normal ROS Estimates)	N/A	N/A	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A	
Anderson-Darling (NDs = DL/2)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A	
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A	
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A	

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Antimony.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All

General Statistics

Number of Valid Data	51	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	49
		Percent Non-Detects	96.08%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.58	Minimum Detected	-0.545
Maximum Detected	1.3	Maximum Detected	0.262
Mean of Detected	0.94	Mean of Detected	-0.141
SD of Detected	0.509	SD of Detected	0.571
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	51
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.687	Mean (Log Scale)	-0.518

SD	0.683	SD (Log Scale)	0.398
95% UTL 95% Coverage	2.089	95% UTL 95% Coverage	1.35
95% UPL (t)	1.843	95% UPL (t)	1.169
90% Percentile (z)	1.562	90% Percentile (z)	0.993
95% Percentile (z)	1.81	95% Percentile (z)	1.147
99% Percentile (z)	2.276	99% Percentile (z)	1.505
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		95% UTL 95% Coverage	N/A
		95% UPL (t)	N/A
		90% Percentile (z)	N/A
		95% Percentile (z)	N/A
		99% Percentile (z)	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.595
5% K-S Critical Value	N/A	SD	0.102
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0206
		95% KM UTL with 95% Coverage	0.804
Assuming Gamma Distribution		95% KM Chebyshev UPL	1.043
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.767
Mean	N/A	90% Percentile (z)	0.725
Median	N/A	95% Percentile (z)	0.762
SD	N/A	99% Percentile (z)	0.832
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Antimony.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for All

Mean	0.687
Standard Deviation	0.683
Number of data	51
Number of suspected outliers	1

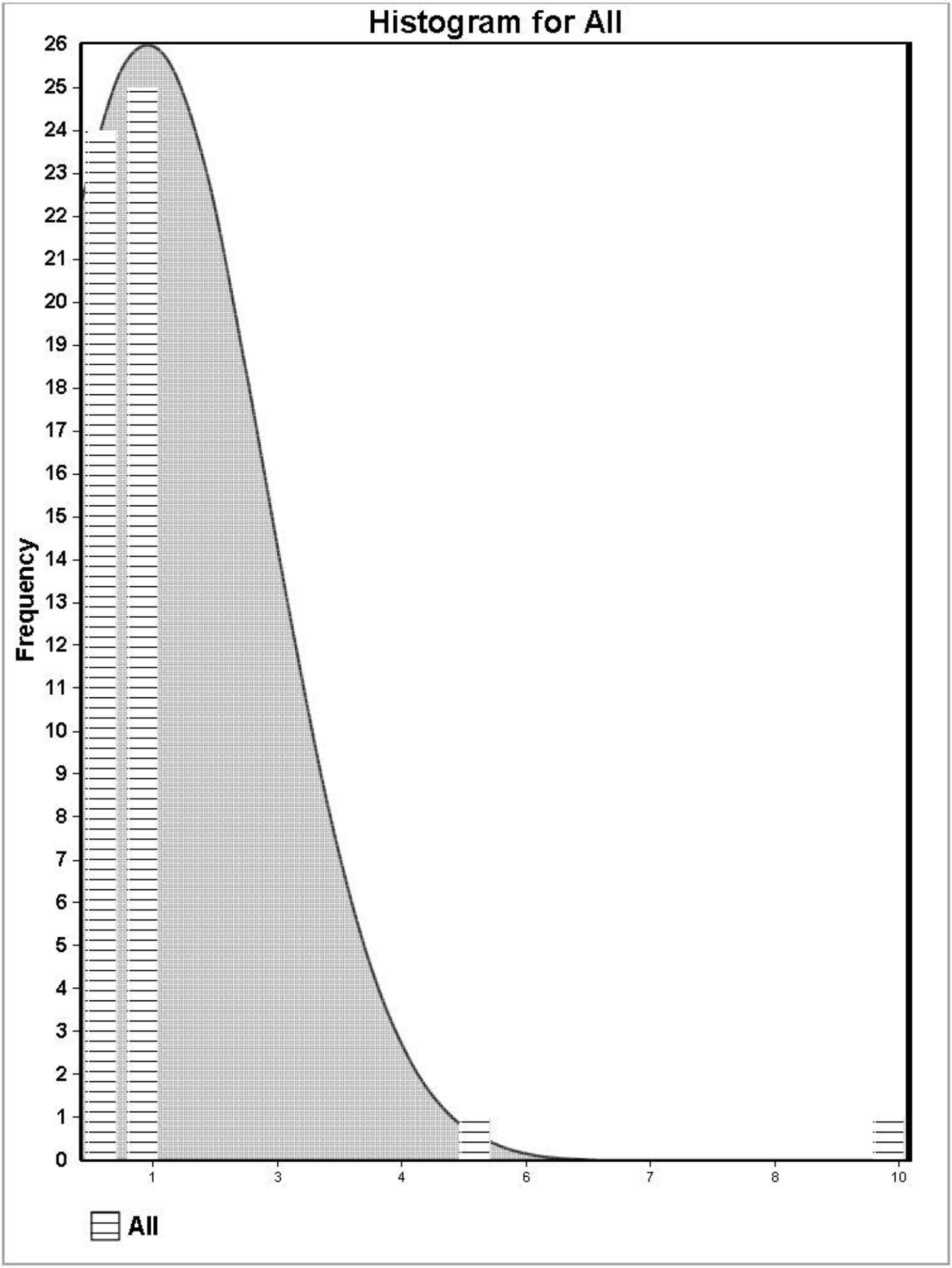
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.687	0.676	5	5	6.379	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 5 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 5 is a Potential Statistical Outlier


Histogram for All
Frequency
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1
3
4
6
7
8
10
All

Location	All	D_All
BG-1-2	1	0
BG-1-10	1	0
BG-2-2	1	0
BG-2-10	1	0
BG-2-19	10	0
BG-3-2	1	0
BG-3-10	1.1	0
BG-3-17	1	0
BG-4-2	1	0
BG-4-10	1.1	0
BG-4-19	1.2	0
BG-6-2	1	0
BG-6-9	1	0
BG-1-29	1	0
BG-1-40	1	0
BG-1-43	1	0
BG-1-46	1	0
BG-1-55	1	0
BG-1-78	1	0
BG-1-92	1	0
BG-2-21	1	0
BG-2-30	1	0
BG-2-32	1	0
BG-2-75	1	0
BG-2-81	5	0
BG-3-22	1	0
BG-3-29	1	0
BG-3-63	1.2	0
BG-3-65	0.58	1
BG-3-69	1.1	0
BG-3-95	1.1	0
BG-3-105	1.2	0
BG-3-131	1.1	0
BG-3-136	1.2	0
BG-4-40	1.2	0
BG-4-65	1	0
BG-4-79	1.2	0
BG-4-82	1.2	0
BG-4-95	1.2	0
BG-4-117	1.3	1
BG-4-120	1.2	0
BG-4-161	1.2	0
BG-4-163	1.2	0
BG-6-28	1.2	0
BG-6-53	1.2	0
BG-6-58	1.2	0
BG-6-75	1.2	0
BG-6-87	1.2	0
BG-6-98	1.2	0
BG-6-114	1.2	0
BG-6-127	1.2	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Antimony.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	0	13	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 0-20 was not processed!

>20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	38	0	38	2	36	94.74%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	36	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	38	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	38	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	38	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Shapiro-Wilks (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	
Shapiro-Wilks (NDs = DL/2)	N/A	N/A	
Lilliefors (NDs = DL/2)	N/A	N/A	
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A	
Lilliefors (Normal ROS Estimates)	N/A	N/A	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

			Anderson-Darling (Detects Only)	N/A	N/A						
			Kolmogorov-Smirnov (Detects Only)	N/A	N/A						
			Anderson-Darling (NDs = DL)	N/A	N/A						
			Kolmogorov-Smirnov (NDs = DL)	N/A	N/A						
			Anderson-Darling (NDs = DL/2)	N/A	N/A						
			Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A						
			Anderson-Darling (Gamma ROS Estimates)	N/A	N/A						
			Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A						
Note: Substitution methods such as DL or DL/2 are not recommended.											

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Antimony.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Number of Valid Data	13	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	13

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 0-20 was not processed!

>20

General Statistics

Number of Valid Data	38	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	36
		Percent Non-Detects	94.74%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.58	Minimum Detected	-0.545
Maximum Detected	1.3	Maximum Detected	0.262
Mean of Detected	0.94	Mean of Detected	-0.141
SD of Detected	0.509	SD of Detected	0.571
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	5	Maximum Non-Detect	1.609

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	38
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.627	Mean (Log Scale)	-0.528
SD	0.338	SD (Log Scale)	0.29
95% UTL 95% Coverage	1.347	95% UTL 95% Coverage	1.095
95% UPL (t)	1.204	95% UPL (t)	0.968
90% Percentile (z)	1.06	90% Percentile (z)	0.855
95% Percentile (z)	1.183	95% Percentile (z)	0.95
99% Percentile (z)	1.413	99% Percentile (z)	1.158
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		95% UTL 95% Coverage	N/A
		95% UPL (t)	N/A
		90% Percentile (z)	N/A
		95% Percentile (z)	N/A
		99% Percentile (z)	N/A
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.599
5% K-S Critical Value	N/A	SD	0.117
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0271
		95% KM UTL with 95% Coverage	0.848
Assuming Gamma Distribution		95% KM Chebyshev UPL	1.115
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.799
Mean	N/A	90% Percentile (z)	0.749
Median	N/A	95% Percentile (z)	0.792
SD	N/A	99% Percentile (z)	0.871
k star	N/A		
Theta star	N/A	**Gamma ROS Limits with Extrapolated Data**	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A

				90% Percentile	N/A	95% HW Approx. Gamma UTL with				95% Coverage	N/A
				95% Percentile	N/A						
				99% Percentile	N/A						
Note: DL/2 is not a recommended method.											

Outlier Tests for Selected Variables

User Selected Options	
From File	Antimony.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.989

For 10% significance level, 5 is an outlier.
For 5% significance level, 5 is an outlier.
For 1% significance level, 5 is an outlier.

2. Data Value 0.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.000

For 10% significance level, 0.5 is not an outlier.
For 5% significance level, 0.5 is not an outlier.
For 1% significance level, 0.5 is not an outlier.

Rosner's Outlier Test for >20

Mean	0.627
Standard Deviation	0.338
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.627	0.333	2.5	12	5.62	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 2.5 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 2.5 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Antimony.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Data	38	13
Number of Non-Detect Data	36	13
Number of Detect Data	2	0
Minimum Non-Detect	1	1
Maximum Non-Detect	5	10
Percent Non detects	94.74%	100.00%
Minimum Detected	0.58	N/A
Maximum Detected	1.3	N/A
Mean of Detected Data	0.94	N/A
Median of Detected Data	0.94	N/A
SD of Detected Data	0.509	N/A

Site vs Background Gehan Test

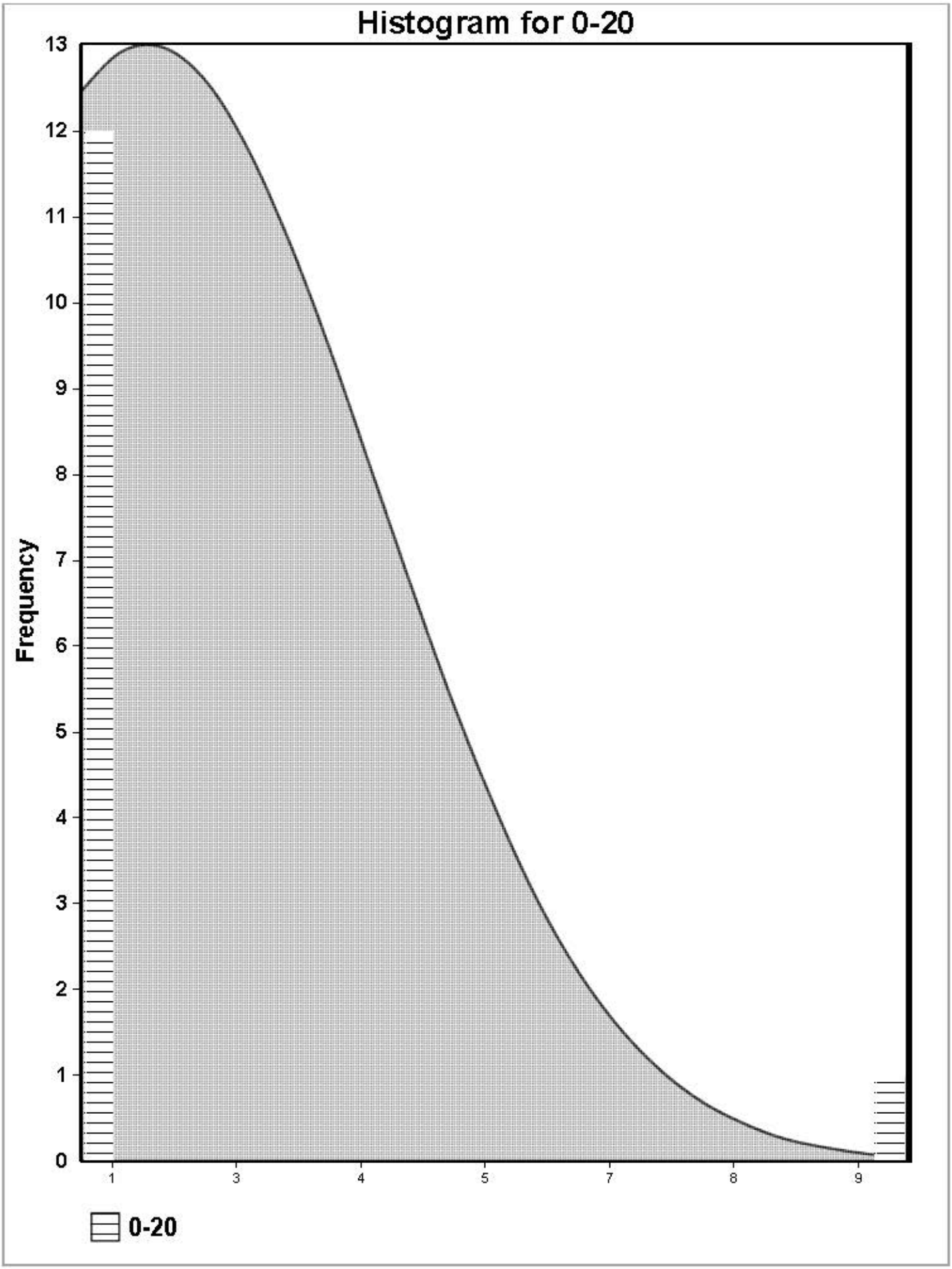
H0: Mu of Site or AOC = Mu of background

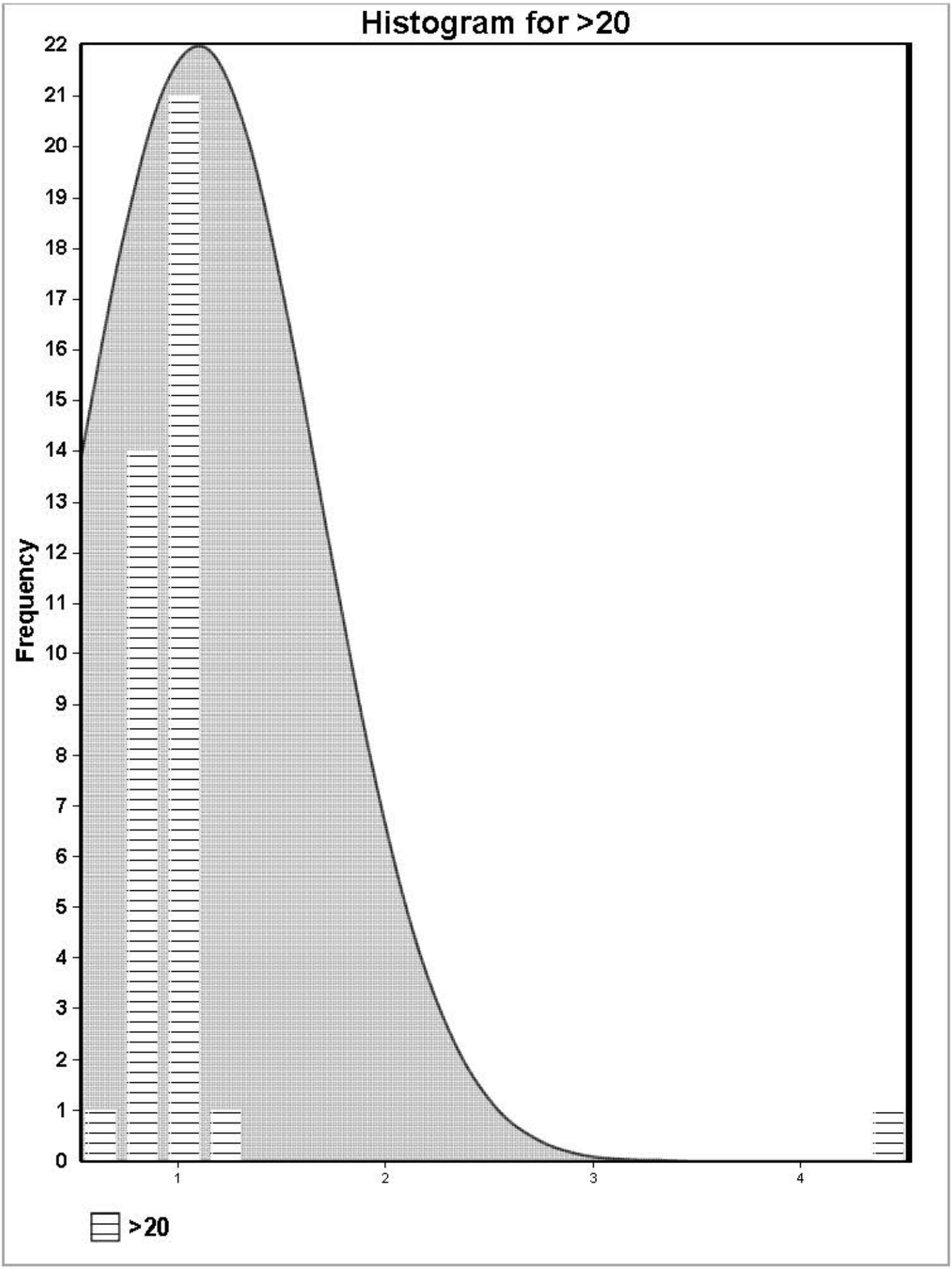
Gehan z Test Value	0.562
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.574

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for 0-20
Frequency
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1
3
4
5
7
8
9
0-20


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
1
2
3
4
>20

Location	0-20	D_0-20
BG-1-2	1	0
BG-1-10	1	0
BG-2-2	1	0
BG-2-10	1	0
BG-2-19	10	0
BG-3-2	1	0
BG-3-10	1.1	0
BG-3-17	1	0
BG-4-2	1	0
BG-4-10	1.1	0
BG-4-19	1.2	0
BG-6-2	1	0
BG-6-9	1	0

Location	>20	D_>20
BG-1-29	1	0
BG-1-40	1	0
BG-1-43	1	0
BG-1-46	1	0
BG-1-55	1	0
BG-1-78	1	0
BG-1-92	1	0
BG-2-21	1	0
BG-2-30	1	0
BG-2-32	1	0
BG-2-75	1	0
BG-2-81	5	0
BG-3-22	1	0
BG-3-29	1	0
BG-3-63	1.2	0
BG-3-65	0.58	1
BG-3-69	1.1	0
BG-3-95	1.1	0
BG-3-105	1.2	0
BG-3-131	1.1	0
BG-3-136	1.2	0
BG-4-40	1.2	0
BG-4-65	1	0
BG-4-79	1.2	0
BG-4-82	1.2	0
BG-4-95	1.2	0
BG-4-117	1.3	1
BG-4-120	1.2	0
BG-4-161	1.2	0
BG-4-163	1.2	0
BG-6-28	1.2	0
BG-6-53	1.2	0
BG-6-58	1.2	0
BG-6-75	1.2	0
BG-6-87	1.2	0
BG-6-98	1.2	0
BG-6-114	1.2	0
BG-6-127	1.2	0

Location	All	D_All
BG-1-2	1	0
BG-1-10	1	0
BG-2-2	1	0
BG-2-10	1	0
BG-2-19	10	0
BG-3-2	1	0
BG-3-10	1.1	0
BG-3-17	1	0
BG-4-2	1	0
BG-4-10	1.1	0
BG-4-19	1.2	0
BG-6-2	1	0
BG-6-9	1	0
BG-1-29	1	0
BG-1-40	1	0
BG-1-43	1	0
BG-1-46	1	0
BG-1-55	1	0
BG-1-78	1	0
BG-1-92	1	0
BG-2-21	1	0
BG-2-30	1	0
BG-2-32	1	0
BG-2-75	1	0
BG-2-81	5	0
BG-3-22	1	0
BG-3-29	1	0
BG-3-63	1.2	0
BG-3-65	0.58	1
BG-3-69	1.1	0
BG-3-95	1.1	0
BG-3-105	1.2	0
BG-3-131	1.1	0
BG-3-136	1.2	0
BG-4-40	1.2	0
BG-4-65	1	0
BG-4-79	1.2	0
BG-4-82	1.2	0
BG-4-95	1.2	0
BG-4-117	1.3	1
BG-4-120	1.2	0
BG-4-161	1.2	0
BG-4-163	1.2	0
BG-6-28	1.2	0
BG-6-53	1.2	0
BG-6-58	1.2	0
BG-6-75	1.2	0
BG-6-87	1.2	0
BG-6-98	1.2	0
BG-6-114	1.2	0
BG-6-127	1.2	0
Average	1.336863	

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Antimony.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	0	18	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Clay was not processed!

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	2	31	93.94%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	31	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	33	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	33	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	33	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Shapiro-Wilks (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	
Shapiro-Wilks (NDs = DL/2)	N/A	N/A	
Lilliefors (NDs = DL/2)	N/A	N/A	
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A	
Lilliefors (Normal ROS Estimates)	N/A	N/A	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

			Anderson-Darling (Detects Only)	N/A	N/A						
			Kolmogorov-Smirnov (Detects Only)	N/A	N/A						
			Anderson-Darling (NDs = DL)	N/A	N/A						
			Kolmogorov-Smirnov (NDs = DL)	N/A	N/A						
			Anderson-Darling (NDs = DL/2)	N/A	N/A						
			Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A						
			Anderson-Darling (Gamma ROS Estimates)	N/A	N/A						
			Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A						
Note: Substitution methods such as DL or DL/2 are not recommended.											

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Antimony.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Number of Valid Data	18	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	18

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Clay was not processed!

Non-Clay

General Statistics

Number of Valid Data	33	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	31
		Percent Non-Detects	93.94%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.58	Minimum Detected	-0.545
Maximum Detected	1.3	Maximum Detected	0.262
Mean of Detected	0.94	Mean of Detected	-0.141
SD of Detected	0.509	SD of Detected	0.571
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	33
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.702	Mean (Log Scale)	-0.518
SD	0.784	SD (Log Scale)	0.419
95% UTL 95% Coverage	2.408	95% UTL 95% Coverage	1.484
95% UPL (t)	2.05	95% UPL (t)	1.225
90% Percentile (z)	1.707	90% Percentile (z)	1.02
95% Percentile (z)	1.992	95% Percentile (z)	1.187
99% Percentile (z)	2.526	99% Percentile (z)	1.58
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		95% UTL 95% Coverage	N/A
		95% UPL (t)	N/A
		90% Percentile (z)	N/A
		95% Percentile (z)	N/A
		99% Percentile (z)	N/A
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.603
5% K-S Critical Value	N/A	SD	0.125
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0313
		95% KM UTL with 95% Coverage	0.875
Assuming Gamma Distribution		95% KM Chebyshev UPL	1.157
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.818
Mean	N/A	90% Percentile (z)	0.763
Median	N/A	95% Percentile (z)	0.809
SD	N/A	99% Percentile (z)	0.894
k star	N/A		
Theta star	N/A	**Gamma ROS Limits with Extrapolated Data**	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A

				90% Percentile	N/A	95% HW Approx. Gamma UTL with				95% Coverage	N/A
				95% Percentile	N/A						
				99% Percentile	N/A						
Note: DL/2 is not a recommended method.											

Outlier Tests for Selected Variables

User Selected Options	
From File	Antimony.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18
10% critical value: 0.424
5% critical value: 0.475
1% critical value: 0.561

1. Data Value 2.5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.950

For 10% significance level, 2.5 is an outlier.
For 5% significance level, 2.5 is an outlier.
For 1% significance level, 2.5 is an outlier.

2. Data Value 0.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.000

For 10% significance level, 0.5 is not an outlier.
For 5% significance level, 0.5 is not an outlier.
For 1% significance level, 0.5 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	0.702
Standard Deviation	0.784
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.702	0.772	5	8	5.567	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 5 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 5 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Antimony.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Data	33	18
Number of Non-Detect Data	31	18
Number of Detect Data	2	0
Minimum Non-Detect	1	1
Maximum Non-Detect	10	5
Percent Non detects	93.94%	100.00%
Minimum Detected	0.58	N/A
Maximum Detected	1.3	N/A
Mean of Detected Data	0.94	N/A
Median of Detected Data	0.94	N/A
SD of Detected Data	0.509	N/A

Site vs Background Gehan Test

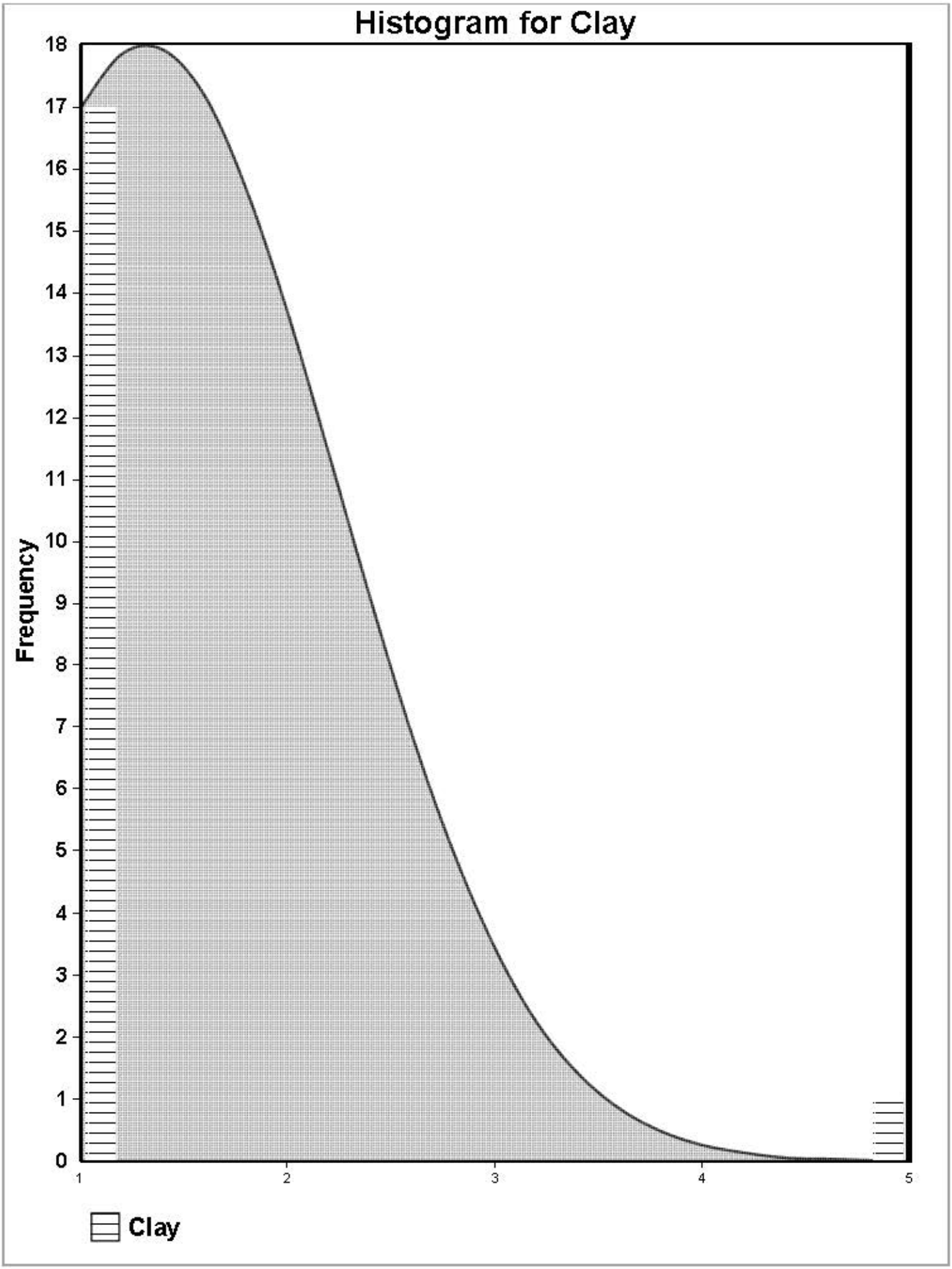
H0: Mu of Site or AOC = Mu of background

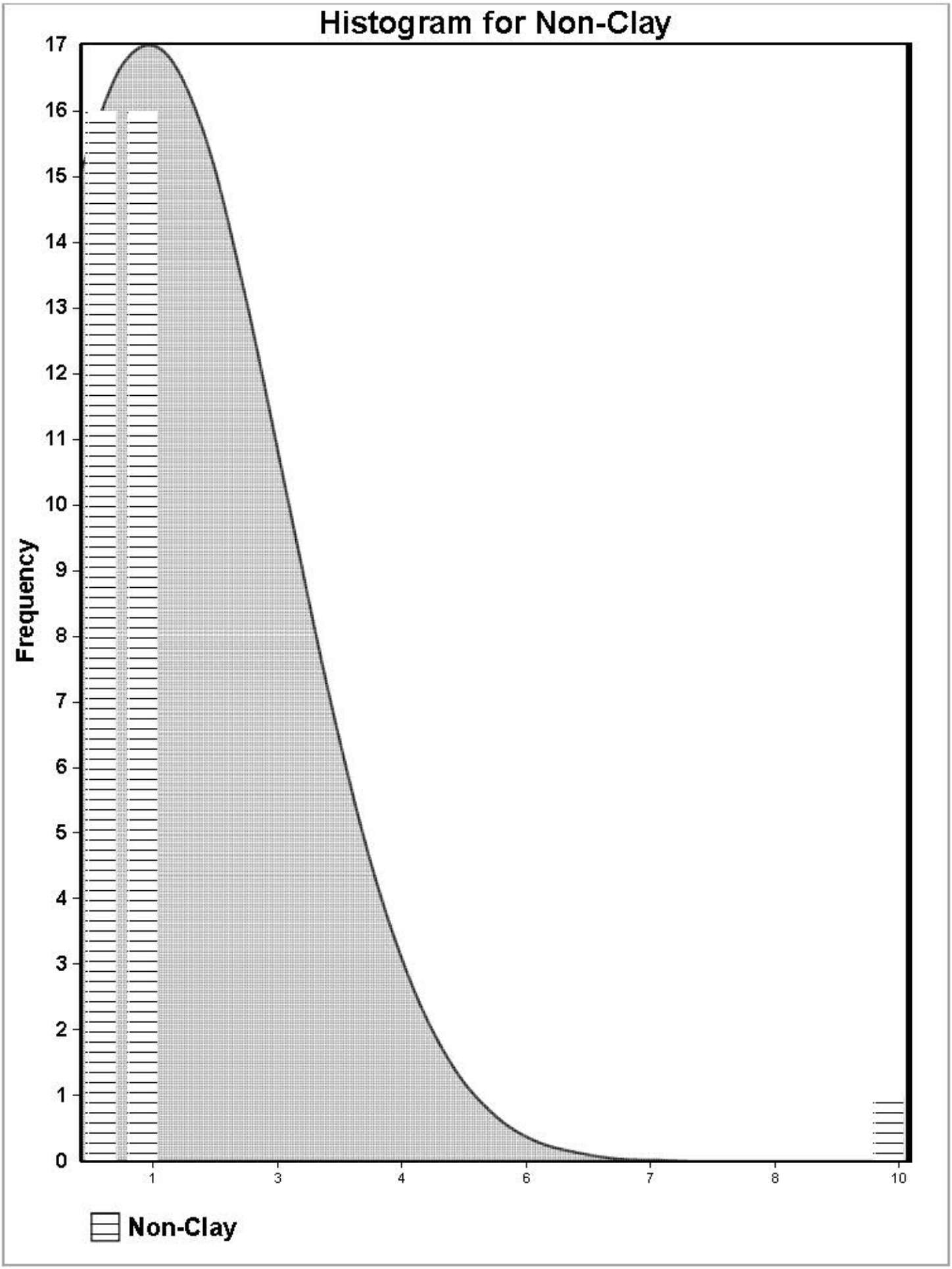
Gehan z Test Value	0.726
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.468

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
1
2
3
4
5
Clay


Histogram for Non-Clay
Frequency
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1
3
4
6
7
8
10
Non-Clay

Location	Clay	D_Clay
BG-1-2	1	0
BG-1-43	1	0
BG-1-55	1	0
BG-1-78	1	0
BG-2-30	1	0
BG-2-81	5	0
BG-3-17	1	0
BG-3-22	1	0
BG-3-69	1.1	0
BG-4-2	1	0
BG-4-19	1.2	0
BG-4-40	1.2	0
BG-4-79	1.2	0
BG-4-161	1.2	0
BG-4-163	1.2	0
BG-6-28	1.2	0
BG-6-53	1.2	0
BG-6-87	1.2	0

Location	Non-Clay	D_Non-Clay
BG-1-10	1	0
BG-1-29	1	0
BG-1-40	1	0
BG-1-46	1	0
BG-1-92	1	0
BG-2-2	1	0
BG-2-10	1	0
BG-2-19	10	0
BG-2-21	1	0
BG-2-32	1	0
BG-2-75	1	0
BG-3-2	1	0
BG-3-10	1.1	0
BG-3-29	1	0
BG-3-63	1.2	0
BG-3-65	0.58	1
BG-3-95	1.1	0
BG-3-105	1.2	0
BG-3-131	1.1	0
BG-3-136	1.2	0
BG-4-10	1.1	0
BG-4-65	1	0
BG-4-82	1.2	0
BG-4-95	1.2	0
BG-4-117	1.3	1
BG-4-120	1.2	0
BG-6-2	1	0
BG-6-9	1	0
BG-6-58	1.2	0
BG-6-75	1.2	0
BG-6-98	1.2	0
BG-6-114	1.2	0
BG-6-127	1.2	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Antimony.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	0	12	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv was not processed!

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	39	0	39	2	37	94.87%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	37	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	39	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	39	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	39	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Shapiro-Wilks (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	
Shapiro-Wilks (NDs = DL/2)	N/A	N/A	
Lilliefors (NDs = DL/2)	N/A	N/A	
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A	
Lilliefors (Normal ROS Estimates)	N/A	N/A	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

			Anderson-Darling (Detects Only)	N/A	N/A						
			Kolmogorov-Smirnov (Detects Only)	N/A	N/A						
			Anderson-Darling (NDs = DL)	N/A	N/A						
			Kolmogorov-Smirnov (NDs = DL)	N/A	N/A						
			Anderson-Darling (NDs = DL/2)	N/A	N/A						
			Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A						
			Anderson-Darling (Gamma ROS Estimates)	N/A	N/A						
			Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A						
Note: Substitution methods such as DL or DL/2 are not recommended.											

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Antimony.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Number of Valid Data	12	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	12

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv was not processed!

MC

General Statistics

Number of Valid Data	39	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	37
		Percent Non-Detects	94.87%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.58	Minimum Detected	-0.545
Maximum Detected	1.3	Maximum Detected	0.262
Mean of Detected	0.94	Mean of Detected	-0.141
SD of Detected	0.509	SD of Detected	0.571
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	5	Maximum Non-Detect	1.609

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	39
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.628	Mean (Log Scale)	-0.525
SD	0.333	SD (Log Scale)	0.285
95% UTL 95% Coverage	1.335	95% UTL 95% Coverage	1.084
95% UPL (t)	1.196	95% UPL (t)	0.963
90% Percentile (z)	1.054	90% Percentile (z)	0.853
95% Percentile (z)	1.175	95% Percentile (z)	0.946
99% Percentile (z)	1.402	99% Percentile (z)	1.148
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		95% UTL 95% Coverage	N/A
		95% UPL (t)	N/A
		90% Percentile (z)	N/A
		95% Percentile (z)	N/A
		99% Percentile (z)	N/A
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	**Nonparametric Statistics**	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.599
5% K-S Critical Value	N/A	SD	0.115
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0264
		95% KM UTL with 95% Coverage	0.844
Assuming Gamma Distribution		95% KM Chebyshev UPL	1.108
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.796
Mean	N/A	90% Percentile (z)	0.747
Median	N/A	95% Percentile (z)	0.789
SD	N/A	99% Percentile (z)	0.867
k star	N/A		
Theta star	N/A	**Gamma ROS Limits with Extrapolated Data**	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A

				90% Percentile	N/A	95% HW Approx. Gamma UTL with				95% Coverage	N/A
				95% Percentile	N/A						
				99% Percentile	N/A						
Note: DL/2 is not a recommended method.											

Outlier Tests for Selected Variables

User Selected Options	
From File	Antimony.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 5 is a Potential Outlier (Upper Tail)?

Test Statistic: 1.000

For 10% significance level, 5 is an outlier.
For 5% significance level, 5 is an outlier.
For 1% significance level, 5 is an outlier.

2. Data Value 0.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.000

For 10% significance level, 0.5 is not an outlier.
For 5% significance level, 0.5 is not an outlier.
For 1% significance level, 0.5 is not an outlier.

Rosner's Outlier Test for MC

Mean	0.628
Standard Deviation	0.333
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.628	0.329	2.5	9	5.698	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 2.5 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 2.5 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Antimony.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Data	39	12
Number of Non-Detect Data	37	12
Number of Detect Data	2	0
Minimum Non-Detect	1	1
Maximum Non-Detect	5	10
Percent Non detects	94.87%	100.00%
Minimum Detected	0.58	N/A
Maximum Detected	1.3	N/A
Mean of Detected Data	0.94	N/A
Median of Detected Data	0.94	N/A
SD of Detected Data	0.509	N/A

Site vs Background Gehan Test

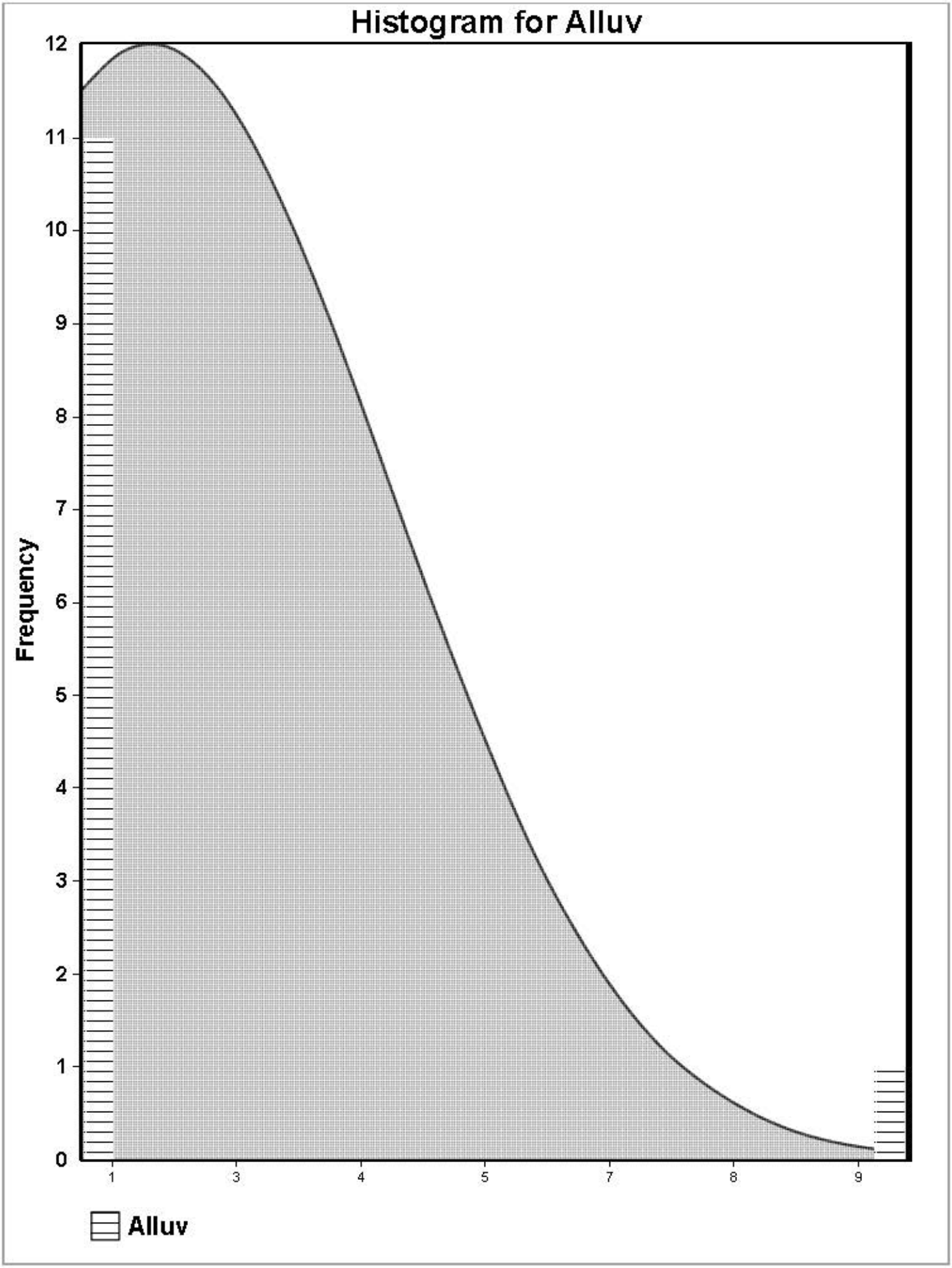
H0: Mu of Site or AOC = Mu of background

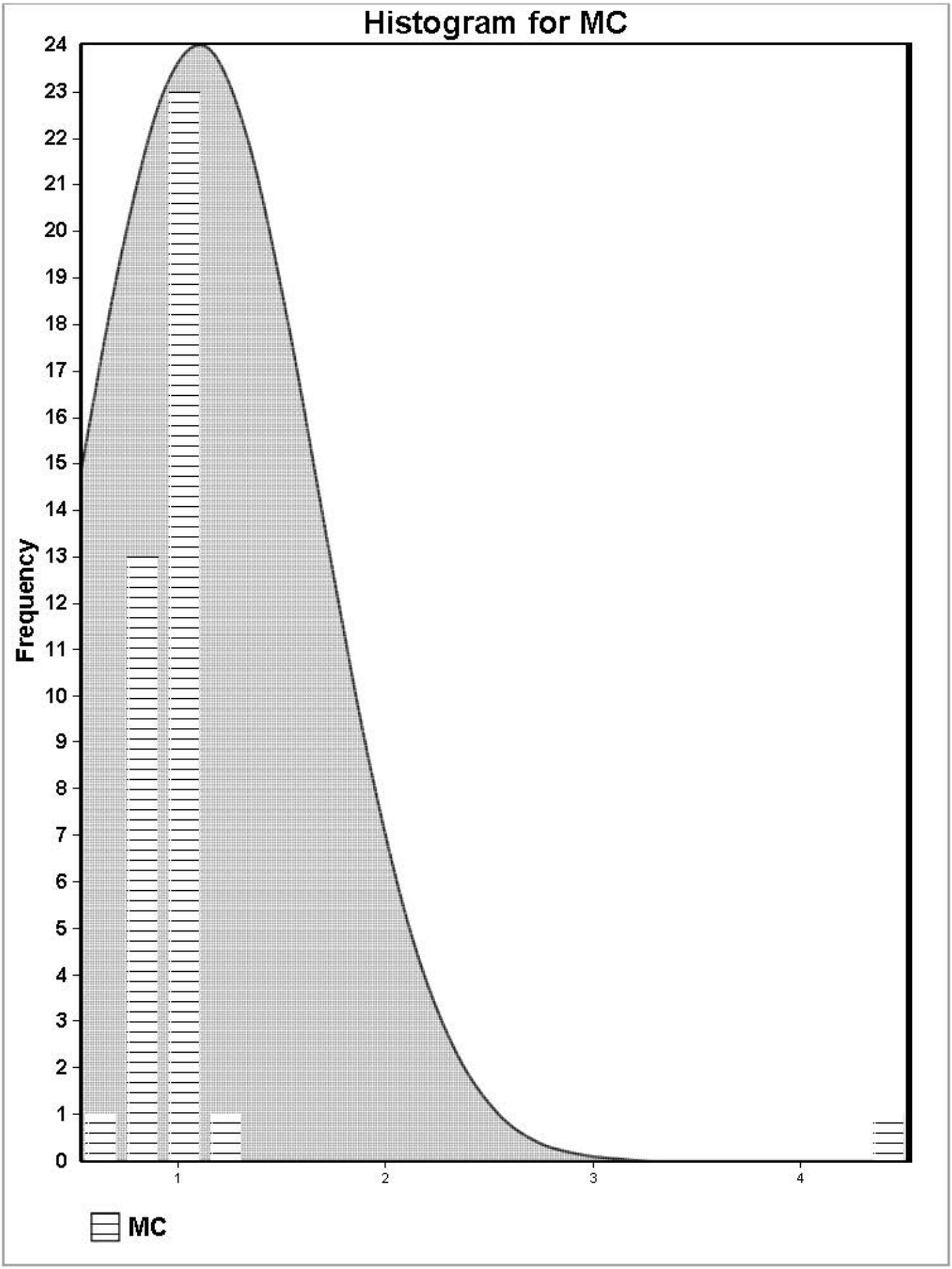
Gehan z Test Value	0.529
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.596

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
1
3
4
5
7
8
9
Alluv


Histogram for MC
Frequency
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1
2
3
4
MC

Location	Alluv	D_Alluv
BG-1-2	1	0
BG-1-10	1	0
BG-1-29	1	0
BG-1-40	1	0
BG-2-2	1	0
BG-2-10	1	0
BG-2-19	10	0
BG-2-21	1	0
BG-3-2	1	0
BG-3-10	1.1	0
BG-6-2	1	0
BG-6-9	1	0

Location	MC	D_MC
BG-1-43	1	0
BG-1-46	1	0
BG-1-55	1	0
BG-1-78	1	0
BG-1-92	1	0
BG-2-30	1	0
BG-2-32	1	0
BG-2-75	1	0
BG-2-81	5	0
BG-3-17	1	0
BG-3-22	1	0
BG-3-29	1	0
BG-3-63	1.2	0
BG-3-65	0.58	1
BG-3-69	1.1	0
BG-3-95	1.1	0
BG-3-105	1.2	0
BG-3-131	1.1	0
BG-3-136	1.2	0
BG-4-1	1	0
BG-4-10	1.1	0
BG-4-19	1.2	0
BG-4-40	1.2	0
BG-4-65	1	0
BG-4-79	1.2	0
BG-4-82	1.2	0
BG-4-95	1.2	0
BG-4-117	1.3	1
BG-4-120	1.2	0
BG-4-161	1.2	0
BG-4-163	1.2	0
BG-6-28	1.2	0
BG-6-53	1.2	0
BG-6-58	1.2	0
BG-6-75	1.2	0
BG-6-87	1.2	0
BG-6-98	1.2	0
BG-6-114	1.2	0
BG-1-127	1.2	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Arsenic.wst
Full Precision	OFF
Confidence Coefficient	0.95

All

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	50	1	1.96%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	50	0.97	140	18.36	12	23.12
Statistics (All: NDs treated as DL value)	51	0.97	140	18.02	12	23.01
Statistics (All: NDs treated as DL/2 value)	51	0.5	140	18.01	12	23.02
Statistics (Normal ROS Estimated Data)	51	-22.12	140	17.57	12	23.57
Statistics (Gamma ROS Estimated Data)	51	1.000E-12	140	18	12	23.03
Statistics (Lognormal ROS Estimated Data)	51	0.97	140	18.03	12	23.01

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.194	1.137	15.38	2.436	0.986	0.405
Statistics (NDs = DL)	1.131	1.078	15.93	2.388	1.034	0.433
Statistics (NDs = DL/2)	1.106	1.054	16.29	2.375	1.07	0.451
Statistics (Gamma ROS Estimates)	0.593	0.571	30.36	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.393	1.024	0.428

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.767	0.769	0.769	0.795

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.621	0.947	Data Not Normal
Lilliefors (Detects Only)	0.292	0.125	Data Not Normal
Lilliefors (NDs = DL)	0.289	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.289	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.282	0.124	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.93	0.933	0.934	0.961

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.235	0.775	
Kolmogorov-Smirnov (Detects Only)	0.164	0.128	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	1.133	0.777	
Kolmogorov-Smirnov (NDs = DL)	0.158	0.127	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.097	0.777	
Kolmogorov-Smirnov (NDs = DL/2)	0.157	0.128	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.33	0.807	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.231	0.131	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.984	0.982	0.979	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.973	0.947	Data Appear Lognormal
Lilliefors (Detects Only)	0.105	0.125	Data Appear Lognormal
Lilliefors (NDs = DL)	0.109	0.124	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.12	0.124	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.105	0.124	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Arsenic.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All

General Statistics

Number of Valid Data	51	Number of Detected Data	50
Number of Distinct Detected Data	38	Number of Non-Detect Data	1
		Percent Non-Detects	1.96%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.97	Minimum Detected	-0.0305
Maximum Detected	140	Maximum Detected	4.942
Mean of Detected	18.36	Mean of Detected	2.436
SD of Detected	23.12	SD of Detected	0.986
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.621	Shapiro Wilk Test Statistic	0.973
5% Shapiro Wilk Critical Value	0.947	5% Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	18.01	Mean (Log Scale)	2.375
SD	23.02	SD (Log Scale)	1.07
95% UTL 95% Coverage	65.29	95% UTL 95% Coverage	96.77
95% UPL (t)	56.97	95% UPL (t)	65.73
90% Percentile (z)	47.51	90% Percentile (z)	42.36
95% Percentile (z)	55.87	95% Percentile (z)	62.48
99% Percentile (z)	71.56	99% Percentile (z)	129.5
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	17.48	Mean in Original Scale	18.03
SD	23.45	SD in Original Scale	23.01
95% UTL with 95% Coverage	65.64	95% UTL with 95% Coverage	89.67
		95% BCA UTL with 95% Coverage	104
		95% Bootstrap (%) UTL with 95% Coverage	104
95% UPL (t)	57.16	95% UPL (t)	61.93
90% Percentile (z)	47.53	90% Percentile (z)	40.66
95% Percentile (z)	56.05	95% Percentile (z)	58.99
99% Percentile (z)	72.03	99% Percentile (z)	118.6

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.136	Data appear Lognormal at 5% Significance Level	
Theta Star	16.17		
nu star	113.6		
A-D Test Statistic	1.235	Nonparametric Statistics	
5% A-D Critical Value	0.775	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.164	Mean	18.02
5% K-S Critical Value	0.128	SD	22.79
Data not Gamma Distributed at 5% Significance Level		SE of Mean	3.223
		95% KM UTL with 95% Coverage	64.81
Assuming Gamma Distribution		95% KM Chebyshev UPL	118.3
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	56.58
Mean	18	90% Percentile (z)	47.22
Median	12	95% Percentile (z)	55.5
SD	23.03	99% Percentile (z)	71.03
k star	0.571		
Theta star	31.52	Gamma ROS Limits with Extrapolated Data	
Nu star	58.26	95% Wilson Hilferty (WH) Approx. Gamma UPL	53.82
95% Percentile of Chisquare (2k)	4.184	95% Hawkins Wixley (HW) Approx. Gamma UPL	58.31
		95% WH Approx. Gamma UTL with 95% Coverage	68.17
90% Percentile	47.33	95% HW Approx. Gamma UTL with 95% Coverage	76.46
95% Percentile	65.93		
99% Percentile	111.1		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Arsenic.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for All

Mean	18.01
Standard Deviation	23.02
Number of data	51
Number of suspected outliers	1

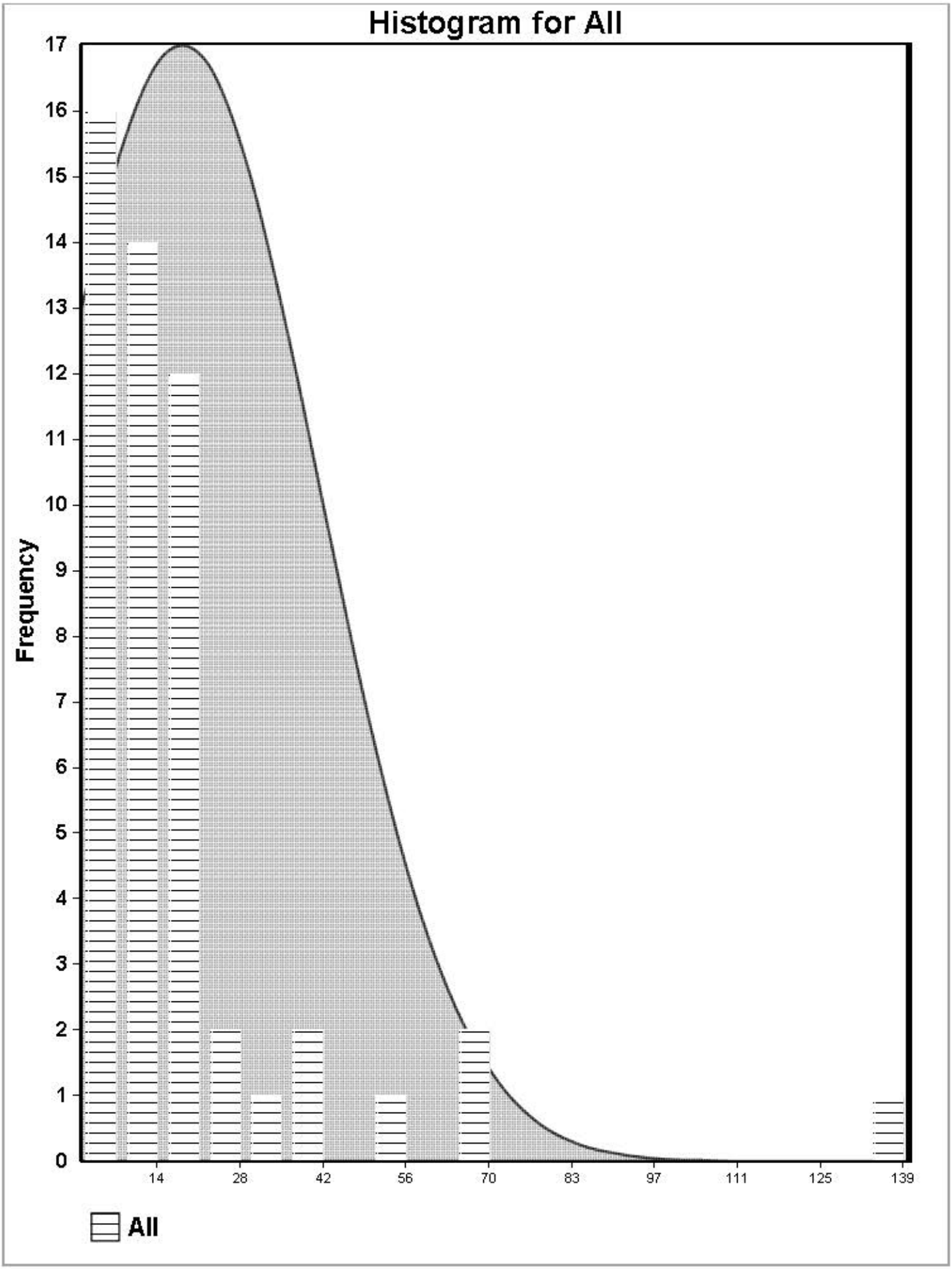
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	18.01	22.79	140	21	5.352	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 140 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 140 is a Potential Statistical Outlier


Histogram for All
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
14
28
42
56
70
83
97
111
125
139
All

Location	All	D_All
BG-1-2	3.6	1
BG-1-10	1	1
BG-2-2	6.5	1
BG-2-10	6	1
BG-2-19	56	1
BG-3-2	20	1
BG-3-10	40	1
BG-3-17	15	1
BG-4-2	12	1
BG-4-10	15	1
BG-4-19	24	1
BG-6-2	9.3	1
BG-6-9	6.1	1
BG-1-29	1	0
BG-1-40	0.97	1
BG-1-43	9.1	1
BG-1-46	1.8	1
BG-1-55	4	1
BG-1-78	2.6	1
BG-1-92	3.4	1
BG-2-21	140	1
BG-2-30	10	1
BG-2-32	8.9	1
BG-2-75	68	1
BG-2-81	6.7	1
BG-3-22	8.5	1
BG-3-29	12	1
BG-3-63	15	1
BG-3-65	27	1
BG-3-69	41	1
BG-3-95	13	1
BG-3-105	35	1
BG-3-131	9.1	1
BG-3-136	66	1
BG-4-40	12	1
BG-4-65	6.7	1
BG-4-79	18	1
BG-4-82	17	1
BG-4-95	6.4	1
BG-4-117	5.7	1
BG-4-120	19	1
BG-4-161	11	1
BG-4-163	16	1
BG-6-28	16	1
BG-6-53	13	1
BG-6-58	6.3	1
BG-6-75	8.4	1
BG-6-87	16	1
BG-6-98	13	1
BG-6-114	17	1
BG-6-127	20	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Arsenic.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	13	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	13	1	56	16.5	12	15.77

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.287	1.041	12.82	2.367	1.06	0.448

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.903	0.903	0.903	0.903

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.823	0.866	Data Not Normal
Lilliefors (Full: no NDs)	0.23	0.246	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.991	0.991	0.991	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.194	0.753	
Kolmogorov-Smirnov (Full: no NDs)	0.116	0.242	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.979	0.979	0.979	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.968	0.866	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.14	0.246	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

>20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	38	0	38	37	1	2.63%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	37	0.97	140	19.02	12	25.35

Statistics (All: NDs treated as DL value)	38	0.97	140	18.54	12	25.18
Statistics (All: NDs treated as DL/2 value)	38	0.5	140	18.53	12	25.19
Statistics (Normal ROS Estimated Data)	38	-22.36	140	17.93	12	25.89
Statistics (Gamma ROS Estimated Data)	38	1.000E-12	140	18.52	12	25.2
Statistics (Lognormal ROS Estimated Data)	38	0.97	140	18.55	12	25.17

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.17	1.095	16.25	2.461	0.973	0.395
Statistics (NDs = DL)	1.09	1.022	17.01	2.396	1.039	0.434
Statistics (NDs = DL/2)	1.058	0.992	17.5	2.378	1.087	0.457
Statistics (Gamma ROS Estimates)	0.507	0.485	36.51	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.405	1.018	0.423

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.744	0.745	0.746	0.778

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.583	0.936	Data Not Normal
Lilliefors (Detects Only)	0.322	0.146	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.585	0.938	Data Not Normal
Lilliefors (NDs = DL)	0.319	0.144	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.587	0.938	Data Not Normal
Lilliefors (NDs = DL/2)	0.319	0.144	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.646	0.938	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.31	0.144	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.915	0.919	0.921	0.957

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.327	0.773	
Kolmogorov-Smirnov (Detects Only)	0.195	0.149	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	1.188	0.775	
Kolmogorov-Smirnov (NDs = DL)	0.186	0.147	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.152	0.776	
Kolmogorov-Smirnov (NDs = DL/2)	0.185	0.147	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.429	0.812	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.26	0.151	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.98	0.979	0.973	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.973	0.936	Data Appear Lognormal
Lilliefors (Detects Only)	0.129	0.146	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.963	0.938	Data Appear Lognormal
Lilliefors (NDs = DL)	0.124	0.144	Data Appear Lognormal

Shapiro-Wilks (NDs = DL/2)	0.959	0.938	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.127	0.144	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.971	0.938	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.123	0.144	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Arsenic.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	12

Raw Statistics		Log-Transformed Statistics	
Minimum	1	Minimum	0
Maximum	56	Maximum	4.025
Second Largest	40	Second Largest	3.689
First Quartile	6.1	First Quartile	1.808
Median	12	Median	2.485
Third Quartile	20	Third Quartile	2.996
Mean	16.5	Mean	2.367
SD	15.77	SD	1.06
Coefficient of Variation	0.955		
Skewness	1.645		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.823	Shapiro Wilk Test Statistic	0.968
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	58.61	95% UTL with 95% Coverage	181
95% UPL (t)	45.66	95% UPL (t)	75.78
90% Percentile (z)	36.7	90% Percentile (z)	41.5
95% Percentile (z)	42.43	95% Percentile (z)	61
99% Percentile (z)	53.18	99% Percentile (z)	125.6

Gamma Distribution Test		Data Distribution Test
k star	1.041	Data appear Gamma Distributed at 5% Significance Level
Theta Star	15.84	
MLE of Mean	16.5	
MLE of Standard Deviation	16.17	
nu star	27.08	
A-D Test Statistic	0.194	Nonparametric Statistics
5% A-D Critical Value	0.753	90% Percentile 36.8
K-S Test Statistic	0.116	95% Percentile 46.4
5% K-S Critical Value	0.242	99% Percentile 54.08
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	56
90% Percentile	37.61	95% Percentile Bootstrap UTL with 95% Coverage	56
95% Percentile	48.73	95% BCA Bootstrap UTL with 95% Coverage	56
99% Percentile	74.45	95% UPL	56
		95% Chebyshev UPL	87.81
95% WH Approx. Gamma UPL	52.62	Upper Threshold Limit Based upon IQR	40.85
95% HW Approx. Gamma UPL	55.58		
95% WH Approx. Gamma UTL with 95% Coverage	84		
95% HW Approx. Gamma UTL with 95% Coverage	94.18		

>20

General Statistics			
Number of Valid Data	38	Number of Detected Data	37
Number of Distinct Detected Data	29	Number of Non-Detect Data	1
		Percent Non-Detects	2.63%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.97	Minimum Detected	-0.0305
Maximum Detected	140	Maximum Detected	4.942
Mean of Detected	19.02	Mean of Detected	2.461
SD of Detected	25.35	SD of Detected	0.973
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.583	Shapiro Wilk Test Statistic	0.973
5% Shapiro Wilk Critical Value	0.936	5% Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	18.53	Mean (Log Scale)	2.378
SD	25.19	SD (Log Scale)	1.087
95% UTL 95% Coverage	72.23	95% UTL 95% Coverage	109.5
95% UPL (t)	61.58	95% UPL (t)	69.14
90% Percentile (z)	50.81	90% Percentile (z)	43.43
95% Percentile (z)	59.96	95% Percentile (z)	64.48
99% Percentile (z)	77.12	99% Percentile (z)	135.3
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	17.72	Mean in Original Scale	18.55
SD	25.82	SD in Original Scale	25.17
95% UTL with 95% Coverage	72.77	95% UTL with 95% Coverage	97.14
		95% BCA UTL with 95% Coverage	140
		95% Bootstrap (%) UTL with 95% Coverage	140
95% UPL (t)	61.85	95% UPL (t)	63.15
90% Percentile (z)	50.81	90% Percentile (z)	40.86
95% Percentile (z)	60.19	95% Percentile (z)	59.15

99% Percentile (z)	77.79	99% Percentile (z)	118.4
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.093	Data appear Lognormal at 5% Significance Level	
Theta Star	17.39		
nu star	80.89		
A-D Test Statistic	1.327	Nonparametric Statistics	
5% A-D Critical Value	0.773	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.195	Mean	18.54
5% K-S Critical Value	0.149	SD	24.84
Data not Gamma Distributed at 5% Significance Level		SE of Mean	4.086
		95% KM UTL with 95% Coverage	71.51
Assuming Gamma Distribution		95% KM Chebyshev UPL	128.2
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	61
Mean	18.52	90% Percentile (z)	50.38
Median	12	95% Percentile (z)	59.41
SD	25.2	99% Percentile (z)	76.34
k star	0.485		
Theta star	38.21	Gamma ROS Limits with Extrapolated Data	
Nu star	36.83	95% Wilson Hilferty (WH) Approx. Gamma UPL	57.29
95% Percentile of Chisquare (2k)	3.765	95% Hawkins Wixley (HW) Approx. Gamma UPL	62.88
		95% WH Approx. Gamma UTL with 95% Coverage	75.84
90% Percentile	50.42	95% HW Approx. Gamma UTL with 95% Coverage	87
95% Percentile	71.92		
99% Percentile	125		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Arsenic.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13

10% critical value: 0.467

5% critical value: 0.521

1% critical value: 0.615

1. Data Value 56 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.611

For 10% significance level, 56 is an outlier.

For 5% significance level, 56 is an outlier.

For 1% significance level, 56 is not an outlier.

2. Data Value 1 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.128

For 10% significance level, 1 is not an outlier.

For 5% significance level, 1 is not an outlier.

For 1% significance level, 1 is not an outlier.

Rosner's Outlier Test for >20

Mean	18.53
Standard Deviation	25.19
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	18.53	24.85	140	8	4.888	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 140 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 140 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Arsenic.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Data	38	13
Number of Non-Detect Data	1	0
Number of Detect Data	37	13
Minimum Non-Detect	1	N/A
Maximum Non-Detect	1	N/A
Percent Non detects	2.63%	0.00%
Minimum Detected	0.97	1
Maximum Detected	140	56
Mean of Detected Data	19.02	16.5
Median of Detected Data	12	12
SD of Detected Data	25.35	15.77

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

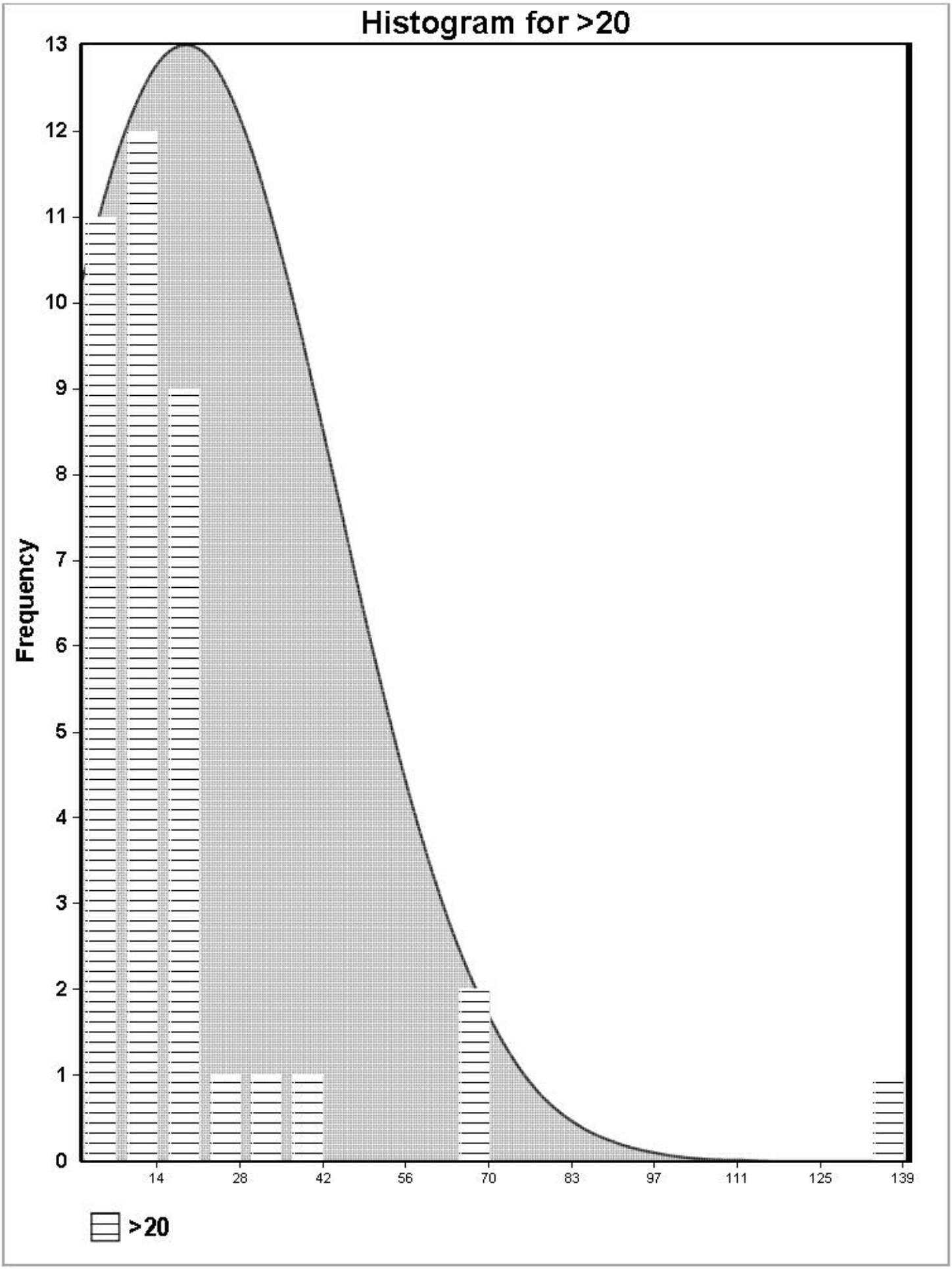
H0: Mean/Median of Site or AOC = Mean/Median of Background

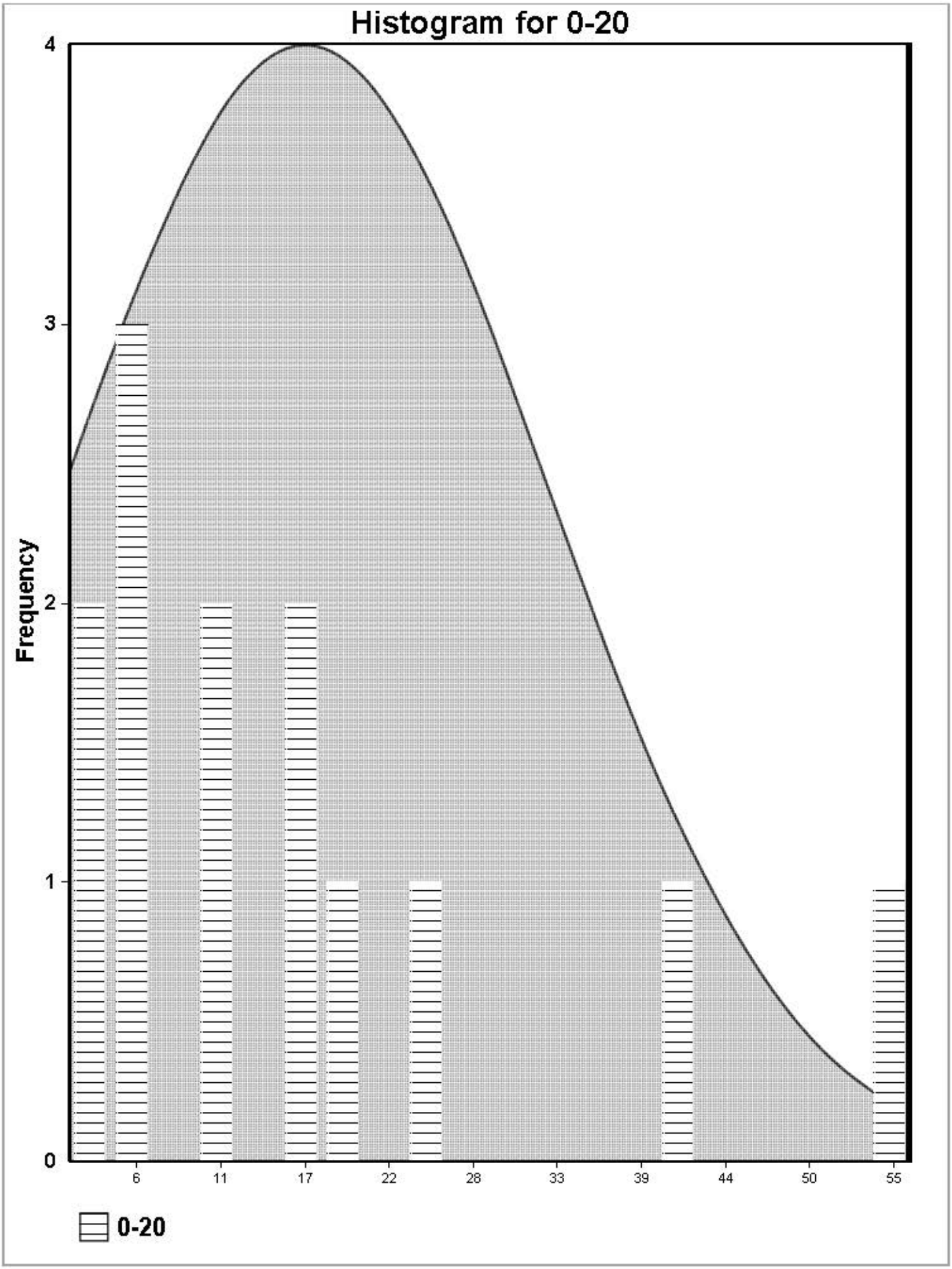
Site Rank Sum W-Stat	991.5
WMW Test U-Stat	0.0648
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.948

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
28
42
56
70
83
97
111
125
139
>20


Histogram for 0-20
Frequency
0
1
2
3
4
6
11
17
22
28
33
39
44
50
55
0-20

Location	0-20	D_0-20
BG-1-2	3.6	1
BG-1-10	1	1
BG-2-2	6.5	1
BG-2-10	6	1
BG-2-19	56	1
BG-3-2	20	1
BG-3-10	40	1
BG-3-17	15	1
BG-4-2	12	1
BG-4-10	15	1
BG-4-19	24	1
BG-6-2	9.3	1
BG-6-9	6.1	1

Location	>20	D_>20
BG-1-29	1	0
BG-1-40	0.97	1
BG-1-43	9.1	1
BG-1-46	1.8	1
BG-1-55	4	1
BG-1-78	2.6	1
BG-1-92	3.4	1
BG-2-21	140	1
BG-2-30	10	1
BG-2-32	8.9	1
BG-2-75	68	1
BG-2-81	6.7	1
BG-3-22	8.5	1
BG-3-29	12	1
BG-3-63	15	1
BG-3-65	27	1
BG-3-69	41	1
BG-3-95	13	1
BG-3-105	35	1
BG-3-131	9.1	1
BG-3-136	66	1
BG-4-40	12	1
BG-4-65	6.7	1
BG-4-79	18	1
BG-4-82	17	1
BG-4-95	6.4	1
BG-4-117	5.7	1
BG-4-120	19	1
BG-4-161	11	1
BG-4-163	16	1
BG-6-28	16	1
BG-6-53	13	1
BG-6-58	6.3	1
BG-6-75	8.4	1
BG-6-87	16	1
BG-6-98	13	1
BG-6-114	17	1
BG-6-127	20	1

Location	All	D_All
BG-1-2	3.6	1
BG-1-10	1	1
BG-2-2	6.5	1
BG-2-10	6	1
BG-2-19	56	1
BG-3-2	20	1
BG-3-10	40	1
BG-3-17	15	1
BG-4-2	12	1
BG-4-10	15	1
BG-4-19	24	1
BG-6-2	9.3	1
BG-6-9	6.1	1
BG-1-29	1	0
BG-1-40	0.97	1
BG-1-43	9.1	1
BG-1-46	1.8	1
BG-1-55	4	1
BG-1-78	2.6	1
BG-1-92	3.4	1
BG-2-21	140	1
BG-2-30	10	1
BG-2-32	8.9	1
BG-2-75	68	1
BG-2-81	6.7	1
BG-3-22	8.5	1
BG-3-29	12	1
BG-3-63	15	1
BG-3-65	27	1
BG-3-69	41	1
BG-3-95	13	1
BG-3-105	35	1
BG-3-131	9.1	1
BG-3-136	66	1
BG-4-40	12	1
BG-4-65	6.7	1
BG-4-79	18	1
BG-4-82	17	1
BG-4-95	6.4	1
BG-4-117	5.7	1
BG-4-120	19	1
BG-4-161	11	1
BG-4-163	16	1
BG-6-28	16	1
BG-6-53	13	1
BG-6-58	6.3	1
BG-6-75	8.4	1
BG-6-87	16	1
BG-6-98	13	1
BG-6-114	17	1
BG-6-127	20	1
Average	18.02098039	

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Arsenic.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	18	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	18	2.6	41	13.25	12	8.837

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	2.658	2.252	4.985	2.384	0.679	0.285

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.906	0.906	0.906	0.906

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.84	0.897	Data Not Normal
Lilliefors (Full: no NDs)	0.211	0.209	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.963	0.963	0.963	0.963

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.333	0.748	
Kolmogorov-Smirnov (Full: no NDs)	0.135	0.205	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.973	0.973	0.973	0.973

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.953	0.897	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.137	0.209	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	32	1	3.03%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	32	0.97	140	21.24	12.5	27.89

Statistics (All: NDs treated as DL value)	33	0.97	140	20.62	12	27.68
Statistics (All: NDs treated as DL/2 value)	33	0.5	140	20.61	12	27.69
Statistics (Normal ROS Estimated Data)	33	-26.48	140	19.79	12	28.68
Statistics (Gamma ROS Estimated Data)	33	1.000E-12	140	20.59	12	27.7
Statistics (Lognormal ROS Estimated Data)	33	0.97	140	20.63	12	27.68

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.98	0.911	21.67	2.465	1.132	0.459
Statistics (NDs = DL)	0.917	0.854	22.48	2.391	1.194	0.499
Statistics (NDs = DL/2)	0.892	0.831	23.1	2.37	1.242	0.524
Statistics (Gamma ROS Estimates)	0.44	0.421	46.76	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.393	1.19	0.497

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.792	0.792	0.792	0.828

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.651	0.93	Data Not Normal
Lilliefors (Detects Only)	0.299	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.65	0.931	Data Not Normal
Lilliefors (NDs = DL)	0.297	0.154	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.651	0.931	Data Not Normal
Lilliefors (NDs = DL/2)	0.297	0.154	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.719	0.931	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.285	0.154	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.958	0.96	0.961	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.824	0.777	
Kolmogorov-Smirnov (Detects Only)	0.17	0.16	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.752	0.78	
Kolmogorov-Smirnov (NDs = DL)	0.161	0.158	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL/2)	0.694	0.781	
Kolmogorov-Smirnov (NDs = DL/2)	0.159	0.158	Data appear Approximate Gamma Distribution
Anderson-Darling (Gamma ROS Estimates)	2.483	0.824	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.279	0.163	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.984	0.982	0.981	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.968	0.93	Data Appear Lognormal
Lilliefors (Detects Only)	0.136	0.157	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.96	0.931	Data Appear Lognormal
Lilliefors (NDs = DL)	0.141	0.154	Data Appear Lognormal

Shapiro-Wilks (NDs = DL/2)	0.964	0.931	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.155	0.154	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.962	0.931	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.14	0.154	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Arsenic.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	15

Raw Statistics		Log-Transformed Statistics	
Minimum	2.6	Minimum	0.956
Maximum	41	Maximum	3.714
Second Largest	24	Second Largest	3.178
First Quartile	8.65	First Quartile	2.157
Median	12	Median	2.485
Third Quartile	16	Third Quartile	2.773
Mean	13.25	Mean	2.384
SD	8.837	SD	0.679
Coefficient of Variation	0.667		
Skewness	1.858		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.84	Shapiro Wilk Test Statistic	0.953
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	34.93	95% UTL with 95% Coverage	57.45
95% UPL (t)	29.04	95% UPL (t)	36.55
90% Percentile (z)	24.57	90% Percentile (z)	25.92
95% Percentile (z)	27.79	95% Percentile (z)	33.18
99% Percentile (z)	33.81	99% Percentile (z)	52.71

Gamma Distribution Test		Data Distribution Test
k star	2.252	Data appear Gamma Distributed at 5% Significance Level
Theta Star	5.884	
MLE of Mean	13.25	
MLE of Standard Deviation	8.83	
nu star	81.07	
A-D Test Statistic	0.333	Nonparametric Statistics
5% A-D Critical Value	0.748	90% Percentile 19.8
K-S Test Statistic	0.135	95% Percentile 26.55
5% K-S Critical Value	0.205	99% Percentile 38.11
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	41
90% Percentile	25.07	95% Percentile Bootstrap UTL with 95% Coverage	41
95% Percentile	30.29	95% BCA Bootstrap UTL with 95% Coverage	41
99% Percentile	41.78	95% UPL	41
		95% Chebyshev UPL	52.82
95% WH Approx. Gamma UPL	31.34	Upper Threshold Limit Based upon IQR	27.03
95% HW Approx. Gamma UPL	32.2		
95% WH Approx. Gamma UTL with 95% Coverage	42.26		
95% HW Approx. Gamma UTL with 95% Coverage	44.6		

Non-Clay

General Statistics			
Number of Valid Data	33	Number of Detected Data	32
Number of Distinct Detected Data	28	Number of Non-Detect Data	1
		Percent Non-Detects	3.03%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.97	Minimum Detected	-0.0305
Maximum Detected	140	Maximum Detected	4.942
Mean of Detected	21.24	Mean of Detected	2.465
SD of Detected	27.89	SD of Detected	1.132
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.651	Shapiro Wilk Test Statistic	0.968
5% Shapiro Wilk Critical Value	0.93	5% Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	20.61	Mean (Log Scale)	2.37
SD	27.69	SD (Log Scale)	1.242
95% UTL 95% Coverage	80.86	95% UTL 95% Coverage	159.7
95% UPL (t)	68.22	95% UPL (t)	90.55
90% Percentile (z)	56.09	90% Percentile (z)	52.56
95% Percentile (z)	66.15	95% Percentile (z)	82.54
99% Percentile (z)	85.02	99% Percentile (z)	192.5
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	19.58	Mean in Original Scale	20.63
SD	28.5	SD in Original Scale	27.68
95% UTL with 95% Coverage	81.61	95% UTL with 95% Coverage	145.8
		95% BCA UTL with 95% Coverage	140
		95% Bootstrap (%) UTL with 95% Coverage	140
95% UPL (t)	68.59	95% UPL (t)	84.68
90% Percentile (z)	56.11	90% Percentile (z)	50.29
95% Percentile (z)	66.47	95% Percentile (z)	77.49

99% Percentile (z)	85.9	99% Percentile (z)	174.4
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.909	Data appear Lognormal at 5% Significance Level	
Theta Star	23.36		
nu star	58.18		
A-D Test Statistic	0.824	Nonparametric Statistics	
5% A-D Critical Value	0.777	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.17	Mean	20.62
5% K-S Critical Value	0.16	SD	27.26
Data not Gamma Distributed at 5% Significance Level		SE of Mean	4.821
		95% KM UTL with 95% Coverage	79.93
Assuming Gamma Distribution		95% KM Chebyshev UPL	141.2
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	67.49
Mean	20.59	90% Percentile (z)	55.55
Median	12	95% Percentile (z)	65.46
SD	27.7	99% Percentile (z)	84.03
k star	0.421		
Theta star	48.97	Gamma ROS Limits with Extrapolated Data	
Nu star	27.75	95% Wilson Hilferty (WH) Approx. Gamma UPL	68.37
95% Percentile of Chisquare (2k)	3.434	95% Hawkins Wixley (HW) Approx. Gamma UPL	76
		95% WH Approx. Gamma UTL with 95% Coverage	94.08
90% Percentile	57.64	95% HW Approx. Gamma UTL with 95% Coverage	110.4
95% Percentile	84.09		
99% Percentile	150.2		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Arsenic.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18
10% critical value: 0.424
5% critical value: 0.475
1% critical value: 0.561

1. Data Value 41 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.622

For 10% significance level, 41 is an outlier.
For 5% significance level, 41 is an outlier.
For 1% significance level, 41 is an outlier.

2. Data Value 2.6 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.091

For 10% significance level, 2.6 is not an outlier.
For 5% significance level, 2.6 is not an outlier.
For 1% significance level, 2.6 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	20.61
Standard Deviation	27.69
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	20.61	27.27	140	9	4.379	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 140 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 140 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Arsenic.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Data	33	18
Number of Non-Detect Data	1	0
Number of Detect Data	32	18
Minimum Non-Detect	1	N/A
Maximum Non-Detect	1	N/A
Percent Non detects	3.03%	0.00%
Minimum Detected	0.97	2.6
Maximum Detected	140	41
Mean of Detected Data	21.24	13.25
Median of Detected Data	12.5	12
SD of Detected Data	27.89	8.837

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

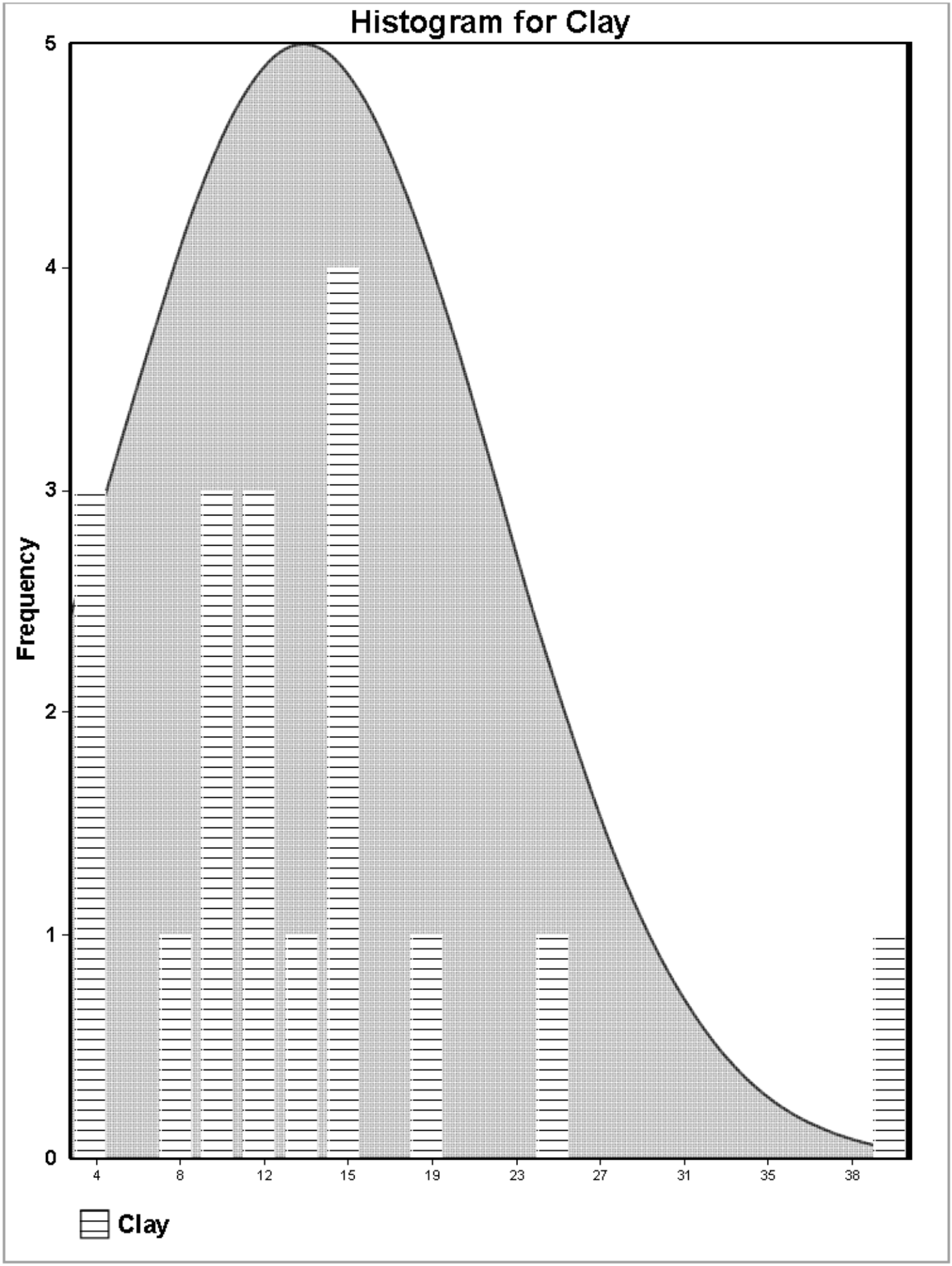
H0: Mean/Median of Site or AOC = Mean/Median of Background

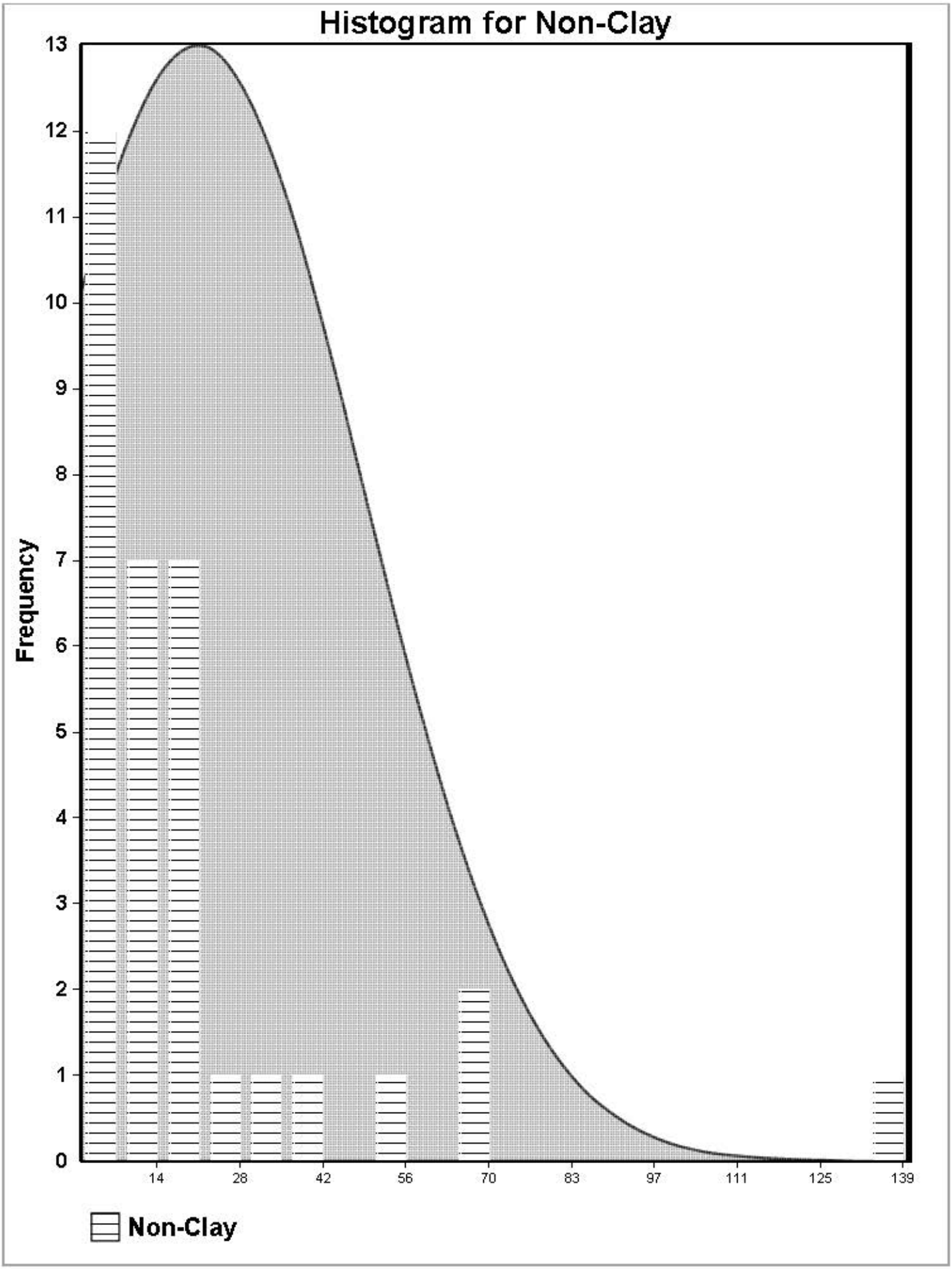
Site Rank Sum W-Stat	858
WMW Test U-Stat	-0.00986
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.992

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
5
4
8
12
15
19
23
27
31
35
38
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
28
42
56
70
83
97
111
125
139
Non-Clay

Location	0-20	D_0-20
BG-1-2	3.6	1
BG-1-10	1	1
BG-2-2	6.5	1
BG-2-10	6	1
BG-2-19	56	1
BG-3-2	20	1
BG-3-10	40	1
BG-3-17	15	1
BG-4-2	12	1
BG-4-10	15	1
BG-4-19	24	1
BG-6-2	9.3	1
BG-6-9	6.1	1

Location	>20	D_>20
BG-1-29	1	0
BG-1-40	0.97	1
BG-1-43	9.1	1
BG-1-46	1.8	1
BG-1-55	4	1
BG-1-78	2.6	1
BG-1-92	3.4	1
BG-2-21	140	1
BG-2-30	10	1
BG-2-32	8.9	1
BG-2-75	68	1
BG-2-81	6.7	1
BG-3-22	8.5	1
BG-3-29	12	1
BG-3-63	15	1
BG-3-65	27	1
BG-3-69	41	1
BG-3-95	13	1
BG-3-105	35	1
BG-3-131	9.1	1
BG-3-136	66	1
BG-4-40	12	1
BG-4-65	6.7	1
BG-4-79	18	1
BG-4-82	17	1
BG-4-95	6.4	1
BG-4-117	5.7	1
BG-4-120	19	1
BG-4-161	11	1
BG-4-163	16	1
BG-6-28	16	1
BG-6-53	13	1
BG-6-58	6.3	1
BG-6-75	8.4	1
BG-6-87	16	1
BG-6-98	13	1
BG-6-114	17	1
BG-6-127	20	1

Location	All	D_All
BG-1-2	3.6	1
BG-1-10	1	1
BG-2-2	6.5	1
BG-2-10	6	1
BG-2-19	56	1
BG-3-2	20	1
BG-3-10	40	1
BG-3-17	15	1
BG-4-2	12	1
BG-4-10	15	1
BG-4-19	24	1
BG-6-2	9.3	1
BG-6-9	6.1	1
BG-1-29	1	0
BG-1-40	0.97	1
BG-1-43	9.1	1
BG-1-46	1.8	1
BG-1-55	4	1
BG-1-78	2.6	1
BG-1-92	3.4	1
BG-2-21	140	1
BG-2-30	10	1
BG-2-32	8.9	1
BG-2-75	68	1
BG-2-81	6.7	1
BG-3-22	8.5	1
BG-3-29	12	1
BG-3-63	15	1
BG-3-65	27	1
BG-3-69	41	1
BG-3-95	13	1
BG-3-105	35	1
BG-3-131	9.1	1
BG-3-136	66	1
BG-4-40	12	1
BG-4-65	6.7	1
BG-4-79	18	1
BG-4-82	17	1
BG-4-95	6.4	1
BG-4-117	5.7	1
BG-4-120	19	1
BG-4-161	11	1
BG-4-163	16	1
BG-6-28	16	1
BG-6-53	13	1
BG-6-58	6.3	1
BG-6-75	8.4	1
BG-6-87	16	1
BG-6-98	13	1
BG-6-114	17	1
BG-6-127	20	1
Average	18.02098039	

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Arsenic.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	18	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	18	2.6	41	13.25	12	8.837

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	2.658	2.252	4.985	2.384	0.679	0.285

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.906	0.906	0.906	0.906

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.84	0.897	Data Not Normal
Lilliefors (Full: no NDs)	0.211	0.209	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.963	0.963	0.963	0.963

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.333	0.748	
Kolmogorov-Smirnov (Full: no NDs)	0.135	0.205	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.973	0.973	0.973	0.973

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.953	0.897	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.137	0.209	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	32	1	3.03%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	32	0.97	140	21.24	12.5	27.89

Statistics (All: NDs treated as DL value)	33	0.97	140	20.62	12	27.68
Statistics (All: NDs treated as DL/2 value)	33	0.5	140	20.61	12	27.69
Statistics (Normal ROS Estimated Data)	33	-26.48	140	19.79	12	28.68
Statistics (Gamma ROS Estimated Data)	33	1.000E-12	140	20.59	12	27.7
Statistics (Lognormal ROS Estimated Data)	33	0.97	140	20.63	12	27.68

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.98	0.911	21.67	2.465	1.132	0.459
Statistics (NDs = DL)	0.917	0.854	22.48	2.391	1.194	0.499
Statistics (NDs = DL/2)	0.892	0.831	23.1	2.37	1.242	0.524
Statistics (Gamma ROS Estimates)	0.44	0.421	46.76	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.393	1.19	0.497

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.792	0.792	0.792	0.828

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.651	0.93	Data Not Normal
Lilliefors (Detects Only)	0.299	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.65	0.931	Data Not Normal
Lilliefors (NDs = DL)	0.297	0.154	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.651	0.931	Data Not Normal
Lilliefors (NDs = DL/2)	0.297	0.154	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.719	0.931	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.285	0.154	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.958	0.96	0.961	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.824	0.777	
Kolmogorov-Smirnov (Detects Only)	0.17	0.16	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.752	0.78	
Kolmogorov-Smirnov (NDs = DL)	0.161	0.158	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL/2)	0.694	0.781	
Kolmogorov-Smirnov (NDs = DL/2)	0.159	0.158	Data appear Approximate Gamma Distribution
Anderson-Darling (Gamma ROS Estimates)	2.483	0.824	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.279	0.163	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.984	0.982	0.981	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.968	0.93	Data Appear Lognormal
Lilliefors (Detects Only)	0.136	0.157	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.96	0.931	Data Appear Lognormal
Lilliefors (NDs = DL)	0.141	0.154	Data Appear Lognormal

Shapiro-Wilks (NDs = DL/2)	0.964	0.931	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.155	0.154	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.962	0.931	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.14	0.154	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Arsenic.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	15

Raw Statistics		Log-Transformed Statistics	
Minimum	2.6	Minimum	0.956
Maximum	41	Maximum	3.714
Second Largest	24	Second Largest	3.178
First Quartile	8.65	First Quartile	2.157
Median	12	Median	2.485
Third Quartile	16	Third Quartile	2.773
Mean	13.25	Mean	2.384
SD	8.837	SD	0.679
Coefficient of Variation	0.667		
Skewness	1.858		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.84	Shapiro Wilk Test Statistic	0.953
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	34.93	95% UTL with 95% Coverage	57.45
95% UPL (t)	29.04	95% UPL (t)	36.55
90% Percentile (z)	24.57	90% Percentile (z)	25.92
95% Percentile (z)	27.79	95% Percentile (z)	33.18
99% Percentile (z)	33.81	99% Percentile (z)	52.71

Gamma Distribution Test		Data Distribution Test
k star	2.252	Data appear Gamma Distributed at 5% Significance Level
Theta Star	5.884	
MLE of Mean	13.25	
MLE of Standard Deviation	8.83	
nu star	81.07	
A-D Test Statistic	0.333	Nonparametric Statistics
5% A-D Critical Value	0.748	90% Percentile 19.8
K-S Test Statistic	0.135	95% Percentile 26.55
5% K-S Critical Value	0.205	99% Percentile 38.11
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	41
90% Percentile	25.07	95% Percentile Bootstrap UTL with 95% Coverage	41
95% Percentile	30.29	95% BCA Bootstrap UTL with 95% Coverage	41
99% Percentile	41.78	95% UPL	41
		95% Chebyshev UPL	52.82
95% WH Approx. Gamma UPL	31.34	Upper Threshold Limit Based upon IQR	27.03
95% HW Approx. Gamma UPL	32.2		
95% WH Approx. Gamma UTL with 95% Coverage	42.26		
95% HW Approx. Gamma UTL with 95% Coverage	44.6		

Non-Clay

General Statistics			
Number of Valid Data	33	Number of Detected Data	32
Number of Distinct Detected Data	28	Number of Non-Detect Data	1
		Percent Non-Detects	3.03%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.97	Minimum Detected	-0.0305
Maximum Detected	140	Maximum Detected	4.942
Mean of Detected	21.24	Mean of Detected	2.465
SD of Detected	27.89	SD of Detected	1.132
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.651	Shapiro Wilk Test Statistic	0.968
5% Shapiro Wilk Critical Value	0.93	5% Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	20.61	Mean (Log Scale)	2.37
SD	27.69	SD (Log Scale)	1.242
95% UTL 95% Coverage	80.86	95% UTL 95% Coverage	159.7
95% UPL (t)	68.22	95% UPL (t)	90.55
90% Percentile (z)	56.09	90% Percentile (z)	52.56
95% Percentile (z)	66.15	95% Percentile (z)	82.54
99% Percentile (z)	85.02	99% Percentile (z)	192.5
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	19.58	Mean in Original Scale	20.63
SD	28.5	SD in Original Scale	27.68
95% UTL with 95% Coverage	81.61	95% UTL with 95% Coverage	145.8
		95% BCA UTL with 95% Coverage	140
		95% Bootstrap (%) UTL with 95% Coverage	140
95% UPL (t)	68.59	95% UPL (t)	84.68
90% Percentile (z)	56.11	90% Percentile (z)	50.29
95% Percentile (z)	66.47	95% Percentile (z)	77.49

99% Percentile (z)	85.9	99% Percentile (z)	174.4
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.909	Data appear Lognormal at 5% Significance Level	
Theta Star	23.36		
nu star	58.18		
A-D Test Statistic	0.824	Nonparametric Statistics	
5% A-D Critical Value	0.777	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.17	Mean	20.62
5% K-S Critical Value	0.16	SD	27.26
Data not Gamma Distributed at 5% Significance Level		SE of Mean	4.821
		95% KM UTL with 95% Coverage	79.93
Assuming Gamma Distribution		95% KM Chebyshev UPL	141.2
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	67.49
Mean	20.59	90% Percentile (z)	55.55
Median	12	95% Percentile (z)	65.46
SD	27.7	99% Percentile (z)	84.03
k star	0.421		
Theta star	48.97	Gamma ROS Limits with Extrapolated Data	
Nu star	27.75	95% Wilson Hilferty (WH) Approx. Gamma UPL	68.37
95% Percentile of Chisquare (2k)	3.434	95% Hawkins Wixley (HW) Approx. Gamma UPL	76
		95% WH Approx. Gamma UTL with 95% Coverage	94.08
90% Percentile	57.64	95% HW Approx. Gamma UTL with 95% Coverage	110.4
95% Percentile	84.09		
99% Percentile	150.2		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Arsenic.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18
10% critical value: 0.424
5% critical value: 0.475
1% critical value: 0.561

1. Data Value 41 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.622

For 10% significance level, 41 is an outlier.
For 5% significance level, 41 is an outlier.
For 1% significance level, 41 is an outlier.

2. Data Value 2.6 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.091

For 10% significance level, 2.6 is not an outlier.
For 5% significance level, 2.6 is not an outlier.
For 1% significance level, 2.6 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	20.61
Standard Deviation	27.69
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	20.61	27.27	140	9	4.379	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 140 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 140 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Arsenic.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Data	33	18
Number of Non-Detect Data	1	0
Number of Detect Data	32	18
Minimum Non-Detect	1	N/A
Maximum Non-Detect	1	N/A
Percent Non detects	3.03%	0.00%
Minimum Detected	0.97	2.6
Maximum Detected	140	41
Mean of Detected Data	21.24	13.25
Median of Detected Data	12.5	12
SD of Detected Data	27.89	8.837

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

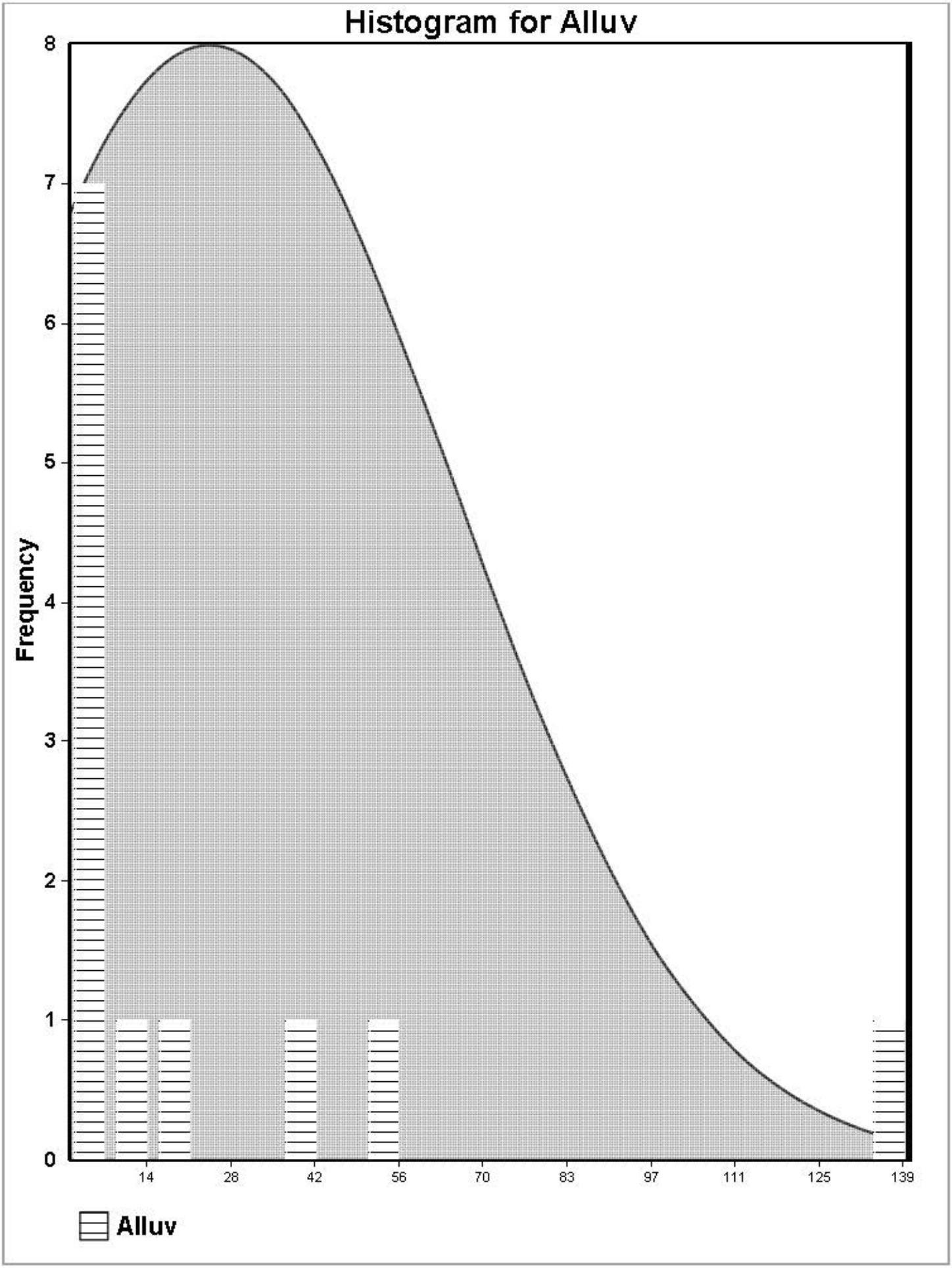
H0: Mean/Median of Site or AOC = Mean/Median of Background

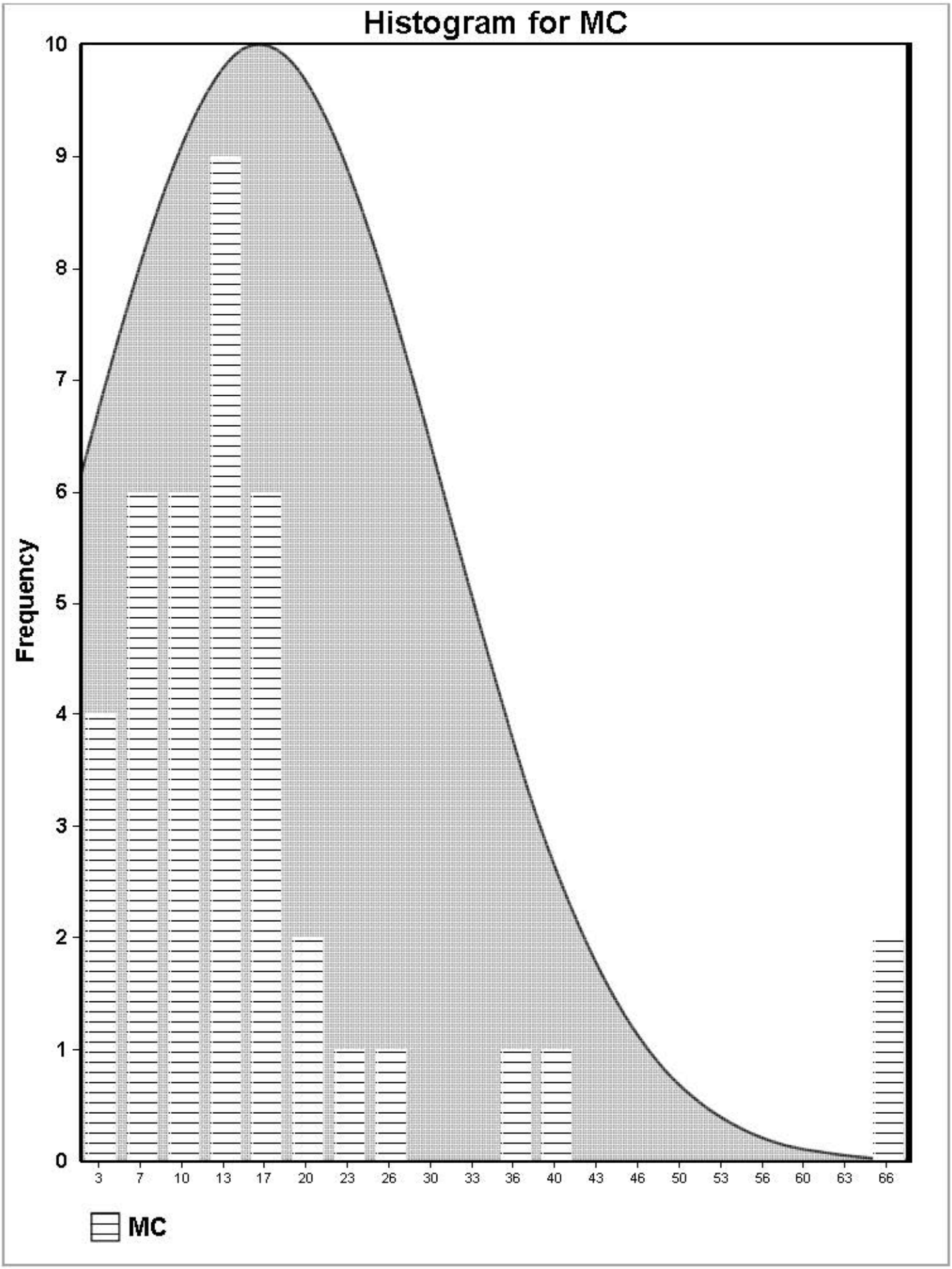
Site Rank Sum W-Stat	858
WMW Test U-Stat	-0.00986
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.992

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
7
8
14
28
42
56
70
83
97
111
125
139
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
10
3
7
10
13
17
20
23
26
30
33
36
40
43
46
50
53
56
60
63
66
MC

Location	Alluv	D_Alluv
BG-1-2	3.6	1
BG-1-10	1	1
BG-1-29	1	0
BG-1-40	0.97	1
BG-2-2	6.5	1
BG-2-10	6	1
BG-2-19	56	1
BG-2-21	140	1
BG-3-2	20	1
BG-3-10	40	1
BG-6-2	9.3	1
BG-6-9	6.1	1

Location	MC	D_MC
BG-1-43	9.1	1
BG-1-46	1.8	1
BG-1-55	4	1
BG-1-78	2.6	1
BG-1-92	3.4	1
BG-2-30	10	1
BG-2-32	8.9	1
BG-2-75	68	1
BG-2-81	6.7	1
BG-3-17	15	1
BG-3-22	8.5	1
BG-3-29	12	1
BG-3-63	15	1
BG-3-65	27	1
BG-3-69	41	1
BG-3-95	13	1
BG-3-105	35	1
BG-3-131	9.1	1
BG-3-136	66	1
BG-4-1	12	1
BG-4-10	15	1
BG-4-19	24	1
BG-4-40	12	1
BG-4-65	6.7	1
BG-4-79	18	1
BG-4-82	17	1
BG-4-95	6.4	1
BG-4-117	5.7	1
BG-4-120	19	1
BG-4-161	11	1
BG-4-163	16	1
BG-6-28	16	1
BG-6-53	13	1
BG-6-58	6.3	1
BG-6-75	8.4	1
BG-6-87	16	1
BG-6-98	13	1
BG-6-114	17	1
BG-1-127	20	1

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Barium.wst
Full Precision	OFF
Confidence Coefficient	0.95

All

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	43
Minimum	6.9
Maximum	250
Mean of Raw Data	65.5
Standard Deviation of Raw Data	60.65
Kstar	1.391
Mean of Log Transformed Data	3.803
Standard Deviation of Log Transformed Data	0.886

Normal Distribution Test Results	
Correlation Coefficient R	0.895
Approximate Shapiro Wilk Test Statistic	0.794
Approximate Shapiro Wilk P Value	4.0007E-9
Lilliefors Test Statistic	0.227
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.982
A-D Test Statistic	1.095
A-D Critical (0.95) Value	0.768
K-S Test Statistic	0.163
K-S Critical(0.95) Value	0.127

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.991
Approximate Shapiro Wilk Test Statistic	0.967
Approximate Shapiro Wilk P Value	0.282
Lilliefors Test Statistic	0.109
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Barium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All

General Statistics

Total Number of Observations	51	Number of Distinct Observations	43

Raw Statistics		Log-Transformed Statistics	
Minimum	6.9	Minimum	1.932
Maximum	250	Maximum	5.521
Second Largest	220	Second Largest	5.394
First Quartile	24	First Quartile	3.178
Median	37	Median	3.611
Third Quartile	88.5	Third Quartile	4.482
Mean	65.5	Mean	3.803
SD	60.65	SD	0.886
Coefficient of Variation	0.926		
Skewness	1.525		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.227	Lilliefors Test Statistic	0.109
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	190.1	95% UTL with 95% Coverage	276.9
95% UPL (t)	168.1	95% UPL (t)	201
90% Percentile (z)	143.2	90% Percentile (z)	139.7
95% Percentile (z)	165.3	95% Percentile (z)	192.7
99% Percentile (z)	206.6	99% Percentile (z)	352.6

Gamma Distribution Test		Data Distribution Test	
k star	1.391	Data appear Lognormal at 5% Significance Level	
Theta Star	47.08		
MLE of Mean	65.5		
MLE of Standard Deviation	55.53		
nu star	141.9		
A-D Test Statistic	1.095	Nonparametric Statistics	
5% A-D Critical Value	0.768	90% Percentile	150
K-S Test Statistic	0.163	95% Percentile	200
5% K-S Critical Value	0.127	99% Percentile	235
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	220
90% Percentile	139	95% Percentile Bootstrap UTL with 95% Coverage	225
95% Percentile	175	95% BCA Bootstrap UTL with 95% Coverage	220
99% Percentile	256.6	95% UPL	208
		95% Chebyshev UPL	332.5
95% WH Approx. Gamma UPL	175.5	Upper Threshold Limit Based upon IQR	185.3
95% HW Approx. Gamma UPL	179.3		
95% WH Approx. Gamma UTL with 95% Coverage	216.2		
95% HW Approx. Gamma UTL with 95% Coverage	225.3		

Outlier Tests for Selected Variables

User Selected Options	
From File	Barium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

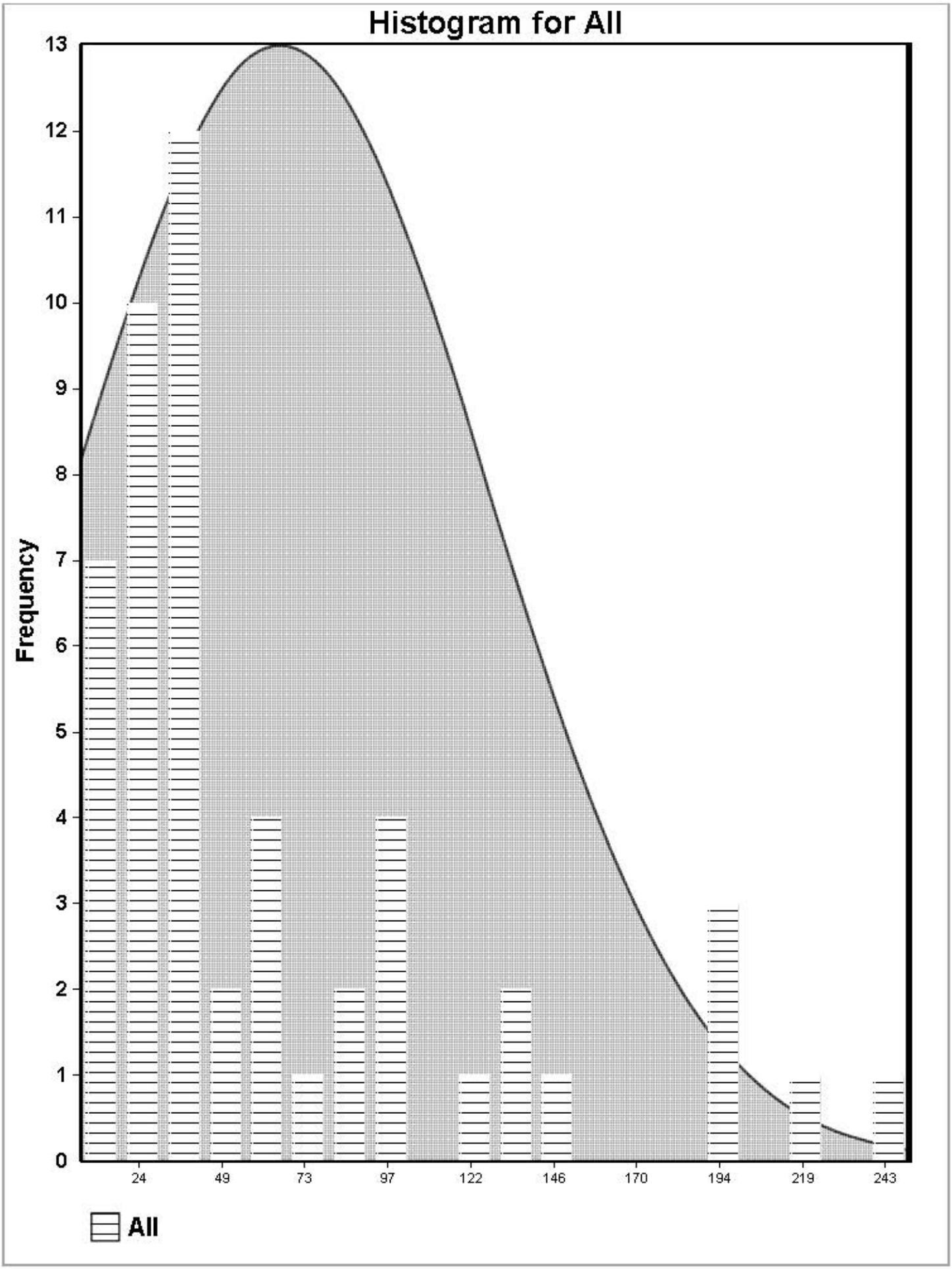
Rosner's Outlier Test for All

Mean	65.5
Standard Deviation	60.65
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	65.5	60.05	250	42	3.072	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier


Histogram for All
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
24
49
73
97
122
146
170
194
219
243
All

Location	All
BG-1-2	37
BG-1-10	37
BG-2-2	44
BG-2-10	40
BG-2-19	190
BG-3-2	140
BG-3-10	67
BG-3-17	200
BG-4-2	16
BG-4-10	24
BG-4-19	36
BG-6-2	100
BG-6-9	32
BG-1-29	34
BG-1-40	22
BG-1-43	23
BG-1-46	140
BG-1-55	7.8
BG-1-78	200
BG-1-92	92
BG-2-21	35
BG-2-30	34
BG-2-32	12
BG-2-75	6.9
BG-2-81	26
BG-3-22	220
BG-3-29	85
BG-3-63	84
BG-3-65	76
BG-3-69	66
BG-3-95	55
BG-3-105	120
BG-3-131	97
BG-3-136	33
BG-4-40	93
BG-4-65	9.9
BG-4-79	29
BG-4-82	18
BG-4-95	20
BG-4-117	58
BG-4-120	21
BG-4-161	250
BG-4-163	26
BG-6-28	41
BG-6-53	24
BG-6-58	17
BG-6-75	150
BG-6-87	39
BG-6-98	59
BG-6-114	22
BG-6-127	32

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Barium.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	12
Minimum	16
Maximum	200
Mean of Raw Data	74.08
Standard Deviation of Raw Data	63.43
Kstar	1.424
Mean of Log Transformed Data	3.999
Standard Deviation of Log Transformed Data	0.797

Normal Distribution Test Results	
Correlation Coefficient R	0.89
Shapiro Wilk Test Statistic	0.783
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.00423
Lilliefors Test Statistic	0.298
Lilliefors Critical (0.95) Value	0.246

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.959
A-D Test Statistic	0.772
A-D Critical (0.95) Value	0.746
K-S Test Statistic	0.263
K-S Critical(0.95) Value	0.24

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.964
Shapiro Wilk Test Statistic	0.919
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.279
Lilliefors Test Statistic	0.222
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

>20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	35
Minimum	6.9
Maximum	250
Mean of Raw Data	62.57
Standard Deviation of Raw Data	60.26
Kstar	1.3
Mean of Log Transformed Data	3.736
Standard Deviation of Log Transformed Data	0.915

Normal Distribution Test Results

Correlation Coefficient R	0.888
Shapiro Wilk Test Statistic	0.788
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	7.5829E-7
Lilliefors Test Statistic	0.219
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.986
A-D Test Statistic	0.742
A-D Critical (0.95) Value	0.769
K-S Test Statistic	0.155
K-S Critical(0.95) Value	0.146

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.992
Shapiro Wilk Test Statistic	0.972
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.541
Lilliefors Test Statistic	0.105
Lilliefors Critical (0.95) Value	0.144

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Barium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	12

Raw Statistics		Log-Transformed Statistics	
Minimum	16	Minimum	2.773
Maximum	200	Maximum	5.298
Second Largest	190	Second Largest	5.247
First Quartile	36	First Quartile	3.584
Median	40	Median	3.689
Third Quartile	100	Third Quartile	4.605
Mean	74.08	Mean	3.999
SD	63.43	SD	0.797
Coefficient of Variation	0.856		
Skewness	1.25		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.783	Shapiro Wilk Test Statistic	0.919
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	243.5	95% UTL with 95% Coverage	458.6
95% UPL (t)	191.4	95% UPL (t)	238.3
90% Percentile (z)	155.4	90% Percentile (z)	151.5
95% Percentile (z)	178.4	95% Percentile (z)	202.4
99% Percentile (z)	221.6	99% Percentile (z)	348.4

Gamma Distribution Test		Data Distribution Test	
k star	1.424	Data appear Lognormal at 5% Significance Level	
Theta Star	52.04		
MLE of Mean	74.08		
MLE of Standard Deviation	62.09		
nu star	37.01		
A-D Test Statistic	0.772	Nonparametric Statistics	
5% A-D Critical Value	0.746	90% Percentile	180
K-S Test Statistic	0.263	95% Percentile	194
5% K-S Critical Value	0.24	99% Percentile	198.8
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	200
90% Percentile	156.3	95% Percentile Bootstrap UTL with 95% Coverage	200
95% Percentile	196.4	95% BCA Bootstrap UTL with 95% Coverage	200
99% Percentile	287.1	95% UPL	200
		95% Chebyshev UPL	361
95% WH Approx. Gamma UPL	209.6	Upper Threshold Limit Based upon IQR	196
95% HW Approx. Gamma UPL	214.6		
95% WH Approx. Gamma UTL with 95% Coverage	319.5		
95% HW Approx. Gamma UTL with 95% Coverage	341		

>20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	35
Raw Statistics		**Log-Transformed Statistics**	
Minimum	6.9	Minimum	1.932
Maximum	250	Maximum	5.521
Second Largest	220	Second Largest	5.394
First Quartile	22.25	First Quartile	3.102
Median	34.5	Median	3.541
Third Quartile	84.75	Third Quartile	4.44
Mean	62.57	Mean	3.736
SD	60.26	SD	0.915
Coefficient of Variation	0.963		
Skewness	1.7		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.788	Shapiro Wilk Test Statistic	0.972
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	191.1	95% UTL with 95% Coverage	295.2
95% UPL (t)	165.6	95% UPL (t)	200.4
90% Percentile (z)	139.8	90% Percentile (z)	135.5
95% Percentile (z)	161.7	95% Percentile (z)	189
99% Percentile (z)	202.8	99% Percentile (z)	352.6
Gamma Distribution Test		**Data Distribution Test**	
k star	1.3	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	48.11		
MLE of Mean	62.57		
MLE of Standard Deviation	54.87		
nu star	98.84		
A-D Test Statistic	0.742	**Nonparametric Statistics**	
5% A-D Critical Value	0.769	90% Percentile	143
K-S Test Statistic	0.155	95% Percentile	203
5% K-S Critical Value	0.146	99% Percentile	238.9

Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	250
90% Percentile	135	95% Percentile Bootstrap UTL with 95% Coverage	250
95% Percentile	171.1	95% BCA Bootstrap UTL with 95% Coverage	250
99% Percentile	253.2	95% UPL	221.5
		95% Chebyshev UPL	328.7
95% WH Approx. Gamma UPL	172.6	Upper Threshold Limit Based upon IQR	178.5
95% HW Approx. Gamma UPL	176.6		
95% WH Approx. Gamma UTL with 95% Coverage	221		
95% HW Approx. Gamma UTL with 95% Coverage	231.8		

Outlier Tests for Selected Variables

User Selected Options	
From File	Barium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 200 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.341

For 10% significance level, 200 is not an outlier.
For 5% significance level, 200 is not an outlier.
For 1% significance level, 200 is not an outlier.

2. Data Value 16 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.092

For 10% significance level, 16 is not an outlier.
For 5% significance level, 16 is not an outlier.
For 1% significance level, 16 is not an outlier.

Rosner's Outlier Test for >20

Mean	62.57
Standard Deviation	60.26
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	62.57	59.46	250	29	3.152	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 250 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Barium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Observations	38	13
Number of Distinct Observations	35	12
Minimum	6.9	16
Maximum	250	200
Mean	62.57	74.08
Median	34.5	40
SD	60.26	63.43
SE of Mean	9.776	17.59

Wilcoxon-Mann-Whitney (WMW) Test

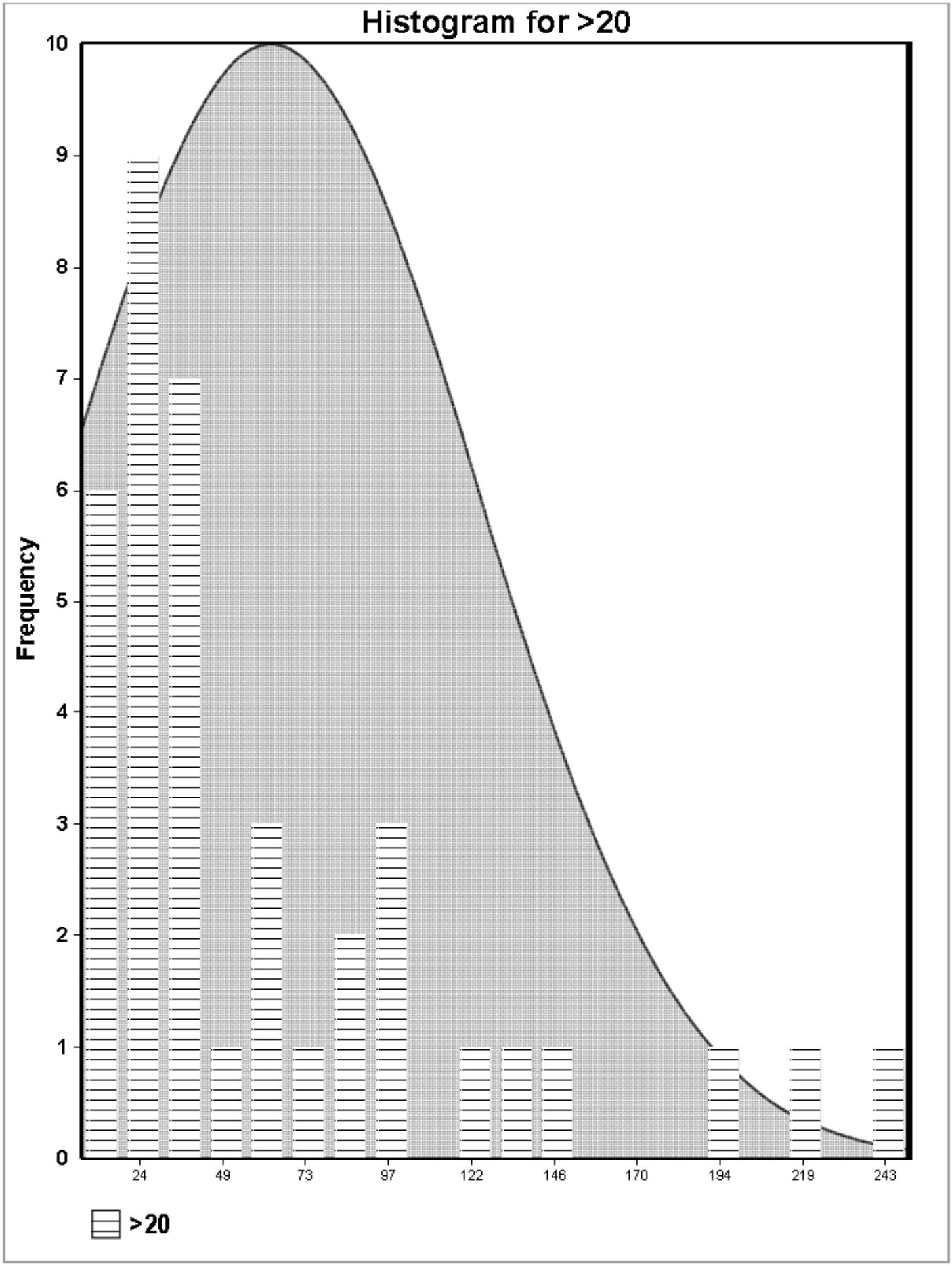
H0: Mean/Median of Site or AOC = Mean/Median of Background

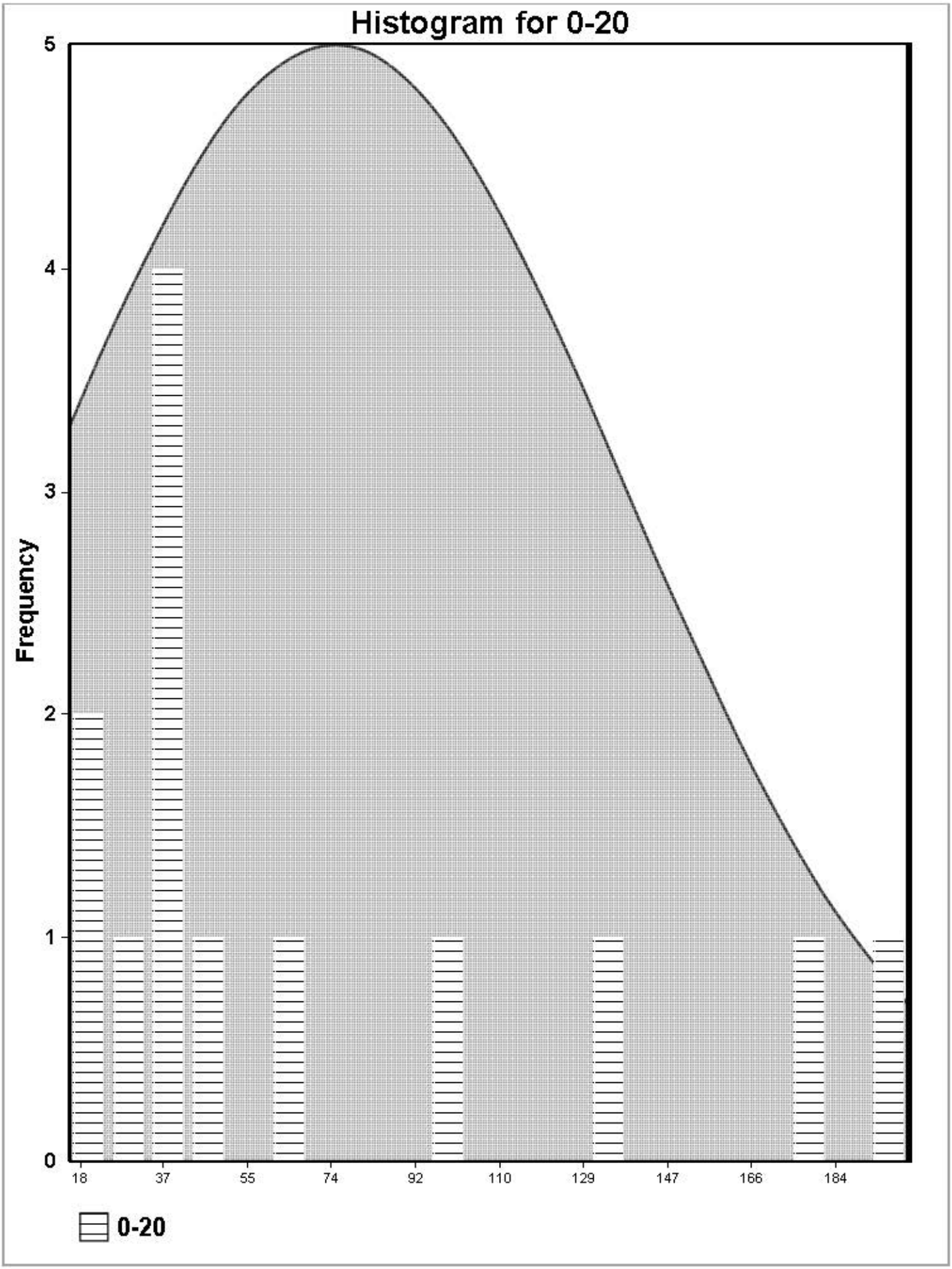
Site Rank Sum W-Stat	939
WMW Test U-Stat	1.048
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.285

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
10
9
8
7
6
5
4
3
2
1
0
24
49
73
97
122
146
170
194
219
243
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5
18
37
55
74
92
110
129
147
166
184
0-20

Location	0-20	Location	>20	Location	All
BG-1-2	37	BG-1-29	34	BG-1-2	37
BG-1-10	37	BG-1-40	22	BG-1-10	37
BG-2-2	44	BG-1-43	23	BG-2-2	44
BG-2-10	40	BG-1-46	140	BG-2-10	40
BG-2-19	190	BG-1-55	7.8	BG-2-19	190
BG-3-2	140	BG-1-78	200	BG-3-2	140
BG-3-10	67	BG-1-92	92	BG-3-10	67
BG-3-17	200	BG-2-21	35	BG-3-17	200
BG-4-2	16	BG-2-30	34	BG-4-2	16
BG-4-10	24	BG-2-32	12	BG-4-10	24
BG-4-19	36	BG-2-75	6.9	BG-4-19	36
BG-6-2	100	BG-2-81	26	BG-6-2	100
BG-6-9	32	BG-3-22	220	BG-6-9	32
		BG-3-29	85	BG-1-29	34
		BG-3-63	84	BG-1-40	22
		BG-3-65	76	BG-1-43	23
		BG-3-69	66	BG-1-46	140
		BG-3-95	55	BG-1-55	7.8
		BG-3-105	120	BG-1-78	200
		BG-3-131	97	BG-1-92	92
		BG-3-136	33	BG-2-21	35
		BG-4-40	93	BG-2-30	34
		BG-4-65	9.9	BG-2-32	12
		BG-4-79	29	BG-2-75	6.9
		BG-4-82	18	BG-2-81	26
		BG-4-95	20	BG-3-22	220
		BG-4-117	58	BG-3-29	85
		BG-4-120	21	BG-3-63	84
		BG-4-161	250	BG-3-65	76
		BG-4-163	26	BG-3-69	66
		BG-6-28	41	BG-3-95	55
		BG-6-53	24	BG-3-105	120
		BG-6-58	17	BG-3-131	97
		BG-6-75	150	BG-3-136	33
		BG-6-87	39	BG-4-40	93
		BG-6-98	59	BG-4-65	9.9
		BG-6-114	22	BG-4-79	29
		BG-6-127	32	BG-4-82	18
				BG-4-95	20
				BG-4-117	58
				BG-4-120	21
				BG-4-161	250
				BG-4-163	26
				BG-6-28	41
				BG-6-53	24
				BG-6-58	17
				BG-6-75	150
				BG-6-87	39
				BG-6-98	59
				BG-6-114	22
				BG-6-127	32
				Average	65.50196078

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Barium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	16
Minimum	7.8
Maximum	250
Mean of Raw Data	75.99
Standard Deviation of Raw Data	80.66
Kstar	1.025
Mean of Log Transformed Data	3.853
Standard Deviation of Log Transformed Data	0.986

Normal Distribution Test Results	
Correlation Coefficient R	0.853
Shapiro Wilk Test Statistic	0.72
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	6.6804E-5
Lilliefors Test Statistic	0.334
Lilliefors Critical (0.95) Value	0.209

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.938
A-D Test Statistic	1.289
A-D Critical (0.95) Value	0.763
K-S Test Statistic	0.28
K-S Critical(0.95) Value	0.209

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.957
Shapiro Wilk Test Statistic	0.911
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.0962
Lilliefors Test Statistic	0.223
Lilliefors Critical (0.95) Value	0.209

Data appear Lognormal at (0.05) Significance Level

Non-Clay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	30
Minimum	6.9
Maximum	190
Mean of Raw Data	59.78
Standard Deviation of Raw Data	46.86
Kstar	1.6
Mean of Log Transformed Data	3.776
Standard Deviation of Log Transformed Data	0.842

Normal Distribution Test Results

Correlation Coefficient R	0.94
Shapiro Wilk Test Statistic	0.877
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.00119
Lilliefors Test Statistic	0.179
Lilliefors Critical (0.95) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.991
A-D Test Statistic	0.368
A-D Critical (0.95) Value	0.762
K-S Test Statistic	0.111
K-S Critical(0.95) Value	0.156

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.992
Shapiro Wilk Test Statistic	0.973
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.649
Lilliefors Test Statistic	0.0846
Lilliefors Critical (0.95) Value	0.154

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Barium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	16

Raw Statistics		Log-Transformed Statistics	
Minimum	7.8	Minimum	2.054
Maximum	250	Maximum	5.521
Second Largest	220	Second Largest	5.394
First Quartile	26	First Quartile	3.258
Median	36.5	Median	3.597
Third Quartile	86.25	Third Quartile	4.447
Mean	75.99	Mean	3.853
SD	80.66	SD	0.986
Coefficient of Variation	1.061		
Skewness	1.338		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.72	Shapiro Wilk Test Statistic	0.911
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	273.9	95% UTL with 95% Coverage	529.2
95% UPL (t)	220.2	95% UPL (t)	274.5
90% Percentile (z)	179.4	90% Percentile (z)	166.7
95% Percentile (z)	208.7	95% Percentile (z)	238.6
99% Percentile (z)	263.6	99% Percentile (z)	467

Gamma Distribution Test		Data Distribution Test	
k star	1.025	Data appear Lognormal at 5% Significance Level	
Theta Star	74.11		
MLE of Mean	75.99		
MLE of Standard Deviation	75.04		
nu star	36.91		
A-D Test Statistic	1.289	Nonparametric Statistics	
5% A-D Critical Value	0.763	90% Percentile	206
K-S Test Statistic	0.28	95% Percentile	224.5
5% K-S Critical Value	0.209	99% Percentile	244.9
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	250
90% Percentile	173.9	95% Percentile Bootstrap UTL with 95% Coverage	250
95% Percentile	225.6	95% BCA Bootstrap UTL with 95% Coverage	250
99% Percentile	345.6	95% UPL	250
		95% Chebyshev UPL	437.2
95% WH Approx. Gamma UPL	236	Upper Threshold Limit Based upon IQR	176.6
95% HW Approx. Gamma UPL	241.7		
95% WH Approx. Gamma UTL with 95% Coverage	352.3		
95% HW Approx. Gamma UTL with 95% Coverage	377		

Non-Clay

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	30

Raw Statistics		Log-Transformed Statistics	
Minimum	6.9	Minimum	1.932
Maximum	190	Maximum	5.247
Second Largest	150	Second Largest	5.011
First Quartile	22	First Quartile	3.091
Median	40	Median	3.689
Third Quartile	85	Third Quartile	4.443
Mean	59.78	Mean	3.776
SD	46.86	SD	0.842
Coefficient of Variation	0.784		
Skewness	1.116		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.877	Shapiro Wilk Test Statistic	0.973
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	161.7	95% UTL with 95% Coverage	272.8
95% UPL (t)	140.3	95% UPL (t)	185.7
90% Percentile (z)	119.8	90% Percentile (z)	128.4
95% Percentile (z)	136.9	95% Percentile (z)	174.4
99% Percentile (z)	168.8	99% Percentile (z)	309.6
Gamma Distribution Test		Data Distribution Test	
k star	1.6	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	37.37		
MLE of Mean	59.78		
MLE of Standard Deviation	47.27		
nu star	105.6		
A-D Test Statistic	0.368	Nonparametric Statistics	
5% A-D Critical Value	0.762	90% Percentile	136
K-S Test Statistic	0.111	95% Percentile	144
5% K-S Critical Value	0.156	99% Percentile	177.2

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	190
90% Percentile	122.6	95% Percentile Bootstrap UTL with 95% Coverage	190
95% Percentile	152.4	95% BCA Bootstrap UTL with 95% Coverage	166
99% Percentile	219.4	95% UPL	162
		95% Chebyshev UPL	267.1
95% WH Approx. Gamma UPL	155.5	Upper Threshold Limit Based upon IQR	179.5
95% HW Approx. Gamma UPL	160.4		
95% WH Approx. Gamma UTL with 95% Coverage	198.7		
95% HW Approx. Gamma UTL with 95% Coverage	210		

Outlier Tests for Selected Variables

User Selected Options	
From File	Barium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 250 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.220

For 10% significance level, 250 is not an outlier.

For 5% significance level, 250 is not an outlier.

For 1% significance level, 250 is not an outlier.

2. Data Value 7.8 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.079

For 10% significance level, 7.8 is not an outlier.

For 5% significance level, 7.8 is not an outlier.

For 1% significance level, 7.8 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	59.78
Standard Deviation	46.86
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	59.78	46.14	190	8	2.822	2.95	3.29

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Barium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Observations	33	18
Number of Distinct Observations	30	16
Minimum	6.9	7.8
Maximum	190	250
Mean	59.78	75.99
Median	40	36.5
SD	46.86	80.66
SE of Mean	8.157	19.01

Wilcoxon-Mann-Whitney (WMW) Test

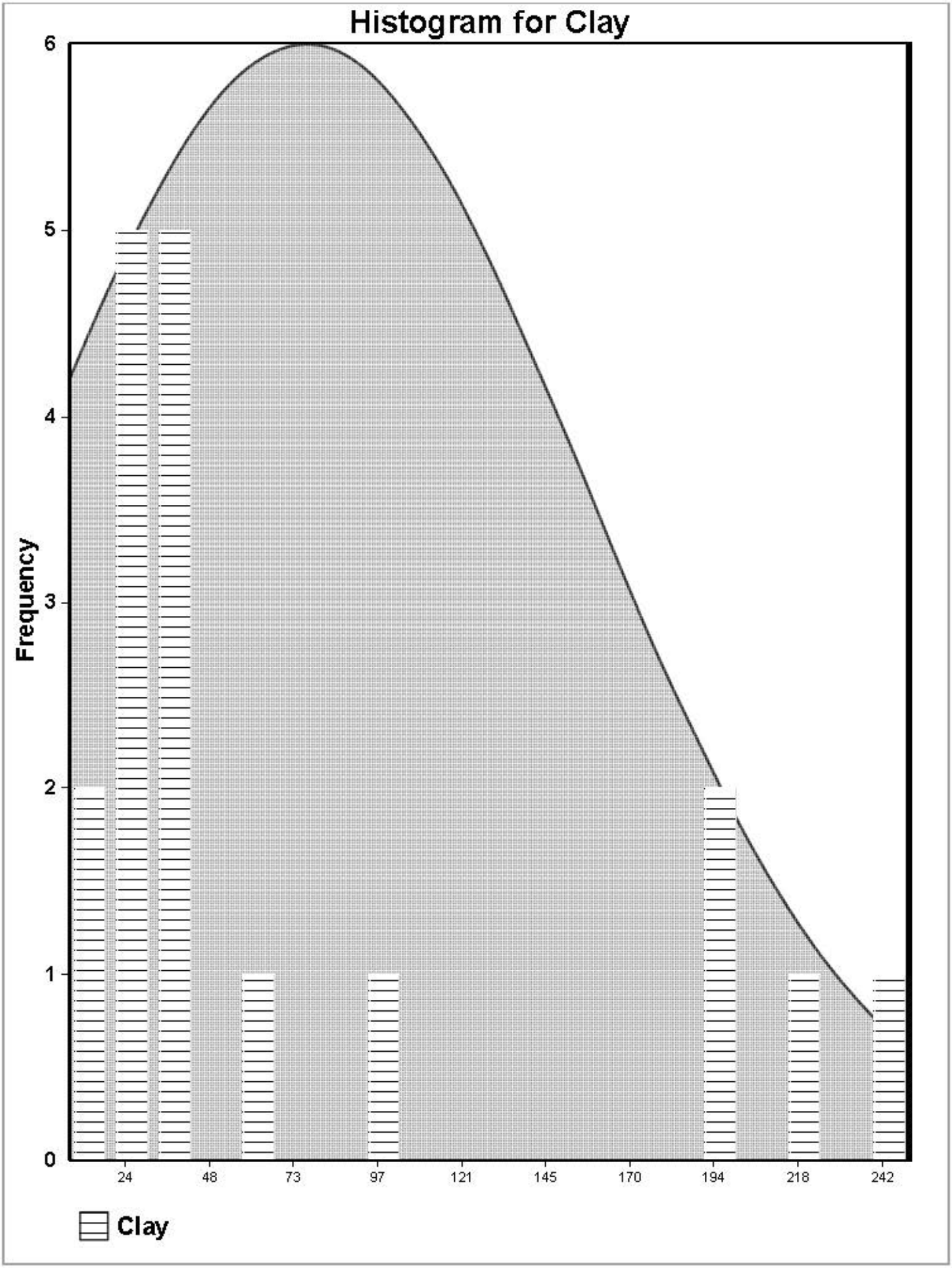
H0: Mean/Median of Site or AOC = Mean/Median of Background

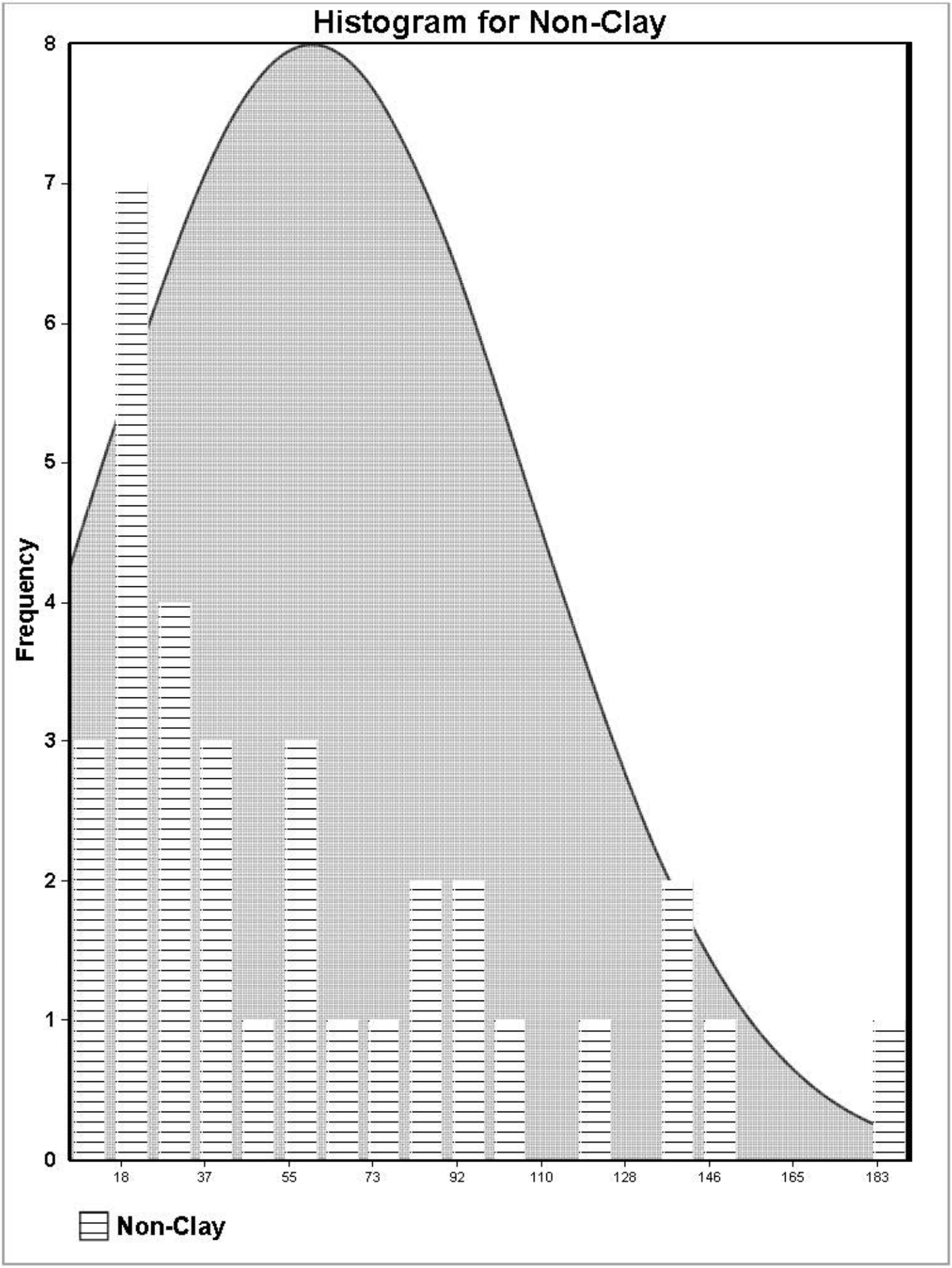
Site Rank Sum W-Stat	846.5
WMW Test U-Stat	0.217
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.813

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
5
6
24
48
73
97
121
145
170
194
218
242
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
18
37
55
73
92
110
128
146
165
183
Non-Clay

Location	Clay	Location	Non-Clay
BG-1-2	37	BG-1-10	37
BG-1-43	23	BG-1-29	34
BG-1-55	7.8	BG-1-40	22
BG-1-78	200	BG-1-46	140
BG-2-30	34	BG-1-92	92
BG-2-81	26	BG-2-2	44
BG-3-17	200	BG-2-10	40
BG-3-22	220	BG-2-19	190
BG-3-69	66	BG-2-21	35
BG-4-2	16	BG-2-32	12
BG-4-19	36	BG-2-75	6.9
BG-4-40	93	BG-3-2	140
BG-4-79	29	BG-3-10	67
BG-4-161	250	BG-3-29	85
BG-4-163	26	BG-3-63	84
BG-6-28	41	BG-3-65	76
BG-6-53	24	BG-3-95	55
BG-6-87	39	BG-3-105	120
		BG-3-131	97
		BG-3-136	33
		BG-4-10	24
		BG-4-65	9.9
		BG-4-82	18
		BG-4-95	20
		BG-4-117	58
		BG-4-120	21
		BG-6-2	100
		BG-6-9	32
		BG-6-58	17
		BG-6-75	150
		BG-6-98	59
		BG-6-114	22
		BG-6-127	32

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Barium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	11
Minimum	22
Maximum	190
Mean of Raw Data	64.83
Standard Deviation of Raw Data	52.15
Kstar	1.819
Mean of Log Transformed Data	3.944
Standard Deviation of Log Transformed Data	0.66

Normal Distribution Test Results	
Correlation Coefficient R	0.859
Shapiro Wilk Test Statistic	0.744
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.00152
Lilliefors Test Statistic	0.322
Lilliefors Critical (0.95) Value	0.256

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.957
A-D Test Statistic	1.01
A-D Critical (0.95) Value	0.741
K-S Test Statistic	0.297
K-S Critical(0.95) Value	0.248

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.935
Shapiro Wilk Test Statistic	0.873
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.0716
Lilliefors Test Statistic	0.263
Lilliefors Critical (0.95) Value	0.256

Data appear Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	36
Minimum	6.9
Maximum	250
Mean of Raw Data	65.71
Standard Deviation of Raw Data	63.66
Kstar	1.233
Mean of Log Transformed Data	3.76
Standard Deviation of Log Transformed Data	0.948

Normal Distribution Test Results

Correlation Coefficient R	0.895
Shapiro Wilk Test Statistic	0.795
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	7.8462E-7
Lilliefors Test Statistic	0.215
Lilliefors Critical (0.95) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.983
A-D Test Statistic	0.805
A-D Critical (0.95) Value	0.77
K-S Test Statistic	0.143
K-S Critical(0.95) Value	0.145

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.991
Shapiro Wilk Test Statistic	0.966
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.373
Lilliefors Test Statistic	0.0866
Lilliefors Critical (0.95) Value	0.142

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Barium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-Transformed Statistics	
Minimum	22	Minimum	3.091
Maximum	190	Maximum	5.247
Second Largest	140	Second Largest	4.942
First Quartile	34.75	First Quartile	3.548
Median	38.5	Median	3.65
Third Quartile	75.25	Third Quartile	4.305
Mean	64.83	Mean	3.944
SD	52.15	SD	0.66
Coefficient of Variation	0.804		
Skewness	1.686		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.744	Shapiro Wilk Test Statistic	0.873
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	207.5	95% UTL with 95% Coverage	314.3
95% UPL (t)	162.3	95% UPL (t)	177.4
90% Percentile (z)	131.7	90% Percentile (z)	120.3
95% Percentile (z)	150.6	95% Percentile (z)	152.9
99% Percentile (z)	186.1	99% Percentile (z)	239.8

Gamma Distribution Test		Data Distribution Test	
k star	1.819	Data appear Lognormal at 5% Significance Level	
Theta Star	35.65		
MLE of Mean	64.83		
MLE of Standard Deviation	48.07		
nu star	43.65		
A-D Test Statistic	1.01	Nonparametric Statistics	
5% A-D Critical Value	0.741	90% Percentile	136
K-S Test Statistic	0.297	95% Percentile	162.5
5% K-S Critical Value	0.248	99% Percentile	184.5
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	190
90% Percentile	129	95% Percentile Bootstrap UTL with 95% Coverage	190
95% Percentile	158.5	95% BCA Bootstrap UTL with 95% Coverage	190
99% Percentile	224.5	95% UPL	190
		95% Chebyshev UPL	301.4
95% WH Approx. Gamma UPL	167.9	Upper Threshold Limit Based upon IQR	136
95% HW Approx. Gamma UPL	169.6		
95% WH Approx. Gamma UTL with 95% Coverage	250.9		
95% HW Approx. Gamma UTL with 95% Coverage	261.9		

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	36

Raw Statistics		Log-Transformed Statistics	
Minimum	6.9	Minimum	1.932
Maximum	250	Maximum	5.521
Second Largest	220	Second Largest	5.394
First Quartile	22.5	First Quartile	3.113
Median	36	Median	3.584
Third Quartile	88.5	Third Quartile	4.482
Mean	65.71	Mean	3.76
SD	63.66	SD	0.948
Coefficient of Variation	0.969		
Skewness	1.518		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.795	Shapiro Wilk Test Statistic	0.966
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	201	95% UTL with 95% Coverage	322.1
95% UPL (t)	174.4	95% UPL (t)	216.9
90% Percentile (z)	147.3	90% Percentile (z)	144.8
95% Percentile (z)	170.4	95% Percentile (z)	204.4
99% Percentile (z)	213.8	99% Percentile (z)	390.1

Gamma Distribution Test		Data Distribution Test	
k star	1.233	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	53.29		
MLE of Mean	65.71		
MLE of Standard Deviation	59.17		
nu star	96.17		
A-D Test Statistic	0.805	Nonparametric Statistics	
5% A-D Critical Value	0.77	90% Percentile	160
K-S Test Statistic	0.143	95% Percentile	202
5% K-S Critical Value	0.145	99% Percentile	238.6

Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	250
90% Percentile	143.7	95% Percentile Bootstrap UTL with 95% Coverage	250
95% Percentile	183	95% BCA Bootstrap UTL with 95% Coverage	223
99% Percentile	272.8	95% UPL	220
		95% Chebyshev UPL	346.7
95% WH Approx. Gamma UPL	184.6	Upper Threshold Limit Based upon IQR	187.5
95% HW Approx. Gamma UPL	189.4		
95% WH Approx. Gamma UTL with 95% Coverage	236.8		
95% HW Approx. Gamma UTL with 95% Coverage	249.2		

Outlier Tests for Selected Variables

User Selected Options	
From File	Barium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 190 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.570

For 10% significance level, 190 is an outlier.
For 5% significance level, 190 is an outlier.
For 1% significance level, 190 is not an outlier.

2. Data Value 22 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.102

For 10% significance level, 22 is not an outlier.
For 5% significance level, 22 is not an outlier.
For 1% significance level, 22 is not an outlier.

Rosner's Outlier Test for MC

Mean	65.71
Standard Deviation	63.66
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	65.71	62.84	250	30	2.933	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Barium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Observations	39	12
Number of Distinct Observations	36	11
Minimum	6.9	22
Maximum	250	190
Mean	65.71	64.83
Median	36	38.5
SD	63.66	52.15
SE of Mean	10.19	15.05

Wilcoxon-Mann-Whitney (WMW) Test

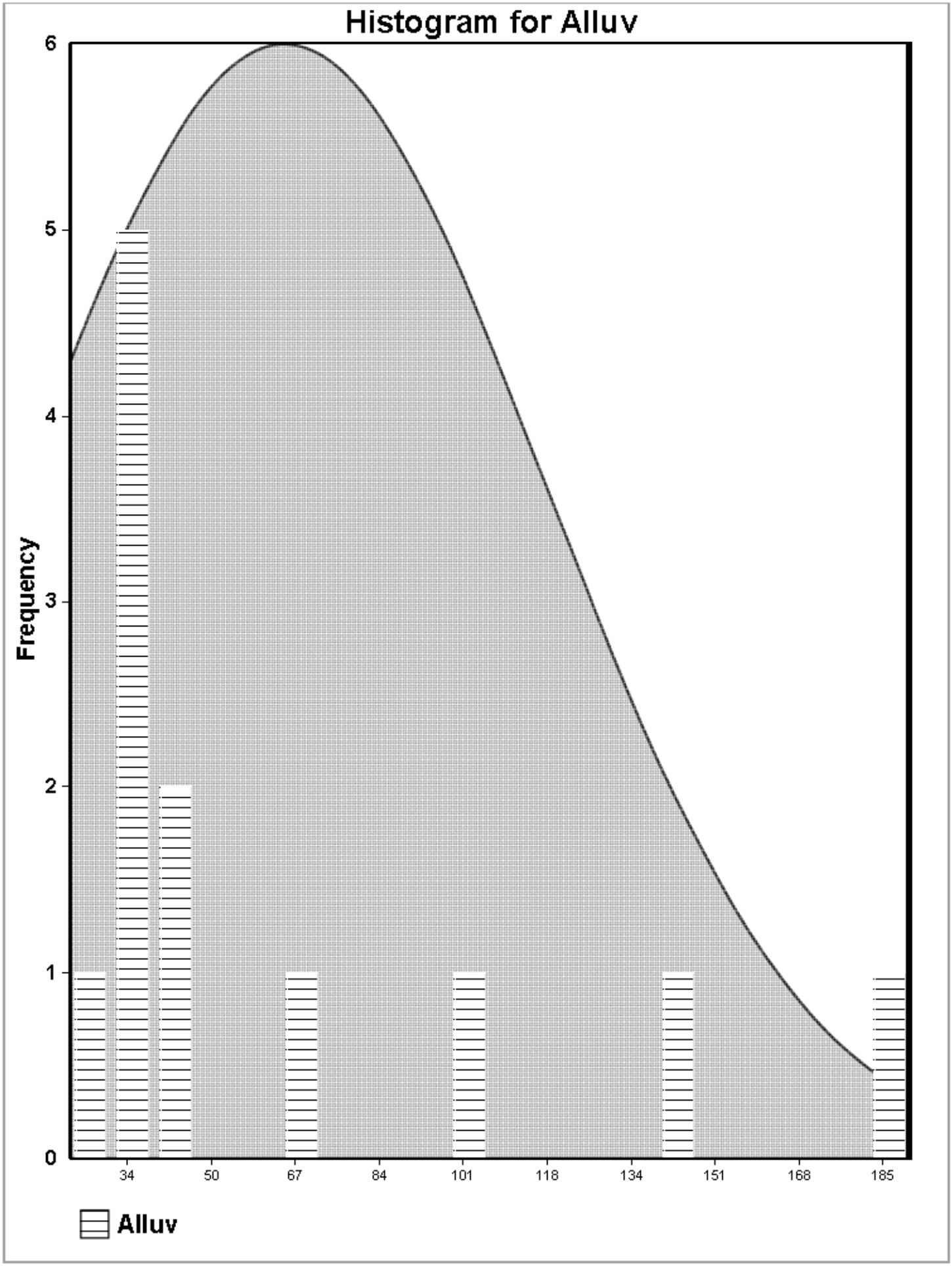
H0: Mean/Median of Site or AOC = Mean/Median of Background

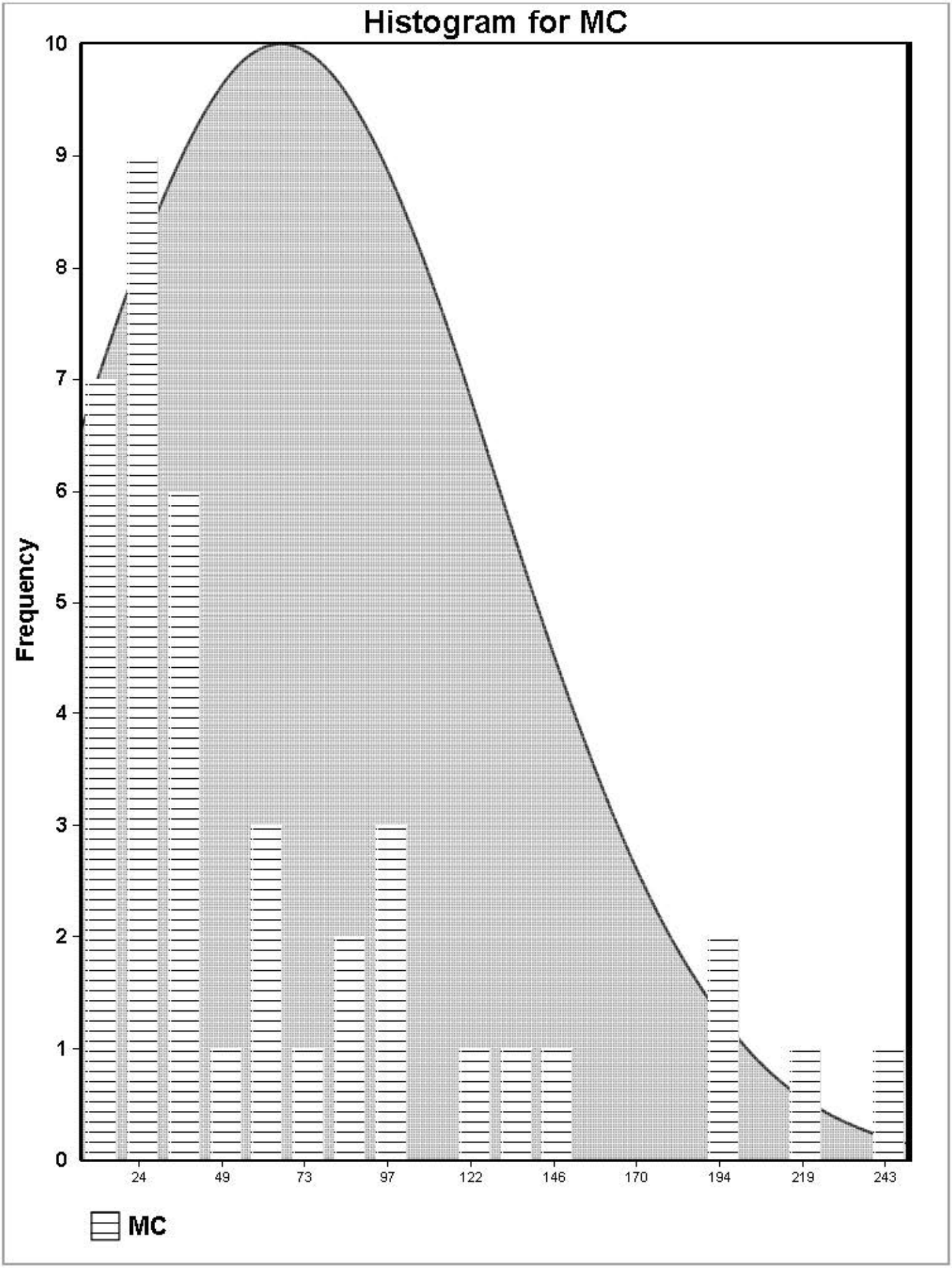
Site Rank Sum W-Stat	975
WMW Test U-Stat	0.855
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.38

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
34
50
67
84
101
118
134
151
168
185
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
10
24
49
73
97
122
146
170
194
219
243
MC

Location	Alluv	Location	MC
BG-1-2	37	BG-1-43	23
BG-1-10	37	BG-1-46	140
BG-1-29	34	BG-1-55	7.8
BG-1-40	22	BG-1-78	200
BG-2-2	44	BG-1-92	92
BG-2-10	40	BG-2-30	34
BG-2-19	190	BG-2-32	12
BG-2-21	35	BG-2-75	6.9
BG-3-2	140	BG-2-81	26
BG-3-10	67	BG-3-17	200
BG-6-2	100	BG-3-22	220
BG-6-9	32	BG-3-29	85
		BG-3-63	84
		BG-3-65	76
		BG-3-69	66
		BG-3-95	55
		BG-3-105	120
		BG-3-131	97
		BG-3-136	33
		BG-4-1	16
		BG-4-10	24
		BG-4-19	36
		BG-4-40	93
		BG-4-65	9.9
		BG-4-79	29
		BG-4-82	18
		BG-4-95	20
		BG-4-117	58
		BG-4-120	21
		BG-4-161	250
		BG-4-163	26
		BG-6-28	41
		BG-6-53	24
		BG-6-58	17
		BG-6-75	150
		BG-6-87	39
		BG-6-98	59
		BG-6-114	22
		BG-1-127	32

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Beryllium.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	37	14	27.45%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	14	0.1	1	0.426	0.5	0.244
Statistics (Detects Only)	37	0.022	1.6	0.427	0.28	0.429
Statistics (All: NDs treated as DL value)	51	0.022	1.6	0.427	0.33	0.385
Statistics (All: NDs treated as DL/2 value)	51	0.022	1.6	0.369	0.25	0.382
Statistics (Normal ROS Estimated Data)	51	-0.192	1.6	0.348	0.216	0.402
Statistics (Gamma ROS Estimated Data)	51	0.022	1.6	0.416	0.29	0.372
Statistics (Lognormal ROS Estimated Data)	51	0.022	1.6	0.343	0.17	0.391

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.995	0.95	0.429	-1.43	1.192	-0.833
Statistics (NDs = DL)	1.18	1.124	0.362	-1.331	1.095	-0.823
Statistics (NDs = DL/2)	1.092	1.041	0.337	-1.521	1.093	-0.719
Statistics (Gamma ROS Estimates)	1.276	1.214	0.326	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.672	1.136	-0.68

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.916	0.927	0.89	0.924

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.831	0.936	Data Not Normal
Lilliefors (Detects Only)	0.193	0.146	Data Not Normal
Lilliefors (NDs = DL)	0.16	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.248	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.168	0.124	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.985	0.985	0.988	0.929

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.462	0.777	
Kolmogorov-Smirnov (Detects Only)	0.098	0.149	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.729	0.775	
Kolmogorov-Smirnov (NDs = DL)	0.142	0.127	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL/2)	0.747	0.778	
Kolmogorov-Smirnov (NDs = DL/2)	0.132	0.128	Data appear Approximate Gamma Distribution
Anderson-Darling (Gamma ROS Estimates)	0.226	0.773	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.07	0.127	Data Appear Gamma Distributed	

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.984	0.978	0.985	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.952	0.936	Data Appear Lognormal
Lilliefors (Detects Only)	0.114	0.146	Data Appear Lognormal
Lilliefors (NDs = DL)	0.184	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.137	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0896	0.124	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Beryllium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Number of Valid Data	51	Number of Detected Data	37
Number of Distinct Detected Data	28	Number of Non-Detect Data	14
		Percent Non-Detects	27.45%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.022	Minimum Detected	-3.817
Maximum Detected	1.6	Maximum Detected	0.47
Mean of Detected	0.427	Mean of Detected	-1.43
SD of Detected	0.429	SD of Detected	1.192
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	1	Maximum Non-Detect	0

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	46
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	5
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	90.20%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.831	Shapiro Wilk Test Statistic	0.952
5% Shapiro Wilk Critical Value	0.936	5% Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.369	Mean (Log Scale)	-1.521
SD	0.382	SD (Log Scale)	1.093
95% UTL 95% Coverage	1.152	95% UTL 95% Coverage	2.062
95% UPL (t)	1.014	95% UPL (t)	1.389
90% Percentile (z)	0.858	90% Percentile (z)	0.887
95% Percentile (z)	0.996	95% Percentile (z)	1.319
99% Percentile (z)	1.256	99% Percentile (z)	2.778
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.214	Mean in Original Scale	0.343
SD	0.607	SD in Original Scale	0.391
95% UTL with 95% Coverage	1.46	95% UTL with 95% Coverage	1.937
		95% BCA UTL with 95% Coverage	1.6
		95% Bootstrap (%) UTL with 95% Coverage	1.6
95% UPL (t)	1.241	95% UPL (t)	1.285

90% Percentile (z)	0.991	90% Percentile (z)	0.806
95% Percentile (z)	1.212	95% Percentile (z)	1.218
99% Percentile (z)	1.625	99% Percentile (z)	2.641
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.933	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.458		
nu star	69.01		
A-D Test Statistic	0.462	Nonparametric Statistics	
5% A-D Critical Value	0.777	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.098	Mean	0.348
5% K-S Critical Value	0.149	SD	0.39
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0564
		95% KM UTL with 95% Coverage	1.148
Assuming Gamma Distribution		95% KM Chebyshev UPL	2.063
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.007
Mean	0.416	90% Percentile (z)	0.847
Median	0.29	95% Percentile (z)	0.989
SD	0.372	99% Percentile (z)	1.254
k star	1.214		
Theta star	0.343	Gamma ROS Limits with Extrapolated Data	
Nu star	123.9	95% Wilson Hilferty (WH) Approx. Gamma UPL	1.173
95% Percentile of Chisquare (2k)	6.798	95% Hawkins Wixley (HW) Approx. Gamma UPL	1.229
		95% WH Approx. Gamma UTL with 95% Coverage	1.46
90% Percentile	0.914	95% HW Approx. Gamma UTL with 95% Coverage	1.568
95% Percentile	1.165		
99% Percentile	1.741		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Beryllium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for All Data

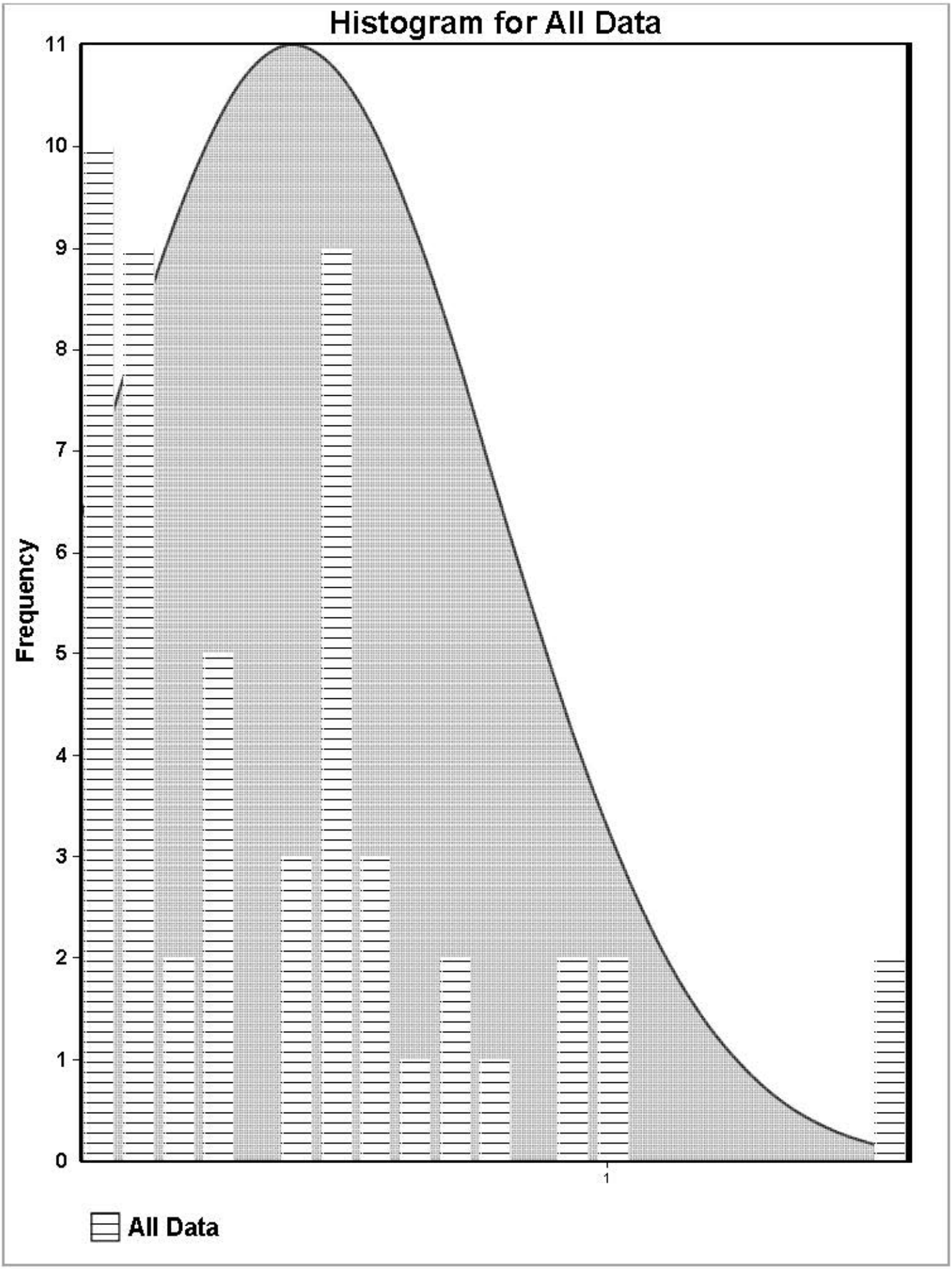
Mean	0.369
Standard Deviation	0.382
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.369	0.378	1.6	34	3.259	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1.6 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
1
All Data

Location	All Data	D_All Data
BG-1-2	0.05	1
BG-1-10	0.5	0
BG-1-29	0.5	0
BG-1-40	0.5	0
BG-2-2	0.5	0
BG-2-10	0.5	0
BG-2-19	1	0
BG-2-21	0.5	0
BG-3-2	0.022	1
BG-3-10	0.28	1
BG-6-2	0.51	0
BG-6-9	0.51	0
BG-1-43	1.1	1
BG-1-46	0.13	1
BG-1-55	0.1	0
BG-1-78	0.59	1
BG-1-92	0.058	1
BG-2-30	0.33	1
BG-2-32	0.5	0
BG-2-75	0.13	1
BG-2-81	0.87	1
BG-3-17	0.078	1
BG-3-22	0.032	1
BG-3-29	0.055	1
BG-3-63	0.19	1
BG-3-65	0.17	1
BG-3-69	0.59	1
BG-3-95	0.11	0
BG-3-105	0.2	1
BG-3-131	0.046	1
BG-3-136	0.58	1
BG-4-1	0.46	1
BG-4-10	0.46	1
BG-4-19	1.6	1
BG-4-40	1	1
BG-4-65	0.11	1
BG-4-79	0.69	1
BG-4-82	0.12	0
BG-4-95	0.057	1
BG-4-117	0.12	0
BG-4-120	0.79	1
BG-4-161	0.29	1
BG-4-163	0.48	1
BG-6-28	0.81	1
BG-6-53	0.29	1
BG-6-58	0.11	1
BG-6-75	0.046	1
BG-6-87	1.6	1
BG-6-98	0.28	1
BG-6-114	0.14	1
BG-1-127	1.1	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Beryllium.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	7	6	46.15%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	6	0.5	1	0.587	0.505	0.203
Statistics (Detects Only)	7	0.022	1.6	0.421	0.28	0.552
Statistics (All: NDs treated as DL value)	13	0.022	1.6	0.498	0.5	0.42
Statistics (All: NDs treated as DL/2 value)	13	0.022	1.6	0.362	0.255	0.401
Statistics (Normal ROS Estimated Data)	13	-0.0427	1.6	0.36	0.293	0.427
Statistics (Gamma ROS Estimated Data)	13	0.022	1.6	0.421	0.423	0.39
Statistics (Lognormal ROS Estimated Data)	13	0.022	1.6	0.298	0.129	0.419

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.74	0.621	0.569	-1.674	1.499	-0.895
Statistics (NDs = DL)	1.209	0.982	0.411	-1.165	1.218	-1.045
Statistics (NDs = DL/2)	1.204	0.977	0.301	-1.485	1.096	-0.738
Statistics (Gamma ROS Estimates)	1.287	1.041	0.327	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.853	1.171	-0.632

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.849	0.891	0.793	0.861

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.738	0.803	Data Not Normal
Lilliefors (Detects Only)	0.329	0.335	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.811	0.866	Data Not Normal
Lilliefors (NDs = DL)	0.334	0.246	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.657	0.866	Data Not Normal
Lilliefors (NDs = DL/2)	0.289	0.246	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.762	0.866	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.22	0.246	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.976	0.948	0.918	0.968

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.289	0.737	
Kolmogorov-Smirnov (Detects Only)	0.192	0.323	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.852	0.754	
Kolmogorov-Smirnov (NDs = DL)	0.281	0.242	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	0.663	0.755	
Kolmogorov-Smirnov (NDs = DL/2)	0.242	0.242	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.206	0.753	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.29	0.242	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.982	0.911	0.942	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.958	0.803	Data Appear Lognormal
Lilliefors (Detects Only)	0.177	0.335	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.838	0.866	Data Not Lognormal
Lilliefors (NDs = DL)	0.317	0.246	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.904	0.866	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.305	0.246	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.977	0.866	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.109	0.246	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

>20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	38	0	38	30	8	21.05%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	8	0.1	0.5	0.306	0.31	0.207
Statistics (Detects Only)	30	0.032	1.6	0.429	0.285	0.407
Statistics (All: NDs treated as DL value)	38	0.032	1.6	0.403	0.285	0.374
Statistics (All: NDs treated as DL/2 value)	38	0.032	1.6	0.371	0.25	0.38
Statistics (Normal ROS Estimated Data)	38	-0.127	1.6	0.351	0.195	0.4
Statistics (Gamma ROS Estimated Data)	38	0.032	1.6	0.391	0.256	0.379
Statistics (Lognormal ROS Estimated Data)	38	0.032	1.6	0.359	0.18	0.386

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.086	1.018	0.395	-1.373	1.132	-0.824
Statistics (NDs = DL)	1.183	1.107	0.341	-1.388	1.061	-0.765
Statistics (NDs = DL/2)	1.059	0.993	0.35	-1.533	1.107	-0.722
Statistics (Gamma ROS Estimates)	1.134	1.062	0.345	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.606	1.131	-0.704

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.928	0.924	0.902	0.935

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.856	0.927	Data Not Normal
Lilliefors (Detects Only)	0.2	0.162	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.852	0.938	Data Not Normal
Lilliefors (NDs = DL)	0.18	0.144	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.813	0.938	Data Not Normal

Lilliefors (NDs = DL/2)	0.242	0.144	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.873	0.938	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.192	0.144	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.984	0.99	0.989	0.913

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.523	0.773	
Kolmogorov-Smirnov (Detects Only)	0.11	0.164	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.659	0.773	
Kolmogorov-Smirnov (NDs = DL)	0.137	0.147	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.797	0.776	
Kolmogorov-Smirnov (NDs = DL/2)	0.125	0.147	Data appear Approximate Gamma Distribution
Anderson-Darling (Gamma ROS Estimates)	0.646	0.774	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.121	0.147	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.98	0.982	0.979	0.976

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.944	0.927	Data Appear Lognormal
Lilliefors (Detects Only)	0.135	0.162	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.948	0.938	Data Appear Lognormal
Lilliefors (NDs = DL)	0.152	0.144	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.94	0.938	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.139	0.144	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.933	0.938	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.127	0.144	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Beryllium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Number of Valid Data	13	Number of Detected Data	7
Number of Distinct Detected Data	6	Number of Non-Detect Data	6
		Percent Non-Detects	46.15%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.022	Minimum Detected	-3.817
Maximum Detected	1.6	Maximum Detected	0.47
Mean of Detected	0.421	Mean of Detected	-1.674
SD of Detected	0.552	SD of Detected	1.499
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	1	Maximum Non-Detect	0

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	12
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	92.31%

Warning: There are only 7 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.738	Shapiro Wilk Test Statistic	0.958
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.362	Mean (Log Scale)	-1.485
SD	0.401	SD (Log Scale)	1.096
95% UTL 95% Coverage	1.434	95% UTL 95% Coverage	4.229
95% UPL (t)	1.104	95% UPL (t)	1.719
90% Percentile (z)	0.876	90% Percentile (z)	0.923
95% Percentile (z)	1.022	95% Percentile (z)	1.374
99% Percentile (z)	1.296	99% Percentile (z)	2.899

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.298
		SD in Original Scale	0.419
		Mean in Log Scale	-1.853
		SD in Log Scale	1.171
		95% UTL 95% Coverage	3.579
		95% UPL (t)	1.368
		90% Percentile (z)	0.703
		95% Percentile (z)	1.076
		99% Percentile (z)	2.39
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.518	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.813		
nu star	7.255		
A-D Test Statistic	0.289	Nonparametric Statistics	
5% A-D Critical Value	0.737	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.192	Mean	0.331
5% K-S Critical Value	0.323	SD	0.408
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.133
		95% KM UTL with 95% Coverage	1.419
Assuming Gamma Distribution		95% KM Chebyshev UPL	2.174
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.085
Mean	0.421	90% Percentile (z)	0.853
Median	0.423	95% Percentile (z)	1.001
SD	0.39	99% Percentile (z)	1.279
k star	1.041		
Theta star	0.405	Gamma ROS Limits with Extrapolated Data	
Nu star	27.07	95% Wilson Hilferty (WH) Approx. Gamma UPL	1.344
95% Percentile of Chisquare (2k)	6.15	95% Hawkins Wixley (HW) Approx. Gamma UPL	1.45
		95% WH Approx. Gamma UTL with 95% Coverage	2.137
90% Percentile	0.96	95% HW Approx. Gamma UTL with 95% Coverage	2.463
95% Percentile	1.244		
99% Percentile	1.901		

Note: DL/2 is not a recommended method.

>20

General Statistics			
Number of Valid Data	38	Number of Detected Data	30
Number of Distinct Detected Data	24	Number of Non-Detect Data	8
		Percent Non-Detects	21.05%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.032	Minimum Detected	-3.442
Maximum Detected	1.6	Maximum Detected	0.47
Mean of Detected	0.429	Mean of Detected	-1.373
SD of Detected	0.407	SD of Detected	1.132
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693

Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	27
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	11
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	71.05%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.856	Shapiro Wilk Test Statistic	0.944
5% Shapiro Wilk Critical Value	0.927	5% Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.371	Mean (Log Scale)	-1.533
SD	0.38	SD (Log Scale)	1.107
95% UTL 95% Coverage	1.181	95% UTL 95% Coverage	2.284
95% UPL (t)	1.021	95% UPL (t)	1.43
90% Percentile (z)	0.858	90% Percentile (z)	0.891
95% Percentile (z)	0.996	95% Percentile (z)	1.332
99% Percentile (z)	1.255	99% Percentile (z)	2.832
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.172	Mean in Original Scale	0.359
SD	0.599	SD in Original Scale	0.386
95% UTL with 95% Coverage	1.448	95% UTL with 95% Coverage	2.237
		95% BCA UTL with 95% Coverage	1.175
		95% Bootstrap (%) UTL with 95% Coverage	1.6
95% UPL (t)	1.195	95% UPL (t)	1.387
90% Percentile (z)	0.939	90% Percentile (z)	0.855
95% Percentile (z)	1.156	95% Percentile (z)	1.289
99% Percentile (z)	1.564	99% Percentile (z)	2.787
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.999	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.429		
nu star	59.96		
A-D Test Statistic	0.523	Nonparametric Statistics	
5% A-D Critical Value	0.773	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.11	Mean	0.36
5% K-S Critical Value	0.164	SD	0.382
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0634
		95% KM UTL with 95% Coverage	1.174
Assuming Gamma Distribution		95% KM Chebyshev UPL	2.046
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.013
Mean	0.391	90% Percentile (z)	0.849
Median	0.256	95% Percentile (z)	0.988
SD	0.379	99% Percentile (z)	1.248
k star	1.062		
Theta star	0.368	Gamma ROS Limits with Extrapolated Data	
Nu star	80.73	95% Wilson Hilferty (WH) Approx. Gamma UPL	1.164
95% Percentile of Chisquare (2k)	6.23	95% Hawkins Wixley (HW) Approx. Gamma UPL	1.211

										95% WH Approx. Gamma UTL with	95% Coverage	1.518
					90% Percentile	0.888				95% HW Approx. Gamma UTL with	95% Coverage	1.63
					95% Percentile	1.147						
					99% Percentile	1.748						

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Beryllium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 1.6 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.735

For 10% significance level, 1.6 is an outlier.
For 5% significance level, 1.6 is an outlier.
For 1% significance level, 1.6 is an outlier.

2. Data Value 0.022 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.117

For 10% significance level, 0.022 is not an outlier.
For 5% significance level, 0.022 is not an outlier.
For 1% significance level, 0.022 is not an outlier.

Rosner's Outlier Test for >20

Mean	0.371
Standard Deviation	0.38
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.371	0.375	1.6	32	3.277	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1.6 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Beryllium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Data	38	13
Number of Non-Detect Data	8	6
Number of Detect Data	30	7
Minimum Non-Detect	0.1	0.5
Maximum Non-Detect	0.5	1
Percent Non detects	21.05%	46.15%
Minimum Detected	0.032	0.022
Maximum Detected	1.6	1.6
Mean of Detected Data	0.429	0.421
Median of Detected Data	0.285	0.28
SD of Detected Data	0.407	0.552

Site vs Background Gehan Test

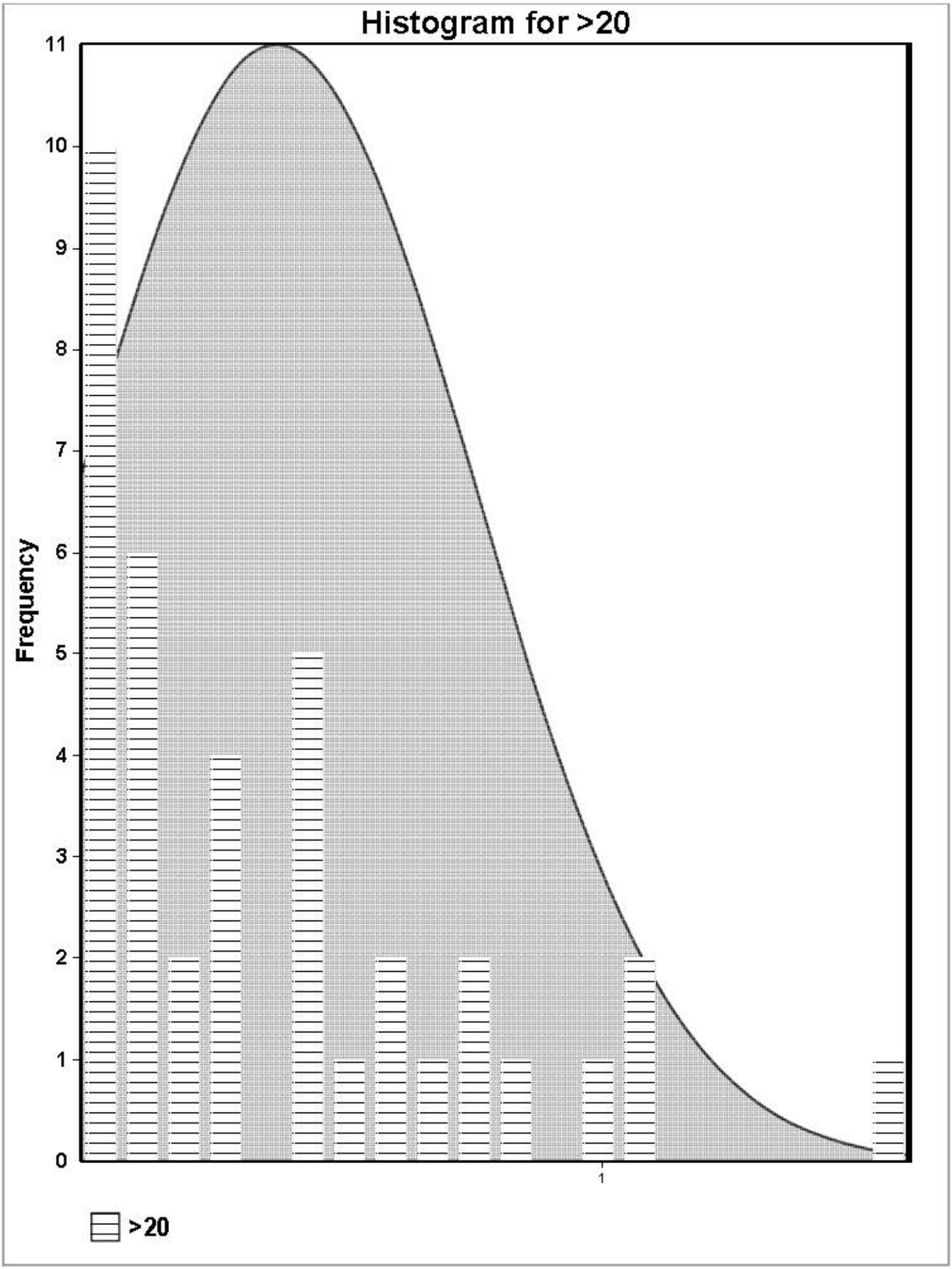
H0: Mu of Site or AOC = Mu of background

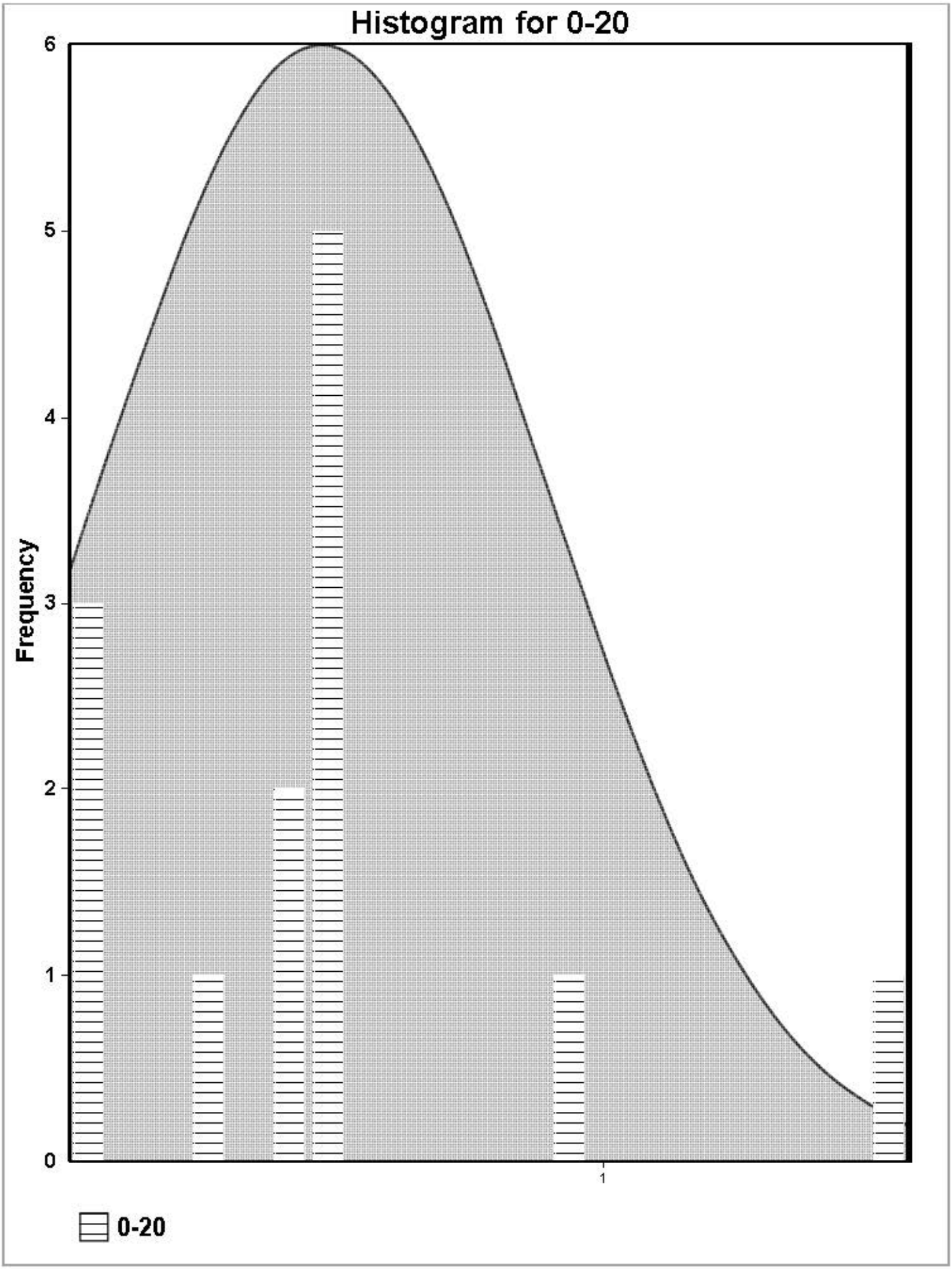
Gehan z Test Value	0.885
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.376

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
1
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5
6
1
0-20

Location	0-20	D_0-20
BG-1-2	0.05	1
BG-1-10	0.5	0
BG-2-2	0.5	0
BG-2-10	0.5	0
BG-2-19	1	0
BG-3-2	0.022	1
BG-3-10	0.28	1
BG-6-2	0.51	0
BG-6-9	0.51	0
BG-3-17	0.078	1
BG-4-1	0.46	1
BG-4-10	0.46	1
BG-4-19	1.6	1

Location	>20	D_>20
BG-1-43	1.1	1
BG-1-46	0.13	1
BG-1-55	0.1	0
BG-1-78	0.59	1
BG-1-92	0.058	1
BG-2-30	0.33	1
BG-2-32	0.5	0
BG-2-75	0.13	1
BG-2-81	0.87	1
BG-3-22	0.032	1
BG-3-29	0.055	1
BG-3-63	0.19	1
BG-3-65	0.17	1
BG-3-69	0.59	1
BG-3-95	0.11	0
BG-3-105	0.2	1
BG-3-131	0.046	1
BG-3-136	0.58	1
BG-4-40	1	1
BG-4-65	0.11	1
BG-4-79	0.69	1
BG-4-82	0.12	0
BG-4-95	0.057	1
BG-4-117	0.12	0
BG-4-120	0.79	1
BG-4-161	0.29	1
BG-4-163	0.48	1
BG-6-28	0.81	1
BG-6-53	0.29	1
BG-6-58	0.11	1
BG-6-75	0.046	1
BG-6-87	1.6	1
BG-6-98	0.28	1
BG-6-114	0.14	1
BG-1-127	1.1	1
BG-1-29	0.5	0
BG-1-40	0.5	0
BG-2-21	0.5	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Beryllium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	17	1	5.56%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	17	0.032	1.6	0.639	0.59	0.481
Statistics (All: NDs treated as DL value)	18	0.032	1.6	0.609	0.535	0.484
Statistics (All: NDs treated as DL/2 value)	18	0.032	1.6	0.606	0.535	0.487
Statistics (Normal ROS Estimated Data)	18	-0.0394	1.6	0.601	0.535	0.494
Statistics (Gamma ROS Estimated Data)	18	0.0228	1.6	0.605	0.535	0.489
Statistics (Lognormal ROS Estimated Data)	18	0.032	1.6	0.608	0.535	0.485

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.321	1.138	0.483	-0.872	1.147	-1.315
Statistics (NDs = DL)	1.238	1.069	0.492	-0.952	1.163	-1.222
Statistics (NDs = DL/2)	1.16	1.004	0.522	-0.99	1.22	-1.232
Statistics (Gamma ROS Estimates)	1.079	0.936	0.56	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.961	1.175	-1.223

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.966	0.962	0.961	0.968

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.923	0.892	Data Appear Normal
Lilliefors (Detects Only)	0.129	0.215	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.913	0.897	Data Appear Normal
Lilliefors (NDs = DL)	0.127	0.209	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.912	0.897	Data Appear Normal
Lilliefors (NDs = DL/2)	0.124	0.209	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.927	0.897	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.12	0.209	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.97	0.971	0.968	0.893

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.365	0.759	
Kolmogorov-Smirnov (Detects Only)	0.134	0.214	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.32	0.762	
Kolmogorov-Smirnov (NDs = DL)	0.116	0.208	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.439	0.763	

Kolmogorov-Smirnov (NDs = DL/2)	0.13	0.209	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.454	0.765	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.144	0.209	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.94	0.955	0.944	0.952

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.878	0.892	Data Not Lognormal
Lilliefors (Detects Only)	0.198	0.215	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.903	0.897	Data Appear Lognormal
Lilliefors (NDs = DL)	0.181	0.209	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.88	0.897	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.197	0.209	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.898	0.897	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.185	0.209	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	20	13	39.39%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	13	0.11	1	0.452	0.5	0.235
Statistics (Detects Only)	20	0.022	1.1	0.248	0.135	0.282
Statistics (All: NDs treated as DL value)	33	0.022	1.1	0.328	0.2	0.279
Statistics (All: NDs treated as DL/2 value)	33	0.022	1.1	0.239	0.2	0.229
Statistics (Normal ROS Estimated Data)	33	-0.104	1.1	0.199	0.13	0.243
Statistics (Gamma ROS Estimated Data)	33	1.000E-12	1.1	0.232	0.14	0.244
Statistics (Lognormal ROS Estimated Data)	33	0.022	1.1	0.192	0.113	0.232

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.119	1.037	0.221	-1.905	1.034	-0.543
Statistics (NDs = DL)	1.324	1.224	0.248	-1.538	1.015	-0.66
Statistics (NDs = DL/2)	1.461	1.348	0.164	-1.811	0.912	-0.503
Statistics (Gamma ROS Estimates)	0.346	0.335	0.671	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.109	0.921	-0.437

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.854	0.925	0.862	0.883

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.737	0.905	Data Not Normal
Lilliefors (Detects Only)	0.267	0.198	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.849	0.931	Data Not Normal
Lilliefors (NDs = DL)	0.192	0.154	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.757	0.931	Data Not Normal
Lilliefors (NDs = DL/2)	0.278	0.154	Data Not Normal

Shapiro-Wilks (Normal ROS Estimates)	0.796	0.931	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.196	0.154	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.983	0.967	0.968	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.576	0.766	
Kolmogorov-Smirnov (Detects Only)	0.158	0.199	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.948	0.769	
Kolmogorov-Smirnov (NDs = DL)	0.183	0.157	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.782	0.766	
Kolmogorov-Smirnov (NDs = DL/2)	0.167	0.156	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.208	0.845	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.315	0.165	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.989	0.971	0.978	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.974	0.905	Data Appear Lognormal
Lilliefors (Detects Only)	0.119	0.198	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.934	0.931	Data Appear Lognormal
Lilliefors (NDs = DL)	0.198	0.154	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.955	0.931	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.164	0.154	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.967	0.931	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0916	0.154	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Beryllium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Number of Valid Data	18	Number of Detected Data	17
Number of Distinct Detected Data	14	Number of Non-Detect Data	1
		Percent Non-Detects	5.56%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.032	Minimum Detected	-3.442
Maximum Detected	1.6	Maximum Detected	0.47
Mean of Detected	0.639	Mean of Detected	-0.872
SD of Detected	0.481	SD of Detected	1.147
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.923	Shapiro Wilk Test Statistic	0.878
5% Shapiro Wilk Critical Value	0.892	5% Shapiro Wilk Critical Value	0.892
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.606	Mean (Log Scale)	-0.99
SD	0.487	SD (Log Scale)	1.22
95% UTL 95% Coverage	1.801	95% UTL 95% Coverage	7.41
95% UPL (t)	1.477	95% UPL (t)	3.289
90% Percentile (z)	1.23	90% Percentile (z)	1.775
95% Percentile (z)	1.407	95% Percentile (z)	2.764
99% Percentile (z)	1.739	99% Percentile (z)	6.349
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.545	Mean in Original Scale	0.608
SD	0.567	SD in Original Scale	0.485
95% UTL with 95% Coverage	1.935	95% UTL with 95% Coverage	6.832
		95% BCA UTL with 95% Coverage	1.6
		95% Bootstrap (%) UTL with 95% Coverage	1.6
95% UPL (t)	1.558	95% UPL (t)	3.124
90% Percentile (z)	1.271	90% Percentile (z)	1.724
95% Percentile (z)	1.477	95% Percentile (z)	2.643
99% Percentile (z)	1.863	99% Percentile (z)	5.887

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.127	Data appear Normal at 5% Significance Level	
Theta Star	0.567		
nu star	38.33		
A-D Test Statistic	0.365	Nonparametric Statistics	
5% A-D Critical Value	0.759	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.134	Mean	0.606
5% K-S Critical Value	0.214	SD	0.473
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.115
		95% KM UTL with 95% Coverage	1.767
Assuming Gamma Distribution		95% KM Chebyshev UPL	2.725
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.452
Mean	0.605	90% Percentile (z)	1.213
Median	0.535	95% Percentile (z)	1.385
SD	0.489	99% Percentile (z)	1.707
k star	0.936		
Theta star	0.646	Gamma ROS Limits with Extrapolated Data	
Nu star	33.7	95% Wilson Hilferty (WH) Approx. Gamma UPL	1.977
95% Percentile of Chisquare (2k)	5.742	95% Hawkins Wixley (HW) Approx. Gamma UPL	2.174
		95% WH Approx. Gamma UTL with 95% Coverage	2.969
90% Percentile	1.415	95% HW Approx. Gamma UTL with 95% Coverage	3.477
95% Percentile	1.854		
99% Percentile	2.879		

Note: DL/2 is not a recommended method.

Non-Clay

General Statistics

Number of Valid Data	33	Number of Detected Data	20
Number of Distinct Detected Data	16	Number of Non-Detect Data	13
		Percent Non-Detects	39.39%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.022	Minimum Detected	-3.817
Maximum Detected	1.1	Maximum Detected	0.0953
Mean of Detected	0.248	Mean of Detected	-1.905
SD of Detected	0.282	SD of Detected	1.034
Minimum Non-Detect	0.11	Minimum Non-Detect	-2.207
Maximum Non-Detect	1	Maximum Non-Detect	0

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	32
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	96.97%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.737	Shapiro Wilk Test Statistic	0.974
5% Shapiro Wilk Critical Value	0.905	5% Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.239	Mean (Log Scale)	-1.811
SD	0.229	SD (Log Scale)	0.912
95% UTL 95% Coverage	0.737	95% UTL 95% Coverage	1.189
95% UPL (t)	0.633	95% UPL (t)	0.784
90% Percentile (z)	0.532	90% Percentile (z)	0.526
95% Percentile (z)	0.616	95% Percentile (z)	0.732
99% Percentile (z)	0.772	99% Percentile (z)	1.363
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.192
		SD in Original Scale	0.232
		Mean in Log Scale	-2.109
		SD in Log Scale	0.921
		95% UTL 95% Coverage	0.9
		95% UPL (t)	0.591
		90% Percentile (z)	0.395
		95% Percentile (z)	0.552
		99% Percentile (z)	1.034
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.984	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.252		
nu star	39.37		
A-D Test Statistic	0.576	Nonparametric Statistics	
5% A-D Critical Value	0.766	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.158	Mean	0.197
5% K-S Critical Value	0.199	SD	0.233
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0438
		95% KM UTL with 95% Coverage	0.703
Assuming Gamma Distribution		95% KM Chebyshev UPL	1.227
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.597
Mean	0.232	90% Percentile (z)	0.495
Median	0.14	95% Percentile (z)	0.58
SD	0.244	99% Percentile (z)	0.738
k star	0.335		
Theta star	0.694	Gamma ROS Limits with Extrapolated Data	
Nu star	22.08	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.801
95% Percentile of Chisquare (2k)	2.954	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.966
		95% WH Approx. Gamma UTL with 95% Coverage	1.102
90% Percentile	0.675	95% HW Approx. Gamma UTL with 95% Coverage	1.426
95% Percentile	1.025		
99% Percentile	1.922		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Beryllium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 1.6 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.323

For 10% significance level, 1.6 is not an outlier.

For 5% significance level, 1.6 is not an outlier.

For 1% significance level, 1.6 is not an outlier.

2. Data Value 0.032 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.017

For 10% significance level, 0.032 is not an outlier.

For 5% significance level, 0.032 is not an outlier.

For 1% significance level, 0.032 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	0.239
Standard Deviation	0.229
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.239	0.225	1.1	33	3.818	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1.1 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1.1 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Beryllium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Data	33	18
Number of Non-Detect Data	13	1
Number of Detect Data	20	17
Minimum Non-Detect	0.11	0.1
Maximum Non-Detect	1	0.1
Percent Non detects	39.39%	5.56%
Minimum Detected	0.022	0.032
Maximum Detected	1.1	1.6
Mean of Detected Data	0.248	0.639
Median of Detected Data	0.135	0.59
SD of Detected Data	0.282	0.481

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 1 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

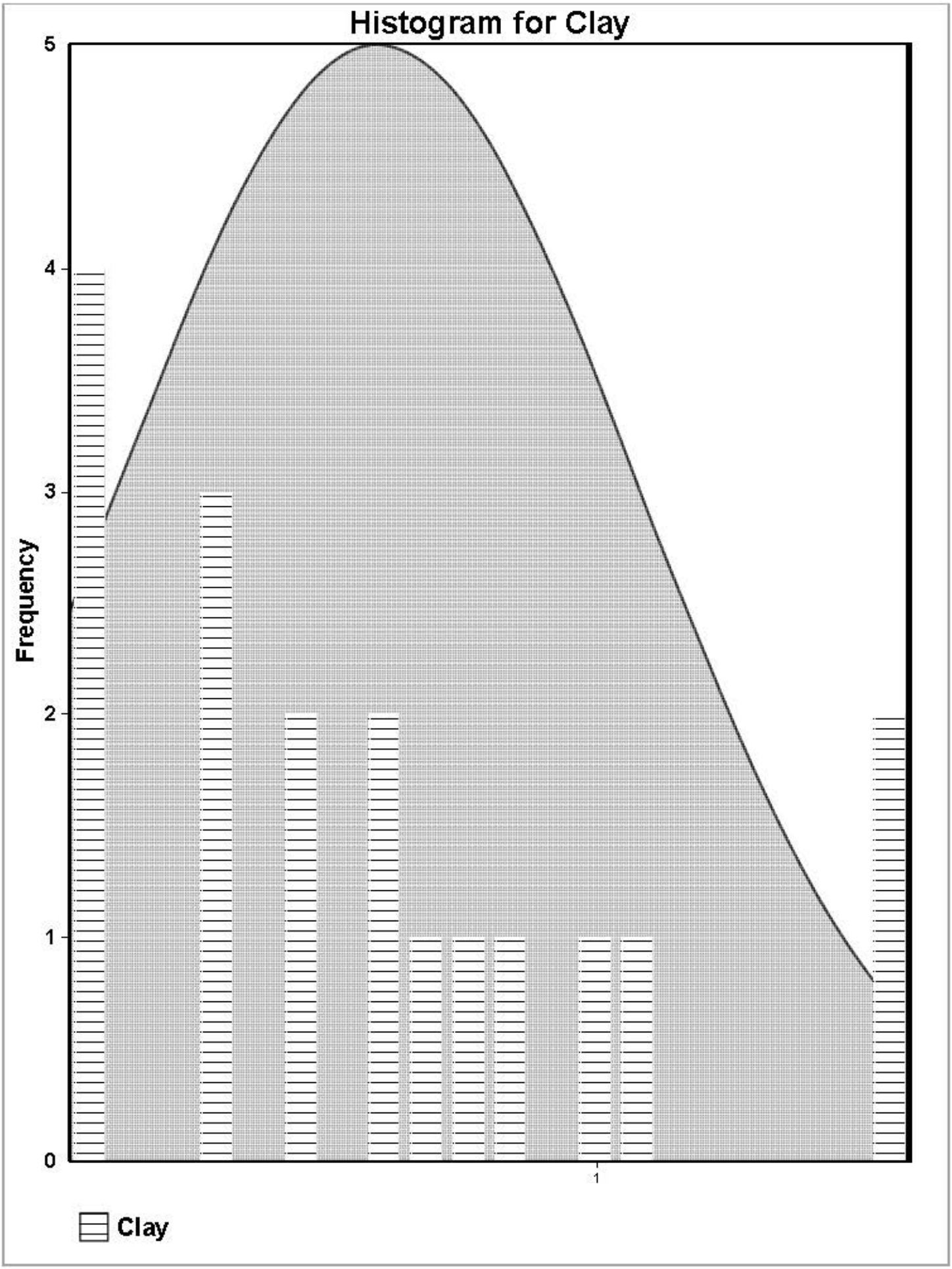
H0: Mean/Median of Site or AOC = Mean/Median of Background

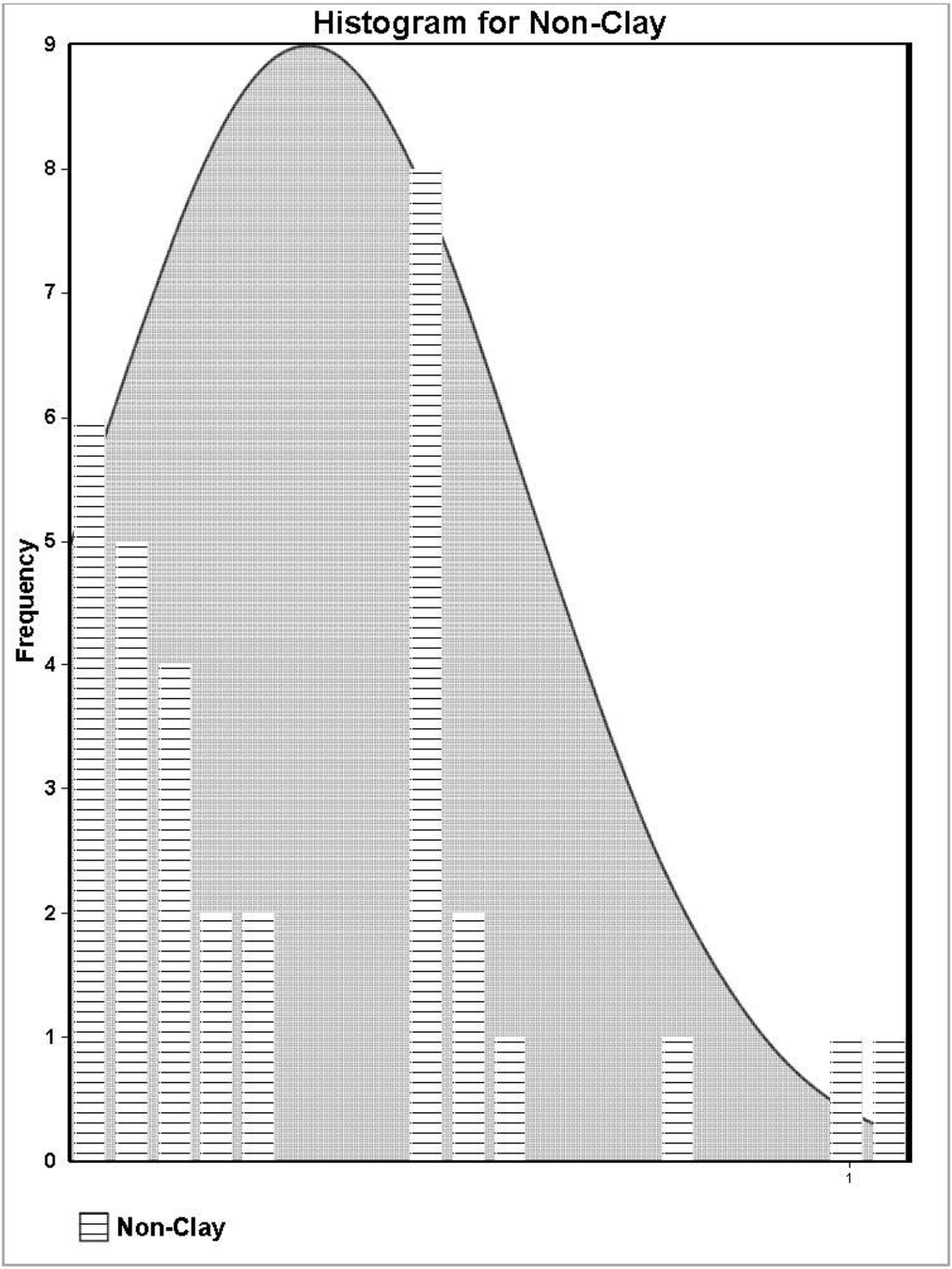
Site Rank Sum W-Stat	816.5
WMW Test U-Stat	0.808
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.408

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
5
1
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
1
Non-Clay

Location	Clay	D_Clay
BG-1-2	0.05	1
BG-1-43	1.1	1
BG-1-55	0.1	0
BG-1-78	0.59	1
BG-2-30	0.33	1
BG-2-81	0.87	1
BG-3-17	0.078	1
BG-3-22	0.032	1
BG-3-69	0.59	1
BG-4-2	0.46	1
BG-4-19	1.6	1
BG-4-40	1	1
BG-4-79	0.69	1
BG-4-161	0.29	1
BG-4-163	0.48	1
BG-6-28	0.81	1
BG-6-53	0.29	1
BG-6-87	1.6	1

Location	Non-Clay	D_Non-Clay
BG-1-10	0.5	0
BG-1-29	0.5	0
BG-1-40	0.5	0
BG-1-46	0.13	1
BG-1-92	0.058	1
BG-2-2	0.5	0
BG-2-10	0.5	0
BG-2-19	1	0
BG-2-21	0.5	0
BG-2-32	0.5	0
BG-2-75	0.13	1
BG-3-2	0.022	1
BG-3-10	0.28	1
BG-3-29	0.055	1
BG-3-63	0.19	1
BG-3-65	0.17	1
BG-3-95	0.11	0
BG-3-105	0.2	1
BG-3-131	0.046	1
BG-3-136	0.58	1
BG-4-10	0.46	1
BG-4-65	0.11	1
BG-4-82	0.12	0
BG-4-95	0.057	1
BG-4-117	0.12	0
BG-4-120	0.79	1
BG-6-2	0.51	0
BG-6-9	0.51	0
BG-6-58	0.11	1
BG-6-75	0.046	1
BG-6-98	0.28	1
BG-6-114	0.14	1
BG-6-127	1.1	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Beryllium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	3	9	75.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	9	0.5	1	0.558	0.5	0.166
Statistics (Detects Only)	3	0.022	0.28	0.117	0.05	0.142
Statistics (All: NDs treated as DL value)	12	0.022	1	0.448	0.5	0.252
Statistics (All: NDs treated as DL/2 value)	12	0.022	0.5	0.239	0.25	0.118
Statistics (Normal ROS Estimated Data)	12	-0.0868	0.322	0.117	0.1	0.122
Statistics (Gamma ROS Estimated Data)	12	1.000E-12	0.28	0.0293	1.000E-12	0.0804
Statistics (Lognormal ROS Estimated Data)	12	0.00902	0.506	0.123	0.0588	0.146

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.04	0.836	0.113	-2.695	1.298	-0.482
Statistics (NDs = DL)	1.668	1.306	0.268	-1.133	1.11	-0.98
Statistics (NDs = DL/2)	2.436	1.883	0.0979	-1.652	0.86	-0.521
Statistics (Gamma ROS Estimates)	0.0491	0.0924	0.598	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.695	1.18	-0.438

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.911	0.875	0.847	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.83	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.349	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.791	0.859	Data Not Normal
Lilliefors (NDs = DL)	0.332	0.256	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.752	0.859	Data Not Normal
Lilliefors (NDs = DL/2)	0.372	0.256	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.973	0.859	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.127	0.256	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.832	0.824	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	1.857	0.744	
Kolmogorov-Smirnov (NDs = DL)	0.407	0.249	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	2.086	0.74	
Kolmogorov-Smirnov (NDs = DL/2)	0.447	0.248	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.552	0.992	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.479	0.288	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.98	0.804	0.787	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.96	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.258	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.665	0.859	Data Not Lognormal
Lilliefors (NDs = DL)	0.404	0.256	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.645	0.859	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.455	0.256	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.984	0.859	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.101	0.256	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	39	0	39	34	5	12.82%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	5	0.1	0.5	0.19	0.12	0.173
Statistics (Detects Only)	34	0.032	1.6	0.455	0.29	0.436
Statistics (All: NDs treated as DL value)	39	0.032	1.6	0.421	0.28	0.42
Statistics (All: NDs treated as DL/2 value)	39	0.032	1.6	0.409	0.25	0.425
Statistics (Normal ROS Estimated Data)	39	-0.134	1.6	0.396	0.218	0.437
Statistics (Gamma ROS Estimated Data)	39	1.000E-12	1.6	0.408	0.28	0.427
Statistics (Lognormal ROS Estimated Data)	39	0.032	1.6	0.407	0.2	0.426

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.078	1.012	0.422	-1.319	1.136	-0.861
Statistics (NDs = DL)	1.086	1.02	0.387	-1.392	1.098	-0.789
Statistics (NDs = DL/2)	0.987	0.928	0.414	-1.481	1.162	-0.785
Statistics (Gamma ROS Estimates)	0.283	0.278	1.442	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.483	1.151	-0.776

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.924	0.909	0.905	0.93

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.844	0.933	Data Not Normal
Lilliefors (Detects Only)	0.177	0.152	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.819	0.939	Data Not Normal
Lilliefors (NDs = DL)	0.188	0.142	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.811	0.939	Data Not Normal

Lilliefors (NDs = DL/2)	0.2	0.142	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.858	0.939	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.186	0.142	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.984	0.986	0.985	0.925

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.453	0.774	
Kolmogorov-Smirnov (Detects Only)	0.104	0.155	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.717	0.776	
Kolmogorov-Smirnov (NDs = DL)	0.145	0.145	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.816	0.779	
Kolmogorov-Smirnov (NDs = DL/2)	0.117	0.146	Data appear Approximate Gamma Distribution
Anderson-Darling (Gamma ROS Estimates)	5.367	0.865	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.314	0.154	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.983	0.984	0.977	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.946	0.933	Data Appear Lognormal
Lilliefors (Detects Only)	0.125	0.152	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.95	0.939	Data Appear Lognormal
Lilliefors (NDs = DL)	0.123	0.142	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.932	0.939	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.131	0.142	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.936	0.939	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.115	0.142	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Beryllium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

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General Statistics

Number of Valid Data	12	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	9
		Percent Non-Detects	75.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.022	Minimum Detected	-3.817
Maximum Detected	0.28	Maximum Detected	-1.273
Mean of Detected	0.117	Mean of Detected	-2.695
SD of Detected	0.142	SD of Detected	1.298
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	1	Maximum Non-Detect	0

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	12
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.83	Shapiro Wilk Test Statistic	0.96
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.239	Mean (Log Scale)	-1.652
SD	0.118	SD (Log Scale)	0.86
95% UTL 95% Coverage	0.562	95% UTL 95% Coverage	2.016
95% UPL (t)	0.46	95% UPL (t)	0.957
90% Percentile (z)	0.39	90% Percentile (z)	0.577
95% Percentile (z)	0.433	95% Percentile (z)	0.789

99% Percentile (z)	0.514	99% Percentile (z)	1.418
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.123
		SD in Original Scale	0.146
		Mean in Log Scale	-2.695
		SD in Log Scale	1.18
		95% UTL 95% Coverage	1.702
		95% UPL (t)	0.612
		90% Percentile (z)	0.306
		95% Percentile (z)	0.47
		99% Percentile (z)	1.05
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.117
5% K-S Critical Value	N/A	SD	0.116
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0817
		95% KM UTL with 95% Coverage	0.434
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.642
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.333
Mean	N/A	90% Percentile (z)	0.265
Median	N/A	95% Percentile (z)	0.307
SD	N/A	99% Percentile (z)	0.386
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

MC

General Statistics			
Number of Valid Data	39	Number of Detected Data	34
Number of Distinct Detected Data	26	Number of Non-Detect Data	5
		Percent Non-Detects	12.82%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.032	Minimum Detected	-3.442
Maximum Detected	1.6	Maximum Detected	0.47
Mean of Detected	0.455	Mean of Detected	-1.319
SD of Detected	0.436	SD of Detected	1.136

Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693

Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	27
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	12
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	69.23%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.844	Shapiro Wilk Test Statistic	0.946
5% Shapiro Wilk Critical Value	0.933	5% Shapiro Wilk Critical Value	0.933
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.409	Mean (Log Scale)	-1.481
SD	0.425	SD (Log Scale)	1.162
95% UTL 95% Coverage	1.311	95% UTL 95% Coverage	2.687
95% UPL (t)	1.134	95% UPL (t)	1.655
90% Percentile (z)	0.953	90% Percentile (z)	1.009
95% Percentile (z)	1.108	95% Percentile (z)	1.539
99% Percentile (z)	1.397	99% Percentile (z)	3.398
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.161	Mean in Original Scale	0.407
SD	0.681	SD in Original Scale	0.426
95% UTL with 95% Coverage	1.608	95% UTL with 95% Coverage	2.618
		95% BCA UTL with 95% Coverage	1.6
		95% Bootstrap (%) UTL with 95% Coverage	1.6
95% UPL (t)	1.324	95% UPL (t)	1.62
90% Percentile (z)	1.034	90% Percentile (z)	0.992
95% Percentile (z)	1.282	95% Percentile (z)	1.508
99% Percentile (z)	1.746	99% Percentile (z)	3.303
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.003	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.454		
nu star	68.18		
A-D Test Statistic	0.453	Nonparametric Statistics	
5% A-D Critical Value	0.774	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.104	Mean	0.407
5% K-S Critical Value	0.155	SD	0.421
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0685
		95% KM UTL with 95% Coverage	1.301
Assuming Gamma Distribution		95% KM Chebyshev UPL	2.265
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.125
Mean	0.408	90% Percentile (z)	0.946
Median	0.28	95% Percentile (z)	1.099
SD	0.427	99% Percentile (z)	1.386
k star	0.278		
Theta star	1.466	Gamma ROS Limits with Extrapolated Data	

				Nu star	21.71					95% Wilson Hilferty (WH) Approx. Gamma UPL	1.478
				95% Percentile of Chisquare (2k)	2.608					95% Hawkins Wixley (HW) Approx. Gamma UPL	1.813
										95% WH Approx. Gamma UTL with 95% Coverage	2.016
				90% Percentile	1.213					95% HW Approx. Gamma UTL with 95% Coverage	2.652
				95% Percentile	1.911						
				99% Percentile	3.742						

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Beryllium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 0.5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.544

For 10% significance level, 0.5 is an outlier.
For 5% significance level, 0.5 is not an outlier.
For 1% significance level, 0.5 is not an outlier.

2. Data Value 0.022 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.884

For 10% significance level, 0.022 is an outlier.
For 5% significance level, 0.022 is an outlier.
For 1% significance level, 0.022 is an outlier.

Rosner's Outlier Test for MC

Mean	0.409
Standard Deviation	0.425
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.409	0.419	1.6	22	2.84	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Beryllium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Data	39	12
Number of Non-Detect Data	5	9
Number of Detect Data	34	3
Minimum Non-Detect	0.1	0.5
Maximum Non-Detect	0.5	1
Percent Non detects	12.82%	75.00%
Minimum Detected	0.032	0.022
Maximum Detected	1.6	0.28
Mean of Detected Data	0.455	0.117
Median of Detected Data	0.29	0.05
SD of Detected Data	0.436	0.142

Site vs Background Gehan Test

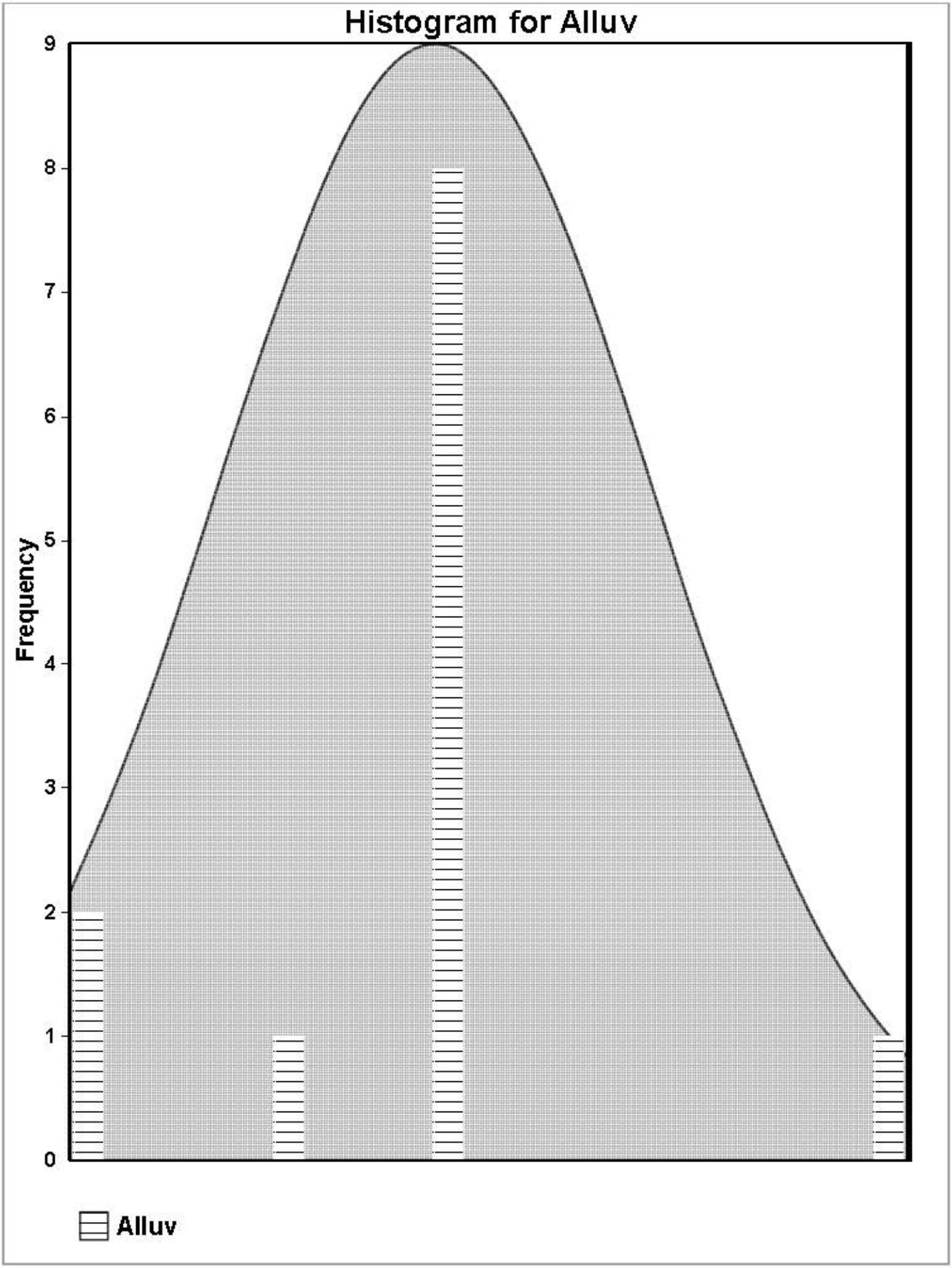
H0: Mu of Site or AOC = Mu of background

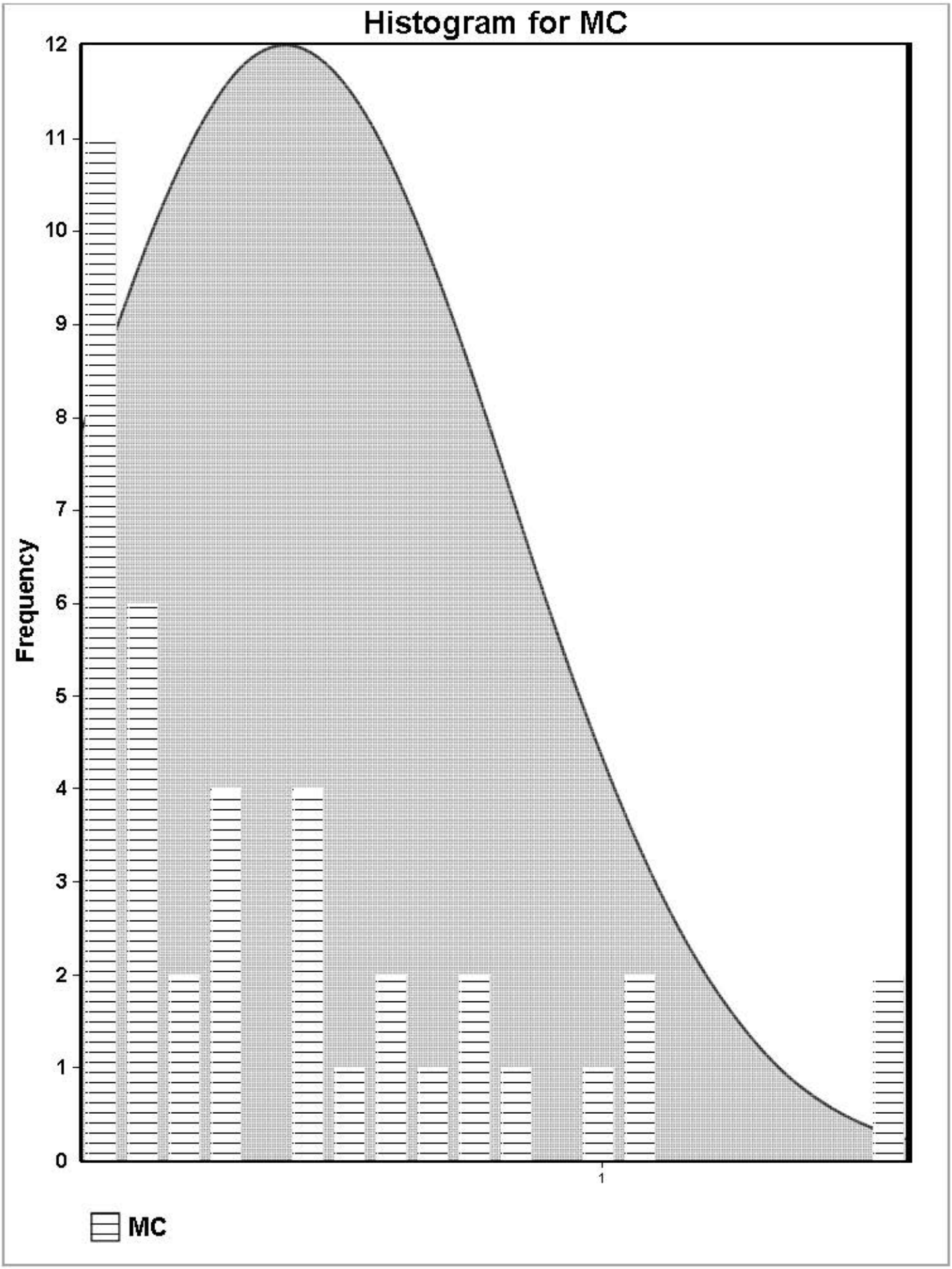
Gehan z Test Value	2.122
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0339

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
7
8
9
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
1
MC

Location	Alluv	D_Alluv
BG-1-2	0.05	1
BG-1-10	0.5	0
BG-1-29	0.5	0
BG-1-40	0.5	0
BG-2-2	0.5	0
BG-2-10	0.5	0
BG-2-19	1	0
BG-2-21	0.5	0
BG-3-2	0.022	1
BG-3-10	0.28	1
BG-6-2	0.51	0
BG-6-9	0.51	0

Location	MC	D_MC
BG-1-43	1.1	1
BG-1-46	0.13	1
BG-1-55	0.1	0
BG-1-78	0.59	1
BG-1-92	0.058	1
BG-2-30	0.33	1
BG-2-32	0.5	0
BG-2-75	0.13	1
BG-2-81	0.87	1
BG-3-17	0.078	1
BG-3-22	0.032	1
BG-3-29	0.055	1
BG-3-63	0.19	1
BG-3-65	0.17	1
BG-3-69	0.59	1
BG-3-95	0.11	0
BG-3-105	0.2	1
BG-3-131	0.046	1
BG-3-136	0.58	1
BG-4-1	0.46	1
BG-4-10	0.46	1
BG-4-19	1.6	1
BG-4-40	1	1
BG-4-65	0.11	1
BG-4-79	0.69	1
BG-4-82	0.12	0
BG-4-95	0.057	1
BG-4-117	0.12	0
BG-4-120	0.79	1
BG-4-161	0.29	1
BG-4-163	0.48	1
BG-6-28	0.81	1
BG-6-53	0.29	1
BG-6-58	0.11	1
BG-6-75	0.046	1
BG-6-87	1.6	1
BG-6-98	0.28	1
BG-6-114	0.14	1
BG-1-127	1.1	1
Average	0.420821	

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Bis.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	4	47	92.16%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	47	0.33	0.42	0.362	0.36	0.0301
Statistics (Detects Only)	4	0.0017	0.92	0.366	0.271	0.448
Statistics (All: NDs treated as DL value)	51	0.0017	0.92	0.363	0.36	0.113
Statistics (All: NDs treated as DL/2 value)	51	0.0017	0.92	0.196	0.18	0.122
Statistics (Normal ROS Estimated Data)	51	-0.48	0.92	0.0422	0.0198	0.26
Statistics (Gamma ROS Estimated Data)	51	1.000E-12	0.92	0.279	0.345	0.237
Statistics (Lognormal ROS Estimated Data)	51	4.3388E-5	0.92	0.0363	0.00232	0.147

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.299	0.295	1.223	-3.311	3.427	-1.035
Statistics (NDs = DL)	2.875	2.719	0.126	-1.198	1.048	-0.875
Statistics (NDs = DL/2)	2.585	2.446	0.0757	-1.837	0.948	-0.516
Statistics (Gamma ROS Estimates)	0.0987	0.106	2.824	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.888	2.057	-0.349

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.939	0.741	0.603	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.864	0.748	Data Appear Normal
Lilliefors (Detects Only)	0.292	0.443	Data Appear Normal
Lilliefors (NDs = DL)	0.348	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.414	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.103	0.124	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.906	0.752	0.703	0.904

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.562	0.704	
Kolmogorov-Smirnov (Detects Only)	0.334	0.418	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	12.22	0.758	
Kolmogorov-Smirnov (NDs = DL)	0.478	0.125	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	11.27	0.759	
Kolmogorov-Smirnov (NDs = DL/2)	0.439	0.125	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	13.83	0.99	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.428	0.142	Data Not Gamma Distributed	

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.902	0.532	0.588	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.784	0.748	Data Appear Lognormal
Lilliefors (Detects Only)	0.298	0.443	Data Appear Lognormal
Lilliefors (NDs = DL)	0.495	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.476	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.103	0.124	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Bis.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Number of Valid Data	51	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	47
		Percent Non-Detects	92.16%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0017	Minimum Detected	-6.377
Maximum Detected	0.92	Maximum Detected	-0.0834
Mean of Detected	0.366	Mean of Detected	-3.311
SD of Detected	0.448	SD of Detected	3.427
Minimum Non-Detect	0.33	Minimum Non-Detect	-1.109
Maximum Non-Detect	0.42	Maximum Non-Detect	-0.868

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	49
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	2
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	96.08%

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.864	Shapiro Wilk Test Statistic	0.784
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.196	Mean (Log Scale)	-1.837
SD	0.122	SD (Log Scale)	0.948
95% UTL 95% Coverage	0.445	95% UTL 95% Coverage	1.117
95% UPL (t)	0.401	95% UPL (t)	0.793
90% Percentile (z)	0.351	90% Percentile (z)	0.537
95% Percentile (z)	0.396	95% Percentile (z)	0.758
99% Percentile (z)	0.478	99% Percentile (z)	1.446

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0363
		SD in Original Scale	0.147
		Mean in Log Scale	-5.888
		SD in Log Scale	2.057
		95% UTL 95% Coverage	0.19
		95% UPL (t)	0.0901
		90% Percentile (z)	0.0387
		95% Percentile (z)	0.0818
		99% Percentile (z)	0.332
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.241	Data appear Normal at 5% Significance Level	
Theta Star	1.515		
nu star	1.932		
A-D Test Statistic	0.562	Nonparametric Statistics	
5% A-D Critical Value	0.704	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.334	Mean	0.0305
5% K-S Critical Value	0.418	SD	0.146
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0236
		95% KM UTL with 95% Coverage	0.331
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.674
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.278
Mean	0.279	90% Percentile (z)	0.218
Median	0.345	95% Percentile (z)	0.271
SD	0.237	99% Percentile (z)	0.371
k star	0.106		
Theta star	2.63	Gamma ROS Limits with Extrapolated Data	
Nu star	10.81	95% Wilson Hilferty (WH) Approx. Gamma UPL	1.325
95% Percentile of Chisquare (2k)	1.226	95% Hawkins Wixley (HW) Approx. Gamma UPL	1.887
		95% WH Approx. Gamma UTL with 95% Coverage	1.857
90% Percentile	0.759	95% HW Approx. Gamma UTL with 95% Coverage	2.947
95% Percentile	1.612		
99% Percentile	4.301		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Bis.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for All Data

Mean	0.196
Standard Deviation	0.122
Number of data	51
Number of suspected outliers	1

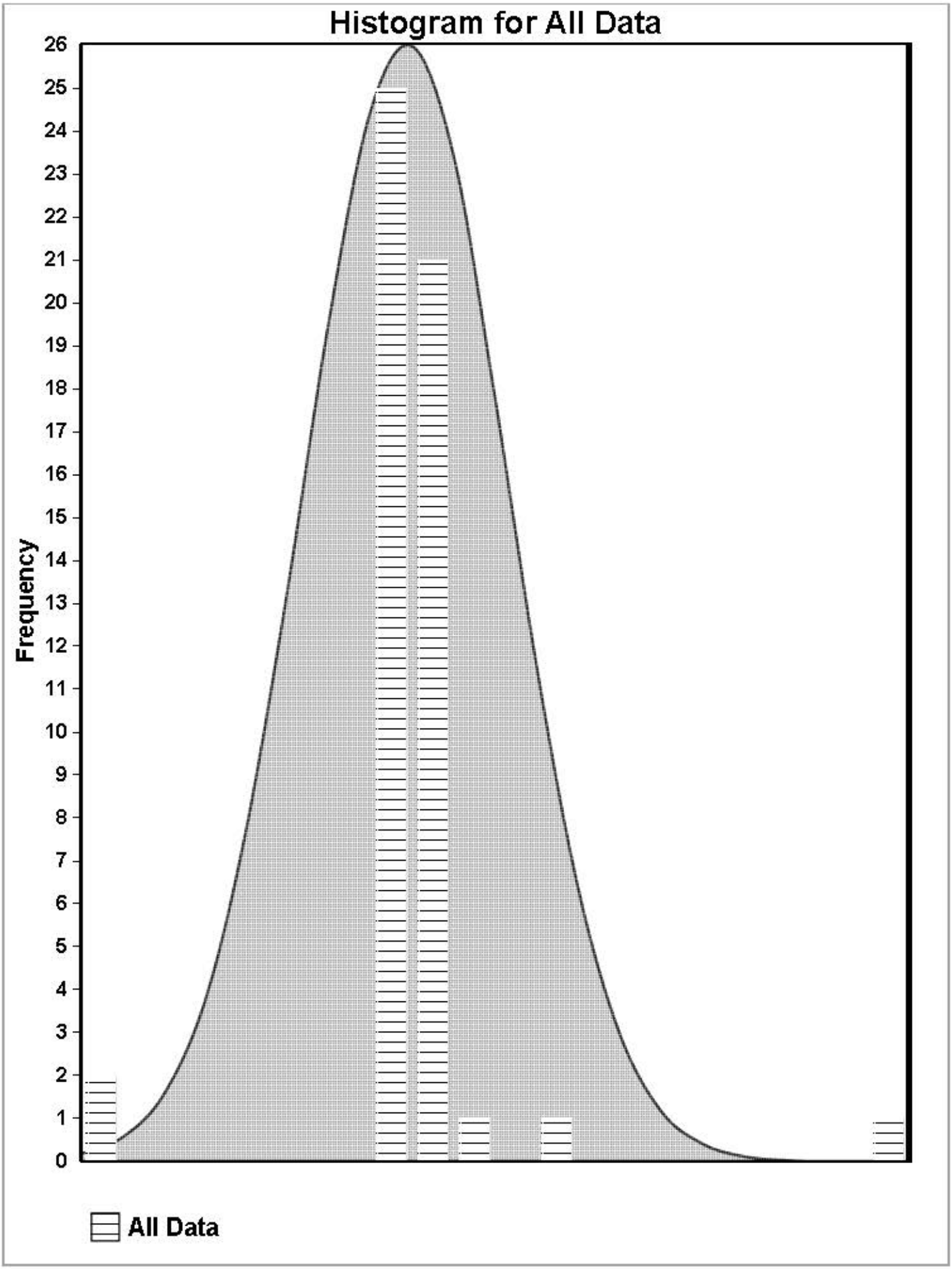
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.196	0.12	0.92	30	6.019	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.92 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.92 is a Potential Statistical Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
All Data

Location	All Data	D_All Data
BG-1-2	0.0021	1
BG-3-17	0.350	0
BG-4-2	0.35	0
BG-4-19	0.39	0
BG-1-10	0.33	0
BG-2-2	0.33	0
BG-2-10	0.33	0
BG-2-19	0.33	0
BG-3-2	0.34	0
BG-3-10	0.36	0
BG-4-10	0.36	0
BG-6-2	0.34	0
BG-6-9	0.33	0
BG-1-29	0.33	0
BG-1-40	0.33	0
BG-1-46	0.33	0
BG-1-92	0.33	0
BG-2-21	0.33	0
BG-2-32	0.33	0
BG-2-75	0.33	0
BG-3-29	0.34	0
BG-3-63	0.42	0
BG-3-65	0.4	0
BG-3-95	0.38	0
BG-3-105	0.39	0
BG-3-131	0.37	0
BG-3-136	0.4	0
BG-4-65	0.34	0
BG-4-82	0.4	0
BG-4-95	0.92	1
BG-4-117	0.39	0
BG-4-120	0.39	0
BG-6-58	0.39	0
BG-6-75	0.39	0
BG-6-98	0.39	0
BG-6-114	0.39	0
BG-6-127	0.39	0
BG-1-43	0.33	0
BG-1-55	0.54	1
BG-1-78	0.33	0
BG-2-30	0.33	0
BG-2-81	0.33	0
BG-3-22	0.340	0
BG-3-69	0.0017	1
BG-4-40	0.38	0
BG-4-79	0.39	0
BG-4-161	0.4	0
BG-4-163	0.39	0
BG-6-28	0.38	0
BG-6-53	0.4	0
BG-6-87	0.41	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Bis.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	1	12	92.31%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable 0-20 was not processed!

>20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	38	0	38	3	35	92.11%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	35	0.33	0.42	0.368	0.38	0.0312
Statistics (Detects Only)	3	0.0017	0.92	0.487	0.54	0.461
Statistics (All: NDs treated as DL value)	38	0.0017	0.92	0.378	0.385	0.116
Statistics (All: NDs treated as DL/2 value)	38	0.0017	0.92	0.208	0.193	0.136
Statistics (Normal ROS Estimated Data)	38	-0.522	0.92	0.0155	-0.018	0.296
Statistics (Gamma ROS Estimated Data)	38	1.000E-12	0.92	0.0385	1.000E-12	0.171
Statistics (Lognormal ROS Estimated Data)	38	3.2526E-5	0.92	0.0452	0.00174	0.17

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.401	0.387	1.215	-2.359	3.49	-1.48
Statistics (NDs = DL)	3.84	3.555	0.0983	-1.11	0.896	-0.807
Statistics (NDs = DL/2)	2.964	2.747	0.0702	-1.748	0.835	-0.478
Statistics (Gamma ROS Estimates)	0.0399	0.0543	0.965	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-6.087	2.33	-0.383

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.995	0.731	0.604	0.981

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.99	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.212	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.599	0.938	Data Not Normal
Lilliefors (NDs = DL)	0.318	0.144	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.412	0.938	Data Not Normal
Lilliefors (NDs = DL/2)	0.442	0.144	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.969	0.938	Data Appear Normal

Lilliefors (Normal ROS Estimates)	0.0977	0.144	Data Appear Normal	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.767	0.715	0.964

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	8.19	0.753	
Kolmogorov-Smirnov (NDs = DL)	0.439	0.144	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.992	0.754	
Kolmogorov-Smirnov (NDs = DL/2)	0.4	0.144	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	13.59	1.777	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.581	0.202	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.902	0.504	0.58	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.813	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.358	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.301	0.938	Data Not Lognormal
Lilliefors (NDs = DL)	0.474	0.144	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.392	0.938	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.448	0.144	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.966	0.938	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.124	0.144	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Bis.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Number of Valid Data	13	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	12

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable 0-20 was not processed!

>20

General Statistics

Number of Valid Data	38	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	35
		Percent Non-Detects	92.11%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0017	Minimum Detected	-6.377
Maximum Detected	0.92	Maximum Detected	-0.0834
Mean of Detected	0.487	Mean of Detected	-2.359
SD of Detected	0.461	SD of Detected	3.49
Minimum Non-Detect	0.33	Minimum Non-Detect	-1.109
Maximum Non-Detect	0.42	Maximum Non-Detect	-0.868

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	36
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	2
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	94.74%

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.99
5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level	

Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.813
5% Shapiro Wilk Critical Value	0.767
Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution	
DL/2 Substitution Method	
Mean	0.208
SD	0.136
95% UTL 95% Coverage	0.499
95% UPL (t)	0.441
90% Percentile (z)	0.383
95% Percentile (z)	0.432
99% Percentile (z)	0.525
Maximum Likelihood Estimate(MLE) Method	N/A

Assuming Lognormal Distribution	
DL/2 Substitution Method	
Mean (Log Scale)	-1.748
SD (Log Scale)	0.835
95% UTL 95% Coverage	1.034
95% UPL (t)	0.726
90% Percentile (z)	0.508
95% Percentile (z)	0.688
99% Percentile (z)	1.216
Log ROS Method	
Mean in Original Scale	0.0452
SD in Original Scale	0.17
Mean in Log Scale	-6.087
SD in Log Scale	2.33
95% UTL 95% Coverage	0.327
95% UPL (t)	0.122
90% Percentile (z)	0.045
95% Percentile (z)	0.105
99% Percentile (z)	0.514

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	N/A
Theta Star	N/A
nu star	N/A
A-D Test Statistic	N/A
5% A-D Critical Value	N/A
K-S Test Statistic	N/A
5% K-S Critical Value	N/A
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics with Extrapolated Data	
Mean	N/A
Median	N/A
SD	N/A
k star	N/A
Theta star	N/A
Nu star	N/A
95% Percentile of Chisquare (2k)	N/A
90% Percentile	N/A
95% Percentile	N/A
99% Percentile	N/A

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	

Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.04
SD	0.168
SE of Mean	0.0335
95% KM UTL with 95% Coverage	0.399
95% KM Chebyshev UPL	0.784
95% KM UPL (t)	0.328
90% Percentile (z)	0.256
95% Percentile (z)	0.317
99% Percentile (z)	0.432

Gamma ROS Limits with Extrapolated Data	
95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
95% WH Approx. Gamma UTL with 95% Coverage	N/A
95% HW Approx. Gamma UTL with 95% Coverage	N/A

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Bis.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 0.195 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.500

For 10% significance level, 0.195 is an outlier.
For 5% significance level, 0.195 is not an outlier.
For 1% significance level, 0.195 is not an outlier.

2. Data Value 0.0021 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.916

For 10% significance level, 0.0021 is an outlier.
For 5% significance level, 0.0021 is an outlier.
For 1% significance level, 0.0021 is an outlier.

Rosner's Outlier Test for >20

Mean	0.208
Standard Deviation	0.136
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.208	0.135	0.92	17	5.291	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 0.92 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 0.92 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Bis.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Data	38	13
Number of Non-Detect Data	35	12
Number of Detect Data	3	1
Minimum Non-Detect	0.33	0.33
Maximum Non-Detect	0.42	0.39
Percent Non detects	92.11%	92.31%
Minimum Detected	0.0017	0.0021
Maximum Detected	0.92	0.0021
Mean of Detected Data	0.487	0.0021
Median of Detected Data	0.54	0.0021
SD of Detected Data	0.461	N/A

Site vs Background Gehan Test

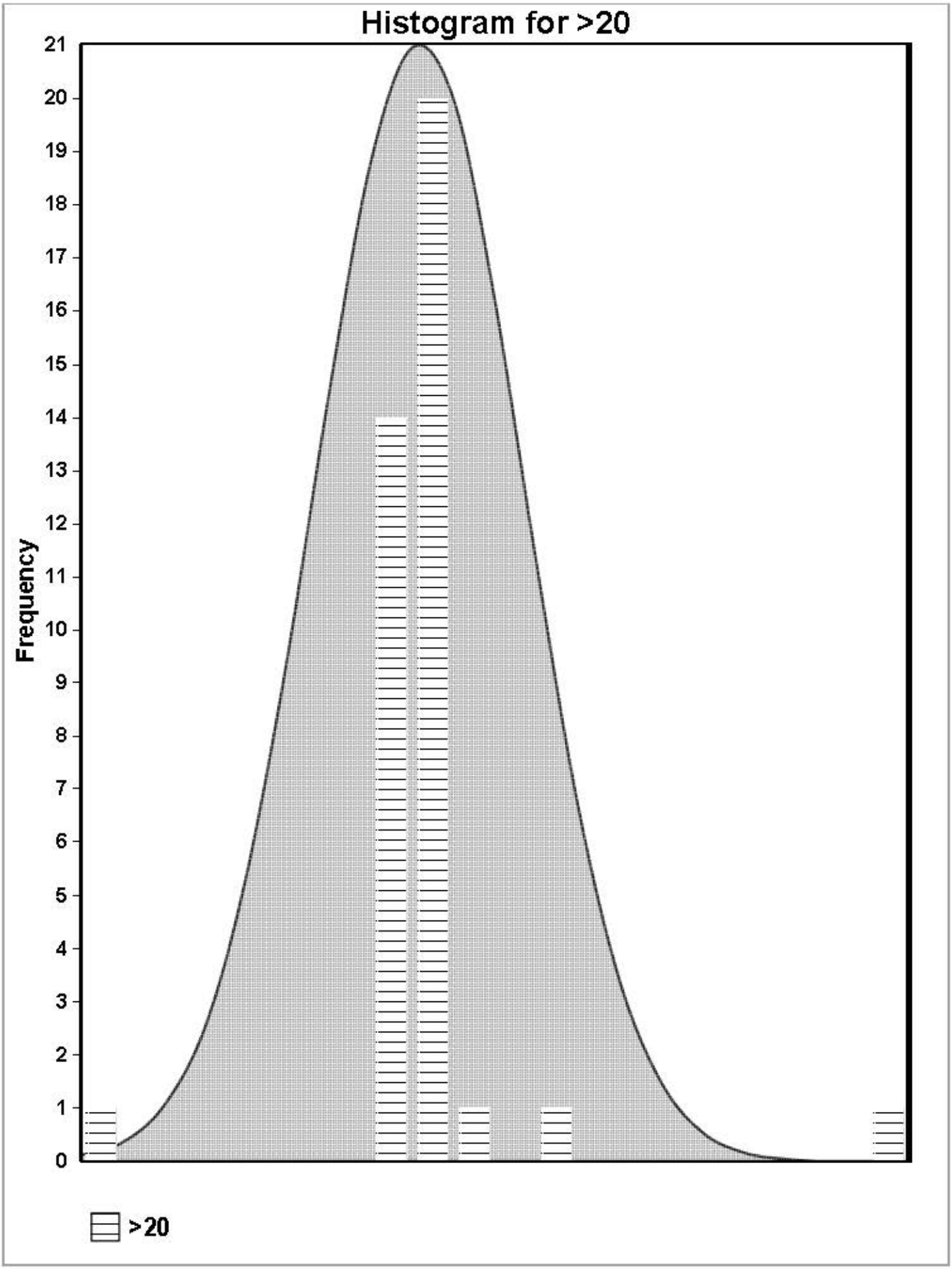
H0: Mu of Site or AOC = Mu of background

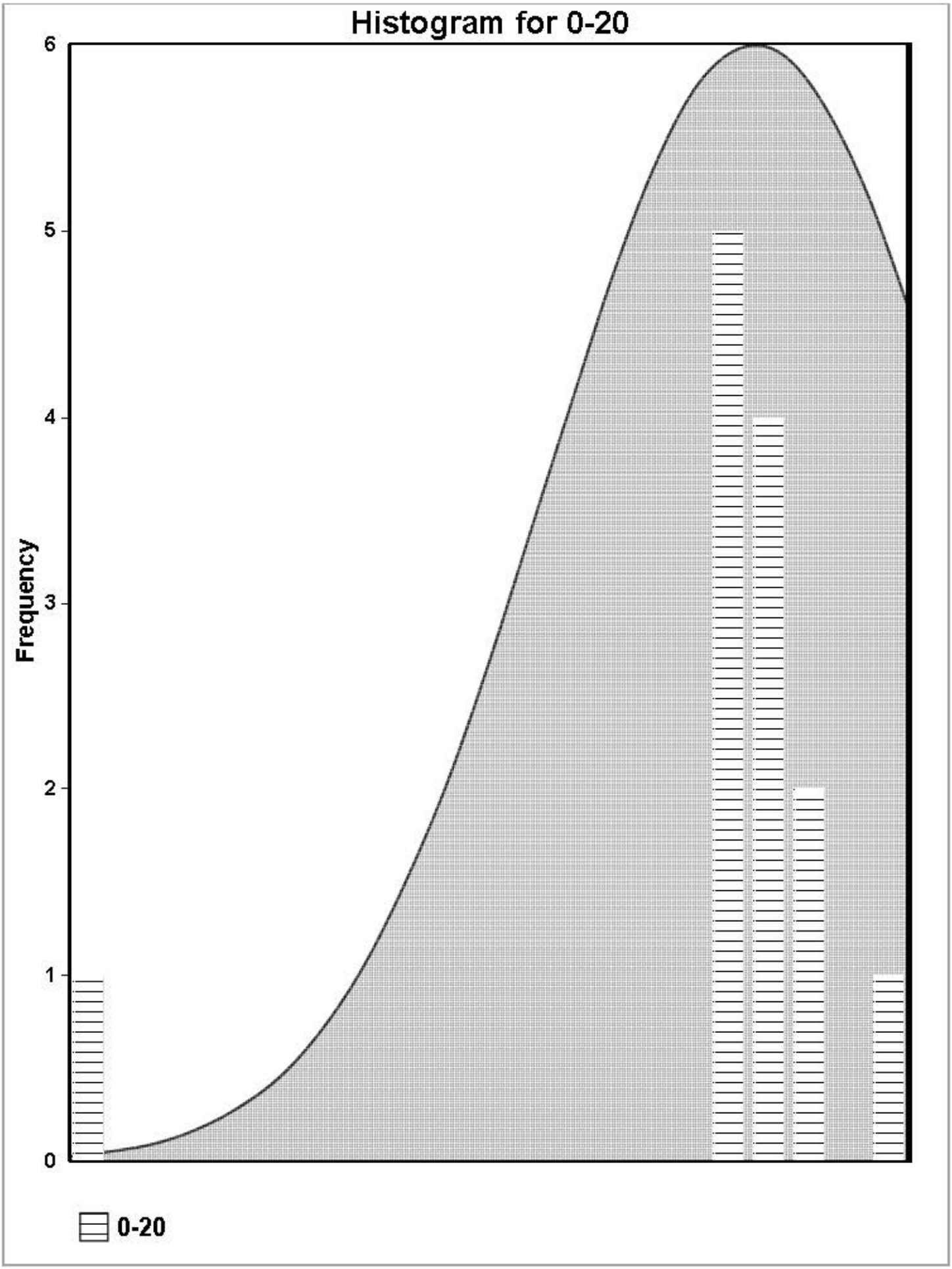
Gehan z Test Value	0.803
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.422

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5
6
0-20

Location	0-20	D_0-20
BG-1-2	0.0021	1
BG-3-17	0.350	0
BG-4-2	0.35	0
BG-4-19	0.39	0
BG-1-10	0.33	0
BG-2-2	0.33	0
BG-2-10	0.33	0
BG-2-19	0.33	0
BG-3-2	0.34	0
BG-3-10	0.36	0
BG-4-10	0.36	0
BG-6-2	0.34	0
BG-6-9	0.33	0

Location	>20	D_>20
BG-1-29	0.33	0
BG-1-40	0.33	0
BG-1-46	0.33	0
BG-1-92	0.33	0
BG-2-21	0.33	0
BG-2-32	0.33	0
BG-2-75	0.33	0
BG-3-29	0.34	0
BG-3-63	0.42	0
BG-3-65	0.4	0
BG-3-95	0.38	0
BG-3-105	0.39	0
BG-3-131	0.37	0
BG-3-136	0.4	0
BG-4-65	0.34	0
BG-4-82	0.4	0
BG-4-95	0.92	1
BG-4-117	0.39	0
BG-4-120	0.39	0
BG-6-58	0.39	0
BG-6-75	0.39	0
BG-6-98	0.39	0
BG-6-114	0.39	0
BG-6-127	0.39	0
BG-1-43	0.33	0
BG-1-55	0.54	1
BG-1-78	0.33	0
BG-2-30	0.33	0
BG-2-81	0.33	0
BG-3-22	0.340	0
BG-3-69	0.0017	1
BG-4-40	0.38	0
BG-4-79	0.39	0
BG-4-161	0.4	0
BG-4-163	0.39	0
BG-6-28	0.38	0
BG-6-53	0.4	0
BG-6-87	0.41	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Bis.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	3	15	83.33%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	15	0.33	0.41	0.367	0.38	0.0302
Statistics (Detects Only)	3	0.0017	0.54	0.181	0.0021	0.311
Statistics (All: NDs treated as DL value)	18	0.0017	0.54	0.336	0.365	0.131
Statistics (All: NDs treated as DL/2 value)	18	0.0017	0.54	0.183	0.183	0.107
Statistics (Normal ROS Estimated Data)	18	-0.172	0.54	0.048	0.0233	0.161
Statistics (Gamma ROS Estimated Data)	18	1.000E-12	0.54	0.0302	1.000E-12	0.127
Statistics (Lognormal ROS Estimated Data)	18	2.9149E-4	0.54	0.0337	0.00232	0.126

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.263	0.256	0.689	-4.386	3.267	-0.745
Statistics (NDs = DL)	1.184	1.024	0.284	-1.57	1.715	-1.092
Statistics (NDs = DL/2)	1.254	1.082	0.146	-2.147	1.524	-0.71
Statistics (Gamma ROS Estimates)	0.0437	0.0735	0.691	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.803	1.7	-0.293

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.866	0.823	0.78	0.923

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.751	0.767	Data Not Normal
Lilliefors (Detects Only)	0.385	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.696	0.897	Data Not Normal
Lilliefors (NDs = DL)	0.371	0.209	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.648	0.897	Data Not Normal
Lilliefors (NDs = DL/2)	0.363	0.209	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.871	0.897	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.172	0.209	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.663	0.809	0.952

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	4.724	0.763	
Kolmogorov-Smirnov (NDs = DL)	0.504	0.209	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	3.84	0.761	
Kolmogorov-Smirnov (NDs = DL/2)	0.464	0.208	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.908	1.198	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.522	0.254	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.882	0.651	0.695	0.925

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.777	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.374	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.438	0.897	Data Not Lognormal
Lilliefors (NDs = DL)	0.495	0.209	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.503	0.897	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.479	0.209	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.873	0.897	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.173	0.209	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	1	32	96.97%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Non-Clay was not processed!

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Bis.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Number of Valid Data	18	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	15
		Percent Non-Detects	83.33%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0017	Minimum Detected	-6.377
Maximum Detected	0.54	Maximum Detected	-0.616
Mean of Detected	0.181	Mean of Detected	-4.386
SD of Detected	0.311	SD of Detected	3.267
Minimum Non-Detect	0.33	Minimum Non-Detect	-1.109
Maximum Non-Detect	0.41	Maximum Non-Detect	-0.892

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	17
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	94.44%

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.751	Shapiro Wilk Test Statistic	0.777
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.183	Mean (Log Scale)	-2.147
SD	0.107	SD (Log Scale)	1.524
95% UTL 95% Coverage	0.447	95% UTL 95% Coverage	4.909
95% UPL (t)	0.375	95% UPL (t)	1.78
90% Percentile (z)	0.321	90% Percentile (z)	0.823
95% Percentile (z)	0.36	95% Percentile (z)	1.432

99% Percentile (z)	0.433	99% Percentile (z)	4.047
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0337
		SD in Original Scale	0.126
		Mean in Log Scale	-5.803
		SD in Log Scale	1.7
		95% UTL 95% Coverage	0.195
		95% UPL (t)	0.063
		90% Percentile (z)	0.0267
		95% Percentile (z)	0.0494
		99% Percentile (z)	0.157
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data appear Lognormal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.0318
5% K-S Critical Value	N/A	SD	0.123
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0356
		95% KM UTL with 95% Coverage	0.334
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.584
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.252
Mean	N/A	90% Percentile (z)	0.19
Median	N/A	95% Percentile (z)	0.235
SD	N/A	99% Percentile (z)	0.319
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

Non-Clay

General Statistics

Number of Valid Data	33	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	32

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Non-Clay was not processed!

Outlier Tests for Selected Variables

User Selected Options	
From File	Bis.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 0.54 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.907

For 10% significance level, 0.54 is an outlier.

For 5% significance level, 0.54 is an outlier.

For 1% significance level, 0.54 is an outlier.

2. Data Value 0.0017 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.823

For 10% significance level, 0.0017 is an outlier.

For 5% significance level, 0.0017 is an outlier.

For 1% significance level, 0.0017 is an outlier.

Rosner's Outlier Test for Non-Clay

Mean	0.203
Standard Deviation	0.13
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.203	0.128	0.92	24	5.619	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.92 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.92 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Bis.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Data	33	18
Number of Non-Detect Data	32	15
Number of Detect Data	1	3
Minimum Non-Detect	0.33	0.33
Maximum Non-Detect	0.42	0.41
Percent Non detects	96.97%	83.33%
Minimum Detected	0.92	0.0017
Maximum Detected	0.92	0.54
Mean of Detected Data	0.92	0.181
Median of Detected Data	0.92	0.0021
SD of Detected Data	N/A	0.311

Site vs Background Gehan Test

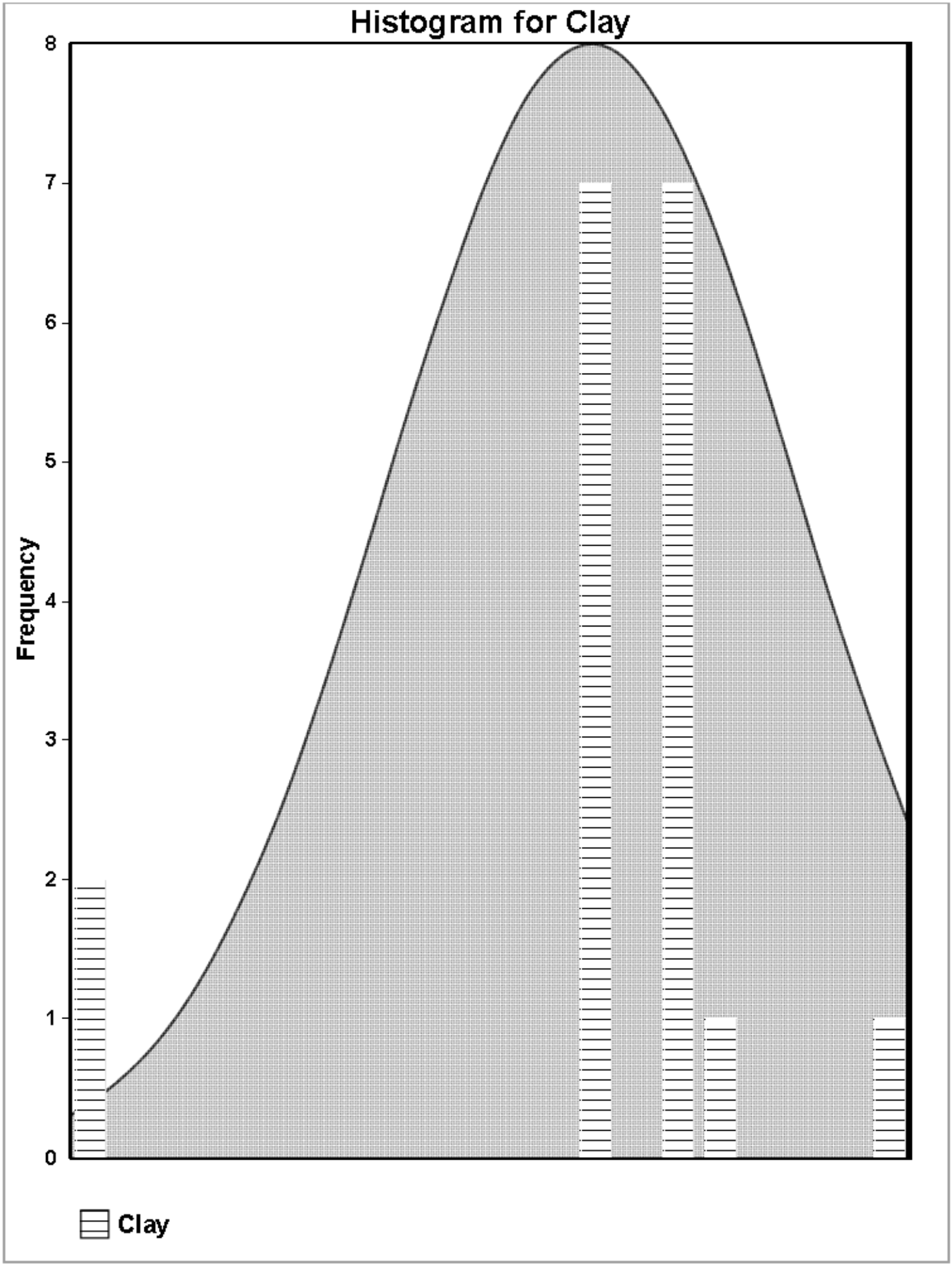
H0: Mu of Site or AOC = Mu of background

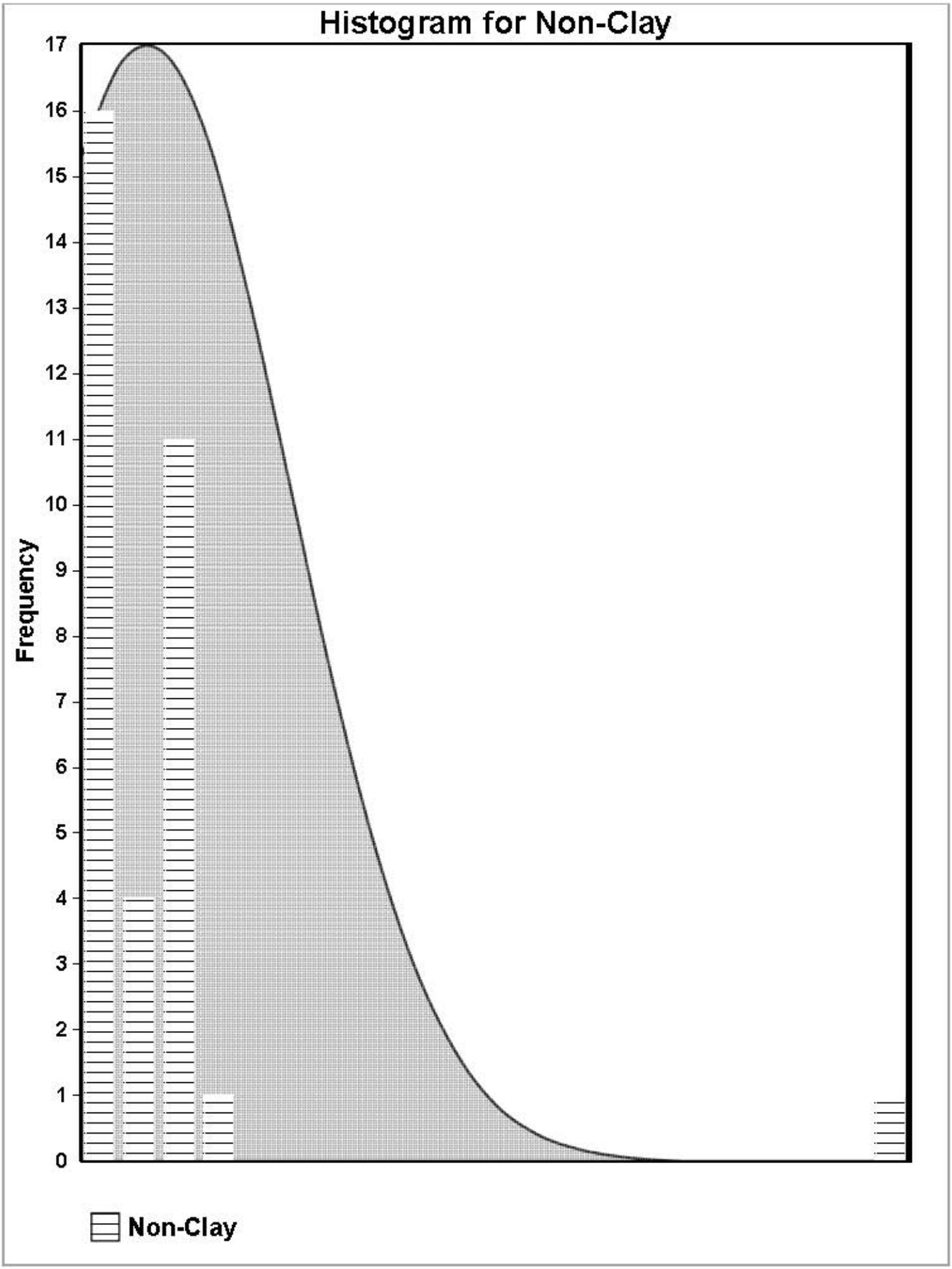
Gehan z Test Value	-0.41
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.682

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
5
6
7
8
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
Non-Clay

Location	Clay	D_Clay	Location	Non-Clay	D_Non-Clay
BG-1-2	0.0021	1	BG-1-10	0.33	0
BG-1-43	0.33	0	BG-1-29	0.33	0
BG-1-55	0.54	1	BG-1-40	0.33	0
BG-1-78	0.33	0	BG-1-46	0.33	0
BG-2-30	0.33	0	BG-1-92	0.33	0
BG-2-81	0.33	0	BG-2-2	0.33	0
BG-3-17	0.350	0	BG-2-10	0.33	0
BG-3-22	0.340	0	BG-2-19	0.33	0
BG-3-69	0.0017	1	BG-2-21	0.33	0
BG-4-2	0.35	0	BG-2-32	0.33	0
BG-4-19	0.39	0	BG-2-75	0.33	0
BG-4-40	0.38	0	BG-3-2	0.34	0
BG-4-79	0.39	0	BG-3-10	0.36	0
BG-4-161	0.4	0	BG-3-29	0.34	0
BG-4-163	0.39	0	BG-3-63	0.42	0
BG-6-28	0.38	0	BG-3-65	0.4	0
BG-6-53	0.4	0	BG-3-95	0.38	0
BG-6-87	0.41	0	BG-3-105	0.39	0
			BG-3-131	0.37	0
			BG-3-136	0.4	0
			BG-4-10	0.36	0
			BG-4-65	0.34	0
			BG-4-82	0.4	0
			BG-4-95	0.92	1
			BG-4-117	0.39	0
			BG-4-120	0.39	0
			BG-6-2	0.34	0
			BG-6-9	0.33	0
			BG-6-58	0.39	0
			BG-6-75	0.39	0
			BG-6-98	0.39	0
			BG-6-114	0.39	0
			BG-6-127	0.39	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Bis.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	1	11	91.67%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Alluv was not processed!

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	39	0	39	3	36	92.31%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	36	0.33	0.42	0.371	0.385	0.0291
Statistics (Detects Only)	3	0.017	0.92	0.492	0.54	0.453
Statistics (All: NDs treated as DL value)	39	0.017	0.92	0.38	0.39	0.113
Statistics (All: NDs treated as DL/2 value)	39	0.017	0.92	0.209	0.195	0.134
Statistics (Normal ROS Estimated Data)	39	-0.494	0.92	0.0299	-0.00276	0.28
Statistics (Gamma ROS Estimated Data)	39	1.000E-12	0.92	0.0379	1.000E-12	0.169
Statistics (Lognormal ROS Estimated Data)	39	0.00144	0.92	0.0653	0.017	0.166

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.686	0.651	0.717	-1.591	2.167	-1.362
Statistics (NDs = DL)	6.936	6.419	0.0548	-1.041	0.528	-0.507
Statistics (NDs = DL/2)	4.49	4.162	0.0465	-1.681	0.504	-0.3
Statistics (Gamma ROS Estimates)	0.0399	0.0539	0.949	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.91	1.393	-0.356

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.996	0.724	0.594	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.992	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.209	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.59	0.939	Data Not Normal
Lilliefors (NDs = DL)	0.328	0.142	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.4	0.939	Data Not Normal
Lilliefors (NDs = DL/2)	0.446	0.142	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.964	0.939	Data Appear Normal

Lilliefors (Normal ROS Estimates)	0.111	0.142	Data Appear Normal	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.755	0.689	0.966

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	7.082	0.75	
Kolmogorov-Smirnov (NDs = DL)	0.381	0.142	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.838	0.752	
Kolmogorov-Smirnov (NDs = DL/2)	0.382	0.142	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	13.96	1.799	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.583	0.2	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.921	0.581	0.673	0.981

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.848	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.34	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.393	0.939	Data Not Lognormal
Lilliefors (NDs = DL)	0.423	0.142	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.517	0.939	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.379	0.142	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.964	0.939	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.137	0.142	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Bis.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Number of Valid Data	12	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	11

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Alluv was not processed!

MC

General Statistics

Number of Valid Data	39	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	36
		Percent Non-Detects	92.31%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.017	Minimum Detected	-4.075
Maximum Detected	0.92	Maximum Detected	-0.0834
Mean of Detected	0.492	Mean of Detected	-1.591
SD of Detected	0.453	SD of Detected	2.167
Minimum Non-Detect	0.33	Minimum Non-Detect	-1.109
Maximum Non-Detect	0.42	Maximum Non-Detect	-0.868

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	37
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	2
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	94.87%

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.992
5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level	

Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.848
5% Shapiro Wilk Critical Value	0.767
Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution	
DL/2 Substitution Method	
Mean	0.209
SD	0.134
95% UTL 95% Coverage	0.493
95% UPL (t)	0.437
90% Percentile (z)	0.38
95% Percentile (z)	0.429
99% Percentile (z)	0.52
Maximum Likelihood Estimate(MLE) Method	N/A

Assuming Lognormal Distribution	
DL/2 Substitution Method	
Mean (Log Scale)	-1.681
SD (Log Scale)	0.504
95% UTL 95% Coverage	0.543
95% UPL (t)	0.44
90% Percentile (z)	0.355
95% Percentile (z)	0.426
99% Percentile (z)	0.601
Log ROS Method	
Mean in Original Scale	0.0653
SD in Original Scale	0.166
Mean in Log Scale	-3.91
SD in Log Scale	1.393
95% UTL 95% Coverage	0.386
95% UPL (t)	0.216
90% Percentile (z)	0.119
95% Percentile (z)	0.198
99% Percentile (z)	0.512

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	N/A
Theta Star	N/A
nu star	N/A
A-D Test Statistic	N/A
5% A-D Critical Value	N/A
K-S Test Statistic	N/A
5% K-S Critical Value	N/A
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics with Extrapolated Data	
Mean	N/A
Median	N/A
SD	N/A
k star	N/A
Theta star	N/A
Nu star	N/A
95% Percentile of Chisquare (2k)	N/A
90% Percentile	N/A
95% Percentile	N/A
99% Percentile	N/A

Data Distribution Test with Detected Values Only
Data appear Normal at 5% Significance Level

Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.0536
SD	0.163
SE of Mean	0.032
95% KM UTL with 95% Coverage	0.4
95% KM Chebyshev UPL	0.773
95% KM UPL (t)	0.332
90% Percentile (z)	0.263
95% Percentile (z)	0.322
99% Percentile (z)	0.433
Gamma ROS Limits with Extrapolated Data	
95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
95% WH Approx. Gamma UTL with 95% Coverage	N/A
95% HW Approx. Gamma UTL with 95% Coverage	N/A

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Bis.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 0.18 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.667

For 10% significance level, 0.18 is an outlier.
For 5% significance level, 0.18 is an outlier.
For 1% significance level, 0.18 is an outlier.

2. Data Value 0.021 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.966

For 10% significance level, 0.021 is an outlier.
For 5% significance level, 0.021 is an outlier.
For 1% significance level, 0.021 is an outlier.

Rosner's Outlier Test for MC

Mean	0.209
Standard Deviation	0.134
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.209	0.132	0.92	27	5.387	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 0.92 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 0.92 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Bis.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Data	39	12
Number of Non-Detect Data	36	11
Number of Detect Data	3	1
Minimum Non-Detect	0.33	0.33
Maximum Non-Detect	0.42	0.36
Percent Non detects	92.31%	91.67%
Minimum Detected	0.017	0.021
Maximum Detected	0.92	0.021
Mean of Detected Data	0.492	0.021
Median of Detected Data	0.54	0.021
SD of Detected Data	0.453	N/A

Site vs Background Gehan Test

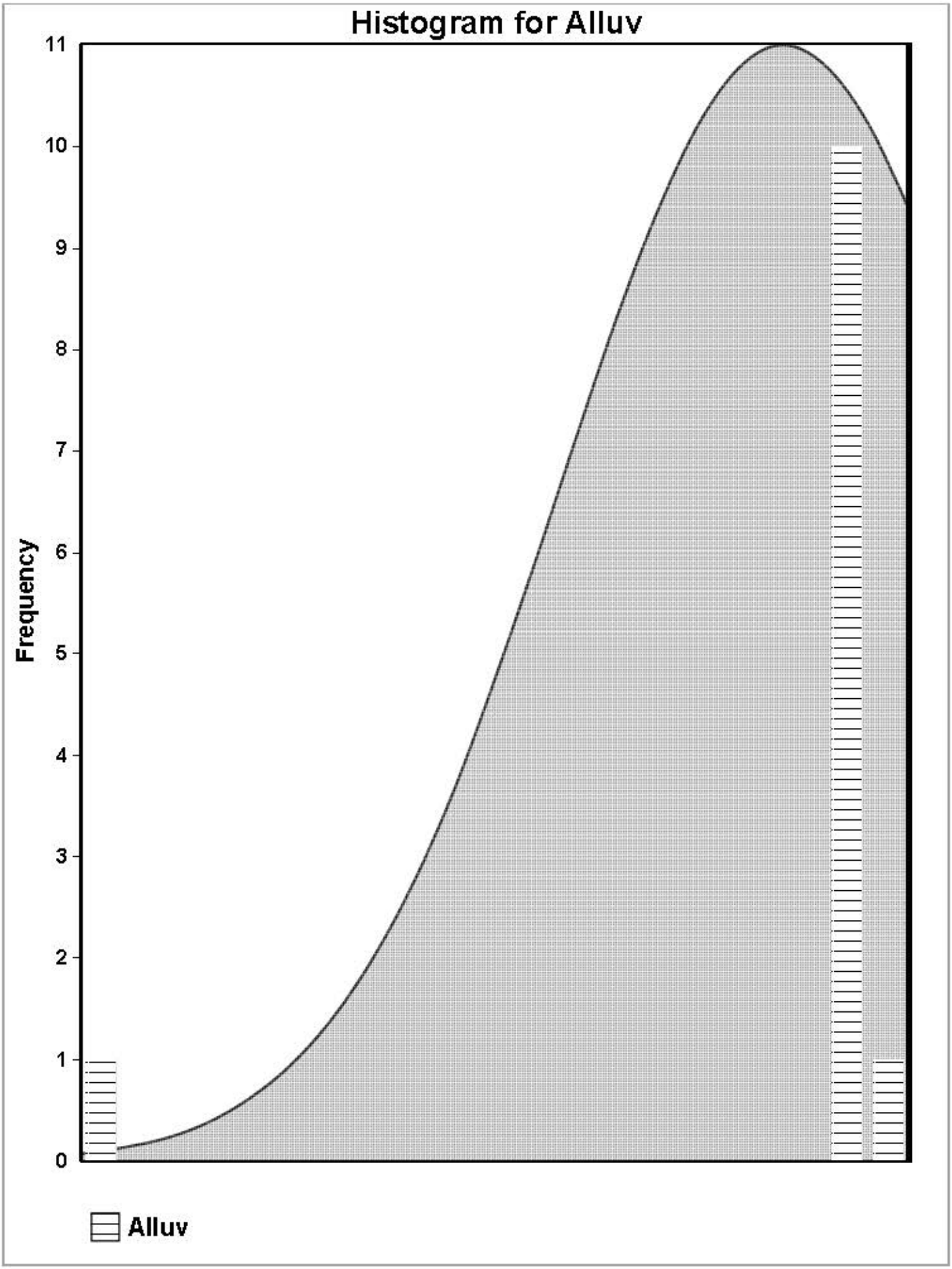
H0: Mu of Site or AOC = Mu of background

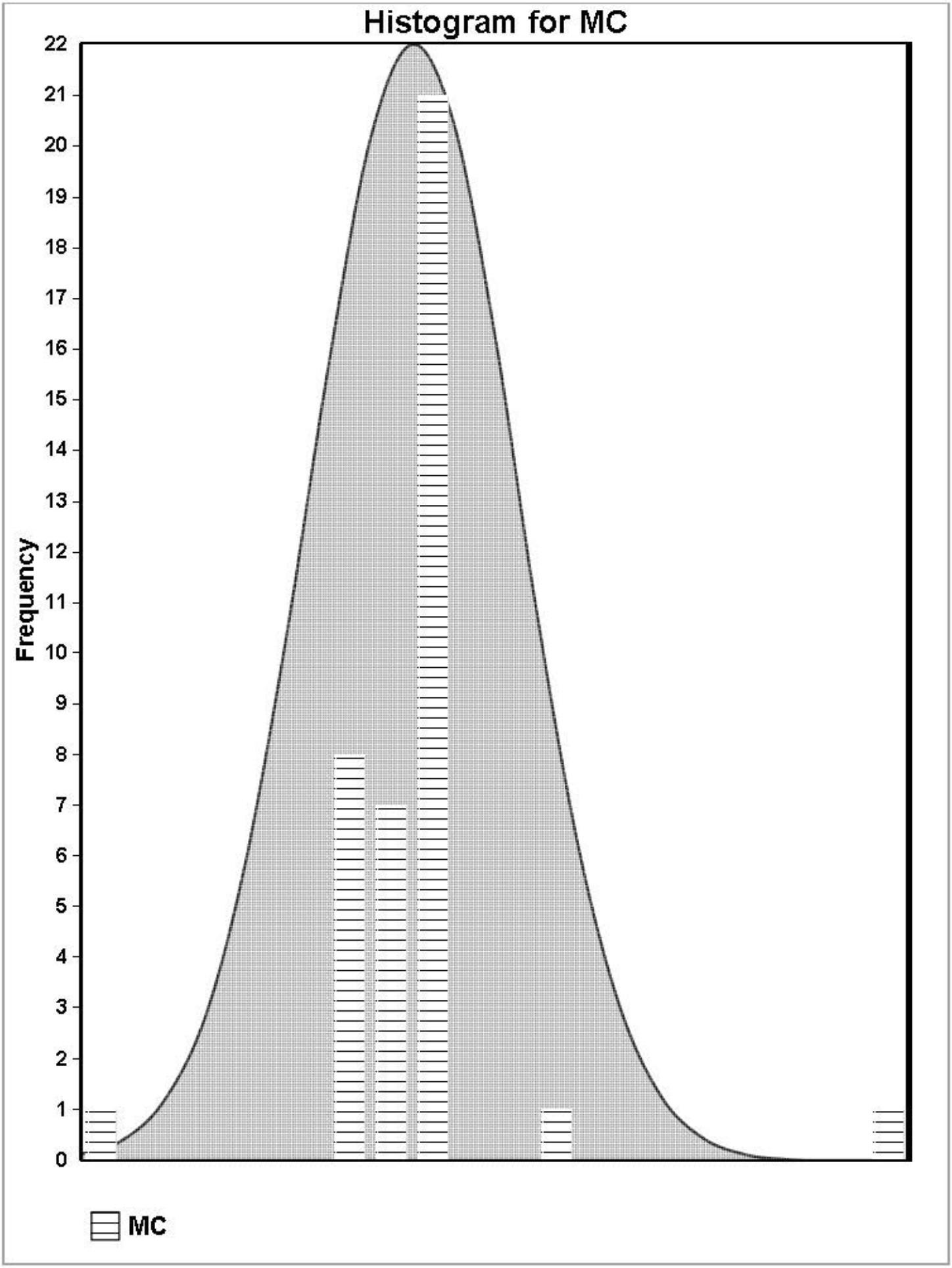
Gehan z Test Value	0.759
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.448

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
MC

Location	Alluv	D_Alluv
BG-1-2	0.021	1
BG-1-10	0.33	0
BG-1-29	0.33	0
BG-1-40	0.33	0
BG-2-2	0.33	0
BG-2-10	0.33	0
BG-2-19	0.33	0
BG-2-21	0.33	0
BG-3-2	0.34	0
BG-3-10	0.36	0
BG-6-2	0.34	0
BG-6-9	0.33	0

Location	MC	D_MC
BG-1-43	0.33	0
BG-1-46	0.33	0
BG-1-55	0.54	1
BG-1-78	0.33	0
BG-1-92	0.33	0
BG-2-30	0.33	0
BG-2-32	0.33	0
BG-2-75	0.33	0
BG-2-81	0.33	0
BG-3-17	0.35	0
BG-3-22	0.34	0
BG-3-29	0.34	0
BG-3-63	0.42	0
BG-3-65	0.4	0
BG-3-69	0.017	1
BG-3-95	0.38	0
BG-3-105	0.39	0
BG-3-131	0.37	0
BG-3-136	0.4	0
BG-4-1	0.35	0
BG-4-10	0.36	0
BG-4-19	0.39	0
BG-4-40	0.38	0
BG-4-65	0.34	0
BG-4-79	0.39	0
BG-4-82	0.4	0
BG-4-95	0.92	1
BG-4-117	0.39	0
BG-4-120	0.39	0
BG-4-161	0.4	0
BG-4-163	0.39	0
BG-6-28	0.38	0
BG-6-53	0.4	0
BG-6-58	0.39	0
BG-6-75	0.39	0
BG-6-87	0.41	0
BG-6-98	0.39	0
BG-6-114	0.39	0
BG-1-127	0.39	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Boron.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	50	1	1.96%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	50	1.2	30	11.02	9.3	7.396
Statistics (All: NDs treated as DL value)	51	1.2	30	11	9.3	7.323
Statistics (All: NDs treated as DL/2 value)	51	1.2	30	10.9	9.3	7.37
Statistics (Normal ROS Estimated Data)	51	1.2	30	10.93	9.3	7.349
Statistics (Gamma ROS Estimated Data)	51	1.2	30	10.94	9.3	7.342
Statistics (Lognormal ROS Estimated Data)	51	1.2	30	10.91	9.3	7.361

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.388	2.26	4.615	2.176	0.709	0.326
Statistics (NDs = DL)	2.432	2.302	4.523	2.178	0.702	0.322
Statistics (NDs = DL/2)	2.384	2.257	4.572	2.165	0.706	0.326
Statistics (Gamma ROS Estimates)	2.417	2.288	4.528	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.167	0.705	0.325

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.937	0.936	0.935	0.935

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.866	0.947	Data Not Normal
Lilliefors (Detects Only)	0.174	0.125	Data Not Normal
Lilliefors (NDs = DL)	0.177	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.172	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.173	0.124	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.979	0.979	0.98	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.436	0.761	
Kolmogorov-Smirnov (Detects Only)	0.0965	0.127	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.476	0.76	
Kolmogorov-Smirnov (NDs = DL)	0.0997	0.126	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.425	0.761	
Kolmogorov-Smirnov (NDs = DL/2)	0.0947	0.126	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.464	0.76	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0968	0.126	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.986	0.985	0.987	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.966	0.947	Data Appear Lognormal
Lilliefors (Detects Only)	0.0929	0.125	Data Appear Lognormal
Lilliefors (NDs = DL)	0.0981	0.124	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.0864	0.124	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.085	0.124	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Boron.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Number of Valid Data	51	Number of Detected Data	50
Number of Distinct Detected Data	36	Number of Non-Detect Data	1
		Percent Non-Detects	1.96%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.2	Minimum Detected	0.182
Maximum Detected	30	Maximum Detected	3.401
Mean of Detected	11.02	Mean of Detected	2.176
SD of Detected	7.396	SD of Detected	0.709
Minimum Non-Detect	10	Minimum Non-Detect	2.303
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.866	Shapiro Wilk Test Statistic	0.966
5% Shapiro Wilk Critical Value	0.947	5% Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	10.9	Mean (Log Scale)	2.165
SD	7.37	SD (Log Scale)	0.706
95% UTL 95% Coverage	26.04	95% UTL 95% Coverage	37.16
95% UPL (t)	23.37	95% UPL (t)	28.79
90% Percentile (z)	20.35	90% Percentile (z)	21.54
95% Percentile (z)	23.02	95% Percentile (z)	27.84
99% Percentile (z)	28.05	99% Percentile (z)	45.05
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	8.229	Mean in Original Scale	10.91
SD	10.27	SD in Original Scale	7.361
95% UTL with 95% Coverage	29.31	95% UTL with 95% Coverage	37.12
		95% BCA UTL with 95% Coverage	29
		95% Bootstrap (%) UTL with 95% Coverage	29
95% UPL (t)	25.6	95% UPL (t)	28.77
90% Percentile (z)	21.38	90% Percentile (z)	21.54
95% Percentile (z)	25.11	95% Percentile (z)	27.83
99% Percentile (z)	32.11	99% Percentile (z)	44.98

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.258	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	4.88		
nu star	225.8		
A-D Test Statistic	0.436	Nonparametric Statistics	
5% A-D Critical Value	0.761	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.0965	Mean	10.92
5% K-S Critical Value	0.127	SD	7.291
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.032
		95% KM UTL with 95% Coverage	25.89
Assuming Gamma Distribution		95% KM Chebyshev UPL	43.01
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	23.26
Mean	10.94	90% Percentile (z)	20.26
Median	9.3	95% Percentile (z)	22.91
SD	7.342	99% Percentile (z)	27.88
k star	2.288		
Theta star	4.783	Gamma ROS Limits with Extrapolated Data	
Nu star	233.3	95% Wilson Hilferty (WH) Approx. Gamma UPL	25.1
95% Percentile of Chisquare (2k)	10.41	95% Hawkins Wixley (HW) Approx. Gamma UPL	25.7
		95% WH Approx. Gamma UTL with 95% Coverage	29.83
90% Percentile	20.63	95% HW Approx. Gamma UTL with 95% Coverage	30.99
95% Percentile	24.89		
99% Percentile	34.27		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Boron.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

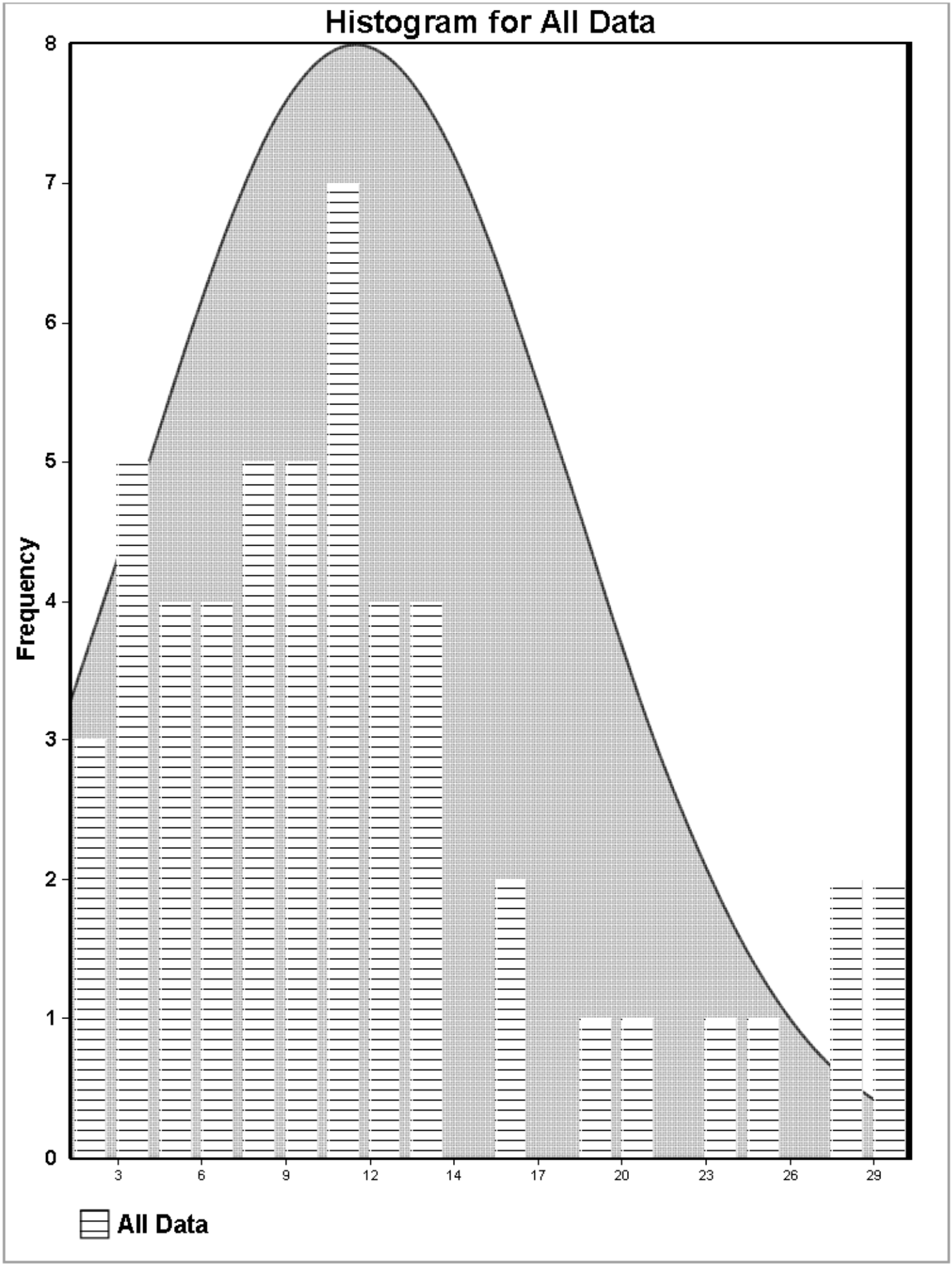
Rosner's Outlier Test for All Data

Mean	10.9
Standard Deviation	7.37
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	10.9	7.298	30	1	2.617	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
3
6
9
12
14
17
20
23
26
29
All Data

Location	All Data	D_All Data
BG-1-2	30	1
BG-1-10	6.5	1
BG-2-2	9.3	1
BG-2-10	8.5	1
BG-2-19	13	1
BG-3-2	6.6	1
BG-3-10	8.1	1
BG-6-2	8.8	1
BG-6-9	5.5	1
BG-4-1	24	1
BG-4-10	13	1
BG-4-19	28	1
BG-3-17	6.4	1
BG-1-43	16	1
BG-1-46	11	1
BG-1-55	1.2	1
BG-1-78	16	1
BG-1-92	3.1	1
BG-2-30	25	1
BG-2-32	10	1
BG-2-75	9.3	1
BG-2-81	29	1
BG-3-22	5.3	1
BG-3-29	3.5	1
BG-3-63	12	1
BG-3-65	11	1
BG-3-69	14	1
BG-3-95	2.4	1
BG-3-105	6.8	1
BG-3-131	3.4	1
BG-3-136	12	1
BG-4-40	28	1
BG-4-65	7	1
BG-4-79	19	1
BG-4-82	12	1
BG-4-95	5.5	1
BG-4-117	2.8	1
BG-4-120	12	1
BG-4-161	8.3	1
BG-4-163	10	1
BG-6-28	20	1
BG-6-53	10	1
BG-6-58	5.1	1
BG-6-75	2.6	1
BG-6-87	8.2	1
BG-6-98	9.9	1

BG-6-114	7	1
BG-1-127	8.5	1
BG-1-29	3.3	1
BG-1-40	10	0
BG-2-21	13	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Boron.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	13	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	13	5.5	30	12.9	8.8	8.629

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.051	2.398	4.229	2.384	0.584	0.245

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.883	0.883	0.883	0.883

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.769	0.866	Data Not Normal
Lilliefors (Full: no NDs)	0.277	0.246	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.945	0.945	0.945	0.945

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.941	0.739	
Kolmogorov-Smirnov (Full: no NDs)	0.25	0.238	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.942	0.942	0.942	0.942

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.871	0.866	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.22	0.246	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

>20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	38	0	38	37	1	2.63%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	37	1.2	29	10.36	9.9	6.922

Statistics (All: NDs treated as DL value)	38	1.2	29	10.35	9.95	6.828
Statistics (All: NDs treated as DL/2 value)	38	1.2	29	10.22	9.6	6.883
Statistics (Normal ROS Estimated Data)	38	1.2	29	10.24	9.6	6.867
Statistics (Gamma ROS Estimated Data)	38	1.2	29	10.25	9.6	6.859
Statistics (Lognormal ROS Estimated Data)	38	1.2	29	10.21	9.6	6.884

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.278	2.116	4.546	2.102	0.741	0.353
Statistics (NDs = DL)	2.336	2.169	4.43	2.108	0.732	0.347
Statistics (NDs = DL/2)	2.285	2.122	4.471	2.089	0.735	0.352
Statistics (Gamma ROS Estimates)	2.311	2.146	4.436	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.089	0.736	0.352

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.949	0.948	0.947	0.947

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.895	0.936	Data Not Normal
Lilliefors (Detects Only)	0.163	0.146	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.894	0.938	Data Not Normal
Lilliefors (NDs = DL)	0.168	0.144	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.891	0.938	Data Not Normal
Lilliefors (NDs = DL/2)	0.161	0.144	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.892	0.938	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.162	0.144	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.988	0.987	0.989	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.308	0.758	
Kolmogorov-Smirnov (Detects Only)	0.0913	0.147	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.357	0.758	
Kolmogorov-Smirnov (NDs = DL)	0.0897	0.145	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.273	0.758	
Kolmogorov-Smirnov (NDs = DL/2)	0.083	0.145	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.272	0.758	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0857	0.145	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.983	0.981	0.986	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.962	0.936	Data Appear Lognormal
Lilliefors (Detects Only)	0.123	0.146	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.959	0.938	Data Appear Lognormal
Lilliefors (NDs = DL)	0.13	0.144	Data Appear Lognormal

Shapiro-Wilks (NDs = DL/2)	0.967	0.938	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.113	0.144	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.967	0.938	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.113	0.144	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Boron.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	12

Raw Statistics		Log-Transformed Statistics	
Minimum	5.5	Minimum	1.705
Maximum	30	Maximum	3.401
Second Largest	28	Second Largest	3.332
First Quartile	6.6	First Quartile	1.887
Median	8.8	Median	2.175
Third Quartile	13	Third Quartile	2.565
Mean	12.9	Mean	2.384
SD	8.629	SD	0.584
Coefficient of Variation	0.669		
Skewness	1.273		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.769	Shapiro Wilk Test Statistic	0.871
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	35.95	95% UTL with 95% Coverage	51.63
95% UPL (t)	28.86	95% UPL (t)	31.96
90% Percentile (z)	23.96	90% Percentile (z)	22.94
95% Percentile (z)	27.09	95% Percentile (z)	28.36
99% Percentile (z)	32.97	99% Percentile (z)	42.22

Gamma Distribution Test		Data Distribution Test	
k star	2.398	Data appear Lognormal at 5% Significance Level	
Theta Star	5.38		
MLE of Mean	12.9		
MLE of Standard Deviation	8.331		
nu star	62.34		
A-D Test Statistic	0.941	Nonparametric Statistics	
5% A-D Critical Value	0.739	90% Percentile	27.2
K-S Test Statistic	0.25	95% Percentile	28.8
5% K-S Critical Value	0.238	99% Percentile	29.76
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	30
90% Percentile	24.06	95% Percentile Bootstrap UTL with 95% Coverage	30
95% Percentile	28.92	95% BCA Bootstrap UTL with 95% Coverage	30
99% Percentile	39.61	95% UPL	30
		95% Chebyshev UPL	51.93
95% WH Approx. Gamma UPL	30.3	Upper Threshold Limit Based upon IQR	22.6
95% HW Approx. Gamma UPL	30.63		
95% WH Approx. Gamma UTL with 95% Coverage	42.9		
95% HW Approx. Gamma UTL with 95% Coverage	44.51		

>20

General Statistics			
Number of Valid Data	38	Number of Detected Data	37
Number of Distinct Detected Data	29	Number of Non-Detect Data	1
		Percent Non-Detects	2.63%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.2	Minimum Detected	0.182
Maximum Detected	29	Maximum Detected	3.367
Mean of Detected	10.36	Mean of Detected	2.102
SD of Detected	6.922	SD of Detected	0.741
Minimum Non-Detect	10	Minimum Non-Detect	2.303
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.895	Shapiro Wilk Test Statistic	0.962
5% Shapiro Wilk Critical Value	0.936	5% Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	10.22	Mean (Log Scale)	2.089
SD	6.883	SD (Log Scale)	0.735
95% UTL 95% Coverage	24.89	95% UTL 95% Coverage	38.76
95% UPL (t)	21.98	95% UPL (t)	28.4
90% Percentile (z)	19.04	90% Percentile (z)	20.74
95% Percentile (z)	21.54	95% Percentile (z)	27.09
99% Percentile (z)	26.23	99% Percentile (z)	44.71
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	8.782	Mean in Original Scale	10.21
SD	8.589	SD in Original Scale	6.884
95% UTL with 95% Coverage	27.09	95% UTL with 95% Coverage	38.77
		95% BCA UTL with 95% Coverage	29
		95% Bootstrap (%) UTL with 95% Coverage	29
95% UPL (t)	23.46	95% UPL (t)	28.4
90% Percentile (z)	19.79	90% Percentile (z)	20.74
95% Percentile (z)	22.91	95% Percentile (z)	27.09

99% Percentile (z)	28.76	99% Percentile (z)	44.72
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.112	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	4.905		
nu star	156.3		
A-D Test Statistic	0.308	Nonparametric Statistics	
5% A-D Critical Value	0.758	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.0913	Mean	10.23
5% K-S Critical Value	0.147	SD	6.796
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.12
		95% KM UTL with 95% Coverage	24.72
Assuming Gamma Distribution		95% KM Chebyshev UPL	40.24
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	21.84
Mean	10.25	90% Percentile (z)	18.94
Median	9.6	95% Percentile (z)	21.41
SD	6.859	99% Percentile (z)	26.04
k star	2.146		
Theta star	4.777	Gamma ROS Limits with Extrapolated Data	
Nu star	163.1	95% Wilson Hilferty (WH) Approx. Gamma UPL	24.15
95% Percentile of Chisquare (2k)	9.957	95% Hawkins Wixley (HW) Approx. Gamma UPL	24.85
		95% WH Approx. Gamma UTL with 95% Coverage	29.61
90% Percentile	19.61	95% HW Approx. Gamma UTL with 95% Coverage	31.05
95% Percentile	23.78		
99% Percentile	33		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Boron.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 30 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.254

For 10% significance level, 30 is not an outlier.
For 5% significance level, 30 is not an outlier.
For 1% significance level, 30 is not an outlier.

2. Data Value 5.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.044

For 10% significance level, 5.5 is not an outlier.
For 5% significance level, 5.5 is not an outlier.
For 1% significance level, 5.5 is not an outlier.

Rosner's Outlier Test for >20

Mean	10.22
Standard Deviation	6.883
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	10.22	6.792	29	9	2.766	3.01	3.36

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Boron.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Data	38	13
Number of Non-Detect Data	1	0
Number of Detect Data	37	13
Minimum Non-Detect	10	N/A
Maximum Non-Detect	10	N/A
Percent Non detects	2.63%	0.00%
Minimum Detected	1.2	5.5
Maximum Detected	29	30
Mean of Detected Data	10.36	12.9
Median of Detected Data	9.9	8.8
SD of Detected Data	6.922	8.629

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

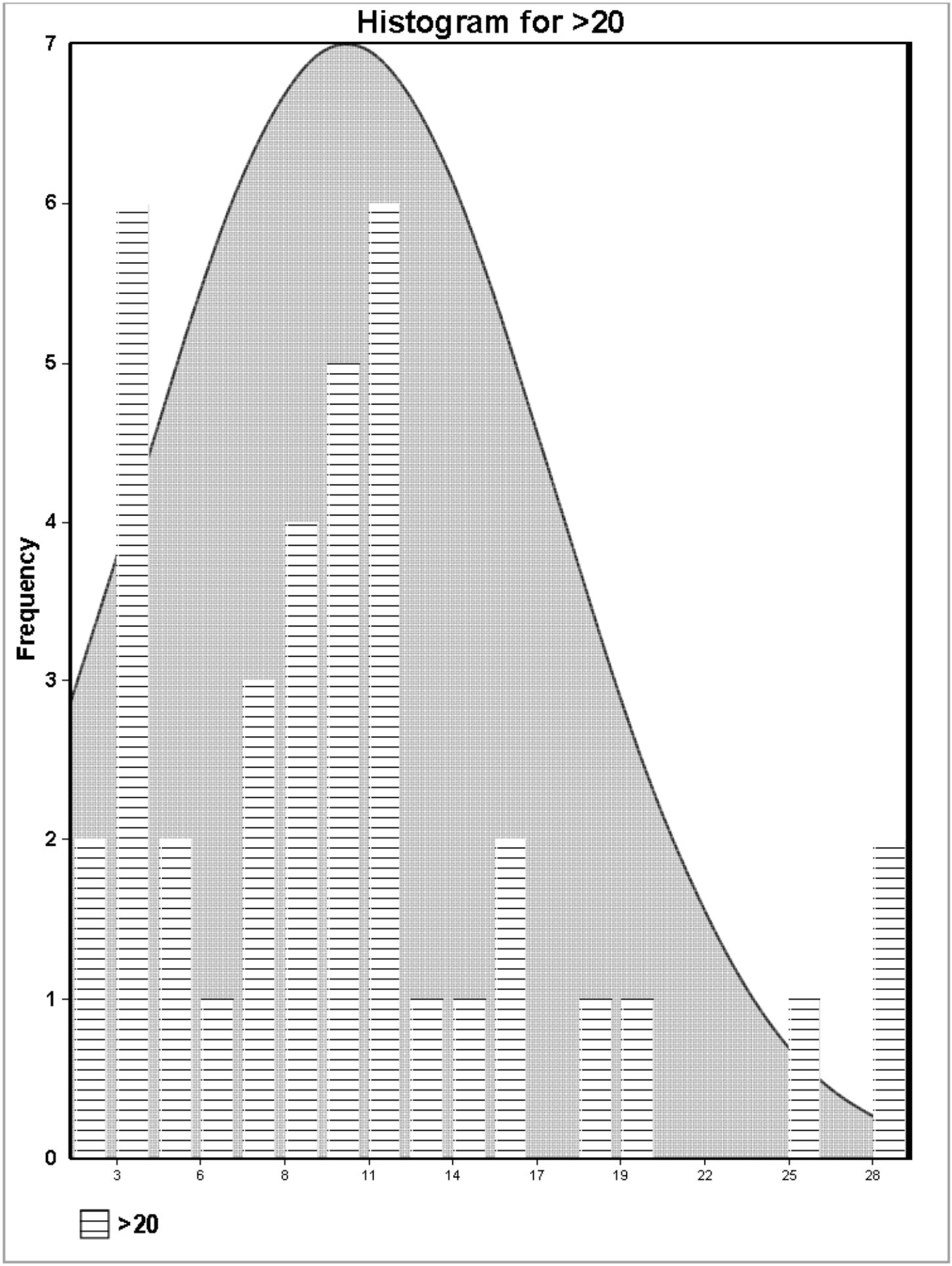
H0: Mean/Median of Site or AOC = Mean/Median of Background

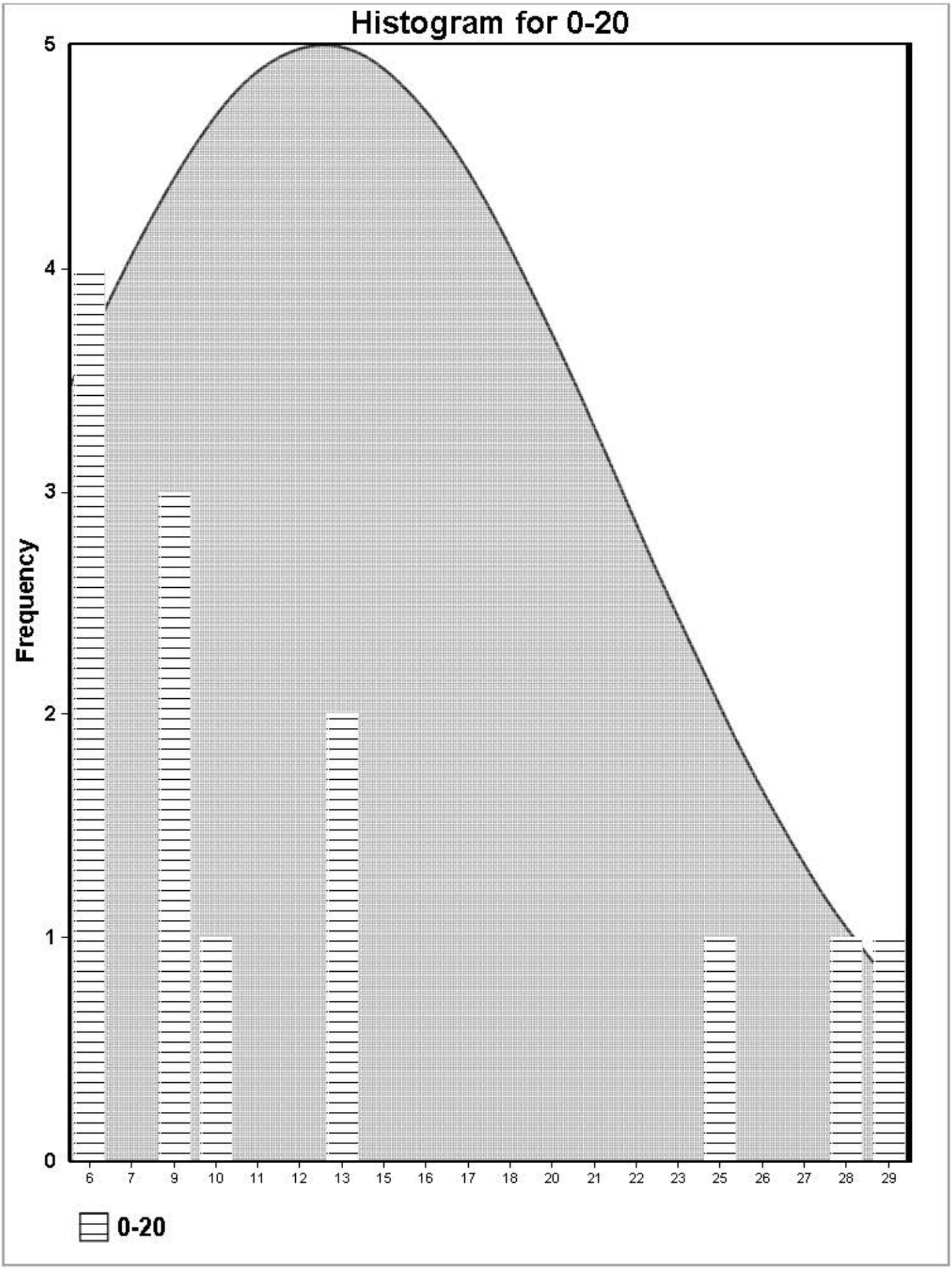
Site Rank Sum W-Stat	974.5
WMW Test U-Stat	0.281
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.762

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
3
6
8
11
14
17
19
22
25
28
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5
6
7
9
10
11
12
13
15
16
17
18
20
21
22
23
25
26
27
28
29
0-20

Location	0-20	D_0-20
BG-1-2	30	1
BG-1-10	6.5	1
BG-2-2	9.3	1
BG-2-10	8.5	1
BG-2-19	13	1
BG-3-2	6.6	1
BG-3-10	8.1	1
BG-6-2	8.8	1
BG-6-9	5.5	1
BG-4-1	24	1
BG-4-10	13	1
BG-4-19	28	1
BG-3-17	6.4	1

Location	>20	D_>20
BG-1-43	16	1
BG-1-46	11	1
BG-1-55	1.2	1
BG-1-78	16	1
BG-1-92	3.1	1
BG-2-30	25	1
BG-2-32	10	1
BG-2-75	9.3	1
BG-2-81	29	1
BG-3-22	5.3	1
BG-3-29	3.5	1
BG-3-63	12	1
BG-3-65	11	1
BG-3-69	14	1
BG-3-95	2.4	1
BG-3-105	6.8	1
BG-3-131	3.4	1
BG-3-136	12	1
BG-4-40	28	1
BG-4-65	7	1
BG-4-79	19	1
BG-4-82	12	1
BG-4-95	5.5	1
BG-4-117	2.8	1
BG-4-120	12	1
BG-4-161	8.3	1
BG-4-163	10	1
BG-6-28	20	1
BG-6-53	10	1
BG-6-58	5.1	1
BG-6-75	2.6	1
BG-6-87	8.2	1
BG-6-98	9.9	1
BG-6-114	7	1
BG-1-127	8.5	1
BG-1-29	3.3	1
BG-1-40	10	0
BG-2-21	13	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Boron.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	18	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	18	1.2	30	16.58	16	9.2

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	2.371	2.013	6.993	2.583	0.814	0.315

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.977	0.977	0.977	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.937	0.897	Data Appear Normal
Lilliefors (Full: no NDs)	0.152	0.209	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.932	0.932	0.932	0.932

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.452	0.75	
Kolmogorov-Smirnov (Full: no NDs)	0.127	0.206	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.92	0.92	0.92	0.92

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.855	0.897	Data Not Lognormal
Lilliefors (Full: no NDs)	0.157	0.209	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	32	1	3.03%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	32	2.4	13	7.891	8.3	3.466

Statistics (All: NDs treated as DL value)	33	2.4	13	7.955	8.5	3.431
Statistics (All: NDs treated as DL/2 value)	33	2.4	13	7.803	8.1	3.448
Statistics (Normal ROS Estimated Data)	33	2.4	13	7.846	8.1	3.421
Statistics (Gamma ROS Estimated Data)	33	2.4	13	7.865	8.1	3.414
Statistics (Lognormal ROS Estimated Data)	33	2.4	13	7.822	8.1	3.434

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.37	3.993	1.806	1.947	0.53	0.272
Statistics (NDs = DL)	4.468	4.082	1.78	1.958	0.525	0.268
Statistics (NDs = DL/2)	4.403	4.023	1.772	1.937	0.525	0.271
Statistics (Gamma ROS Estimates)	4.495	4.106	1.75	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.94	0.523	0.269

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.975	0.976	0.976	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.926	0.93	Data Not Normal
Lilliefors (Detects Only)	0.116	0.157	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.927	0.931	Data Not Normal
Lilliefors (NDs = DL)	0.115	0.154	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.928	0.931	Data Not Normal
Lilliefors (NDs = DL/2)	0.106	0.154	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.93	0.931	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.11	0.154	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.943	0.941	0.948	0.947

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.871	0.75	
Kolmogorov-Smirnov (Detects Only)	0.127	0.156	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	0.948	0.75	
Kolmogorov-Smirnov (NDs = DL)	0.133	0.154	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL/2)	0.775	0.75	
Kolmogorov-Smirnov (NDs = DL/2)	0.118	0.154	Data appear Approximate Gamma Distribution
Anderson-Darling (Gamma ROS Estimates)	0.832	0.75	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.123	0.154	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.953	0.95	0.959	0.958

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.889	0.93	Data Not Lognormal
Lilliefors (Detects Only)	0.142	0.157	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.884	0.931	Data Not Lognormal
Lilliefors (NDs = DL)	0.151	0.154	Data Appear Lognormal

Shapiro-Wilks (NDs = DL/2)	0.899	0.931	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.136	0.154	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.898	0.931	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.134	0.154	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Boron.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	15

Raw Statistics		Log-Transformed Statistics	
Minimum	1.2	Minimum	0.182
Maximum	30	Maximum	3.401
Second Largest	29	Second Largest	3.367
First Quartile	8.725	First Quartile	2.163
Median	16	Median	2.773
Third Quartile	24.75	Third Quartile	3.209
Mean	16.58	Mean	2.583
SD	9.2	SD	0.814
Coefficient of Variation	0.555		
Skewness	0.0433		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.937	Shapiro Wilk Test Statistic	0.855
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	39.14	95% UTL with 95% Coverage	97.54
95% UPL (t)	33.02	95% UPL (t)	56.72
90% Percentile (z)	28.37	90% Percentile (z)	37.57
95% Percentile (z)	31.71	95% Percentile (z)	50.51
99% Percentile (z)	37.98	99% Percentile (z)	87.98

Gamma Distribution Test		Data Distribution Test	
k star	2.013	Data appear Normal at 5% Significance Level	
Theta Star	8.237		
MLE of Mean	16.58		
MLE of Standard Deviation	11.69		
nu star	72.45		
A-D Test Statistic	0.452	Nonparametric Statistics	
5% A-D Critical Value	0.75	90% Percentile	28.3
K-S Test Statistic	0.127	95% Percentile	29.15
5% K-S Critical Value	0.206	99% Percentile	29.83
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	30
90% Percentile	32.19	95% Percentile Bootstrap UTL with 95% Coverage	30
95% Percentile	39.24	95% BCA Bootstrap UTL with 95% Coverage	30
99% Percentile	54.87	95% UPL	30
		95% Chebyshev UPL	57.78
95% WH Approx. Gamma UPL	40.83	Upper Threshold Limit Based upon IQR	48.79
95% HW Approx. Gamma UPL	43.18		
95% WH Approx. Gamma UTL with 95% Coverage	55.64		
95% HW Approx. Gamma UTL with 95% Coverage	61.04		

Non-Clay

General Statistics			
Number of Valid Data	33	Number of Detected Data	32
Number of Distinct Detected Data	22	Number of Non-Detect Data	1
		Percent Non-Detects	3.03%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	2.4	Minimum Detected	0.875
Maximum Detected	13	Maximum Detected	2.565
Mean of Detected	7.891	Mean of Detected	1.947
SD of Detected	3.466	SD of Detected	0.53
Minimum Non-Detect	10	Minimum Non-Detect	2.303
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.926	Shapiro Wilk Test Statistic	0.889
5% Shapiro Wilk Critical Value	0.93	5% Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	7.803	Mean (Log Scale)	1.937
SD	3.448	SD (Log Scale)	0.525
95% UTL 95% Coverage	15.31	95% UTL 95% Coverage	21.73
95% UPL (t)	13.73	95% UPL (t)	17.1
90% Percentile (z)	12.22	90% Percentile (z)	13.59
95% Percentile (z)	13.47	95% Percentile (z)	16.44
99% Percentile (z)	15.82	99% Percentile (z)	23.51
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	8.754	Mean in Original Scale	7.822
SD	2.62	SD in Original Scale	3.434
95% UTL with 95% Coverage	14.46	95% UTL with 95% Coverage	21.72
		95% BCA UTL with 95% Coverage	13
		95% Bootstrap (%) UTL with 95% Coverage	13
95% UPL (t)	13.26	95% UPL (t)	17.1
90% Percentile (z)	12.11	90% Percentile (z)	13.6
95% Percentile (z)	13.06	95% Percentile (z)	16.45

99% Percentile (z)	14.85	99% Percentile (z)	23.49
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.981	Data follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	1.982		
nu star	254.8		
A-D Test Statistic	0.871	Nonparametric Statistics	
5% A-D Critical Value	0.75	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.127	Mean	7.835
5% K-S Critical Value	0.156	SD	3.4
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	0.606
		95% KM UTL with 95% Coverage	15.23
Assuming Gamma Distribution		95% KM Chebyshev UPL	22.88
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	13.68
Mean	7.865	90% Percentile (z)	12.19
Median	8.1	95% Percentile (z)	13.43
SD	3.414	99% Percentile (z)	15.75
k star	4.106		
Theta star	1.915	Gamma ROS Limits with Extrapolated Data	
Nu star	271	95% Wilson Hilferty (WH) Approx. Gamma UPL	15.38
95% Percentile of Chisquare (2k)	15.81	95% Hawkins Wixley (HW) Approx. Gamma UPL	15.73
		95% WH Approx. Gamma UTL with 95% Coverage	18.23
90% Percentile	13.07	95% HW Approx. Gamma UTL with 95% Coverage	18.9
95% Percentile	15.14		
99% Percentile	19.56		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Boron.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 30 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.085

For 10% significance level, 30 is not an outlier.

For 5% significance level, 30 is not an outlier.

For 1% significance level, 30 is not an outlier.

2. Data Value 1.2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.194

For 10% significance level, 1.2 is not an outlier.

For 5% significance level, 1.2 is not an outlier.

For 1% significance level, 1.2 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	7.803
Standard Deviation	3.448
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.803	3.396	2.4	17	1.591	2.95	3.29

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Boron.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Data	33	18
Number of Non-Detect Data	1	0
Number of Detect Data	32	18
Minimum Non-Detect	10	N/A
Maximum Non-Detect	10	N/A
Percent Non detects	3.03%	0.00%
Minimum Detected	2.4	1.2
Maximum Detected	13	30
Mean of Detected Data	7.891	16.58
Median of Detected Data	8.3	16
SD of Detected Data	3.466	9.2

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

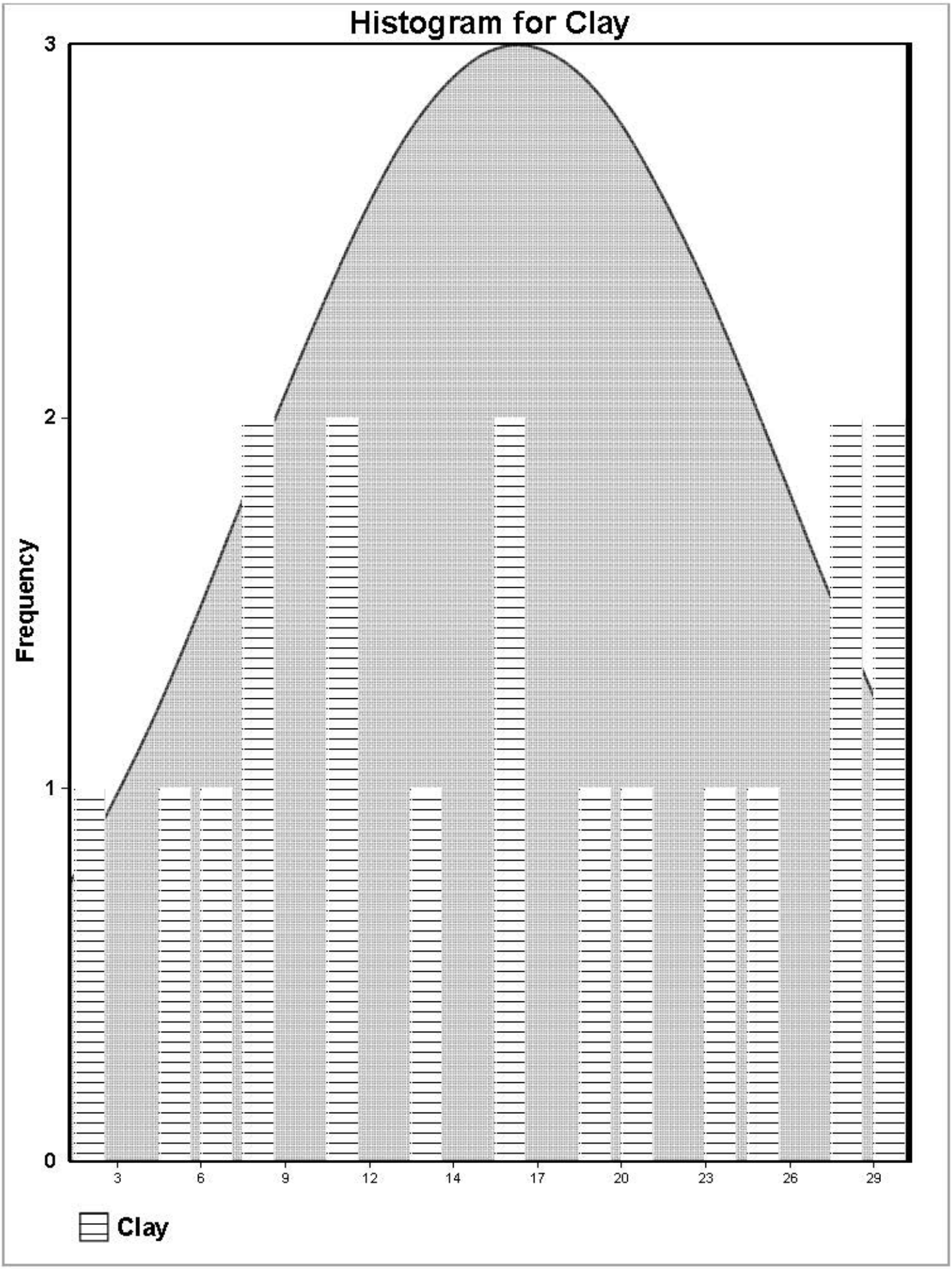
H0: Mean/Median of Site or AOC = Mean/Median of Background

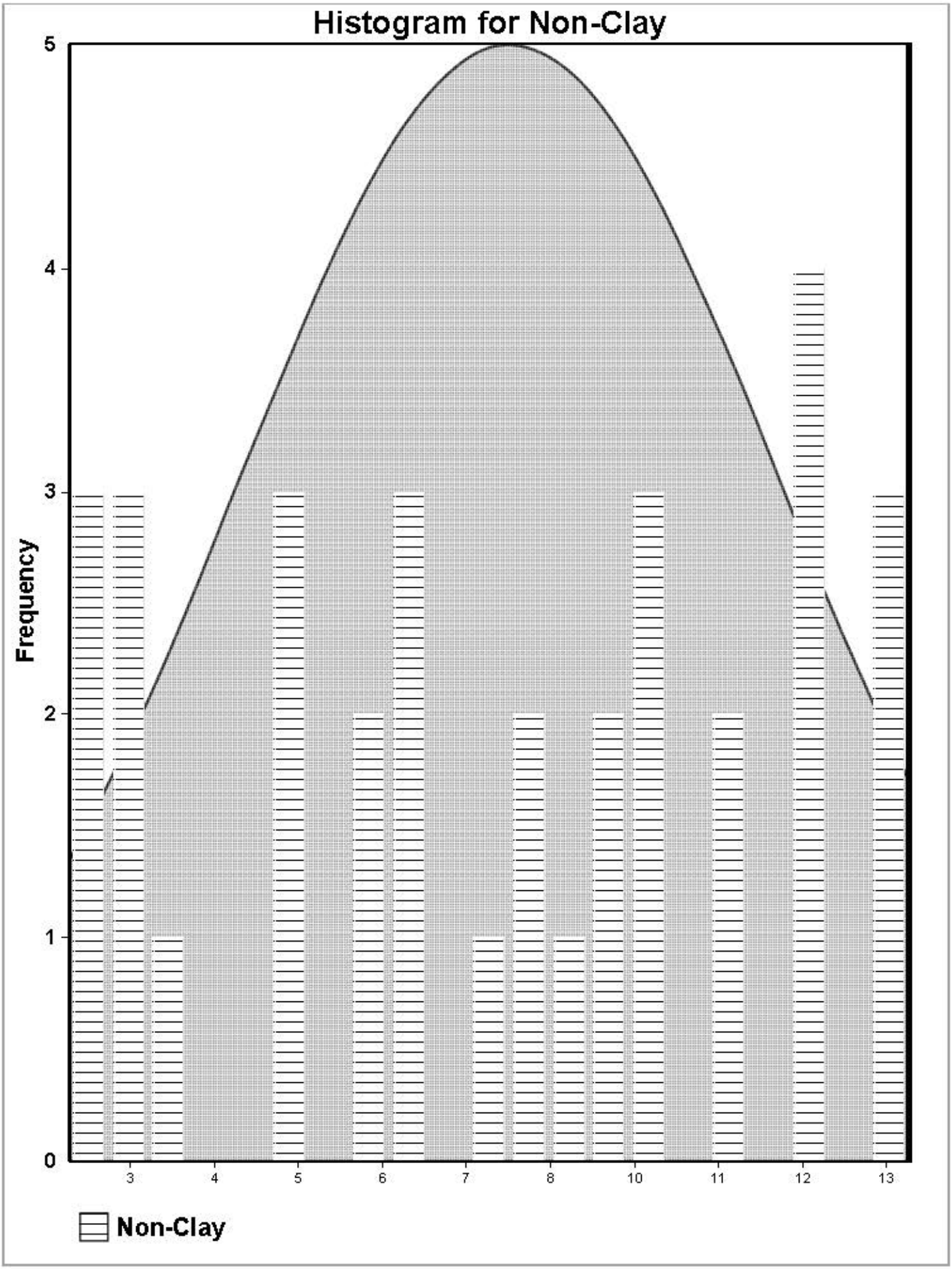
Site Rank Sum W-Stat	708
WMW Test U-Stat	2.947
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.00301

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Clay
Frequency
3
2
1
0
3
6
9
12
14
17
20
23
26
29
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
3
4
5
6
7
8
10
11
12
13
Non-Clay

Location	Clay	D_Clay	Location	Non-Clay	D_Non-Clay
BG-1-2	30	1	BG-1-10	6.5	1
BG-1-43	16	1	BG-1-29	3.3	1
BG-1-55	1.2	1	BG-1-40	10	0
BG-1-78	16	1	BG-1-46	11	1
BG-2-30	25	1	BG-1-92	3.1	1
BG-2-81	29	1	BG-2-2	9.3	1
BG-3-17	6.4	1	BG-2-10	8.5	1
BG-3-22	5.3	1	BG-2-19	13	1
BG-3-69	14	1	BG-2-21	13	1
BG-4-2	24	1	BG-2-32	10	1
BG-4-19	28	1	BG-2-75	9.3	1
BG-4-40	28	1	BG-3-2	6.6	1
BG-4-79	19	1	BG-3-10	8.1	1
BG-4-161	8.3	1	BG-3-29	3.5	1
BG-4-163	10	1	BG-3-63	12	1
BG-6-28	20	1	BG-3-65	11	1
BG-6-53	10	1	BG-3-95	2.4	1
BG-6-87	8.2	1	BG-3-105	6.8	1
			BG-3-131	3.4	1
			BG-3-136	12	1
			BG-4-10	13	1
			BG-4-65	7	1
			BG-4-82	12	1
			BG-4-95	5.5	1
			BG-4-117	2.8	1
			BG-4-120	12	1
			BG-6-2	8.8	1
			BG-6-9	5.5	1
			BG-6-58	5.1	1
			BG-6-75	2.6	1
			BG-6-98	9.9	1
			BG-6-114	7	1
			BG-6-127	8.5	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Boron.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	11	1	8.33%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	11	3.3	30	10.24	8.5	7.17
Statistics (All: NDs treated as DL value)	12	3.3	30	10.22	8.65	6.837
Statistics (All: NDs treated as DL/2 value)	12	3.3	30	9.8	8.3	7.002
Statistics (Normal ROS Estimated Data)	12	3.3	30	10.03	8.3	6.872
Statistics (Gamma ROS Estimated Data)	12	3.3	30	10.15	8.65	6.843
Statistics (Lognormal ROS Estimated Data)	12	3.3	30	9.968	8.3	6.9

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.282	2.517	3.119	2.166	0.564	0.26
Statistics (NDs = DL)	3.567	2.73	2.865	2.177	0.539	0.247
Statistics (NDs = DL/2)	3.228	2.477	3.036	2.12	0.561	0.265
Statistics (Gamma ROS Estimates)	3.558	2.724	2.854	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.148	0.541	0.252

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.837	0.833	0.832	0.823

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.728	0.85	Data Not Normal
Lilliefors (Detects Only)	0.279	0.267	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.724	0.859	Data Not Normal
Lilliefors (NDs = DL)	0.263	0.256	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.719	0.859	Data Not Normal
Lilliefors (NDs = DL/2)	0.278	0.256	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.707	0.859	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.293	0.256	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.92	0.913	0.919	0.906

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.541	0.733	
Kolmogorov-Smirnov (Detects Only)	0.221	0.257	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.553	0.737	
Kolmogorov-Smirnov (NDs = DL)	0.195	0.247	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.534	0.738	

Kolmogorov-Smirnov (NDs = DL/2)	0.212	0.247	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.622	0.737	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.244	0.247	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.96	0.959	0.965	0.953

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.945	0.85	Data Appear Lognormal
Lilliefors (Detects Only)	0.182	0.267	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.945	0.859	Data Appear Lognormal
Lilliefors (NDs = DL)	0.158	0.256	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.95	0.859	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.172	0.256	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.934	0.859	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.19	0.256	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	39	0	39	39	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	39	1.2	29	11.24	10	7.536

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	2.229	2.074	5.043	2.179	0.751	0.345

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.95	0.95	0.95	0.95

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.89	0.939	Data Not Normal
Lilliefors (Full: no NDs)	0.178	0.142	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.981	0.981	0.981	0.981

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.287	0.758	
Kolmogorov-Smirnov (Full: no NDs)	0.0913	0.143	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.983	0.983	0.983	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.96	0.939	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.102	0.142	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Boron.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Number of Valid Data	12	Number of Detected Data	11
Number of Distinct Detected Data	10	Number of Non-Detect Data	1
		Percent Non-Detects	8.33%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	3.3	Minimum Detected	1.194
Maximum Detected	30	Maximum Detected	3.401
Mean of Detected	10.24	Mean of Detected	2.166
SD of Detected	7.17	SD of Detected	0.564
Minimum Non-Detect	10	Minimum Non-Detect	2.303
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.728	Shapiro Wilk Test Statistic	0.945
5% Shapiro Wilk Critical Value	0.85	5% Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	9.8	Mean (Log Scale)	2.12
SD	7.002	SD (Log Scale)	0.561
95% UTL 95% Coverage	28.96	95% UTL 95% Coverage	38.63
95% UPL (t)	22.89	95% UPL (t)	23.76
90% Percentile (z)	18.77	90% Percentile (z)	17.09
95% Percentile (z)	21.32	95% Percentile (z)	20.95
99% Percentile (z)	26.09	99% Percentile (z)	30.7
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	20.91	Mean in Original Scale	9.968
SD	8.014	SD in Original Scale	6.9
95% UTL with 95% Coverage	42.83	95% UTL with 95% Coverage	37.64
		95% BCA UTL with 95% Coverage	30
		95% Bootstrap (%) UTL with 95% Coverage	30
95% UPL (t)	35.89	95% UPL (t)	23.55
90% Percentile (z)	31.18	90% Percentile (z)	17.14
95% Percentile (z)	34.09	95% Percentile (z)	20.86
99% Percentile (z)	39.55	99% Percentile (z)	30.16

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.448	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	4.182		
nu star	53.85		
A-D Test Statistic	0.541	Nonparametric Statistics	
5% A-D Critical Value	0.733	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.221	Mean	9.973
5% K-S Critical Value	0.257	SD	6.626
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	2.014
		95% KM UTL with 95% Coverage	28.1
Assuming Gamma Distribution		95% KM Chebyshev UPL	40.03
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	22.36
Mean	10.15	90% Percentile (z)	18.46
Median	8.65	95% Percentile (z)	20.87
SD	6.843	99% Percentile (z)	25.39
k star	2.724		
Theta star	3.727	Gamma ROS Limits with Extrapolated Data	
Nu star	65.37	95% Wilson Hilferty (WH) Approx. Gamma UPL	22.85
95% Percentile of Chisquare (2k)	11.76	95% Hawkins Wixley (HW) Approx. Gamma UPL	23.01
		95% WH Approx. Gamma UTL with 95% Coverage	32.24
90% Percentile	18.4	95% HW Approx. Gamma UTL with 95% Coverage	33.24
95% Percentile	21.91		
99% Percentile	29.57		

Note: DL/2 is not a recommended method.

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	30
Raw Statistics		Log-Transformed Statistics	
Minimum	1.2	Minimum	0.182
Maximum	29	Maximum	3.367
Second Largest	28	Second Largest	3.332
First Quartile	5.95	First Quartile	1.781
Median	10	Median	2.303
Third Quartile	13.5	Third Quartile	2.602
Mean	11.24	Mean	2.179
SD	7.536	SD	0.751
Coefficient of Variation	0.671		
Skewness	1.01		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.89	Shapiro Wilk Test Statistic	0.96
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	27.25	95% UTL with 95% Coverage	43.59

95% UPL (t)	24.1	95% UPL (t)	31.86
90% Percentile (z)	20.9	90% Percentile (z)	23.14
95% Percentile (z)	23.63	95% Percentile (z)	30.4
99% Percentile (z)	28.77	99% Percentile (z)	50.73
Gamma Distribution Test		Data Distribution Test	
k star	2.074	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	5.418		
MLE of Mean	11.24		
MLE of Standard Deviation	7.803		
nu star	161.8		
A-D Test Statistic	0.287	Nonparametric Statistics	
5% A-D Critical Value	0.758	90% Percentile	24.2
K-S Test Statistic	0.0913	95% Percentile	28
5% K-S Critical Value	0.143	99% Percentile	28.62
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	29
90% Percentile	21.67	95% Percentile Bootstrap UTL with 95% Coverage	29
95% Percentile	26.35	95% BCA Bootstrap UTL with 95% Coverage	28.1
99% Percentile	36.71	95% UPL	28
		95% Chebyshev UPL	44.5
95% WH Approx. Gamma UPL	26.76	Upper Threshold Limit Based upon IQR	24.83
95% HW Approx. Gamma UPL	27.59		
95% WH Approx. Gamma UTL with 95% Coverage	32.82		
95% HW Approx. Gamma UTL with 95% Coverage	34.49		

Outlier Tests for Selected Variables

User Selected Options	
From File	Boron.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 30 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.680

For 10% significance level, 30 is an outlier.
For 5% significance level, 30 is an outlier.
For 1% significance level, 30 is an outlier.

2. Data Value 3.3 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.227

For 10% significance level, 3.3 is not an outlier.
For 5% significance level, 3.3 is not an outlier.
For 1% significance level, 3.3 is not an outlier.

Rosner's Outlier Test for MC

Mean	11.24
Standard Deviation	7.536
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	11.24	7.438	29	9	2.388	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Boron.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Data	39	12
Number of Non-Detect Data	0	1
Number of Detect Data	39	11
Minimum Non-Detect	N/A	10
Maximum Non-Detect	N/A	10
Percent Non detects	0.00%	8.33%
Minimum Detected	1.2	3.3
Maximum Detected	29	30
Mean of Detected Data	11.24	10.24
Median of Detected Data	10	8.5
SD of Detected Data	7.536	7.17

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 10 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

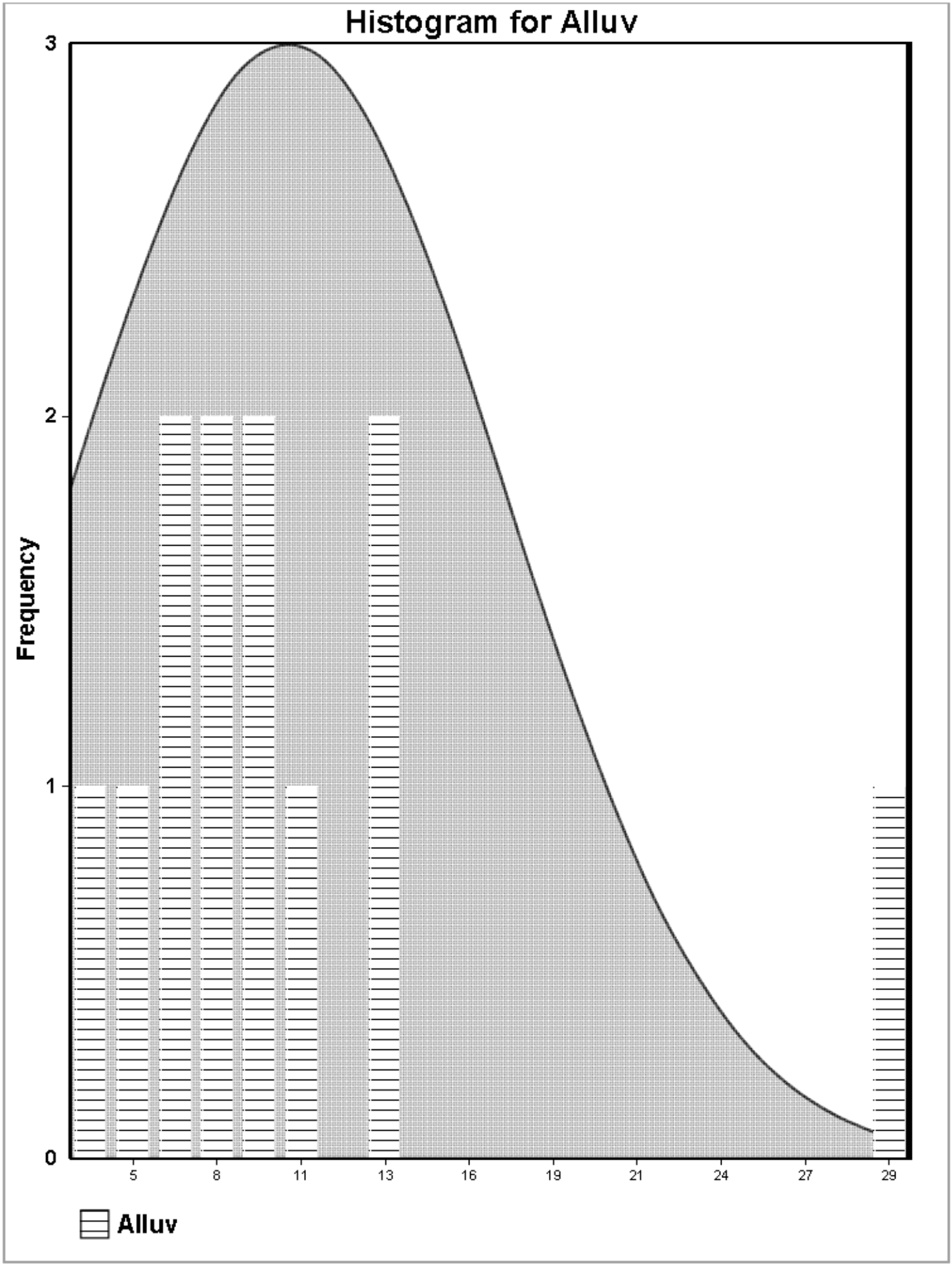
H0: Mean/Median of Site or AOC = Mean/Median of Background

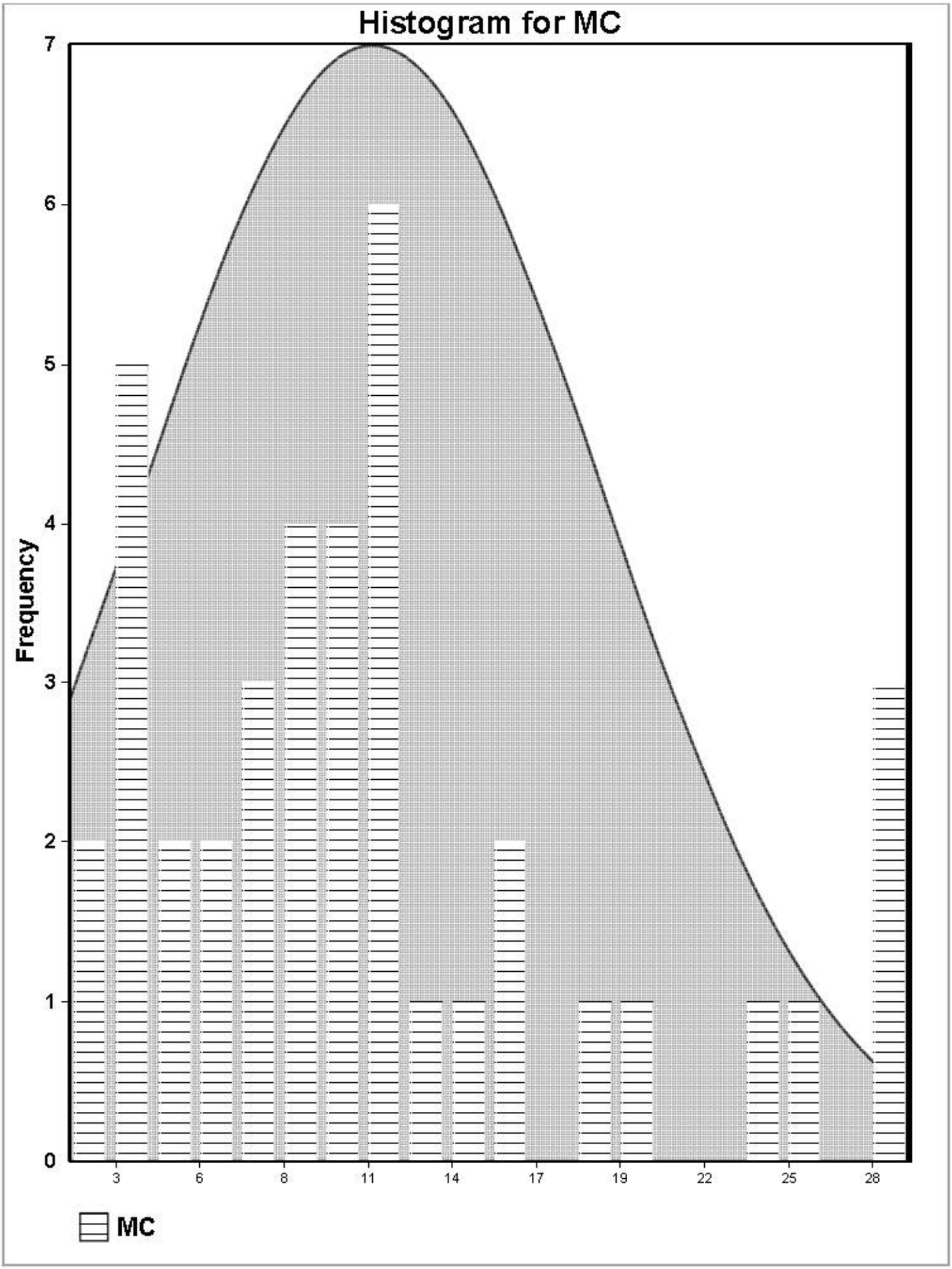
Site Rank Sum W-Stat	1053
WMW Test U-Stat	0.855
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.393

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
3
2
1
0
5
8
11
13
16
19
21
24
27
29
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
3
6
8
11
14
17
19
22
25
28
MC

Location	Alluv	D_Alluv
BG-1-2	30	1
BG-1-10	6.5	1
BG-1-29	3.3	1
BG-1-40	10	0
BG-2-2	9.3	1
BG-2-10	8.5	1
BG-2-19	13	1
BG-2-21	13	1
BG-3-2	6.6	1
BG-3-10	8.1	1
BG-6-2	8.8	1
BG-6-9	5.5	1

Location	MC	D_MC
BG-1-43	16	1
BG-1-46	11	1
BG-1-55	1.2	1
BG-1-78	16	1
BG-1-92	3.1	1
BG-2-30	25	1
BG-2-32	10	1
BG-2-75	9.3	1
BG-2-81	29	1
BG-3-17	6.4	1
BG-3-22	5.3	1
BG-3-29	3.5	1
BG-3-63	12	1
BG-3-65	11	1
BG-3-69	14	1
BG-3-95	2.4	1
BG-3-105	6.8	1
BG-3-131	3.4	1
BG-3-136	12	1
BG-4-1	24	1
BG-4-10	13	1
BG-4-19	28	1
BG-4-40	28	1
BG-4-65	7	1
BG-4-79	19	1
BG-4-82	12	1
BG-4-95	5.5	1
BG-4-117	2.8	1
BG-4-120	12	1
BG-4-161	8.3	1
BG-4-163	10	1
BG-6-28	20	1
BG-6-53	10	1
BG-6-58	5.1	1
BG-6-75	2.6	1
BG-6-87	8.2	1
BG-6-98	9.9	1
BG-6-114	7	1
BG-1-127	8.5	1

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Calcium.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	37
Minimum	4000
Maximum	160000
Mean of Raw Data	54196
Standard Deviation of Raw Data	33858
Kstar	2.784
Mean of Log Transformed Data	10.72
Standard Deviation of Log Transformed Data	0.636

Normal Distribution Test Results	
Correlation Coefficient R	0.923
Approximate Shapiro Wilk Test Statistic	0.853
Approximate Shapiro Wilk P Value	1.3808E-6
Lilliefors Test Statistic	0.212
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.981
A-D Test Statistic	0.708
A-D Critical (0.95) Value	0.757
K-S Test Statistic	0.134
K-S Critical(0.95) Value	0.125

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.965
Approximate Shapiro Wilk Test Statistic	0.949
Approximate Shapiro Wilk P Value	0.047
Lilliefors Test Statistic	0.104
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Calcium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Total Number of Observations	51	Number of Distinct Observations	37

Raw Statistics		Log-Transformed Statistics	
Minimum	4000	Minimum	8.294
Maximum	160000	Maximum	11.98
Second Largest	150000	Second Largest	11.92
First Quartile	31500	First Quartile	10.36
Median	46000	Median	10.74
Third Quartile	63500	Third Quartile	11.05
Mean	54196	Mean	10.72
SD	33858	SD	0.636
Coefficient of Variation	0.625		
Skewness	1.518		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.212	Lilliefors Test Statistic	0.104
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	123730	95% UTL with 95% Coverage	167114
95% UPL (t)	111492	95% UPL (t)	132811
90% Percentile (z)	97587	90% Percentile (z)	102296
95% Percentile (z)	109887	95% Percentile (z)	128869
99% Percentile (z)	132961	99% Percentile (z)	198735

Gamma Distribution Test		Data Distribution Test	
k star	2.784	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	19467		
MLE of Mean	54196		
MLE of Standard Deviation	32481		
nu star	284		
A-D Test Statistic	0.708	Nonparametric Statistics	
5% A-D Critical Value	0.757	90% Percentile	100000
K-S Test Statistic	0.134	95% Percentile	130000
5% K-S Critical Value	0.125	99% Percentile	155000
Data follow Appx. Gamma Distribution at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	150000
90% Percentile	97736	95% Percentile Bootstrap UTL with 95% Coverage	155000
95% Percentile	116225	95% BCA Bootstrap UTL with 95% Coverage	150000
99% Percentile	156465	95% UPL	144000
		95% Chebyshev UPL	203219
95% WH Approx. Gamma UPL	116855	Upper Threshold Limit Based upon IQR	111500
95% HW Approx. Gamma UPL	119234		
95% WH Approx. Gamma UTL with 95% Coverage	137036		
95% HW Approx. Gamma UTL with 95% Coverage	141584		

Outlier Tests for Selected Variables

User Selected Options	
From File	Calcium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for All Data

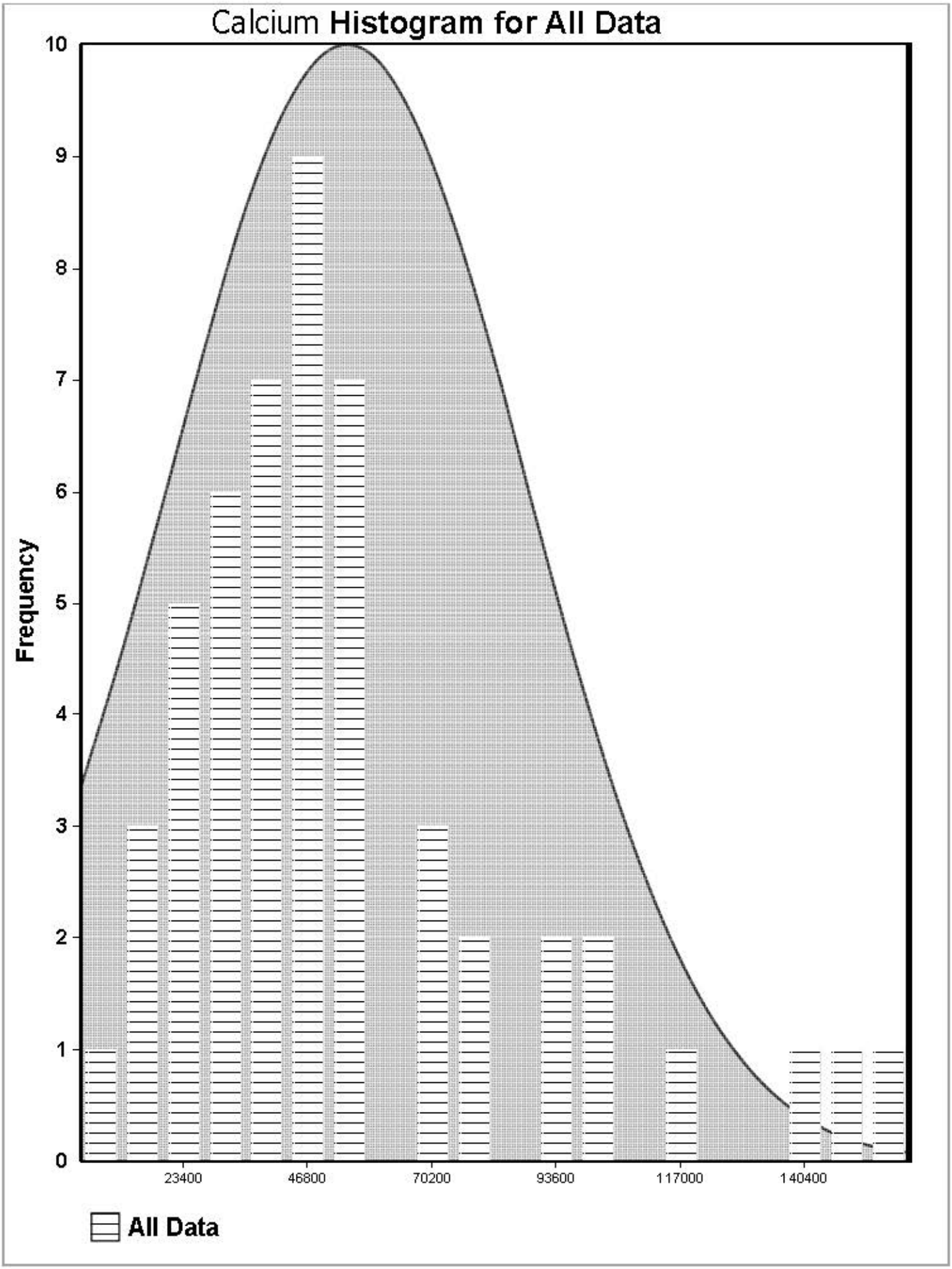
Mean	54196
Standard Deviation	33858
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	54196	33524	160000	8	3.156	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 160000 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier


Calcium Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
23400
46800
70200
93600
117000
140400
All Data

Location	All Data
BG-1-2	100000
BG-3-17	76000
BG-4-2	35000
BG-4-19	47000
BG-1-10	79000
BG-2-2	23000
BG-2-10	19000
BG-2-19	160000
BG-3-2	100000
BG-3-10	70000
BG-4-10	46000
BG-6-2	96000
BG-6-9	38000
BG-1-29	48000
BG-1-40	140000
BG-1-46	46000
BG-1-92	26000
BG-2-21	42000
BG-2-32	4000
BG-2-75	19000
BG-3-29	36000
BG-3-63	25000
BG-3-65	38000
BG-3-95	29000
BG-3-105	32000
BG-3-131	120000
BG-3-136	48000
BG-4-65	30000
BG-4-82	50000
BG-4-95	30000
BG-4-117	25000
BG-4-120	39000
BG-6-58	25000
BG-6-75	54000
BG-6-98	39000
BG-6-114	52000
BG-6-127	46000
BG-1-43	31000
BG-1-55	38000
BG-1-78	71000
BG-2-30	17000
BG-2-81	57000
BG-3-22	150000
BG-3-69	55000
BG-4-40	57000
BG-4-79	70000
BG-4-161	52000
BG-4-163	90000
BG-6-28	44000
BG-6-53	49000
BG-6-87	51000

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Calcium.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	12
Minimum	19000
Maximum	160000
Mean of Raw Data	68385
Standard Deviation of Raw Data	39605
Kstar	2.469
Mean of Log Transformed Data	10.97
Standard Deviation of Log Transformed Data	0.627

Normal Distribution Test Results	
Correlation Coefficient R	0.96
Shapiro Wilk Test Statistic	0.925
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.276
Lilliefors Test Statistic	0.167
Lilliefors Critical (0.95) Value	0.246

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.982
A-D Test Statistic	0.251
A-D Critical (0.95) Value	0.739
K-S Test Statistic	0.13
K-S Critical(0.95) Value	0.238

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.983
Shapiro Wilk Test Statistic	0.96
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.761
Lilliefors Test Statistic	0.158
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

>20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	29
Minimum	4000
Maximum	150000
Mean of Raw Data	49342
Standard Deviation of Raw Data	30749
Kstar	2.885
Mean of Log Transformed Data	10.64
Standard Deviation of Log Transformed Data	0.625

Normal Distribution Test Results

Correlation Coefficient R	0.889
Shapiro Wilk Test Statistic	0.802
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	1.8875E-6
Lilliefors Test Statistic	0.244
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.955
A-D Test Statistic	0.963
A-D Critical (0.95) Value	0.754
K-S Test Statistic	0.169
K-S Critical(0.95) Value	0.144

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.94
Shapiro Wilk Test Statistic	0.91
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.00484
Lilliefors Test Statistic	0.15
Lilliefors Critical (0.95) Value	0.144

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Calcium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	12

Raw Statistics		Log-Transformed Statistics	
Minimum	19000	Minimum	9.852
Maximum	160000	Maximum	11.98
Second Largest	100000	Second Largest	11.51
First Quartile	38000	First Quartile	10.55
Median	70000	Median	11.16
Third Quartile	96000	Third Quartile	11.47
Mean	68385	Mean	10.97
SD	39605	SD	0.627
Coefficient of Variation	0.579		
Skewness	0.879		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.925	Shapiro Wilk Test Statistic	0.96
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	174171	95% UTL with 95% Coverage	308508
95% UPL (t)	141638	95% UPL (t)	184365
90% Percentile (z)	119141	90% Percentile (z)	129142
95% Percentile (z)	133530	95% Percentile (z)	162165
99% Percentile (z)	160521	99% Percentile (z)	248574

Gamma Distribution Test		Data Distribution Test	
k star	2.469	Data appear Normal at 5% Significance Level	
Theta Star	27698		
MLE of Mean	68385		
MLE of Standard Deviation	43521		
nu star	64.19		
A-D Test Statistic	0.251	Nonparametric Statistics	
5% A-D Critical Value	0.739	90% Percentile	100000
K-S Test Statistic	0.13	95% Percentile	124000
5% K-S Critical Value	0.238	99% Percentile	152800
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	160000
90% Percentile	126683	95% Percentile Bootstrap UTL with 95% Coverage	160000
95% Percentile	151981	95% BCA Bootstrap UTL with 95% Coverage	160000
99% Percentile	207411	95% UPL	160000
		95% Chebyshev UPL	247538
95% WH Approx. Gamma UPL	159651	Upper Threshold Limit Based upon IQR	183000
95% HW Approx. Gamma UPL	164162		
95% WH Approx. Gamma UTL with 95% Coverage	225027		
95% HW Approx. Gamma UTL with 95% Coverage	238705		

>20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	29

Raw Statistics		Log-Transformed Statistics	
Minimum	4000	Minimum	8.294
Maximum	150000	Maximum	11.92
Second Largest	140000	Second Largest	11.85
First Quartile	30250	First Quartile	10.32
Median	45000	Median	10.71
Third Quartile	53500	Third Quartile	10.89
Mean	49342	Mean	10.64
SD	30749	SD	0.625
Coefficient of Variation	0.623		
Skewness	1.915		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.802	Shapiro Wilk Test Statistic	0.91
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	114901	95% UTL with 95% Coverage	157881
95% UPL (t)	101896	95% UPL (t)	121216
90% Percentile (z)	88748	90% Percentile (z)	92796
95% Percentile (z)	99919	95% Percentile (z)	116443
99% Percentile (z)	120874	99% Percentile (z)	178256
Gamma Distribution Test		Data Distribution Test	
k star	2.885	Data do not follow a Discernable Distribution (0.05)	
Theta Star	17104		
MLE of Mean	49342		
MLE of Standard Deviation	29051		
nu star	219.2		
A-D Test Statistic	0.963	Nonparametric Statistics	
5% A-D Critical Value	0.754	90% Percentile	76700
K-S Test Statistic	0.169	95% Percentile	123000
5% K-S Critical Value	0.144	99% Percentile	146300

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 95% Coverage	150000
90% Percentile	88289	95% Percentile Bootstrap UTL with 95% Coverage	150000
95% Percentile	104725	95% BCA Bootstrap UTL with 95% Coverage	150000
99% Percentile	140428	95% UPL	140500
		95% Chebyshev UPL	185124
95% WH Approx. Gamma UPL	105542	Upper Threshold Limit Based upon IQR	88375
95% HW Approx. Gamma UPL	107776		
95% WH Approx. Gamma UTL with 95% Coverage	126511		
95% HW Approx. Gamma UTL with 95% Coverage	131054		

Outlier Tests for Selected Variables

User Selected Options	
From File	Calcium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13

10% critical value: 0.467

5% critical value: 0.521

1% critical value: 0.615

1. Data Value 160000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.438

For 10% significance level, 160000 is not an outlier.

For 5% significance level, 160000 is not an outlier.

For 1% significance level, 160000 is not an outlier.

2. Data Value 19000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.198

For 10% significance level, 19000 is not an outlier.

For 5% significance level, 19000 is not an outlier.

For 1% significance level, 19000 is not an outlier.

Rosner's Outlier Test for >20

Mean	49342
Standard Deviation	30749
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	49342	30341	150000	30	3.318	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 150000 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Calcium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Observations	38	13
Number of Distinct Observations	29	12
Minimum	4000	19000
Maximum	150000	160000
Mean	49342	68385
Median	45000	70000
SD	30749	39605
SE of Mean	4988	10985

Wilcoxon-Mann-Whitney (WMW) Test

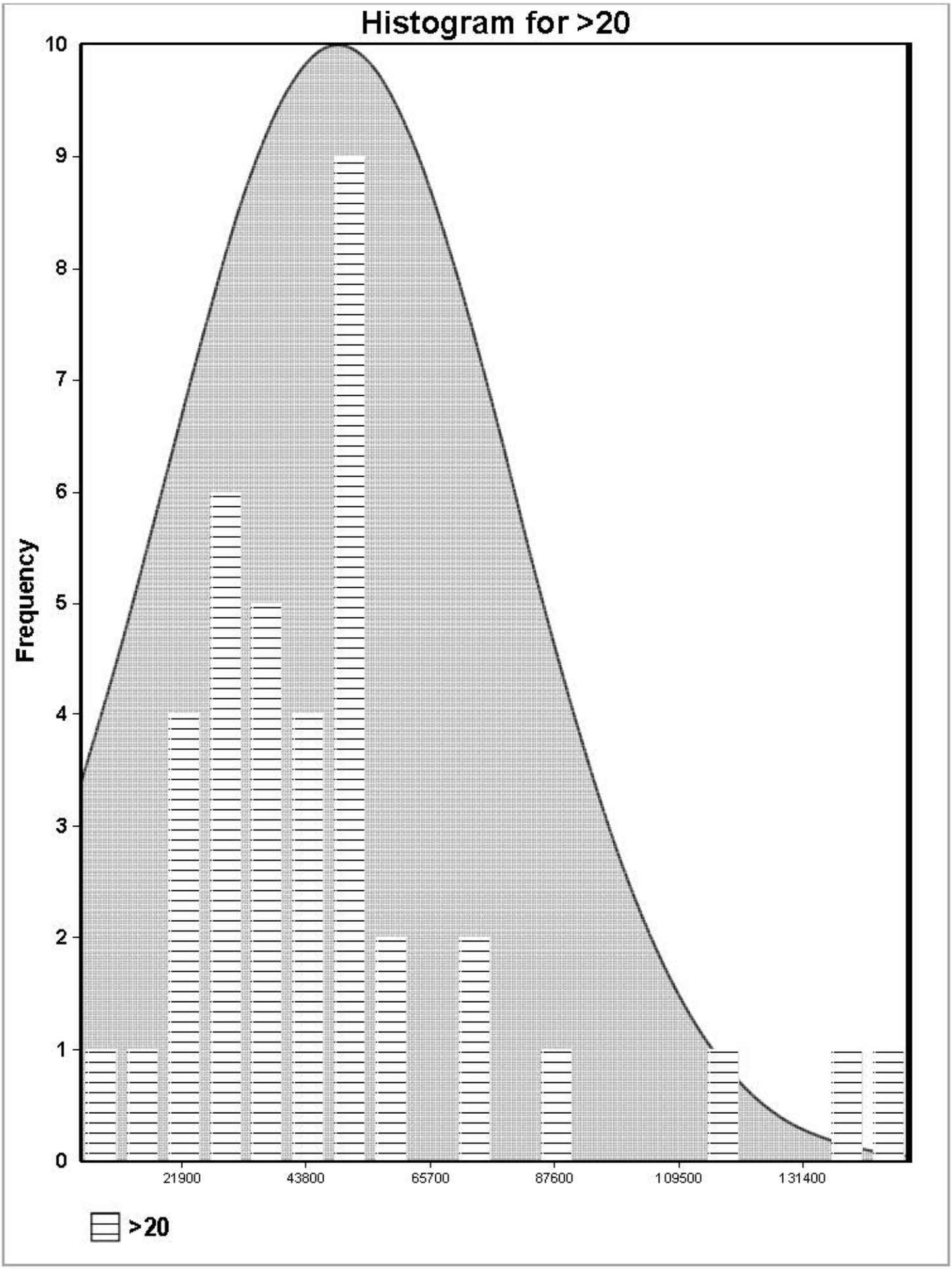
H0: Mean/Median of Site or AOC = Mean/Median of Background

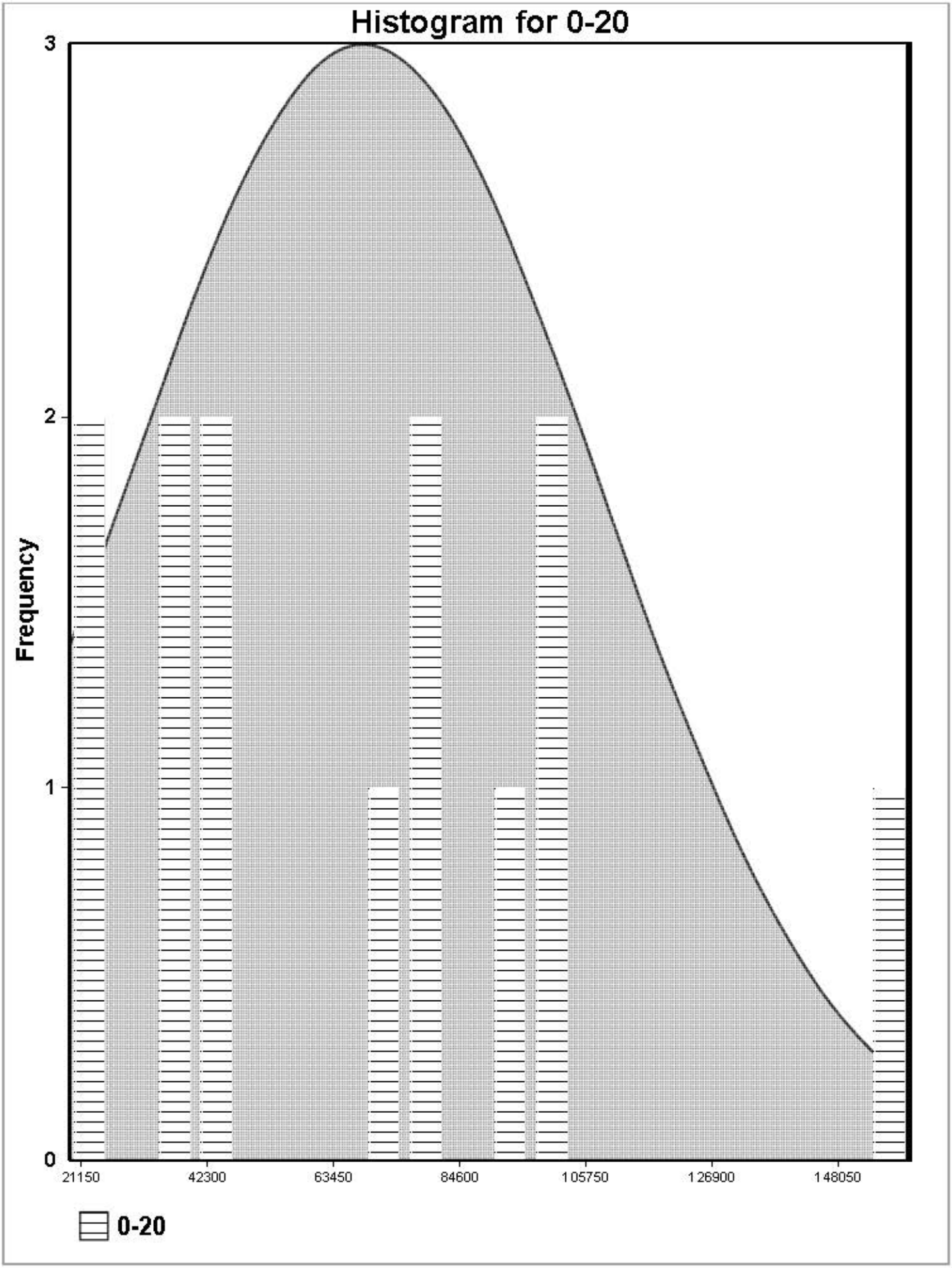
Site Rank Sum W-Stat	919
WMW Test U-Stat	1.481
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.133

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
10
21900
43800
65700
87600
109500
131400
>20


Histogram for 0-20
Frequency
3
2
1
0
21150
42300
63450
84600
105750
126900
148050
0-20

Location	0-20
BG-1-2	100000
BG-3-17	76000
BG-4-2	35000
BG-4-19	47000
BG-1-10	79000
BG-2-2	23000
BG-2-10	19000
BG-2-19	160000
BG-3-2	100000
BG-3-10	70000
BG-4-10	46000
BG-6-2	96000
BG-6-9	38000

Location	>20
BG-1-29	48000
BG-1-40	140000
BG-1-46	46000
BG-1-92	26000
BG-2-21	42000
BG-2-32	4000
BG-2-75	19000
BG-3-29	36000
BG-3-63	25000
BG-3-65	38000
BG-3-95	29000
BG-3-105	32000
BG-3-131	120000
BG-3-136	48000
BG-4-65	30000
BG-4-82	50000
BG-4-95	30000
BG-4-117	25000
BG-4-120	39000
BG-6-58	25000
BG-6-75	54000
BG-6-98	39000
BG-6-114	52000
BG-6-127	46000
BG-1-43	31000
BG-1-55	38000
BG-1-78	71000
BG-2-30	17000
BG-2-81	57000
BG-3-22	150000
BG-3-69	55000
BG-4-40	57000
BG-4-79	70000
BG-4-161	52000
BG-4-163	90000
BG-6-28	44000
BG-6-53	49000
BG-6-87	51000

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Calcium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	17
Minimum	17000
Maximum	150000
Mean of Raw Data	60556
Standard Deviation of Raw Data	30297
Kstar	4.029
Mean of Log Transformed Data	10.9
Standard Deviation of Log Transformed Data	0.484

Normal Distribution Test Results	
Correlation Coefficient R	0.929
Shapiro Wilk Test Statistic	0.881
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.0221
Lilliefors Test Statistic	0.213
Lilliefors Critical (0.95) Value	0.209

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.974
A-D Test Statistic	0.29
A-D Critical (0.95) Value	0.743
K-S Test Statistic	0.158
K-S Critical(0.95) Value	0.204

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.979
Shapiro Wilk Test Statistic	0.974
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.795
Lilliefors Test Statistic	0.128
Lilliefors Critical (0.95) Value	0.209

Data appear Lognormal at (0.05) Significance Level

Non-Clay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	24
Minimum	4000
Maximum	160000
Mean of Raw Data	50727
Standard Deviation of Raw Data	35614
Kstar	2.298
Mean of Log Transformed Data	10.62
Standard Deviation of Log Transformed Data	0.691

Normal Distribution Test Results

Correlation Coefficient R	0.897
Shapiro Wilk Test Statistic	0.811
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	2.0382E-5
Lilliefors Test Statistic	0.251
Lilliefors Critical (0.95) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.972
A-D Test Statistic	0.889
A-D Critical (0.95) Value	0.756
K-S Test Statistic	0.166
K-S Critical(0.95) Value	0.155

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.953
Shapiro Wilk Test Statistic	0.928
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.037
Lilliefors Test Statistic	0.133
Lilliefors Critical (0.95) Value	0.154

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Calcium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	17

Raw Statistics		Log-Transformed Statistics	
Minimum	17000	Minimum	9.741
Maximum	150000	Maximum	11.92
Second Largest	100000	Second Largest	11.51
First Quartile	44750	First Quartile	10.71
Median	53500	Median	10.89
Third Quartile	70750	Third Quartile	11.17
Mean	60556	Mean	10.9
SD	30297	SD	0.484
Coefficient of Variation	0.5		
Skewness	1.573		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.881	Shapiro Wilk Test Statistic	0.974
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	134874	95% UTL with 95% Coverage	178111
95% UPL (t)	114705	95% UPL (t)	129064
90% Percentile (z)	99383	90% Percentile (z)	101051
95% Percentile (z)	110390	95% Percentile (z)	120470
99% Percentile (z)	131037	99% Percentile (z)	167524

Gamma Distribution Test		Data Distribution Test	
k star	4.029	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	15029		
MLE of Mean	60556		
MLE of Standard Deviation	30168		
nu star	145		
A-D Test Statistic	0.29	Nonparametric Statistics	
5% A-D Critical Value	0.743	90% Percentile	93000
K-S Test Statistic	0.158	95% Percentile	107500
5% K-S Critical Value	0.204	99% Percentile	141500
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	150000
90% Percentile	100991	95% Percentile Bootstrap UTL with 95% Coverage	150000
95% Percentile	117156	95% BCA Bootstrap UTL with 95% Coverage	150000
99% Percentile	151669	95% UPL	150000
		95% Chebyshev UPL	196236
95% WH Approx. Gamma UPL	119976	Upper Threshold Limit Based upon IQR	109750
95% HW Approx. Gamma UPL	121611		
95% WH Approx. Gamma UTL with 95% Coverage	152356		
95% HW Approx. Gamma UTL with 95% Coverage	156934		

Non-Clay

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	24

Raw Statistics		Log-Transformed Statistics	
Minimum	4000	Minimum	8.294
Maximum	160000	Maximum	11.98
Second Largest	140000	Second Largest	11.85
First Quartile	29000	First Quartile	10.28
Median	39000	Median	10.57
Third Quartile	52000	Third Quartile	10.86
Mean	50727	Mean	10.62
SD	35614	SD	0.691
Coefficient of Variation	0.702		
Skewness	1.687		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.811	Shapiro Wilk Test Statistic	0.928
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	128226	95% UTL with 95% Coverage	184632
95% UPL (t)	111961	95% UPL (t)	134641
90% Percentile (z)	96369	90% Percentile (z)	99475
95% Percentile (z)	109308	95% Percentile (z)	127881
99% Percentile (z)	133579	99% Percentile (z)	204852
Gamma Distribution Test		Data Distribution Test	
k star	2.298	Data do not follow a Discernable Distribution (0.05)	
Theta Star	22074		
MLE of Mean	50727		
MLE of Standard Deviation	33463		
nu star	151.7		
A-D Test Statistic	0.889	Nonparametric Statistics	
5% A-D Critical Value	0.756	90% Percentile	99200
K-S Test Statistic	0.166	95% Percentile	128000
5% K-S Critical Value	0.155	99% Percentile	153600

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 95% Coverage	160000
90% Percentile	95522	95% Percentile Bootstrap UTL with 95% Coverage	160000
95% Percentile	115225	95% BCA Bootstrap UTL with 95% Coverage	160000
99% Percentile	158570	95% UPL	146000
		95% Chebyshev UPL	208302
95% WH Approx. Gamma UPL	116619	Upper Threshold Limit Based upon IQR	86500
95% HW Approx. Gamma UPL	119155		
95% WH Approx. Gamma UTL with 95% Coverage	144246		
95% HW Approx. Gamma UTL with 95% Coverage	150031		

Outlier Tests for Selected Variables

User Selected Options	
From File	Calcium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 150000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.522

For 10% significance level, 150000 is an outlier.

For 5% significance level, 150000 is an outlier.

For 1% significance level, 150000 is not an outlier.

2. Data Value 17000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.247

For 10% significance level, 17000 is not an outlier.

For 5% significance level, 17000 is not an outlier.

For 1% significance level, 17000 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	50727
Standard Deviation	35614
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	50727	35071	160000	8	3.116	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 160000 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Calcium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Observations	33	18
Number of Distinct Observations	24	17
Minimum	4000	17000
Maximum	160000	150000
Mean	50727	60556
Median	39000	53500
SD	35614	30297
SE of Mean	6200	7141

Wilcoxon-Mann-Whitney (WMW) Test

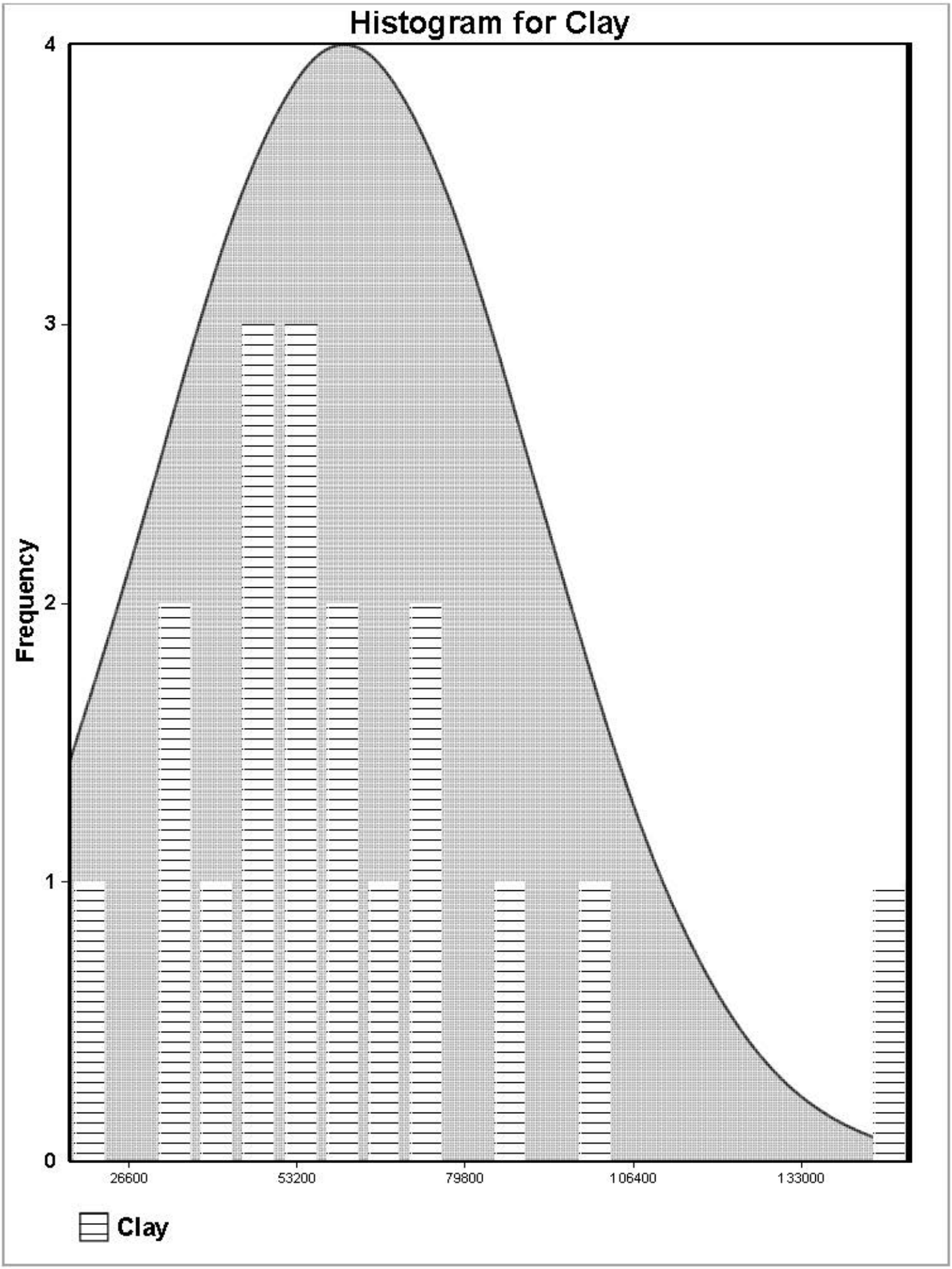
H0: Mean/Median of Site or AOC = Mean/Median of Background

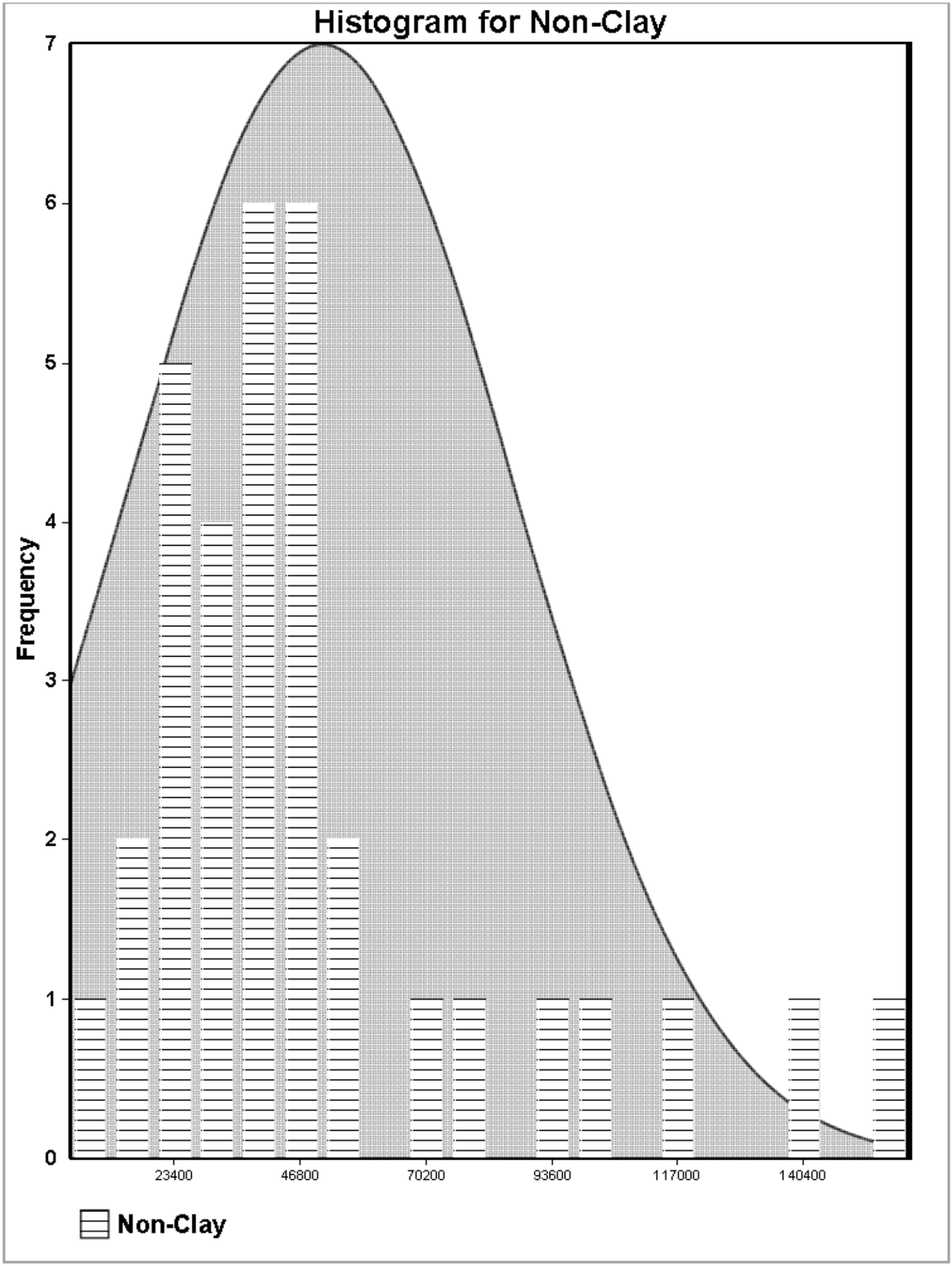
Site Rank Sum W-Stat	758.5
WMW Test U-Stat	1.951
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.0487

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value < alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
26600
53200
79800
106400
133000
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
23400
46800
70200
93600
117000
140400
Non-Clay

Location	Clay
BG-1-2	100000
BG-1-43	31000
BG-1-55	38000
BG-1-78	71000
BG-2-30	17000
BG-2-81	57000
BG-3-17	76000
BG-3-22	150000
BG-3-69	55000
BG-4-2	35000
BG-4-19	47000
BG-4-40	57000
BG-4-79	70000
BG-4-161	52000
BG-4-163	90000
BG-6-28	44000
BG-6-53	49000
BG-6-87	51000

Location	Non-Clay
BG-1-10	79000
BG-1-29	48000
BG-1-40	140000
BG-1-46	46000
BG-1-92	26000
BG-2-2	23000
BG-2-10	19000
BG-2-19	160000
BG-2-21	42000
BG-2-32	4000
BG-2-75	19000
BG-3-2	100000
BG-3-10	70000
BG-3-29	36000
BG-3-63	25000
BG-3-65	38000
BG-3-95	29000
BG-3-105	32000
BG-3-131	120000
BG-3-136	48000
BG-4-10	46000
BG-4-65	30000
BG-4-82	50000
BG-4-95	30000
BG-4-117	25000
BG-4-120	39000
BG-6-2	96000
BG-6-9	38000
BG-6-58	25000
BG-6-75	54000
BG-6-98	39000
BG-6-114	52000
BG-6-127	46000

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Calcium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	11
Minimum	19000
Maximum	160000
Mean of Raw Data	76250
Standard Deviation of Raw Data	44914
Kstar	2.152
Mean of Log Transformed Data	11.05
Standard Deviation of Log Transformed Data	0.682

Normal Distribution Test Results	
Correlation Coefficient R	0.976
Shapiro Wilk Test Statistic	0.942
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.579
Lilliefors Test Statistic	0.152
Lilliefors Critical (0.95) Value	0.256

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.98
A-D Test Statistic	0.249
A-D Critical (0.95) Value	0.74
K-S Test Statistic	0.142
K-S Critical(0.95) Value	0.248

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.978
Shapiro Wilk Test Statistic	0.945
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.631
Lilliefors Test Statistic	0.147
Lilliefors Critical (0.95) Value	0.256

Data appear Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	30
Minimum	4000
Maximum	150000
Mean of Raw Data	47410
Standard Deviation of Raw Data	26899
Kstar	3.291
Mean of Log Transformed Data	10.62
Standard Deviation of Log Transformed Data	0.593

Normal Distribution Test Results

Correlation Coefficient R	0.904
Shapiro Wilk Test Statistic	0.839
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	1.7124E-5
Lilliefors Test Statistic	0.207
Lilliefors Critical (0.95) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.962
A-D Test Statistic	0.726
A-D Critical (0.95) Value	0.753
K-S Test Statistic	0.143
K-S Critical(0.95) Value	0.142

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.935
Shapiro Wilk Test Statistic	0.906
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.00322
Lilliefors Test Statistic	0.134
Lilliefors Critical (0.95) Value	0.142

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Calcium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	90%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-Transformed Statistics	
Minimum	19000	Minimum	9.852
Maximum	160000	Maximum	11.98
Second Largest	140000	Second Largest	11.85
First Quartile	41000	First Quartile	10.62
Median	74500	Median	11.22
Third Quartile	100000	Third Quartile	11.51
Mean	76250	Mean	11.05
SD	44914	SD	0.682
Coefficient of Variation	0.589		
Skewness	0.51		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.942	Shapiro Wilk Test Statistic	0.945
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	175511	95% UTL with 90% Coverage	284940
95% UPL (t)	160205	95% UPL (t)	225834
90% Percentile (z)	133810	90% Percentile (z)	151246
95% Percentile (z)	150127	95% Percentile (z)	193784
99% Percentile (z)	180736	99% Percentile (z)	308478

Gamma Distribution Test		Data Distribution Test	
k star	2.152	Data appear Normal at 5% Significance Level	
Theta Star	35424		
MLE of Mean	76250		
MLE of Standard Deviation	51972		
nu star	51.66		
A-D Test Statistic	0.249	Nonparametric Statistics	
5% A-D Critical Value	0.74	90% Percentile	136000
K-S Test Statistic	0.142	95% Percentile	149000
5% K-S Critical Value	0.248	99% Percentile	157800
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 90% Coverage	160000
90% Percentile	145770	95% Percentile Bootstrap UTL with 90% Coverage	160000
95% Percentile	176737	95% BCA Bootstrap UTL with 90% Coverage	158000
99% Percentile	245123	95% UPL	160000
		95% Chebyshev UPL	280021
95% WH Approx. Gamma UPL	187578	Upper Threshold Limit Based upon IQR	188500
95% HW Approx. Gamma UPL	194395		
95% WH Approx. Gamma UTL with 90% Coverage	218752		
95% HW Approx. Gamma UTL with 90% Coverage	229964		

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	30

Raw Statistics		Log-Transformed Statistics	
Minimum	4000	Minimum	8.294
Maximum	150000	Maximum	11.92
Second Largest	120000	Second Largest	11.7
First Quartile	30500	First Quartile	10.33
Median	46000	Median	10.74
Third Quartile	53000	Third Quartile	10.88
Mean	47410	Mean	10.62
SD	26899	SD	0.593
Coefficient of Variation	0.567		
Skewness	1.97		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.839	Shapiro Wilk Test Statistic	0.906
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 90% Coverage	93031	95% UTL with 90% Coverage	111822
95% UPL (t)	93339	95% UPL (t)	112582
90% Percentile (z)	81883	90% Percentile (z)	87459
95% Percentile (z)	91655	95% Percentile (z)	108481
99% Percentile (z)	109987	99% Percentile (z)	162495
Gamma Distribution Test		Data Distribution Test	
k star	3.291	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	14404		
MLE of Mean	47410		
MLE of Standard Deviation	26132		
nu star	256.7		
A-D Test Statistic	0.726	Nonparametric Statistics	
5% A-D Critical Value	0.753	90% Percentile	72000
K-S Test Statistic	0.143	95% Percentile	93000
5% K-S Critical Value	0.142	99% Percentile	138600

Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 90% Coverage	120000
90% Percentile	82452	95% Percentile Bootstrap UTL with 90% Coverage	120000
95% Percentile	96914	95% BCA Bootstrap UTL with 90% Coverage	96000
99% Percentile	128110	95% UPL	120000
		95% Chebyshev UPL	166155
95% WH Approx. Gamma UPL	97623	Upper Threshold Limit Based upon IQR	86750
95% HW Approx. Gamma UPL	99834		
95% WH Approx. Gamma UTL with 90% Coverage	97157		
95% HW Approx. Gamma UTL with 90% Coverage	99322		

Outlier Tests for Selected Variables

User Selected Options	
From File	Calcium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 160000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.438

For 10% significance level, 160000 is not an outlier.
For 5% significance level, 160000 is not an outlier.
For 1% significance level, 160000 is not an outlier.

2. Data Value 19000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.157

For 10% significance level, 19000 is not an outlier.
For 5% significance level, 19000 is not an outlier.
For 1% significance level, 19000 is not an outlier.

Rosner's Outlier Test for MC

Mean	47410
Standard Deviation	26899
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	47410	26552	150000	11	3.864	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 150000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 150000 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Calcium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Observations	39	12
Number of Distinct Observations	30	11
Minimum	4000	19000
Maximum	150000	160000
Mean	47410	76250
Median	46000	74500
SD	26899	44914
SE of Mean	4307	12966

Wilcoxon-Mann-Whitney (WMW) Test

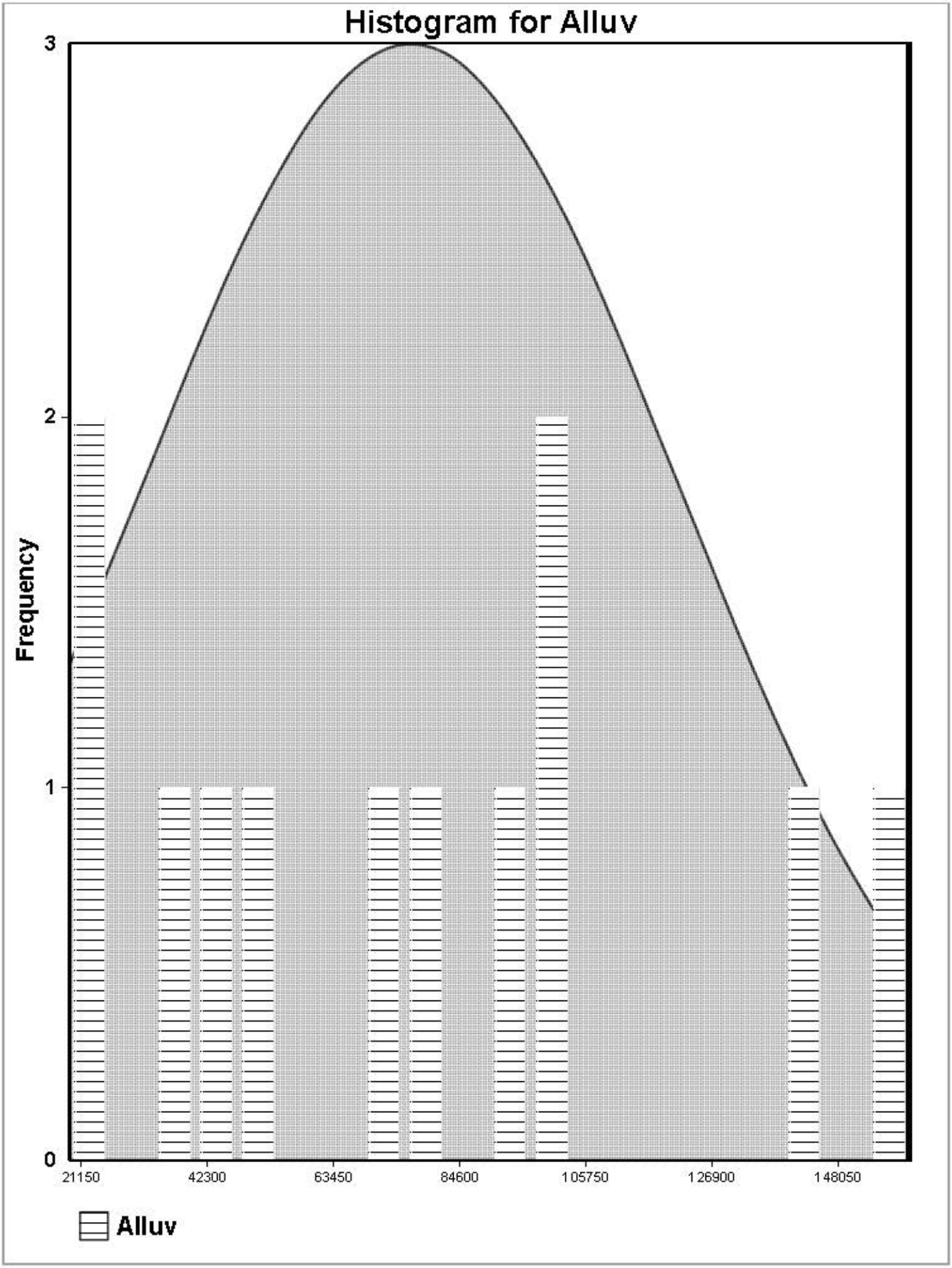
H0: Mean/Median of Site or AOC = Mean/Median of Background

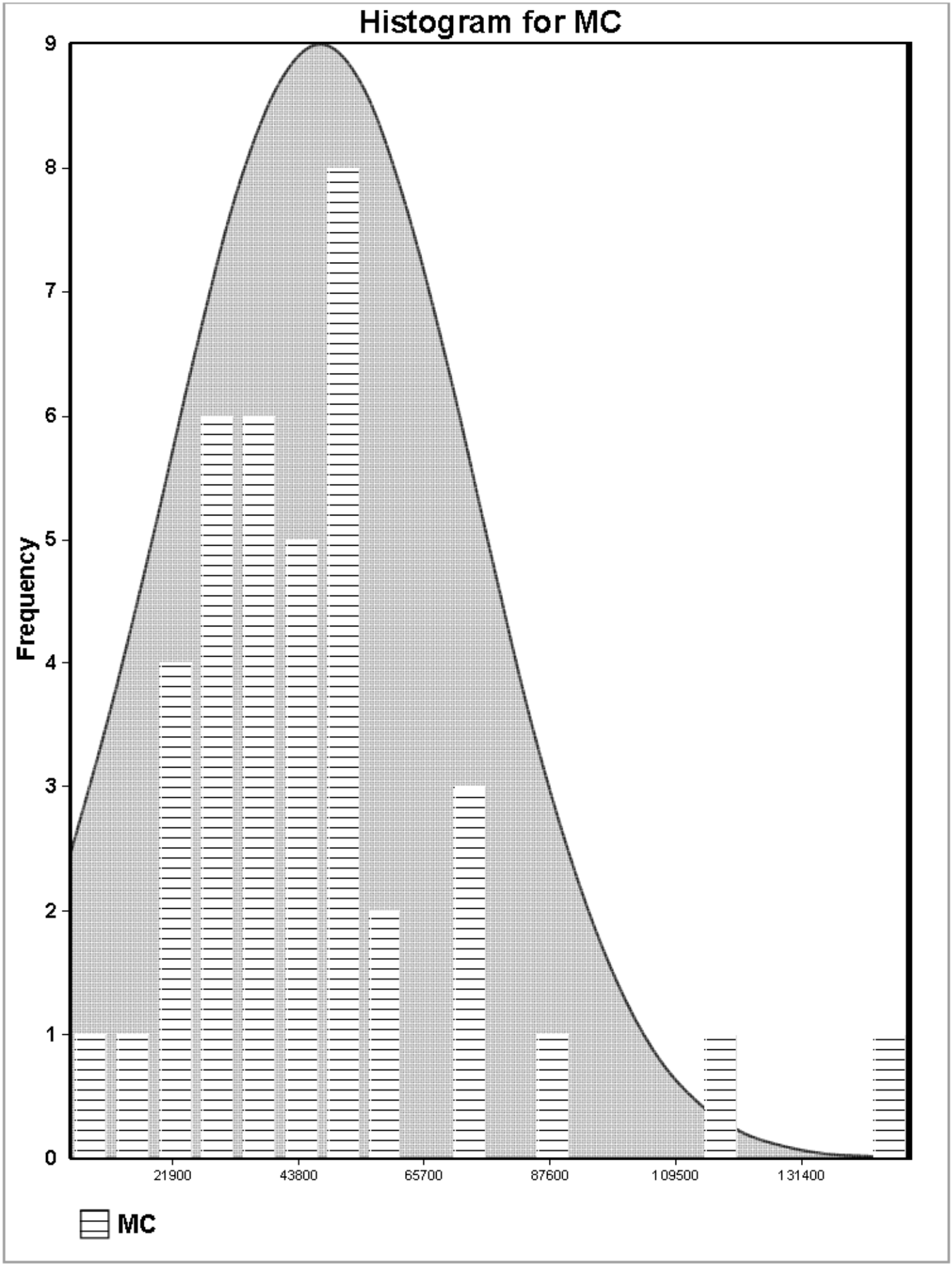
Site Rank Sum W-Stat	928.5
WMW Test U-Stat	1.887
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.0562

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
3
2
1
0
21150
42300
63450
84600
105750
126900
148050
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
21900
43800
65700
87600
109500
131400
MC

Location	Alluv
BG-1-2	100000
BG-1-10	79000
BG-1-29	48000
BG-1-40	140000
BG-2-2	23000
BG-2-10	19000
BG-2-19	160000
BG-2-21	42000
BG-3-2	100000
BG-3-10	70000
BG-6-2	96000
BG-6-9	38000

Location	MC
BG-1-43	31000
BG-1-46	46000
BG-1-55	38000
BG-1-78	71000
BG-1-92	26000
BG-2-30	17000
BG-2-32	4000
BG-2-75	19000
BG-2-81	57000
BG-3-17	76000
BG-3-22	150000
BG-3-29	36000
BG-3-63	25000
BG-3-65	38000
BG-3-69	55000
BG-3-95	29000
BG-3-105	32000
BG-3-131	120000
BG-3-136	48000
BG-4-1	35000
BG-4-10	46000
BG-4-19	47000
BG-4-40	57000
BG-4-65	30000
BG-4-79	70000
BG-4-82	50000
BG-4-95	30000
BG-4-117	25000
BG-4-120	39000
BG-4-161	52000
BG-4-163	90000
BG-6-28	44000
BG-6-53	49000
BG-6-58	25000
BG-6-75	54000
BG-6-87	51000
BG-6-98	39000
BG-6-114	52000
BG-1-127	46000

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Cadmium.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	29	22	43.14%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	22	0.25	0.31	0.262	0.25	0.0215
Statistics (Detects Only)	29	0.043	0.48	0.148	0.11	0.116
Statistics (All: NDs treated as DL value)	51	0.043	0.48	0.197	0.25	0.105
Statistics (All: NDs treated as DL/2 value)	51	0.043	0.48	0.141	0.125	0.0875
Statistics (Normal ROS Estimated Data)	51	-0.0314	0.48	0.137	0.12	0.0992
Statistics (Gamma ROS Estimated Data)	51	0.043	0.48	0.148	0.148	0.0868
Statistics (Lognormal ROS Estimated Data)	51	0.0371	0.48	0.131	0.101	0.0943

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.251	2.132	0.0658	-2.149	0.678	-0.315
Statistics (NDs = DL)	2.979	2.817	0.0662	-1.801	0.65	-0.361
Statistics (NDs = DL/2)	3.766	3.557	0.0373	-2.1	0.513	-0.244
Statistics (Gamma ROS Estimates)	3.85	3.636	0.0385	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.221	0.592	-0.267

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.89	0.954	0.847	0.929

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.79	0.926	Data Not Normal
Lilliefors (Detects Only)	0.183	0.165	Data Not Normal
Lilliefors (NDs = DL)	0.203	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.261	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.147	0.124	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.975	0.943	0.922	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.758	0.756	
Kolmogorov-Smirnov (Detects Only)	0.129	0.165	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	2.292	0.757	
Kolmogorov-Smirnov (NDs = DL)	0.241	0.125	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.18	0.754	
Kolmogorov-Smirnov (NDs = DL/2)	0.187	0.125	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.513	0.754	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.246	0.125	Data Not Gamma Distributed	

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.981	0.945	0.961	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.949	0.926	Data Appear Lognormal
Lilliefors (Detects Only)	0.0863	0.165	Data Appear Lognormal
Lilliefors (NDs = DL)	0.248	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.183	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0805	0.124	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Cadmium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Number of Valid Data	51	Number of Detected Data	29
Number of Distinct Detected Data	25	Number of Non-Detect Data	22
		Percent Non-Detects	43.14%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.043	Minimum Detected	-3.147
Maximum Detected	0.48	Maximum Detected	-0.734
Mean of Detected	0.148	Mean of Detected	-2.149
SD of Detected	0.116	SD of Detected	0.678
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.31	Maximum Non-Detect	-1.171

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	47
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	4
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	92.16%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.79	Shapiro Wilk Test Statistic	0.949
5% Shapiro Wilk Critical Value	0.926	5% Shapiro Wilk Critical Value	0.926
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.141	Mean (Log Scale)	-2.1
SD	0.0875	SD (Log Scale)	0.513
95% UTL 95% Coverage	0.32	95% UTL 95% Coverage	0.351
95% UPL (t)	0.289	95% UPL (t)	0.292
90% Percentile (z)	0.253	90% Percentile (z)	0.236
95% Percentile (z)	0.285	95% Percentile (z)	0.285
99% Percentile (z)	0.344	99% Percentile (z)	0.404
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0461	Mean in Original Scale	0.131
SD	0.186	SD in Original Scale	0.0943
95% UTL with 95% Coverage	0.428	95% UTL with 95% Coverage	0.366
		95% BCA UTL with 95% Coverage	0.46
		95% Bootstrap (%) UTL with 95% Coverage	0.47
95% UPL (t)	0.361	95% UPL (t)	0.296

90% Percentile (z)	0.285	90% Percentile (z)	0.232
95% Percentile (z)	0.352	95% Percentile (z)	0.287
99% Percentile (z)	0.479	99% Percentile (z)	0.43
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.041	Data follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.0725		
nu star	118.4		
A-D Test Statistic	0.758	Nonparametric Statistics	
5% A-D Critical Value	0.756	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.129	Mean	0.131
5% K-S Critical Value	0.165	SD	0.0952
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	0.0153
		95% KM UTL with 95% Coverage	0.327
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.55
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.292
Mean	0.148	90% Percentile (z)	0.253
Median	0.148	95% Percentile (z)	0.288
SD	0.0868	99% Percentile (z)	0.353
k star	3.636		
Theta star	0.0407	Gamma ROS Limits with Extrapolated Data	
Nu star	370.9	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.296
95% Percentile of Chisquare (2k)	14.46	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.299
		95% WH Approx. Gamma UTL with 95% Coverage	0.342
90% Percentile	0.252	95% HW Approx. Gamma UTL with 95% Coverage	0.348
95% Percentile	0.295		
99% Percentile	0.385		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Cadmium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for All Data

Mean	0.141
Standard Deviation	0.0875
Number of data	51
Number of suspected outliers	1

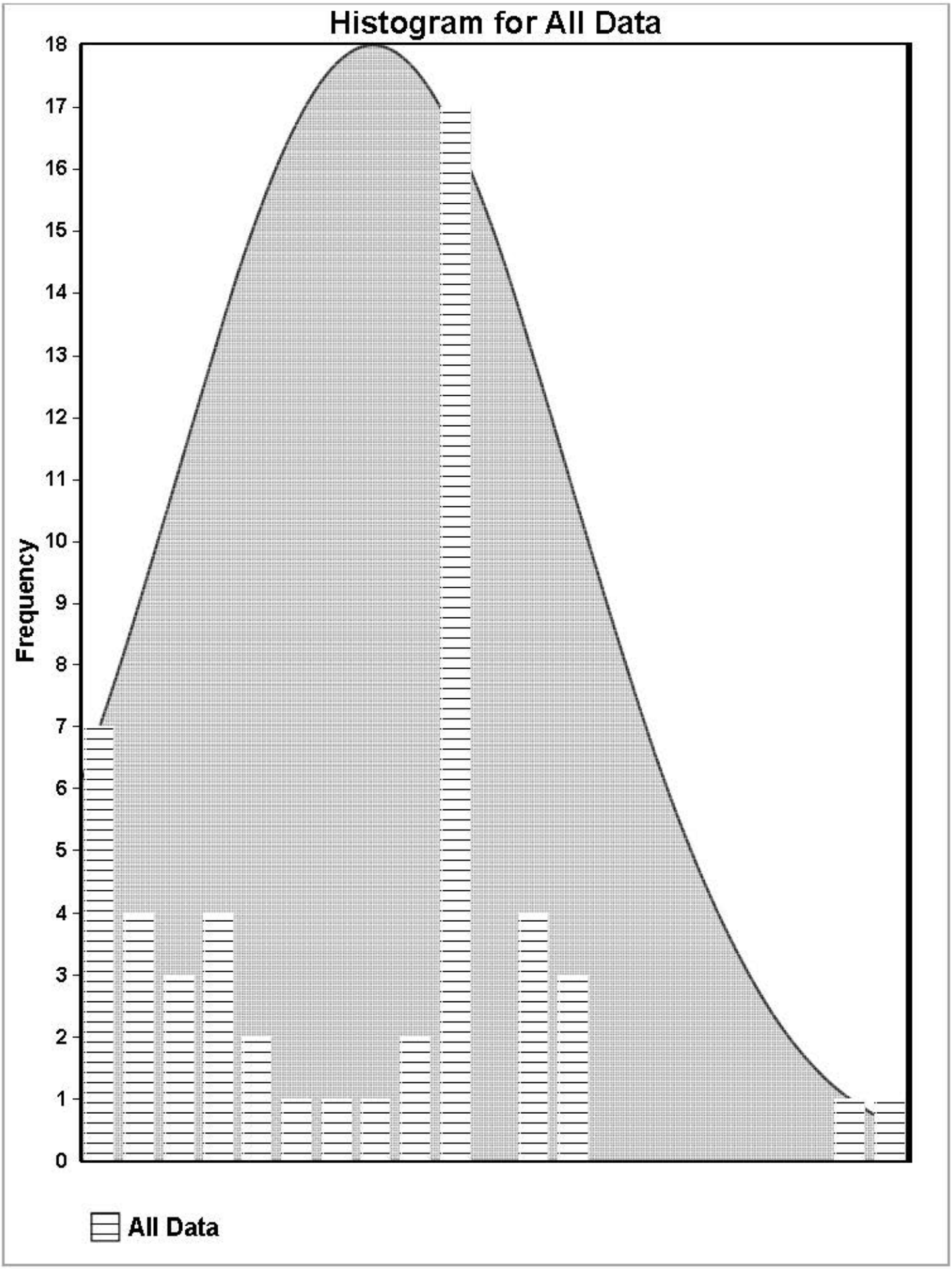
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.141	0.0867	0.48	43	3.916	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.48 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.48 is a Potential Statistical Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
All Data

Location	All Data	D_All Data
BG-1-2	0.25	0
BG-3-17	0.057	1
BG-4-2	0.061	1
BG-4-19	0.18	1
BG-1-10	0.25	0
BG-2-2	0.25	0
BG-2-10	0.25	0
BG-2-19	0.11	1
BG-3-2	0.16	1
BG-3-10	0.07	1
BG-4-10	0.08	1
BG-6-2	0.26	0
BG-6-9	0.052	1
BG-1-29	0.25	0
BG-1-40	0.25	0
BG-1-46	0.25	0
BG-1-92	0.25	0
BG-2-21	0.25	0
BG-2-32	0.25	0
BG-2-75	0.25	0
BG-3-29	0.25	0
BG-3-63	0.31	0
BG-3-65	0.052	1
BG-3-95	0.29	0
BG-3-105	0.3	0
BG-3-131	0.23	1
BG-3-136	0.3	0
BG-4-65	0.043	1
BG-4-82	0.092	1
BG-4-95	0.3	0
BG-4-117	0.057	1
BG-4-120	0.083	1
BG-6-58	0.07	1
BG-6-75	0.15	1
BG-6-98	0.099	1
BG-6-114	0.12	1
BG-6-127	0.21	1
BG-1-43	0.25	0
BG-1-55	0.25	0
BG-1-78	0.25	0
BG-2-30	0.25	0
BG-2-81	0.46	1
BG-3-22	0.48	1
BG-3-69	0.11	1
BG-4-40	0.13	1
BG-4-79	0.22	1
BG-4-161	0.14	1
BG-4-163	0.32	1
BG-6-28	0.049	1
BG-6-53	0.098	1
BG-6-87	0.31	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Cadmium.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	8	5	38.46%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	5	0.25	0.26	0.252	0.25	0.00447
Statistics (Detects Only)	8	0.052	0.18	0.0963	0.075	0.0492
Statistics (All: NDs treated as DL value)	13	0.052	0.26	0.156	0.16	0.0874
Statistics (All: NDs treated as DL/2 value)	13	0.052	0.18	0.108	0.125	0.0405
Statistics (Normal ROS Estimated Data)	13	0.0487	0.18	0.0963	0.0819	0.0427
Statistics (Gamma ROS Estimated Data)	13	0.0491	0.18	0.0973	0.0873	0.0424
Statistics (Lognormal ROS Estimated Data)	13	0.052	0.18	0.0943	0.08	0.042

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.972	3.876	0.0194	-2.445	0.475	-0.194
Statistics (NDs = DL)	2.97	2.336	0.0526	-2.035	0.651	-0.32
Statistics (NDs = DL/2)	7.037	5.464	0.0153	-2.301	0.409	-0.178
Statistics (Gamma ROS Estimates)	5.977	4.649	0.0163	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.445	0.416	-0.17

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.923	0.923	0.965	0.959

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.837	0.818	Data Appear Normal
Lilliefors (Detects Only)	0.254	0.313	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.821	0.866	Data Not Normal
Lilliefors (NDs = DL)	0.243	0.246	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.92	0.866	Data Appear Normal
Lilliefors (NDs = DL/2)	0.204	0.246	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.907	0.866	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.17	0.246	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.964	0.886	0.959	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.503	0.719	
Kolmogorov-Smirnov (Detects Only)	0.223	0.295	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.917	0.739	
Kolmogorov-Smirnov (NDs = DL)	0.242	0.238	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	0.617	0.735	
Kolmogorov-Smirnov (NDs = DL/2)	0.24	0.237	Data appear Approximate Gamma Distribution
Anderson-Darling (Gamma ROS Estimates)	0.265	0.736	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.128	0.237	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.957	0.931	0.957	0.975

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.894	0.818	Data Appear Lognormal
Lilliefors (Detects Only)	0.193	0.313	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.838	0.866	Data Not Lognormal
Lilliefors (NDs = DL)	0.225	0.246	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.902	0.866	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.245	0.246	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.933	0.866	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.116	0.246	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

>20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	38	0	38	21	17	44.74%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	17	0.25	0.31	0.265	0.25	0.0237
Statistics (Detects Only)	21	0.043	0.48	0.168	0.12	0.128
Statistics (All: NDs treated as DL value)	38	0.043	0.48	0.211	0.25	0.107
Statistics (All: NDs treated as DL/2 value)	38	0.043	0.48	0.152	0.125	0.0965
Statistics (Normal ROS Estimated Data)	38	-0.0268	0.48	0.15	0.131	0.109
Statistics (Gamma ROS Estimated Data)	38	0.043	0.48	0.168	0.168	0.0945
Statistics (Lognormal ROS Estimated Data)	38	0.0406	0.48	0.143	0.108	0.104

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.148	1.996	0.0781	-2.036	0.718	-0.353
Statistics (NDs = DL)	3.17	2.937	0.0666	-1.721	0.638	-0.371
Statistics (NDs = DL/2)	3.561	3.298	0.0427	-2.031	0.531	-0.261
Statistics (Gamma ROS Estimates)	3.77	3.49	0.0445	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.142	0.619	-0.289

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.913	0.96	0.853	0.941

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.829	0.908	Data Not Normal
Lilliefors (Detects Only)	0.222	0.193	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.914	0.938	Data Not Normal
Lilliefors (NDs = DL)	0.194	0.144	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.737	0.938	Data Not Normal

Lilliefors (NDs = DL/2)	0.303	0.144	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.891	0.938	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.16	0.144	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.98	0.946	0.929	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.479	0.753	
Kolmogorov-Smirnov (Detects Only)	0.139	0.192	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.708	0.754	
Kolmogorov-Smirnov (NDs = DL)	0.242	0.144	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.941	0.753	
Kolmogorov-Smirnov (NDs = DL/2)	0.231	0.144	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.73	0.753	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.247	0.144	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.987	0.942	0.957	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.962	0.908	Data Appear Lognormal
Lilliefors (Detects Only)	0.0902	0.193	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.877	0.938	Data Not Lognormal
Lilliefors (NDs = DL)	0.253	0.144	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.918	0.938	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.192	0.144	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.968	0.938	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0827	0.144	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Cadmium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Number of Valid Data	13	Number of Detected Data	8
Number of Distinct Detected Data	8	Number of Non-Detect Data	5
		Percent Non-Detects	38.46%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.052	Minimum Detected	-2.957
Maximum Detected	0.18	Maximum Detected	-1.715
Mean of Detected	0.0963	Mean of Detected	-2.445
SD of Detected	0.0492	SD of Detected	0.475
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.26	Maximum Non-Detect	-1.347

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	13
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 8 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.837	Shapiro Wilk Test Statistic	0.894
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.108	Mean (Log Scale)	-2.301
SD	0.0405	SD (Log Scale)	0.409
95% UTL 95% Coverage	0.216	95% UTL 95% Coverage	0.299
95% UPL (t)	0.183	95% UPL (t)	0.213
90% Percentile (z)	0.16	90% Percentile (z)	0.169
95% Percentile (z)	0.174	95% Percentile (z)	0.196
99% Percentile (z)	0.202	99% Percentile (z)	0.259

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0943
		SD in Original Scale	0.042
		Mean in Log Scale	-2.445
		SD in Log Scale	0.416
		95% UTL 95% Coverage	0.263
		95% UPL (t)	0.187
		90% Percentile (z)	0.148
		95% Percentile (z)	0.172
		99% Percentile (z)	0.228
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.191	Data appear Normal at 5% Significance Level	
Theta Star	0.0302		
nu star	51.06		
A-D Test Statistic	0.503	Nonparametric Statistics	
5% A-D Critical Value	0.719	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.223	Mean	0.0963
5% K-S Critical Value	0.295	SD	0.046
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0174
		95% KM UTL with 95% Coverage	0.219
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.305
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.181
Mean	0.0973	90% Percentile (z)	0.155
Median	0.0873	95% Percentile (z)	0.172
SD	0.0424	99% Percentile (z)	0.203
k star	4.649		
Theta star	0.0209	Gamma ROS Limits with Extrapolated Data	
Nu star	120.9	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.187
95% Percentile of Chisquare (2k)	17.34	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.189
		95% WH Approx. Gamma UTL with 95% Coverage	0.245
90% Percentile	0.158	95% HW Approx. Gamma UTL with 95% Coverage	0.252
95% Percentile	0.181		
99% Percentile	0.231		

Note: DL/2 is not a recommended method.

>20

General Statistics			
Number of Valid Data	38	Number of Detected Data	21
Number of Distinct Detected Data	21	Number of Non-Detect Data	17
		Percent Non-Detects	44.74%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.043	Minimum Detected	-3.147
Maximum Detected	0.48	Maximum Detected	-0.734
Mean of Detected	0.168	Mean of Detected	-2.036
SD of Detected	0.128	SD of Detected	0.718
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.31	Maximum Non-Detect	-1.171

Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	34
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	89.47%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.829	Shapiro Wilk Test Statistic	0.962
5% Shapiro Wilk Critical Value	0.908	5% Shapiro Wilk Critical Value	0.908
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.152	Mean (Log Scale)	-2.031
SD	0.0965	SD (Log Scale)	0.531
95% UTL 95% Coverage	0.358	95% UTL 95% Coverage	0.407
95% UPL (t)	0.317	95% UPL (t)	0.325
90% Percentile (z)	0.276	90% Percentile (z)	0.259
95% Percentile (z)	0.311	95% Percentile (z)	0.314
99% Percentile (z)	0.376	99% Percentile (z)	0.451
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0884	Mean in Original Scale	0.143
SD	0.177	SD in Original Scale	0.104
95% UTL with 95% Coverage	0.465	95% UTL with 95% Coverage	0.439
		95% BCA UTL with 95% Coverage	0.48
		95% Bootstrap (%) UTL with 95% Coverage	0.48
95% UPL (t)	0.39	95% UPL (t)	0.338
90% Percentile (z)	0.315	90% Percentile (z)	0.26
95% Percentile (z)	0.379	95% Percentile (z)	0.325
99% Percentile (z)	0.499	99% Percentile (z)	0.496
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.873	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0896		
nu star	78.66		
A-D Test Statistic	0.479	Nonparametric Statistics	
5% A-D Critical Value	0.753	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.139	Mean	0.144
5% K-S Critical Value	0.192	SD	0.104
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0196
		95% KM UTL with 95% Coverage	0.366
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.604
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.322
Mean	0.168	90% Percentile (z)	0.278
Median	0.168	95% Percentile (z)	0.316
SD	0.0945	99% Percentile (z)	0.387
k star	3.49		
Theta star	0.0481	Gamma ROS Limits with Extrapolated Data	
Nu star	265.3	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.341
95% Percentile of Chisquare (2k)	14.04	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.346

										95% WH Approx. Gamma UTL with	95% Coverage	0.404
					90% Percentile	0.288				95% HW Approx. Gamma UTL with	95% Coverage	0.414
					95% Percentile	0.337						
					99% Percentile	0.443						

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Cadmium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13

10% critical value: 0.467

5% critical value: 0.521

1% critical value: 0.615

1. Data Value 0.18 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.407

For 10% significance level, 0.18 is not an outlier.

For 5% significance level, 0.18 is not an outlier.

For 1% significance level, 0.18 is not an outlier.

2. Data Value 0.052 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.083

For 10% significance level, 0.052 is not an outlier.

For 5% significance level, 0.052 is not an outlier.

For 1% significance level, 0.052 is not an outlier.

Rosner's Outlier Test for >20

Mean	0.152
Standard Deviation	0.0965
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.152	0.0952	0.48	30	3.447	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.48 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.48 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Cadmium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Data	38	13
Number of Non-Detect Data	17	5
Number of Detect Data	21	8
Minimum Non-Detect	0.25	0.25
Maximum Non-Detect	0.31	0.26
Percent Non detects	44.74%	38.46%
Minimum Detected	0.043	0.052
Maximum Detected	0.48	0.18
Mean of Detected Data	0.168	0.0963
Median of Detected Data	0.12	0.075
SD of Detected Data	0.128	0.0492

Site vs Background Gehan Test

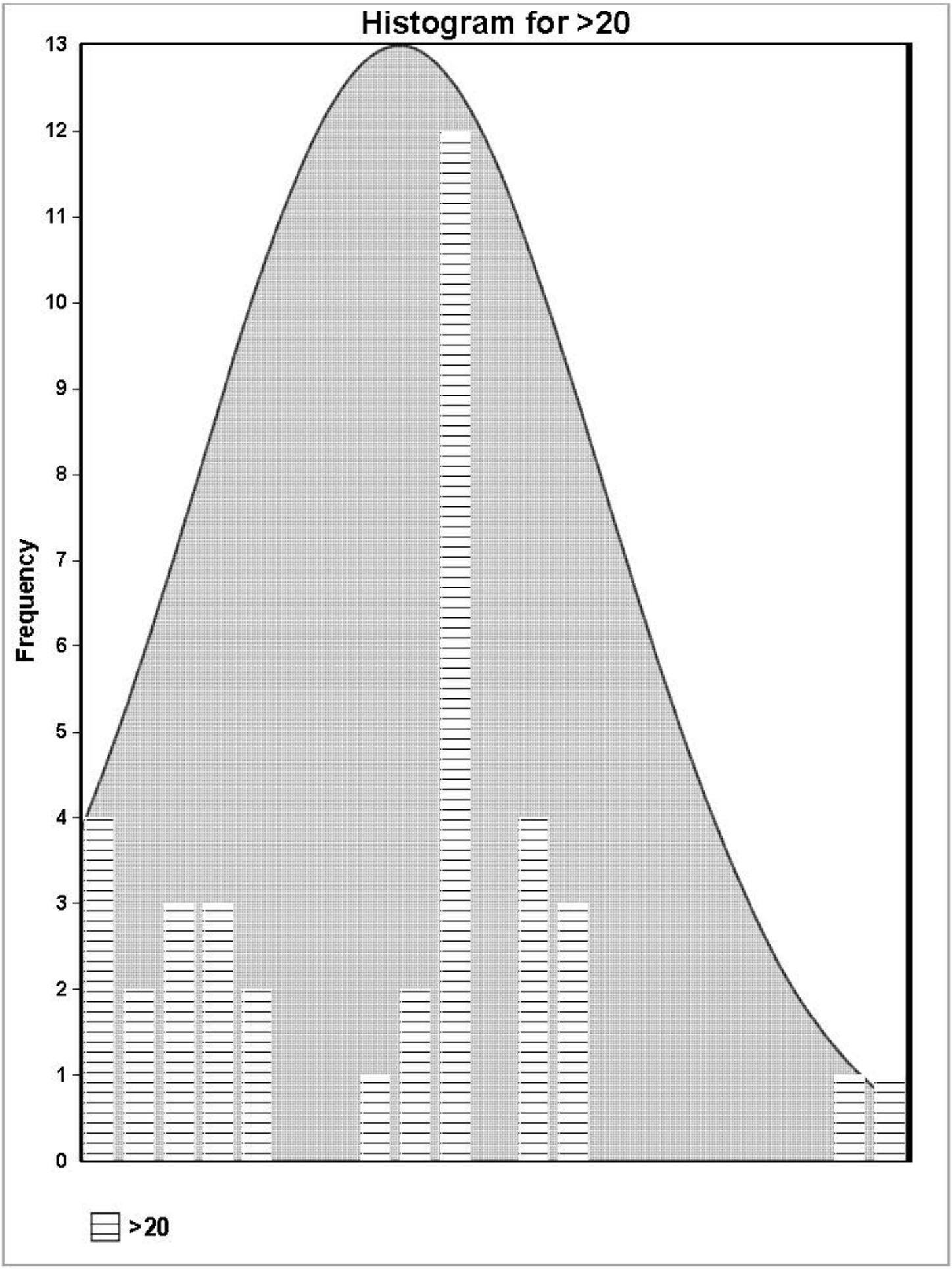
H0: Mu of Site or AOC = Mu of background

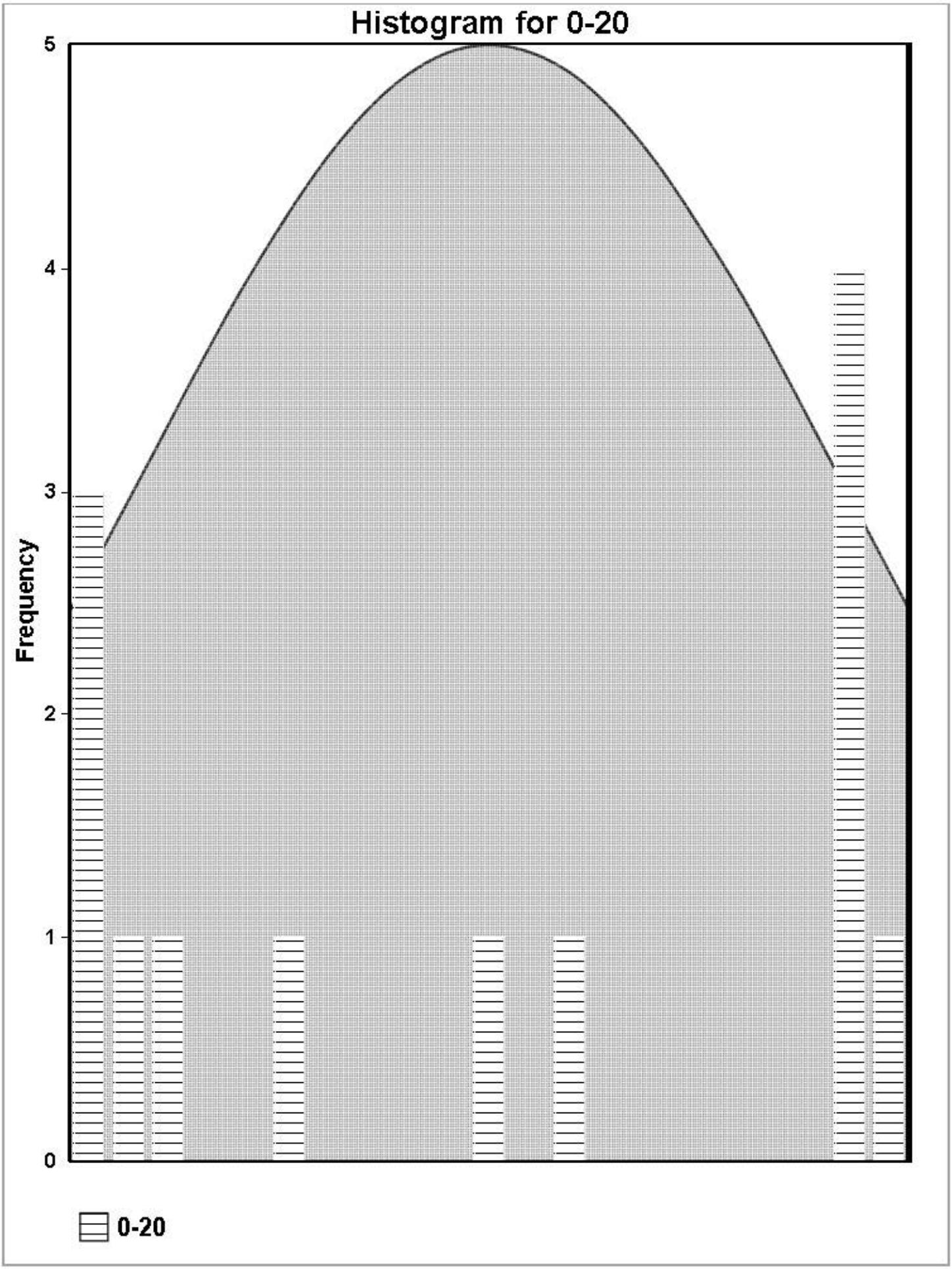
Gehan z Test Value	1.307
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.191

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5
0-20

Location	0-20	D_0-20	Location	>20	D_>20
BG-1-2	0.25	0	BG-1-29	0.25	0
BG-3-17	0.057	1	BG-1-40	0.25	0
BG-4-2	0.061	1	BG-1-46	0.25	0
BG-4-19	0.18	1	BG-1-92	0.25	0
BG-1-10	0.25	0	BG-2-21	0.25	0
BG-2-2	0.25	0	BG-2-32	0.25	0
BG-2-10	0.25	0	BG-2-75	0.25	0
BG-2-19	0.11	1	BG-3-29	0.25	0
BG-3-2	0.16	1	BG-3-63	0.31	0
BG-3-10	0.07	1	BG-3-65	0.052	1
BG-4-10	0.08	1	BG-3-95	0.29	0
BG-6-2	0.26	0	BG-3-105	0.3	0
BG-6-9	0.052	1	BG-3-131	0.23	1
			BG-3-136	0.3	0
			BG-4-65	0.043	1
			BG-4-82	0.092	1
			BG-4-95	0.3	0
			BG-4-117	0.057	1
			BG-4-120	0.083	1
			BG-6-58	0.07	1
			BG-6-75	0.15	1
			BG-6-98	0.099	1
			BG-6-114	0.12	1
			BG-6-127	0.21	1
			BG-1-43	0.25	0
			BG-1-55	0.25	0
			BG-1-78	0.25	0
			BG-2-30	0.25	0
			BG-2-81	0.46	1
			BG-3-22	0.48	1
			BG-3-69	0.11	1
			BG-4-40	0.13	1
			BG-4-79	0.22	1
			BG-4-161	0.14	1
			BG-4-163	0.32	1
			BG-6-28	0.049	1
			BG-6-53	0.098	1
			BG-6-87	0.31	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Cadmium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	13	5	27.78%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	5	0.25	0.25	0.25	0.25	0
Statistics (Detects Only)	13	0.049	0.48	0.201	0.14	0.148
Statistics (All: NDs treated as DL value)	18	0.049	0.48	0.215	0.235	0.126
Statistics (All: NDs treated as DL/2 value)	18	0.049	0.48	0.18	0.125	0.129
Statistics (Normal ROS Estimated Data)	18	0.0108	0.48	0.181	0.138	0.135
Statistics (Gamma ROS Estimated Data)	18	0.049	0.48	0.202	0.181	0.126
Statistics (Lognormal ROS Estimated Data)	18	0.049	0.48	0.177	0.135	0.133

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.054	1.749	0.0979	-1.866	0.773	-0.414
Statistics (NDs = DL)	2.724	2.307	0.0788	-1.733	0.686	-0.396
Statistics (NDs = DL/2)	2.526	2.142	0.0713	-1.926	0.657	-0.341
Statistics (Gamma ROS Estimates)	2.724	2.307	0.0743	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.975	0.713	-0.361

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.941	0.965	0.896	0.949

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.871	0.866	Data Appear Normal
Lilliefors (Detects Only)	0.199	0.246	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.923	0.897	Data Appear Normal
Lilliefors (NDs = DL)	0.168	0.209	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.799	0.897	Data Not Normal
Lilliefors (NDs = DL/2)	0.288	0.209	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.895	0.897	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.175	0.209	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.976	0.973	0.961	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.313	0.743	
Kolmogorov-Smirnov (Detects Only)	0.137	0.239	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.423	0.748	
Kolmogorov-Smirnov (NDs = DL)	0.177	0.205	Data Appear Gamma Distributed

Anderson-Darling (NDs = DL/2)	0.82	0.749	
Kolmogorov-Smirnov (NDs = DL/2)	0.233	0.206	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.171	0.748	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0908	0.205	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.984	0.969	0.969	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.947	0.866	Data Appear Lognormal
Lilliefors (Detects Only)	0.123	0.246	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.928	0.897	Data Appear Lognormal
Lilliefors (NDs = DL)	0.193	0.209	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.932	0.897	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.191	0.209	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.953	0.897	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0997	0.209	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	16	17	51.52%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	17	0.25	0.31	0.265	0.25	0.0235
Statistics (Detects Only)	16	0.043	0.23	0.105	0.0875	0.0563
Statistics (All: NDs treated as DL value)	33	0.043	0.31	0.188	0.25	0.0916
Statistics (All: NDs treated as DL/2 value)	33	0.043	0.23	0.119	0.125	0.0418
Statistics (Normal ROS Estimated Data)	33	0.0211	0.23	0.105	0.105	0.049
Statistics (Gamma ROS Estimated Data)	33	0.0172	0.23	0.106	0.11	0.0477
Statistics (Lognormal ROS Estimated Data)	33	0.0421	0.23	0.102	0.0928	0.0484

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.233	3.869	0.0248	-2.378	0.504	-0.212
Statistics (NDs = DL)	3.2	2.929	0.0586	-1.838	0.637	-0.346
Statistics (NDs = DL/2)	7.496	6.835	0.0159	-2.195	0.394	-0.179
Statistics (Gamma ROS Estimates)	4.55	4.156	0.0234	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.378	0.447	-0.188

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.941	0.932	0.962	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.879	0.887	Data Not Normal
Lilliefors (Detects Only)	0.167	0.222	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.846	0.931	Data Not Normal
Lilliefors (NDs = DL)	0.268	0.154	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.929	0.931	Data Not Normal

Lilliefors (NDs = DL/2)	0.192	0.154	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.954	0.931	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.136	0.154	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.984	0.873	0.96	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.339	0.742	
Kolmogorov-Smirnov (Detects Only)	0.117	0.216	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.346	0.753	
Kolmogorov-Smirnov (NDs = DL)	0.28	0.154	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.309	0.748	
Kolmogorov-Smirnov (NDs = DL/2)	0.236	0.153	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.267	0.75	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.106	0.154	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.988	0.918	0.95	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.963	0.887	Data Appear Lognormal
Lilliefors (Detects Only)	0.0873	0.222	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.824	0.931	Data Not Lognormal
Lilliefors (NDs = DL)	0.276	0.154	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.902	0.931	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.252	0.154	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.97	0.931	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.106	0.154	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Cadmium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Number of Valid Data	18	Number of Detected Data	13
Number of Distinct Detected Data	13	Number of Non-Detect Data	5
		Percent Non-Detects	27.78%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.049	Minimum Detected	-3.016
Maximum Detected	0.48	Maximum Detected	-0.734
Mean of Detected	0.201	Mean of Detected	-1.866
SD of Detected	0.148	SD of Detected	0.773
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.25	Maximum Non-Detect	-1.386

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.871	Shapiro Wilk Test Statistic	0.947
5% Shapiro Wilk Critical Value	0.866	5% Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.18	Mean (Log Scale)	-1.926
SD	0.129	SD (Log Scale)	0.657
95% UTL 95% Coverage	0.497	95% UTL 95% Coverage	0.731
95% UPL (t)	0.411	95% UPL (t)	0.472
90% Percentile (z)	0.346	90% Percentile (z)	0.338
95% Percentile (z)	0.393	95% Percentile (z)	0.43
99% Percentile (z)	0.481	99% Percentile (z)	0.672
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	N/A	Mean in Original Scale	0.177
SD	N/A	SD in Original Scale	0.133
95% UTL with 95% Coverage	N/A	95% UTL with 95% Coverage	0.797
		95% BCA UTL with 95% Coverage	0.48
		95% Bootstrap (%) UTL with 95% Coverage	0.48
95% UPL (t)	N/A	95% UPL (t)	0.496
90% Percentile (z)	N/A	90% Percentile (z)	0.346
95% Percentile (z)	N/A	95% Percentile (z)	0.448
99% Percentile (z)	N/A	99% Percentile (z)	0.728

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.631	Data appear Normal at 5% Significance Level	
Theta Star	0.123		
nu star	42.41		
A-D Test Statistic	0.313	Nonparametric Statistics	
5% A-D Critical Value	0.743	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.137	Mean	0.178
5% K-S Critical Value	0.239	SD	0.13
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0331
		95% KM UTL with 95% Coverage	0.496
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.76
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.41
Mean	0.202	90% Percentile (z)	0.344
Median	0.181	95% Percentile (z)	0.391
SD	0.126	99% Percentile (z)	0.48
k star	2.307		
Theta star	0.0877	Gamma ROS Limits with Extrapolated Data	
Nu star	83.06	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.476
95% Percentile of Chisquare (2k)	10.47	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.489
		95% WH Approx. Gamma UTL with 95% Coverage	0.641
90% Percentile	0.381	95% HW Approx. Gamma UTL with 95% Coverage	0.677
95% Percentile	0.459		
99% Percentile	0.632		

Note: DL/2 is not a recommended method.

Non-Clay

General Statistics

Number of Valid Data	33	Number of Detected Data	16
Number of Distinct Detected Data	14	Number of Non-Detect Data	17
		Percent Non-Detects	51.52%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.043	Minimum Detected	-3.147
Maximum Detected	0.23	Maximum Detected	-1.47
Mean of Detected	0.105	Mean of Detected	-2.378
SD of Detected	0.0563	SD of Detected	0.504
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.31	Maximum Non-Detect	-1.171

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	33
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.879	Shapiro Wilk Test Statistic	0.963
5% Shapiro Wilk Critical Value	0.887	5% Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.119	Mean (Log Scale)	-2.195
SD	0.0418	SD (Log Scale)	0.394
95% UTL 95% Coverage	0.21	95% UTL 95% Coverage	0.262
95% UPL (t)	0.191	95% UPL (t)	0.219
90% Percentile (z)	0.173	90% Percentile (z)	0.184
95% Percentile (z)	0.188	95% Percentile (z)	0.213
99% Percentile (z)	0.217	99% Percentile (z)	0.278
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.102
		SD in Original Scale	0.0484
		Mean in Log Scale	-2.378
		SD in Log Scale	0.447
		95% UTL 95% Coverage	0.246
		95% UPL (t)	0.2
		90% Percentile (z)	0.165
		95% Percentile (z)	0.194
		99% Percentile (z)	0.263
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.481	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0301		
nu star	111.4		
A-D Test Statistic	0.339	Nonparametric Statistics	
5% A-D Critical Value	0.742	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.117	Mean	0.105
5% K-S Critical Value	0.216	SD	0.0545
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0141
		95% KM UTL with 95% Coverage	0.223
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.346
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.199
Mean	0.106	90% Percentile (z)	0.175
Median	0.11	95% Percentile (z)	0.194
SD	0.0477	99% Percentile (z)	0.232
k star	4.156		
Theta star	0.0256	Gamma ROS Limits with Extrapolated Data	
Nu star	274.3	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.207
95% Percentile of Chisquare (2k)	15.95	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.212
		95% WH Approx. Gamma UTL with 95% Coverage	0.245
90% Percentile	0.176	95% HW Approx. Gamma UTL with 95% Coverage	0.254
95% Percentile	0.204		
99% Percentile	0.263		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Cadmium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 0.48 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.382

For 10% significance level, 0.48 is not an outlier.

For 5% significance level, 0.48 is not an outlier.

For 1% significance level, 0.48 is not an outlier.

2. Data Value 0.049 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.044

For 10% significance level, 0.049 is not an outlier.

For 5% significance level, 0.049 is not an outlier.

For 1% significance level, 0.049 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	0.119
Standard Deviation	0.0418
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.119	0.0412	0.23	19	2.689	2.95	3.29

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Cadmium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Data	33	18
Number of Non-Detect Data	17	5
Number of Detect Data	16	13
Minimum Non-Detect	0.25	0.25
Maximum Non-Detect	0.31	0.25
Percent Non detects	51.52%	27.78%
Minimum Detected	0.043	0.049
Maximum Detected	0.23	0.48
Mean of Detected Data	0.105	0.201
Median of Detected Data	0.0875	0.14
SD of Detected Data	0.0563	0.148

Site vs Background Gehan Test

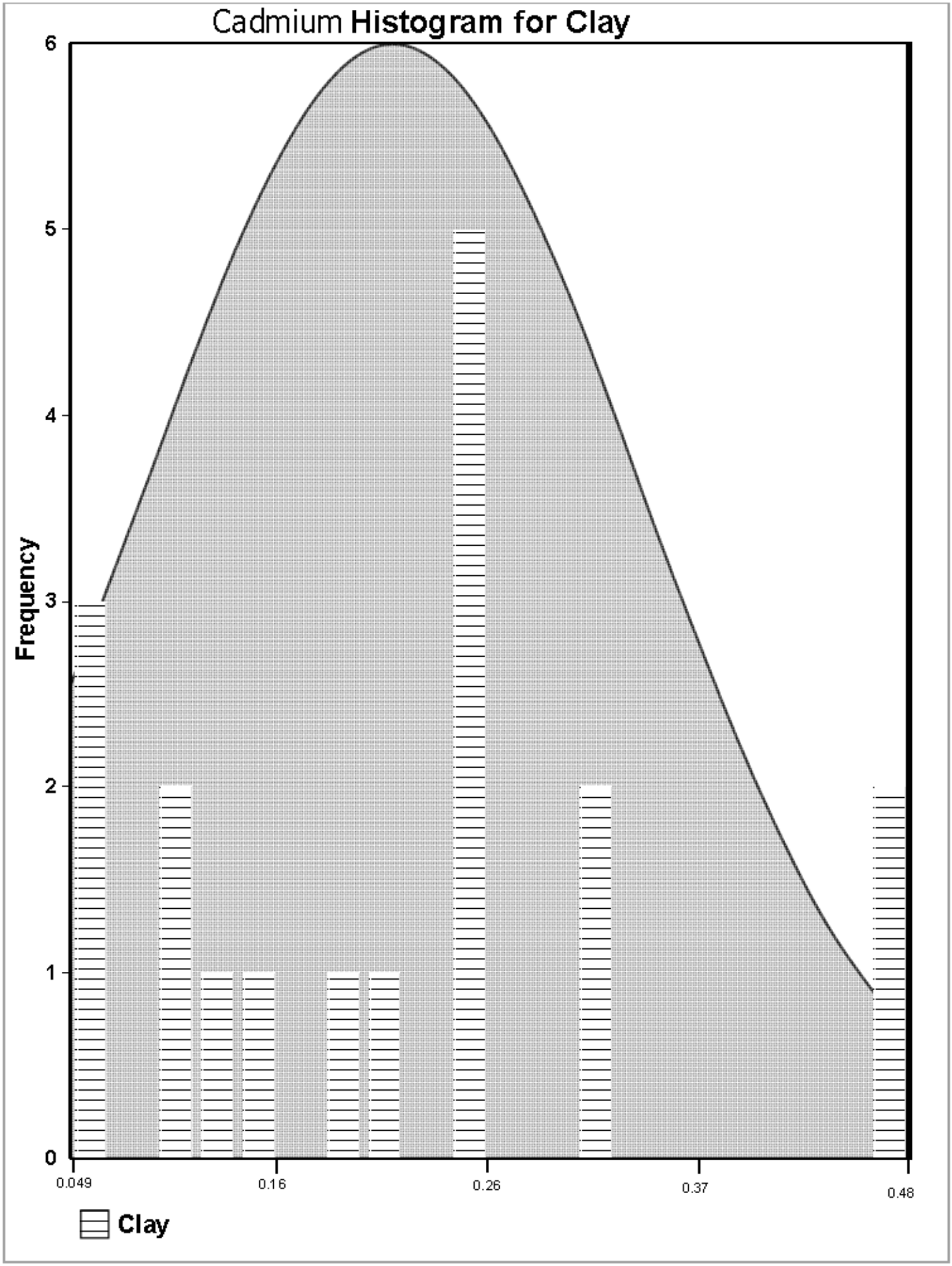
H0: Mu of Site or AOC = Mu of background

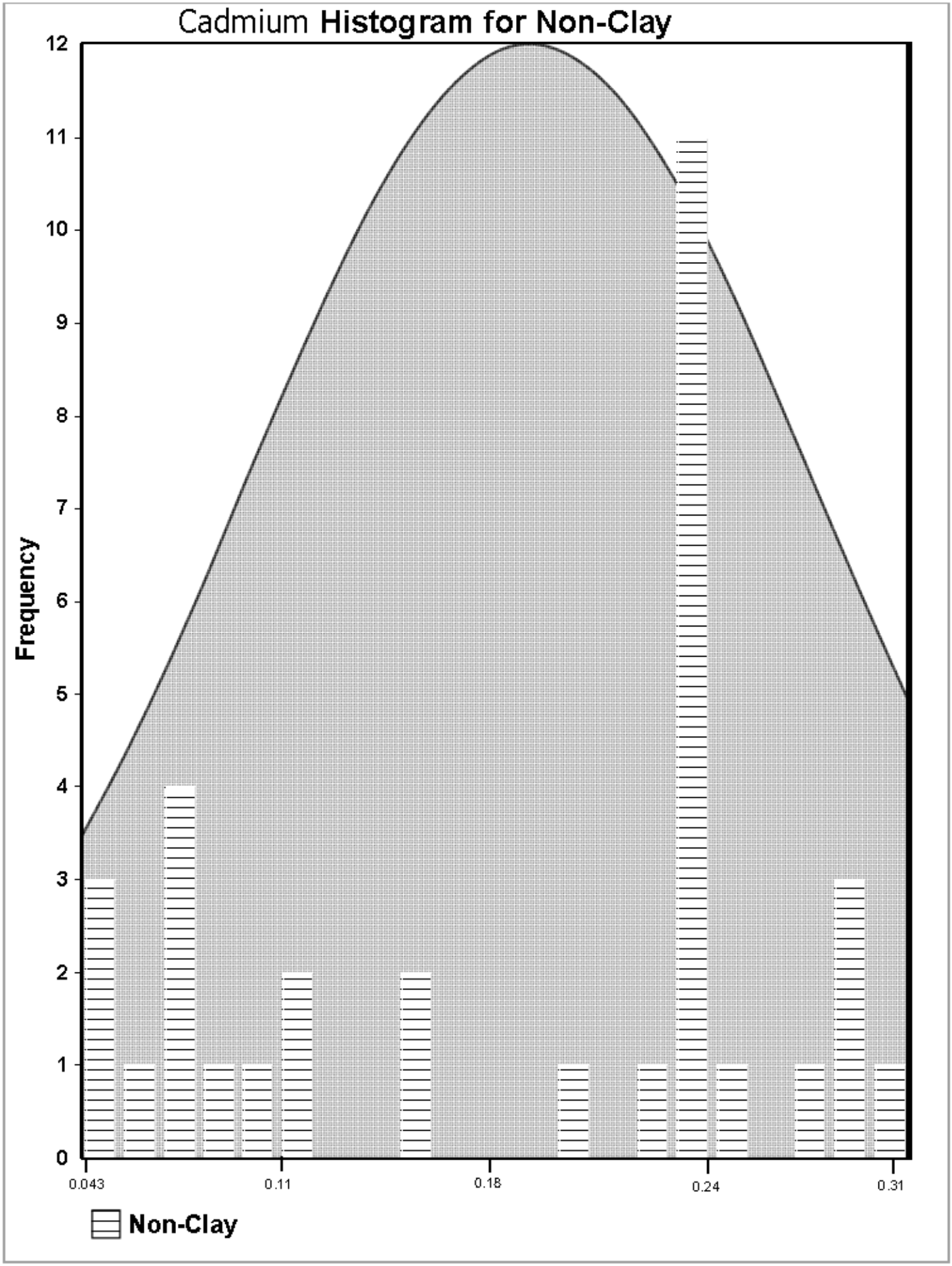
Gehan z Test Value	-2.588
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.00965

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Cadmium Histogram for Clay
Frequency
0
1
2
3
4
5
6
0.049
0.16
0.26
0.37
0.48
Clay


Cadmium Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
0.043
0.11
0.18
0.24
0.31
Non-Clay

Location	Clay	D_Clay	Location	Non-Clay	D_Non-Clay
BG-1-2	0.25	0	BG-1-10	0.25	0
BG-1-43	0.25	0	BG-1-29	0.25	0
BG-1-55	0.25	0	BG-1-40	0.25	0
BG-1-78	0.25	0	BG-1-46	0.25	0
BG-2-30	0.25	0	BG-1-92	0.25	0
BG-2-81	0.46	1	BG-2-2	0.25	0
BG-3-17	0.057	1	BG-2-10	0.25	0
BG-3-22	0.48	1	BG-2-19	0.11	1
BG-3-69	0.11	1	BG-2-21	0.25	0
BG-4-2	0.061	1	BG-2-32	0.25	0
BG-4-19	0.18	1	BG-2-75	0.25	0
BG-4-40	0.13	1	BG-3-2	0.16	1
BG-4-79	0.22	1	BG-3-10	0.07	1
BG-4-161	0.14	1	BG-3-29	0.25	0
BG-4-163	0.32	1	BG-3-63	0.31	0
BG-6-28	0.049	1	BG-3-65	0.052	1
BG-6-53	0.098	1	BG-3-95	0.29	0
BG-6-87	0.31	1	BG-3-105	0.3	0
			BG-3-131	0.23	1
			BG-3-136	0.3	0
			BG-4-10	0.08	1
			BG-4-65	0.043	1
			BG-4-82	0.092	1
			BG-4-95	0.3	0
			BG-4-117	0.057	1
			BG-4-120	0.083	1
			BG-6-2	0.26	0
			BG-6-9	0.052	1
			BG-6-58	0.07	1
			BG-6-75	0.15	1
			BG-6-98	0.099	1
			BG-6-114	0.12	1
			BG-6-127	0.21	1
			Average	0.187515	

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Cadmium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	4	8	66.67%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	8	0.25	0.26	0.251	0.25	0.00354
Statistics (Detects Only)	4	0.052	0.16	0.098	0.09	0.0479
Statistics (All: NDs treated as DL value)	12	0.052	0.26	0.2	0.25	0.0795
Statistics (All: NDs treated as DL/2 value)	12	0.052	0.16	0.116	0.125	0.0285
Statistics (Normal ROS Estimated Data)	12	0.0228	0.173	0.098	0.098	0.0457
Statistics (Gamma ROS Estimated Data)	12	0.0234	0.161	0.0977	0.101	0.0441
Statistics (Lognormal ROS Estimated Data)	12	0.0406	0.197	0.0992	0.0895	0.0474

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	5.649	4.292	0.0173	-2.414	0.495	-0.205
Statistics (NDs = DL)	4.435	3.382	0.0451	-1.726	0.57	-0.331
Statistics (NDs = DL/2)	13.65	10.29	0.00853	-2.188	0.308	-0.141
Statistics (Gamma ROS Estimates)	4.243	3.238	0.023	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.414	0.477	-0.198

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.978	0.844	0.859	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.951	0.748	Data Appear Normal
Lilliefors (Detects Only)	0.221	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.701	0.859	Data Not Normal
Lilliefors (NDs = DL)	0.401	0.256	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.763	0.859	Data Not Normal
Lilliefors (NDs = DL/2)	0.368	0.256	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.977	0.859	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0925	0.256	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.996	0.745	0.826	0.96

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.237	0.659	
Kolmogorov-Smirnov (Detects Only)	0.23	0.396	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.854	0.734	
Kolmogorov-Smirnov (NDs = DL)	0.406	0.246	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	1.819	0.731	
Kolmogorov-Smirnov (NDs = DL/2)	0.389	0.245	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.281	0.735	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.172	0.246	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.994	0.831	0.819	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.978	0.748	Data Appear Lognormal
Lilliefors (Detects Only)	0.19	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.687	0.859	Data Not Lognormal
Lilliefors (NDs = DL)	0.391	0.256	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.694	0.859	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.387	0.256	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.981	0.859	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0933	0.256	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	39	0	39	25	14	35.90%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	14	0.25	0.31	0.268	0.25	0.0252
Statistics (Detects Only)	25	0.043	0.48	0.156	0.11	0.122
Statistics (All: NDs treated as DL value)	39	0.043	0.48	0.196	0.22	0.112
Statistics (All: NDs treated as DL/2 value)	39	0.043	0.48	0.148	0.125	0.098
Statistics (Normal ROS Estimated Data)	39	-0.00785	0.48	0.145	0.128	0.106
Statistics (Gamma ROS Estimated Data)	39	0.043	0.48	0.157	0.148	0.0975
Statistics (Lognormal ROS Estimated Data)	39	0.043	0.48	0.139	0.102	0.103

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.165	2.015	0.0721	-2.106	0.701	-0.333
Statistics (NDs = DL)	2.711	2.52	0.0724	-1.824	0.677	-0.371
Statistics (NDs = DL/2)	3.219	2.988	0.046	-2.073	0.562	-0.271
Statistics (Gamma ROS Estimates)	3.269	3.034	0.0481	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.175	0.618	-0.284

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.9	0.961	0.872	0.922

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.807	0.918	Data Not Normal
Lilliefors (Detects Only)	0.2	0.177	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.913	0.939	Data Not Normal
Lilliefors (NDs = DL)	0.146	0.142	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.767	0.939	Data Not Normal

Lilliefors (NDs = DL/2)	0.267	0.142	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.855	0.939	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.171	0.142	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.978	0.961	0.948	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.633	0.756	
Kolmogorov-Smirnov (Detects Only)	0.13	0.177	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.212	0.756	
Kolmogorov-Smirnov (NDs = DL)	0.193	0.143	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.182	0.754	
Kolmogorov-Smirnov (NDs = DL/2)	0.189	0.142	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.689	0.754	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.151	0.142	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.983	0.961	0.977	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.953	0.918	Data Appear Lognormal
Lilliefors (Detects Only)	0.0958	0.177	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.906	0.939	Data Not Lognormal
Lilliefors (NDs = DL)	0.203	0.142	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.949	0.939	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.15	0.142	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.958	0.939	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.105	0.142	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Cadmium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Number of Valid Data	12	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	8
		Percent Non-Detects	66.67%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.052	Minimum Detected	-2.957
Maximum Detected	0.16	Maximum Detected	-1.833
Mean of Detected	0.098	Mean of Detected	-2.414
SD of Detected	0.0479	SD of Detected	0.495
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.26	Maximum Non-Detect	-1.347

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	12
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.951	Shapiro Wilk Test Statistic	0.978
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.116	Mean (Log Scale)	-2.188
SD	0.0285	SD (Log Scale)	0.308
95% UTL 95% Coverage	0.194	95% UTL 95% Coverage	0.261
95% UPL (t)	0.17	95% UPL (t)	0.2
90% Percentile (z)	0.153	90% Percentile (z)	0.166
95% Percentile (z)	0.163	95% Percentile (z)	0.186
99% Percentile (z)	0.183	99% Percentile (z)	0.23

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0992
		SD in Original Scale	0.0474
		Mean in Log Scale	-2.414
		SD in Log Scale	0.477
		95% UTL 95% Coverage	0.33
		95% UPL (t)	0.218
		90% Percentile (z)	0.165
		95% Percentile (z)	0.196
		99% Percentile (z)	0.272
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.579	Data appear Normal at 5% Significance Level	
Theta Star	0.0621		
nu star	12.63		
A-D Test Statistic	0.237	Nonparametric Statistics	
5% A-D Critical Value	0.659	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.23	Mean	0.098
5% K-S Critical Value	0.396	SD	0.0415
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.024
		95% KM UTL with 95% Coverage	0.212
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.286
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.176
Mean	0.0977	90% Percentile (z)	0.151
Median	0.101	95% Percentile (z)	0.166
SD	0.0441	99% Percentile (z)	0.195
k star	3.238		
Theta star	0.0302	Gamma ROS Limits with Extrapolated Data	
Nu star	77.7	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.21
95% Percentile of Chisquare (2k)	13.3	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.217
		95% WH Approx. Gamma UTL with 95% Coverage	0.29
90% Percentile	0.171	95% HW Approx. Gamma UTL with 95% Coverage	0.308
95% Percentile	0.201		
99% Percentile	0.266		

Note: DL/2 is not a recommended method.

MC

General Statistics			
Number of Valid Data	39	Number of Detected Data	25
Number of Distinct Detected Data	24	Number of Non-Detect Data	14
		Percent Non-Detects	35.90%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.043	Minimum Detected	-3.147
Maximum Detected	0.48	Maximum Detected	-0.734
Mean of Detected	0.156	Mean of Detected	-2.106
SD of Detected	0.122	SD of Detected	0.701
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.31	Maximum Non-Detect	-1.171

Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	35
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	89.74%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.807	Shapiro Wilk Test Statistic	0.953
5% Shapiro Wilk Critical Value	0.918	5% Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.148	Mean (Log Scale)	-2.073
SD	0.098	SD (Log Scale)	0.562
95% UTL 95% Coverage	0.356	95% UTL 95% Coverage	0.415
95% UPL (t)	0.315	95% UPL (t)	0.328
90% Percentile (z)	0.274	90% Percentile (z)	0.258
95% Percentile (z)	0.309	95% Percentile (z)	0.317
99% Percentile (z)	0.376	99% Percentile (z)	0.465
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0847	Mean in Original Scale	0.139
SD	0.177	SD in Original Scale	0.103
95% UTL with 95% Coverage	0.462	95% UTL with 95% Coverage	0.422
		95% BCA UTL with 95% Coverage	0.48
		95% Bootstrap (%) UTL with 95% Coverage	0.48
95% UPL (t)	0.388	95% UPL (t)	0.326
90% Percentile (z)	0.312	90% Percentile (z)	0.251
95% Percentile (z)	0.376	95% Percentile (z)	0.314
99% Percentile (z)	0.497	99% Percentile (z)	0.478
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.931	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0808		
nu star	96.57		
A-D Test Statistic	0.633	Nonparametric Statistics	
5% A-D Critical Value	0.756	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.13	Mean	0.14
5% K-S Critical Value	0.177	SD	0.104
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0184
		95% KM UTL with 95% Coverage	0.361
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.599
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.317
Mean	0.157	90% Percentile (z)	0.273
Median	0.148	95% Percentile (z)	0.311
SD	0.0975	99% Percentile (z)	0.382
k star	3.034		
Theta star	0.0518	Gamma ROS Limits with Extrapolated Data	
Nu star	236.7	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.332
95% Percentile of Chisquare (2k)	12.69	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.336

										95% WH Approx. Gamma UTL with	95% Coverage	0.396
					90% Percentile	0.278				95% HW Approx. Gamma UTL with	95% Coverage	0.406
					95% Percentile	0.329						
					99% Percentile	0.438						

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Cadmium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12

10% critical value: 0.49

5% critical value: 0.546

1% critical value: 0.642

1. Data Value 0.16 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.389

For 10% significance level, 0.16 is not an outlier.

For 5% significance level, 0.16 is not an outlier.

For 1% significance level, 0.16 is not an outlier.

2. Data Value 0.052 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.744

For 10% significance level, 0.052 is an outlier.

For 5% significance level, 0.052 is an outlier.

For 1% significance level, 0.052 is an outlier.

Rosner's Outlier Test for MC

Mean	0.148
Standard Deviation	0.098
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.148	0.0967	0.48	11	3.432	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.48 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.48 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Cadmium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Data	39	12
Number of Non-Detect Data	14	8
Number of Detect Data	25	4
Minimum Non-Detect	0.25	0.25
Maximum Non-Detect	0.31	0.26
Percent Non detects	35.90%	66.67%
Minimum Detected	0.043	0.052
Maximum Detected	0.48	0.16
Mean of Detected Data	0.156	0.098
Median of Detected Data	0.11	0.09
SD of Detected Data	0.122	0.0479

Site vs Background Gehan Test

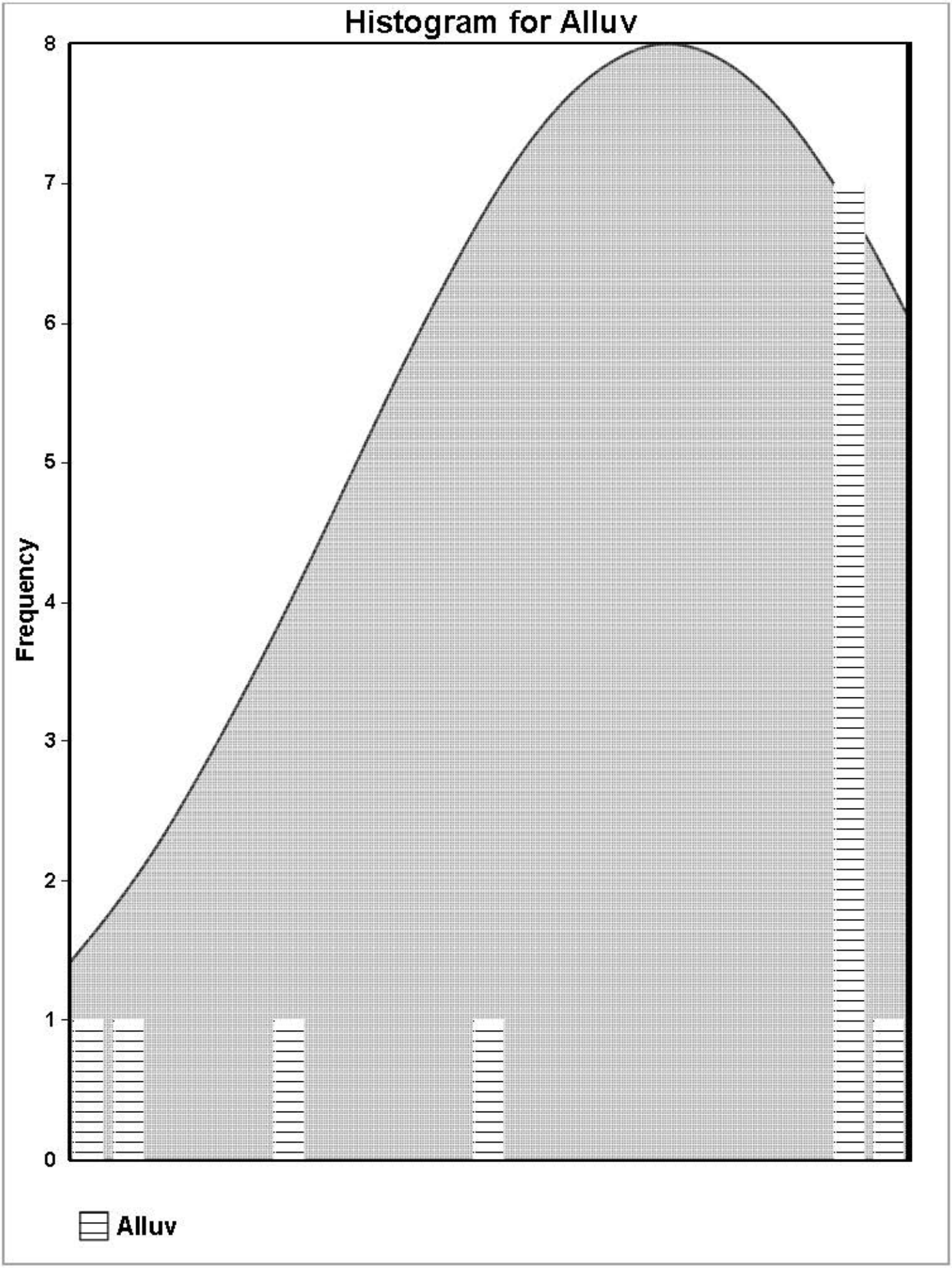
H0: Mu of Site or AOC = Mu of background

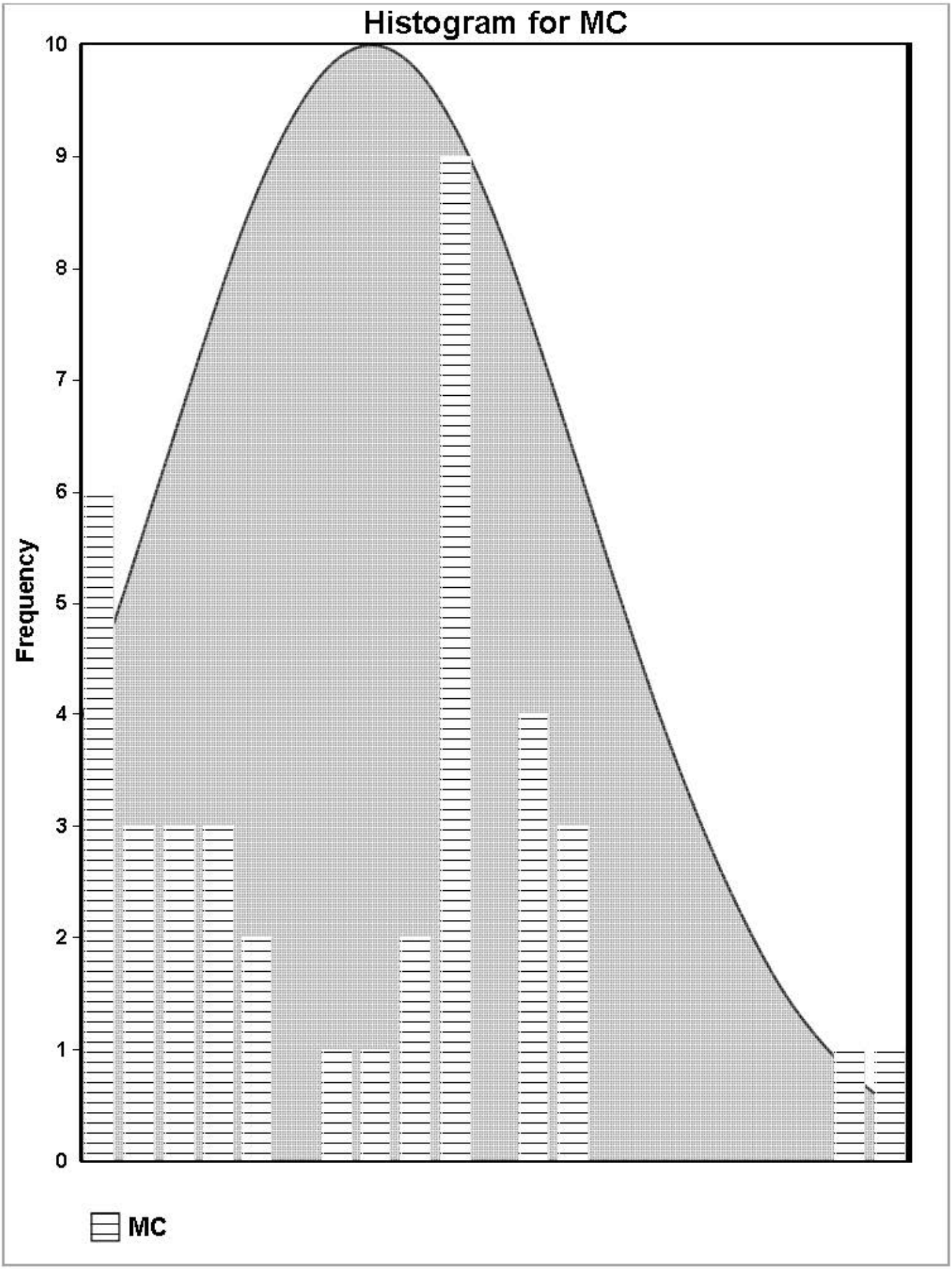
Gehan z Test Value	0.997
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.319

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
7
8
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
10
MC

Location	Alluv	D_Alluv
BG-1-2	0.25	0
BG-1-10	0.25	0
BG-1-29	0.25	0
BG-1-40	0.25	0
BG-2-2	0.25	0
BG-2-10	0.25	0
BG-2-19	0.11	1
BG-2-21	0.25	0
BG-3-2	0.16	1
BG-3-10	0.07	1
BG-6-2	0.26	0
BG-6-9	0.052	1

Location	MC	D_MC
BG-1-43	0.25	0
BG-1-46	0.25	0
BG-1-55	0.25	0
BG-1-78	0.25	0
BG-1-92	0.25	0
BG-2-30	0.25	0
BG-2-32	0.25	0
BG-2-75	0.25	0
BG-2-81	0.46	1
BG-3-17	0.057	1
BG-3-22	0.48	1
BG-3-29	0.25	0
BG-3-63	0.31	0
BG-3-65	0.052	1
BG-3-69	0.11	1
BG-3-95	0.29	0
BG-3-105	0.3	0
BG-3-131	0.23	1
BG-3-136	0.3	0
BG-4-1	0.061	1
BG-4-10	0.08	1
BG-4-19	0.18	1
BG-4-40	0.13	1
BG-4-65	0.043	1
BG-4-79	0.22	1
BG-4-82	0.092	1
BG-4-95	0.3	0
BG-4-117	0.057	1
BG-4-120	0.083	1
BG-4-161	0.14	1
BG-4-163	0.32	1
BG-6-28	0.049	1
BG-6-53	0.098	1
BG-6-58	0.07	1
BG-6-75	0.15	1
BG-6-87	0.31	1
BG-6-98	0.099	1
BG-6-114	0.12	1
BG-1-127	0.21	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	50	1	1.96%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	50	7.6	3800	261.7	95.5	645.3
Statistics (All: NDs treated as DL value)	51	7.6	3800	256.8	93	639.8
Statistics (All: NDs treated as DL/2 value)	51	5	3800	256.7	93	639.9
Statistics (Normal ROS Estimated Data)	51	-450.2	3800	247.7	93	646.6
Statistics (Gamma ROS Estimated Data)	51	1.000E-12	3800	256.6	93	639.9
Statistics (Lognormal ROS Estimated Data)	51	7.6	3800	256.8	93	639.8

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.634	0.61	412.8	4.601	1.192	0.259
Statistics (NDs = DL)	0.62	0.596	414.5	4.555	1.223	0.268
Statistics (NDs = DL/2)	0.612	0.589	419.1	4.542	1.252	0.276
Statistics (Gamma ROS Estimates)	0.414	0.403	619.1	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	4.558	1.218	0.267

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.581	0.58	0.58	0.606

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.371	0.947	Data Not Normal
Lilliefors (Detects Only)	0.393	0.125	Data Not Normal
Lilliefors (NDs = DL)	0.393	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.393	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.387	0.124	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.849	0.849	0.85	0.884

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	5.62	0.803	
Kolmogorov-Smirnov (Detects Only)	0.286	0.131	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	5.443	0.804	
Kolmogorov-Smirnov (NDs = DL)	0.281	0.13	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.343	0.805	
Kolmogorov-Smirnov (NDs = DL/2)	0.279	0.13	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	5.415	0.835	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.257	0.133	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.939	0.943	0.944	0.943

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.891	0.947	Data Not Lognormal
Lilliefors (Detects Only)	0.178	0.125	Data Not Lognormal
Lilliefors (NDs = DL)	0.173	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.181	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.172	0.124	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Number of Valid Data	51	Number of Detected Data	50
Number of Distinct Detected Data	39	Number of Non-Detect Data	1
		Percent Non-Detects	1.96%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	7.6	Minimum Detected	2.028
Maximum Detected	3800	Maximum Detected	8.243
Mean of Detected	261.7	Mean of Detected	4.601
SD of Detected	645.3	SD of Detected	1.192
Minimum Non-Detect	10	Minimum Non-Detect	2.303
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.371	Shapiro Wilk Test Statistic	0.891
5% Shapiro Wilk Critical Value	0.947	5% Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	256.7	Mean (Log Scale)	4.542
SD	639.9	SD (Log Scale)	1.252
95% UTL 95% Coverage	1571	95% UTL 95% Coverage	1228
95% UPL (t)	1339	95% UPL (t)	780.8
90% Percentile (z)	1077	90% Percentile (z)	466.9
95% Percentile (z)	1309	95% Percentile (z)	735.8
99% Percentile (z)	1745	99% Percentile (z)	1727
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	220.6	Mean in Original Scale	256.8
SD	667.2	SD in Original Scale	639.8
95% UTL with 95% Coverage	1591	95% UTL with 95% Coverage	1163
		95% BCA UTL with 95% Coverage	2200
		95% Bootstrap (%) UTL with 95% Coverage	3000
95% UPL (t)	1350	95% UPL (t)	749
90% Percentile (z)	1076	90% Percentile (z)	454.3
95% Percentile (z)	1318	95% Percentile (z)	707
99% Percentile (z)	1773	99% Percentile (z)	1621

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.609	Data do not follow a Discernable Distribution (0.05)	
Theta Star	429.5		
nu star	60.93		
A-D Test Statistic	5.62	Nonparametric Statistics	
5% A-D Critical Value	0.803	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.286	Mean	256.7
5% K-S Critical Value	0.131	SD	633.5
Data not Gamma Distributed at 5% Significance Level		SE of Mean	89.61
		95% KM UTL with 95% Coverage	1558
Assuming Gamma Distribution		95% KM Chebyshev UPL	3045
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1329
Mean	256.6	90% Percentile (z)	1069
Median	93	95% Percentile (z)	1299
SD	639.9	99% Percentile (z)	1731
k star	0.403		
Theta star	636.5	Gamma ROS Limits with Extrapolated Data	
Nu star	41.12	95% Wilson Hilferty (WH) Approx. Gamma UPL	810.4
95% Percentile of Chisquare (2k)	3.341	95% Hawkins Wixley (HW) Approx. Gamma UPL	802.9
		95% WH Approx. Gamma UTL with 95% Coverage	1079
90% Percentile	723.7	95% HW Approx. Gamma UTL with 95% Coverage	1106
95% Percentile	1063		
99% Percentile	1916		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for All Data

Mean	256.7
Standard Deviation	639.9
Number of data	51
Number of suspected outliers	1

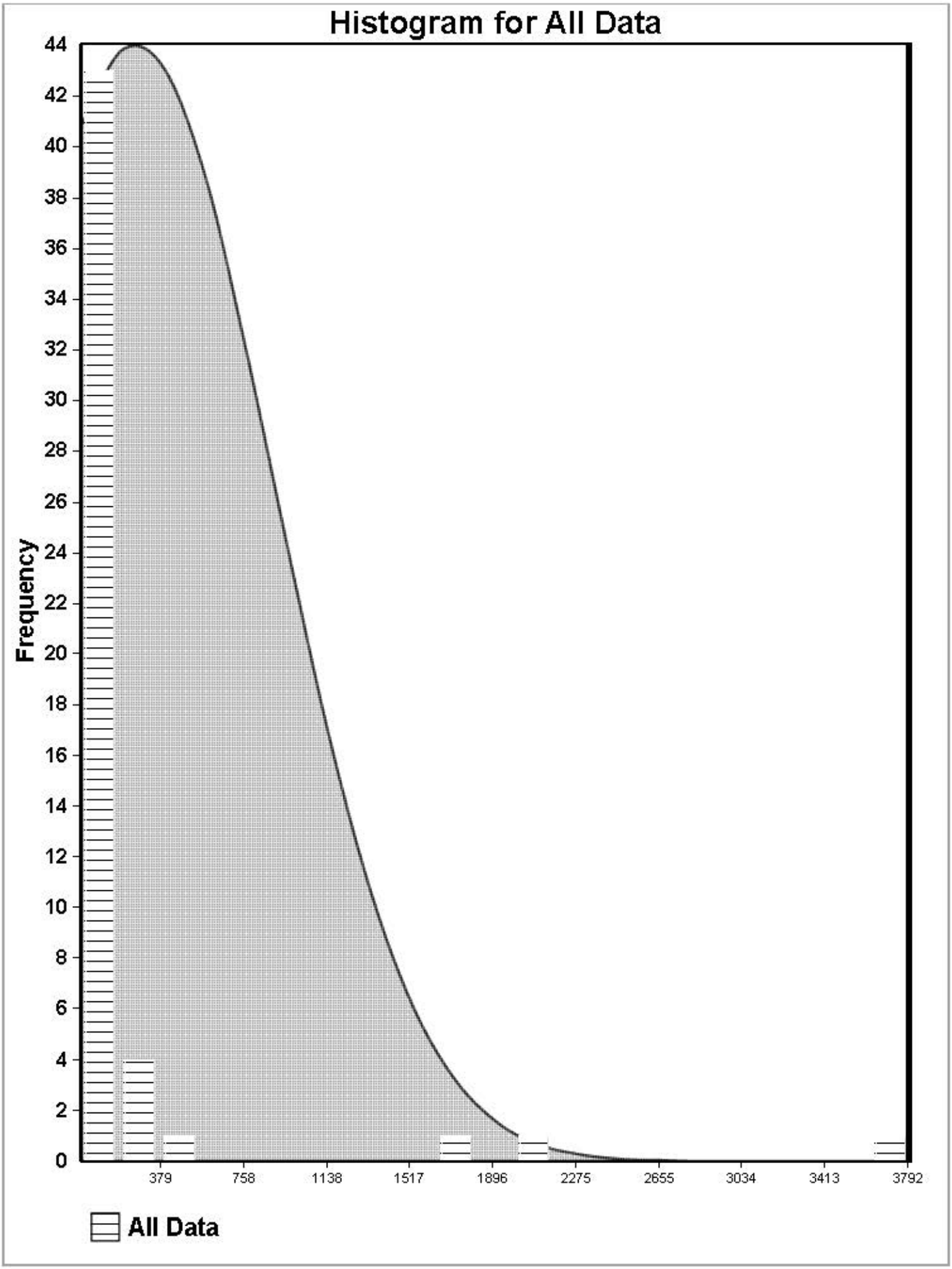
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	256.7	633.5	3800	3	5.593	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 3800 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 3800 is a Potential Statistical Outlier


Histogram for All Data
Frequency
44
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
379
758
1138
1517
1896
2275
2655
3034
3413
3792
All Data

Location	All Data	D_All Data
BG-1-2	2200	1
BG-3-17	120	1
BG-4-2	3800	1
BG-4-19	340	1
BG-1-10	490	1
BG-2-2	8.2	1
BG-2-10	25	1
BG-2-19	7.6	1
BG-3-2	110	1
BG-3-10	1900	1
BG-4-10	310	1
BG-6-2	190	1
BG-6-9	240	1
BG-1-29	89	1
BG-1-40	65	1
BG-1-46	67	1
BG-1-92	77	1
BG-2-21	18	1
BG-2-32	14	1
BG-2-75	10	0
BG-3-29	120	1
BG-3-63	88	1
BG-3-65	69	1
BG-3-95	60	1
BG-3-105	66	1
BG-3-131	55	1
BG-3-136	69	1
BG-4-65	52	1
BG-4-82	110	1
BG-4-95	110	1
BG-4-117	140	1
BG-4-120	140	1
BG-6-58	120	1
BG-6-75	110	1
BG-6-98	93	1
BG-6-114	100	1
BG-6-127	82	1
BG-1-43	210	1
BG-1-55	81	1
BG-1-78	66	1
BG-2-30	9.4	1
BG-2-81	75	1
BG-3-22	62	1
BG-3-69	59	1
BG-4-40	180	1
BG-4-79	120	1
BG-4-161	98	1
BG-4-163	80	1
BG-6-28	170	1
BG-6-53	110	1
BG-6-87	110	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	13	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	13	7.6	3800	749.3	240	1161

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	0.482	0.422	1555	5.293	1.971	0.372

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.817	0.817	0.817	0.817

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.677	0.866	Data Not Normal
Lilliefors (Full: no NDs)	0.358	0.246	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.981	0.981	0.981	0.981

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.426	0.794	
Kolmogorov-Smirnov (Full: no NDs)	0.186	0.25	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.977	0.977	0.977	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.943	0.866	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.151	0.246	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

>20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	38	0	38	37	1	2.63%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	37	9.4	210	90.39	82	42.61

Statistics (All: NDs treated as DL value)	38	9.4	210	88.27	81.5	44.01
Statistics (All: NDs treated as DL/2 value)	38	5	210	88.14	81.5	44.26
Statistics (Normal ROS Estimated Data)	38	-0.943	210	87.99	81.5	44.57
Statistics (Gamma ROS Estimated Data)	38	1.000E-12	210	88.01	81.5	44.52
Statistics (Lognormal ROS Estimated Data)	38	9.4	210	88.59	81.5	43.47

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.558	3.295	25.4	4.357	0.635	0.146
Statistics (NDs = DL)	2.974	2.757	29.68	4.303	0.709	0.165
Statistics (NDs = DL/2)	2.73	2.532	32.29	4.285	0.769	0.179
Statistics (Gamma ROS Estimates)	0.637	0.604	138.2	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	4.324	0.659	0.152

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.974	0.976	0.977	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.952	0.936	Data Appear Normal
Lilliefors (Detects Only)	0.108	0.146	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.954	0.938	Data Appear Normal
Lilliefors (NDs = DL)	0.104	0.144	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.957	0.938	Data Appear Normal
Lilliefors (NDs = DL/2)	0.104	0.144	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.961	0.938	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.105	0.144	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.982	0.978	0.976	0.914

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.008	0.753	
Kolmogorov-Smirnov (Detects Only)	0.15	0.146	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	1.305	0.754	
Kolmogorov-Smirnov (NDs = DL)	0.168	0.144	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.453	0.756	
Kolmogorov-Smirnov (NDs = DL/2)	0.182	0.144	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	7.479	0.8	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.414	0.15	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.908	0.902	0.885	0.92

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.836	0.936	Data Not Lognormal
Lilliefors (Detects Only)	0.195	0.146	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.818	0.938	Data Not Lognormal
Lilliefors (NDs = DL)	0.217	0.144	Data Not Lognormal

Shapiro-Wilks (NDs = DL/2)	0.796	0.938	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.236	0.144	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.855	0.938	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.196	0.144	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	13

Raw Statistics		Log-Transformed Statistics	
Minimum	7.6	Minimum	2.028
Maximum	3800	Maximum	8.243
Second Largest	2200	Second Largest	7.696
First Quartile	110	First Quartile	4.7
Median	240	Median	5.481
Third Quartile	490	Third Quartile	6.194
Mean	749.3	Mean	5.293
SD	1161	SD	1.971
Coefficient of Variation	1.549		
Skewness	1.939		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.677	Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	3849	95% UTL with 95% Coverage	38531
95% UPL (t)	2896	95% UPL (t)	7630
90% Percentile (z)	2237	90% Percentile (z)	2490
95% Percentile (z)	2658	95% Percentile (z)	5096
99% Percentile (z)	3449	99% Percentile (z)	19531

Gamma Distribution Test		Data Distribution Test
k star	0.422	Data appear Gamma Distributed at 5% Significance Level
Theta Star	1776	
MLE of Mean	749.3	
MLE of Standard Deviation	1153	
nu star	10.97	
A-D Test Statistic	0.426	Nonparametric Statistics
5% A-D Critical Value	0.794	90% Percentile 2140
K-S Test Statistic	0.186	95% Percentile 2840
5% K-S Critical Value	0.25	99% Percentile 3608
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	3800
90% Percentile	2096	95% Percentile Bootstrap UTL with 95% Coverage	3800
95% Percentile	3056	95% BCA Bootstrap UTL with 95% Coverage	3800
99% Percentile	5456	95% UPL	3800
		95% Chebyshev UPL	5999
95% WH Approx. Gamma UPL	3309	Upper Threshold Limit Based upon IQR	1060
95% HW Approx. Gamma UPL	3621		
95% WH Approx. Gamma UTL with 95% Coverage	6233		
95% HW Approx. Gamma UTL with 95% Coverage	7635		

>20

General Statistics			
Number of Valid Data	38	Number of Detected Data	37
Number of Distinct Detected Data	28	Number of Non-Detect Data	1
		Percent Non-Detects	2.63%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	9.4	Minimum Detected	2.241
Maximum Detected	210	Maximum Detected	5.347
Mean of Detected	90.39	Mean of Detected	4.357
SD of Detected	42.61	SD of Detected	0.635
Minimum Non-Detect	10	Minimum Non-Detect	2.303
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.952	Shapiro Wilk Test Statistic	0.836
5% Shapiro Wilk Critical Value	0.936	5% Shapiro Wilk Critical Value	0.936
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	88.14	Mean (Log Scale)	4.285
SD	44.26	SD (Log Scale)	0.769
95% UTL 95% Coverage	182.5	95% UTL 95% Coverage	373.7
95% UPL (t)	163.8	95% UPL (t)	270
90% Percentile (z)	144.9	90% Percentile (z)	194.4
95% Percentile (z)	160.9	95% Percentile (z)	257
99% Percentile (z)	191.1	99% Percentile (z)	433.9
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	87.31	Mean in Original Scale	88.59
SD	45.49	SD in Original Scale	43.47
95% UTL with 95% Coverage	184.3	95% UTL with 95% Coverage	307.5
		95% BCA UTL with 95% Coverage	210
		95% Bootstrap (%) UTL with 95% Coverage	210
95% UPL (t)	165.1	95% UPL (t)	232.7
90% Percentile (z)	145.6	90% Percentile (z)	175.6
95% Percentile (z)	162.1	95% Percentile (z)	223.1

99% Percentile (z)	193.1	99% Percentile (z)	349.5
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.288	Data appear Normal at 5% Significance Level	
Theta Star	27.49		
nu star	243.3		
A-D Test Statistic	1.008	Nonparametric Statistics	
5% A-D Critical Value	0.753	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.15	Mean	88.26
5% K-S Critical Value	0.146	SD	43.45
Data not Gamma Distributed at 5% Significance Level		SE of Mean	7.147
		95% KM UTL with 95% Coverage	180.9
Assuming Gamma Distribution		95% KM Chebyshev UPL	280.1
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	162.5
Mean	88.01	90% Percentile (z)	143.9
Median	81.5	95% Percentile (z)	159.7
SD	44.52	99% Percentile (z)	189.3
k star	0.604		
Theta star	145.7	Gamma ROS Limits with Extrapolated Data	
Nu star	45.9	95% Wilson Hilferty (WH) Approx. Gamma UPL	221.2
95% Percentile of Chisquare (2k)	4.336	95% Hawkins Wixley (HW) Approx. Gamma UPL	262.6
		95% WH Approx. Gamma UTL with 95% Coverage	274
90% Percentile	228.6	95% HW Approx. Gamma UTL with 95% Coverage	341.1
95% Percentile	316		
99% Percentile	527.2		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 3800 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.501

For 10% significance level, 3800 is an outlier.
For 5% significance level, 3800 is not an outlier.
For 1% significance level, 3800 is not an outlier.

2. Data Value 7.6 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.008

For 10% significance level, 7.6 is not an outlier.
For 5% significance level, 7.6 is not an outlier.
For 1% significance level, 7.6 is not an outlier.

Rosner's Outlier Test for >20

Mean	88.14
Standard Deviation	44.26
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	88.14	43.67	210	25	2.79	3.01	3.36

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: 0-20

Background Data: >20

Raw Statistics

	Site	Background
Number of Valid Data	13	38
Number of Non-Detect Data	0	1
Number of Detect Data	13	37
Minimum Non-Detect	N/A	10
Maximum Non-Detect	N/A	10
Percent Non detects	0.00%	2.63%
Minimum Detected	7.6	9.4
Maximum Detected	3800	210
Mean of Detected Data	749.3	90.39
Median of Detected Data	240	82
SD of Detected Data	1161	42.61

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 10 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

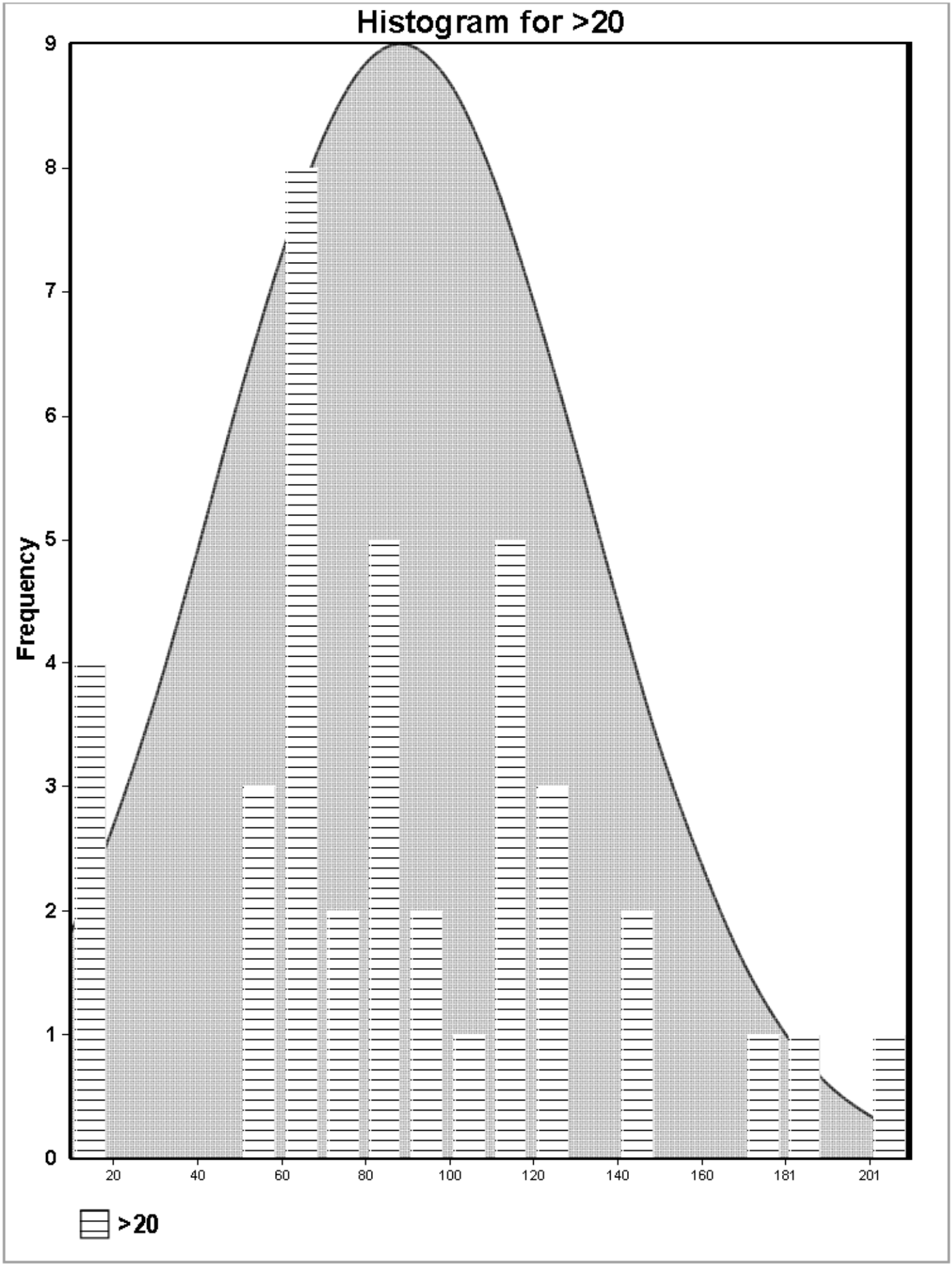
H0: Mean/Median of Site or AOC = Mean/Median of Background

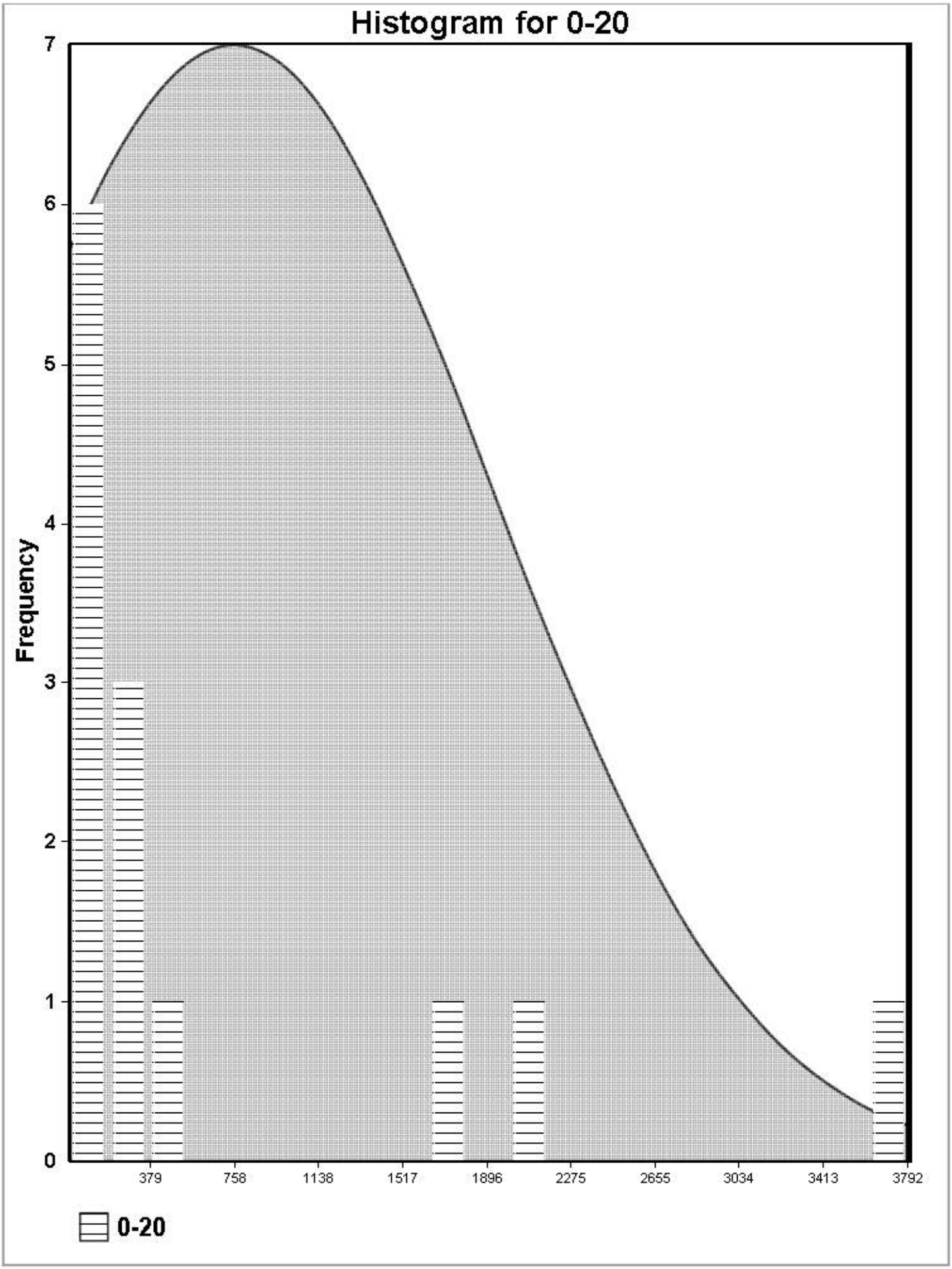
Site Rank Sum W-Stat	459
WMW Test U-Stat	2.604
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.0092

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
20
40
60
80
100
120
140
160
181
201
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5
6
7
379
758
1138
1517
1896
2275
2655
3034
3413
3792
0-20

Location	0-20	D_0-20
BG-1-2	2200	1
BG-3-17	120	1
BG-4-2	3800	1
BG-4-19	340	1
BG-1-10	490	1
BG-2-2	8.2	1
BG-2-10	25	1
BG-2-19	7.6	1
BG-3-2	110	1
BG-3-10	1900	1
BG-4-10	310	1
BG-6-2	190	1
BG-6-9	240	1

Location	>20	D_>20
BG-1-29	89	1
BG-1-40	65	1
BG-1-46	67	1
BG-1-92	77	1
BG-2-21	18	1
BG-2-32	14	1
BG-2-75	10	0
BG-3-29	120	1
BG-3-63	88	1
BG-3-65	69	1
BG-3-95	60	1
BG-3-105	66	1
BG-3-131	55	1
BG-3-136	69	1
BG-4-65	52	1
BG-4-82	110	1
BG-4-95	110	1
BG-4-117	140	1
BG-4-120	140	1
BG-6-58	120	1
BG-6-75	110	1
BG-6-98	93	1
BG-6-114	100	1
BG-6-127	82	1
BG-1-43	210	1
BG-1-55	81	1
BG-1-78	66	1
BG-2-30	9.4	1
BG-2-81	75	1
BG-3-22	62	1
BG-3-69	59	1
BG-4-40	180	1
BG-4-79	120	1
BG-4-161	98	1
BG-4-163	80	1
BG-6-28	170	1
BG-6-53	110	1
BG-6-87	110	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	18	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	18	9.4	3800	438.4	110	974.2

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	0.544	0.49	806.3	4.93	1.331	0.27

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.65	0.65	0.65	0.65

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.445	0.897	Data Not Normal
Lilliefors (Full: no NDs)	0.429	0.209	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.909	0.909	0.909	0.909

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	2.622	0.796	
Kolmogorov-Smirnov (Full: no NDs)	0.338	0.214	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.908	0.908	0.908	0.908

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.848	0.897	Data Not Lognormal
Lilliefors (Full: no NDs)	0.21	0.209	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	32	1	3.03%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	32	7.6	1900	162.3	88.5	330.8

Statistics (All: NDs treated as DL value)	33	7.6	1900	157.7	88	326.7
Statistics (All: NDs treated as DL/2 value)	33	5	1900	157.6	88	326.8
Statistics (Normal ROS Estimated Data)	33	-204.4	1900	151.2	88	331.8
Statistics (Gamma ROS Estimated Data)	33	1.000E-12	1900	157.4	88	326.9
Statistics (Lognormal ROS Estimated Data)	33	7.6	1900	157.8	88	326.7

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.871	0.812	186.5	4.415	1.084	0.246
Statistics (NDs = DL)	0.832	0.777	189.5	4.351	1.129	0.259
Statistics (NDs = DL/2)	0.812	0.758	194.1	4.33	1.174	0.271
Statistics (Gamma ROS Estimates)	0.406	0.39	387.3	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	4.355	1.122	0.258

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.587	0.587	0.587	0.62

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.381	0.93	Data Not Normal
Lilliefors (Detects Only)	0.371	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.381	0.931	Data Not Normal
Lilliefors (NDs = DL)	0.37	0.154	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.382	0.931	Data Not Normal
Lilliefors (NDs = DL/2)	0.37	0.154	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.429	0.931	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.362	0.154	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.804	0.807	0.809	0.863

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.15	0.782	
Kolmogorov-Smirnov (Detects Only)	0.253	0.161	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.016	0.784	
Kolmogorov-Smirnov (NDs = DL)	0.244	0.159	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.961	0.785	
Kolmogorov-Smirnov (NDs = DL/2)	0.241	0.159	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.676	0.832	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.298	0.164	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.952	0.956	0.954	0.957

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.923	0.93	Data Not Lognormal
Lilliefors (Detects Only)	0.178	0.157	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.925	0.931	Data Not Lognormal
Lilliefors (NDs = DL)	0.18	0.154	Data Not Lognormal

Shapiro-Wilks (NDs = DL/2)	0.925	0.931	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.192	0.154	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.928	0.931	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.178	0.154	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	16

Raw Statistics		Log-Transformed Statistics	
Minimum	9.4	Minimum	2.241
Maximum	3800	Maximum	8.243
Second Largest	2200	Second Largest	7.696
First Quartile	76.25	First Quartile	4.334
Median	110	Median	4.7
Third Quartile	177.5	Third Quartile	5.179
Mean	438.4	Mean	4.93
SD	974.2	SD	1.331
Coefficient of Variation	2.222		
Skewness	3.067		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.445	Shapiro Wilk Test Statistic	0.848
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	2828	95% UTL with 95% Coverage	3618
95% UPL (t)	2180	95% UPL (t)	1492
90% Percentile (z)	1687	90% Percentile (z)	761.2
95% Percentile (z)	2041	95% Percentile (z)	1234
99% Percentile (z)	2705	99% Percentile (z)	3057

Gamma Distribution Test		Data Distribution Test	
k star	0.49	Data do not follow a Discernable Distribution (0.05)	
Theta Star	894.4		
MLE of Mean	438.4		
MLE of Standard Deviation	626.2		
nu star	17.64		
A-D Test Statistic	2.622	Nonparametric Statistics	
5% A-D Critical Value	0.796	90% Percentile	898
K-S Test Statistic	0.338	95% Percentile	2440
5% K-S Critical Value	0.214	99% Percentile	3528
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	3800
90% Percentile	1191	95% Percentile Bootstrap UTL with 95% Coverage	3800
95% Percentile	1696	95% BCA Bootstrap UTL with 95% Coverage	3800
99% Percentile	2940	95% UPL	3800
		95% Chebyshev UPL	4801
95% WH Approx. Gamma UPL	1583	Upper Threshold Limit Based upon IQR	329.4
95% HW Approx. Gamma UPL	1520		
95% WH Approx. Gamma UTL with 95% Coverage	2658		
95% HW Approx. Gamma UTL with 95% Coverage	2711		

Non-Clay

General Statistics			
Number of Valid Data	33	Number of Detected Data	32
Number of Distinct Detected Data	26	Number of Non-Detect Data	1
		Percent Non-Detects	3.03%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	7.6	Minimum Detected	2.028
Maximum Detected	1900	Maximum Detected	7.55
Mean of Detected	162.3	Mean of Detected	4.415
SD of Detected	330.8	SD of Detected	1.084
Minimum Non-Detect	10	Minimum Non-Detect	2.303
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.381	Shapiro Wilk Test Statistic	0.923
5% Shapiro Wilk Critical Value	0.93	5% Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	157.6	Mean (Log Scale)	4.33
SD	326.8	SD (Log Scale)	1.174
95% UTL 95% Coverage	868.7	95% UTL 95% Coverage	976.6
95% UPL (t)	719.4	95% UPL (t)	571.5
90% Percentile (z)	576.4	90% Percentile (z)	341.9
95% Percentile (z)	695.1	95% Percentile (z)	523.6
99% Percentile (z)	917.8	99% Percentile (z)	1165
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	136.8	Mean in Original Scale	157.8
SD	342.4	SD in Original Scale	326.7
95% UTL with 95% Coverage	881.9	95% UTL with 95% Coverage	894.2
		95% BCA UTL with 95% Coverage	1900
		95% Bootstrap (%) UTL with 95% Coverage	1900
95% UPL (t)	725.5	95% UPL (t)	535.8
90% Percentile (z)	575.6	90% Percentile (z)	327.9
95% Percentile (z)	700	95% Percentile (z)	492.8

99% Percentile (z)	933.3	99% Percentile (z)	1058
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.81	Data do not follow a Discernable Distribution (0.05)	
Theta Star	200.5		
nu star	51.83		
A-D Test Statistic	2.15	Nonparametric Statistics	
5% A-D Critical Value	0.782	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.253	Mean	157.7
5% K-S Critical Value	0.161	SD	321.8
Data not Gamma Distributed at 5% Significance Level		SE of Mean	56.91
		95% KM UTL with 95% Coverage	857.8
Assuming Gamma Distribution		95% KM Chebyshev UPL	1581
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	710.9
Mean	157.4	90% Percentile (z)	570
Median	88	95% Percentile (z)	686.9
SD	326.9	99% Percentile (z)	906.2
k star	0.39		
Theta star	403.9	Gamma ROS Limits with Extrapolated Data	
Nu star	25.72	95% Wilson Hilferty (WH) Approx. Gamma UPL	508.9
95% Percentile of Chisquare (2k)	3.268	95% Hawkins Wixley (HW) Approx. Gamma UPL	543.8
		95% WH Approx. Gamma UTL with 95% Coverage	706.5
90% Percentile	446.7	95% HW Approx. Gamma UTL with 95% Coverage	792.7
95% Percentile	659.9		
99% Percentile	1198		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 3800 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.926

For 10% significance level, 3800 is an outlier.

For 5% significance level, 3800 is an outlier.

For 1% significance level, 3800 is an outlier.

2. Data Value 9.4 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.159

For 10% significance level, 9.4 is not an outlier.

For 5% significance level, 9.4 is not an outlier.

For 1% significance level, 9.4 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	157.6
Standard Deviation	326.8
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	157.6	321.8	1900	13	5.415	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1900 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1900 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Data	33	18
Number of Non-Detect Data	1	0
Number of Detect Data	32	18
Minimum Non-Detect	10	N/A
Maximum Non-Detect	10	N/A
Percent Non detects	3.03%	0.00%
Minimum Detected	7.6	9.4
Maximum Detected	1900	3800
Mean of Detected Data	162.3	438.4
Median of Detected Data	88.5	110
SD of Detected Data	330.8	974.2

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

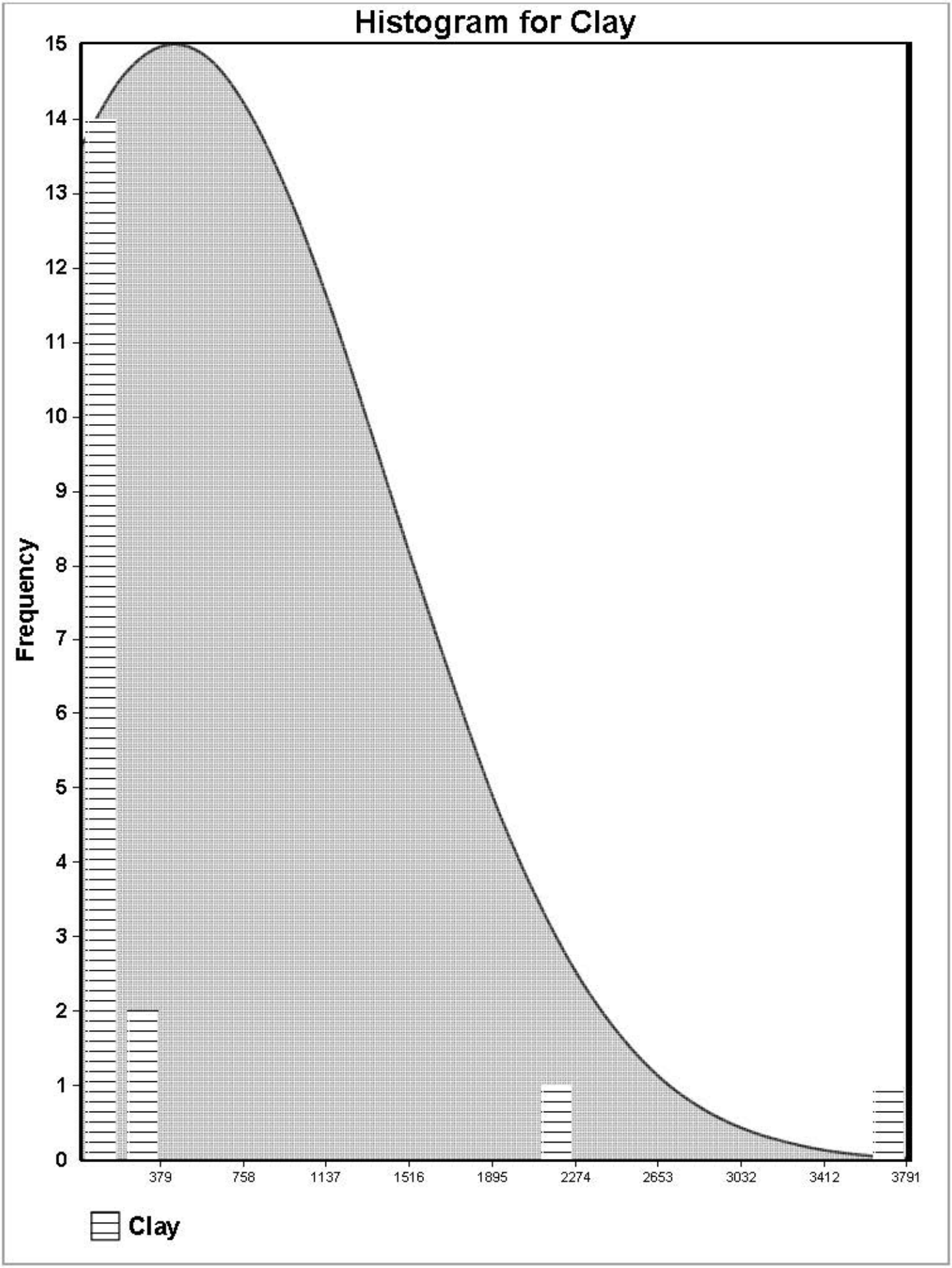
H0: Mean/Median of Site or AOC = Mean/Median of Background

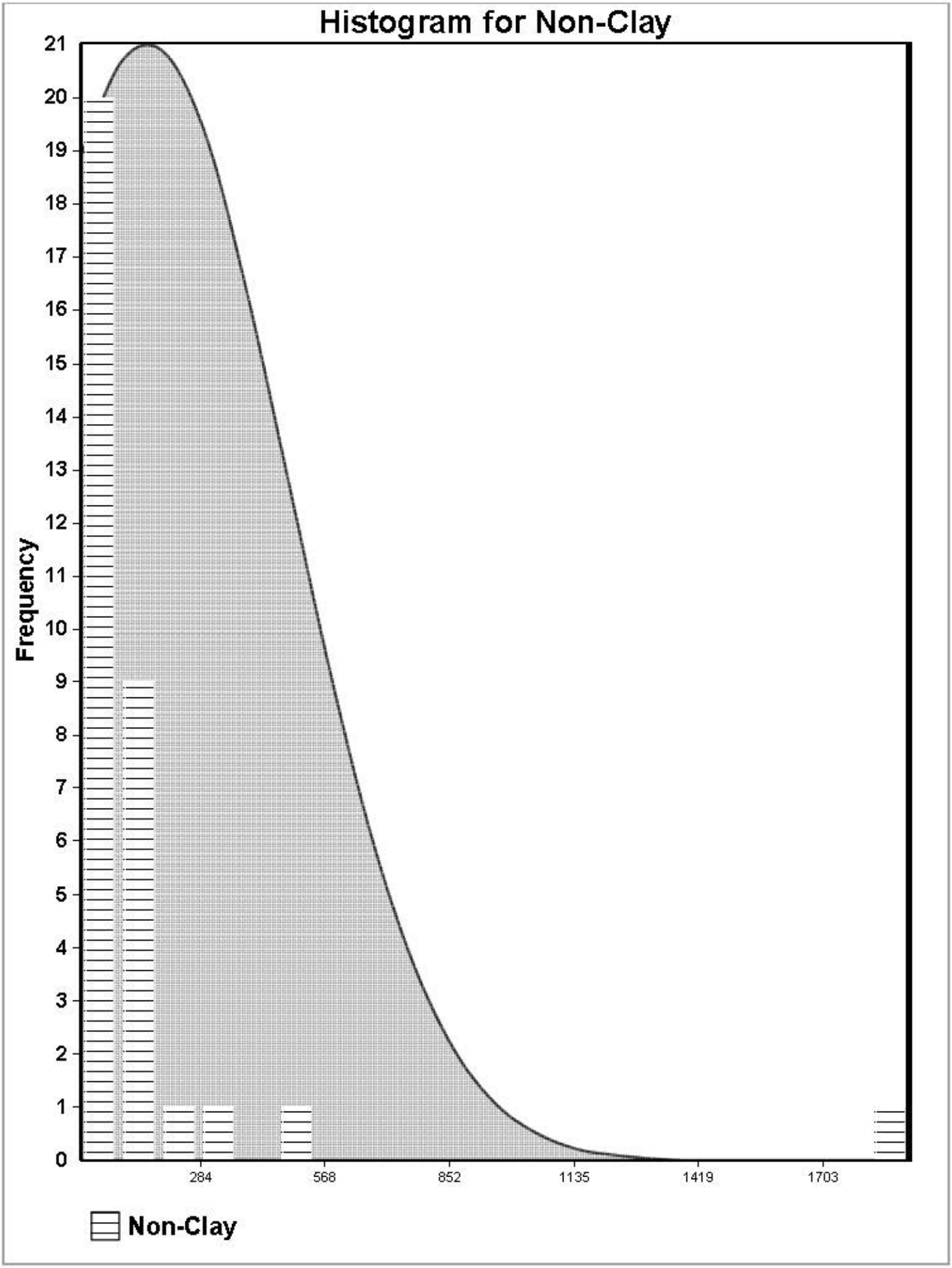
Site Rank Sum W-Stat	787
WMW Test U-Stat	1.39
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.159

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
379
758
1137
1516
1895
2274
2653
3032
3412
3791
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
284
568
852
1135
1419
1703
Non-Clay

Location	Clay	D_Clay
BG-1-2	2200	1
BG-1-43	210	1
BG-1-55	81	1
BG-1-78	66	1
BG-2-30	9.4	1
BG-2-81	75	1
BG-3-17	120	1
BG-3-22	62	1
BG-3-69	59	1
BG-4-2	3800	1
BG-4-19	340	1
BG-4-40	180	1
BG-4-79	120	1
BG-4-161	98	1
BG-4-163	80	1
BG-6-28	170	1
BG-6-53	110	1
BG-6-87	110	1

Location	Non-Clay	D_Non-Clay
BG-1-10	490	1
BG-1-29	89	1
BG-1-40	65	1
BG-1-46	67	1
BG-1-92	77	1
BG-2-2	8.2	1
BG-2-10	25	1
BG-2-19	7.6	1
BG-2-21	18	1
BG-2-32	14	1
BG-2-75	10	0
BG-3-2	110	1
BG-3-10	1900	1
BG-3-29	120	1
BG-3-63	88	1
BG-3-65	69	1
BG-3-95	60	1
BG-3-105	66	1
BG-3-131	55	1
BG-3-136	69	1
BG-4-10	310	1
BG-4-65	52	1
BG-4-82	110	1
BG-4-95	110	1
BG-4-117	140	1
BG-4-120	140	1
BG-6-2	190	1
BG-6-9	240	1
BG-6-58	120	1
BG-6-75	110	1
BG-6-98	93	1
BG-6-114	100	1
BG-6-127	82	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	12	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	12	7.6	2200	445.2	99.5	764.6

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	0.446	0.39	998.8	4.648	1.904	0.41

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.781	0.781	0.781	0.781

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.614	0.859	Data Not Normal
Lilliefors (Full: no NDs)	0.356	0.256	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.949	0.949	0.949	0.949

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.596	0.795	
Kolmogorov-Smirnov (Full: no NDs)	0.193	0.26	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.984	0.984	0.984	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.95	0.859	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.107	0.256	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	39	0	39	38	1	2.56%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	38	9.4	3800	203.7	95.5	602.8

Statistics (All: NDs treated as DL value)	39	9.4	3800	198.8	93	595.6
Statistics (All: NDs treated as DL/2 value)	39	5	3800	198.7	93	595.6
Statistics (Normal ROS Estimated Data)	39	-384.9	3800	188.7	93	602.2
Statistics (Gamma ROS Estimated Data)	39	1.000E-12	3800	198.5	93	595.7
Statistics (Lognormal ROS Estimated Data)	39	9.4	3800	199	93	595.5

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.81	0.765	251.5	4.586	0.896	0.195
Statistics (NDs = DL)	0.779	0.736	255.3	4.527	0.956	0.211
Statistics (NDs = DL/2)	0.763	0.722	260.2	4.509	1.004	0.223
Statistics (Gamma ROS Estimates)	0.425	0.41	466.6	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	4.541	0.926	0.204

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.451	0.451	0.451	0.484

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.241	0.938	Data Not Normal
Lilliefors (Detects Only)	0.417	0.144	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.241	0.939	Data Not Normal
Lilliefors (NDs = DL)	0.416	0.142	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.242	0.939	Data Not Normal
Lilliefors (NDs = DL/2)	0.415	0.142	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.279	0.939	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.409	0.142	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.681	0.682	0.684	0.739

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	5.559	0.786	
Kolmogorov-Smirnov (Detects Only)	0.316	0.148	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	5.227	0.788	
Kolmogorov-Smirnov (NDs = DL)	0.307	0.147	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.14	0.788	
Kolmogorov-Smirnov (NDs = DL/2)	0.304	0.147	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	6.222	0.83	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.352	0.151	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.88	0.893	0.89	0.896

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.82	0.938	Data Not Lognormal
Lilliefors (Detects Only)	0.2	0.144	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.834	0.939	Data Not Lognormal
Lilliefors (NDs = DL)	0.197	0.142	Data Not Lognormal

			Shapiro-Wilks (NDs = DL/2)	0.834	0.939	Data Not Lognormal					
			Lilliefors (NDs = DL/2)	0.212	0.142	Data Not Lognormal					
			Shapiro-Wilks (Lognormal ROS Estimates)	0.842	0.939	Data Not Lognormal					
			Lilliefors (Lognormal ROS Estimates)	0.19	0.142	Data Not Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.											

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-Transformed Statistics	
Minimum	7.6	Minimum	2.028
Maximum	2200	Maximum	7.696
Second Largest	1900	Second Largest	7.55
First Quartile	23.25	First Quartile	3.137
Median	99.5	Median	4.595
Third Quartile	302.5	Third Quartile	5.659
Mean	445.2	Mean	4.648
SD	764.6	SD	1.904
Coefficient of Variation	1.717		
Skewness	1.953		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.614	Shapiro Wilk Test Statistic	0.95
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	2537	95% UTL with 95% Coverage	19088
95% UPL (t)	1874	95% UPL (t)	3665
90% Percentile (z)	1425	90% Percentile (z)	1197
95% Percentile (z)	1703	95% Percentile (z)	2391
99% Percentile (z)	2224	99% Percentile (z)	8751

Gamma Distribution Test		Data Distribution Test
k star	0.39	Data appear Gamma Distributed at 5% Significance Level
Theta Star	1142	
MLE of Mean	445.2	
MLE of Standard Deviation	713.1	
nu star	9.357	
A-D Test Statistic	0.596	Nonparametric Statistics
5% A-D Critical Value	0.795	90% Percentile 1759
K-S Test Statistic	0.193	95% Percentile 2035
5% K-S Critical Value	0.26	99% Percentile 2167
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	2200
90% Percentile	1263	95% Percentile Bootstrap UTL with 95% Coverage	2200
95% Percentile	1866	95% BCA Bootstrap UTL with 95% Coverage	2200
99% Percentile	3387	95% UPL	2200
		95% Chebyshev UPL	3914
95% WH Approx. Gamma UPL	2020	Upper Threshold Limit Based upon IQR	721.4
95% HW Approx. Gamma UPL	2154		
95% WH Approx. Gamma UTL with 95% Coverage	3999		
95% HW Approx. Gamma UTL with 95% Coverage	4804		

MC

General Statistics			
Number of Valid Data	39	Number of Detected Data	38
Number of Distinct Detected Data	28	Number of Non-Detect Data	1
		Percent Non-Detects	2.56%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	9.4	Minimum Detected	2.241
Maximum Detected	3800	Maximum Detected	8.243
Mean of Detected	203.7	Mean of Detected	4.586
SD of Detected	602.8	SD of Detected	0.896
Minimum Non-Detect	10	Minimum Non-Detect	2.303
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.241	Shapiro Wilk Test Statistic	0.82
5% Shapiro Wilk Critical Value	0.938	5% Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	198.7	Mean (Log Scale)	4.509
SD	595.6	SD (Log Scale)	1.004
95% UTL 95% Coverage	1464	95% UTL 95% Coverage	766.9
95% UPL (t)	1216	95% UPL (t)	504.5
90% Percentile (z)	962	90% Percentile (z)	329
95% Percentile (z)	1178	95% Percentile (z)	473.8
99% Percentile (z)	1584	99% Percentile (z)	939.2
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	176.8	Mean in Original Scale	199
SD	607.2	SD in Original Scale	595.5
95% UTL with 95% Coverage	1467	95% UTL with 95% Coverage	671.1
		95% BCA UTL with 95% Coverage	686
		95% Bootstrap (%) UTL with 95% Coverage	3800
95% UPL (t)	1214	95% UPL (t)	456
90% Percentile (z)	955	90% Percentile (z)	307.4
95% Percentile (z)	1176	95% Percentile (z)	430.4

99% Percentile (z)	1589	99% Percentile (z)	809
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.764	Data do not follow a Discernable Distribution (0.05)	
Theta Star	266.7		
nu star	58.05		
A-D Test Statistic	5.559	Nonparametric Statistics	
5% A-D Critical Value	0.786	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.316	Mean	198.8
5% K-S Critical Value	0.148	SD	587.9
Data not Gamma Distributed at 5% Significance Level		SE of Mean	95.41
		95% KM UTL with 95% Coverage	1448
Assuming Gamma Distribution		95% KM Chebyshev UPL	2794
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1203
Mean	198.5	90% Percentile (z)	952.2
Median	93	95% Percentile (z)	1166
SD	595.7	99% Percentile (z)	1566
k star	0.41		
Theta star	484.4	Gamma ROS Limits with Extrapolated Data	
Nu star	31.97	95% Wilson Hilferty (WH) Approx. Gamma UPL	586.2
95% Percentile of Chisquare (2k)	3.377	95% Hawkins Wixley (HW) Approx. Gamma UPL	582.3
		95% WH Approx. Gamma UTL with 95% Coverage	793.7
90% Percentile	558.3	95% HW Approx. Gamma UTL with 95% Coverage	814.7
95% Percentile	817.9		
99% Percentile	1469		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12

10% critical value: 0.49

5% critical value: 0.546

1% critical value: 0.642

1. Data Value 2200 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.780

For 10% significance level, 2200 is an outlier.

For 5% significance level, 2200 is an outlier.

For 1% significance level, 2200 is an outlier.

2. Data Value 7.6 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.005

For 10% significance level, 7.6 is not an outlier.

For 5% significance level, 7.6 is not an outlier.

For 1% significance level, 7.6 is not an outlier.

Rosner's Outlier Test for MC

Mean	198.7
Standard Deviation	595.6
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	198.7	588	3800	20	6.125	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 3800 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 3800 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Data	39	12
Number of Non-Detect Data	1	0
Number of Detect Data	38	12
Minimum Non-Detect	10	N/A
Maximum Non-Detect	10	N/A
Percent Non detects	2.56%	0.00%
Minimum Detected	9.4	7.6
Maximum Detected	3800	2200
Mean of Detected Data	203.7	445.2
Median of Detected Data	95.5	99.5
SD of Detected Data	602.8	764.6

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

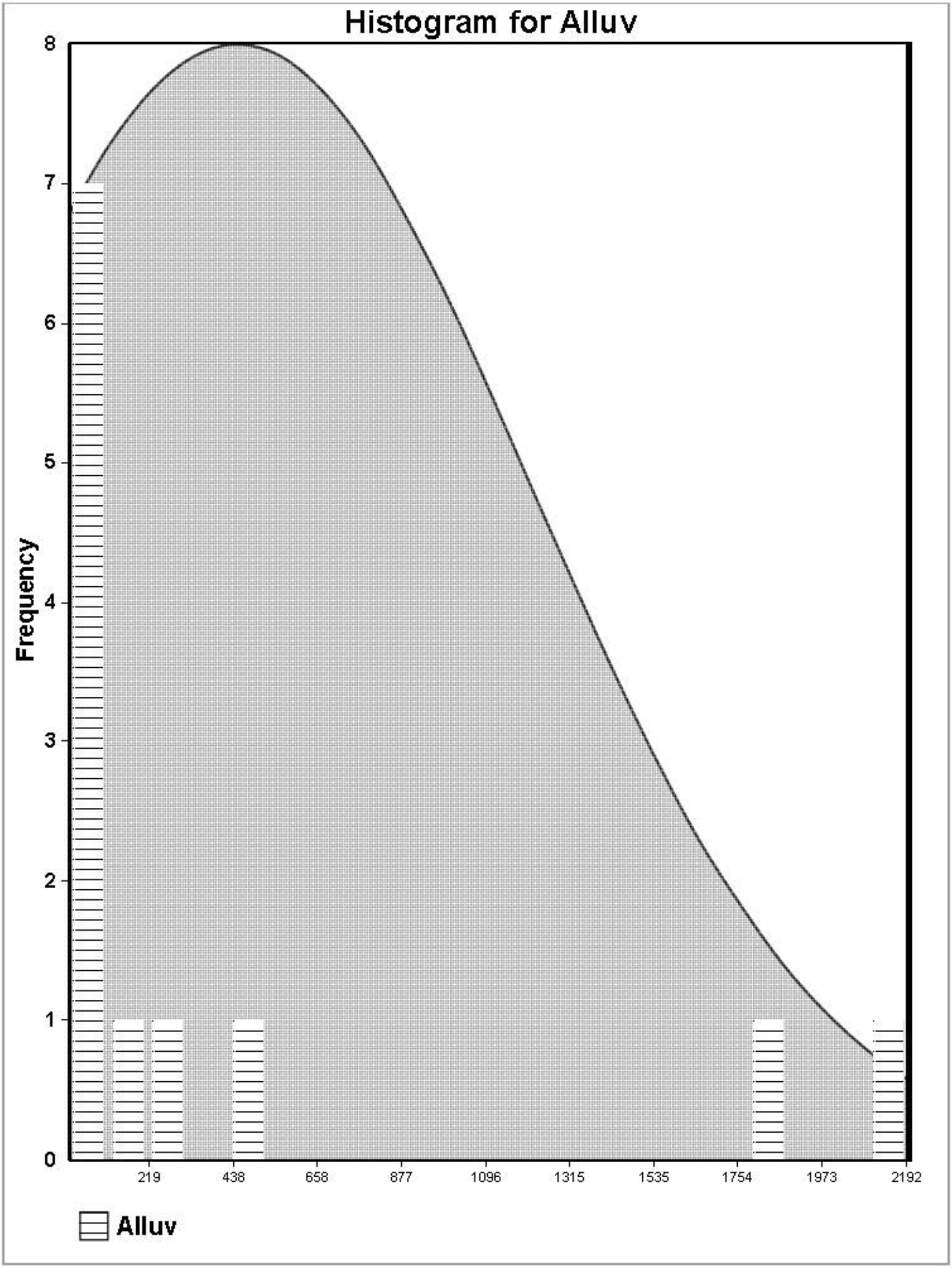
H0: Mean/Median of Site or AOC = Mean/Median of Background

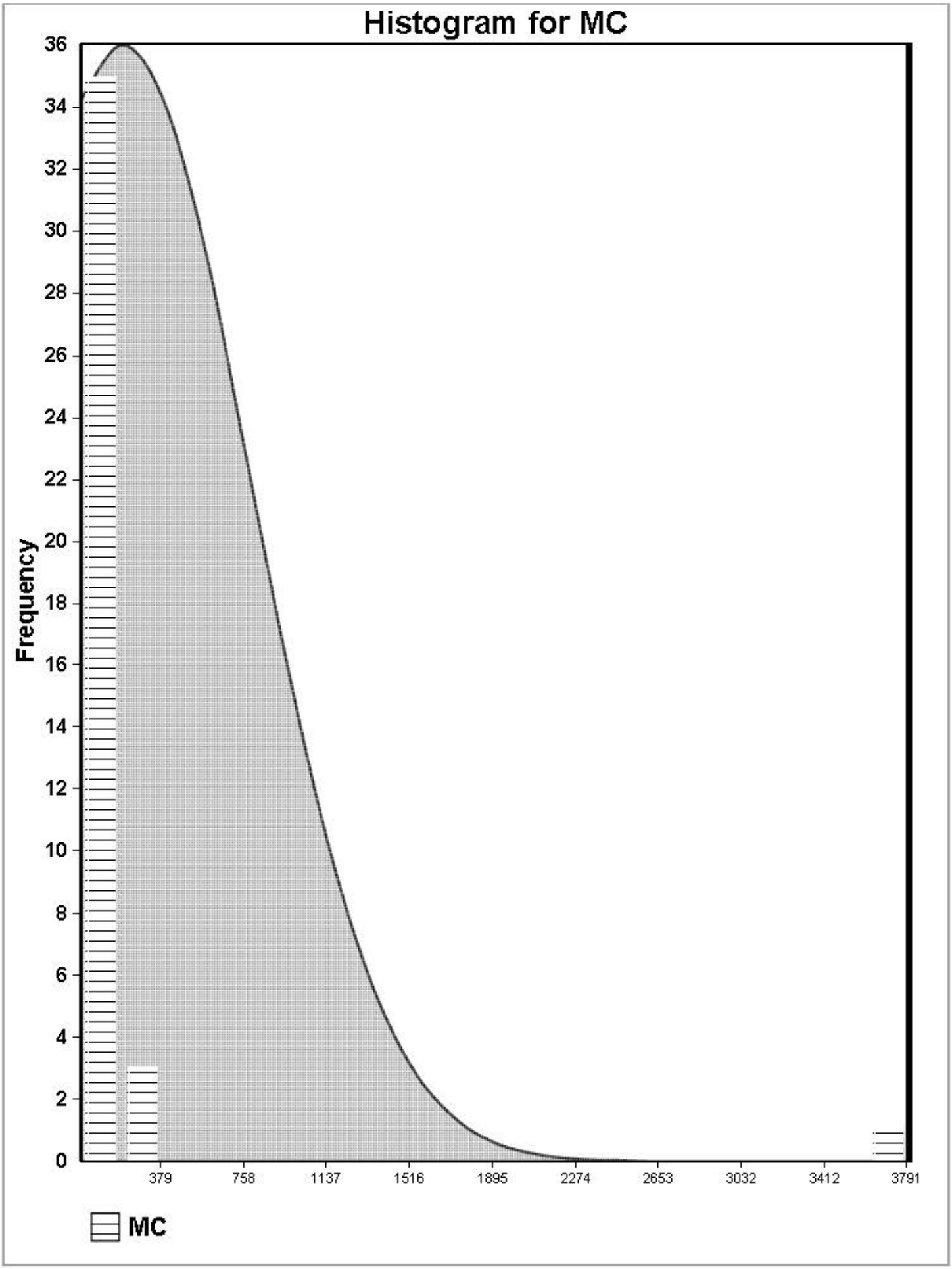
Site Rank Sum W-Stat	1004
WMW Test U-Stat	0.222
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.807

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
7
8
219
438
658
877
1096
1315
1535
1754
1973
2192
Alluv


Histogram for MC
Frequency
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
379
758
1137
1516
1895
2274
2653
3032
3412
3791
MC

Location	Alluv	D_Alluv
BG-1-2	2200	1
BG-1-10	490	1
BG-1-29	89	1
BG-1-40	65	1
BG-2-2	8.2	1
BG-2-10	25	1
BG-2-19	7.6	1
BG-2-21	18	1
BG-3-2	110	1
BG-3-10	1900	1
BG-6-2	190	1
BG-6-9	240	1

Location	MC	D_MC
BG-1-43	210	1
BG-1-46	67	1
BG-1-55	81	1
BG-1-78	66	1
BG-1-92	77	1
BG-2-30	9.4	1
BG-2-32	14	1
BG-2-75	10	0
BG-2-81	75	1
BG-3-17	120	1
BG-3-22	62	1
BG-3-29	120	1
BG-3-63	88	1
BG-3-65	69	1
BG-3-69	59	1
BG-3-95	60	1
BG-3-105	66	1
BG-3-131	55	1
BG-3-136	69	1
BG-4-1	3800	1
BG-4-10	310	1
BG-4-19	340	1
BG-4-40	180	1
BG-4-65	52	1
BG-4-79	120	1
BG-4-82	110	1
BG-4-95	110	1
BG-4-117	140	1
BG-4-120	140	1
BG-4-161	98	1
BG-4-163	80	1
BG-6-28	170	1
BG-6-53	110	1
BG-6-58	120	1
BG-6-75	110	1
BG-6-87	110	1
BG-6-98	93	1
BG-6-114	100	1
BG-1-127	82	1

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Chromium.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	34
Minimum	2.6
Maximum	38
Mean of Raw Data	11.02
Standard Deviation of Raw Data	7.754
Kstar	2.265
Mean of Log Transformed Data	2.177
Standard Deviation of Log Transformed Data	0.676

Normal Distribution Test Results	
Correlation Coefficient R	0.926
Approximate Shapiro Wilk Test Statistic	0.857
Approximate Shapiro Wilk P Value	2.1111E-6
Lilliefors Test Statistic	0.175
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.99
A-D Test Statistic	1.03
A-D Critical (0.95) Value	0.761
K-S Test Statistic	0.16
K-S Critical(0.95) Value	0.126

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.984
Approximate Shapiro Wilk Test Statistic	0.952
Approximate Shapiro Wilk P Value	0.065
Lilliefors Test Statistic	0.139
Lilliefors Critical (0.95) Value	0.124

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Chromium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Total Number of Observations	51	Number of Distinct Observations	34

Raw Statistics		Log-Transformed Statistics	
Minimum	2.6	Minimum	0.956
Maximum	38	Maximum	3.638
Second Largest	32	Second Largest	3.466
First Quartile	5.1	First Quartile	1.629
Median	8.4	Median	2.128
Third Quartile	15	Third Quartile	2.708
Mean	11.02	Mean	2.177
SD	7.754	SD	0.676
Coefficient of Variation	0.703		
Skewness	1.415		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.175	Lilliefors Test Statistic	0.139
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	26.95	95% UTL with 95% Coverage	35.33
95% UPL (t)	24.15	95% UPL (t)	27.68
90% Percentile (z)	20.96	90% Percentile (z)	20.97
95% Percentile (z)	23.78	95% Percentile (z)	26.8
99% Percentile (z)	29.06	99% Percentile (z)	42.48
Gamma Distribution Test		Data Distribution Test	
k star	2.265	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.867		
MLE of Mean	11.02		
MLE of Standard Deviation	7.325		
nu star	231		
A-D Test Statistic	1.03	Nonparametric Statistics	
5% A-D Critical Value	0.761	90% Percentile	20
K-S Test Statistic	0.16	95% Percentile	24.5
5% K-S Critical Value	0.126	99% Percentile	35
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	32
90% Percentile	20.83	95% Percentile Bootstrap UTL with 95% Coverage	32
95% Percentile	25.15	95% BCA Bootstrap UTL with 95% Coverage	32
99% Percentile	34.67	95% UPL	28.4
		95% Chebyshev UPL	45.15
95% WH Approx. Gamma UPL	25.36	Upper Threshold Limit Based upon IQR	29.85
95% HW Approx. Gamma UPL	25.77		
95% WH Approx. Gamma UTL with 95% Coverage	30.17		
95% HW Approx. Gamma UTL with 95% Coverage	31.08		

Outlier Tests for Selected Variables

User Selected Options	
From File	Chromium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for All Data

Mean	11.02
Standard Deviation	7.754
Number of data	51
Number of suspected outliers	1

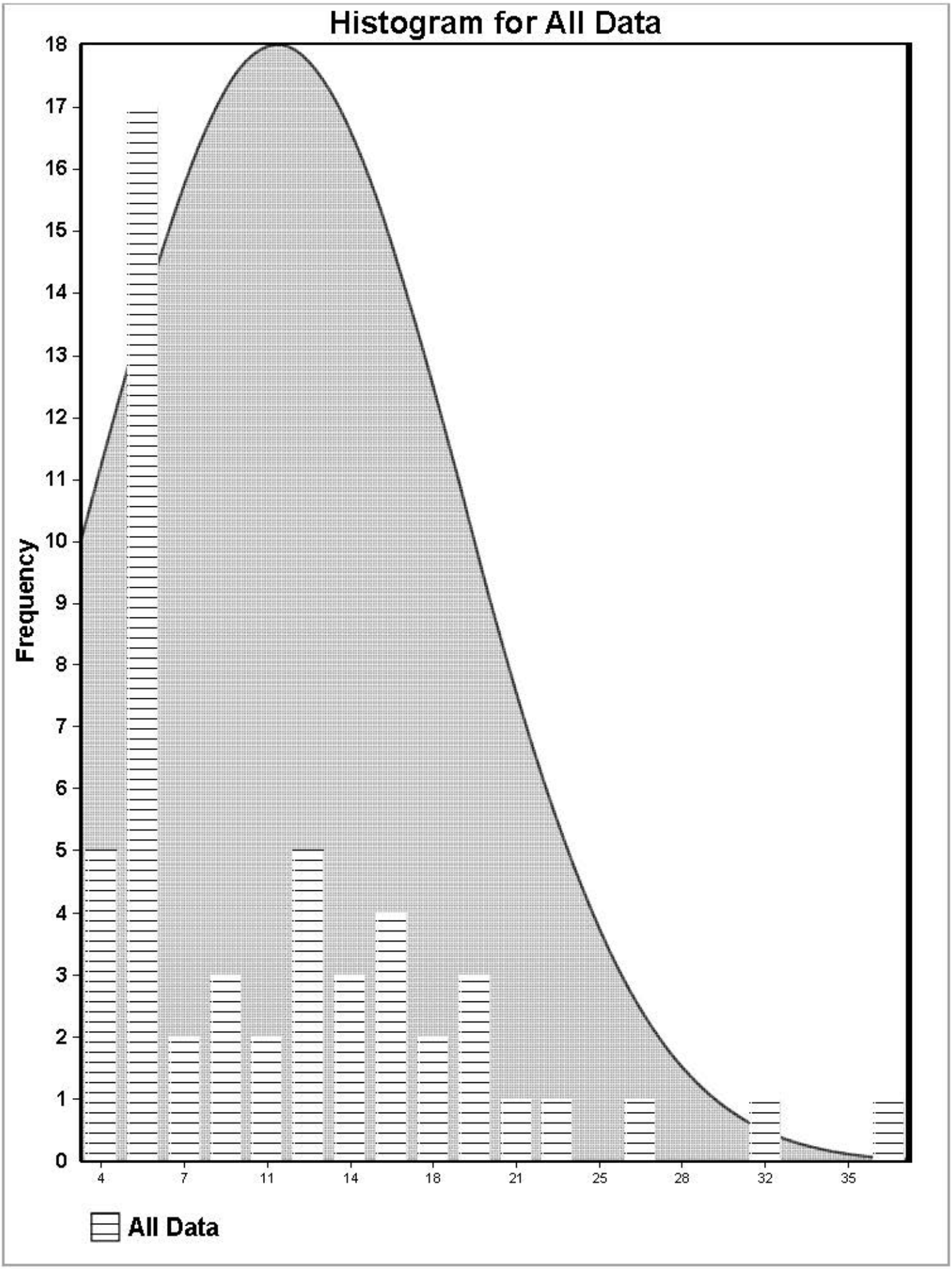
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	11.02	7.678	38	51	3.514	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 38 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 38 is a Potential Statistical Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
4
7
11
14
18
21
25
28
32
35
All Data

Location	All Data
BG-1-2	13
BG-3-17	4.8
BG-4-2	12
BG-4-19	32
BG-1-10	5.5
BG-2-2	5.3
BG-2-10	4.6
BG-2-19	8.8
BG-3-2	5.1
BG-3-10	14
BG-4-10	14
BG-6-2	8.3
BG-6-9	6
BG-1-29	7.5
BG-1-40	3.2
BG-1-46	5.3
BG-1-92	5.3
BG-2-21	5.1
BG-2-32	6.1
BG-2-75	4.4
BG-3-29	4.5
BG-3-63	5
BG-3-65	8.4
BG-3-95	4.6
BG-3-105	12
BG-3-131	2.6
BG-3-136	20
BG-4-65	5.5
BG-4-82	10
BG-4-95	4.2
BG-4-117	2.8
BG-4-120	18
BG-6-58	6.4
BG-6-75	6.1
BG-6-98	13
BG-6-114	12
BG-6-127	26
BG-1-43	20
BG-1-55	2.8
BG-1-78	15
BG-2-30	15
BG-2-81	17
BG-3-22	5
BG-3-69	15
BG-4-40	23
BG-4-79	19
BG-4-161	10
BG-4-163	16
BG-6-28	21
BG-6-53	14
BG-6-87	38

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Chromium.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	12
Minimum	4.6
Maximum	32
Mean of Raw Data	10.26
Standard Deviation of Raw Data	7.478
Kstar	2.349
Mean of Log Transformed Data	2.152
Standard Deviation of Log Transformed Data	0.581

Normal Distribution Test Results	
Correlation Coefficient R	0.842
Shapiro Wilk Test Statistic	0.726
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	5.7049E-4
Lilliefors Test Statistic	0.232
Lilliefors Critical (0.95) Value	0.246

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.932
A-D Test Statistic	0.702
A-D Critical (0.95) Value	0.739
K-S Test Statistic	0.204
K-S Critical(0.95) Value	0.238

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.945
Shapiro Wilk Test Statistic	0.889
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.102
Lilliefors Test Statistic	0.194
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

>20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	29
Minimum	2.6
Maximum	38
Mean of Raw Data	11.28
Standard Deviation of Raw Data	7.927
Kstar	2.092
Mean of Log Transformed Data	2.185
Standard Deviation of Log Transformed Data	0.712

Normal Distribution Test Results

Correlation Coefficient R	0.935
Shapiro Wilk Test Statistic	0.877
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	3.9136E-4
Lilliefors Test Statistic	0.178
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.988
A-D Test Statistic	0.764
A-D Critical (0.95) Value	0.758
K-S Test Statistic	0.155
K-S Critical(0.95) Value	0.145

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.981
Shapiro Wilk Test Statistic	0.949
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.111
Lilliefors Test Statistic	0.125
Lilliefors Critical (0.95) Value	0.144

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Chromium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	12

Raw Statistics		Log-Transformed Statistics	
Minimum	4.6	Minimum	1.526
Maximum	32	Maximum	3.466
Second Largest	14	Second Largest	2.639
First Quartile	5.3	First Quartile	1.668
Median	8.3	Median	2.116
Third Quartile	13	Third Quartile	2.565
Mean	10.26	Mean	2.152
SD	7.478	SD	0.581
Coefficient of Variation	0.729		
Skewness	2.262		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.726	Shapiro Wilk Test Statistic	0.889
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	30.23	95% UTL with 95% Coverage	40.61
95% UPL (t)	24.09	95% UPL (t)	25.2
90% Percentile (z)	19.84	90% Percentile (z)	18.11
95% Percentile (z)	22.56	95% Percentile (z)	22.37
99% Percentile (z)	27.66	99% Percentile (z)	33.24

Gamma Distribution Test		Data Distribution Test	
k star	2.349	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	4.369		
MLE of Mean	10.26		
MLE of Standard Deviation	6.696		
nu star	61.07		
A-D Test Statistic	0.702	Nonparametric Statistics	
5% A-D Critical Value	0.739	90% Percentile	14
K-S Test Statistic	0.204	95% Percentile	21.2
5% K-S Critical Value	0.238	99% Percentile	29.84
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	32
90% Percentile	19.23	95% Percentile Bootstrap UTL with 95% Coverage	32
95% Percentile	23.15	95% BCA Bootstrap UTL with 95% Coverage	32
99% Percentile	31.78	95% UPL	32
		95% Chebyshev UPL	44.09
95% WH Approx. Gamma UPL	24.18	Upper Threshold Limit Based upon IQR	24.55
95% HW Approx. Gamma UPL	24.35		
95% WH Approx. Gamma UTL with 95% Coverage	34.31		
95% HW Approx. Gamma UTL with 95% Coverage	35.42		

>20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	29
Raw Statistics		**Log-Transformed Statistics**	
Minimum	2.6	Minimum	0.956
Maximum	38	Maximum	3.638
Second Largest	26	Second Largest	3.258
First Quartile	5.025	First Quartile	1.614
Median	9.2	Median	2.215
Third Quartile	15.75	Third Quartile	2.756
Mean	11.28	Mean	2.185
SD	7.927	SD	0.712
Coefficient of Variation	0.702		
Skewness	1.249		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.877	Shapiro Wilk Test Statistic	0.949
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	28.19	95% UTL with 95% Coverage	40.62
95% UPL (t)	24.83	95% UPL (t)	30.05
90% Percentile (z)	21.44	90% Percentile (z)	22.16
95% Percentile (z)	24.32	95% Percentile (z)	28.71
99% Percentile (z)	29.73	99% Percentile (z)	46.65
Gamma Distribution Test		**Data Distribution Test**	
k star	2.092	Data appear Lognormal at 5% Significance Level	
Theta Star	5.394		
MLE of Mean	11.28		
MLE of Standard Deviation	7.802		
nu star	159		
A-D Test Statistic	0.764	**Nonparametric Statistics**	
5% A-D Critical Value	0.758	90% Percentile	20.3
K-S Test Statistic	0.155	95% Percentile	23.45
5% K-S Critical Value	0.145	99% Percentile	33.56

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 95% Coverage	38
90% Percentile	21.72	95% Percentile Bootstrap UTL with 95% Coverage	38
95% Percentile	26.39	95% BCA Bootstrap UTL with 95% Coverage	38
99% Percentile	36.73	95% UPL	26.6
		95% Chebyshev UPL	46.29
95% WH Approx. Gamma UPL	26.8	Upper Threshold Limit Based upon IQR	31.84
95% HW Approx. Gamma UPL	27.38		
95% WH Approx. Gamma UTL with 95% Coverage	32.96		
95% HW Approx. Gamma UTL with 95% Coverage	34.27		

Outlier Tests for Selected Variables

User Selected Options	
From File	Chromium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 32 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.662

For 10% significance level, 32 is an outlier.
For 5% significance level, 32 is an outlier.
For 1% significance level, 32 is an outlier.

2. Data Value 4.6 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.053

For 10% significance level, 4.6 is not an outlier.
For 5% significance level, 4.6 is not an outlier.
For 1% significance level, 4.6 is not an outlier.

Rosner's Outlier Test for >20

Mean	11.28
Standard Deviation	7.927
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	11.28	7.822	38	38	3.415	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 38 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 38 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Chromium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Observations	38	13
Number of Distinct Observations	29	12
Minimum	2.6	4.6
Maximum	38	32
Mean	11.28	10.26
Median	9.2	8.3
SD	7.927	7.478
SE of Mean	1.286	2.074

Wilcoxon-Mann-Whitney (WMW) Test

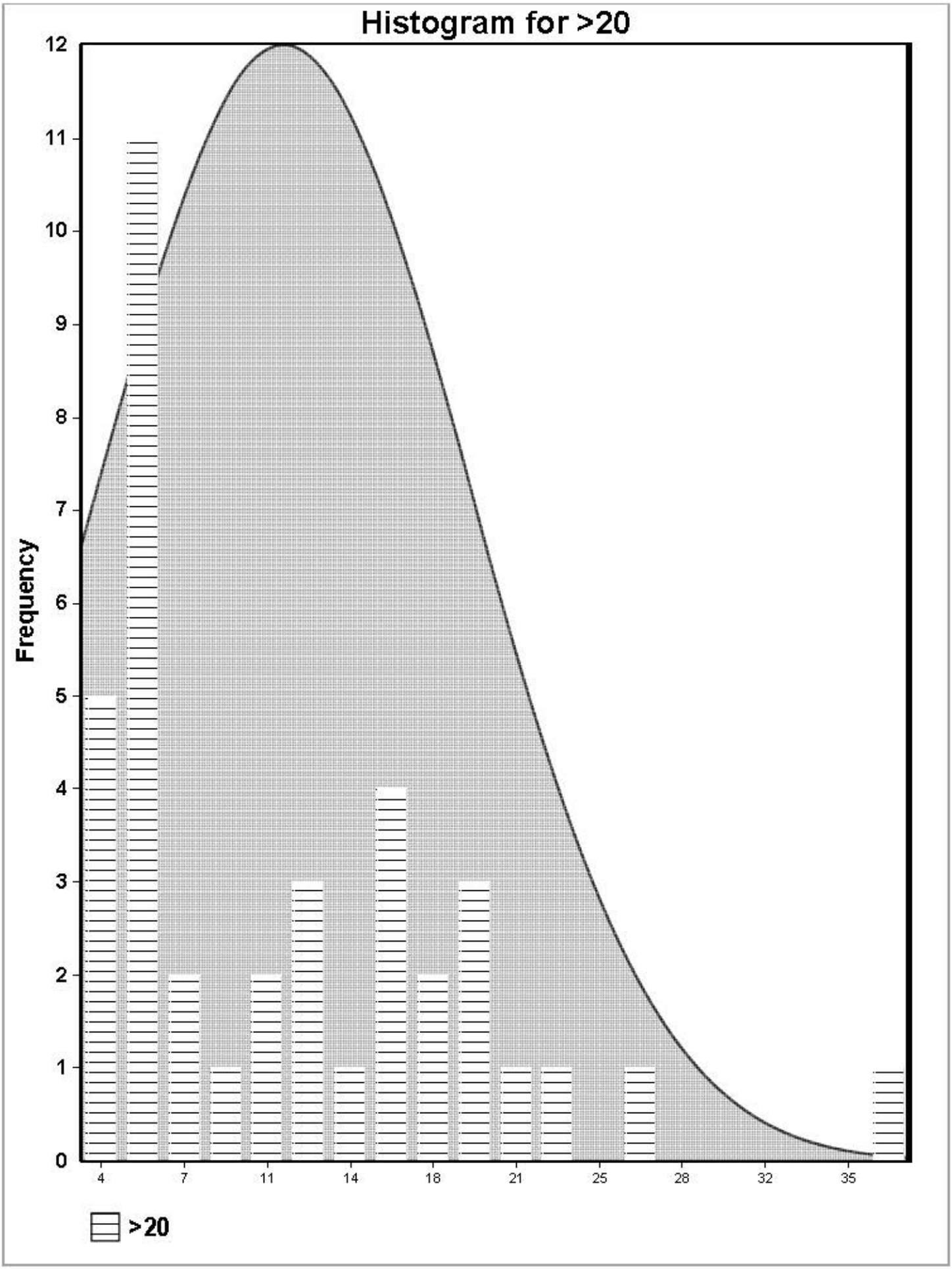
H0: Mean/Median of Site or AOC = Mean/Median of Background

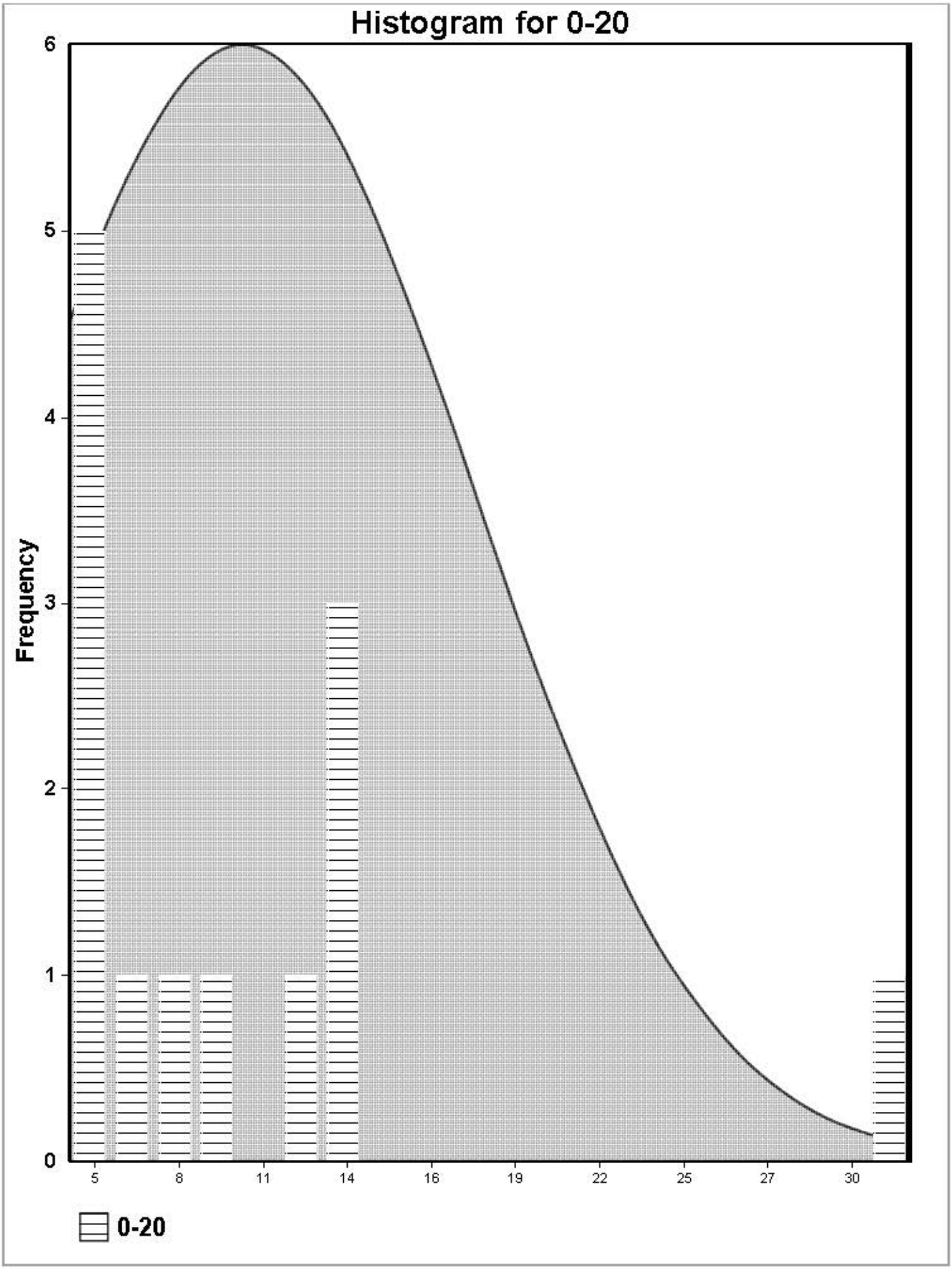
Site Rank Sum W-Stat	1001
WMW Test U-Stat	0.27
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.787

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
4
7
11
14
18
21
25
28
32
35
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5
6
5
8
11
14
16
19
22
25
27
30
0-20

Location	0-20
BG-1-2	13
BG-3-17	4.8
BG-4-2	12
BG-4-19	32
BG-1-10	5.5
BG-2-2	5.3
BG-2-10	4.6
BG-2-19	8.8
BG-3-2	5.1
BG-3-10	14
BG-4-10	14
BG-6-2	8.3
BG-6-9	6

Location	>20
BG-1-29	7.5
BG-1-40	3.2
BG-1-46	5.3
BG-1-92	5.3
BG-2-21	5.1
BG-2-32	6.1
BG-2-75	4.4
BG-3-29	4.5
BG-3-63	5
BG-3-65	8.4
BG-3-95	4.6
BG-3-105	12
BG-3-131	2.6
BG-3-136	20
BG-4-65	5.5
BG-4-82	10
BG-4-95	4.2
BG-4-117	2.8
BG-4-120	18
BG-6-58	6.4
BG-6-75	6.1
BG-6-98	13
BG-6-114	12
BG-6-127	26
BG-1-43	20
BG-1-55	2.8
BG-1-78	15
BG-2-30	15
BG-2-81	17
BG-3-22	5
BG-3-69	15
BG-4-40	23
BG-4-79	19
BG-4-161	10
BG-4-163	16
BG-6-28	21
BG-6-53	14
BG-6-87	38

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Chromium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	16
Minimum	2.8
Maximum	38
Mean of Raw Data	16.26
Standard Deviation of Raw Data	8.837
Kstar	2.635
Mean of Log Transformed Data	2.62
Standard Deviation of Log Transformed Data	0.656

Normal Distribution Test Results	
Correlation Coefficient R	0.962
Shapiro Wilk Test Statistic	0.931
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.195
Lilliefors Test Statistic	0.133
Lilliefors Critical (0.95) Value	0.209

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.98
A-D Test Statistic	0.488
A-D Critical (0.95) Value	0.745
K-S Test Statistic	0.154
K-S Critical(0.95) Value	0.205

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.949
Shapiro Wilk Test Statistic	0.908
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.0754
Lilliefors Test Statistic	0.196
Lilliefors Critical (0.95) Value	0.209

Data appear Lognormal at (0.05) Significance Level

Non-Clay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	25
Minimum	2.6
Maximum	26
Mean of Raw Data	8.17
Standard Deviation of Raw Data	5.354
Kstar	2.913
Mean of Log Transformed Data	1.935
Standard Deviation of Log Transformed Data	0.561

Normal Distribution Test Results

Correlation Coefficient R	0.895
Shapiro Wilk Test Statistic	0.807
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	1.6256E-5
Lilliefors Test Statistic	0.236
Lilliefors Critical (0.95) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.972
A-D Test Statistic	1.163
A-D Critical (0.95) Value	0.753
K-S Test Statistic	0.196
K-S Critical(0.95) Value	0.154

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.976
Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.146
Lilliefors Test Statistic	0.165
Lilliefors Critical (0.95) Value	0.154

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Chromium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	16

Raw Statistics		Log-Transformed Statistics	
Minimum	2.8	Minimum	1.03
Maximum	38	Maximum	3.638
Second Largest	32	Second Largest	3.466
First Quartile	12.25	First Quartile	2.505
Median	15	Median	2.708
Third Quartile	19.75	Third Quartile	2.983
Mean	16.26	Mean	2.62
SD	8.837	SD	0.656
Coefficient of Variation	0.544		
Skewness	0.857		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Test Statistic	0.908
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	37.93	95% UTL with 95% Coverage	68.62
95% UPL (t)	32.05	95% UPL (t)	44.34
90% Percentile (z)	27.58	90% Percentile (z)	31.82
95% Percentile (z)	30.79	95% Percentile (z)	40.38
99% Percentile (z)	36.81	99% Percentile (z)	63.15

Gamma Distribution Test		Data Distribution Test	
k star	2.635	Data appear Normal at 5% Significance Level	
Theta Star	6.168		
MLE of Mean	16.26		
MLE of Standard Deviation	10.01		
nu star	94.87		
A-D Test Statistic	0.488	Nonparametric Statistics	
5% A-D Critical Value	0.745	90% Percentile	25.7
K-S Test Statistic	0.154	95% Percentile	32.9
5% K-S Critical Value	0.205	99% Percentile	36.98
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	38
90% Percentile	29.67	95% Percentile Bootstrap UTL with 95% Coverage	38
95% Percentile	35.43	95% BCA Bootstrap UTL with 95% Coverage	38
99% Percentile	47.99	95% UPL	38
		95% Chebyshev UPL	55.83
95% WH Approx. Gamma UPL	36.65	Upper Threshold Limit Based upon IQR	31
95% HW Approx. Gamma UPL	37.96		
95% WH Approx. Gamma UTL with 95% Coverage	48.54		
95% HW Approx. Gamma UTL with 95% Coverage	51.66		

Non-Clay

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	25
Raw Statistics		**Log-Transformed Statistics**	
Minimum	2.6	Minimum	0.956
Maximum	26	Maximum	3.258
Second Largest	20	Second Largest	2.996
First Quartile	5	First Quartile	1.609
Median	6	Median	1.792
Third Quartile	10	Third Quartile	2.303
Mean	8.17	Mean	1.935
SD	5.354	SD	0.561
Coefficient of Variation	0.655		
Skewness	1.726		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.807	Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	19.82	95% UTL with 95% Coverage	23.48
95% UPL (t)	17.37	95% UPL (t)	18.17
90% Percentile (z)	15.03	90% Percentile (z)	14.21
95% Percentile (z)	16.98	95% Percentile (z)	17.43
99% Percentile (z)	20.62	99% Percentile (z)	25.54
Gamma Distribution Test		**Data Distribution Test**	
k star	2.913	Data appear Lognormal at 5% Significance Level	
Theta Star	2.804		
MLE of Mean	8.17		
MLE of Standard Deviation	4.787		
nu star	192.3		
A-D Test Statistic	1.163	**Nonparametric Statistics**	
5% A-D Critical Value	0.753	90% Percentile	14
K-S Test Statistic	0.196	95% Percentile	18.8
5% K-S Critical Value	0.154	99% Percentile	24.08

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 95% Coverage	26
90% Percentile	14.59	95% Percentile Bootstrap UTL with 95% Coverage	26
95% Percentile	17.29	95% BCA Bootstrap UTL with 95% Coverage	26
99% Percentile	23.16	95% UPL	21.8
		95% Chebyshev UPL	31.86
95% WH Approx. Gamma UPL	17.5	Upper Threshold Limit Based upon IQR	17.5
95% HW Approx. Gamma UPL	17.61		
95% WH Approx. Gamma UTL with 95% Coverage	21.27		
95% HW Approx. Gamma UTL with 95% Coverage	21.67		

Outlier Tests for Selected Variables

User Selected Options	
From File	Chromium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 38 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.455

For 10% significance level, 38 is an outlier.

For 5% significance level, 38 is not an outlier.

For 1% significance level, 38 is not an outlier.

2. Data Value 2.8 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.109

For 10% significance level, 2.8 is not an outlier.

For 5% significance level, 2.8 is not an outlier.

For 1% significance level, 2.8 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	8.17
Standard Deviation	5.354
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	8.17	5.272	26	33	3.382	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 26 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 26 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Chromium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Clay

Background Data: Non-Clay

Raw Statistics

	Site	Background
Number of Valid Observations	18	33
Number of Distinct Observations	16	25
Minimum	2.8	2.6
Maximum	38	26
Mean	16.26	8.17
Median	15	6
SD	8.837	5.354
SE of Mean	2.083	0.932

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

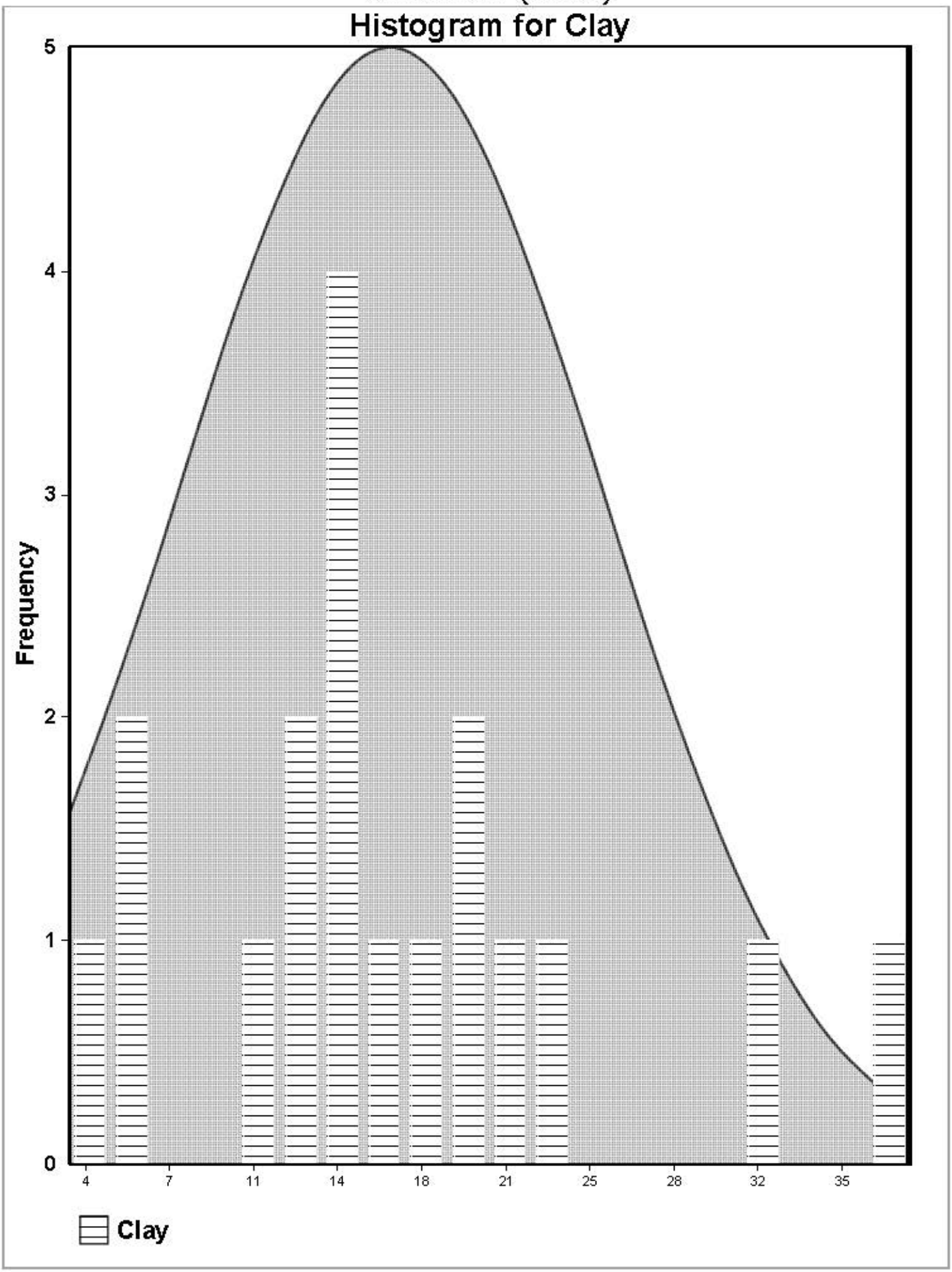
Site Rank Sum W-Stat	638.5
WMW Test U-Stat	3.351
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	8.0587E-4

Conclusion with Alpha = 0.05

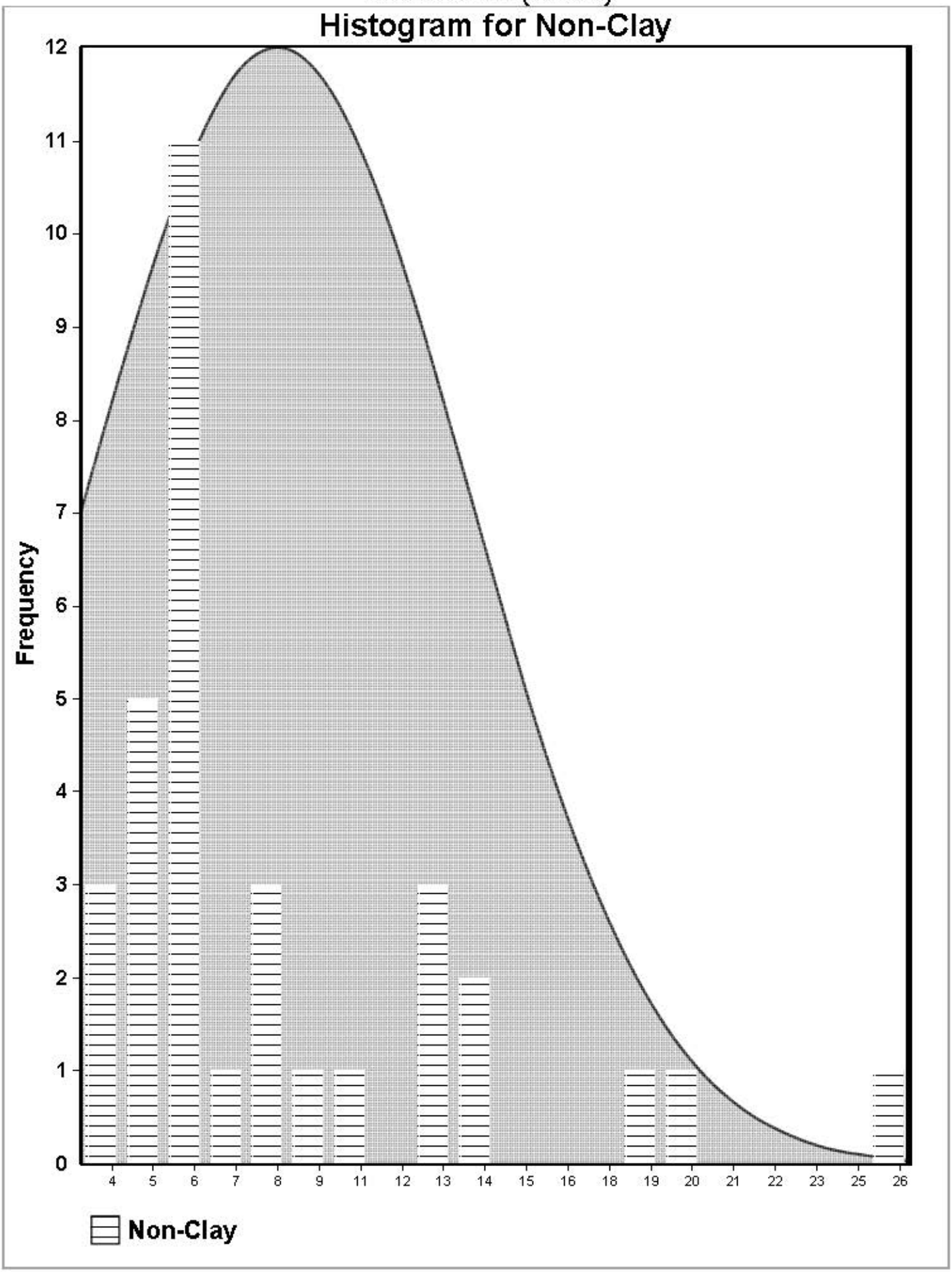
Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Chromium (Total)



Chromium (Total)



Location	Clay
BG-1-2	13
BG-1-43	20
BG-1-55	2.8
BG-1-78	15
BG-2-30	15
BG-2-81	17
BG-3-17	4.8
BG-3-22	5
BG-3-69	15
BG-4-2	12
BG-4-19	32
BG-4-40	23
BG-4-79	19
BG-4-161	10
BG-4-163	16
BG-6-28	21
BG-6-53	14
BG-6-87	38

Location	Non-Clay
BG-1-10	5.5
BG-1-29	7.5
BG-1-40	3.2
BG-1-46	5.3
BG-1-92	5.3
BG-2-2	5.3
BG-2-10	4.6
BG-2-19	8.8
BG-2-21	5.1
BG-2-32	6.1
BG-2-75	4.4
BG-3-2	5.1
BG-3-10	14
BG-3-29	4.5
BG-3-63	5
BG-3-65	8.4
BG-3-95	4.6
BG-3-105	12
BG-3-131	2.6
BG-3-136	20
BG-4-10	14
BG-4-65	5.5
BG-4-82	10
BG-4-95	4.2
BG-4-117	2.8
BG-4-120	18
BG-6-2	8.3
BG-6-9	6
BG-6-58	6.4
BG-6-75	6.1
BG-6-98	13
BG-6-114	12
BG-6-127	26

General Background Statistics for Full Data Sets

User Selected Options	
From File	Chromium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-Transformed Statistics	
Minimum	3.2	Minimum	1.163
Maximum	14	Maximum	2.639
Second Largest	13	Second Largest	2.565
First Quartile	5.1	First Quartile	1.629
Median	5.75	Median	1.748
Third Quartile	8.425	Third Quartile	2.131
Mean	7.183	Mean	1.883
SD	3.346	SD	0.431
Coefficient of Variation	0.466		
Skewness	1.186		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.858	Shapiro Wilk Test Statistic	0.945
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	16.34	95% UTL with 95% Coverage	21.4
95% UPL (t)	13.44	95% UPL (t)	14.72
90% Percentile (z)	11.47	90% Percentile (z)	11.43
95% Percentile (z)	12.69	95% Percentile (z)	13.36
99% Percentile (z)	14.97	99% Percentile (z)	17.93
Gamma Distribution Test		Data Distribution Test	
k star	4.397	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.634		
MLE of Mean	7.183		
MLE of Standard Deviation	3.426		
nu star	105.5		
A-D Test Statistic	0.487	Nonparametric Statistics	
5% A-D Critical Value	0.732	90% Percentile	12.58
K-S Test Statistic	0.193	95% Percentile	13.45
5% K-S Critical Value	0.246	99% Percentile	13.89
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	14
90% Percentile	11.77	95% Percentile Bootstrap UTL with 95% Coverage	14
95% Percentile	13.58	95% BCA Bootstrap UTL with 95% Coverage	14
99% Percentile	17.44	95% UPL	14
		95% Chebyshev UPL	22.37
95% WH Approx. Gamma UPL	14.06	Upper Threshold Limit Based upon IQR	13.41
95% HW Approx. Gamma UPL	14.19		
95% WH Approx. Gamma UTL with 95% Coverage	18.73		
95% HW Approx. Gamma UTL with 95% Coverage	19.25		

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	28

Raw Statistics		Log-Transformed Statistics	
Minimum	2.6	Minimum	0.956
Maximum	38	Maximum	3.638
Second Largest	32	Second Largest	3.466
First Quartile	5.15	First Quartile	1.639
Median	12	Median	2.485
Third Quartile	16.5	Third Quartile	2.803
Mean	12.2	Mean	2.266
SD	8.356	SD	0.716
Coefficient of Variation	0.685		
Skewness	1.138		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.89	Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	29.95	95% UTL with 95% Coverage	44.1
95% UPL (t)	26.47	95% UPL (t)	32.72
90% Percentile (z)	22.91	90% Percentile (z)	24.13
95% Percentile (z)	25.95	95% Percentile (z)	31.29
99% Percentile (z)	31.64	99% Percentile (z)	50.96
Gamma Distribution Test		Data Distribution Test	
k star	2.122	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	5.749		
MLE of Mean	12.2		
MLE of Standard Deviation	8.375		
nu star	165.5		
A-D Test Statistic	0.677	Nonparametric Statistics	
5% A-D Critical Value	0.758	90% Percentile	21.4
K-S Test Statistic	0.152	95% Percentile	26.6
5% K-S Critical Value	0.143	99% Percentile	35.72

Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	38
90% Percentile	23.4	95% Percentile Bootstrap UTL with 95% Coverage	38
95% Percentile	28.4	95% BCA Bootstrap UTL with 95% Coverage	38
99% Percentile	39.46	95% UPL	32
		95% Chebyshev UPL	49.09
95% WH Approx. Gamma UPL	28.84	Upper Threshold Limit Based upon IQR	33.53
95% HW Approx. Gamma UPL	29.53		
95% WH Approx. Gamma UTL with 95% Coverage	35.34		
95% HW Approx. Gamma UTL with 95% Coverage	36.82		

Outlier Tests for Selected Variables

User Selected Options	
From File	Chromium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12

10% critical value: 0.49

5% critical value: 0.546

1% critical value: 0.642

1. Data Value 14 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.553

For 10% significance level, 14 is an outlier.

For 5% significance level, 14 is an outlier.

For 1% significance level, 14 is not an outlier.

2. Data Value 3.2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.194

For 10% significance level, 3.2 is not an outlier.

For 5% significance level, 3.2 is not an outlier.

For 1% significance level, 3.2 is not an outlier.

Rosner's Outlier Test for MC

Mean	12.2
Standard Deviation	8.356
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	12.2	8.249	38	36	3.128	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 38 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Chromium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Observations	39	12
Number of Distinct Observations	28	11
Minimum	2.6	3.2
Maximum	38	14
Mean	12.2	7.183
Median	12	5.75
SD	8.356	3.346
SE of Mean	1.338	0.966

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1087
WMW Test U-Stat	1.599
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.11

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Chromium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	11
Minimum	3.2
Maximum	14
Mean of Raw Data	7.183
Standard Deviation of Raw Data	3.346
Kstar	4.397
Mean of Log Transformed Data	1.883
Standard Deviation of Log Transformed Data	0.431

Normal Distribution Test Results	
Correlation Coefficient R	0.927
Shapiro Wilk Test Statistic	0.858
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.0456
Lilliefors Test Statistic	0.222
Lilliefors Critical (0.95) Value	0.256

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.966
A-D Test Statistic	0.487
A-D Critical (0.95) Value	0.732
K-S Test Statistic	0.193
K-S Critical(0.95) Value	0.246

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.972
Shapiro Wilk Test Statistic	0.945
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.536
Lilliefors Test Statistic	0.167
Lilliefors Critical (0.95) Value	0.256

Data appear Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	28
Minimum	2.6
Maximum	38
Mean of Raw Data	12.2
Standard Deviation of Raw Data	8.356
Kstar	2.122
Mean of Log Transformed Data	2.266
Standard Deviation of Log Transformed Data	0.716

Normal Distribution Test Results

Correlation Coefficient R	0.945
Shapiro Wilk Test Statistic	0.89
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	8.5452E-4
Lilliefors Test Statistic	0.166
Lilliefors Critical (0.95) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

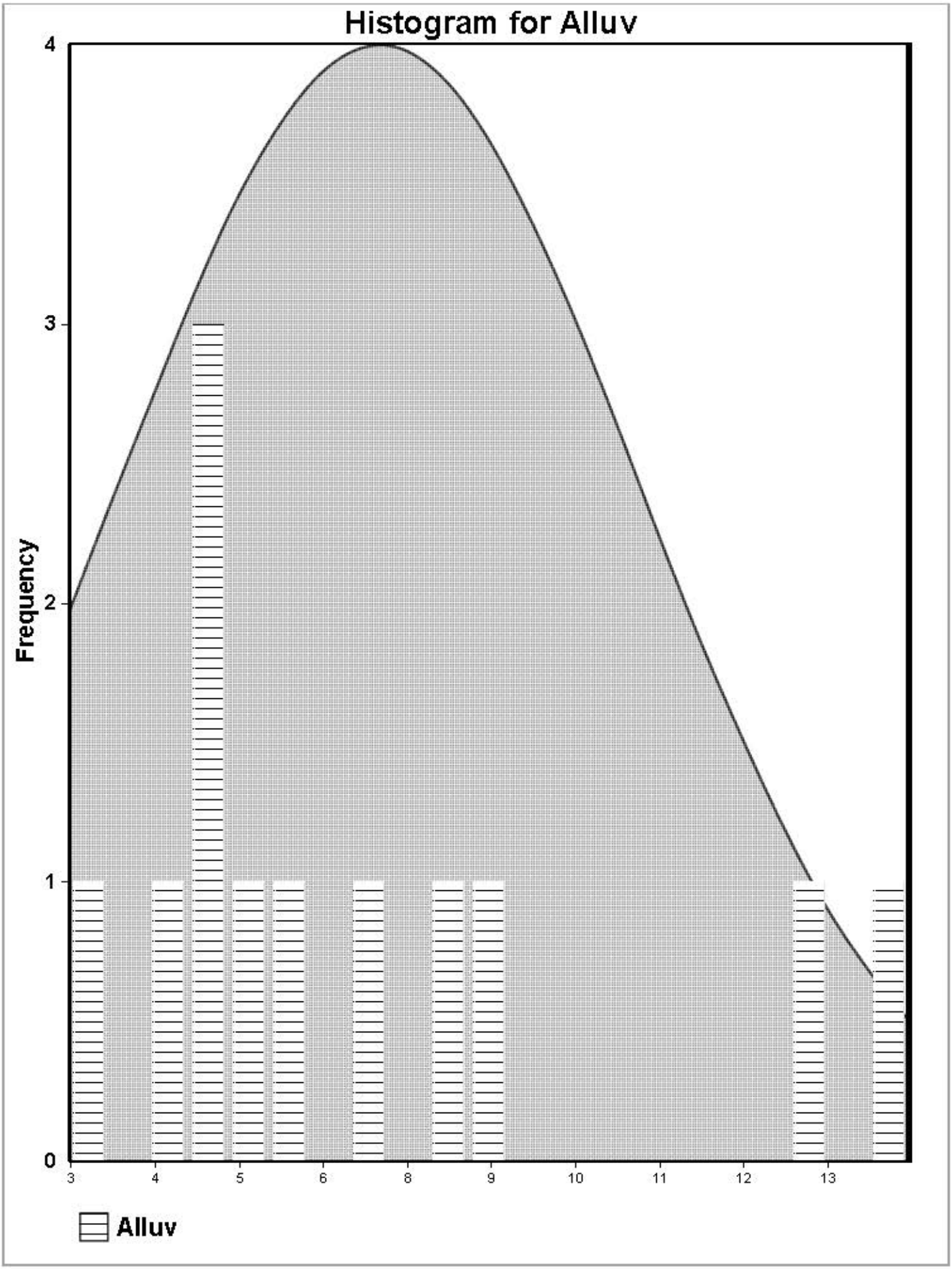
Correlation Coefficient R	0.992
A-D Test Statistic	0.677
A-D Critical (0.95) Value	0.758
K-S Test Statistic	0.152
K-S Critical(0.95) Value	0.143

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.982
Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.1
Lilliefors Test Statistic	0.133
Lilliefors Critical (0.95) Value	0.142

Data appear Lognormal at (0.05) Significance Level


Histogram for Alluv
Frequency
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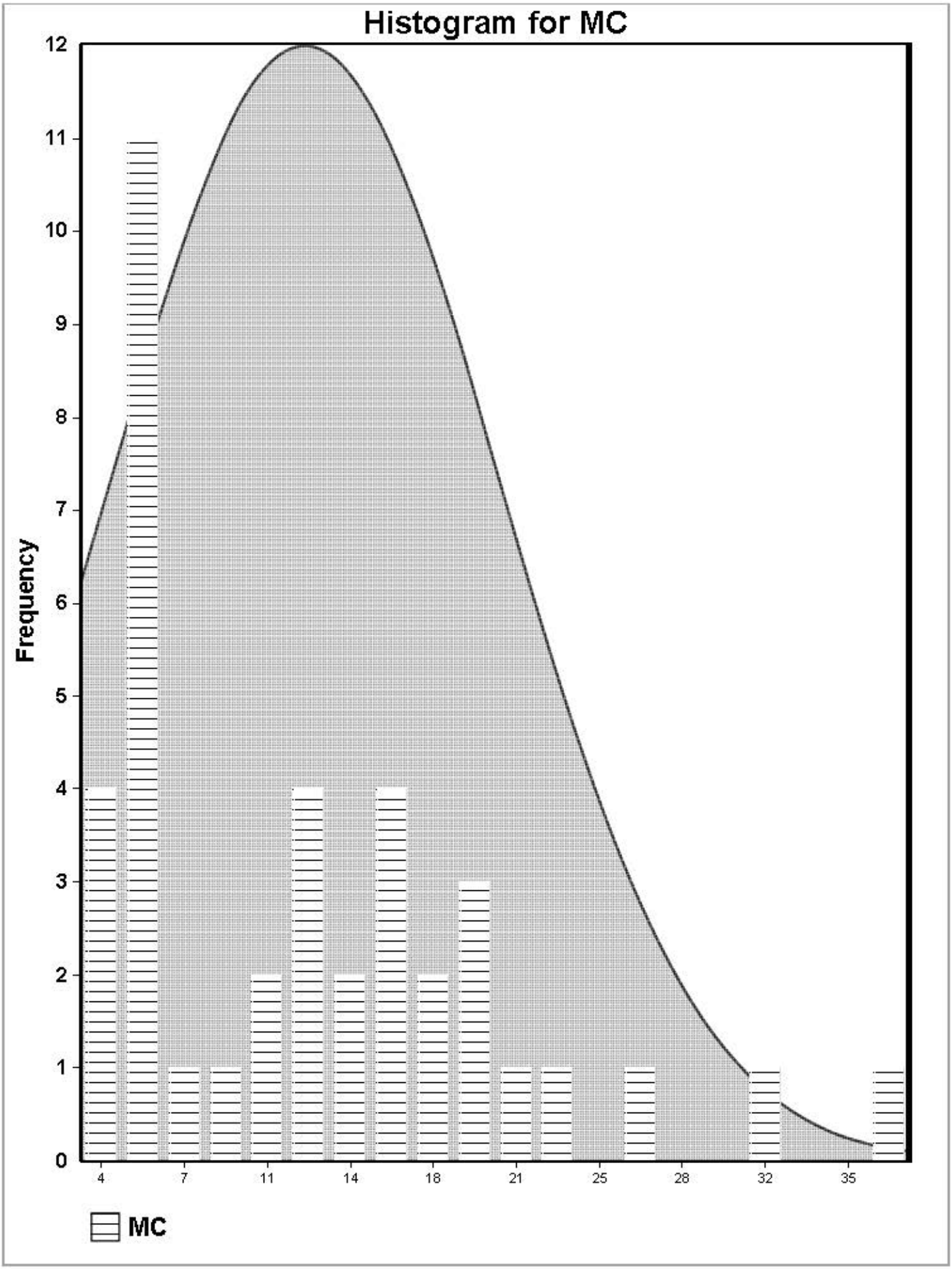
2
3
4
3
4
5
6
8
9
10
11
12
13
Alluv


Histogram for MC
Frequency
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2
3
4
5
6
7
8
9
10
11
12
4
7
11
14
18
21
25
28
32
35
MC

Location	Alluv
BG-1-2	13
BG-1-10	5.5
BG-1-29	7.3
BG-1-40	3.2
BG-2-2	5.3
BG-2-10	4.6
BG-2-19	8.8
BG-2-21	5.1
BG-3-2	5.1
BG-3-10	14
BG-6-2	8.3
BG-6-9	6

Location	MC
BG-1-43	20
BG-1-46	5.3
BG-1-55	2.8
BG-1-78	15
BG-1-92	5.3
BG-2-30	15
BG-2-32	6.1
BG-2-75	4.4
BG-2-81	17
BG-3-17	4.8
BG-3-22	5
BG-3-29	4.5
BG-3-63	5
BG-3-65	8.4
BG-3-69	15
BG-3-95	4.6
BG-3-105	12
BG-3-131	2.6
BG-3-136	20
BG-4-1	12
BG-4-10	14
BG-4-19	32
BG-4-40	23
BG-4-65	5.5
BG-4-79	19
BG-4-82	10
BG-4-95	4.2
BG-4-117	2.8
BG-4-120	18
BG-4-161	10
BG-4-163	16
BG-6-28	21
BG-6-53	14
BG-6-58	6.4
BG-6-75	6.1
BG-6-87	38
BG-6-98	13
BG-6-114	12
BG-1-127	26

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Cobalt.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	36
Minimum	0.89
Maximum	9.4
Mean of Raw Data	3.494
Standard Deviation of Raw Data	2.212
Kstar	2.458
Mean of Log Transformed Data	1.046
Standard Deviation of Log Transformed Data	0.66

Normal Distribution Test Results	
Correlation Coefficient R	0.953
Approximate Shapiro Wilk Test Statistic	0.894
Approximate Shapiro Wilk P Value	1.1059E-4
Lilliefors Test Statistic	0.182
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.986
A-D Test Statistic	1.055
A-D Critical (0.95) Value	0.759
K-S Test Statistic	0.159
K-S Critical(0.95) Value	0.125

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.979
Approximate Shapiro Wilk Test Statistic	0.937
Approximate Shapiro Wilk P Value	0.013
Lilliefors Test Statistic	0.135
Lilliefors Critical (0.95) Value	0.124

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Cobalt.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Total Number of Observations	51	Number of Distinct Observations	36

Raw Statistics		Log-Transformed Statistics	
Minimum	0.89	Minimum	-0.117
Maximum	9.4	Maximum	2.241
Second Largest	8.4	Second Largest	2.128
First Quartile	1.6	First Quartile	0.47
Median	2.9	Median	1.065
Third Quartile	4.8	Third Quartile	1.569
Mean	3.494	Mean	1.046
SD	2.212	SD	0.66
Coefficient of Variation	0.633		
Skewness	0.814		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.182	Lilliefors Test Statistic	0.135
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	8.036	95% UTL with 95% Coverage	11.04
95% UPL (t)	7.236	95% UPL (t)	8.696
90% Percentile (z)	6.328	90% Percentile (z)	6.632
95% Percentile (z)	7.131	95% Percentile (z)	8.428
99% Percentile (z)	8.639	99% Percentile (z)	13.21

Gamma Distribution Test		Data Distribution Test
k star	2.458	Data do not follow a Discernable Distribution (0.05)
Theta Star	1.421	
MLE of Mean	3.494	
MLE of Standard Deviation	2.228	
nu star	250.7	
A-D Test Statistic	1.055	Nonparametric Statistics
5% A-D Critical Value	0.759	90% Percentile 6.6
K-S Test Statistic	0.159	95% Percentile 7.55
5% K-S Critical Value	0.125	99% Percentile 8.9
Data not Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	8.4
90% Percentile	6.479	95% Percentile Bootstrap UTL with 95% Coverage	8.9
95% Percentile	7.775	95% BCA Bootstrap UTL with 95% Coverage	8.65
99% Percentile	10.62	95% UPL	8.1
		95% Chebyshev UPL	13.23
95% WH Approx. Gamma UPL	7.861	Upper Threshold Limit Based upon IQR	9.6
95% HW Approx. Gamma UPL	8.016		
95% WH Approx. Gamma UTL with 95% Coverage	9.301		
95% HW Approx. Gamma UTL with 95% Coverage	9.614		

	Outlier Tests for Selected Variables
User Selected Options	
From File	Cobalt.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

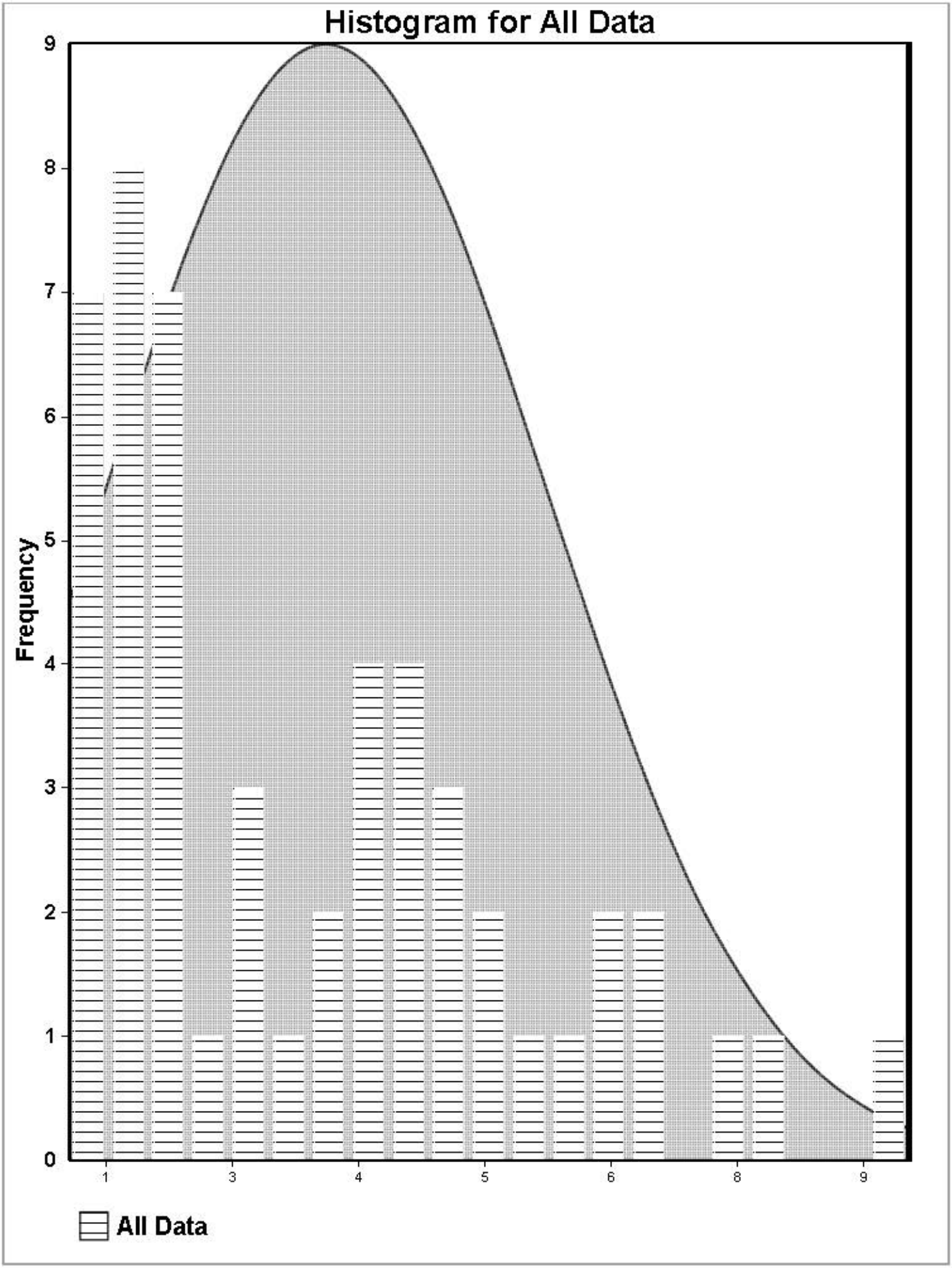
Rosner's Outlier Test for All Data

Mean	3.494
Standard Deviation	2.212
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3.494	2.19	9.4	51	2.697	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
1
3
4
5
6
8
9
All Data

Location	All Data
BG-1-2	4.9
BG-3-17	1.8
BG-4-2	3.8
BG-4-19	8.4
BG-1-10	2.6
BG-2-2	2
BG-2-10	1.9
BG-2-19	1.6
BG-3-2	1.6
BG-3-10	3.9
BG-4-10	5.3
BG-6-2	3.1
BG-6-9	1.8
BG-1-29	2.7
BG-1-40	0.89
BG-1-46	1.8
BG-1-92	1.2
BG-2-21	1.4
BG-2-32	2.2
BG-2-75	1.6
BG-3-29	1.6
BG-3-63	1.8
BG-3-65	3.9
BG-3-95	1.4
BG-3-105	4.1
BG-3-131	1
BG-3-136	7.9
BG-4-65	1.6
BG-4-82	4
BG-4-95	1.2
BG-4-117	0.89
BG-4-120	5.2
BG-6-58	1.7
BG-6-75	2
BG-6-98	3.6
BG-6-114	4.5
BG-6-127	7.2
BG-1-43	5.9
BG-1-55	1.2
BG-1-78	4.7
BG-2-30	6.9
BG-2-81	4.3
BG-3-22	1.3
BG-3-69	4.8
BG-4-40	6.1
BG-4-79	6.6
BG-4-161	2.9
BG-4-163	4.8
BG-6-28	6.5
BG-6-53	4.7
BG-6-87	9.4

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Cobalt.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	11
Minimum	1.6
Maximum	8.4
Mean of Raw Data	3.285
Standard Deviation of Raw Data	1.992
Kstar	2.888
Mean of Log Transformed Data	1.048
Standard Deviation of Log Transformed Data	0.534

Normal Distribution Test Results	
Correlation Coefficient R	0.903
Shapiro Wilk Test Statistic	0.82
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.0103
Lilliefors Test Statistic	0.202
Lilliefors Critical (0.95) Value	0.246

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.972
A-D Test Statistic	0.587
A-D Critical (0.95) Value	0.738
K-S Test Statistic	0.219
K-S Critical(0.95) Value	0.238

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.958
Shapiro Wilk Test Statistic	0.905
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.193
Lilliefors Test Statistic	0.208
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

>20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	29
Minimum	0.89
Maximum	9.4
Mean of Raw Data	3.565
Standard Deviation of Raw Data	2.302
Kstar	2.202
Mean of Log Transformed Data	1.046
Standard Deviation of Log Transformed Data	0.704

Normal Distribution Test Results

Correlation Coefficient R	0.956
Shapiro Wilk Test Statistic	0.901
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.00254
Lilliefors Test Statistic	0.173
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.979
A-D Test Statistic	0.97
A-D Critical (0.95) Value	0.757
K-S Test Statistic	0.158
K-S Critical(0.95) Value	0.145

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.972
Shapiro Wilk Test Statistic	0.923
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.0146
Lilliefors Test Statistic	0.146
Lilliefors Critical (0.95) Value	0.144

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Cobalt.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	11

Raw Statistics		Log-Transformed Statistics	
Minimum	1.6	Minimum	0.47
Maximum	8.4	Maximum	2.128
Second Largest	5.3	Second Largest	1.668
First Quartile	1.8	First Quartile	0.588
Median	2.6	Median	0.956
Third Quartile	3.9	Third Quartile	1.361
Mean	3.285	Mean	1.048
SD	1.992	SD	0.534
Coefficient of Variation	0.607		
Skewness	1.562		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.82	Shapiro Wilk Test Statistic	0.905
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	8.606	95% UTL with 95% Coverage	11.87
95% UPL (t)	6.97	95% UPL (t)	7.655
90% Percentile (z)	5.838	90% Percentile (z)	5.652
95% Percentile (z)	6.562	95% Percentile (z)	6.862
99% Percentile (z)	7.92	99% Percentile (z)	9.874

Gamma Distribution Test		Data Distribution Test
k star	2.888	Data appear Gamma Distributed at 5% Significance Level
Theta Star	1.137	
MLE of Mean	3.285	
MLE of Standard Deviation	1.933	
nu star	75.09	
A-D Test Statistic	0.587	Nonparametric Statistics
5% A-D Critical Value	0.738	90% Percentile 5.22
K-S Test Statistic	0.219	95% Percentile 6.54
5% K-S Critical Value	0.238	99% Percentile 8.028
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	8.4
90% Percentile	5.876	95% Percentile Bootstrap UTL with 95% Coverage	8.4
95% Percentile	6.969	95% BCA Bootstrap UTL with 95% Coverage	8.4
99% Percentile	9.344	95% UPL	8.4
		95% Chebyshev UPL	12.3
95% WH Approx. Gamma UPL	7.262	Upper Threshold Limit Based upon IQR	7.05
95% HW Approx. Gamma UPL	7.338		
95% WH Approx. Gamma UTL with 95% Coverage	10.04		
95% HW Approx. Gamma UTL with 95% Coverage	10.38		

>20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	29

Raw Statistics		Log-Transformed Statistics	
Minimum	0.89	Minimum	-0.117
Maximum	9.4	Maximum	2.241
Second Largest	7.9	Second Largest	2.067
First Quartile	1.6	First Quartile	0.47
Median	3.25	Median	1.173
Third Quartile	4.8	Third Quartile	1.569
Mean	3.565	Mean	1.046
SD	2.302	SD	0.704
Coefficient of Variation	0.646		
Skewness	0.667		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.901	Shapiro Wilk Test Statistic	0.923
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	8.474	95% UTL with 95% Coverage	12.77
95% UPL (t)	7.501	95% UPL (t)	9.481
90% Percentile (z)	6.516	90% Percentile (z)	7.016
95% Percentile (z)	7.353	95% Percentile (z)	9.061
99% Percentile (z)	8.922	99% Percentile (z)	14.64
Gamma Distribution Test		Data Distribution Test	
k star	2.202	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.619		
MLE of Mean	3.565		
MLE of Standard Deviation	2.402		
nu star	167.4		
A-D Test Statistic	0.97	Nonparametric Statistics	
5% A-D Critical Value	0.757	90% Percentile	6.69
K-S Test Statistic	0.158	95% Percentile	7.305
5% K-S Critical Value	0.145	99% Percentile	8.845

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 95% Coverage	9.4
90% Percentile	6.78	95% Percentile Bootstrap UTL with 95% Coverage	9.4
95% Percentile	8.205	95% BCA Bootstrap UTL with 95% Coverage	9.4
99% Percentile	11.35	95% UPL	7.975
		95% Chebyshev UPL	13.73
95% WH Approx. Gamma UPL	8.351	Upper Threshold Limit Based upon IQR	9.6
95% HW Approx. Gamma UPL	8.56		
95% WH Approx. Gamma UTL with 95% Coverage	10.23		
95% HW Approx. Gamma UTL with 95% Coverage	10.67		

Outlier Tests for Selected Variables

User Selected Options	
From File	Cobalt.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 8.4 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.515

For 10% significance level, 8.4 is an outlier.
For 5% significance level, 8.4 is not an outlier.
For 1% significance level, 8.4 is not an outlier.

2. Data Value 1.6 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.054

For 10% significance level, 1.6 is not an outlier.
For 5% significance level, 1.6 is not an outlier.
For 1% significance level, 1.6 is not an outlier.

Rosner's Outlier Test for >20

Mean	3.565
Standard Deviation	2.302
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3.565	2.272	9.4	38	2.568	3.01	3.36

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Cobalt.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Observations	38	13
Number of Distinct Observations	29	11
Minimum	0.89	1.6
Maximum	9.4	8.4
Mean	3.565	3.285
Median	3.25	2.6
SD	2.302	1.992
SE of Mean	0.374	0.553

Wilcoxon-Mann-Whitney (WMW) Test

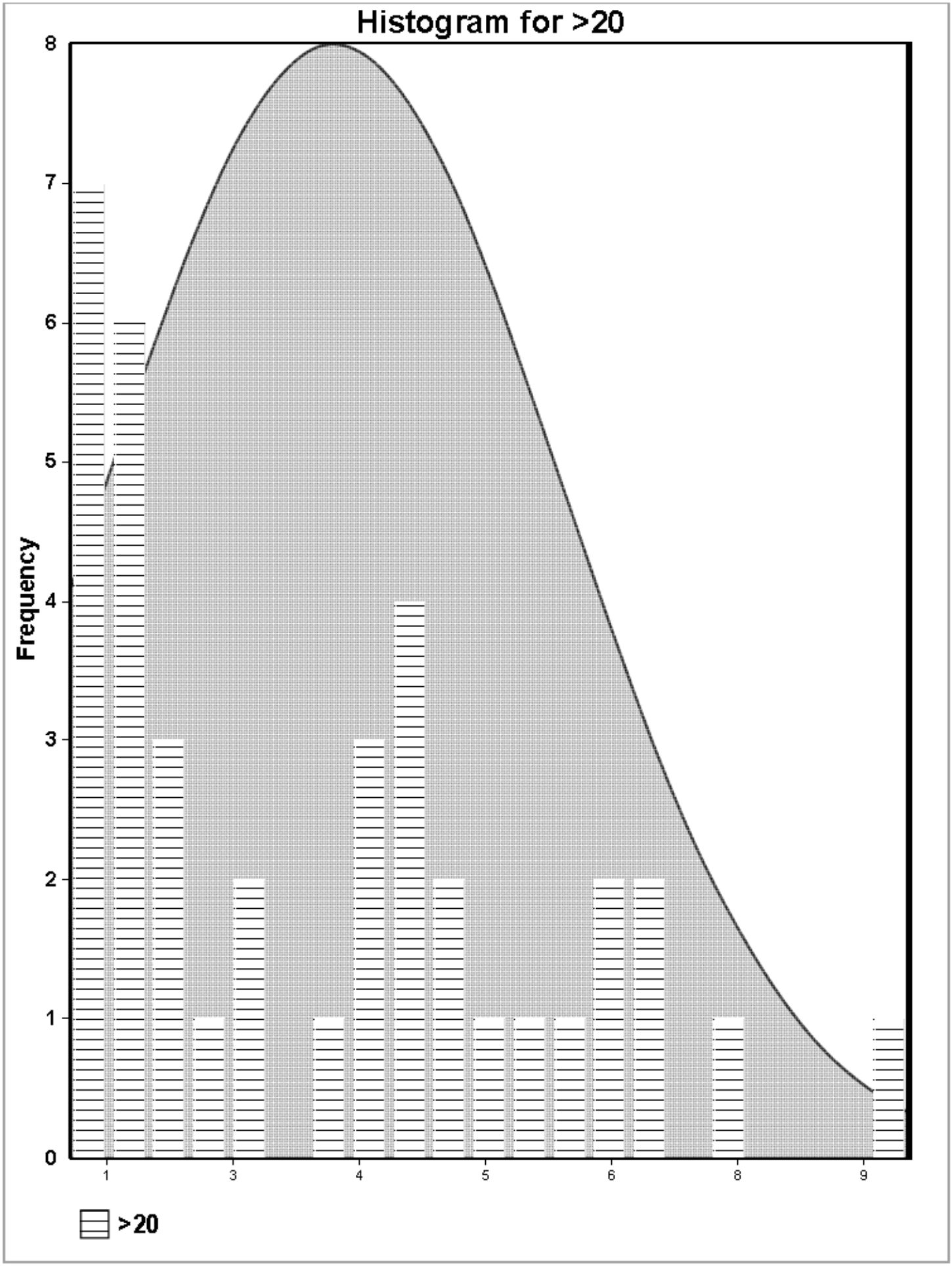
H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	983
WMW Test U-Stat	0.0973
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.905

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
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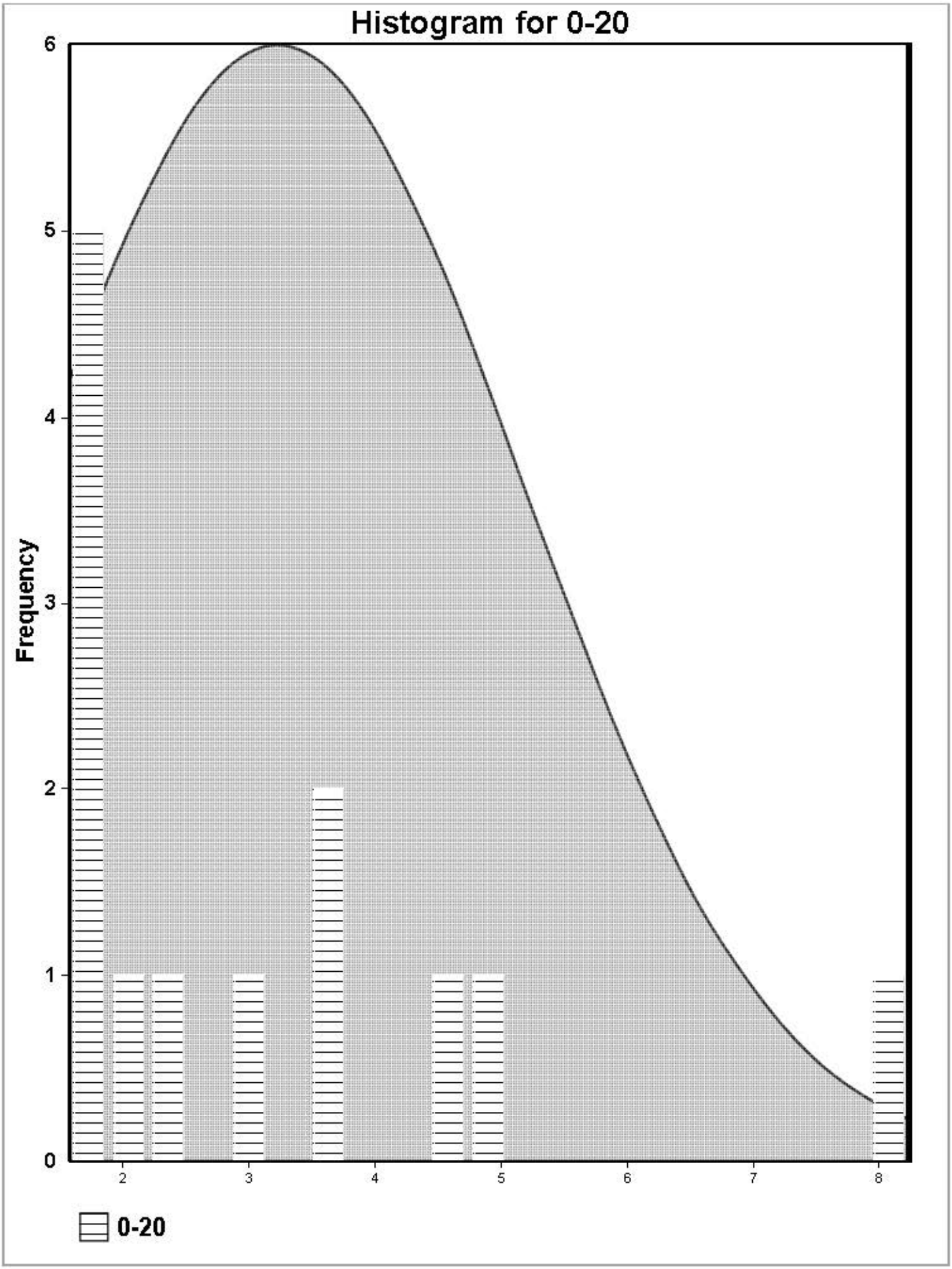
1
3
4
5
6
8
9
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5
6
2
3
4
5
6
7
8
0-20

Location	0-20
BG-1-2	4.9
BG-3-17	1.8
BG-4-2	3.8
BG-4-19	8.4
BG-1-10	2.6
BG-2-2	2
BG-2-10	1.9
BG-2-19	1.6
BG-3-2	1.6
BG-3-10	3.9
BG-4-10	5.3
BG-6-2	3.1
BG-6-9	1.8

Location	>20
BG-1-29	2.7
BG-1-40	0.89
BG-1-46	1.8
BG-1-92	1.2
BG-2-21	1.4
BG-2-32	2.2
BG-2-75	1.6
BG-3-29	1.6
BG-3-63	1.8
BG-3-65	3.9
BG-3-95	1.4
BG-3-105	4.1
BG-3-131	1
BG-3-136	7.9
BG-4-65	1.6
BG-4-82	4
BG-4-95	1.2
BG-4-117	0.89
BG-4-120	5.2
BG-6-58	1.7
BG-6-75	2
BG-6-98	3.6
BG-6-114	4.5
BG-6-127	7.2
BG-1-43	5.9
BG-1-55	1.2
BG-1-78	4.7
BG-2-30	6.9
BG-2-81	4.3
BG-3-22	1.3
BG-3-69	4.8
BG-4-40	6.1
BG-4-79	6.6
BG-4-161	2.9
BG-4-163	4.8
BG-6-28	6.5
BG-6-53	4.7
BG-6-87	9.4

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Cobalt.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	16
Minimum	1.2
Maximum	9.4
Mean of Raw Data	4.944
Standard Deviation of Raw Data	2.253
Kstar	3.277
Mean of Log Transformed Data	1.464
Standard Deviation of Log Transformed Data	0.589

Normal Distribution Test Results	
Correlation Coefficient R	0.984
Shapiro Wilk Test Statistic	0.964
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.696
Lilliefors Test Statistic	0.123
Lilliefors Critical (0.95) Value	0.209

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.966
A-D Test Statistic	0.647
A-D Critical (0.95) Value	0.743
K-S Test Statistic	0.195
K-S Critical(0.95) Value	0.205

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.936
Shapiro Wilk Test Statistic	0.873
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.0192
Lilliefors Test Statistic	0.223
Lilliefors Critical (0.95) Value	0.209

Data not Lognormal at (0.05) Significance Level

Non-Clay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	22
Minimum	0.89
Maximum	7.9
Mean of Raw Data	2.702
Standard Deviation of Raw Data	1.765
Kstar	2.748
Mean of Log Transformed Data	0.818
Standard Deviation of Log Transformed Data	0.586

Normal Distribution Test Results

Correlation Coefficient R	0.912
Shapiro Wilk Test Statistic	0.83
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	6.1493E-5
Lilliefors Test Statistic	0.23
Lilliefors Critical (0.95) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.979
A-D Test Statistic	1.001
A-D Critical (0.95) Value	0.753
K-S Test Statistic	0.193
K-S Critical(0.95) Value	0.154

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.979
Shapiro Wilk Test Statistic	0.946
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.128
Lilliefors Test Statistic	0.16
Lilliefors Critical (0.95) Value	0.154

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Cobalt.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	16

Raw Statistics		Log-Transformed Statistics	
Minimum	1.2	Minimum	0.182
Maximum	9.4	Maximum	2.241
Second Largest	8.4	Second Largest	2.128
First Quartile	3.925	First Quartile	1.366
Median	4.8	Median	1.569
Third Quartile	6.4	Third Quartile	1.856
Mean	4.944	Mean	1.464
SD	2.253	SD	0.589
Coefficient of Variation	0.456		
Skewness	0.0322		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.964	Shapiro Wilk Test Statistic	0.873
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	10.47	95% UTL with 95% Coverage	18.36
95% UPL (t)	8.971	95% UPL (t)	12.4
90% Percentile (z)	7.832	90% Percentile (z)	9.203
95% Percentile (z)	8.65	95% Percentile (z)	11.4
99% Percentile (z)	10.19	99% Percentile (z)	17.04

Gamma Distribution Test		Data Distribution Test	
k star	3.277	Data appear Normal at 5% Significance Level	
Theta Star	1.509		
MLE of Mean	4.944		
MLE of Standard Deviation	2.732		
nu star	118		
A-D Test Statistic	0.647	Nonparametric Statistics	
5% A-D Critical Value	0.743	90% Percentile	7.35
K-S Test Statistic	0.195	95% Percentile	8.55
5% K-S Critical Value	0.205	99% Percentile	9.23
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	9.4
90% Percentile	8.607	95% Percentile Bootstrap UTL with 95% Coverage	9.4
95% Percentile	10.12	95% BCA Bootstrap UTL with 95% Coverage	9.4
99% Percentile	13.38	95% UPL	9.4
		95% Chebyshev UPL	15.03
95% WH Approx. Gamma UPL	10.44	Upper Threshold Limit Based upon IQR	10.11
95% HW Approx. Gamma UPL	10.8		
95% WH Approx. Gamma UTL with 95% Coverage	13.52		
95% HW Approx. Gamma UTL with 95% Coverage	14.32		

Non-Clay

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	22
Raw Statistics		**Log-Transformed Statistics**	
Minimum	0.89	Minimum	-0.117
Maximum	7.9	Maximum	2.067
Second Largest	7.2	Second Largest	1.974
First Quartile	1.6	First Quartile	0.47
Median	1.9	Median	0.642
Third Quartile	3.9	Third Quartile	1.361
Mean	2.702	Mean	0.818
SD	1.765	SD	0.586
Coefficient of Variation	0.653		
Skewness	1.452		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.83	Shapiro Wilk Test Statistic	0.946
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	6.544	95% UTL with 95% Coverage	8.12
95% UPL (t)	5.738	95% UPL (t)	6.213
90% Percentile (z)	4.965	90% Percentile (z)	4.806
95% Percentile (z)	5.606	95% Percentile (z)	5.947
99% Percentile (z)	6.809	99% Percentile (z)	8.869
Gamma Distribution Test		**Data Distribution Test**	
k star	2.748	Data appear Lognormal at 5% Significance Level	
Theta Star	0.983		
MLE of Mean	2.702		
MLE of Standard Deviation	1.63		
nu star	181.4		
A-D Test Statistic	1.001	**Nonparametric Statistics**	
5% A-D Critical Value	0.753	90% Percentile	5.06
K-S Test Statistic	0.193	95% Percentile	6.06
5% K-S Critical Value	0.154	99% Percentile	7.676

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 95% Coverage	7.9
90% Percentile	4.887	95% Percentile Bootstrap UTL with 95% Coverage	7.9
95% Percentile	5.817	95% BCA Bootstrap UTL with 95% Coverage	7.9
99% Percentile	7.843	95% UPL	7.41
		95% Chebyshev UPL	10.51
95% WH Approx. Gamma UPL	5.899	Upper Threshold Limit Based upon IQR	7.35
95% HW Approx. Gamma UPL	5.955		
95% WH Approx. Gamma UTL with 95% Coverage	7.202		
95% HW Approx. Gamma UTL with 95% Coverage	7.371		

Outlier Tests for Selected Variables

User Selected Options	
From File	Cobalt.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 9.4 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.329

For 10% significance level, 9.4 is not an outlier.

For 5% significance level, 9.4 is not an outlier.

For 1% significance level, 9.4 is not an outlier.

2. Data Value 1.2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.105

For 10% significance level, 1.2 is not an outlier.

For 5% significance level, 1.2 is not an outlier.

For 1% significance level, 1.2 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	2.702
Standard Deviation	1.765
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2.702	1.738	7.9	20	2.99	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 7.9 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Cobalt.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Clay

Background Data: Non-Clay

Raw Statistics

	Site	Background
Number of Valid Observations	18	33
Number of Distinct Observations	16	22
Minimum	1.2	0.89
Maximum	9.4	7.9
Mean	4.944	2.702
Median	4.8	1.9
SD	2.253	1.765
SE of Mean	0.531	0.307

Wilcoxon-Mann-Whitney (WMW) Test

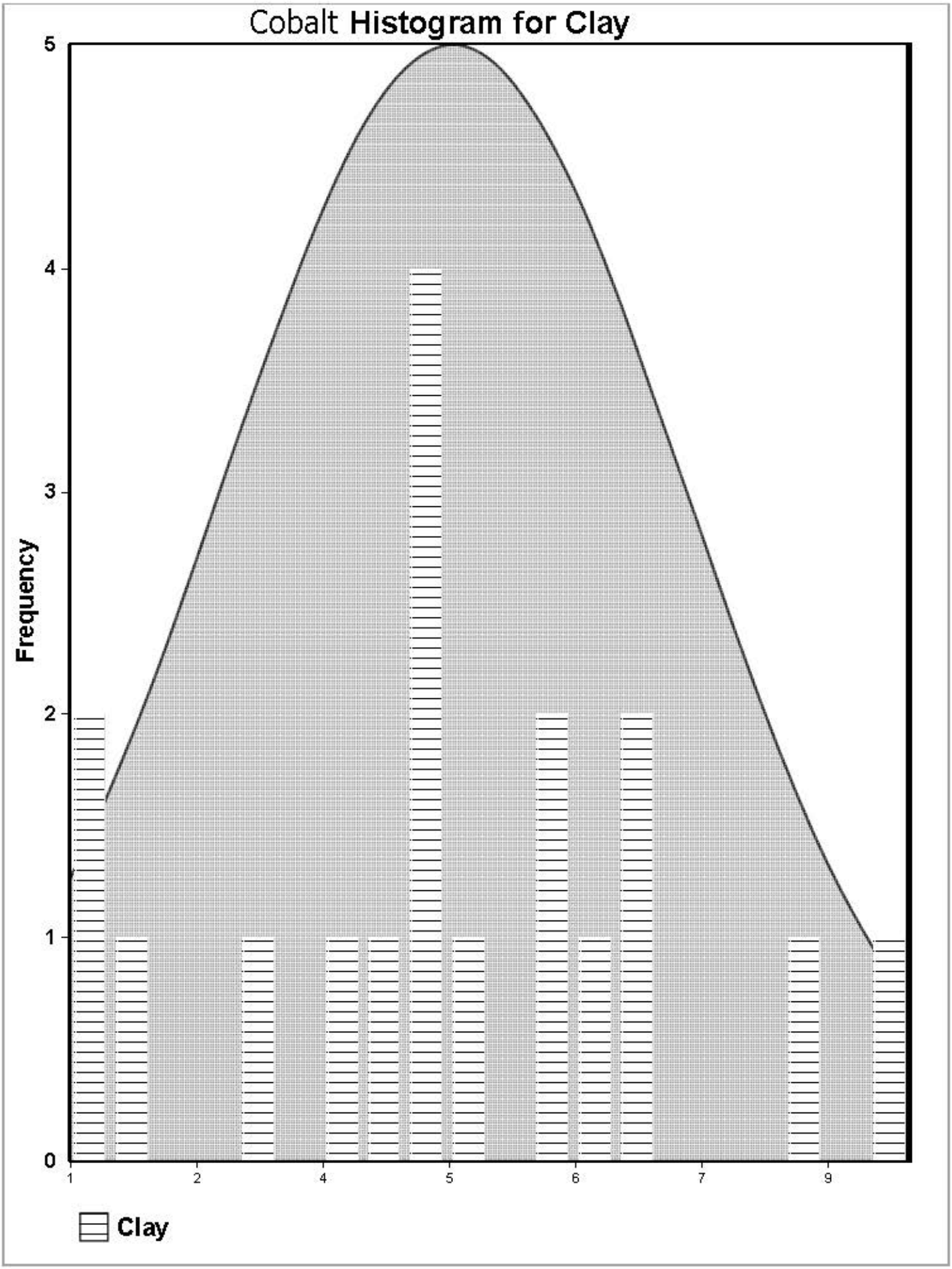
H0: Mean/Median of Site or AOC = Mean/Median of Background

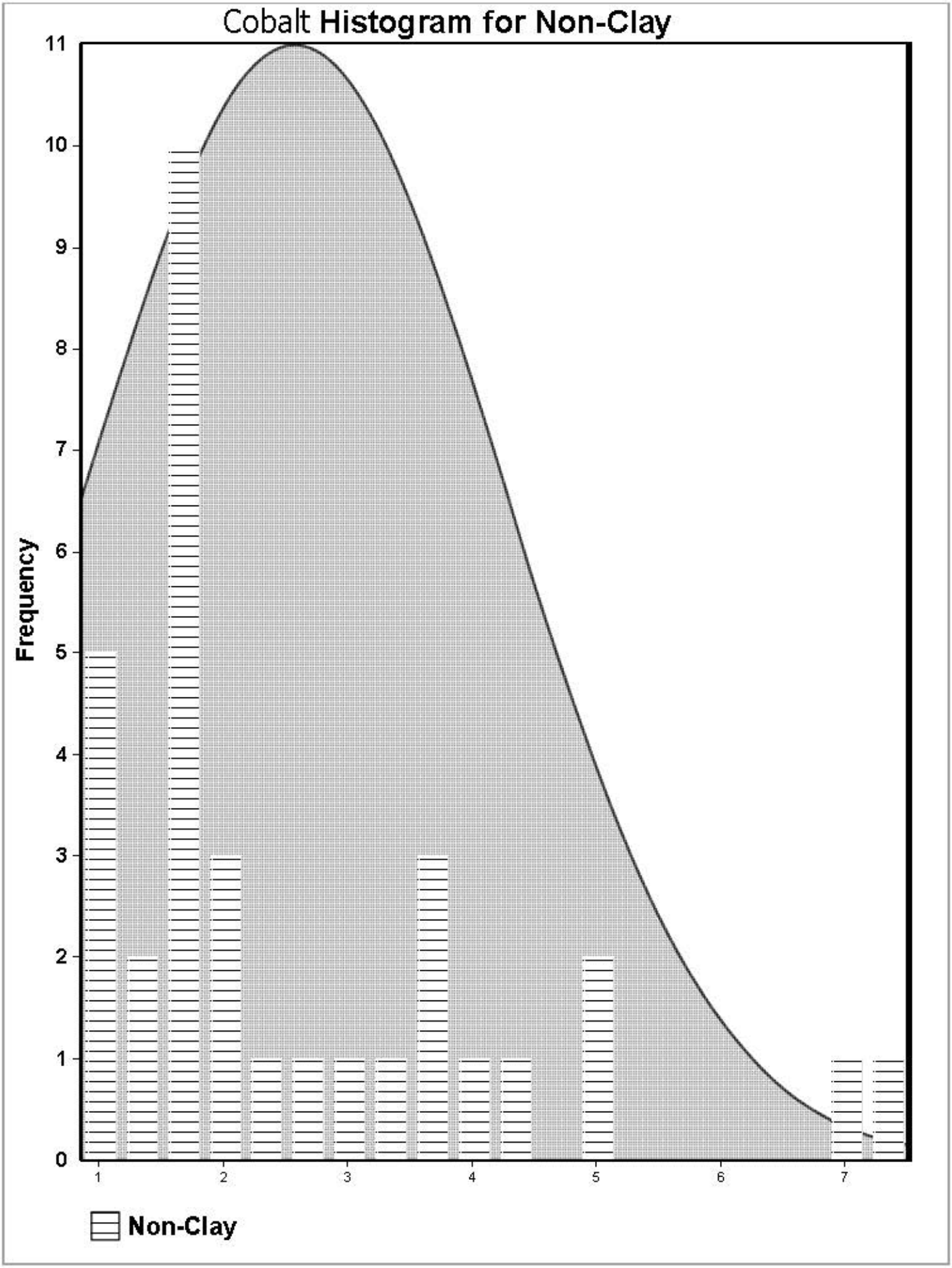
Site Rank Sum W-Stat	634.5
WMW Test U-Stat	3.272
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.00107

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Cobalt Histogram for Clay
Frequency
0
1
2
3
4
5
1
2
4
5
6
7
9
Clay


Cobalt Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
1
2
3
4
5
6
7
Non-Clay

Location	Clay
BG-1-2	4.9
BG-1-43	5.9
BG-1-55	1.2
BG-1-78	4.7
BG-2-30	6.9
BG-2-81	4.3
BG-3-17	1.8
BG-3-22	1.3
BG-3-69	4.8
BG-4-2	3.8
BG-4-19	8.4
BG-4-40	6.1
BG-4-79	6.6
BG-4-161	2.9
BG-4-163	4.8
BG-6-28	6.5
BG-6-53	4.7
BG-6-87	9.4

Location	Non-Clay
BG-1-10	2.6
BG-1-29	2.7
BG-1-40	0.89
BG-1-46	1.8
BG-1-92	1.2
BG-2-2	2
BG-2-10	1.9
BG-2-19	1.6
BG-2-21	1.4
BG-2-32	2.2
BG-2-75	1.6
BG-3-2	1.6
BG-3-10	3.9
BG-3-29	1.6
BG-3-63	1.8
BG-3-65	3.9
BG-3-95	1.4
BG-3-105	4.1
BG-3-131	1
BG-3-136	7.9
BG-4-10	5.3
BG-4-65	1.6
BG-4-82	4
BG-4-95	1.2
BG-4-117	0.89
BG-4-120	5.2
BG-6-2	3.1
BG-6-9	1.8
BG-6-58	1.7
BG-6-75	2
BG-6-98	3.6
BG-6-114	4.5
BG-6-127	7.2
Average	2.702424

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Cobalt.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	11
Minimum	0.89
Maximum	4.9
Mean of Raw Data	2.366
Standard Deviation of Raw Data	1.146
Kstar	3.863
Mean of Log Transformed Data	0.759
Standard Deviation of Log Transformed Data	0.471

Normal Distribution Test Results	
Correlation Coefficient R	0.953
Shapiro Wilk Test Statistic	0.913
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.209
Lilliefors Test Statistic	0.209
Lilliefors Critical (0.95) Value	0.256

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.989
A-D Test Statistic	0.248
A-D Critical (0.95) Value	0.732
K-S Test Statistic	0.169
K-S Critical(0.95) Value	0.246

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.988
Shapiro Wilk Test Statistic	0.981
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.953
Lilliefors Test Statistic	0.139
Lilliefors Critical (0.95) Value	0.256

Data appear Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	31
Minimum	0.89
Maximum	9.4
Mean of Raw Data	3.841
Standard Deviation of Raw Data	2.352
Kstar	2.346
Mean of Log Transformed Data	1.135
Standard Deviation of Log Transformed Data	0.689

Normal Distribution Test Results

Correlation Coefficient R	0.964
Shapiro Wilk Test Statistic	0.914
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.00609
Lilliefors Test Statistic	0.168
Lilliefors Critical (0.95) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.977
A-D Test Statistic	0.976
A-D Critical (0.95) Value	0.757
K-S Test Statistic	0.161
K-S Critical(0.95) Value	0.143

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.97
Shapiro Wilk Test Statistic	0.92
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.0103
Lilliefors Test Statistic	0.153
Lilliefors Critical (0.95) Value	0.142

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Cobalt.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-Transformed Statistics	
Minimum	0.89	Minimum	-0.117
Maximum	4.9	Maximum	1.589
Second Largest	3.9	Second Largest	1.361
First Quartile	1.6	First Quartile	0.47
Median	1.95	Median	0.668
Third Quartile	2.8	Third Quartile	1.028
Mean	2.366	Mean	0.759
SD	1.146	SD	0.471
Coefficient of Variation	0.484		
Skewness	1.087		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.913	Shapiro Wilk Test Statistic	0.981
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	5.5	95% UTL with 95% Coverage	7.759
95% UPL (t)	4.507	95% UPL (t)	5.157
90% Percentile (z)	3.834	90% Percentile (z)	3.91
95% Percentile (z)	4.25	95% Percentile (z)	4.64
99% Percentile (z)	5.031	99% Percentile (z)	6.397

Gamma Distribution Test		Data Distribution Test	
k star	3.863	Data appear Normal at 5% Significance Level	
Theta Star	0.612		
MLE of Mean	2.366		
MLE of Standard Deviation	1.204		
nu star	92.72		
A-D Test Statistic	0.248	Nonparametric Statistics	
5% A-D Critical Value	0.732	90% Percentile	3.82
K-S Test Statistic	0.169	95% Percentile	4.35
5% K-S Critical Value	0.246	99% Percentile	4.79
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	4.9
90% Percentile	3.979	95% Percentile Bootstrap UTL with 95% Coverage	4.9
95% Percentile	4.629	95% BCA Bootstrap UTL with 95% Coverage	4.9
99% Percentile	6.018	95% UPL	4.9
		95% Chebyshev UPL	7.563
95% WH Approx. Gamma UPL	4.807	Upper Threshold Limit Based upon IQR	4.6
95% HW Approx. Gamma UPL	4.875		
95% WH Approx. Gamma UTL with 95% Coverage	6.5		
95% HW Approx. Gamma UTL with 95% Coverage	6.732		

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	31
Raw Statistics		Log-Transformed Statistics	
Minimum	0.89	Minimum	-0.117
Maximum	9.4	Maximum	2.241
Second Largest	8.4	Second Largest	2.128
First Quartile	1.65	First Quartile	0.5
Median	3.9	Median	1.361
Third Quartile	5.25	Third Quartile	1.658
Mean	3.841	Mean	1.135
SD	2.352	SD	0.689
Coefficient of Variation	0.612		
Skewness	0.541		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.914	Shapiro Wilk Test Statistic	0.92
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	8.837	95% UTL with 95% Coverage	13.44
95% UPL (t)	7.856	95% UPL (t)	10.08
90% Percentile (z)	6.855	90% Percentile (z)	7.518
95% Percentile (z)	7.709	95% Percentile (z)	9.656
99% Percentile (z)	9.312	99% Percentile (z)	15.44
Gamma Distribution Test		Data Distribution Test	
k star	2.346	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.637		
MLE of Mean	3.841		
MLE of Standard Deviation	2.508		
nu star	183		
A-D Test Statistic	0.976	Nonparametric Statistics	
5% A-D Critical Value	0.757	90% Percentile	6.96
K-S Test Statistic	0.161	95% Percentile	7.95
5% K-S Critical Value	0.143	99% Percentile	9.02

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 95% Coverage	9.4
90% Percentile	7.198	95% Percentile Bootstrap UTL with 95% Coverage	9.4
95% Percentile	8.669	95% BCA Bootstrap UTL with 95% Coverage	9.4
99% Percentile	11.9	95% UPL	8.4
		95% Chebyshev UPL	14.22
95% WH Approx. Gamma UPL	8.821	Upper Threshold Limit Based upon IQR	10.65
95% HW Approx. Gamma UPL	9.054		
95% WH Approx. Gamma UTL with 95% Coverage	10.72		
95% HW Approx. Gamma UTL with 95% Coverage	11.2		

Outlier Tests for Selected Variables

User Selected Options	
From File	Cobalt.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 4.9 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.514

For 10% significance level, 4.9 is an outlier.
For 5% significance level, 4.9 is not an outlier.
For 1% significance level, 4.9 is not an outlier.

2. Data Value 0.89 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.236

For 10% significance level, 0.89 is not an outlier.
For 5% significance level, 0.89 is not an outlier.
For 1% significance level, 0.89 is not an outlier.

Rosner's Outlier Test for MC

Mean	3.841
Standard Deviation	2.352
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3.841	2.321	9.4	36	2.395	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Cobalt.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Observations	39	12
Number of Distinct Observations	31	11
Minimum	0.89	0.89
Maximum	9.4	4.9
Mean	3.841	2.366
Median	3.9	1.95
SD	2.352	1.146
SE of Mean	0.377	0.331

Wilcoxon-Mann-Whitney (WMW) Test

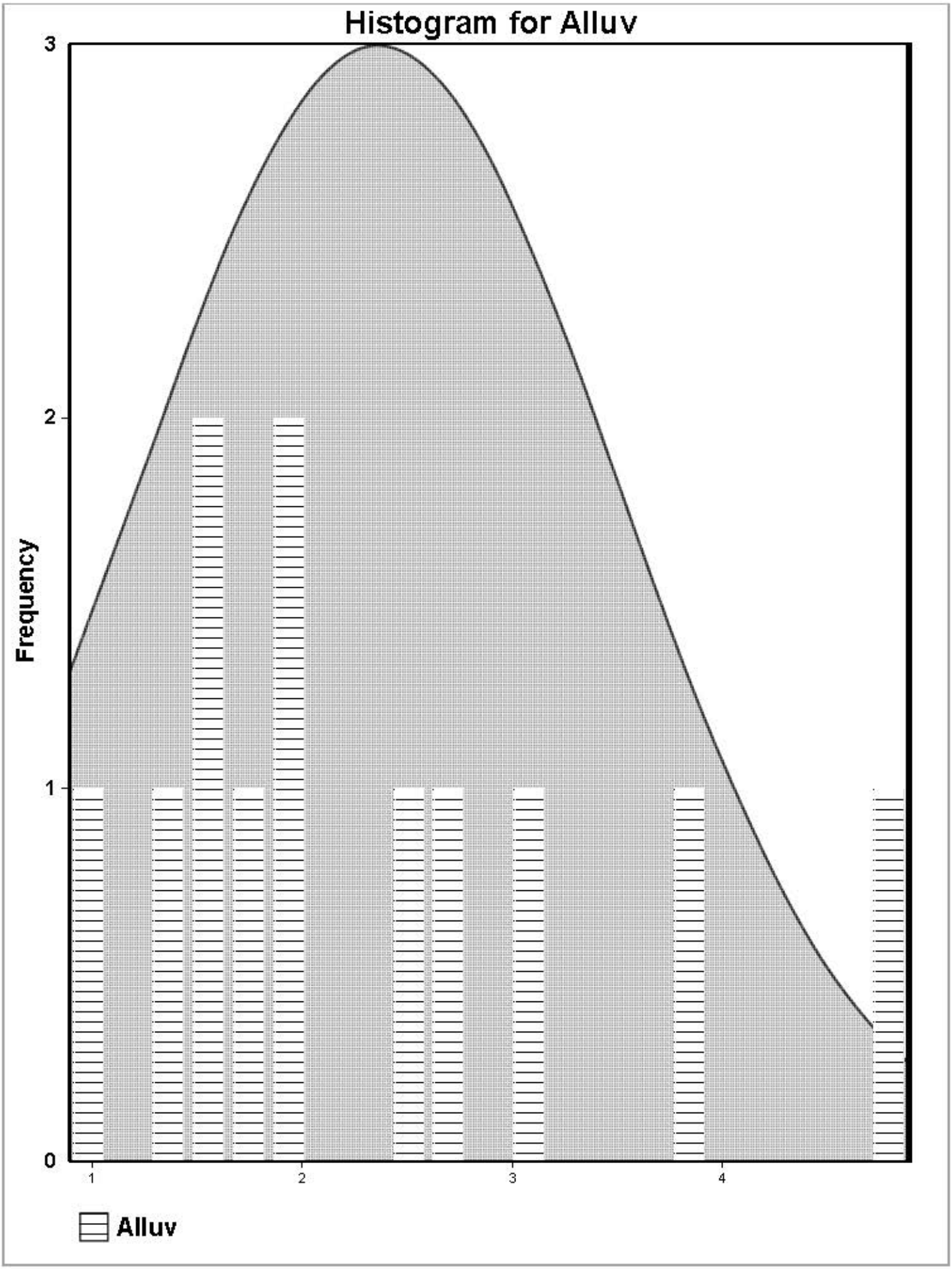
H0: Mean/Median of Site or AOC = Mean/Median of Background

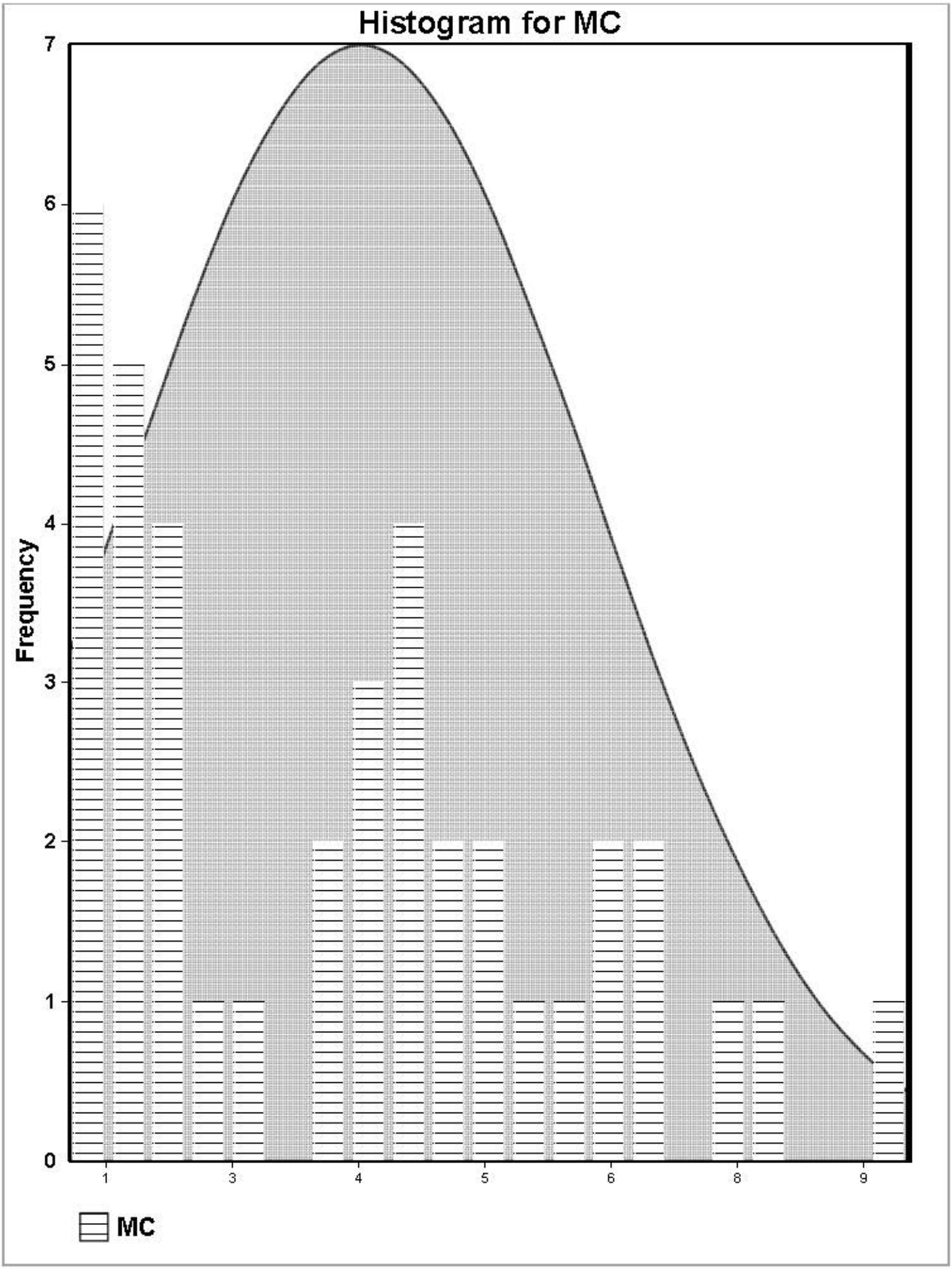
Site Rank Sum W-Stat	1087
WMW Test U-Stat	1.599
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.11

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
3
2
1
0
1
2
3
4
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
1
3
4
5
6
8
9
MC

Location	Alluv	Location	MC
BG-1-2	4.9	BG-1-43	5.9
BG-1-10	2.6	BG-1-46	1.8
BG-1-29	2.7	BG-1-55	1.2
BG-1-40	0.89	BG-1-78	4.7
BG-2-2	2	BG-1-92	1.2
BG-2-10	1.9	BG-2-30	6.9
BG-2-19	1.6	BG-2-32	2.2
BG-2-21	1.4	BG-2-75	1.6
BG-3-2	1.6	BG-2-81	4.3
BG-3-10	3.9	BG-3-17	1.8
BG-6-2	3.1	BG-3-22	1.3
BG-6-9	1.8	BG-3-29	1.6
		BG-3-63	1.8
		BG-3-65	3.9
		BG-3-69	4.8
		BG-3-95	1.4
		BG-3-105	4.1
		BG-3-131	1
		BG-3-136	7.9
		BG-4-1	3.8
		BG-4-10	5.3
		BG-4-19	8.4
		BG-4-40	6.1
		BG-4-65	1.6
		BG-4-79	6.6
		BG-4-82	4
		BG-4-95	1.2
		BG-4-117	0.89
		BG-4-120	5.2
		BG-4-161	2.9
		BG-4-163	4.8
		BG-6-28	6.5
		BG-6-53	4.7
		BG-6-58	1.7
		BG-6-75	2
		BG-6-87	9.4
		BG-6-98	3.6
		BG-6-114	4.5
		BG-1-127	7.2

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Copper.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	38
Minimum	1.2
Maximum	26
Mean of Raw Data	8.002
Standard Deviation of Raw Data	6.137
Kstar	1.75
Mean of Log Transformed Data	1.785
Standard Deviation of Log Transformed Data	0.792

Normal Distribution Test Results	
Correlation Coefficient R	0.935
Approximate Shapiro Wilk Test Statistic	0.865
Approximate Shapiro Wilk P Value	5.0730E-6
Lilliefors Test Statistic	0.189
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.988
A-D Test Statistic	1.172
A-D Critical (0.95) Value	0.764
K-S Test Statistic	0.14
K-S Critical(0.95) Value	0.126

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.979
Approximate Shapiro Wilk Test Statistic	0.942
Approximate Shapiro Wilk P Value	0.0237
Lilliefors Test Statistic	0.125
Lilliefors Critical (0.95) Value	0.124

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Copper.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Total Number of Observations	51	Number of Distinct Observations	38

Raw Statistics		Log-Transformed Statistics	
Minimum	1.2	Minimum	0.182
Maximum	26	Maximum	3.258
Second Largest	22	Second Largest	3.091
First Quartile	3	First Quartile	1.099
Median	5.8	Median	1.758
Third Quartile	11.5	Third Quartile	2.441
Mean	8.002	Mean	1.785
SD	6.137	SD	0.792
Coefficient of Variation	0.767		
Skewness	1.066		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.189	Lilliefors Test Statistic	0.125
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	20.6	95% UTL with 95% Coverage	30.3
95% UPL (t)	18.39	95% UPL (t)	22.76
90% Percentile (z)	15.87	90% Percentile (z)	16.44
95% Percentile (z)	18.1	95% Percentile (z)	21.92
99% Percentile (z)	22.28	99% Percentile (z)	37.6

Gamma Distribution Test		Data Distribution Test	
k star	1.75	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.573		
MLE of Mean	8.002		
MLE of Standard Deviation	6.049		
nu star	178.5		
A-D Test Statistic	1.172	Nonparametric Statistics	
5% A-D Critical Value	0.764	90% Percentile	17
K-S Test Statistic	0.14	95% Percentile	20
5% K-S Critical Value	0.126	99% Percentile	24
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	22
90% Percentile	16.06	95% Percentile Bootstrap UTL with 95% Coverage	24
95% Percentile	19.81	95% BCA Bootstrap UTL with 95% Coverage	22
99% Percentile	28.19	95% UPL	20.8
		95% Chebyshev UPL	35.01
95% WH Approx. Gamma UPL	20.01	Upper Threshold Limit Based upon IQR	24.25
95% HW Approx. Gamma UPL	20.49		
95% WH Approx. Gamma UTL with 95% Coverage	24.24		
95% HW Approx. Gamma UTL with 95% Coverage	25.26		

Outlier Tests for Selected Variables

User Selected Options	
From File	Copper.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

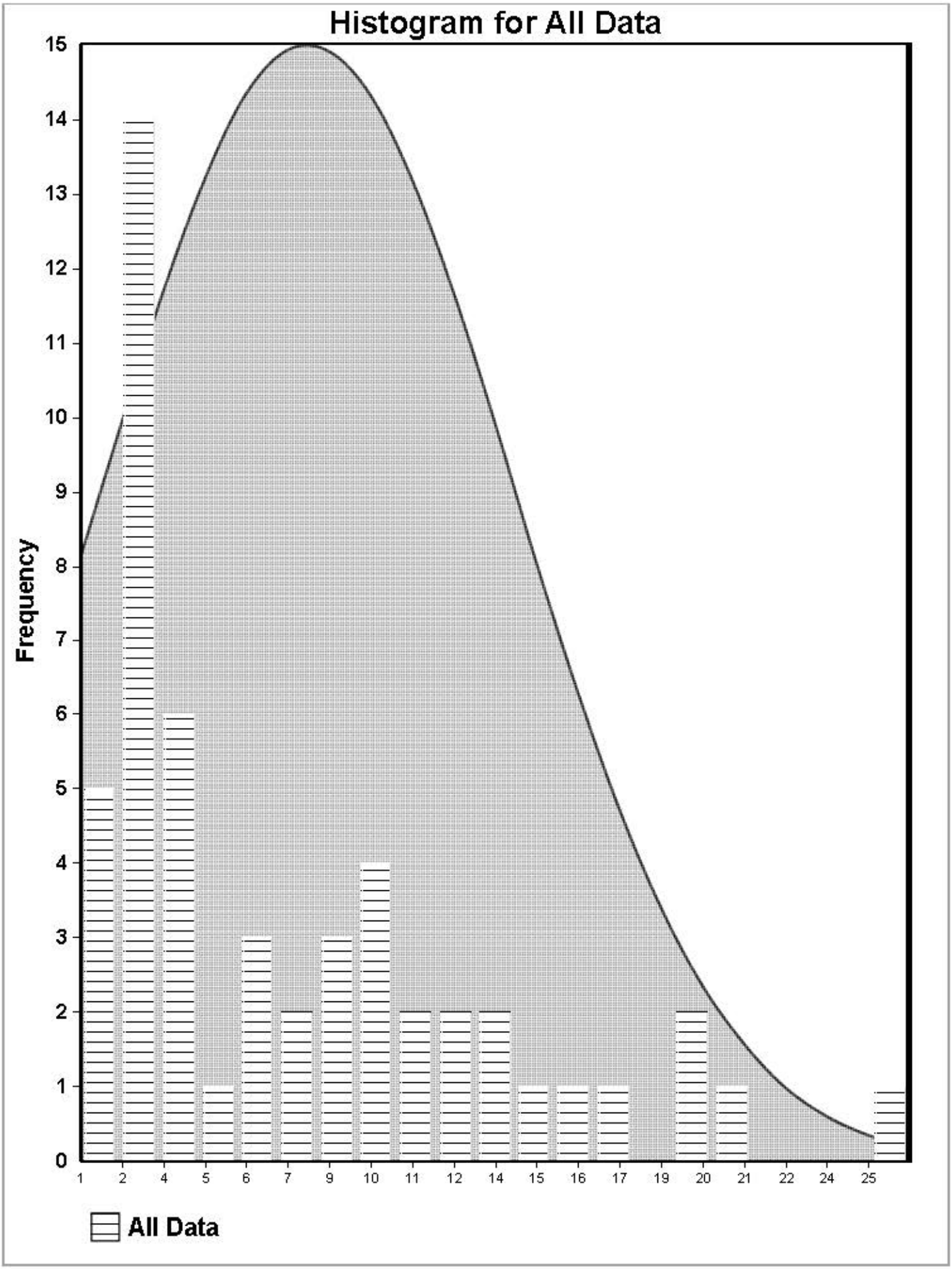
Rosner's Outlier Test for All Data

Mean	8.002
Standard Deviation	6.137
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	8.002	6.076	26	51	2.962	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1
2
4
5
6
7
9
10
11
12
14
15
16
17
19
20
21
22
24
25
All Data

Location	All Data
BG-1-2	11
BG-3-17	4.4
BG-4-2	8.3
BG-4-19	20
BG-1-10	4.2
BG-2-2	2.5
BG-2-10	1.9
BG-2-19	3.2
BG-3-2	3
BG-3-10	9.3
BG-4-10	11
BG-6-2	4.8
BG-6-9	2.6
BG-1-29	5.8
BG-1-40	2.9
BG-1-46	3.3
BG-1-92	2.7
BG-2-21	1.2
BG-2-32	2.9
BG-2-75	3
BG-3-29	3.5
BG-3-63	4.3
BG-3-65	7.1
BG-3-95	2.5
BG-3-105	7.3
BG-3-131	2.2
BG-3-136	17
BG-4-65	3.2
BG-4-82	8.4
BG-4-95	2.6
BG-4-117	1.9
BG-4-120	12
BG-6-58	3.8
BG-6-75	4.6
BG-6-98	8.8
BG-6-114	9.8
BG-6-127	18
BG-1-43	12
BG-1-55	2.1
BG-1-78	20
BG-2-30	16
BG-2-81	22
BG-3-22	3
BG-3-69	11
BG-4-40	14
BG-4-79	14
BG-4-161	7
BG-4-163	13
BG-6-28	13
BG-6-53	10
BG-6-87	26

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Copper.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	12
Minimum	1.9
Maximum	20
Mean of Raw Data	6.631
Standard Deviation of Raw Data	5.178
Kstar	1.734
Mean of Log Transformed Data	1.646
Standard Deviation of Log Transformed Data	0.715

Normal Distribution Test Results	
Correlation Coefficient R	0.901
Shapiro Wilk Test Statistic	0.818
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.00935
Lilliefors Test Statistic	0.254
Lilliefors Critical (0.95) Value	0.246

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.976
A-D Test Statistic	0.5
A-D Critical (0.95) Value	0.742
K-S Test Statistic	0.203
K-S Critical(0.95) Value	0.239

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.976
Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.544
Lilliefors Test Statistic	0.158
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

>20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	33
Minimum	1.2
Maximum	26
Mean of Raw Data	8.471
Standard Deviation of Raw Data	6.427
Kstar	1.668
Mean of Log Transformed Data	1.832
Standard Deviation of Log Transformed Data	0.82

Normal Distribution Test Results

Correlation Coefficient R	0.944
Shapiro Wilk Test Statistic	0.883
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	6.0972E-4
Lilliefors Test Statistic	0.174
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.988
A-D Test Statistic	0.833
A-D Critical (0.95) Value	0.762
K-S Test Statistic	0.147
K-S Critical(0.95) Value	0.145

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.979
Shapiro Wilk Test Statistic	0.944
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.0762
Lilliefors Test Statistic	0.129
Lilliefors Critical (0.95) Value	0.144

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Copper.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	12

Raw Statistics		Log-Transformed Statistics	
Minimum	1.9	Minimum	0.642
Maximum	20	Maximum	2.996
Second Largest	11	Second Largest	2.398
First Quartile	3	First Quartile	1.099
Median	4.4	Median	1.482
Third Quartile	9.3	Third Quartile	2.23
Mean	6.631	Mean	1.646
SD	5.178	SD	0.715
Coefficient of Variation	0.781		
Skewness	1.574		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.818	Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	20.46	95% UTL with 95% Coverage	35.06
95% UPL (t)	16.21	95% UPL (t)	19.48
90% Percentile (z)	13.27	90% Percentile (z)	12.97
95% Percentile (z)	15.15	95% Percentile (z)	16.82
99% Percentile (z)	18.68	99% Percentile (z)	27.4

Gamma Distribution Test		Data Distribution Test	
k star	1.734	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3.824		
MLE of Mean	6.631		
MLE of Standard Deviation	5.036		
nu star	45.08		
A-D Test Statistic	0.5	Nonparametric Statistics	
5% A-D Critical Value	0.742	90% Percentile	11
K-S Test Statistic	0.203	95% Percentile	14.6
5% K-S Critical Value	0.239	99% Percentile	18.92
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	20
90% Percentile	13.34	95% Percentile Bootstrap UTL with 95% Coverage	20
95% Percentile	16.47	95% BCA Bootstrap UTL with 95% Coverage	20
99% Percentile	23.46	95% UPL	20
		95% Chebyshev UPL	30.05
95% WH Approx. Gamma UPL	17.44	Upper Threshold Limit Based upon IQR	18.75
95% HW Approx. Gamma UPL	17.81		
95% WH Approx. Gamma UTL with 95% Coverage	25.82		
95% HW Approx. Gamma UTL with 95% Coverage	27.31		

>20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	33
Raw Statistics		**Log-Transformed Statistics**	
Minimum	1.2	Minimum	0.182
Maximum	26	Maximum	3.258
Second Largest	22	Second Largest	3.091
First Quartile	3	First Quartile	1.099
Median	7.05	Median	1.953
Third Quartile	12.75	Third Quartile	2.545
Mean	8.471	Mean	1.832
SD	6.427	SD	0.82
Coefficient of Variation	0.759		
Skewness	0.948		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.883	Shapiro Wilk Test Statistic	0.944
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	22.17	95% UTL with 95% Coverage	35.89
95% UPL (t)	19.46	95% UPL (t)	25.37
90% Percentile (z)	16.71	90% Percentile (z)	17.87
95% Percentile (z)	19.04	95% Percentile (z)	24.07
99% Percentile (z)	23.42	99% Percentile (z)	42.08
Gamma Distribution Test		**Data Distribution Test**	
k star	1.668	Data appear Lognormal at 5% Significance Level	
Theta Star	5.078		
MLE of Mean	8.471		
MLE of Standard Deviation	6.559		
nu star	126.8		
A-D Test Statistic	0.833	**Nonparametric Statistics**	
5% A-D Critical Value	0.762	90% Percentile	17.3
K-S Test Statistic	0.147	95% Percentile	20.3
5% K-S Critical Value	0.145	99% Percentile	24.52

Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	26
90% Percentile	17.2	95% Percentile Bootstrap UTL with 95% Coverage	26
95% Percentile	21.3	95% BCA Bootstrap UTL with 95% Coverage	26
99% Percentile	30.5	95% UPL	22.2
		95% Chebyshev UPL	36.85
95% WH Approx. Gamma UPL	21.69	Upper Threshold Limit Based upon IQR	27.38
95% HW Approx. Gamma UPL	22.32		
95% WH Approx. Gamma UTL with 95% Coverage	27.17		
95% HW Approx. Gamma UTL with 95% Coverage	28.58		

Outlier Tests for Selected Variables

User Selected Options	
From File	Copper.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 20 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.514

For 10% significance level, 20 is an outlier.
For 5% significance level, 20 is not an outlier.
For 1% significance level, 20 is not an outlier.

2. Data Value 1.9 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.077

For 10% significance level, 1.9 is not an outlier.
For 5% significance level, 1.9 is not an outlier.
For 1% significance level, 1.9 is not an outlier.

Rosner's Outlier Test for >20

Mean	8.471
Standard Deviation	6.427
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	8.471	6.342	26	38	2.764	3.01	3.36

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Copper.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Observations	38	13
Number of Distinct Observations	33	12
Minimum	1.2	1.9
Maximum	26	20
Mean	8.471	6.631
Median	7.05	4.4
SD	6.427	5.178
SE of Mean	1.043	1.436

Wilcoxon-Mann-Whitney (WMW) Test

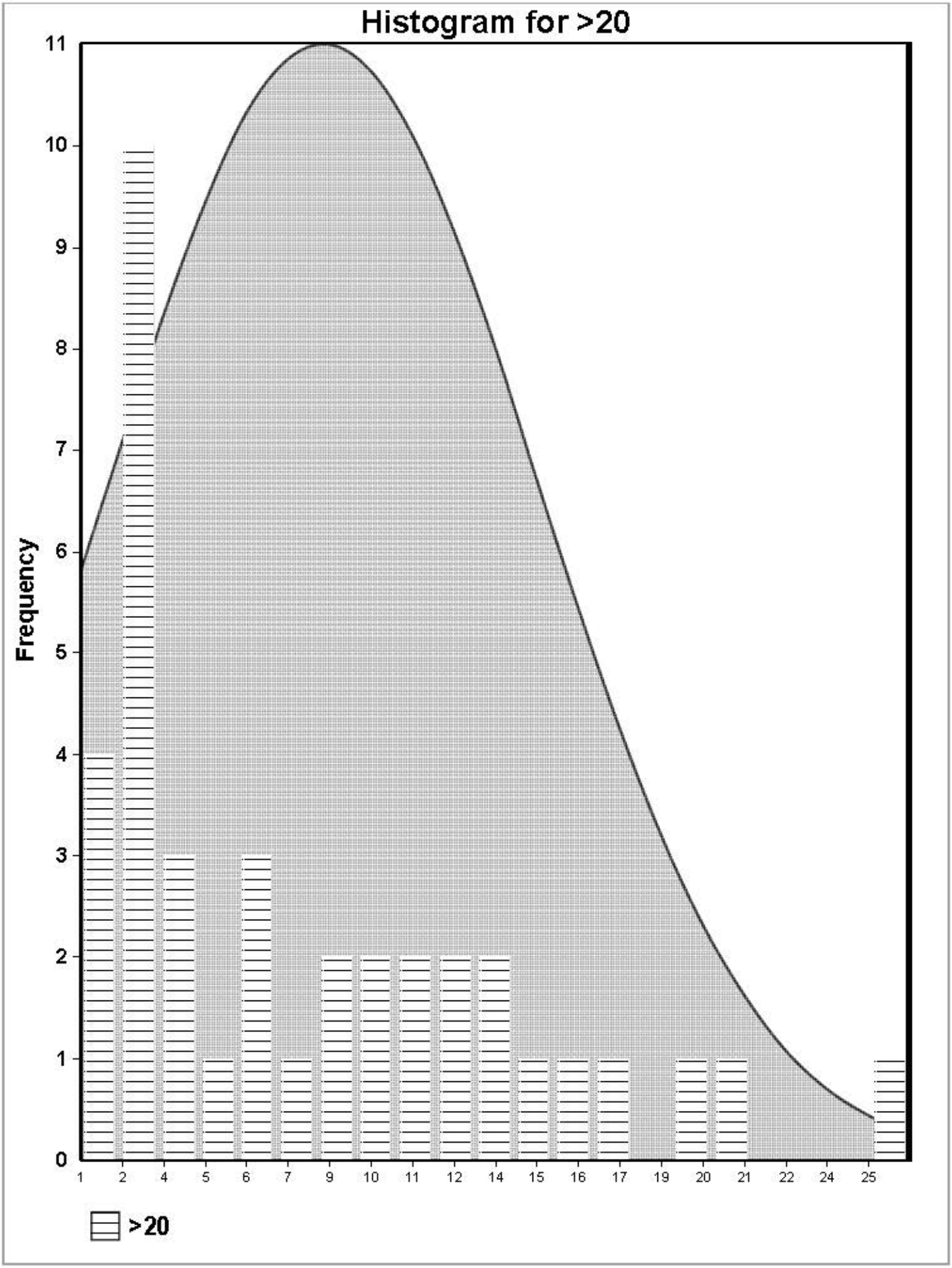
H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1024
WMW Test U-Stat	0.756
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.449

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
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1
2
3
4
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11
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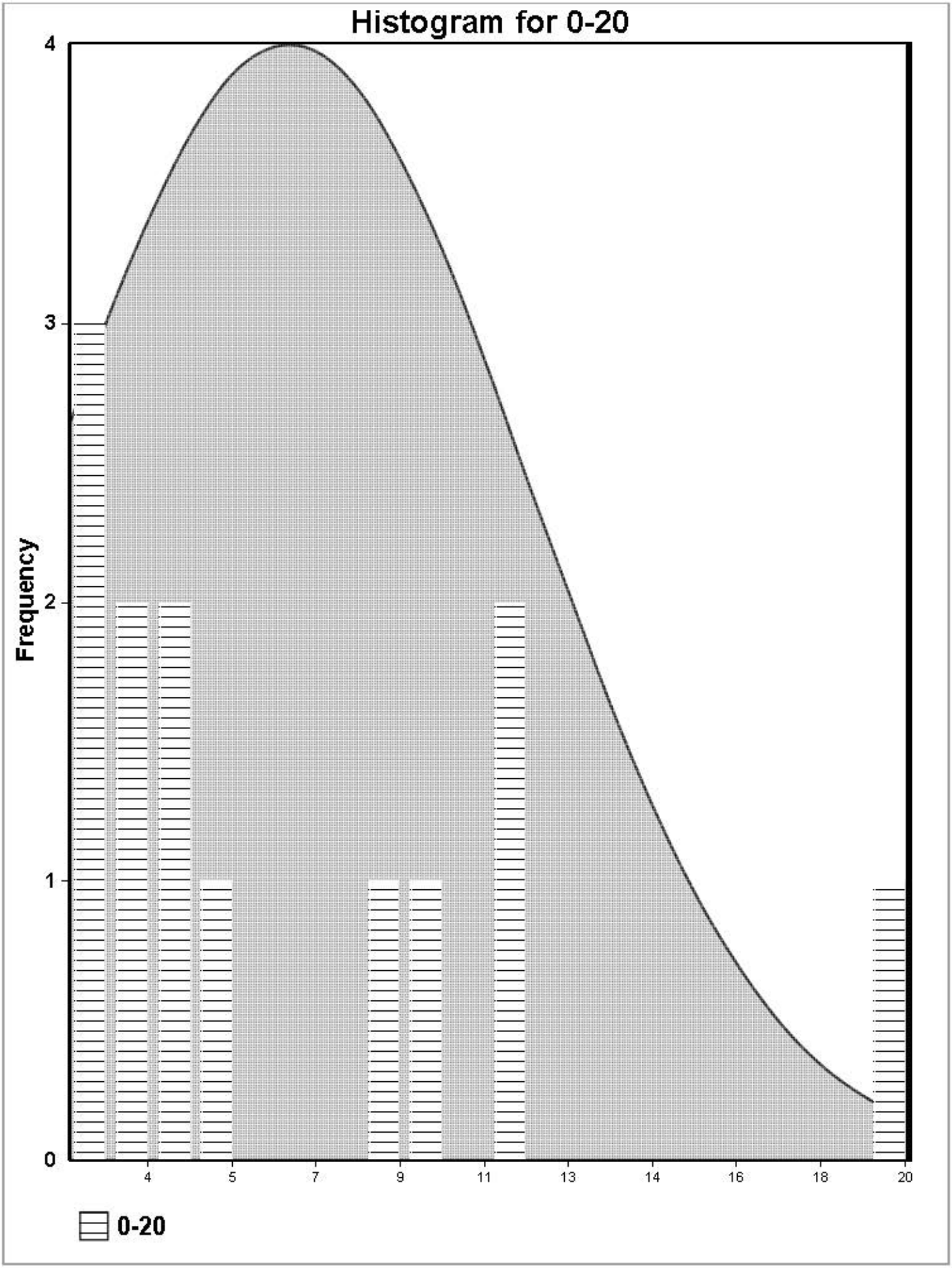
19
20
21
22
24
25
>20


Histogram for 0-20
Frequency
0
1
2
3
4
4
5
7
9
11
13
14
16
18
20
0-20

Location	0-20
BG-1-2	11
BG-3-17	4.4
BG-4-2	8.3
BG-4-19	20
BG-1-10	4.2
BG-2-2	2.5
BG-2-10	1.9
BG-2-19	3.2
BG-3-2	3
BG-3-10	9.3
BG-4-10	11
BG-6-2	4.8
BG-6-9	2.6

Location	>20
BG-1-29	5.8
BG-1-40	2.9
BG-1-46	3.3
BG-1-92	2.7
BG-2-21	1.2
BG-2-32	2.9
BG-2-75	3
BG-3-29	3.5
BG-3-63	4.3
BG-3-65	7.1
BG-3-95	2.5
BG-3-105	7.3
BG-3-131	2.2
BG-3-136	17
BG-4-65	3.2
BG-4-82	8.4
BG-4-95	2.6
BG-4-117	1.9
BG-4-120	12
BG-6-58	3.8
BG-6-75	4.6
BG-6-98	8.8
BG-6-114	9.8
BG-6-127	18
BG-1-43	12
BG-1-55	2.1
BG-1-78	20
BG-2-30	16
BG-2-81	22
BG-3-22	3
BG-3-69	11
BG-4-40	14
BG-4-79	14
BG-4-161	7
BG-4-163	13
BG-6-28	13
BG-6-53	10
BG-6-87	26

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Copper.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	14
Minimum	2.1
Maximum	26
Mean of Raw Data	12.6
Standard Deviation of Raw Data	6.53
Kstar	2.573
Mean of Log Transformed Data	2.36
Standard Deviation of Log Transformed Data	0.677

Normal Distribution Test Results	
Correlation Coefficient R	0.988
Shapiro Wilk Test Statistic	0.972
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.834
Lilliefors Test Statistic	0.137
Lilliefors Critical (0.95) Value	0.209

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.977
A-D Test Statistic	0.4
A-D Critical (0.95) Value	0.746
K-S Test Statistic	0.152
K-S Critical(0.95) Value	0.205

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.949
Shapiro Wilk Test Statistic	0.902
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.0619
Lilliefors Test Statistic	0.189
Lilliefors Critical (0.95) Value	0.209

Data appear Lognormal at (0.05) Significance Level

Non-Clay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	27
Minimum	1.2
Maximum	18
Mean of Raw Data	5.494
Standard Deviation of Raw Data	4.22
Kstar	2.113
Mean of Log Transformed Data	1.471
Standard Deviation of Log Transformed Data	0.669

Normal Distribution Test Results

Correlation Coefficient R	0.891
Shapiro Wilk Test Statistic	0.794
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	7.6225E-6
Lilliefors Test Statistic	0.232
Lilliefors Critical (0.95) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.975
A-D Test Statistic	1.231
A-D Critical (0.95) Value	0.757
K-S Test Statistic	0.173
K-S Critical(0.95) Value	0.155

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.976
Shapiro Wilk Test Statistic	0.946
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.13
Lilliefors Test Statistic	0.145
Lilliefors Critical (0.95) Value	0.154

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Copper.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	14

Raw Statistics		Log-Transformed Statistics	
Minimum	2.1	Minimum	0.742
Maximum	26	Maximum	3.258
Second Largest	22	Second Largest	3.091
First Quartile	8.725	First Quartile	2.163
Median	12.5	Median	2.525
Third Quartile	15.5	Third Quartile	2.739
Mean	12.6	Mean	2.36
SD	6.53	SD	0.677
Coefficient of Variation	0.518		
Skewness	0.289		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.972	Shapiro Wilk Test Statistic	0.902
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	28.62	95% UTL with 95% Coverage	55.77
95% UPL (t)	24.27	95% UPL (t)	35.54
90% Percentile (z)	20.97	90% Percentile (z)	25.23
95% Percentile (z)	23.34	95% Percentile (z)	32.27
99% Percentile (z)	27.79	99% Percentile (z)	51.19

Gamma Distribution Test		Data Distribution Test	
k star	2.573	Data appear Normal at 5% Significance Level	
Theta Star	4.897		
MLE of Mean	12.6		
MLE of Standard Deviation	7.855		
nu star	92.63		
A-D Test Statistic	0.4	Nonparametric Statistics	
5% A-D Critical Value	0.746	90% Percentile	20.6
K-S Test Statistic	0.152	95% Percentile	22.6
5% K-S Critical Value	0.205	99% Percentile	25.32
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	26
90% Percentile	23.13	95% Percentile Bootstrap UTL with 95% Coverage	26
95% Percentile	27.66	95% BCA Bootstrap UTL with 95% Coverage	26
99% Percentile	37.57	95% UPL	26
		95% Chebyshev UPL	41.85
95% WH Approx. Gamma UPL	28.67	Upper Threshold Limit Based upon IQR	25.66
95% HW Approx. Gamma UPL	29.84		
95% WH Approx. Gamma UTL with 95% Coverage	38.06		
95% HW Approx. Gamma UTL with 95% Coverage	40.78		

Non-Clay

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	27
Raw Statistics		**Log-Transformed Statistics**	
Minimum	1.2	Minimum	0.182
Maximum	18	Maximum	2.89
Second Largest	17	Second Largest	2.833
First Quartile	2.7	First Quartile	0.993
Median	3.5	Median	1.253
Third Quartile	7.3	Third Quartile	1.988
Mean	5.494	Mean	1.471
SD	4.22	SD	0.669
Coefficient of Variation	0.768		
Skewness	1.628		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.794	Shapiro Wilk Test Statistic	0.946
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	14.68	95% UTL with 95% Coverage	18.68
95% UPL (t)	12.75	95% UPL (t)	13.76
90% Percentile (z)	10.9	90% Percentile (z)	10.27
95% Percentile (z)	12.44	95% Percentile (z)	13.09
99% Percentile (z)	15.31	99% Percentile (z)	20.66
Gamma Distribution Test		**Data Distribution Test**	
k star	2.113	Data appear Lognormal at 5% Significance Level	
Theta Star	2.6		
MLE of Mean	5.494		
MLE of Standard Deviation	3.78		
nu star	139.4		
A-D Test Statistic	1.231	**Nonparametric Statistics**	
5% A-D Critical Value	0.757	90% Percentile	10.76
K-S Test Statistic	0.173	95% Percentile	14
5% K-S Critical Value	0.155	99% Percentile	17.68

Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	18
90% Percentile	10.55	95% Percentile Bootstrap UTL with 95% Coverage	18
95% Percentile	12.81	95% BCA Bootstrap UTL with 95% Coverage	18
99% Percentile	17.8	95% UPL	17.3
		95% Chebyshev UPL	24.16
95% WH Approx. Gamma UPL	12.98	Upper Threshold Limit Based upon IQR	14.2
95% HW Approx. Gamma UPL	13.11		
95% WH Approx. Gamma UTL with 95% Coverage	16.19		
95% HW Approx. Gamma UTL with 95% Coverage	16.63		

Outlier Tests for Selected Variables

User Selected Options	
From File	Copper.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 26 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.278

For 10% significance level, 26 is not an outlier.

For 5% significance level, 26 is not an outlier.

For 1% significance level, 26 is not an outlier.

2. Data Value 2.1 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.128

For 10% significance level, 2.1 is not an outlier.

For 5% significance level, 2.1 is not an outlier.

For 1% significance level, 2.1 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	5.494
Standard Deviation	4.22
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5.494	4.155	18	33	3.01	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 18 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Copper.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Observations	33	18
Number of Distinct Observations	27	14
Minimum	1.2	2.1
Maximum	18	26
Mean	5.494	12.6
Median	3.5	12.5
SD	4.22	6.53
SE of Mean	0.735	1.539

Wilcoxon-Mann-Whitney (WMW) Test

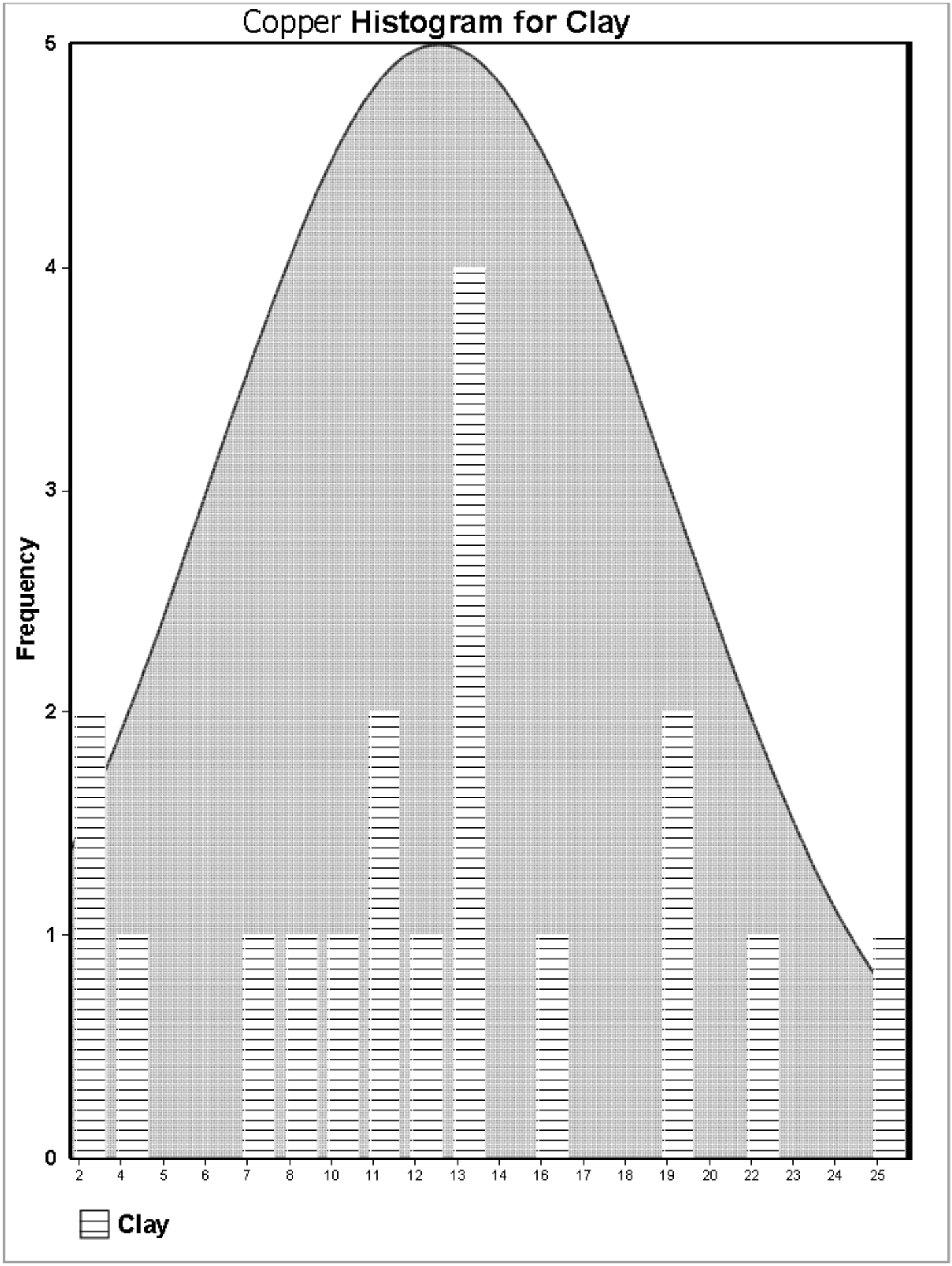
H0: Mean/Median of Site or AOC = Mean/Median of Background

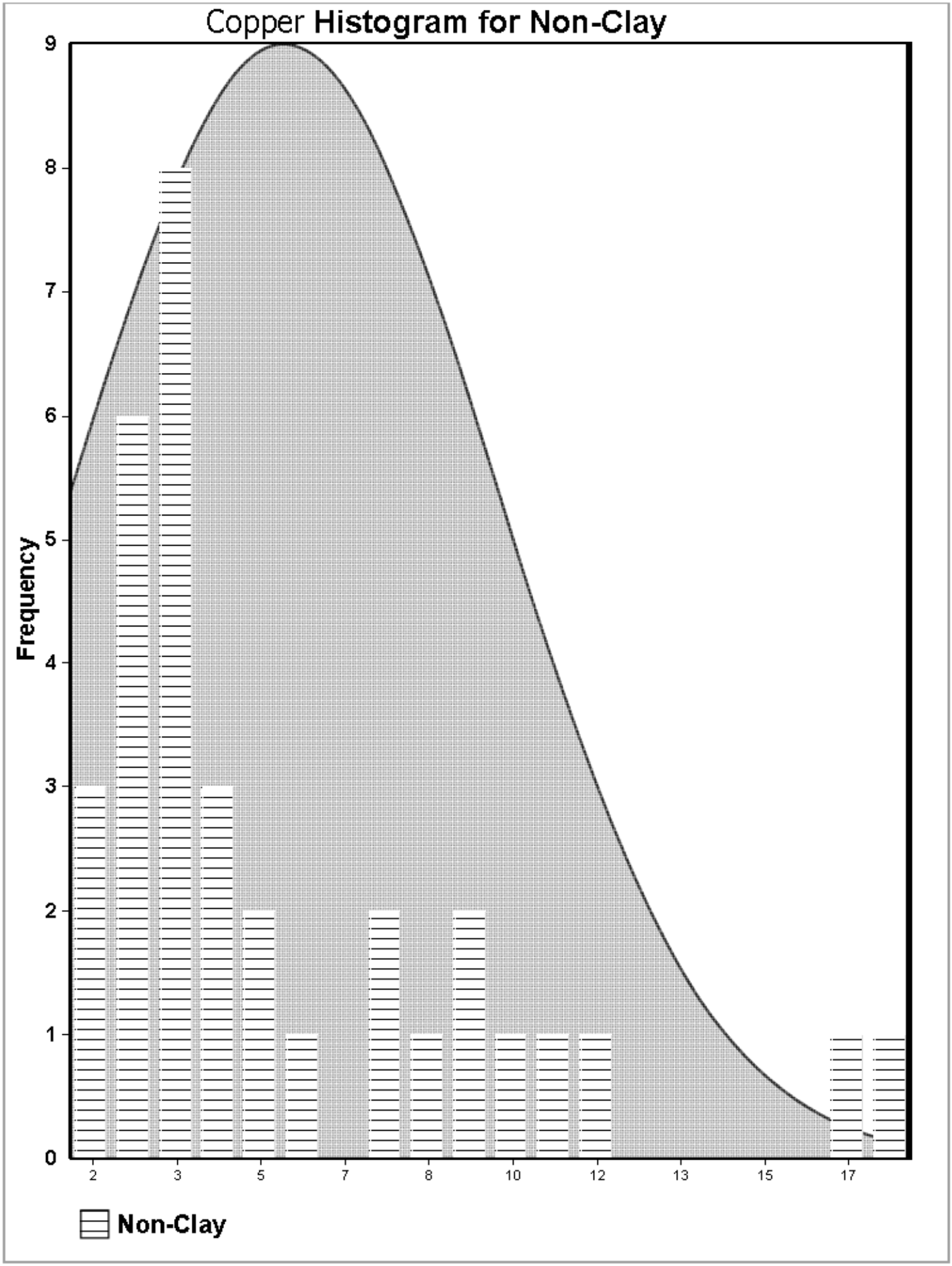
Site Rank Sum W-Stat	666.5
WMW Test U-Stat	3.765
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	1.5408E-4

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Copper Histogram for Clay
Frequency
0
1
2
3
4
5
2
4
5
6
7
8
10
11
12
13
14
16
17
18
19
20
22
23
24
25
Clay


Copper Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
2
3
5
7
8
10
12
13
15
17
Non-Clay

Location	Clay	Location	Non-Clay
BG-1-2	11	BG-1-10	4.2
BG-1-43	12	BG-1-29	5.8
BG-1-55	2.1	BG-1-40	2.9
BG-1-78	20	BG-1-46	3.3
BG-2-30	16	BG-1-92	2.7
BG-2-81	22	BG-2-2	2.5
BG-3-17	4.4	BG-2-10	1.9
BG-3-22	3	BG-2-19	3.2
BG-3-69	11	BG-2-21	1.2
BG-4-2	8.3	BG-2-32	2.9
BG-4-19	20	BG-2-75	3
BG-4-40	14	BG-3-2	3
BG-4-79	14	BG-3-10	9.3
BG-4-161	7	BG-3-29	3.5
BG-4-163	13	BG-3-63	4.3
BG-6-28	13	BG-3-65	7.1
BG-6-53	10	BG-3-95	2.5
BG-6-87	26	BG-3-105	7.3
		BG-3-131	2.2
		BG-3-136	17
		BG-4-10	11
		BG-4-65	3.2
		BG-4-82	8.4
		BG-4-95	2.6
		BG-4-117	1.9
		BG-4-120	12
		BG-6-2	4.8
		BG-6-9	2.6
		BG-6-58	3.8
		BG-6-75	4.6
		BG-6-98	8.8
		BG-6-114	9.8
		BG-6-127	18

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Copper.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	12
Minimum	1.2
Maximum	11
Mean of Raw Data	4.367
Standard Deviation of Raw Data	2.996
Kstar	2.149
Mean of Log Transformed Data	1.284
Standard Deviation of Log Transformed Data	0.635

Normal Distribution Test Results	
Correlation Coefficient R	0.912
Shapiro Wilk Test Statistic	0.834
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.0211
Lilliefors Test Statistic	0.235
Lilliefors Critical (0.95) Value	0.256

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.975
A-D Test Statistic	0.394
A-D Critical (0.95) Value	0.74
K-S Test Statistic	0.197
K-S Critical(0.95) Value	0.248

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.984
Shapiro Wilk Test Statistic	0.969
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.854
Lilliefors Test Statistic	0.159
Lilliefors Critical (0.95) Value	0.256

Data appear Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	33
Minimum	1.9
Maximum	26
Mean of Raw Data	9.121
Standard Deviation of Raw Data	6.442
Kstar	1.856
Mean of Log Transformed Data	1.939
Standard Deviation of Log Transformed Data	0.778

Normal Distribution Test Results

Correlation Coefficient R	0.954
Shapiro Wilk Test Statistic	0.897
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.00151
Lilliefors Test Statistic	0.169
Lilliefors Critical (0.95) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.985
A-D Test Statistic	0.816
A-D Critical (0.95) Value	0.759
K-S Test Statistic	0.142
K-S Critical(0.95) Value	0.143

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.974
Shapiro Wilk Test Statistic	0.927
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.0173
Lilliefors Test Statistic	0.119
Lilliefors Critical (0.95) Value	0.142

Data not Lognormal at (0.05) Significance Level

Outlier Tests for Selected Variables

User Selected Options	
From File	Copper.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 11 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.571

For 10% significance level, 11 is an outlier.
For 5% significance level, 11 is an outlier.
For 1% significance level, 11 is not an outlier.

2. Data Value 1.2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.160

For 10% significance level, 1.2 is not an outlier.
For 5% significance level, 1.2 is not an outlier.
For 1% significance level, 1.2 is not an outlier.

Rosner's Outlier Test for MC

Mean	9.121
Standard Deviation	6.442
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	9.121	6.359	26	36	2.655	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Copper.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Observations	39	12
Number of Distinct Observations	33	12
Minimum	1.9	1.2
Maximum	26	11
Mean	9.121	4.367
Median	8.3	3.1
SD	6.442	2.996
SE of Mean	1.032	0.865

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1124
WMW Test U-Stat	2.42
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.0155

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

General Background Statistics for Full Data Sets

User Selected Options	
From File	Copper.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-Transformed Statistics	
Minimum	1.2	Minimum	0.182
Maximum	11	Maximum	2.398
Second Largest	9.3	Second Largest	2.23
First Quartile	2.575	First Quartile	0.946
Median	3.1	Median	1.131
Third Quartile	5.05	Third Quartile	1.616
Mean	4.367	Mean	1.284
SD	2.996	SD	0.635
Coefficient of Variation	0.686		
Skewness	1.416		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.834	Shapiro Wilk Test Statistic	0.969
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	12.56	95% UTL with 95% Coverage	20.51
95% UPL (t)	9.966	95% UPL (t)	11.83
90% Percentile (z)	8.206	90% Percentile (z)	8.147
95% Percentile (z)	9.294	95% Percentile (z)	10.26
99% Percentile (z)	11.34	99% Percentile (z)	15.81

Gamma Distribution Test		Data Distribution Test
k star	2.149	Data appear Gamma Distributed at 5% Significance Level
Theta Star	2.032	
MLE of Mean	4.367	
MLE of Standard Deviation	2.979	
nu star	51.58	
A-D Test Statistic	0.394	Nonparametric Statistics
5% A-D Critical Value	0.74	90% Percentile 8.95
K-S Test Statistic	0.197	95% Percentile 10.07
5% K-S Critical Value	0.248	99% Percentile 10.81
Data appear Gamma Distributed at 5% Significance Level		

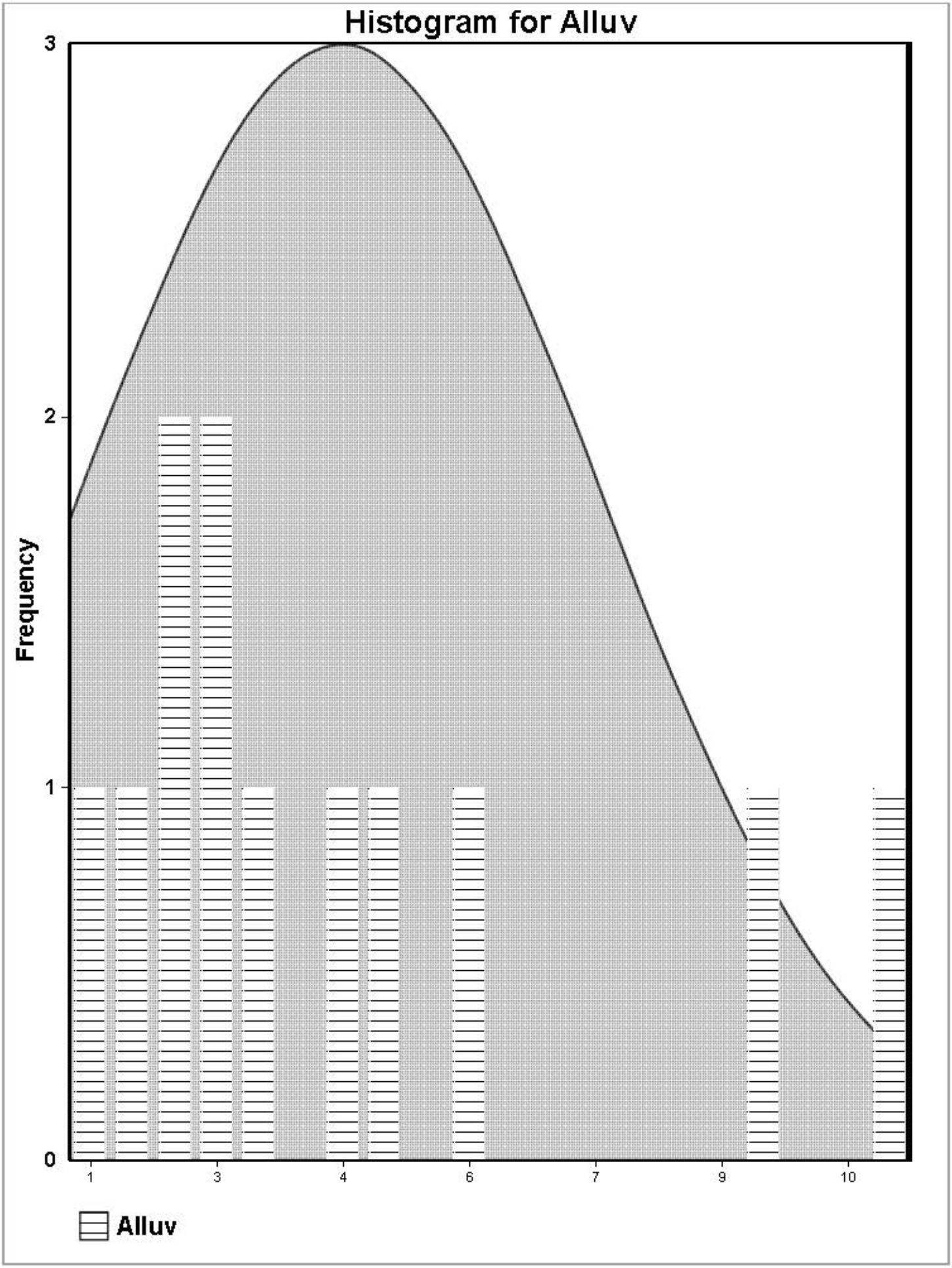
Assuming Gamma Distribution		95% UTL with 95% Coverage	11
90% Percentile	8.351	95% Percentile Bootstrap UTL with 95% Coverage	11
95% Percentile	10.13	95% BCA Bootstrap UTL with 95% Coverage	11
99% Percentile	14.05	95% UPL	11
		95% Chebyshev UPL	17.96
95% WH Approx. Gamma UPL	10.69	Upper Threshold Limit Based upon IQR	8.763
95% HW Approx. Gamma UPL	10.89		
95% WH Approx. Gamma UTL with 95% Coverage	15.59		
95% HW Approx. Gamma UTL with 95% Coverage	16.4		

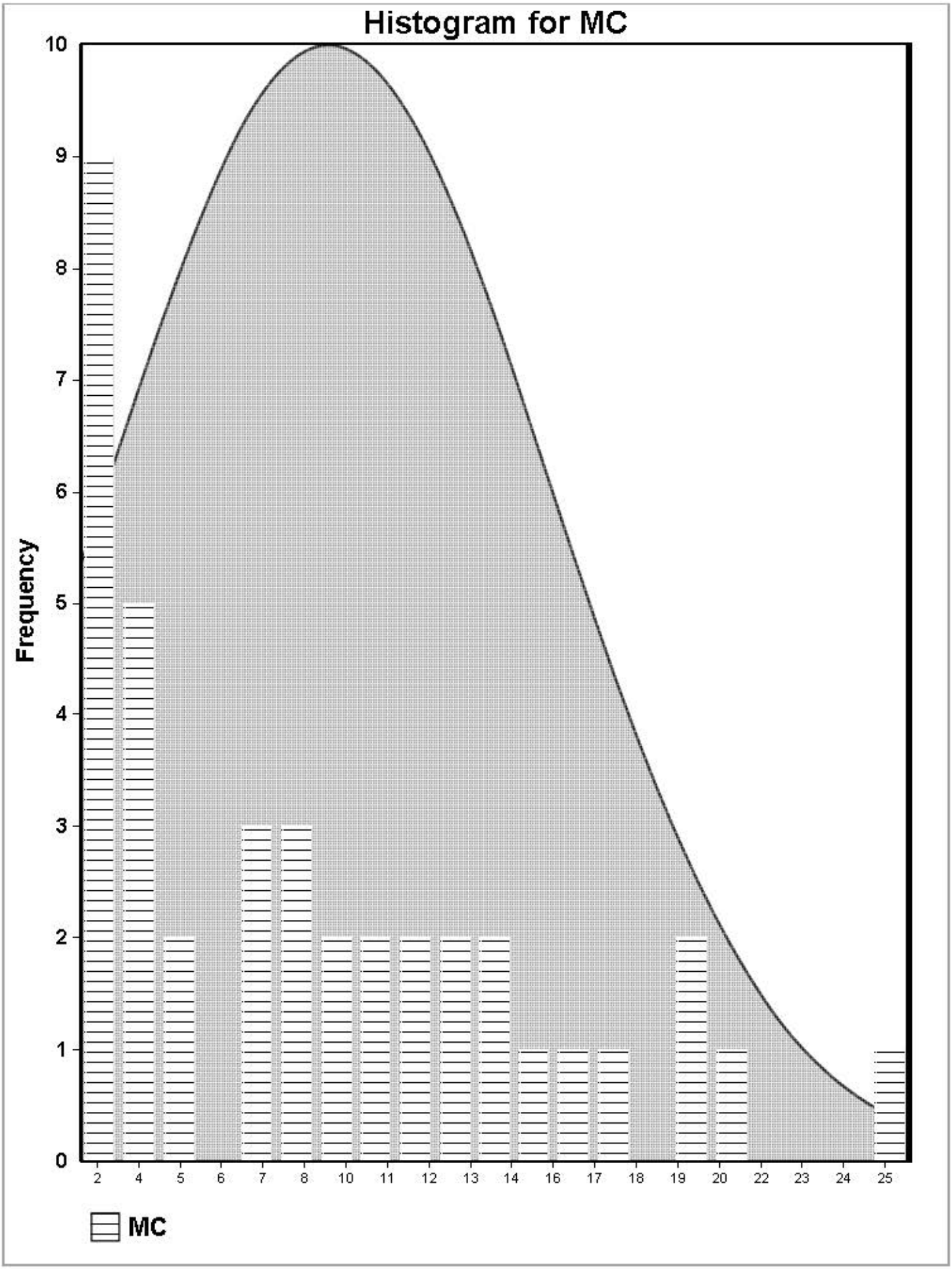
MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	33
Raw Statistics		**Log-Transformed Statistics**	
Minimum	1.9	Minimum	0.642
Maximum	26	Maximum	3.258
Second Largest	22	Second Largest	3.091
First Quartile	3.25	First Quartile	1.179
Median	8.3	Median	2.116
Third Quartile	13	Third Quartile	2.565
Mean	9.121	Mean	1.939
SD	6.442	SD	0.778
Coefficient of Variation	0.706		
Skewness	0.809		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.897	Shapiro Wilk Test Statistic	0.927
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	22.81	95% UTL with 95% Coverage	36.28
95% UPL (t)	20.12	95% UPL (t)	26.23
90% Percentile (z)	17.38	90% Percentile (z)	18.83
95% Percentile (z)	19.72	95% Percentile (z)	24.98
99% Percentile (z)	24.11	99% Percentile (z)	42.44
Gamma Distribution Test		**Data Distribution Test**	
k star	1.856	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	4.915		
MLE of Mean	9.121		
MLE of Standard Deviation	6.696		
nu star	144.7		
A-D Test Statistic	0.816	**Nonparametric Statistics**	
5% A-D Critical Value	0.759	90% Percentile	18.4
K-S Test Statistic	0.142	95% Percentile	20.2
5% K-S Critical Value	0.143	99% Percentile	24.48

Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	26
90% Percentile	18.06	95% Percentile Bootstrap UTL with 95% Coverage	26
95% Percentile	22.16	95% BCA Bootstrap UTL with 95% Coverage	22.4
99% Percentile	31.29	95% UPL	22
		95% Chebyshev UPL	37.56
95% WH Approx. Gamma UPL	22.56	Upper Threshold Limit Based upon IQR	27.63
95% HW Approx. Gamma UPL	23.21		
95% WH Approx. Gamma UTL with 95% Coverage	27.93		
95% HW Approx. Gamma UTL with 95% Coverage	29.32		


Histogram for Alluv
Frequency
3
2
1
0
1
3
4
6
7
9
10
Alluv


Histogram for MC
Frequency
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2
3
4
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9
10
2
4
5
6
7
8
10
11
12
13
14
16
17
18
19
20
22
23
24
25
MC

Location	Alluv
BG-1-2	11
BG-1-10	4.2
BG-1-29	5.8
BG-1-40	2.9
BG-2-2	2.5
BG-2-10	1.9
BG-2-19	3.2
BG-2-21	1.2
BG-3-2	3
BG-3-10	9.3
BG-6-2	4.8
BG-6-9	2.6

Location	MC
BG-1-43	12
BG-1-46	3.3
BG-1-55	2.1
BG-1-78	20
BG-1-92	2.7
BG-2-30	16
BG-2-32	2.9
BG-2-75	3
BG-2-81	22
BG-3-17	4.4
BG-3-22	3
BG-3-29	3.5
BG-3-63	4.3
BG-3-65	7.1
BG-3-69	11
BG-3-95	2.5
BG-3-105	7.3
BG-3-131	2.2
BG-3-136	17
BG-4-1	8.3
BG-4-10	11
BG-4-19	20
BG-4-40	14
BG-4-65	3.2
BG-4-79	14
BG-4-82	8.4
BG-4-95	2.6
BG-4-117	1.9
BG-4-120	12
BG-4-161	7
BG-4-163	13
BG-6-28	13
BG-6-53	10
BG-6-58	3.8
BG-6-75	4.6
BG-6-87	26
BG-6-98	8.8
BG-6-114	9.8
BG-1-127	18
Average	9.120512821

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Hex Chrome.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	8	43	84.31%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	43	2	2.5	2.2	2.2	0.189
Statistics (Detects Only)	8	0.92	1.8	1.265	1.25	0.279
Statistics (All: NDs treated as DL value)	51	0.92	2.5	2.053	2	0.399
Statistics (All: NDs treated as DL/2 value)	51	0.92	1.8	1.126	1.15	0.149
Statistics (Normal ROS Estimated Data)	51	0.724	1.806	1.265	1.265	0.263
Statistics (Gamma ROS Estimated Data)	51	0.604	1.8	1.263	1.3	0.251
Statistics (Lognormal ROS Estimated Data)	51	0.812	1.893	1.265	1.239	0.262

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	24.67	23.23	0.0513	0.215	0.214	0.998
Statistics (NDs = DL)	20.95	19.73	0.098	0.695	0.238	0.342
Statistics (NDs = DL/2)	66.17	62.29	0.017	0.111	0.121	1.091
Statistics (Gamma ROS Estimates)	22.53	21.22	0.056	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.215	0.205	0.957

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.969	0.898	0.88	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.944	0.818	Data Appear Normal
Lilliefors (Detects Only)	0.189	0.313	Data Appear Normal
Lilliefors (NDs = DL)	0.29	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.194	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0609	0.124	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.981	0.86	0.899	0.963

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.205	0.716	
Kolmogorov-Smirnov (Detects Only)	0.156	0.294	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	4.584	0.748	
Kolmogorov-Smirnov (NDs = DL)	0.324	0.124	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.58	0.748	
Kolmogorov-Smirnov (NDs = DL/2)	0.209	0.124	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.091	0.748	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.129	0.124	Data Not Gamma Distributed	

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.986	0.853	0.912	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.973	0.818	Data Appear Lognormal
Lilliefors (Detects Only)	0.16	0.313	Data Appear Lognormal
Lilliefors (NDs = DL)	0.339	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.212	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0612	0.124	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Hex Chrome.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Number of Valid Data	51	Number of Detected Data	8
Number of Distinct Detected Data	7	Number of Non-Detect Data	43
		Percent Non-Detects	84.31%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.92	Minimum Detected	-0.0834
Maximum Detected	1.8	Maximum Detected	0.588
Mean of Detected	1.265	Mean of Detected	0.215
SD of Detected	0.279	SD of Detected	0.214
Minimum Non-Detect	2	Minimum Non-Detect	0.693
Maximum Non-Detect	2.5	Maximum Non-Detect	0.916

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	51
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 8 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.944	Shapiro Wilk Test Statistic	0.973
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.126	Mean (Log Scale)	0.111
SD	0.149	SD (Log Scale)	0.121
95% UTL 95% Coverage	1.431	95% UTL 95% Coverage	1.433
95% UPL (t)	1.377	95% UPL (t)	1.372
90% Percentile (z)	1.316	90% Percentile (z)	1.305
95% Percentile (z)	1.37	95% Percentile (z)	1.364
99% Percentile (z)	1.471	99% Percentile (z)	1.481

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	1.265
		SD in Original Scale	0.262
		Mean in Log Scale	0.215
		SD in Log Scale	0.205
		95% UTL 95% Coverage	1.89
		95% UPL (t)	1.754
		90% Percentile (z)	1.613
		95% Percentile (z)	1.737
		99% Percentile (z)	1.998
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	15.5	Data appear Normal at 5% Significance Level	
Theta Star	0.0816		
nu star	248		
A-D Test Statistic	0.205	Nonparametric Statistics	
5% A-D Critical Value	0.716	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.156	Mean	1.265
5% K-S Critical Value	0.294	SD	0.261
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0986
		95% KM UTL with 95% Coverage	1.801
Assuming Gamma Distribution		95% KM Chebyshev UPL	2.413
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.707
Mean	1.263	90% Percentile (z)	1.599
Median	1.3	95% Percentile (z)	1.694
SD	0.251	99% Percentile (z)	1.872
k star	21.22		
Theta star	0.0595	Gamma ROS Limits with Extrapolated Data	
Nu star	2164	95% Wilson Hilferty (WH) Approx. Gamma UPL	1.751
95% Percentile of Chisquare (2k)	58.64	95% Hawkins Wixley (HW) Approx. Gamma UPL	1.762
		95% WH Approx. Gamma UTL with 95% Coverage	1.875
90% Percentile	1.624	95% HW Approx. Gamma UTL with 95% Coverage	1.891
95% Percentile	1.745		
99% Percentile	1.986		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Hex Chrome.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for All Data

Mean	1.126
Standard Deviation	0.149
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.126	0.147	1.8	23	4.583	3.137	3.488

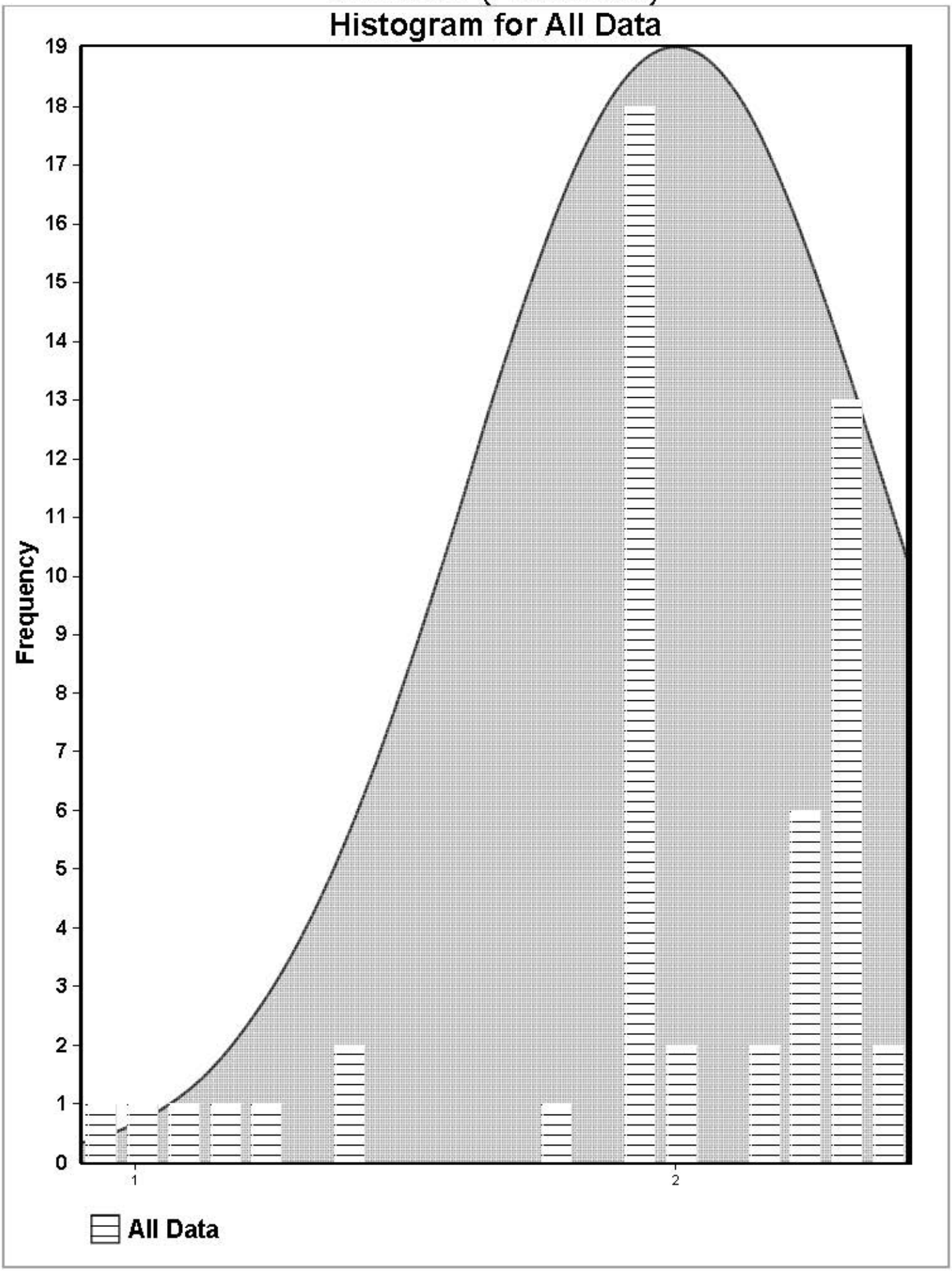
For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1.8 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1.8 is a Potential Statistical Outlier

Chromium (Hexavalent)



Location	All Data	D_All Data
BG-1-2	2	0
BG-4-2	2.1	0
BG-4-19	2.4	0
BG-1-10	1.1	1
BG-2-2	2	0
BG-2-10	2	0
BG-2-19	2	0
BG-3-2	1.3	1
BG-3-10	1.4	1
BG-4-10	2.2	0
BG-6-2	2	0
BG-6-9	2	0
BG-3-17	2.1	0
BG-1-29	0.92	1
BG-1-40	2	0
BG-1-46	2	0
BG-1-92	1.4	1
BG-2-21	2	0
BG-2-32	2	0
BG-2-75	2	0
BG-3-29	2	0
BG-3-63	2.5	0
BG-3-65	1.8	1
BG-3-95	2.3	0
BG-3-105	2.4	0
BG-3-131	2.2	0
BG-3-136	1	1
BG-4-65	2	0
BG-4-82	2.4	0
BG-4-95	2.4	0
BG-4-117	2.4	0
BG-4-120	2.4	0
BG-6-58	2.4	0
BG-6-75	2.4	0
BG-6-98	2.4	0
BG-6-114	2.4	0
BG-6-127	2.4	0
BG-1-43	2	0
BG-1-55	2	0
BG-1-78	2	0
BG-2-30	2	0
BG-2-81	2	0
BG-3-22	1.2	1
BG-3-69	2.3	0
BG-4-40	2.3	0
BG-4-79	2.3	0
BG-4-161	2.4	0
BG-4-163	2.3	0
BG-6-28	2.3	0
BG-6-53	2.4	0
BG-6-87	2.5	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Hex Chrome.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	3	10	76.92%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	10	2	2.4	2.08	2	0.132
Statistics (Detects Only)	3	1.1	1.4	1.267	1.3	0.153
Statistics (All: NDs treated as DL value)	13	1.1	2.4	1.892	2	0.38
Statistics (All: NDs treated as DL/2 value)	13	1	1.4	1.092	1.05	0.13
Statistics (Normal ROS Estimated Data)	13	1.029	1.504	1.267	1.267	0.133
Statistics (Gamma ROS Estimated Data)	13	1.000E-12	1.4	0.292	1.000E-12	0.559
Statistics (Lognormal ROS Estimated Data)	13	1.041	1.525	1.267	1.26	0.135

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	100	77	0.0127	0.231	0.124	0.534
Statistics (NDs = DL)	22.54	17.39	0.084	0.615	0.231	0.375
Statistics (NDs = DL/2)	83.03	63.92	0.0132	0.0823	0.112	1.36
Statistics (Gamma ROS Estimates)	0.0443	0.0853	6.601	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.231	0.107	0.463

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.982	0.895	0.871	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.964	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.253	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.808	0.866	Data Not Normal
Lilliefors (NDs = DL)	0.381	0.246	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.757	0.866	Data Not Normal
Lilliefors (NDs = DL/2)	0.246	0.246	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.987	0.866	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.115	0.246	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.869	0.892	0.765

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	1.549	0.733	
Kolmogorov-Smirnov (NDs = DL)	0.4	0.236	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	1.282	0.732	
Kolmogorov-Smirnov (NDs = DL/2)	0.241	0.236	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.147	1.063	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.492	0.285	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.976	0.87	0.883	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.953	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.266	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.765	0.866	Data Not Lognormal
Lilliefors (NDs = DL)	0.401	0.246	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.773	0.866	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.233	0.246	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.986	0.866	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.115	0.246	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

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	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	38	0	38	5	33	86.84%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	33	2	2.5	2.236	2.3	0.19
Statistics (Detects Only)	5	0.92	1.8	1.264	1.2	0.353
Statistics (All: NDs treated as DL value)	38	0.92	2.5	2.108	2.3	0.395
Statistics (All: NDs treated as DL/2 value)	38	0.92	1.8	1.137	1.15	0.154
Statistics (Normal ROS Estimated Data)	38	0.613	1.915	1.264	1.242	0.349
Statistics (Gamma ROS Estimated Data)	38	0.508	1.8	1.252	1.295	0.331
Statistics (Lognormal ROS Estimated Data)	38	0.741	2.033	1.271	1.214	0.346

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	17.03	15.71	0.0742	0.205	0.269	1.315
Statistics (NDs = DL)	21.74	20.04	0.097	0.723	0.237	0.328
Statistics (NDs = DL/2)	63.49	58.5	0.0179	0.121	0.124	1.026
Statistics (Gamma ROS Estimates)	12.1	11.16	0.103	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.205	0.27	1.32

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.968	0.872	0.859	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.932	0.762	Data Appear Normal
Lilliefors (Detects Only)	0.173	0.396	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.76	0.938	Data Not Normal
Lilliefors (NDs = DL)	0.26	0.144	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.766	0.938	Data Not Normal

Lilliefors (NDs = DL/2)	0.237	0.144	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.972	0.938	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.067	0.144	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.988	0.831	0.876	0.955

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.243	0.679	
Kolmogorov-Smirnov (Detects Only)	0.202	0.357	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	3.936	0.747	
Kolmogorov-Smirnov (NDs = DL)	0.3	0.143	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.363	0.746	
Kolmogorov-Smirnov (NDs = DL/2)	0.213	0.143	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.883	0.748	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.122	0.143	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.985	0.819	0.896	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.96	0.762	Data Appear Lognormal
Lilliefors (Detects Only)	0.177	0.396	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.678	0.938	Data Not Lognormal
Lilliefors (NDs = DL)	0.319	0.144	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.825	0.938	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.205	0.144	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.972	0.938	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0674	0.144	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Hex Chrome.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Number of Valid Data	13	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	10
		Percent Non-Detects	76.92%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.1	Minimum Detected	0.0953
Maximum Detected	1.4	Maximum Detected	0.336
Mean of Detected	1.267	Mean of Detected	0.231
SD of Detected	0.153	SD of Detected	0.124
Minimum Non-Detect	2	Minimum Non-Detect	0.693
Maximum Non-Detect	2.4	Maximum Non-Detect	0.875

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	13
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.964	Shapiro Wilk Test Statistic	0.953
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.092	Mean (Log Scale)	0.0823
SD	0.13	SD (Log Scale)	0.112
95% UTL 95% Coverage	1.441	95% UTL 95% Coverage	1.464
95% UPL (t)	1.334	95% UPL (t)	1.335
90% Percentile (z)	1.259	90% Percentile (z)	1.253
95% Percentile (z)	1.307	95% Percentile (z)	1.305

99% Percentile (z)	1.396	99% Percentile (z)	1.409
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	1.267
		SD in Original Scale	0.135
		Mean in Log Scale	0.231
		SD in Log Scale	0.107
		95% UTL 95% Coverage	1.678
		95% UPL (t)	1.537
		90% Percentile (z)	1.446
		95% Percentile (z)	1.503
		99% Percentile (z)	1.617
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	1.267
5% K-S Critical Value	N/A	SD	0.125
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0882
		95% KM UTL with 95% Coverage	1.6
Assuming Gamma Distribution		95% KM Chebyshev UPL	1.831
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.497
Mean	N/A	90% Percentile (z)	1.427
Median	N/A	95% Percentile (z)	1.472
SD	N/A	99% Percentile (z)	1.557
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

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General Statistics

Number of Valid Data	38	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	33
		Percent Non-Detects	86.84%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.92	Minimum Detected	-0.0834
Maximum Detected	1.8	Maximum Detected	0.588
Mean of Detected	1.264	Mean of Detected	0.205
SD of Detected	0.353	SD of Detected	0.269

Minimum Non-Detect	2	Minimum Non-Detect	0.693
Maximum Non-Detect	2.5	Maximum Non-Detect	0.916

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	38
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 5 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.932	Shapiro Wilk Test Statistic	0.96
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.137	Mean (Log Scale)	0.121
SD	0.154	SD (Log Scale)	0.124
95% UTL 95% Coverage	1.466	95% UTL 95% Coverage	1.47
95% UPL (t)	1.401	95% UPL (t)	1.395
90% Percentile (z)	1.335	90% Percentile (z)	1.323
95% Percentile (z)	1.391	95% Percentile (z)	1.384
99% Percentile (z)	1.496	99% Percentile (z)	1.506
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	1.271
		SD in Original Scale	0.346
		Mean in Log Scale	0.205
		SD in Log Scale	0.27
		95% UTL 95% Coverage	2.182
		95% UPL (t)	1.947
		90% Percentile (z)	1.735
		95% Percentile (z)	1.913
		99% Percentile (z)	2.3
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	6.947	Data appear Normal at 5% Significance Level	
Theta Star	0.182		
nu star	69.47		
A-D Test Statistic	0.243	Nonparametric Statistics	
5% A-D Critical Value	0.679	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.202	Mean	1.264
5% K-S Critical Value	0.357	SD	0.316
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.158
		95% KM UTL with 95% Coverage	1.937

Assuming Gamma Distribution		95% KM Chebyshev UPL	2.658
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.803
Mean	1.252	90% Percentile (z)	1.668
Median	1.295	95% Percentile (z)	1.783
SD	0.331	99% Percentile (z)	1.998
k star	11.16		
Theta star	0.112	Gamma ROS Limits with Extrapolated Data	
Nu star	848.4	95% Wilson Hilferty (WH) Approx. Gamma UPL	1.939
95% Percentile of Chisquare (2k)	34.33	95% Hawkins Wixley (HW) Approx. Gamma UPL	1.962
		95% WH Approx. Gamma UTL with 95% Coverage	2.153
90% Percentile	1.75	95% HW Approx. Gamma UTL with 95% Coverage	2.19
95% Percentile	1.926		
99% Percentile	2.284		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Hex Chrome.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 1.4 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.500

For 10% significance level, 1.4 is an outlier.
For 5% significance level, 1.4 is not an outlier.
For 1% significance level, 1.4 is not an outlier.

2. Data Value 1 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.000

For 10% significance level, 1 is not an outlier.
For 5% significance level, 1 is not an outlier.
For 1% significance level, 1 is not an outlier.

Rosner's Outlier Test for >20

Mean	1.137
Standard Deviation	0.154
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.137	0.152	1.8	10	4.356	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1.8 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1.8 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Hex Chrome.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Data	38	13
Number of Non-Detect Data	33	10
Number of Detect Data	5	3
Minimum Non-Detect	2	2
Maximum Non-Detect	2.5	2.4
Percent Non detects	86.84%	76.92%
Minimum Detected	0.92	1.1
Maximum Detected	1.8	1.4
Mean of Detected Data	1.264	1.267
Median of Detected Data	1.2	1.3
SD of Detected Data	0.353	0.153

Site vs Background Gehan Test

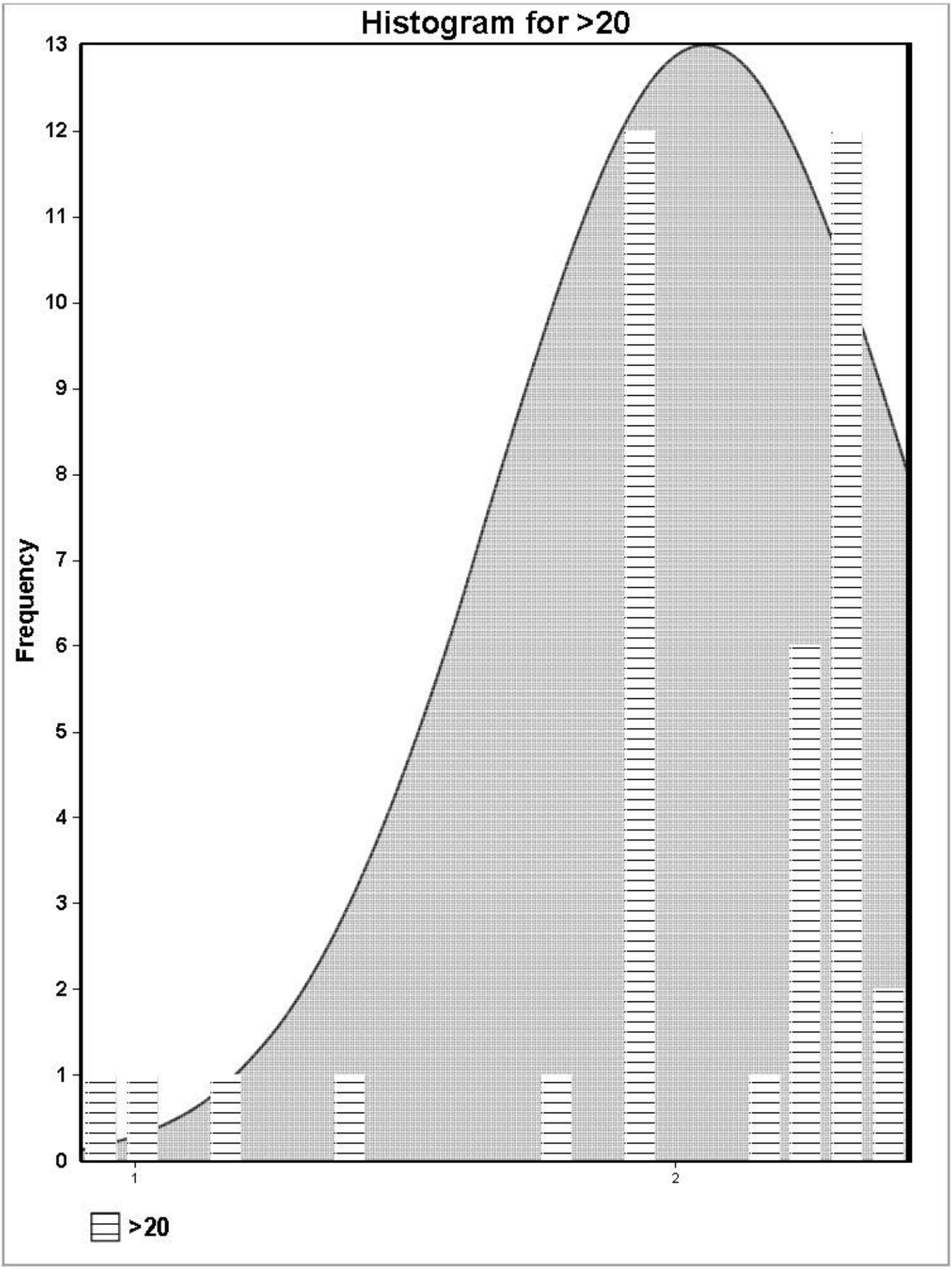
H0: Mu of Site or AOC = Mu of background

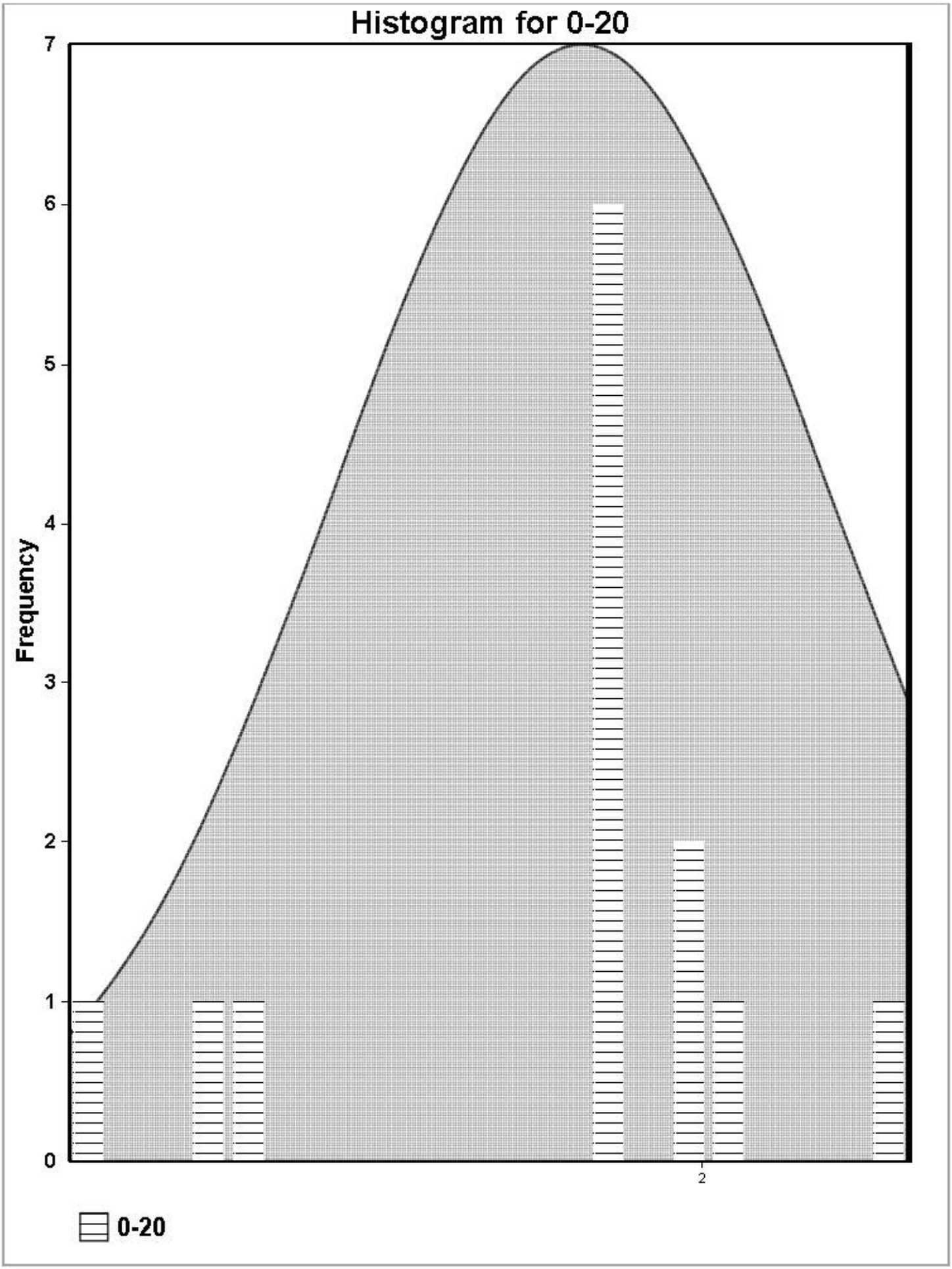
Gehan z Test Value	-0.526
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.599

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
1
2
>20


Histogram for 0-20
Frequency
7
6
5
4
3
2
1
0
2
0-20

Location	0-20	D_0-20
BG-1-2	2	0
BG-4-2	2.1	0
BG-4-19	2.4	0
BG-1-10	1.1	1
BG-2-2	2	0
BG-2-10	2	0
BG-2-19	2	0
BG-3-2	1.3	1
BG-3-10	1.4	1
BG-4-10	2.2	0
BG-6-2	2	0
BG-6-9	2	0
BG-3-17	2.1	0

Location	>20	D_>20
BG-1-29	0.92	1
BG-1-40	2	0
BG-1-46	2	0
BG-1-92	1.4	1
BG-2-21	2	0
BG-2-32	2	0
BG-2-75	2	0
BG-3-29	2	0
BG-3-63	2.5	0
BG-3-65	1.8	1
BG-3-95	2.3	0
BG-3-105	2.4	0
BG-3-131	2.2	0
BG-3-136	1	1
BG-4-65	2	0
BG-4-82	2.4	0
BG-4-95	2.4	0
BG-4-117	2.4	0
BG-4-120	2.4	0
BG-6-58	2.4	0
BG-6-75	2.4	0
BG-6-98	2.4	0
BG-6-114	2.4	0
BG-6-127	2.4	0
BG-1-43	2	0
BG-1-55	2	0
BG-1-78	2	0
BG-2-30	2	0
BG-2-81	2	0
BG-3-22	1.2	1
BG-3-69	2.3	0
BG-4-40	2.3	0
BG-4-79	2.3	0
BG-4-161	2.4	0
BG-4-163	2.3	0
BG-6-28	2.3	0
BG-6-53	2.4	0
BG-6-87	2.5	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Hex Chrome.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	1	17	94.44%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Clay was not processed!

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	7	26	78.79%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	26	2	2.5	2.2	2.2	0.198
Statistics (Detects Only)	7	0.92	1.8	1.274	1.3	0.3
Statistics (All: NDs treated as DL value)	33	0.92	2.5	2.004	2	0.442
Statistics (All: NDs treated as DL/2 value)	33	0.92	1.8	1.137	1.1	0.173
Statistics (Normal ROS Estimated Data)	33	0.752	1.8	1.274	1.274	0.279
Statistics (Gamma ROS Estimated Data)	33	0.658	1.8	1.273	1.327	0.269
Statistics (Lognormal ROS Estimated Data)	33	0.828	1.873	1.274	1.245	0.278

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	21.81	19.85	0.0584	0.219	0.231	1.053
Statistics (NDs = DL)	16.66	15.17	0.12	0.665	0.267	0.402
Statistics (NDs = DL/2)	51.04	46.42	0.0223	0.119	0.138	1.168
Statistics (Gamma ROS Estimates)	20.43	18.59	0.0623	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.219	0.217	0.99

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.968	0.909	0.882	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.939	0.803	Data Appear Normal
Lilliefors (Detects Only)	0.195	0.335	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.818	0.931	Data Not Normal
Lilliefors (NDs = DL)	0.285	0.154	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.797	0.931	Data Not Normal
Lilliefors (NDs = DL/2)	0.211	0.154	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.974	0.931	Data Appear Normal

Lilliefors (Normal ROS Estimates)	0.0512	0.154	Data Appear Normal	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.979	0.869	0.904	0.97

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.256	0.707	
Kolmogorov-Smirnov (Detects Only)	0.16	0.311	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.832	0.746	
Kolmogorov-Smirnov (NDs = DL)	0.318	0.153	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.834	0.745	
Kolmogorov-Smirnov (NDs = DL/2)	0.227	0.153	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.644	0.746	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.154	0.153	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.981	0.873	0.914	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.959	0.803	Data Appear Lognormal
Lilliefors (Detects Only)	0.163	0.335	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.759	0.931	Data Not Lognormal
Lilliefors (NDs = DL)	0.33	0.154	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.848	0.931	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.228	0.154	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.977	0.931	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0482	0.154	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Hex Chrome.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Number of Valid Data	18	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	17

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Clay was not processed!

Non-Clay

General Statistics

Number of Valid Data	33	Number of Detected Data	7
Number of Distinct Detected Data	6	Number of Non-Detect Data	26
		Percent Non-Detects	78.79%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.92	Minimum Detected	-0.0834
Maximum Detected	1.8	Maximum Detected	0.588
Mean of Detected	1.274	Mean of Detected	0.219
SD of Detected	0.3	SD of Detected	0.231
Minimum Non-Detect	2	Minimum Non-Detect	0.693
Maximum Non-Detect	2.5	Maximum Non-Detect	0.916

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	33
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 7 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.939	Shapiro Wilk Test Statistic	0.959

5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.137	Mean (Log Scale)	0.119
SD	0.173	SD (Log Scale)	0.138
95% UTL 95% Coverage	1.512	95% UTL 95% Coverage	1.522
95% UPL (t)	1.434	95% UPL (t)	1.428
90% Percentile (z)	1.358	90% Percentile (z)	1.344
95% Percentile (z)	1.421	95% Percentile (z)	1.414
99% Percentile (z)	1.538	99% Percentile (z)	1.554
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	1.274
		SD in Original Scale	0.278
		Mean in Log Scale	0.219
		SD in Log Scale	0.217
		95% UTL 95% Coverage	1.997
		95% UPL (t)	1.809
		90% Percentile (z)	1.645
		95% Percentile (z)	1.78
		99% Percentile (z)	2.064
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	12.56	Data appear Normal at 5% Significance Level	
Theta Star	0.101		
nu star	175.8		
A-D Test Statistic	0.256	Nonparametric Statistics	
5% A-D Critical Value	0.707	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.16	Mean	1.274
5% K-S Critical Value	0.311	SD	0.278
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.113
		95% KM UTL with 95% Coverage	1.879
Assuming Gamma Distribution		95% KM Chebyshev UPL	2.503
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.752
Mean	1.273	90% Percentile (z)	1.63
Median	1.327	95% Percentile (z)	1.731
SD	0.269	99% Percentile (z)	1.92
k star	18.59		
Theta star	0.0685	Gamma ROS Limits with Extrapolated Data	
Nu star	1227	95% Wilson Hilferty (WH) Approx. Gamma UPL	1.805
95% Percentile of Chisquare (2k)	52.41	95% Hawkins Wixley (HW) Approx. Gamma UPL	1.817
		95% WH Approx. Gamma UTL with 95% Coverage	1.975
90% Percentile	1.663	95% HW Approx. Gamma UTL with 95% Coverage	1.995
95% Percentile	1.795		
99% Percentile	2.059		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Hex Chrome.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18
10% critical value: 0.424
5% critical value: 0.475
1% critical value: 0.561

1. Data Value 1.25 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.200

For 10% significance level, 1.25 is not an outlier.
For 5% significance level, 1.25 is not an outlier.
For 1% significance level, 1.25 is not an outlier.

2. Data Value 1 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.000

For 10% significance level, 1 is not an outlier.
For 5% significance level, 1 is not an outlier.
For 1% significance level, 1 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	1.137
Standard Deviation	0.173
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.137	0.17	1.8	16	3.903	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1.8 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1.8 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Hex Chrome.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Data	33	18
Number of Non-Detect Data	26	17
Number of Detect Data	7	1
Minimum Non-Detect	2	2
Maximum Non-Detect	2.5	2.5
Percent Non detects	78.79%	94.44%
Minimum Detected	0.92	1.2
Maximum Detected	1.8	1.2
Mean of Detected Data	1.274	1.2
Median of Detected Data	1.3	1.2
SD of Detected Data	0.3	N/A

Site vs Background Gehan Test

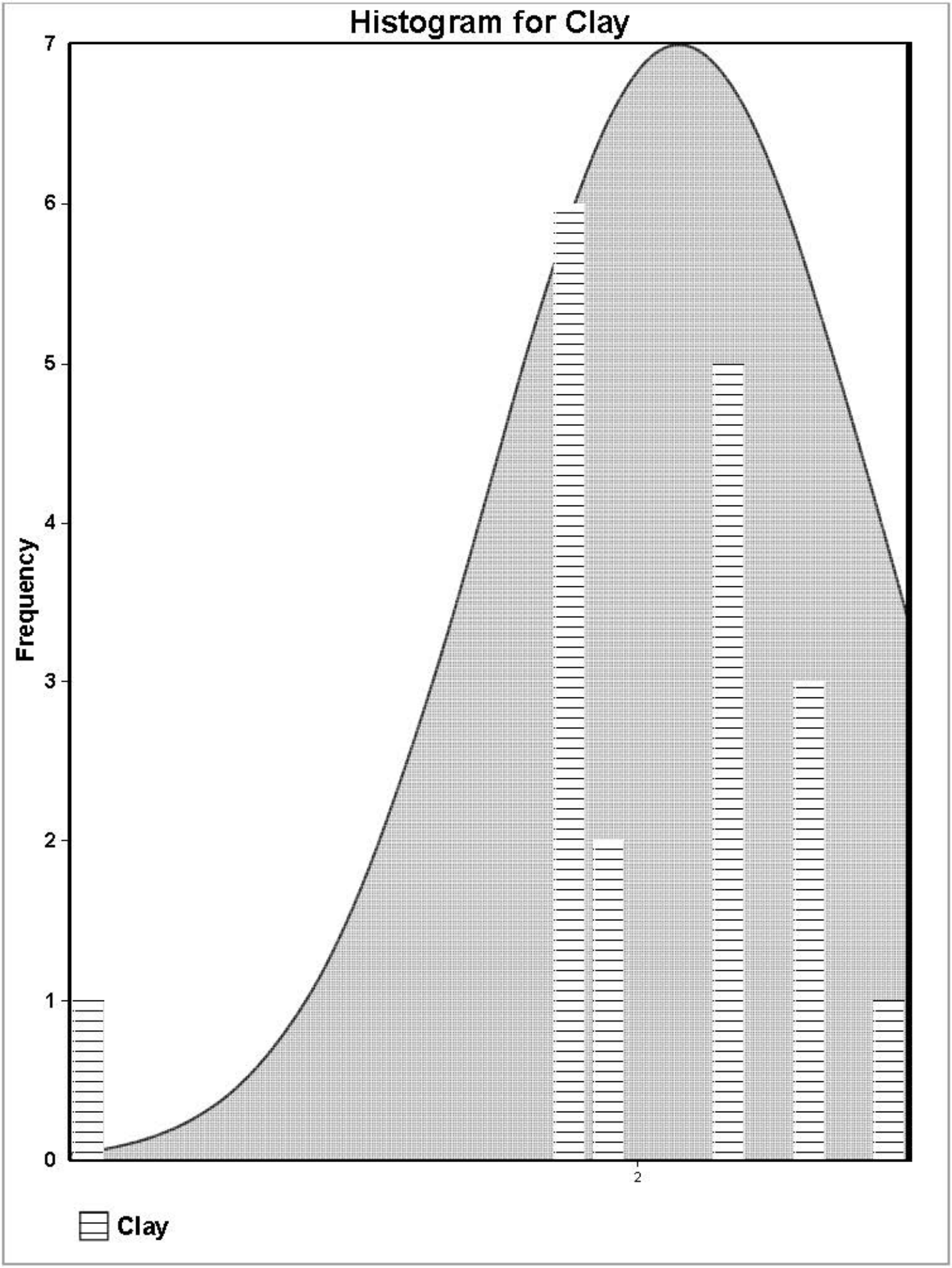
H0: Mu of Site or AOC = Mu of background

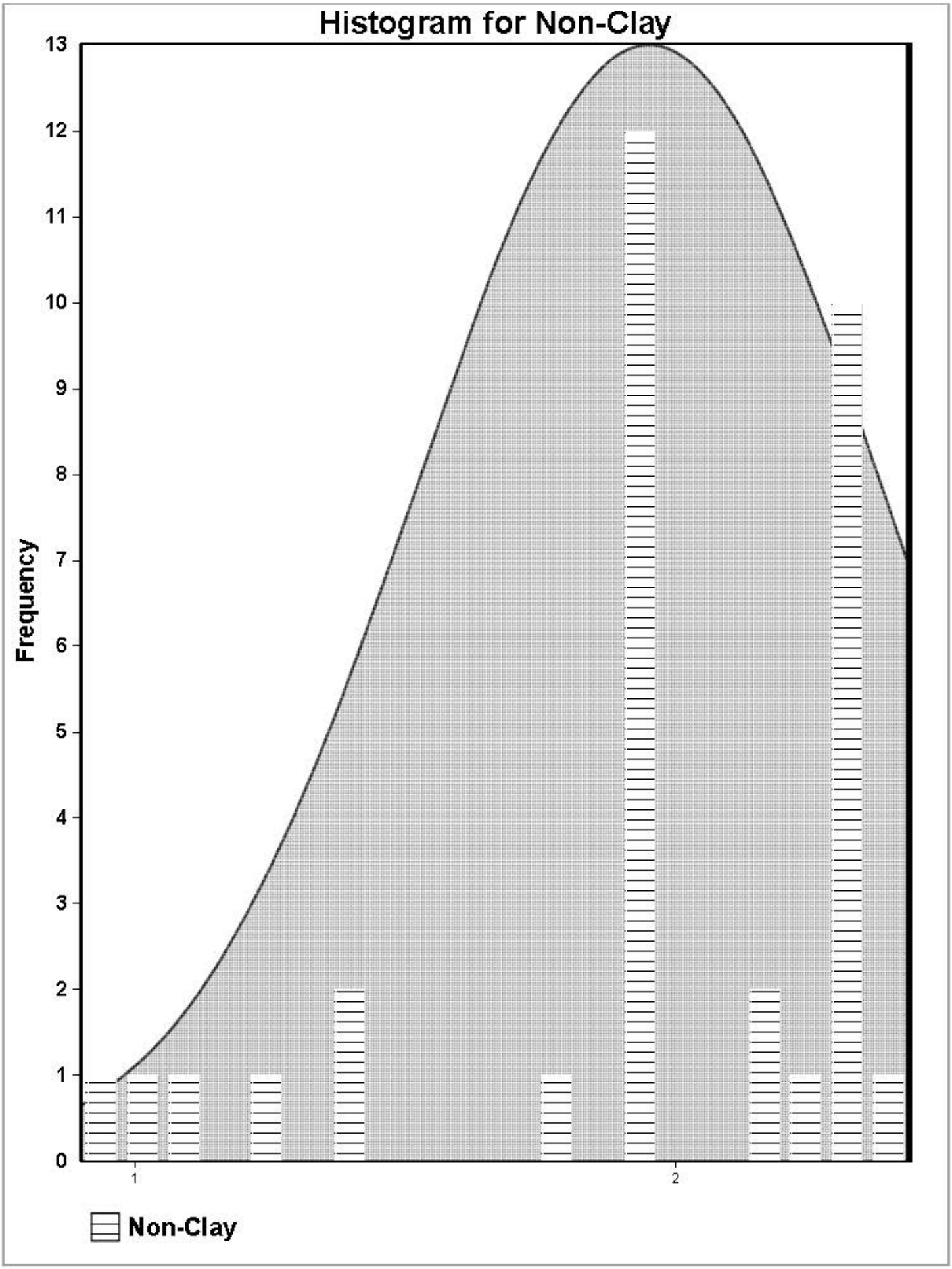
Gehan z Test Value	0.16
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.873

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
5
6
7
2
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
1
2
Non-Clay

Location	Clay	D_Clay
BG-1-2	2	0
BG-1-43	2	0
BG-1-55	2	0
BG-1-78	2	0
BG-2-30	2	0
BG-2-81	2	0
BG-3-17	2.1	0
BG-3-22	1.2	1
BG-3-69	2.3	0
BG-4-2	2.1	0
BG-4-19	2.4	0
BG-4-40	2.3	0
BG-4-79	2.3	0
BG-4-161	2.4	0
BG-4-163	2.3	0
BG-6-28	2.3	0
BG-6-53	2.4	0
BG-6-87	2.5	0

Location	Non-Clay	D_Non-Clay
BG-1-10	1.1	1
BG-1-29	0.92	1
BG-1-40	2	0
BG-1-46	2	0
BG-1-92	1.4	1
BG-2-2	2	0
BG-2-10	2	0
BG-2-19	2	0
BG-2-21	2	0
BG-2-32	2	0
BG-2-75	2	0
BG-3-2	1.3	1
BG-3-10	1.4	1
BG-3-29	2	0
BG-3-63	2.5	0
BG-3-65	1.8	1
BG-3-95	2.3	0
BG-3-105	2.4	0
BG-3-131	2.2	0
BG-3-136	1	1
BG-4-10	2.2	0
BG-4-65	2	0
BG-4-82	2.4	0
BG-4-95	2.4	0
BG-4-117	2.4	0
BG-4-120	2.4	0
BG-6-2	2	0
BG-6-9	2	0
BG-6-58	2.4	0
BG-6-75	2.4	0
BG-6-98	2.4	0
BG-6-114	2.4	0
BG-6-127	2.4	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Hex Chrome.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	4	8	66.67%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	8	2	2	2	2	0
Statistics (Detects Only)	4	0.92	1.4	1.18	1.2	0.214
Statistics (All: NDs treated as DL value)	12	0.92	2	1.727	2	0.419
Statistics (All: NDs treated as DL/2 value)	12	0.92	1.4	1.06	1	0.142
Statistics (Normal ROS Estimated Data)	12	0.821	1.539	1.18	1.18	0.22
Statistics (Gamma ROS Estimated Data)	12	0.751	1.449	1.171	1.209	0.22
Statistics (Lognormal ROS Estimated Data)	12	0.852	1.592	1.185	1.166	0.225

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	39.16	29.42	0.0301	0.153	0.187	1.224
Statistics (NDs = DL)	15.23	11.48	0.113	0.513	0.283	0.553
Statistics (NDs = DL/2)	67.99	51.05	0.0156	0.0509	0.123	2.421
Statistics (Gamma ROS Estimates)	28.24	21.24	0.0415	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.153	0.192	1.255

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.987	0.835	0.807	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.965	0.748	Data Appear Normal
Lilliefors (Detects Only)	0.213	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.685	0.859	Data Not Normal
Lilliefors (NDs = DL)	0.41	0.256	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.668	0.859	Data Not Normal
Lilliefors (NDs = DL/2)	0.413	0.256	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.976	0.859	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.124	0.256	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.975	0.783	0.833	0.959

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.26	0.656	
Kolmogorov-Smirnov (Detects Only)	0.248	0.394	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.898	0.731	
Kolmogorov-Smirnov (NDs = DL)	0.416	0.245	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	2.015	0.73	
Kolmogorov-Smirnov (NDs = DL/2)	0.418	0.245	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.365	0.731	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.161	0.245	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.982	0.836	0.821	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.956	0.748	Data Appear Lognormal
Lilliefors (Detects Only)	0.221	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.691	0.859	Data Not Lognormal
Lilliefors (NDs = DL)	0.404	0.256	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.69	0.859	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.41	0.256	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.975	0.859	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.133	0.256	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	39	0	39	4	35	89.74%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	35	2	2.5	2.246	2.3	0.18
Statistics (Detects Only)	4	1	1.8	1.35	1.3	0.342
Statistics (All: NDs treated as DL value)	39	1	2.5	2.154	2.3	0.338
Statistics (All: NDs treated as DL/2 value)	39	1	1.8	1.146	1.15	0.146
Statistics (Normal ROS Estimated Data)	39	0.663	2.037	1.35	1.35	0.346
Statistics (Gamma ROS Estimated Data)	39	0.538	1.8	1.335	1.396	0.333
Statistics (Lognormal ROS Estimated Data)	39	0.795	2.188	1.361	1.319	0.348

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	21.48	19.84	0.0629	0.277	0.249	0.9
Statistics (NDs = DL)	31.98	29.53	0.0674	0.752	0.193	0.257
Statistics (NDs = DL/2)	72.32	66.78	0.0158	0.129	0.116	0.895
Statistics (Gamma ROS Estimates)	13.73	12.69	0.0972	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.277	0.255	0.921

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.985	0.874	0.847	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.972	0.748	Data Appear Normal
Lilliefors (Detects Only)	0.192	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.77	0.939	Data Not Normal
Lilliefors (NDs = DL)	0.222	0.142	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.741	0.939	Data Not Normal

Lilliefors (NDs = DL/2)	0.254	0.142	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.979	0.939	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.078	0.142	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.998	0.841	0.864	0.949

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.211	0.657	
Kolmogorov-Smirnov (Detects Only)	0.179	0.394	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	3.54	0.746	
Kolmogorov-Smirnov (NDs = DL)	0.259	0.141	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.267	0.746	
Kolmogorov-Smirnov (NDs = DL/2)	0.23	0.141	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.923	0.748	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.121	0.141	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.997	0.82	0.887	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.994	0.748	Data Appear Lognormal
Lilliefors (Detects Only)	0.155	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.687	0.939	Data Not Lognormal
Lilliefors (NDs = DL)	0.279	0.142	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.802	0.939	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.222	0.142	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.979	0.939	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0665	0.142	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Hex Chrome.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Number of Valid Data	12	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	8
		Percent Non-Detects	66.67%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.92	Minimum Detected	-0.0834
Maximum Detected	1.4	Maximum Detected	0.336
Mean of Detected	1.18	Mean of Detected	0.153
SD of Detected	0.214	SD of Detected	0.187
Minimum Non-Detect	2	Minimum Non-Detect	0.693
Maximum Non-Detect	2	Maximum Non-Detect	0.693

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.965	Shapiro Wilk Test Statistic	0.956
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.06	Mean (Log Scale)	0.0509
SD	0.142	SD (Log Scale)	0.123
95% UTL 95% Coverage	1.45	95% UTL 95% Coverage	1.474
95% UPL (t)	1.326	95% UPL (t)	1.325
90% Percentile (z)	1.243	90% Percentile (z)	1.232
95% Percentile (z)	1.294	95% Percentile (z)	1.289
99% Percentile (z)	1.391	99% Percentile (z)	1.401
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	1.185
		SD in Original Scale	0.225
		Mean in Log Scale	0.153

		SD in Log Scale	0.192
		95% UTL 95% Coverage	1.968
		95% UPL (t)	1.667
		90% Percentile (z)	1.489
		95% Percentile (z)	1.597
		99% Percentile (z)	1.819
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	9.956	Data appear Normal at 5% Significance Level	
Theta Star	0.119		
nu star	79.65		
A-D Test Statistic	0.26	Nonparametric Statistics	
5% A-D Critical Value	0.656	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.248	Mean	1.18
5% K-S Critical Value	0.394	SD	0.185
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.107
		95% KM UTL with 95% Coverage	1.686
Assuming Gamma Distribution		95% KM Chebyshev UPL	2.019
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.526
Mean	1.171	90% Percentile (z)	1.417
Median	1.209	95% Percentile (z)	1.484
SD	0.22	99% Percentile (z)	1.61
k star	21.24		
Theta star	0.0552	Gamma ROS Limits with Extrapolated Data	
Nu star	509.7	95% Wilson Hilferty (WH) Approx. Gamma UPL	1.639
95% Percentile of Chisquare (2k)	58.68	95% Hawkins Wixley (HW) Approx. Gamma UPL	1.648
		95% WH Approx. Gamma UTL with 95% Coverage	1.902
90% Percentile	1.507	95% HW Approx. Gamma UTL with 95% Coverage	1.924
95% Percentile	1.618		
99% Percentile	1.842		

Note: DL/2 is not a recommended method.

MC

General Statistics			
Number of Valid Data	39	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	35
		Percent Non-Detects	89.74%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	1	Minimum Detected	0
Maximum Detected	1.8	Maximum Detected	0.588
Mean of Detected	1.35	Mean of Detected	0.277
SD of Detected	0.342	SD of Detected	0.249
Minimum Non-Detect	2	Minimum Non-Detect	0.693
Maximum Non-Detect	2.5	Maximum Non-Detect	0.916
Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	39
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	0

Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.972	Shapiro Wilk Test Statistic	0.994
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.146	Mean (Log Scale)	0.129
SD	0.146	SD (Log Scale)	0.116
95% UTL 95% Coverage	1.457	95% UTL 95% Coverage	1.456
95% UPL (t)	1.396	95% UPL (t)	1.387
90% Percentile (z)	1.333	90% Percentile (z)	1.32
95% Percentile (z)	1.387	95% Percentile (z)	1.377
99% Percentile (z)	1.486	99% Percentile (z)	1.49
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	1.361
		SD in Original Scale	0.348
		Mean in Log Scale	0.277
		SD in Log Scale	0.255
		95% UTL 95% Coverage	2.266
		95% UPL (t)	2.037
		90% Percentile (z)	1.828
		95% Percentile (z)	2.005
		99% Percentile (z)	2.385
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	5.536	Data appear Normal at 5% Significance Level	
Theta Star	0.244		
nu star	44.29		
A-D Test Statistic	0.211	Nonparametric Statistics	
5% A-D Critical Value	0.657	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.179	Mean	1.35
5% K-S Critical Value	0.394	SD	0.296
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.171
		95% KM UTL with 95% Coverage	1.978
Assuming Gamma Distribution		95% KM Chebyshev UPL	2.656
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.855
Mean	1.335	90% Percentile (z)	1.729
Median	1.396	95% Percentile (z)	1.837
SD	0.333	99% Percentile (z)	2.038
k star	12.69		

Theta star	0.105	Gamma ROS Limits with Extrapolated Data	
Nu star	990	95% Wilson Hilferty (WH) Approx. Gamma UPL	2.018
95% Percentile of Chisquare (2k)	38.13	95% Hawkins Wixley (HW) Approx. Gamma UPL	2.039
		95% WH Approx. Gamma UTL with 95% Coverage	2.225
90% Percentile	1.832	95% HW Approx. Gamma UTL with 95% Coverage	2.259
95% Percentile	2.005		
99% Percentile	2.358		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Hex Chrome.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 1.4 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.750

For 10% significance level, 1.4 is an outlier.
For 5% significance level, 1.4 is an outlier.
For 1% significance level, 1.4 is an outlier.

2. Data Value 0.92 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.211

For 10% significance level, 0.92 is not an outlier.
For 5% significance level, 0.92 is not an outlier.
For 1% significance level, 0.92 is not an outlier.

Rosner's Outlier Test for MC

Mean	1.146
Standard Deviation	0.146
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.146	0.144	1.8	14	4.532	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1.8 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1.8 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Hex Chrome.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Data	39	12
Number of Non-Detect Data	35	8
Number of Detect Data	4	4
Minimum Non-Detect	2	2
Maximum Non-Detect	2.5	2
Percent Non detects	89.74%	66.67%
Minimum Detected	1	0.92
Maximum Detected	1.8	1.4
Mean of Detected Data	1.35	1.18
Median of Detected Data	1.3	1.2
SD of Detected Data	0.342	0.214

Site vs Background Gehan Test

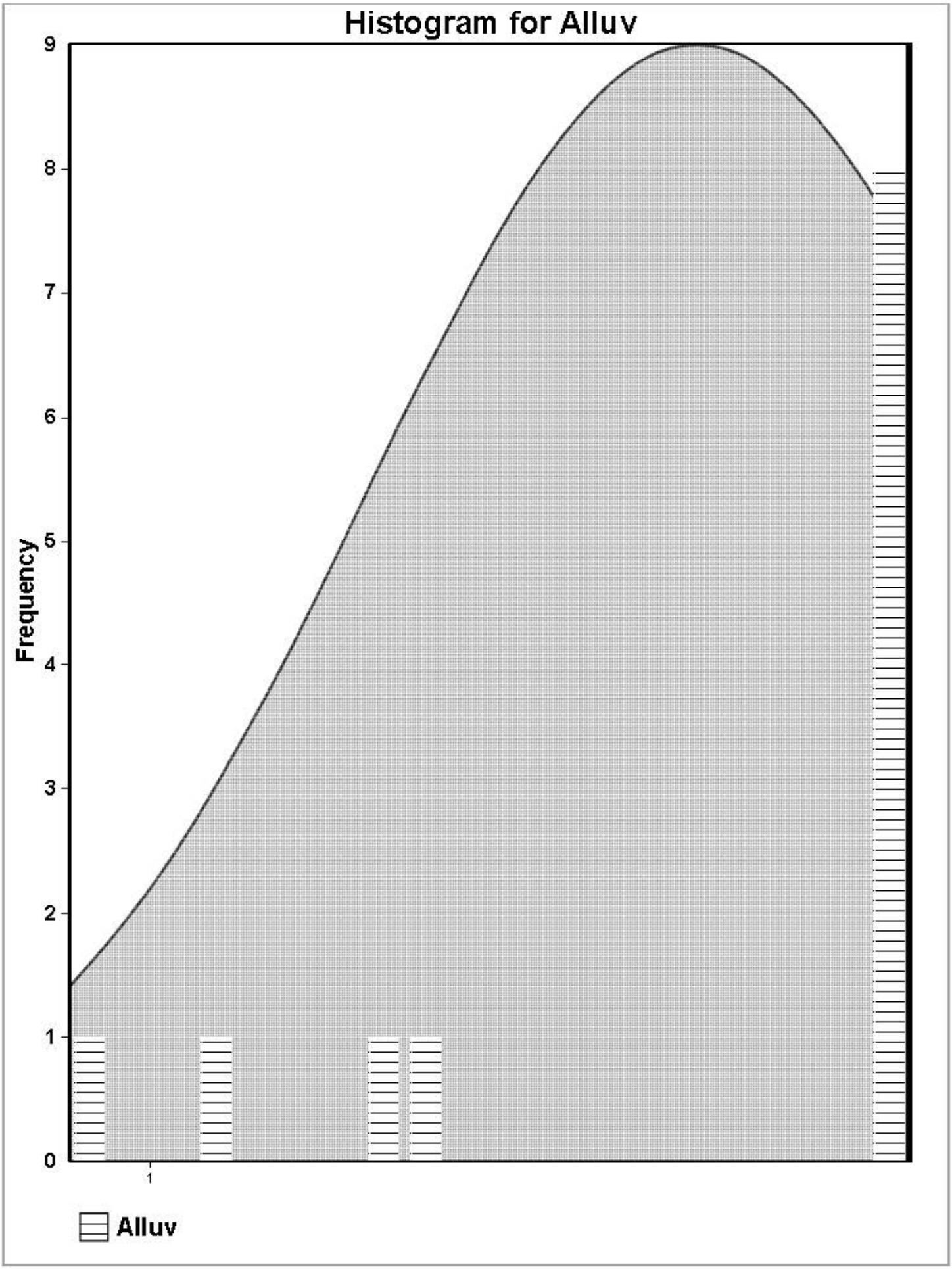
H0: Mu of Site or AOC = Mu of background

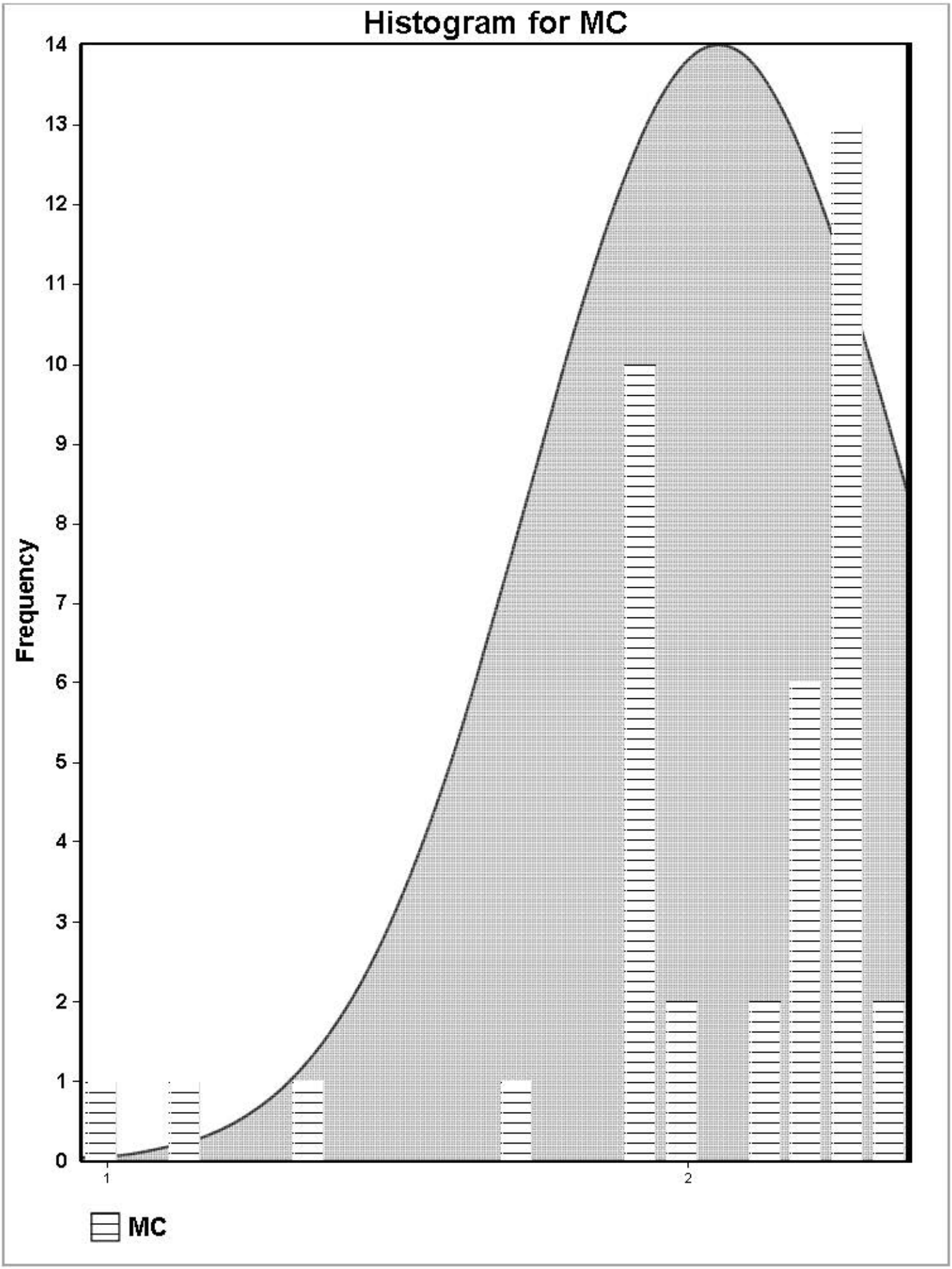
Gehan z Test Value	0.72
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.471

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
7
8
9
1
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
1
2
MC

Location	Alluv	D_Alluv
BG-1-2	2	0
BG-1-10	1.1	1
BG-1-29	0.92	1
BG-1-40	2	0
BG-2-2	2	0
BG-2-10	2	0
BG-2-19	2	0
BG-2-21	2	0
BG-3-2	1.3	1
BG-3-10	1.4	1
BG-6-2	2	0
BG-6-9	2	0

Location	MC	D_MC
BG-1-43	2	0
BG-1-46	2	0
BG-1-55	2	0
BG-1-78	2	0
BG-1-92	1.4	1
BG-2-30	2	0
BG-2-32	2	0
BG-2-75	2	0
BG-2-81	2	0
BG-3-17	2.1	0
BG-3-22	1.2	1
BG-3-29	2	0
BG-3-63	2.5	0
BG-3-65	1.8	1
BG-3-69	2.3	0
BG-3-95	2.3	0
BG-3-105	2.4	0
BG-3-131	2.2	0
BG-3-136	1	1
BG-4-1	2.1	0
BG-4-10	2.2	0
BG-4-19	2.4	0
BG-4-40	2.3	0
BG-4-65	2	0
BG-4-79	2.3	0
BG-4-82	2.4	0
BG-4-95	2.4	0
BG-4-117	2.4	0
BG-4-120	2.4	0
BG-4-161	2.4	0
BG-4-163	2.3	0
BG-6-28	2.3	0
BG-6-53	2.4	0
BG-6-58	2.4	0
BG-6-75	2.4	0
BG-6-87	2.5	0
BG-6-98	2.4	0
BG-6-114	2.4	0
BG-1-127	2.4	0

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Fluoride.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	36
Minimum	2.1
Maximum	18
Mean of Raw Data	6.569
Standard Deviation of Raw Data	3.639
Kstar	3.658
Mean of Log Transformed Data	1.748
Standard Deviation of Log Transformed Data	0.518

Normal Distribution Test Results	
Correlation Coefficient R	0.94
Approximate Shapiro Wilk Test Statistic	0.879
Approximate Shapiro Wilk P Value	2.1342E-5
Lilliefors Test Statistic	0.175
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.989
A-D Test Statistic	0.673
A-D Critical (0.95) Value	0.754
K-S Test Statistic	0.128
K-S Critical(0.95) Value	0.125

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.993
Approximate Shapiro Wilk Test Statistic	0.972
Approximate Shapiro Wilk P Value	0.444
Lilliefors Test Statistic	0.0961
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Fluoride.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Total Number of Observations	51	Number of Distinct Observations	36

Raw Statistics		Log-Transformed Statistics	
Minimum	2.1	Minimum	0.742
Maximum	18	Maximum	2.89
Second Largest	16	Second Largest	2.773
First Quartile	4.05	First Quartile	1.399
Median	5.3	Median	1.668
Third Quartile	8.5	Third Quartile	2.134
Mean	6.569	Mean	1.748
SD	3.639	SD	0.518
Coefficient of Variation	0.554		
Skewness	1.265		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.175	Lilliefors Test Statistic	0.0961
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	14.04	95% UTL with 95% Coverage	16.63
95% UPL (t)	12.73	95% UPL (t)	13.79
90% Percentile (z)	11.23	90% Percentile (z)	11.15
95% Percentile (z)	12.55	95% Percentile (z)	13.46
99% Percentile (z)	15.03	99% Percentile (z)	19.15
Gamma Distribution Test		Data Distribution Test	
k star	3.658	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	1.796		
MLE of Mean	6.569		
MLE of Standard Deviation	3.434		
nu star	373.1		
A-D Test Statistic	0.673	Nonparametric Statistics	
5% A-D Critical Value	0.754	90% Percentile	12
K-S Test Statistic	0.128	95% Percentile	13.5
5% K-S Critical Value	0.125	99% Percentile	17
Data follow Appx. Gamma Distribution at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	16
90% Percentile	11.17	95% Percentile Bootstrap UTL with 95% Coverage	17
95% Percentile	13.04	95% BCA Bootstrap UTL with 95% Coverage	16
99% Percentile	17.05	95% UPL	14.8
		95% Chebyshev UPL	22.58
95% WH Approx. Gamma UPL	13.14	Upper Threshold Limit Based upon IQR	15.18
95% HW Approx. Gamma UPL	13.26		
95% WH Approx. Gamma UTL with 95% Coverage	15.17		
95% HW Approx. Gamma UTL with 95% Coverage	15.45		

Outlier Tests for Selected Variables

User Selected Options	
From File	Fluoride.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for All Data

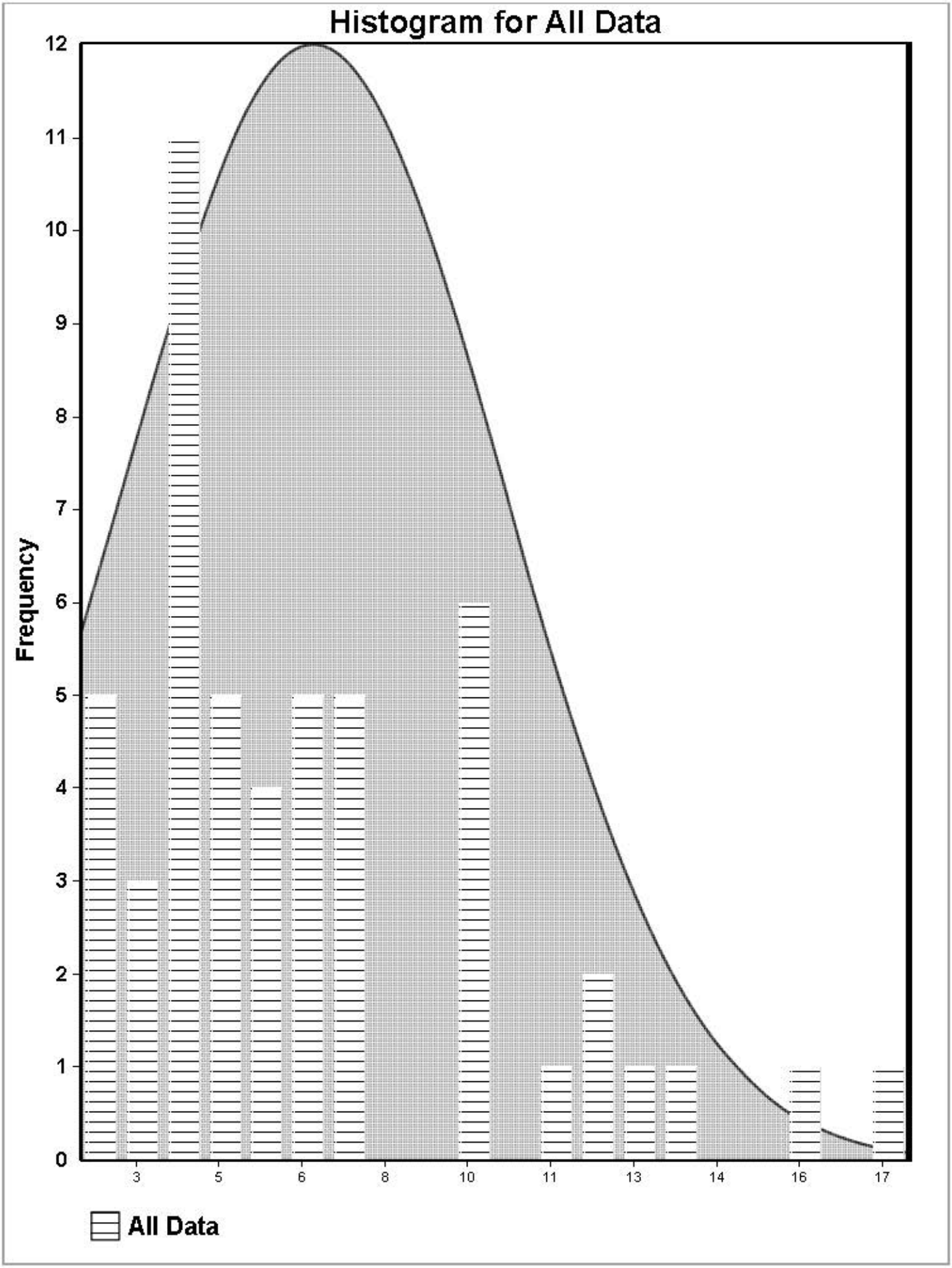
Mean	6.569
Standard Deviation	3.639
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	6.569	3.603	18	42	3.173	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 18 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
3
5
6
8
10
11
13
14
16
17
All Data

Location	All Data
BG-1-2	6.1
BG-3-17	5.4
BG-4-2	3.7
BG-4-19	7.6
BG-1-10	4.4
BG-2-2	2.1
BG-2-10	4.1
BG-2-19	2.7
BG-3-2	7.6
BG-3-10	12
BG-4-10	7
BG-6-2	4.8
BG-6-9	3.3
BG-1-29	11
BG-1-40	4.2
BG-1-46	4.9
BG-1-92	3.5
BG-2-21	4.4
BG-2-32	6.2
BG-2-75	7.6
BG-3-29	3.7
BG-3-63	5
BG-3-65	5.3
BG-3-95	5.4
BG-3-105	10
BG-3-131	3.8
BG-3-136	16
BG-4-65	2.5
BG-4-82	4.6
BG-4-95	2.6
BG-4-117	2.5
BG-4-120	9.4
BG-6-58	5.2
BG-6-75	3.8
BG-6-98	4
BG-6-114	5.3
BG-6-127	6.6
BG-1-43	14
BG-1-55	3
BG-1-78	7
BG-2-30	13
BG-2-81	18
BG-3-22	4.2
BG-3-69	9.4
BG-4-40	9.5
BG-4-79	6.3
BG-4-161	4.3
BG-4-163	9.4
BG-6-28	12
BG-6-53	6.6
BG-6-87	10

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Fluoride.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	12
Minimum	2.1
Maximum	12
Mean of Raw Data	5.446
Standard Deviation of Raw Data	2.658
Kstar	3.869
Mean of Log Transformed Data	1.591
Standard Deviation of Log Transformed Data	0.476

Normal Distribution Test Results	
Correlation Coefficient R	0.952
Shapiro Wilk Test Statistic	0.915
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.186
Lilliefors Test Statistic	0.134
Lilliefors Critical (0.95) Value	0.246

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.985
A-D Test Statistic	0.15
A-D Critical (0.95) Value	0.736
K-S Test Statistic	0.0987
K-S Critical(0.95) Value	0.237

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.994
Shapiro Wilk Test Statistic	0.991
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.998
Lilliefors Test Statistic	0.102
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

>20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	30
Minimum	2.5
Maximum	18
Mean of Raw Data	6.953
Standard Deviation of Raw Data	3.874
Kstar	3.506
Mean of Log Transformed Data	1.801
Standard Deviation of Log Transformed Data	0.526

Normal Distribution Test Results

Correlation Coefficient R	0.941
Shapiro Wilk Test Statistic	0.88
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	4.8543E-4
Lilliefors Test Statistic	0.182
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.988
A-D Test Statistic	0.654
A-D Critical (0.95) Value	0.753
K-S Test Statistic	0.143
K-S Critical(0.95) Value	0.144

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.988
Shapiro Wilk Test Statistic	0.962
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.285
Lilliefors Test Statistic	0.114
Lilliefors Critical (0.95) Value	0.144

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Fluoride.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	12

Raw Statistics		Log-Transformed Statistics	
Minimum	2.1	Minimum	0.742
Maximum	12	Maximum	2.485
Second Largest	7.6	Second Largest	2.028
First Quartile	3.7	First Quartile	1.308
Median	4.8	Median	1.569
Third Quartile	7	Third Quartile	1.946
Mean	5.446	Mean	1.591
SD	2.658	SD	0.476
Coefficient of Variation	0.488		
Skewness	1.197		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.915	Shapiro Wilk Test Statistic	0.991
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	12.55	95% UTL with 95% Coverage	17.52
95% UPL (t)	10.36	95% UPL (t)	11.85
90% Percentile (z)	8.853	90% Percentile (z)	9.038
95% Percentile (z)	9.819	95% Percentile (z)	10.75
99% Percentile (z)	11.63	99% Percentile (z)	14.87

Gamma Distribution Test		Data Distribution Test	
k star	3.869	Data appear Normal at 5% Significance Level	
Theta Star	1.408		
MLE of Mean	5.446		
MLE of Standard Deviation	2.769		
nu star	100.6		
A-D Test Statistic	0.15	Nonparametric Statistics	
5% A-D Critical Value	0.736	90% Percentile	7.6
K-S Test Statistic	0.0987	95% Percentile	9.36
5% K-S Critical Value	0.237	99% Percentile	11.47
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	12
90% Percentile	9.158	95% Percentile Bootstrap UTL with 95% Coverage	12
95% Percentile	10.65	95% BCA Bootstrap UTL with 95% Coverage	12
99% Percentile	13.84	95% UPL	12
		95% Chebyshev UPL	17.47
95% WH Approx. Gamma UPL	11.03	Upper Threshold Limit Based upon IQR	11.95
95% HW Approx. Gamma UPL	11.19		
95% WH Approx. Gamma UTL with 95% Coverage	14.73		
95% HW Approx. Gamma UTL with 95% Coverage	15.24		

>20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	30

Raw Statistics		Log-Transformed Statistics	
Minimum	2.5	Minimum	0.916
Maximum	18	Maximum	2.89
Second Largest	16	Second Largest	2.773
First Quartile	4.2	First Quartile	1.435
Median	5.35	Median	1.677
Third Quartile	9.4	Third Quartile	2.241
Mean	6.953	Mean	1.801
SD	3.874	SD	0.526
Coefficient of Variation	0.557		
Skewness	1.159		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.88	Shapiro Wilk Test Statistic	0.962
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	15.21	95% UTL with 95% Coverage	18.61
95% UPL (t)	13.57	95% UPL (t)	14.9
90% Percentile (z)	11.92	90% Percentile (z)	11.89
95% Percentile (z)	13.32	95% Percentile (z)	14.4
99% Percentile (z)	15.96	99% Percentile (z)	20.62
Gamma Distribution Test		Data Distribution Test	
k star	3.506	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.983		
MLE of Mean	6.953		
MLE of Standard Deviation	3.713		
nu star	266.5		
A-D Test Statistic	0.654	Nonparametric Statistics	
5% A-D Critical Value	0.753	90% Percentile	12.3
K-S Test Statistic	0.143	95% Percentile	14.3
5% K-S Critical Value	0.144	99% Percentile	17.26

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	18
90% Percentile	11.93	95% Percentile Bootstrap UTL with 95% Coverage	18
95% Percentile	13.96	95% BCA Bootstrap UTL with 95% Coverage	18
99% Percentile	18.34	95% UPL	16.1
		95% Chebyshev UPL	24.06
95% WH Approx. Gamma UPL	14.13	Upper Threshold Limit Based upon IQR	17.2
95% HW Approx. Gamma UPL	14.27		
95% WH Approx. Gamma UTL with 95% Coverage	16.73		
95% HW Approx. Gamma UTL with 95% Coverage	17.09		

Outlier Tests for Selected Variables

User Selected Options	
From File	Fluoride.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 12 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.473

For 10% significance level, 12 is an outlier.
For 5% significance level, 12 is not an outlier.
For 1% significance level, 12 is not an outlier.

2. Data Value 2.1 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.218

For 10% significance level, 2.1 is not an outlier.
For 5% significance level, 2.1 is not an outlier.
For 1% significance level, 2.1 is not an outlier.

Rosner's Outlier Test for >20

Mean	6.953
Standard Deviation	3.874
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	6.953	3.822	18	29	2.89	3.01	3.36

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Fluoride.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Observations	38	13
Number of Distinct Observations	30	12
Minimum	2.5	2.1
Maximum	18	12
Mean	6.953	5.446
Median	5.35	4.8
SD	3.874	2.658
SE of Mean	0.628	0.737

Wilcoxon-Mann-Whitney (WMW) Test

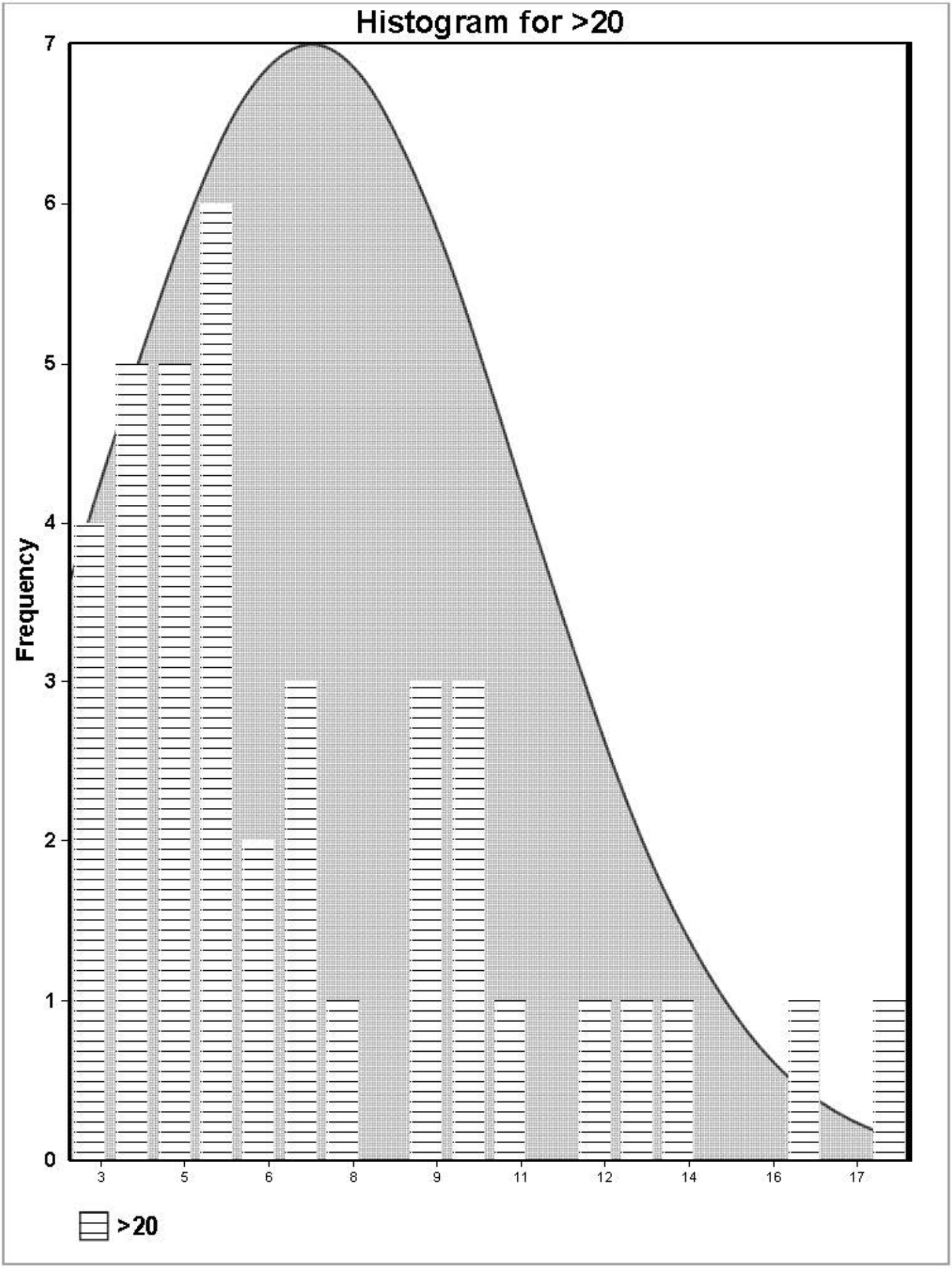
H0: Mean/Median of Site or AOC = Mean/Median of Background

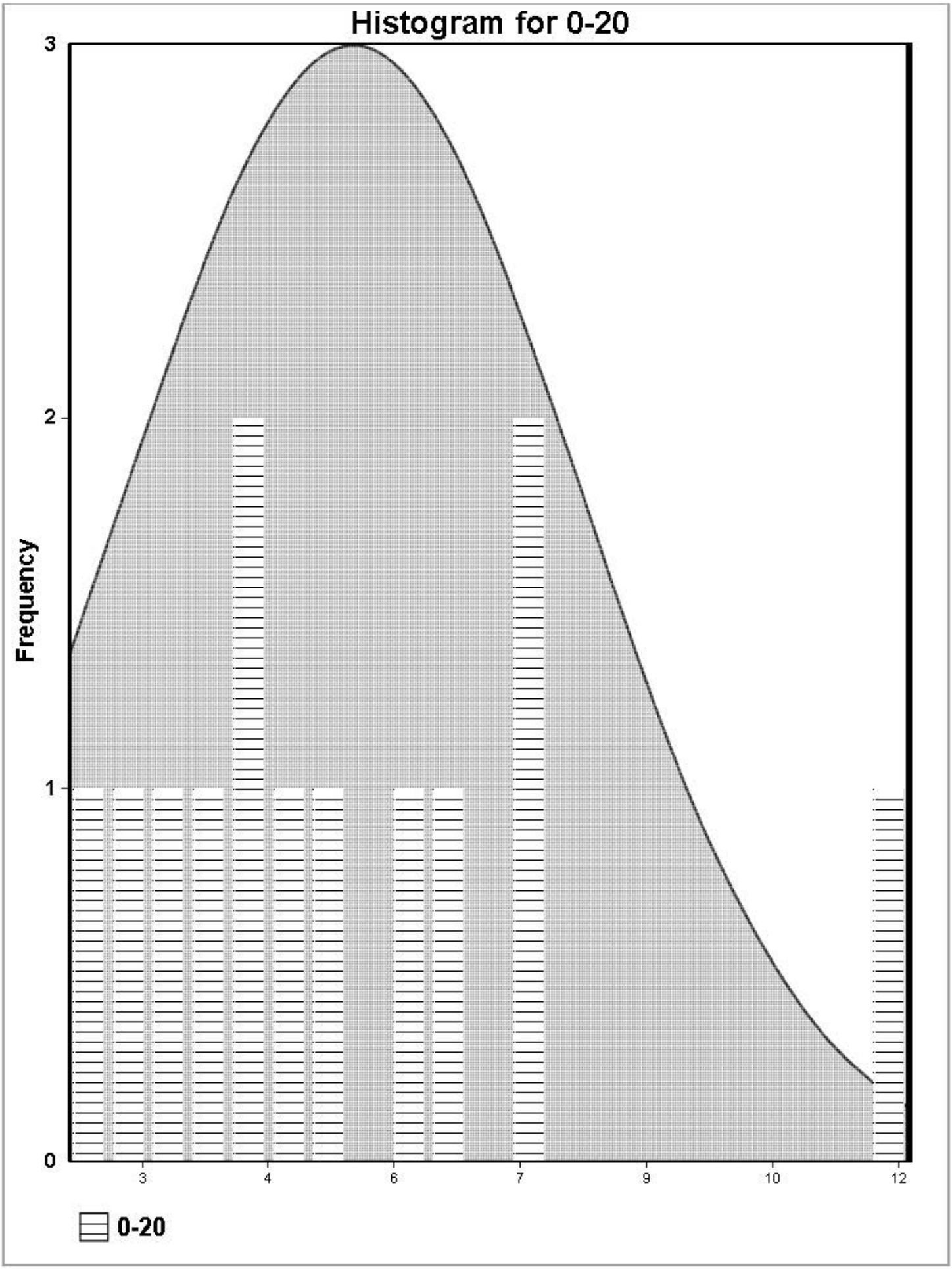
Site Rank Sum W-Stat	1039
WMW Test U-Stat	1.081
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.28

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
3
5
6
8
9
11
12
14
16
17
>20


Histogram for 0-20
Frequency
3
2
1
0
3
4
6
7
9
10
12
0-20

Location	0-20
BG-1-2	6.1
BG-3-17	5.4
BG-4-2	3.7
BG-4-19	7.6
BG-1-10	4.4
BG-2-2	2.1
BG-2-10	4.1
BG-2-19	2.7
BG-3-2	7.6
BG-3-10	12
BG-4-10	7
BG-6-2	4.8
BG-6-9	3.3

Location	>20
BG-1-29	11
BG-1-40	4.2
BG-1-46	4.9
BG-1-92	3.5
BG-2-21	4.4
BG-2-32	6.2
BG-2-75	7.6
BG-3-29	3.7
BG-3-63	5
BG-3-65	5.3
BG-3-95	5.4
BG-3-105	10
BG-3-131	3.8
BG-3-136	16
BG-4-65	2.5
BG-4-82	4.6
BG-4-95	2.6
BG-4-117	2.5
BG-4-120	9.4
BG-6-58	5.2
BG-6-75	3.8
BG-6-98	4
BG-6-114	5.3
BG-6-127	6.6
BG-1-43	14
BG-1-55	3
BG-1-78	7
BG-2-30	13
BG-2-81	18
BG-3-22	4.2
BG-3-69	9.4
BG-4-40	9.5
BG-4-79	6.3
BG-4-161	4.3
BG-4-163	9.4
BG-6-28	12
BG-6-53	6.6
BG-6-87	10

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Fluoride.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	17
Minimum	3
Maximum	18
Mean of Raw Data	8.306
Standard Deviation of Raw Data	4.011
Kstar	3.934
Mean of Log Transformed Data	2.006
Standard Deviation of Log Transformed Data	0.491

Normal Distribution Test Results	
Correlation Coefficient R	0.97
Shapiro Wilk Test Statistic	0.94
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.301
Lilliefors Test Statistic	0.128
Lilliefors Critical (0.95) Value	0.209

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.995
A-D Test Statistic	0.174
A-D Critical (0.95) Value	0.743
K-S Test Statistic	0.11
K-S Critical(0.95) Value	0.204

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.994
Shapiro Wilk Test Statistic	0.982
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.97
Lilliefors Test Statistic	0.128
Lilliefors Critical (0.95) Value	0.209

Data appear Lognormal at (0.05) Significance Level

Non-Clay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	28
Minimum	2.1
Maximum	16
Mean of Raw Data	5.621
Standard Deviation of Raw Data	3.085
Kstar	3.957
Mean of Log Transformed Data	1.607
Standard Deviation of Log Transformed Data	0.482

Normal Distribution Test Results

Correlation Coefficient R	0.914
Shapiro Wilk Test Statistic	0.842
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	1.3065E-4
Lilliefors Test Statistic	0.226
Lilliefors Critical (0.95) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.975
A-D Test Statistic	0.656
A-D Critical (0.95) Value	0.75
K-S Test Statistic	0.166
K-S Critical(0.95) Value	0.154

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.987
Shapiro Wilk Test Statistic	0.97
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.558
Lilliefors Test Statistic	0.131
Lilliefors Critical (0.95) Value	0.154

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Fluoride.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	17

Raw Statistics		Log-Transformed Statistics	
Minimum	3	Minimum	1.099
Maximum	18	Maximum	2.89
Second Largest	14	Second Largest	2.639
First Quartile	5.575	First Quartile	1.717
Median	7.3	Median	1.987
Third Quartile	9.875	Third Quartile	2.29
Mean	8.306	Mean	2.006
SD	4.011	SD	0.491
Coefficient of Variation	0.483		
Skewness	0.849		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.94	Shapiro Wilk Test Statistic	0.982
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	18.14	95% UTL with 95% Coverage	24.82
95% UPL (t)	15.47	95% UPL (t)	17.89
90% Percentile (z)	13.45	90% Percentile (z)	13.96
95% Percentile (z)	14.9	95% Percentile (z)	16.69
99% Percentile (z)	17.64	99% Percentile (z)	23.32

Gamma Distribution Test		Data Distribution Test	
k star	3.934	Data appear Normal at 5% Significance Level	
Theta Star	2.111		
MLE of Mean	8.306		
MLE of Standard Deviation	4.188		
nu star	141.6		
A-D Test Statistic	0.174	Nonparametric Statistics	
5% A-D Critical Value	0.743	90% Percentile	13.3
K-S Test Statistic	0.11	95% Percentile	14.6
5% K-S Critical Value	0.204	99% Percentile	17.32
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	18
90% Percentile	13.92	95% Percentile Bootstrap UTL with 95% Coverage	18
95% Percentile	16.17	95% BCA Bootstrap UTL with 95% Coverage	18
99% Percentile	20.99	95% UPL	18
		95% Chebyshev UPL	26.27
95% WH Approx. Gamma UPL	16.6	Upper Threshold Limit Based upon IQR	16.33
95% HW Approx. Gamma UPL	16.85		
95% WH Approx. Gamma UTL with 95% Coverage	21.14		
95% HW Approx. Gamma UTL with 95% Coverage	21.83		

Non-Clay

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	28

Raw Statistics		Log-Transformed Statistics	
Minimum	2.1	Minimum	0.742
Maximum	16	Maximum	2.773
Second Largest	12	Second Largest	2.485
First Quartile	3.8	First Quartile	1.335
Median	4.8	Median	1.569
Third Quartile	6.6	Third Quartile	1.887
Mean	5.621	Mean	1.607
SD	3.085	SD	0.482
Coefficient of Variation	0.549		
Skewness	1.672		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.842	Shapiro Wilk Test Statistic	0.97
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	12.33	95% UTL with 95% Coverage	14.24
95% UPL (t)	10.93	95% UPL (t)	11.43
90% Percentile (z)	9.575	90% Percentile (z)	9.252
95% Percentile (z)	10.7	95% Percentile (z)	11.02
99% Percentile (z)	12.8	99% Percentile (z)	15.31
Gamma Distribution Test		Data Distribution Test	
k star	3.957	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	1.42		
MLE of Mean	5.621		
MLE of Standard Deviation	2.826		
nu star	261.2		
A-D Test Statistic	0.656	Nonparametric Statistics	
5% A-D Critical Value	0.75	90% Percentile	9.88
K-S Test Statistic	0.166	95% Percentile	11.4
5% K-S Critical Value	0.154	99% Percentile	14.72

Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	16
90% Percentile	9.409	95% Percentile Bootstrap UTL with 95% Coverage	16
95% Percentile	10.93	95% BCA Bootstrap UTL with 95% Coverage	16
99% Percentile	14.17	95% UPL	13.2
		95% Chebyshev UPL	19.27
95% WH Approx. Gamma UPL	11.05	Upper Threshold Limit Based upon IQR	10.8
95% HW Approx. Gamma UPL	11.12		
95% WH Approx. Gamma UTL with 95% Coverage	13.13		
95% HW Approx. Gamma UTL with 95% Coverage	13.34		

Outlier Tests for Selected Variables

User Selected Options	
From File	Fluoride.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 18 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.362

For 10% significance level, 18 is not an outlier.

For 5% significance level, 18 is not an outlier.

For 1% significance level, 18 is not an outlier.

2. Data Value 3 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.120

For 10% significance level, 3 is not an outlier.

For 5% significance level, 3 is not an outlier.

For 1% significance level, 3 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	5.621
Standard Deviation	3.085
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5.621	3.038	16	20	3.416	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 16 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 16 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Fluoride.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Observations	33	18
Number of Distinct Observations	28	17
Minimum	2.1	3
Maximum	16	18
Mean	5.621	8.306
Median	4.8	7.3
SD	3.085	4.011
SE of Mean	0.537	0.945

Wilcoxon-Mann-Whitney (WMW) Test

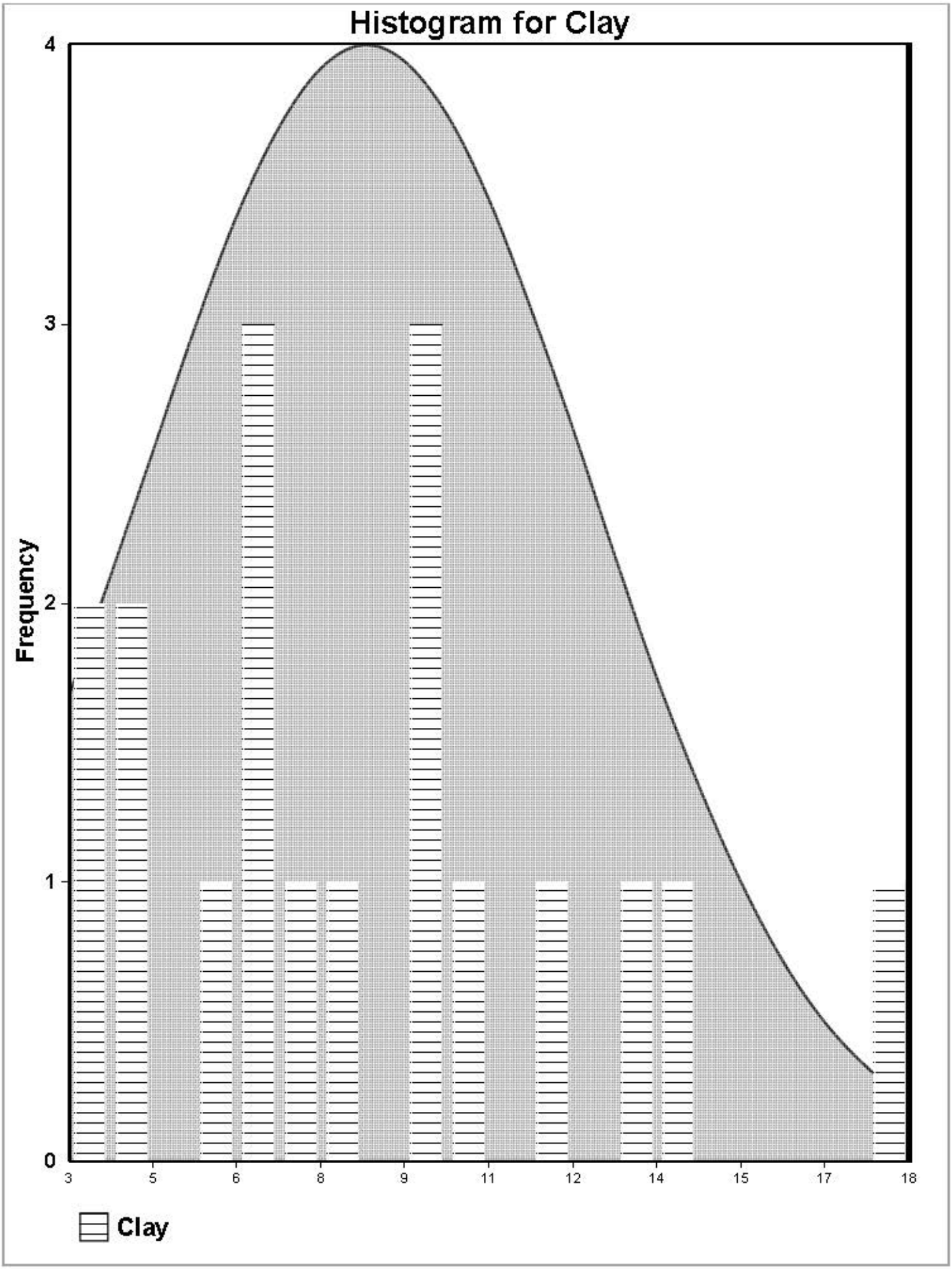
H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	726.5
WMW Test U-Stat	2.582
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.00927

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Clay
Frequency
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1
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3
4
3
5
6
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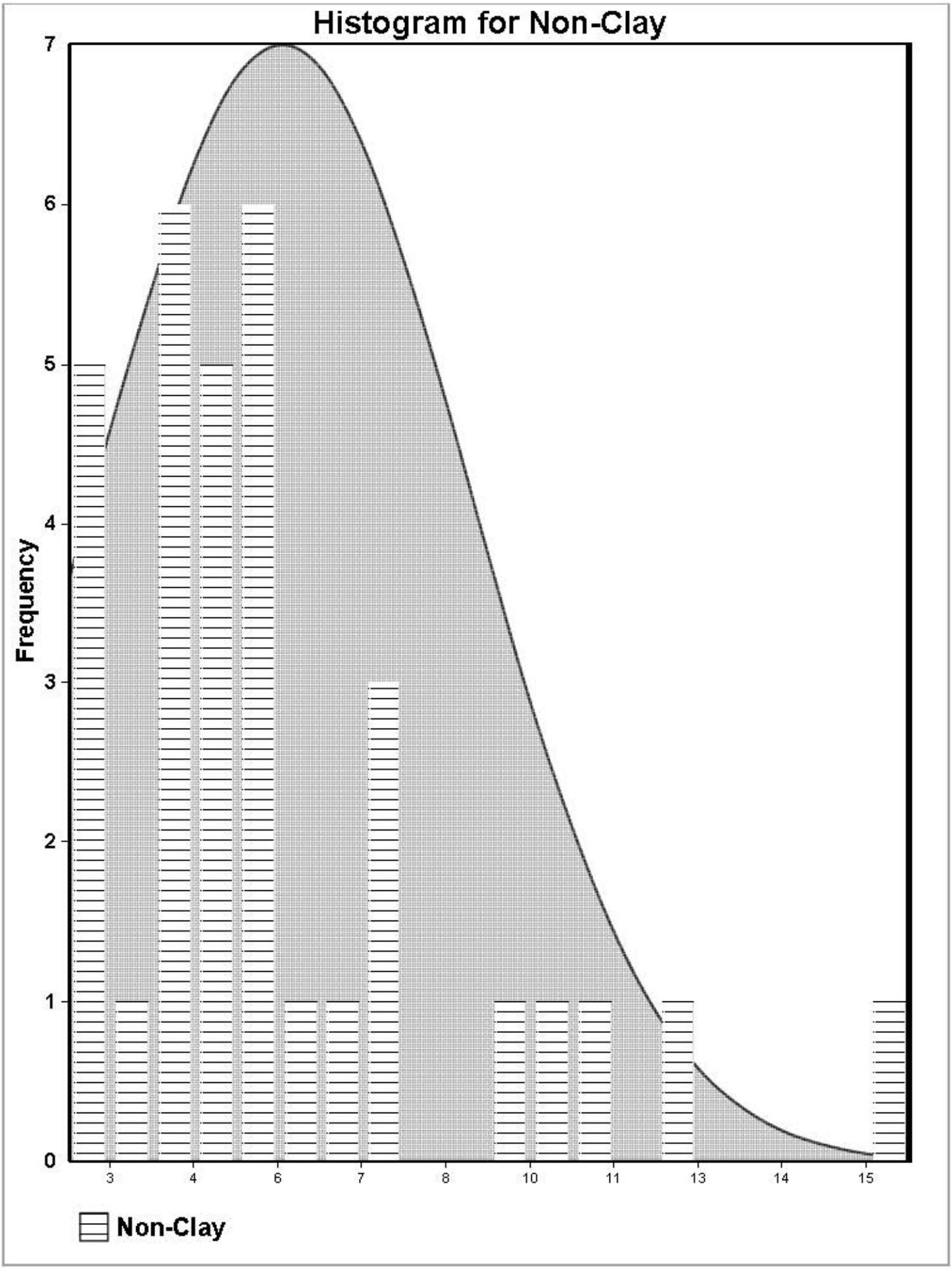
9
11
12
14
15
17
18
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
3
4
6
7
8
10
11
13
14
15
Non-Clay

Location	Clay
BG-1-2	6.1
BG-1-43	14
BG-1-55	3
BG-1-78	7
BG-2-30	13
BG-2-81	18
BG-3-17	5.4
BG-3-22	4.2
BG-3-69	9.4
BG-4-2	3.7
BG-4-19	7.6
BG-4-40	9.5
BG-4-79	6.3
BG-4-161	4.3
BG-4-163	9.4
BG-6-28	12
BG-6-53	6.6
BG-6-87	10

Location	Non-Clay
BG-1-10	4.4
BG-1-29	11
BG-1-40	4.2
BG-1-46	4.9
BG-1-92	3.5
BG-2-2	2.1
BG-2-10	4.1
BG-2-19	2.7
BG-2-21	4.4
BG-2-32	6.2
BG-2-75	7.6
BG-3-2	7.6
BG-3-10	12
BG-3-29	3.7
BG-3-63	5
BG-3-65	5.3
BG-3-95	5.4
BG-3-105	10
BG-3-131	3.8
BG-3-136	16
BG-4-10	7
BG-4-65	2.5
BG-4-82	4.6
BG-4-95	2.6
BG-4-117	2.5
BG-4-120	9.4
BG-6-2	4.8
BG-6-9	3.3
BG-6-58	5.2
BG-6-75	3.8
BG-6-98	4
BG-6-114	5.3
BG-6-127	6.6
Average	5.621212

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Fluoride.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	11
Minimum	2.1
Maximum	12
Mean of Raw Data	5.558
Standard Deviation of Raw Data	3.134
Kstar	3.064
Mean of Log Transformed Data	1.586
Standard Deviation of Log Transformed Data	0.523

Normal Distribution Test Results	
Correlation Coefficient R	0.922
Shapiro Wilk Test Statistic	0.846
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.0326
Lilliefors Test Statistic	0.262
Lilliefors Critical (0.95) Value	0.256

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.967
A-D Test Statistic	0.456
A-D Critical (0.95) Value	0.736
K-S Test Statistic	0.213
K-S Critical(0.95) Value	0.246

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.978
Shapiro Wilk Test Statistic	0.953
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.676
Lilliefors Test Statistic	0.18
Lilliefors Critical (0.95) Value	0.256

Data appear Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	29
Minimum	2.5
Maximum	18
Mean of Raw Data	6.89
Standard Deviation of Raw Data	3.751
Kstar	3.752
Mean of Log Transformed Data	1.801
Standard Deviation of Log Transformed Data	0.507

Normal Distribution Test Results

Correlation Coefficient R	0.939
Shapiro Wilk Test Statistic	0.877
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	3.1563E-4
Lilliefors Test Statistic	0.167
Lilliefors Critical (0.95) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.988
A-D Test Statistic	0.537
A-D Critical (0.95) Value	0.752
K-S Test Statistic	0.131
K-S Critical(0.95) Value	0.142

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.992
Shapiro Wilk Test Statistic	0.97
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.474
Lilliefors Test Statistic	0.103
Lilliefors Critical (0.95) Value	0.142

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Fluoride.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-Transformed Statistics	
Minimum	2.1	Minimum	0.742
Maximum	12	Maximum	2.485
Second Largest	11	Second Largest	2.398
First Quartile	3.9	First Quartile	1.357
Median	4.4	Median	1.482
Third Quartile	6.475	Third Quartile	1.863
Mean	5.558	Mean	1.586
SD	3.134	SD	0.523
Coefficient of Variation	0.564		
Skewness	1.247		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.846	Shapiro Wilk Test Statistic	0.953
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	14.13	95% UTL with 95% Coverage	20.4
95% UPL (t)	11.42	95% UPL (t)	12.97
90% Percentile (z)	9.574	90% Percentile (z)	9.539
95% Percentile (z)	10.71	95% Percentile (z)	11.53
99% Percentile (z)	12.85	99% Percentile (z)	16.47

Gamma Distribution Test		Data Distribution Test
k star	3.064	Data appear Gamma Distributed at 5% Significance Level
Theta Star	1.814	
MLE of Mean	5.558	
MLE of Standard Deviation	3.175	
nu star	73.55	
A-D Test Statistic	0.456	Nonparametric Statistics
5% A-D Critical Value	0.736	90% Percentile 10.66
K-S Test Statistic	0.213	95% Percentile 11.45
5% K-S Critical Value	0.246	99% Percentile 11.89
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	12
90% Percentile	9.816	95% Percentile Bootstrap UTL with 95% Coverage	12
95% Percentile	11.59	95% BCA Bootstrap UTL with 95% Coverage	12
99% Percentile	15.44	95% UPL	12
		95% Chebyshev UPL	19.78
95% WH Approx. Gamma UPL	12.11	Upper Threshold Limit Based upon IQR	10.34
95% HW Approx. Gamma UPL	12.28		
95% WH Approx. Gamma UTL with 95% Coverage	16.85		
95% HW Approx. Gamma UTL with 95% Coverage	17.49		

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	29
Raw Statistics		**Log-Transformed Statistics**	
Minimum	2.5	Minimum	0.916
Maximum	18	Maximum	2.89
Second Largest	16	Second Largest	2.773
First Quartile	4.1	First Quartile	1.411
Median	5.4	Median	1.686
Third Quartile	9.4	Third Quartile	2.241
Mean	6.89	Mean	1.801
SD	3.751	SD	0.507
Coefficient of Variation	0.544		
Skewness	1.271		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.877	Shapiro Wilk Test Statistic	0.97
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	14.86	95% UTL with 95% Coverage	17.77
95% UPL (t)	13.29	95% UPL (t)	14.39
90% Percentile (z)	11.7	90% Percentile (z)	11.59
95% Percentile (z)	13.06	95% Percentile (z)	13.94
99% Percentile (z)	15.62	99% Percentile (z)	19.68
Gamma Distribution Test		**Data Distribution Test**	
k star	3.752	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.837		
MLE of Mean	6.89		
MLE of Standard Deviation	3.557		
nu star	292.6		
A-D Test Statistic	0.537	**Nonparametric Statistics**	
5% A-D Critical Value	0.752	90% Percentile	12.2
K-S Test Statistic	0.131	95% Percentile	14.2
5% K-S Critical Value	0.142	99% Percentile	17.24

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	18
90% Percentile	11.66	95% Percentile Bootstrap UTL with 95% Coverage	18
95% Percentile	13.59	95% BCA Bootstrap UTL with 95% Coverage	18
99% Percentile	17.72	95% UPL	16
		95% Chebyshev UPL	23.45
95% WH Approx. Gamma UPL	13.73	Upper Threshold Limit Based upon IQR	17.35
95% HW Approx. Gamma UPL	13.85		
95% WH Approx. Gamma UTL with 95% Coverage	16.15		
95% HW Approx. Gamma UTL with 95% Coverage	16.46		

Outlier Tests for Selected Variables

User Selected Options	
From File	Fluoride.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12

10% critical value: 0.49

5% critical value: 0.546

1% critical value: 0.642

1. Data Value 12 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.473

For 10% significance level, 12 is not an outlier.

For 5% significance level, 12 is not an outlier.

For 1% significance level, 12 is not an outlier.

2. Data Value 2.1 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.135

For 10% significance level, 2.1 is not an outlier.

For 5% significance level, 2.1 is not an outlier.

For 1% significance level, 2.1 is not an outlier.

Rosner's Outlier Test for MC

Mean	6.89
Standard Deviation	3.751
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	6.89	3.702	18	9	3.001	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Fluoride.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Observations	39	12
Number of Distinct Observations	29	11
Minimum	2.5	2.1
Maximum	18	12
Mean	6.89	5.558
Median	5.4	4.4
SD	3.751	3.134
SE of Mean	0.601	0.905

Wilcoxon-Mann-Whitney (WMW) Test

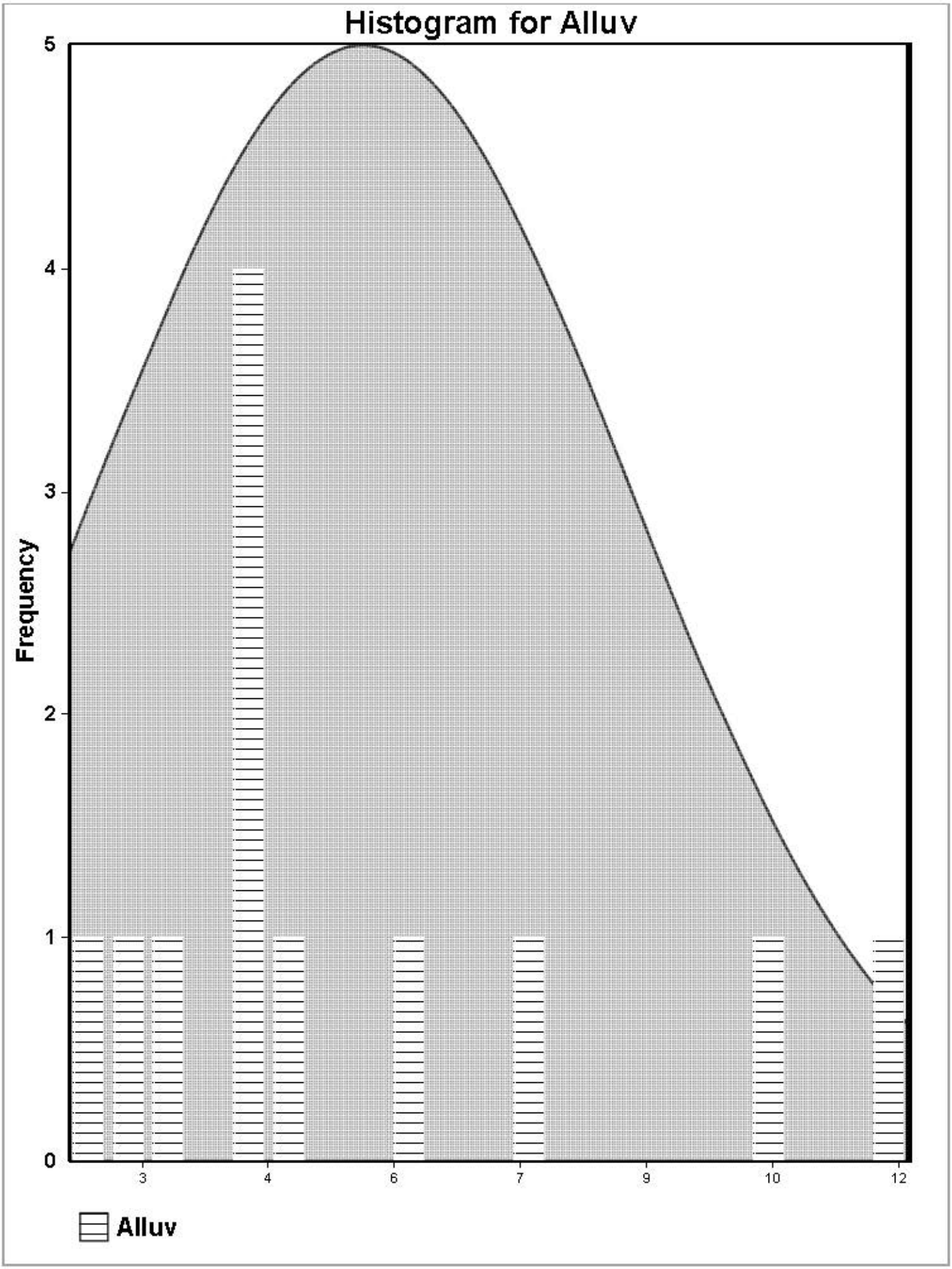
H0: Mean/Median of Site or AOC = Mean/Median of Background

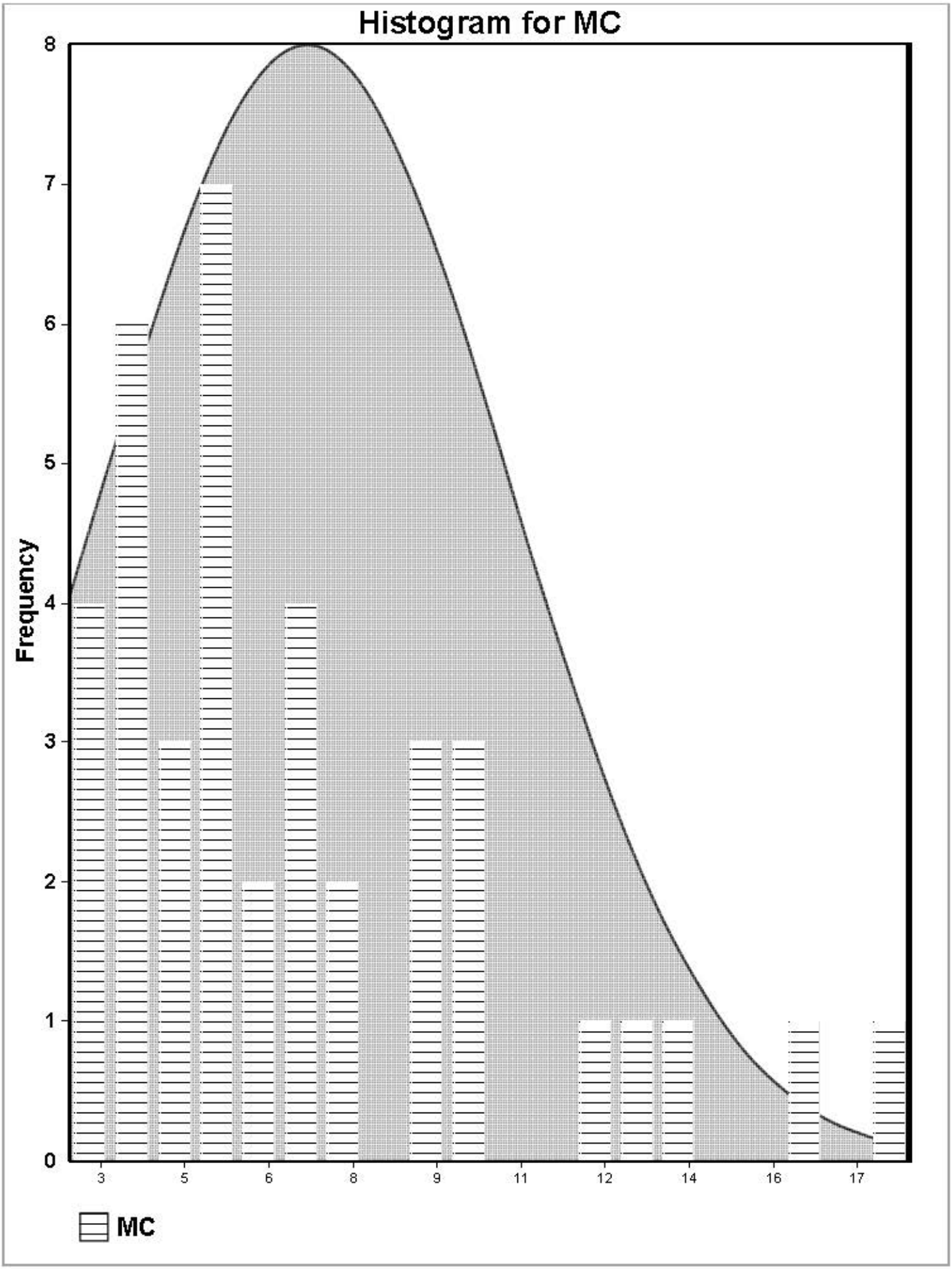
Site Rank Sum W-Stat	1069
WMW Test U-Stat	1.21
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.226

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
3
4
6
7
9
10
12
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
3
5
6
8
9
11
12
14
16
17
MC

Location	Alluv
BG-1-2	6.1
BG-1-10	4.4
BG-1-29	11
BG-1-40	4.2
BG-2-2	2.1
BG-2-10	4.1
BG-2-19	2.7
BG-2-21	4.4
BG-3-2	7.6
BG-3-10	12
BG-6-2	4.8
BG-6-9	3.3

Location	MC
BG-1-43	14
BG-1-46	4.9
BG-1-55	3
BG-1-78	7
BG-1-92	3.5
BG-2-30	13
BG-2-32	6.2
BG-2-75	7.6
BG-2-81	18
BG-3-17	5.4
BG-3-22	4.2
BG-3-29	3.7
BG-3-63	5
BG-3-65	5.3
BG-3-69	9.4
BG-3-95	5.4
BG-3-105	10
BG-3-131	3.8
BG-3-136	16
BG-4-1	3.7
BG-4-10	7
BG-4-19	7.6
BG-4-40	9.5
BG-4-65	2.9
BG-4-79	6.3
BG-4-82	4.6
BG-4-95	2.6
BG-4-117	2.5
BG-4-120	9.4
BG-4-161	4.3
BG-4-163	9.4
BG-6-28	12
BG-6-53	6.6
BG-6-58	5.2
BG-6-75	3.8
BG-6-87	10
BG-6-98	4
BG-6-114	5.3
BG-1-127	6.6

Outlier Tests for Selected Variables

User Selected Options	
From File	Iron.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for All Data

Mean	9625
Standard Deviation	5672
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	9625	5616	26000	51	2.916	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Iron.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	37
Minimum	2800
Maximum	26000
Mean of Raw Data	9625
Standard Deviation of Raw Data	5672
Kstar	2.968
Mean of Log Transformed Data	9.005
Standard Deviation of Log Transformed Data	0.591

Normal Distribution Test Results	
Correlation Coefficient R	0.954
Approximate Shapiro Wilk Test Statistic	0.899
Approximate Shapiro Wilk P Value	1.9556E-4
Lilliefors Test Statistic	0.142
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.992
A-D Test Statistic	0.649
A-D Critical (0.95) Value	0.757
K-S Test Statistic	0.108
K-S Critical(0.95) Value	0.125

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.988
Approximate Shapiro Wilk Test Statistic	0.956
Approximate Shapiro Wilk P Value	0.101
Lilliefors Test Statistic	0.1
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Iron.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Total Number of Observations	51	Number of Distinct Observations	37

Raw Statistics		Log-Transformed Statistics	
Minimum	2800	Minimum	7.937
Maximum	26000	Maximum	10.17
Second Largest	24000	Second Largest	10.09
First Quartile	4850	First Quartile	8.487
Median	8200	Median	9.012
Third Quartile	12500	Third Quartile	9.433
Mean	9625	Mean	9.005
SD	5672	SD	0.591
Coefficient of Variation	0.589		
Skewness	0.977		

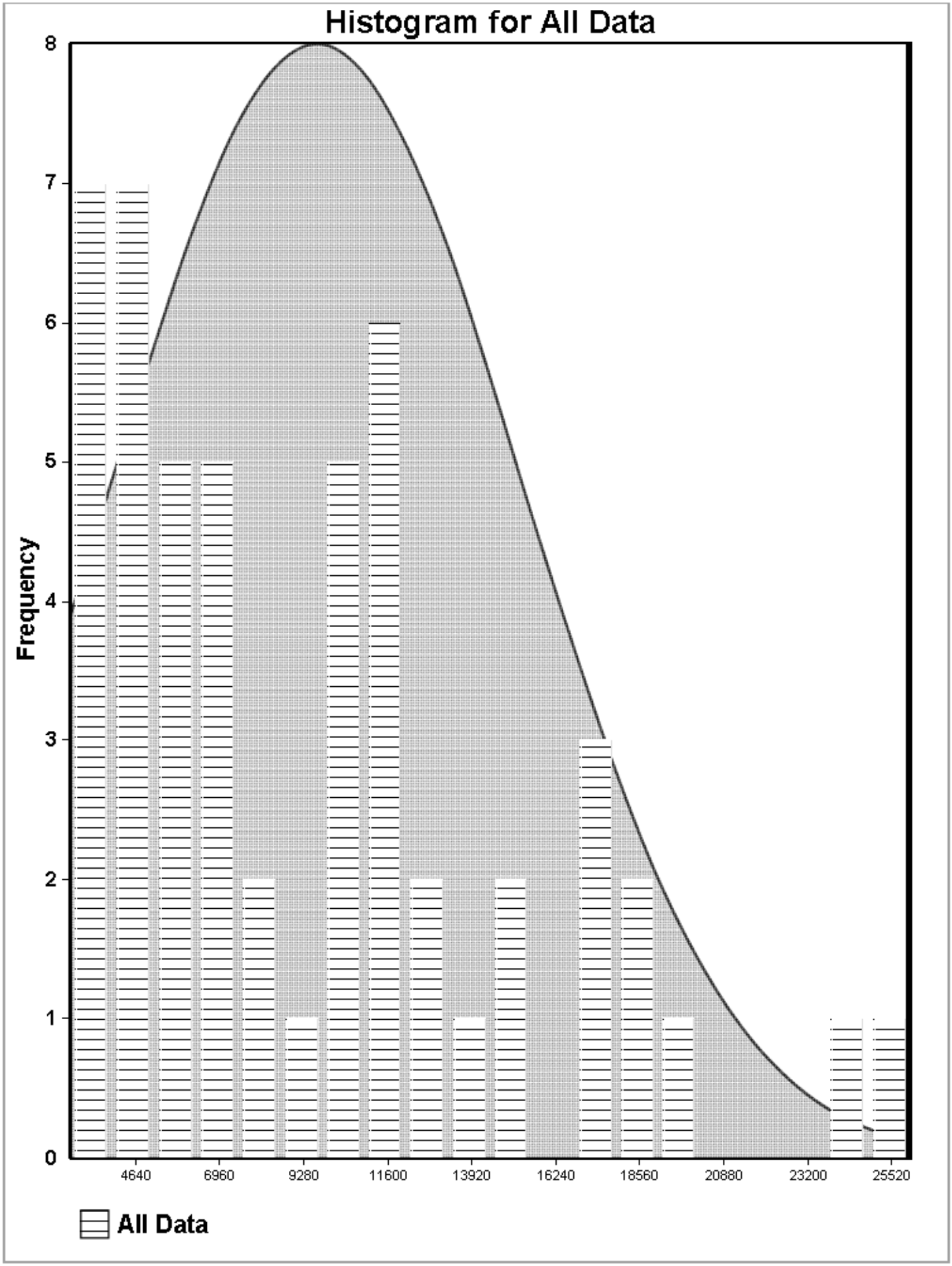
Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.142	Lilliefors Test Statistic	0.1
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	21274	95% UTL with 95% Coverage	27374
95% UPL (t)	19224	95% UPL (t)	22112
90% Percentile (z)	16894	90% Percentile (z)	17350
95% Percentile (z)	18955	95% Percentile (z)	21502
99% Percentile (z)	22821	99% Percentile (z)	32156

Gamma Distribution Test		Data Distribution Test
k star	2.968	Data appear Gamma Distributed at 5% Significance Level
Theta Star	3243	
MLE of Mean	9625	
MLE of Standard Deviation	5587	
nu star	302.7	
A-D Test Statistic	0.649	Nonparametric Statistics
5% A-D Critical Value	0.757	90% Percentile 17000
K-S Test Statistic	0.108	95% Percentile 19500
5% K-S Critical Value	0.125	99% Percentile 25000
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	24000
90% Percentile	17117	95% Percentile Bootstrap UTL with 95% Coverage	24000
95% Percentile	20263	95% BCA Bootstrap UTL with 95% Coverage	24000
99% Percentile	27087	95% UPL	21600
		95% Chebyshev UPL	34591
95% WH Approx. Gamma UPL	20456	Upper Threshold Limit Based upon IQR	23975
95% HW Approx. Gamma UPL	20769		
95% WH Approx. Gamma UTL with 95% Coverage	23916		
95% HW Approx. Gamma UTL with 95% Coverage	24557		


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
4640
6960
9280
11600
13920
16240
18560
20880
23200
25520
All Data

Location	All Data
BG-1-2	12000
BG-3-17	4900
BG-4-2	9900
BG-4-19	24000
BG-1-10	6500
BG-2-2	5800
BG-2-10	5300
BG-2-19	5400
BG-3-2	4400
BG-3-10	11000
BG-6-2	7300
BG-6-9	6400
BG-4-10	13000
BG-1-29	8000
BG-1-40	3800
BG-1-46	4500
BG-1-92	3800
BG-2-21	10000
BG-2-32	6300
BG-2-75	6800
BG-3-29	4700
BG-3-63	5500
BG-3-65	9400
BG-3-95	4000
BG-3-105	11000
BG-3-131	3100
BG-3-136	19000
BG-4-65	4800
BG-4-82	10000
BG-4-95	3800
BG-4-117	2800
BG-4-120	13000
BG-6-58	4800
BG-6-75	5900
BG-6-98	10000
BG-6-114	12000
BG-6-127	20000
BG-1-43	17000
BG-1-55	3600
BG-1-78	10000
BG-2-30	17000
BG-2-81	18000
BG-3-22	3200
BG-3-69	14000
BG-4-40	17000
BG-4-79	15000
BG-4-161	8200
BG-4-163	12000
BG-6-28	15000
BG-6-53	12000
BG-6-87	26000

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Iron.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	13
Minimum	4400
Maximum	24000
Mean of Raw Data	8915
Standard Deviation of Raw Data	5366
Kstar	3.253
Mean of Log Transformed Data	8.971
Standard Deviation of Log Transformed Data	0.49

Normal Distribution Test Results	
Correlation Coefficient R	0.867
Shapiro Wilk Test Statistic	0.766
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.0018
Lilliefors Test Statistic	0.234
Lilliefors Critical (0.95) Value	0.246

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.944
A-D Test Statistic	0.641
A-D Critical (0.95) Value	0.737
K-S Test Statistic	0.21
K-S Critical(0.95) Value	0.238

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.954
Shapiro Wilk Test Statistic	0.91
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.183
Lilliefors Test Statistic	0.19
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

>20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	27
Minimum	2800
Maximum	26000
Mean of Raw Data	9868
Standard Deviation of Raw Data	5822
Kstar	2.706
Mean of Log Transformed Data	9.016
Standard Deviation of Log Transformed Data	0.627

Normal Distribution Test Results

Correlation Coefficient R	0.962
Shapiro Wilk Test Statistic	0.917
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.00865
Lilliefors Test Statistic	0.125
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.987
A-D Test Statistic	0.641
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.13
K-S Critical(0.95) Value	0.144

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.979
Shapiro Wilk Test Statistic	0.941
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.0595
Lilliefors Test Statistic	0.122
Lilliefors Critical (0.95) Value	0.144

Data appear Lognormal at (0.05) Significance Level

Outlier Tests for Selected Variables

User Selected Options	
From File	Iron.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 24000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.628

For 10% significance level, 24000 is an outlier.
For 5% significance level, 24000 is an outlier.
For 1% significance level, 24000 is an outlier.

2. Data Value 4400 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.105

For 10% significance level, 4400 is not an outlier.
For 5% significance level, 4400 is not an outlier.
For 1% significance level, 4400 is not an outlier.

Rosner's Outlier Test for >20

Mean	9868
Standard Deviation	5822
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	9868	5745	26000	38	2.808	3.01	3.36

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

General Background Statistics for Full Data Sets

User Selected Options	
From File	Iron.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	13

Raw Statistics		Log-Transformed Statistics	
Minimum	4400	Minimum	8.389
Maximum	24000	Maximum	10.09
Second Largest	13000	Second Largest	9.473
First Quartile	5400	First Quartile	8.594
Median	6500	Median	8.78
Third Quartile	11000	Third Quartile	9.306
Mean	8915	Mean	8.971
SD	5366	SD	0.49
Coefficient of Variation	0.602		
Skewness	2.058		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.766	Shapiro Wilk Test Statistic	0.91
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	23247	95% UTL with 95% Coverage	29097
95% UPL (t)	18839	95% UPL (t)	19462
90% Percentile (z)	15792	90% Percentile (z)	14737
95% Percentile (z)	17741	95% Percentile (z)	17605
99% Percentile (z)	21398	99% Percentile (z)	24579

Gamma Distribution Test		Data Distribution Test
k star	3.253	Data appear Gamma Distributed at 5% Significance Level
Theta Star	2741	
MLE of Mean	8915	
MLE of Standard Deviation	4943	
nu star	84.57	
A-D Test Statistic	0.641	Nonparametric Statistics
5% A-D Critical Value	0.737	90% Percentile 12800
K-S Test Statistic	0.21	95% Percentile 17400
5% K-S Critical Value	0.238	99% Percentile 22680
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	24000
90% Percentile	15544	95% Percentile Bootstrap UTL with 95% Coverage	24000
95% Percentile	18285	95% BCA Bootstrap UTL with 95% Coverage	24000
99% Percentile	24201	95% UPL	24000
		95% Chebyshev UPL	33186
95% WH Approx. Gamma UPL	18956	Upper Threshold Limit Based upon IQR	19400
95% HW Approx. Gamma UPL	19044		
95% WH Approx. Gamma UTL with 95% Coverage	25822		
95% HW Approx. Gamma UTL with 95% Coverage	26440		

>20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	27

Raw Statistics		Log-Transformed Statistics	
Minimum	2800	Minimum	7.937
Maximum	26000	Maximum	10.17
Second Largest	20000	Second Largest	9.903
First Quartile	4725	First Quartile	8.461
Median	9700	Median	9.179
Third Quartile	13750	Third Quartile	9.528
Mean	9868	Mean	9.016
SD	5822	SD	0.627
Coefficient of Variation	0.59		
Skewness	0.746		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.917	Shapiro Wilk Test Statistic	0.941
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	22282	95% UTL with 95% Coverage	31342
95% UPL (t)	19820	95% UPL (t)	24042
90% Percentile (z)	17330	90% Percentile (z)	18389
95% Percentile (z)	19445	95% Percentile (z)	23092
99% Percentile (z)	23413	99% Percentile (z)	35401
Gamma Distribution Test		Data Distribution Test	
k star	2.706	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3647		
MLE of Mean	9868		
MLE of Standard Deviation	5999		
nu star	205.7		
A-D Test Statistic	0.641	Nonparametric Statistics	
5% A-D Critical Value	0.755	90% Percentile	17300
K-S Test Statistic	0.13	95% Percentile	19150
5% K-S Critical Value	0.144	99% Percentile	23780

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	26000
90% Percentile	17909	95% Percentile Bootstrap UTL with 95% Coverage	26000
95% Percentile	21341	95% BCA Bootstrap UTL with 95% Coverage	26000
99% Percentile	28821	95% UPL	20300
		95% Chebyshev UPL	35580
95% WH Approx. Gamma UPL	21676	Upper Threshold Limit Based upon IQR	27288
95% HW Approx. Gamma UPL	22123		
95% WH Approx. Gamma UTL with 95% Coverage	26141		
95% HW Approx. Gamma UTL with 95% Coverage	27082		

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Iron.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Observations	38	13
Number of Distinct Observations	27	13
Minimum	2800	4400
Maximum	26000	24000
Mean	9868	8915
Median	9700	6500
SD	5822	5366
SE of Mean	944.5	1488

Wilcoxon-Mann-Whitney (WMW) Test

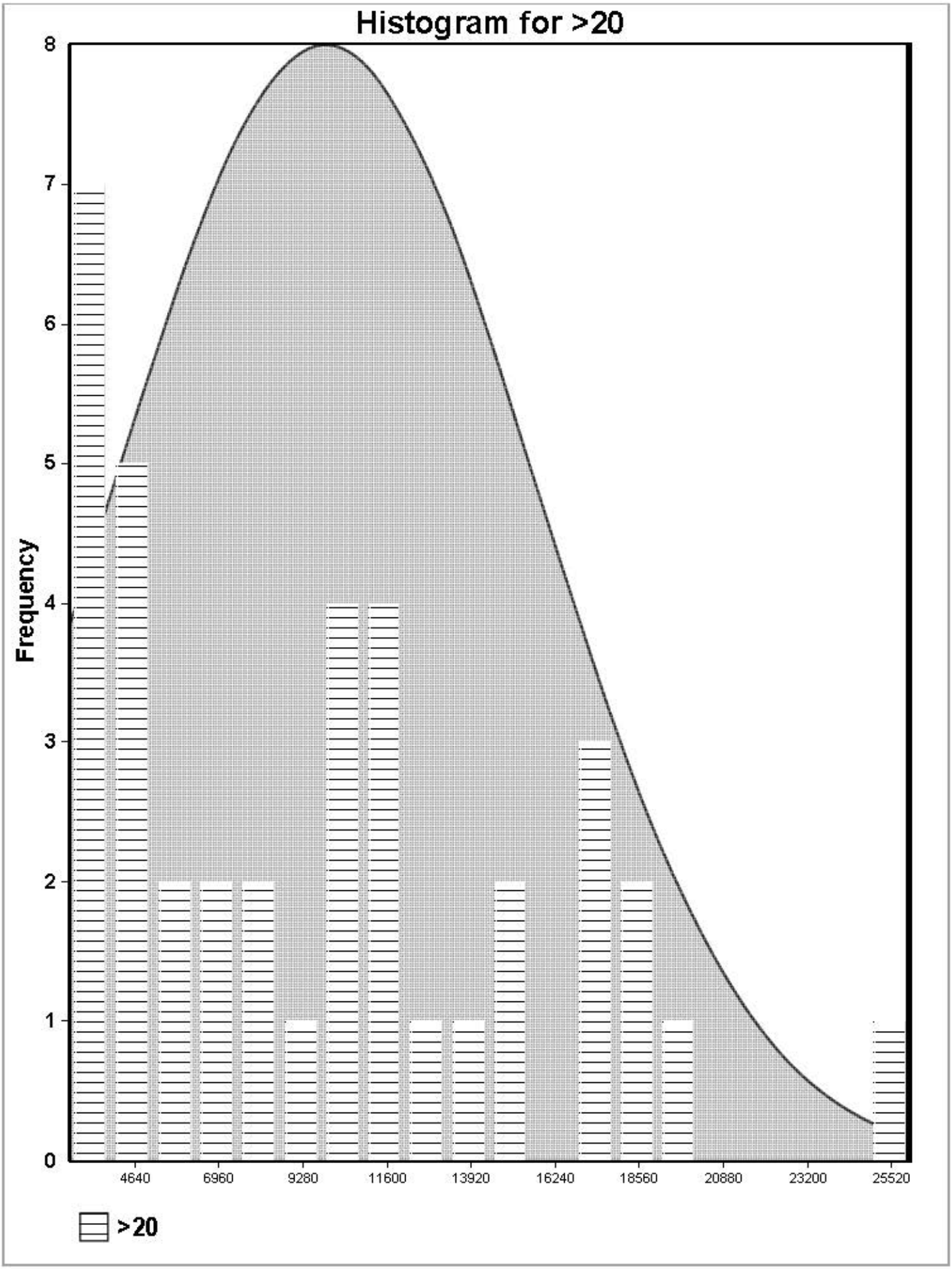
H0: Mean/Median of Site or AOC = Mean/Median of Background

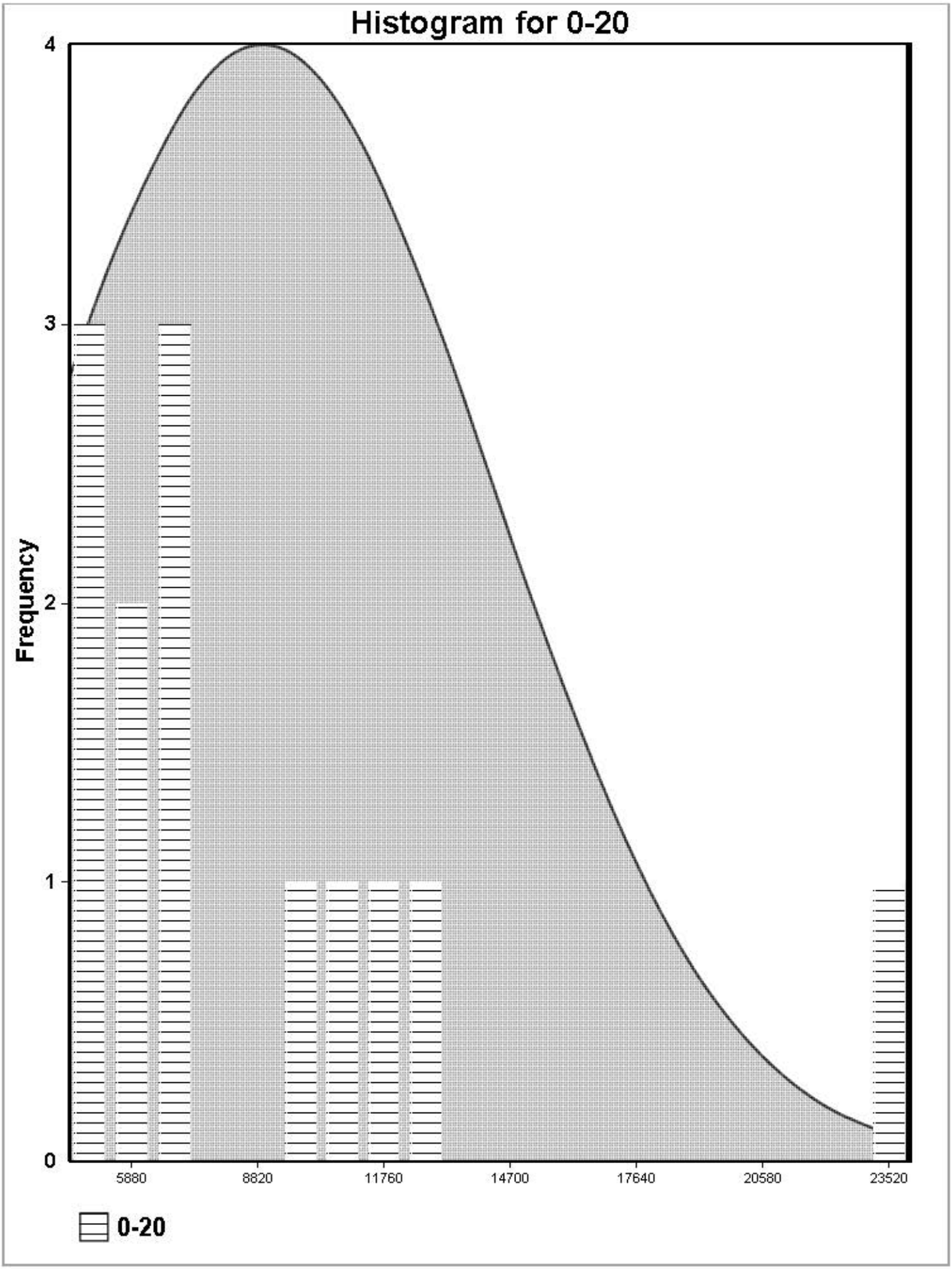
Site Rank Sum W-Stat	999.5
WMW Test U-Stat	0.238
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.812

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
4640
6960
9280
11600
13920
16240
18560
20880
23200
25520
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5880
8820
11760
14700
17640
20580
23520
0-20

Location	0-20
BG-1-2	12000
BG-3-17	4900
BG-4-2	9900
BG-4-19	24000
BG-1-10	6500
BG-2-2	5800
BG-2-10	5300
BG-2-19	5400
BG-3-2	4400
BG-3-10	11000
BG-6-2	7300
BG-6-9	6400
BG-4-10	13000

Location	>20
BG-1-29	8000
BG-1-40	3800
BG-1-46	4500
BG-1-92	3800
BG-2-21	10000
BG-2-32	6300
BG-2-75	6800
BG-3-29	4700
BG-3-63	5500
BG-3-65	9400
BG-3-95	4000
BG-3-105	11000
BG-3-131	3100
BG-3-136	19000
BG-4-65	4800
BG-4-82	10000
BG-4-95	3800
BG-4-117	2800
BG-4-120	13000
BG-6-58	4800
BG-6-75	5900
BG-6-98	10000
BG-6-114	12000
BG-6-127	20000
BG-1-43	17000
BG-1-55	3600
BG-1-78	10000
BG-2-30	17000
BG-2-81	18000
BG-3-22	3200
BG-3-69	14000
BG-4-40	17000
BG-4-79	15000
BG-4-161	8200
BG-4-163	12000
BG-6-28	15000
BG-6-53	12000
BG-6-87	26000

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Iron_a.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	13
Minimum	3200
Maximum	26000
Mean of Raw Data	13267
Standard Deviation of Raw Data	6256
Kstar	3.211
Mean of Log Transformed Data	9.356
Standard Deviation of Log Transformed Data	0.59

Normal Distribution Test Results	
Correlation Coefficient R	0.983
Shapiro Wilk Test Statistic	0.962
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.65
Lilliefors Test Statistic	0.114
Lilliefors Critical (0.95) Value	0.209

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.972
A-D Test Statistic	0.499
A-D Critical (0.95) Value	0.743
K-S Test Statistic	0.159
K-S Critical(0.95) Value	0.205

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.948
Shapiro Wilk Test Statistic	0.895
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.0485
Lilliefors Test Statistic	0.191
Lilliefors Critical (0.95) Value	0.209

Data not Lognormal at (0.05) Significance Level

Non-Clay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	26
Minimum	2800
Maximum	20000
Mean of Raw Data	7639
Standard Deviation of Raw Data	4237
Kstar	3.709
Mean of Log Transformed Data	8.813
Standard Deviation of Log Transformed Data	0.503

Normal Distribution Test Results

Correlation Coefficient R	0.925
Shapiro Wilk Test Statistic	0.853
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	2.5918E-4
Lilliefors Test Statistic	0.185
Lilliefors Critical (0.95) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.978
A-D Test Statistic	0.658
A-D Critical (0.95) Value	0.751
K-S Test Statistic	0.135
K-S Critical(0.95) Value	0.154

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.986
Shapiro Wilk Test Statistic	0.963
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.366
Lilliefors Test Statistic	0.102
Lilliefors Critical (0.95) Value	0.154

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Iron_a.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	13

Raw Statistics		Log-Transformed Statistics	
Minimum	3200	Minimum	8.071
Maximum	26000	Maximum	10.17
Second Largest	24000	Second Largest	10.09
First Quartile	9925	First Quartile	9.203
Median	13000	Median	9.47
Third Quartile	17000	Third Quartile	9.741
Mean	13267	Mean	9.356
SD	6256	SD	0.59
Coefficient of Variation	0.472		
Skewness	0.231		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.962	Shapiro Wilk Test Statistic	0.895
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	28613	95% UTL with 95% Coverage	49195
95% UPL (t)	24448	95% UPL (t)	33213
90% Percentile (z)	21284	90% Percentile (z)	24643
95% Percentile (z)	23557	95% Percentile (z)	30536
99% Percentile (z)	27821	99% Percentile (z)	45652

Gamma Distribution Test		Data Distribution Test	
k star	3.211	Data appear Normal at 5% Significance Level	
Theta Star	4132		
MLE of Mean	13267		
MLE of Standard Deviation	7404		
nu star	115.6		
A-D Test Statistic	0.499	Nonparametric Statistics	
5% A-D Critical Value	0.743	90% Percentile	19800
K-S Test Statistic	0.159	95% Percentile	24300
5% K-S Critical Value	0.205	99% Percentile	25660
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	26000
90% Percentile	23195	95% Percentile Bootstrap UTL with 95% Coverage	26000
95% Percentile	27309	95% BCA Bootstrap UTL with 95% Coverage	26000
99% Percentile	36196	95% UPL	26000
		95% Chebyshev UPL	41284
95% WH Approx. Gamma UPL	28175	Upper Threshold Limit Based upon IQR	27613
95% HW Approx. Gamma UPL	29090		
95% WH Approx. Gamma UTL with 95% Coverage	36571		
95% HW Approx. Gamma UTL with 95% Coverage	38672		

Non-Clay

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	26

Raw Statistics		Log-Transformed Statistics	
Minimum	2800	Minimum	7.937
Maximum	20000	Maximum	9.903
Second Largest	19000	Second Largest	9.852
First Quartile	4700	First Quartile	8.455
Median	6300	Median	8.748
Third Quartile	10000	Third Quartile	9.21
Mean	7639	Mean	8.813
SD	4237	SD	0.503
Coefficient of Variation	0.555		
Skewness	1.423		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.853	Shapiro Wilk Test Statistic	0.963
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	16859	95% UTL with 95% Coverage	20056
95% UPL (t)	14924	95% UPL (t)	15944
90% Percentile (z)	13069	90% Percentile (z)	12795
95% Percentile (z)	14608	95% Percentile (z)	15358
99% Percentile (z)	17496	99% Percentile (z)	21630
Gamma Distribution Test		Data Distribution Test	
k star	3.709	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2060		
MLE of Mean	7639		
MLE of Standard Deviation	3967		
nu star	244.8		
A-D Test Statistic	0.658	Nonparametric Statistics	
5% A-D Critical Value	0.751	90% Percentile	12800
K-S Test Statistic	0.135	95% Percentile	15400
5% K-S Critical Value	0.154	99% Percentile	19680

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	20000
90% Percentile	12958	95% Percentile Bootstrap UTL with 95% Coverage	20000
95% Percentile	15111	95% BCA Bootstrap UTL with 95% Coverage	19400
99% Percentile	19728	95% UPL	19300
		95% Chebyshev UPL	26385
95% WH Approx. Gamma UPL	15301	Upper Threshold Limit Based upon IQR	17950
95% HW Approx. Gamma UPL	15421		
95% WH Approx. Gamma UTL with 95% Coverage	18270		
95% HW Approx. Gamma UTL with 95% Coverage	18611		

Outlier Tests for Selected Variables

User Selected Options	
From File	Iron_a.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 26000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.379

For 10% significance level, 26000 is not an outlier.

For 5% significance level, 26000 is not an outlier.

For 1% significance level, 26000 is not an outlier.

2. Data Value 3200 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.115

For 10% significance level, 3200 is not an outlier.

For 5% significance level, 3200 is not an outlier.

For 1% significance level, 3200 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	7639
Standard Deviation	4237
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7639	4172	20000	33	2.963	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 20000 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Iron_a.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Observations	33	18
Number of Distinct Observations	26	13
Minimum	2800	3200
Maximum	20000	26000
Mean	7639	13267
Median	6300	13000
SD	4237	6256
SE of Mean	737.5	1475

Wilcoxon-Mann-Whitney (WMW) Test

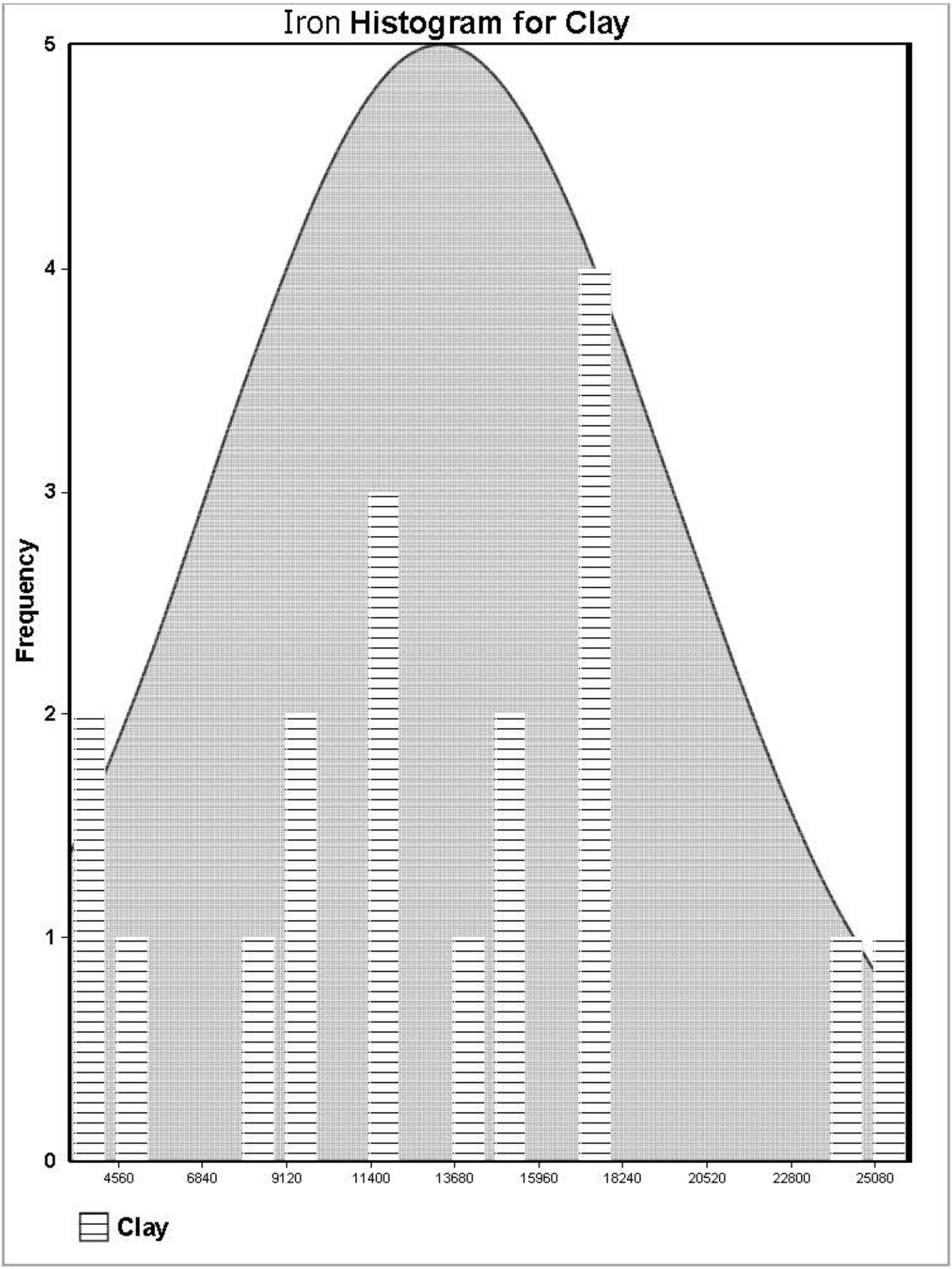
H0: Mean/Median of Site or AOC = Mean/Median of Background

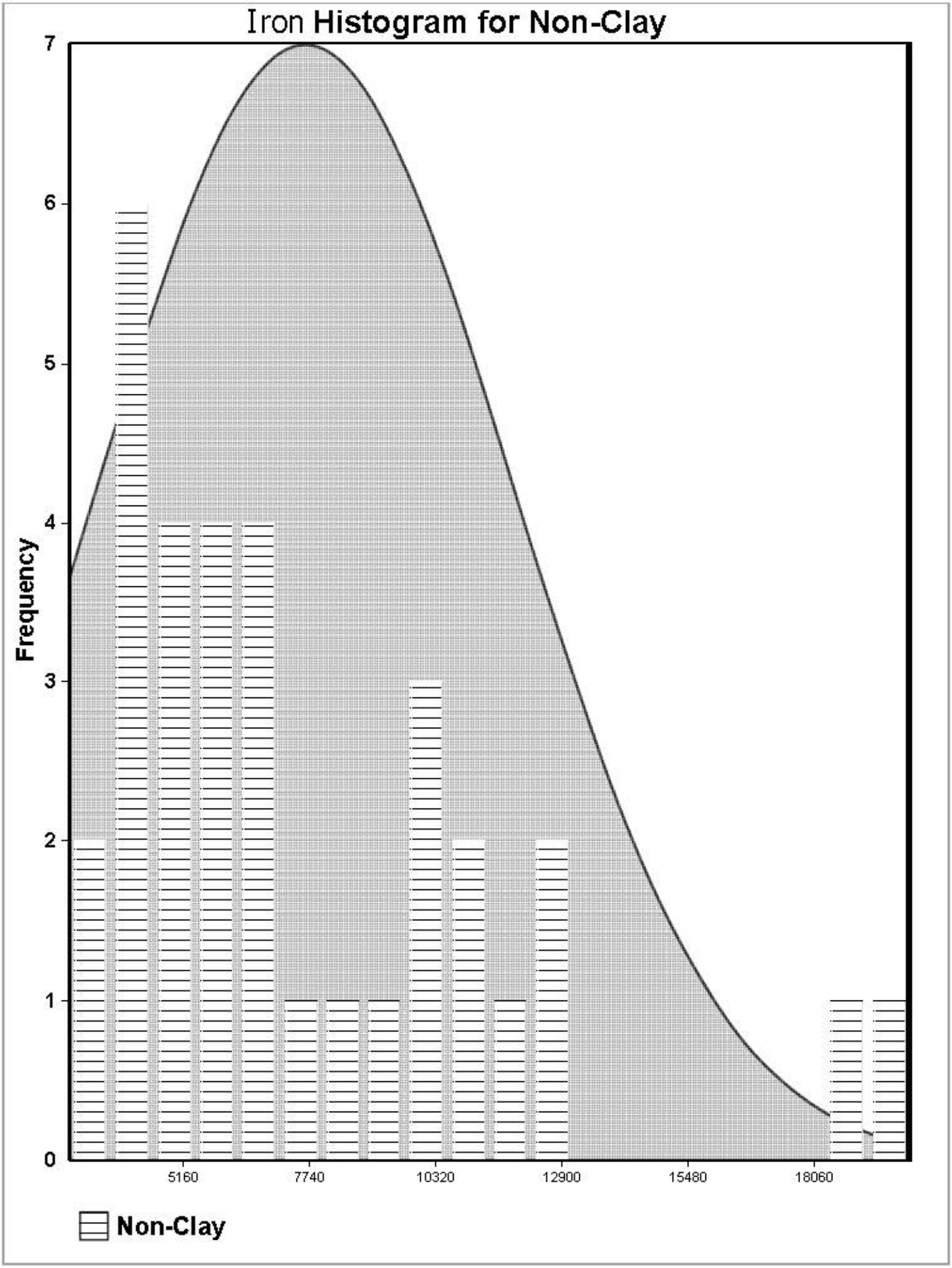
Site Rank Sum W-Stat	702
WMW Test U-Stat	3.065
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.00204

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Iron Histogram for Clay
Frequency
0
1
2
3
4
5
4560
6840
9120
11400
13680
15960
18240
20520
22800
25080
Clay


Iron Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
5160
7740
10320
12900
15480
18060
Non-Clay

Location	Clay
BG-1-2	12000
BG-1-43	17000
BG-1-55	3600
BG-1-78	10000
BG-2-30	17000
BG-2-81	18000
BG-3-17	4900
BG-3-22	3200
BG-3-69	14000
BG-4-2	9900
BG-4-19	24000
BG-4-40	17000
BG-4-79	15000
BG-4-161	8200
BG-4-163	12000
BG-6-28	15000
BG-6-53	12000
BG-6-87	26000

Location	Non-Clay
BG-1-10	6500
BG-1-29	8000
BG-1-40	3800
BG-1-46	4500
BG-1-92	3800
BG-2-2	5800
BG-2-10	5300
BG-2-19	5400
BG-2-21	10000
BG-2-32	6300
BG-2-75	6800
BG-3-2	4400
BG-3-10	11000
BG-3-29	4700
BG-3-63	5500
BG-3-65	9400
BG-3-95	4000
BG-3-105	11000
BG-3-131	3100
BG-3-136	19000
BG-4-10	13000
BG-4-65	4800
BG-4-82	10000
BG-4-95	3800
BG-4-117	2800
BG-4-120	13000
BG-6-2	7300
BG-6-9	6400
BG-6-58	4800
BG-6-75	5900
BG-6-98	10000
BG-6-114	12000
BG-6-127	20000
Average	7639.394

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Iron.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	12
Minimum	3800
Maximum	12000
Mean of Raw Data	7158
Standard Deviation of Raw Data	2616
Kstar	6.516
Mean of Log Transformed Data	8.817
Standard Deviation of Log Transformed Data	0.358

Normal Distribution Test Results	
Correlation Coefficient R	0.967
Shapiro Wilk Test Statistic	0.924
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.365
Lilliefors Test Statistic	0.183
Lilliefors Critical (0.95) Value	0.256

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.984
A-D Test Statistic	0.265
A-D Critical (0.95) Value	0.731
K-S Test Statistic	0.148
K-S Critical(0.95) Value	0.246

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.989
Shapiro Wilk Test Statistic	0.968
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.913
Lilliefors Test Statistic	0.125
Lilliefors Critical (0.95) Value	0.256

Data appear Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	29
Minimum	2800
Maximum	26000
Mean of Raw Data	10385
Standard Deviation of Raw Data	6151
Kstar	2.645
Mean of Log Transformed Data	9.062
Standard Deviation of Log Transformed Data	0.638

Normal Distribution Test Results

Correlation Coefficient R	0.965
Shapiro Wilk Test Statistic	0.917
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.0081
Lilliefors Test Statistic	0.131
Lilliefors Critical (0.95) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.987
A-D Test Statistic	0.642
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.128
K-S Critical(0.95) Value	0.142

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.979
Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.0488
Lilliefors Test Statistic	0.124
Lilliefors Critical (0.95) Value	0.142

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Iron.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-Transformed Statistics	
Minimum	3800	Minimum	8.243
Maximum	12000	Maximum	9.393
Second Largest	11000	Second Largest	9.306
First Quartile	5375	First Quartile	8.589
Median	6450	Median	8.772
Third Quartile	8500	Third Quartile	9.043
Mean	7158	Mean	8.817
SD	2616	SD	0.358
Coefficient of Variation	0.365		
Skewness	0.73		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.924	Shapiro Wilk Test Statistic	0.968
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	14316	95% UTL with 95% Coverage	17956
95% UPL (t)	12049	95% UPL (t)	13168
90% Percentile (z)	10511	90% Percentile (z)	10672
95% Percentile (z)	11462	95% Percentile (z)	12153
99% Percentile (z)	13245	99% Percentile (z)	15508

Gamma Distribution Test		Data Distribution Test	
k star	6.516	Data appear Normal at 5% Significance Level	
Theta Star	1098		
MLE of Mean	7158		
MLE of Standard Deviation	2804		
nu star	156.4		
A-D Test Statistic	0.265	Nonparametric Statistics	
5% A-D Critical Value	0.731	90% Percentile	10900
K-S Test Statistic	0.148	95% Percentile	11450
5% K-S Critical Value	0.246	99% Percentile	11890
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	12000
90% Percentile	10904	95% Percentile Bootstrap UTL with 95% Coverage	12000
95% Percentile	12306	95% BCA Bootstrap UTL with 95% Coverage	12000
99% Percentile	15234	95% UPL	12000
		95% Chebyshev UPL	19028
95% WH Approx. Gamma UPL	12645	Upper Threshold Limit Based upon IQR	13188
95% HW Approx. Gamma UPL	12756		
95% WH Approx. Gamma UTL with 95% Coverage	16156		
95% HW Approx. Gamma UTL with 95% Coverage	16521		

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	29

Raw Statistics		Log-Transformed Statistics	
Minimum	2800	Minimum	7.937
Maximum	26000	Maximum	10.17
Second Largest	24000	Second Largest	10.09
First Quartile	4800	First Quartile	8.476
Median	10000	Median	9.21
Third Quartile	14500	Third Quartile	9.581
Mean	10385	Mean	9.062
SD	6151	SD	0.638
Coefficient of Variation	0.592		
Skewness	0.702		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.917	Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	23453	95% UTL with 95% Coverage	33460
95% UPL (t)	20887	95% UPL (t)	25641
90% Percentile (z)	18268	90% Percentile (z)	19538
95% Percentile (z)	20502	95% Percentile (z)	24637
99% Percentile (z)	24694	99% Percentile (z)	38060
Gamma Distribution Test		Data Distribution Test	
k star	2.645	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3927		
MLE of Mean	10385		
MLE of Standard Deviation	6386		
nu star	206.3		
A-D Test Statistic	0.642	Nonparametric Statistics	
5% A-D Critical Value	0.755	90% Percentile	18200
K-S Test Statistic	0.128	95% Percentile	20400
5% K-S Critical Value	0.142	99% Percentile	25240

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	26000
90% Percentile	18942	95% Percentile Bootstrap UTL with 95% Coverage	26000
95% Percentile	22610	95% BCA Bootstrap UTL with 95% Coverage	26000
99% Percentile	30614	95% UPL	24000
		95% Chebyshev UPL	37538
95% WH Approx. Gamma UPL	22963	Upper Threshold Limit Based upon IQR	29050
95% HW Approx. Gamma UPL	23466		
95% WH Approx. Gamma UTL with 95% Coverage	27672		
95% HW Approx. Gamma UTL with 95% Coverage	28712		

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Iron.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Observations	39	12
Number of Distinct Observations	29	12
Minimum	2800	3800
Maximum	26000	12000
Mean	10385	7158
Median	10000	6450
SD	6151	2616
SE of Mean	985	755.2

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1070
WMW Test U-Stat	1.221
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.222

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Outlier Tests for Selected Variables

User Selected Options	
From File	Iron.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 12000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.263

For 10% significance level, 12000 is not an outlier.
For 5% significance level, 12000 is not an outlier.
For 1% significance level, 12000 is not an outlier.

2. Data Value 3800 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.208

For 10% significance level, 3800 is not an outlier.
For 5% significance level, 3800 is not an outlier.
For 1% significance level, 3800 is not an outlier.

Rosner's Outlier Test for MC

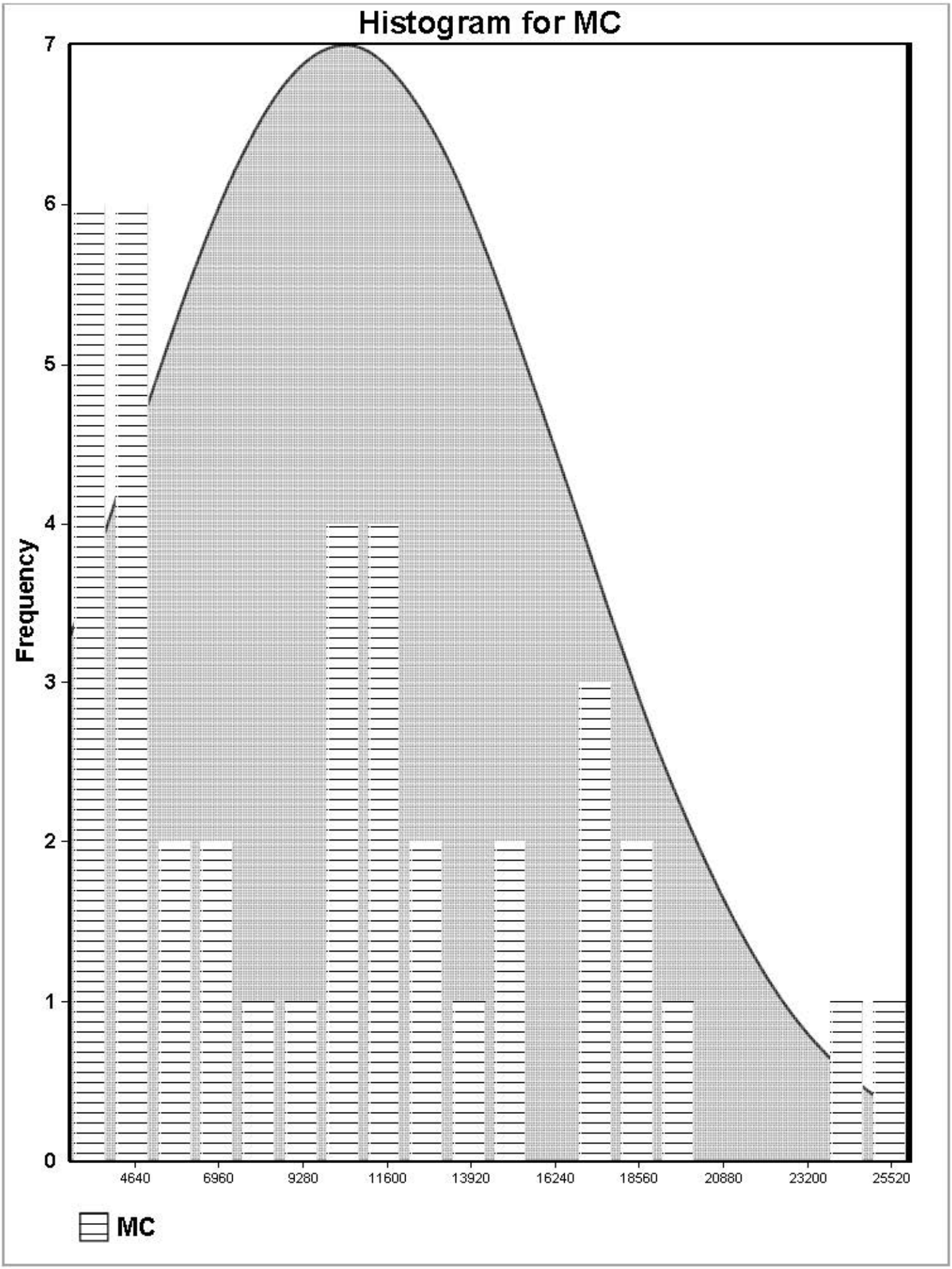
Mean	10385
Standard Deviation	6151
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	10385	6072	26000	36	2.572	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Histogram for Alluv
Frequency
3
2
1
0
4920
6150
7380
8610
9840
11070
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
4640
6960
9280
11600
13920
16240
18560
20880
23200
25520
MC

Location	Alluv
BG-1-2	12000
BG-1-10	6500
BG-1-29	8000
BG-1-40	3800
BG-2-2	5800
BG-2-10	5300
BG-2-19	5400
BG-2-21	10000
BG-3-2	4400
BG-3-10	11000
BG-6-2	7300
BG-6-9	6400

Location	MC
BG-1-43	17000
BG-1-46	4500
BG-1-55	3600
BG-1-78	10000
BG-1-92	3800
BG-2-30	17000
BG-2-32	6300
BG-2-75	6800
BG-2-81	18000
BG-3-17	4900
BG-3-22	3200
BG-3-29	4700
BG-3-63	5500
BG-3-65	9400
BG-3-69	14000
BG-3-95	4000
BG-3-105	11000
BG-3-131	3100
BG-3-136	19000
BG-4-1	9900
BG-4-10	13000
BG-4-19	24000
BG-4-40	17000
BG-4-65	4800
BG-4-79	15000
BG-4-82	10000
BG-4-95	3800
BG-4-117	2800
BG-4-120	13000
BG-4-161	8200
BG-4-163	12000
BG-6-28	15000
BG-6-53	12000
BG-6-58	4800
BG-6-75	5900
BG-6-87	26000
BG-6-98	10000
BG-6-114	12000
BG-1-127	20000

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Lead.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	38
Minimum	0.76
Maximum	18
Mean of Raw Data	6.77
Standard Deviation of Raw Data	3.759
Kstar	3.16
Mean of Log Transformed Data	1.756
Standard Deviation of Log Transformed Data	0.593

Normal Distribution Test Results	
Correlation Coefficient R	0.96
Approximate Shapiro Wilk Test Statistic	0.919
Approximate Shapiro Wilk P Value	0.00181
Lilliefors Test Statistic	0.137
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.994
A-D Test Statistic	0.494
A-D Critical (0.95) Value	0.756
K-S Test Statistic	0.112
K-S Critical(0.95) Value	0.125

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.976
Approximate Shapiro Wilk Test Statistic	0.961
Approximate Shapiro Wilk P Value	0.167
Lilliefors Test Statistic	0.0863
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Lead.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Total Number of Observations	51	Number of Distinct Observations	38

Raw Statistics		Log-Transformed Statistics	
Minimum	0.76	Minimum	-0.274
Maximum	18	Maximum	2.89
Second Largest	16	Second Largest	2.773
First Quartile	3.7	First Quartile	1.308
Median	5.9	Median	1.775
Third Quartile	8.65	Third Quartile	2.158
Mean	6.77	Mean	1.756
SD	3.759	SD	0.593
Coefficient of Variation	0.555		
Skewness	0.967		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.137	Lilliefors Test Statistic	0.0863
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	14.49	95% UTL with 95% Coverage	19.54
95% UPL (t)	13.13	95% UPL (t)	15.78
90% Percentile (z)	11.59	90% Percentile (z)	12.37
95% Percentile (z)	12.95	95% Percentile (z)	15.34
99% Percentile (z)	15.51	99% Percentile (z)	22.97

Gamma Distribution Test		Data Distribution Test
k star	3.16	Data appear Gamma Distributed at 5% Significance Level
Theta Star	2.143	
MLE of Mean	6.77	
MLE of Standard Deviation	3.809	
nu star	322.3	
A-D Test Statistic	0.494	Nonparametric Statistics
5% A-D Critical Value	0.756	90% Percentile 11
K-S Test Statistic	0.112	95% Percentile 13.5
5% K-S Critical Value	0.125	99% Percentile 17
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	16
90% Percentile	11.88	95% Percentile Bootstrap UTL with 95% Coverage	16
95% Percentile	14	95% BCA Bootstrap UTL with 95% Coverage	16
99% Percentile	18.59	95% UPL	14.8
		95% Chebyshev UPL	23.32
95% WH Approx. Gamma UPL	14.12	Upper Threshold Limit Based upon IQR	16.08
95% HW Approx. Gamma UPL	14.4		
95% WH Approx. Gamma UTL with 95% Coverage	16.43		
95% HW Approx. Gamma UTL with 95% Coverage	16.96		

Outlier Tests for Selected Variables

User Selected Options	
From File	Lead.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

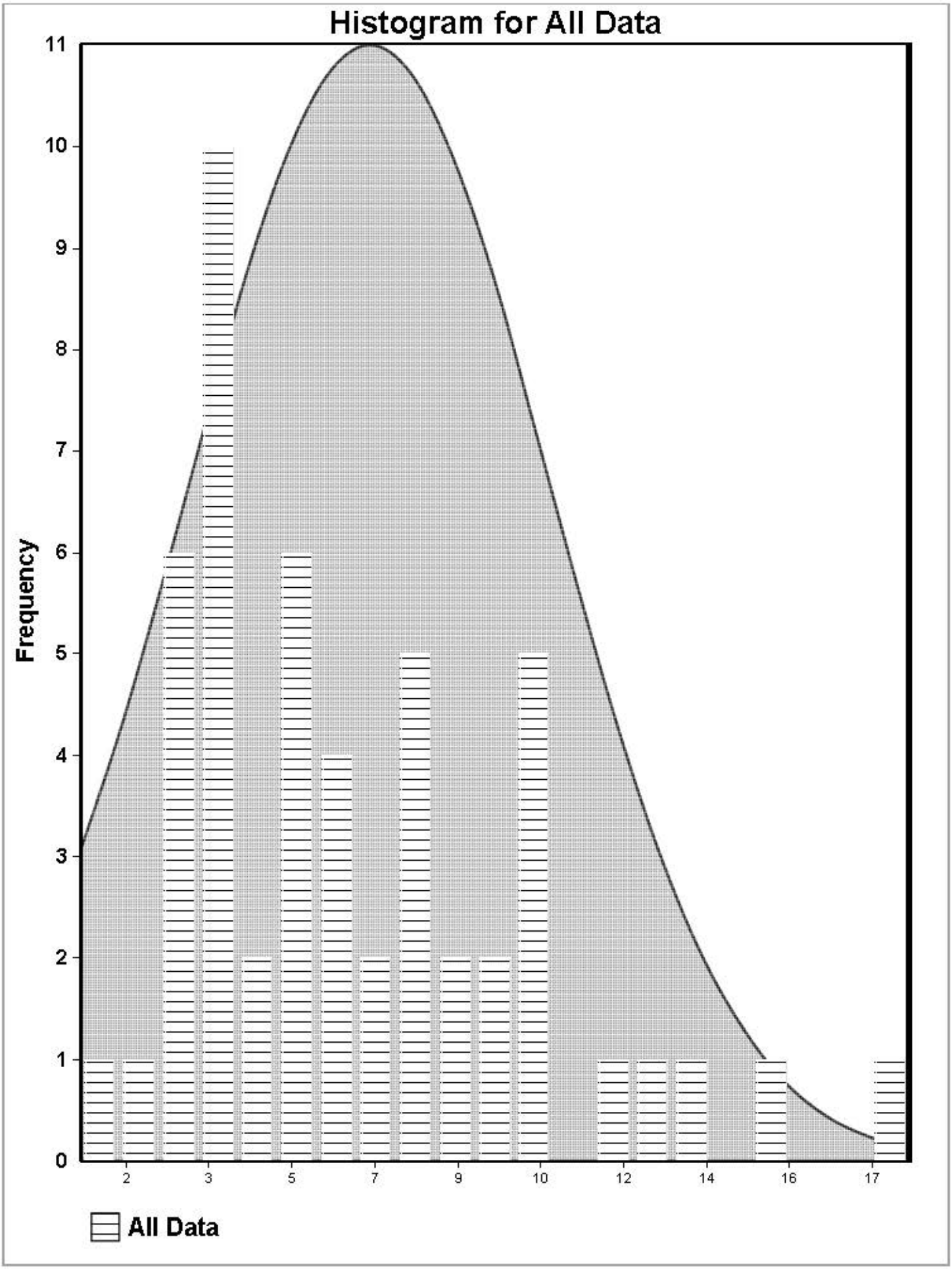
Rosner's Outlier Test for All Data

Mean	6.77
Standard Deviation	3.759
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	6.77	3.722	18	51	3.017	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
2
3
5
7
9
10
12
14
16
17
All Data

Location	All Data
BG-1-2	6.8
BG-3-17	4
BG-4-2	6.4
BG-4-19	14
BG-1-10	3.8
BG-2-2	3.9
BG-2-10	3.4
BG-2-19	8.7
BG-3-2	5.9
BG-3-10	5.5
BG-4-10	9.4
BG-6-2	7.7
BG-6-9	3.6
BG-1-29	4.3
BG-1-40	0.76
BG-1-46	3.1
BG-1-92	2.4
BG-2-21	4.3
BG-2-32	3.5
BG-2-75	3.2
BG-3-29	3.6
BG-3-63	3.8
BG-3-65	5.5
BG-3-95	3.1
BG-3-105	5.4
BG-3-131	5.3
BG-3-136	11
BG-4-65	4
BG-4-82	7.3
BG-4-95	3.3
BG-4-117	2.7
BG-4-120	8.6
BG-6-58	3.6
BG-6-75	5.7
BG-6-98	6.5
BG-6-114	8.1
BG-6-127	13
BG-1-43	11
BG-1-55	2.7
BG-1-78	7.8
BG-2-30	11
BG-2-81	16
BG-3-22	6.6
BG-3-69	8.1
BG-4-40	12
BG-4-79	11
BG-4-161	6.7
BG-4-163	11
BG-6-28	10
BG-6-53	8.2
BG-6-87	18

General Background Statistics for Full Data Sets

User Selected Options	
From File	Lead.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	13

Raw Statistics		Log-Transformed Statistics	
Minimum	3.4	Minimum	1.224
Maximum	14	Maximum	2.639
Second Largest	9.4	Second Largest	2.241
First Quartile	3.9	First Quartile	1.361
Median	5.9	Median	1.775
Third Quartile	7.7	Third Quartile	2.041
Mean	6.392	Mean	1.763
SD	3.035	SD	0.436
Coefficient of Variation	0.475		
Skewness	1.36		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.868	Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	14.5	95% UTL with 95% Coverage	18.68
95% UPL (t)	12.01	95% UPL (t)	13.06
90% Percentile (z)	10.28	90% Percentile (z)	10.2
95% Percentile (z)	11.39	95% Percentile (z)	11.94
99% Percentile (z)	13.45	99% Percentile (z)	16.07

Gamma Distribution Test		Data Distribution Test	
k star	4.37	Data appear Normal at 5% Significance Level	
Theta Star	1.463		
MLE of Mean	6.392		
MLE of Standard Deviation	3.058		
nu star	113.6		
A-D Test Statistic	0.393	Nonparametric Statistics	
5% A-D Critical Value	0.736	90% Percentile	9.26
K-S Test Statistic	0.196	95% Percentile	11.24
5% K-S Critical Value	0.237	99% Percentile	13.45
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	14
90% Percentile	10.49	95% Percentile Bootstrap UTL with 95% Coverage	14
95% Percentile	12.11	95% BCA Bootstrap UTL with 95% Coverage	14
99% Percentile	15.55	95% UPL	14
		95% Chebyshev UPL	20.12
95% WH Approx. Gamma UPL	12.5	Upper Threshold Limit Based upon IQR	13.4
95% HW Approx. Gamma UPL	12.61		
95% WH Approx. Gamma UTL with 95% Coverage	16.47		
95% HW Approx. Gamma UTL with 95% Coverage	16.9		

>20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	29
Raw Statistics		Log-Transformed Statistics	
Minimum	0.76	Minimum	-0.274
Maximum	18	Maximum	2.89
Second Largest	16	Second Largest	2.773
First Quartile	3.6	First Quartile	1.281
Median	6.1	Median	1.806
Third Quartile	9.65	Third Quartile	2.265
Mean	6.899	Mean	1.753
SD	4.005	SD	0.643
Coefficient of Variation	0.581		
Skewness	0.878		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.923	Shapiro Wilk Test Statistic	0.955
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	15.44	95% UTL with 95% Coverage	22.72
95% UPL (t)	13.74	95% UPL (t)	17.31
90% Percentile (z)	12.03	90% Percentile (z)	13.15
95% Percentile (z)	13.49	95% Percentile (z)	16.61
99% Percentile (z)	16.22	99% Percentile (z)	25.74
Gamma Distribution Test		Data Distribution Test	
k star	2.741	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2.517		
MLE of Mean	6.899		
MLE of Standard Deviation	4.167		
nu star	208.3		
A-D Test Statistic	0.407	Nonparametric Statistics	
5% A-D Critical Value	0.755	90% Percentile	11.3
K-S Test Statistic	0.104	95% Percentile	13.45
5% K-S Critical Value	0.144	99% Percentile	17.26

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	18
90% Percentile	12.48	95% Percentile Bootstrap UTL with 95% Coverage	18
95% Percentile	14.86	95% BCA Bootstrap UTL with 95% Coverage	18
99% Percentile	20.04	95% UPL	16.1
		95% Chebyshev UPL	24.58
95% WH Approx. Gamma UPL	15.07	Upper Threshold Limit Based upon IQR	18.73
95% HW Approx. Gamma UPL	15.45		
95% WH Approx. Gamma UTL with 95% Coverage	18.14		
95% HW Approx. Gamma UTL with 95% Coverage	18.89		

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Lead.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	13
Minimum	3.4
Maximum	14
Mean of Raw Data	6.392
Standard Deviation of Raw Data	3.035
Kstar	4.37
Mean of Log Transformed Data	1.763
Standard Deviation of Log Transformed Data	0.436

Normal Distribution Test Results	
Correlation Coefficient R	0.93
Shapiro Wilk Test Statistic	0.868
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.0458
Lilliefors Test Statistic	0.169
Lilliefors Critical (0.95) Value	0.246

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.976
A-D Test Statistic	0.393
A-D Critical (0.95) Value	0.736
K-S Test Statistic	0.196
K-S Critical(0.95) Value	0.237

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.972
Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.445
Lilliefors Test Statistic	0.191
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

>20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	29
Minimum	0.76
Maximum	18
Mean of Raw Data	6.899
Standard Deviation of Raw Data	4.005
Kstar	2.741
Mean of Log Transformed Data	1.753
Standard Deviation of Log Transformed Data	0.643

Normal Distribution Test Results

Correlation Coefficient R	0.962
Shapiro Wilk Test Statistic	0.923
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.0146
Lilliefors Test Statistic	0.137
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.99
A-D Test Statistic	0.407
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.104
K-S Critical(0.95) Value	0.144

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.973
Shapiro Wilk Test Statistic	0.955
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.181
Lilliefors Test Statistic	0.0791
Lilliefors Critical (0.95) Value	0.144

Data appear Lognormal at (0.05) Significance Level

Outlier Tests for Selected Variables

User Selected Options	
From File	Lead.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 14 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.510

For 10% significance level, 14 is an outlier.
For 5% significance level, 14 is not an outlier.
For 1% significance level, 14 is not an outlier.

2. Data Value 3.4 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.067

For 10% significance level, 3.4 is not an outlier.
For 5% significance level, 3.4 is not an outlier.
For 1% significance level, 3.4 is not an outlier.

Rosner's Outlier Test for >20

Mean	6.899
Standard Deviation	4.005
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	6.899	3.952	18	38	2.809	3.01	3.36

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Lead.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Observations	38	13
Number of Distinct Observations	29	13
Minimum	0.76	3.4
Maximum	18	14
Mean	6.899	6.392
Median	6.1	5.9
SD	4.005	3.035
SE of Mean	0.65	0.842

Wilcoxon-Mann-Whitney (WMW) Test

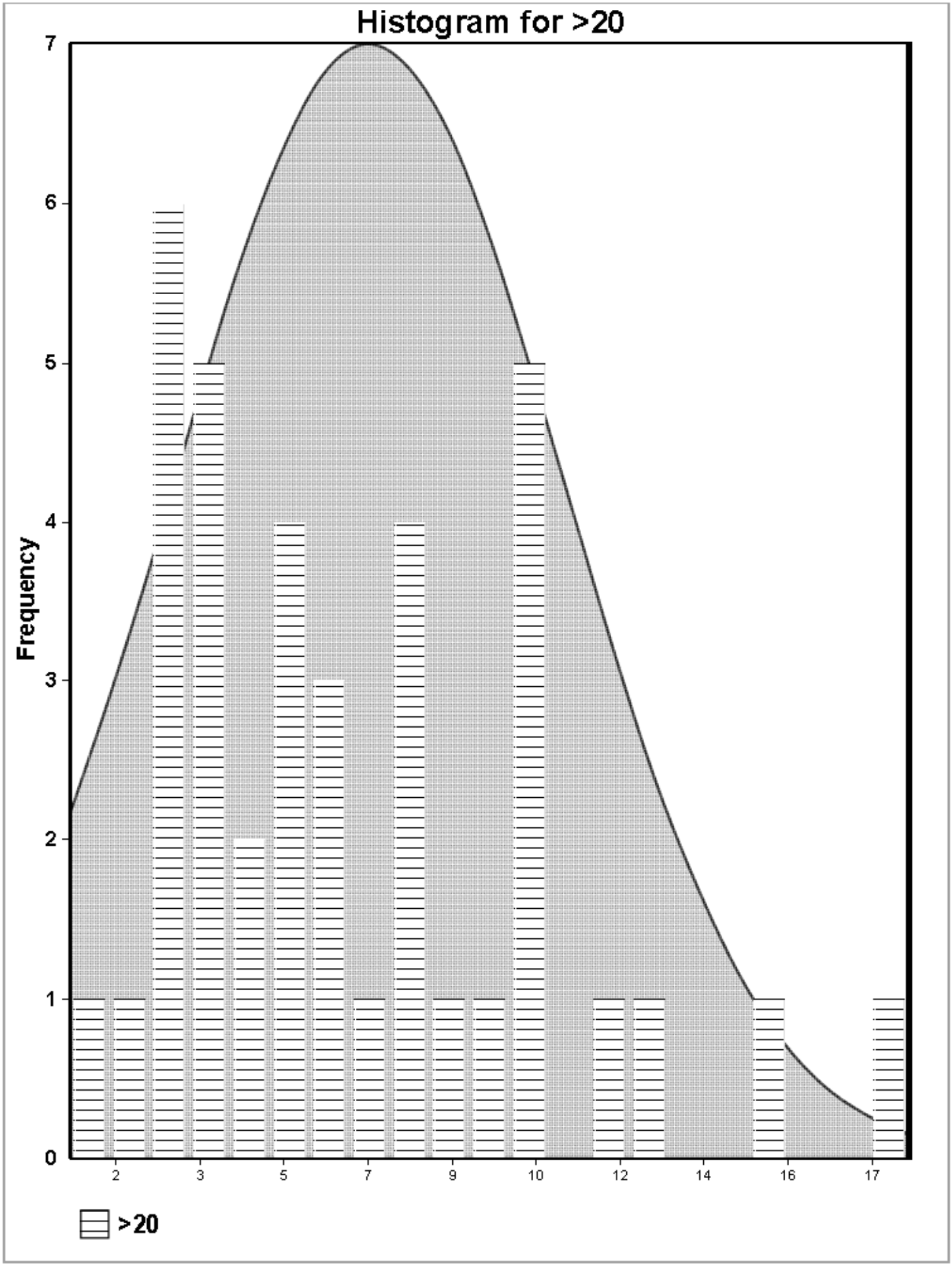
H0: Mean/Median of Site or AOC = Mean/Median of Background

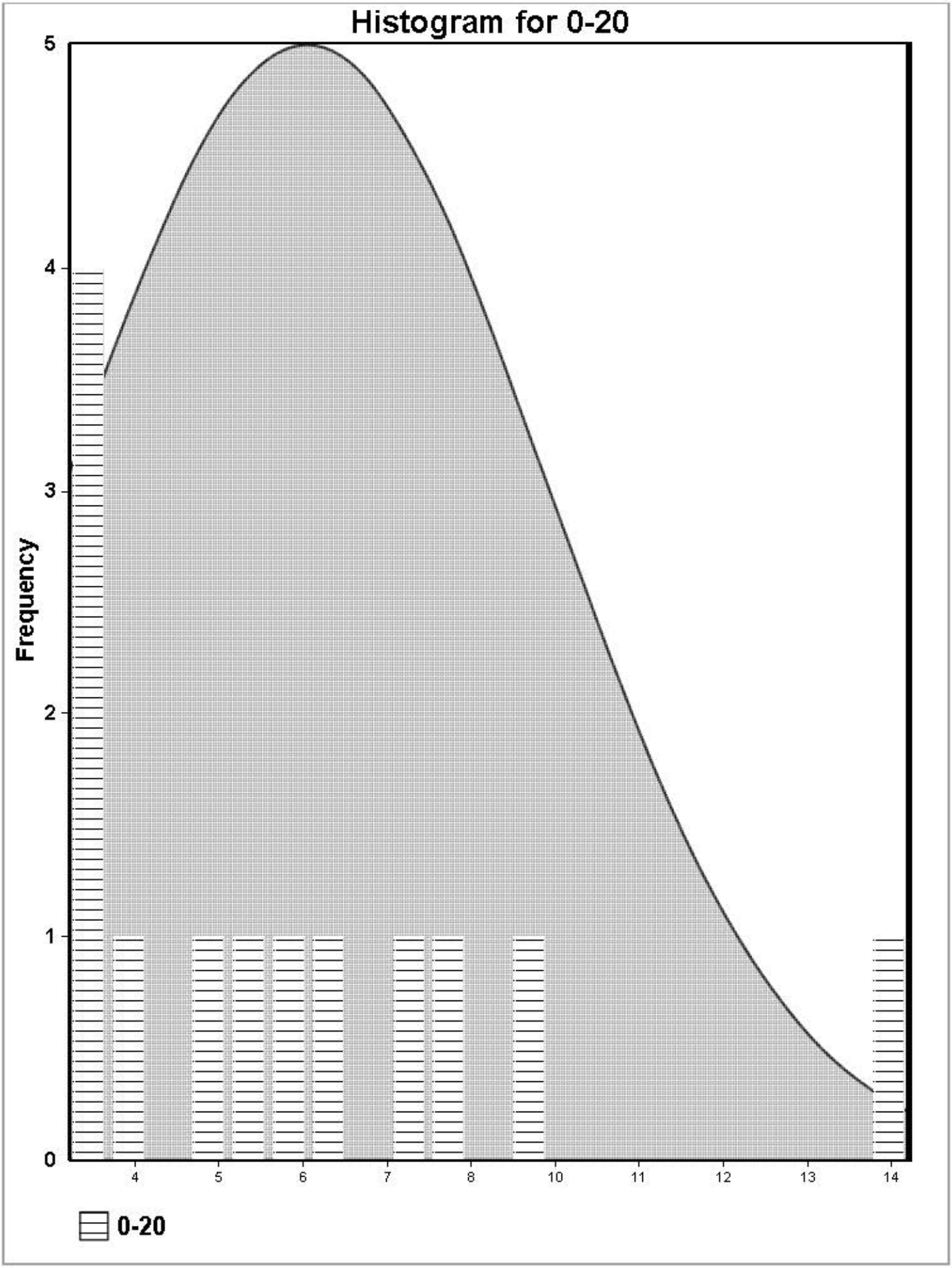
Site Rank Sum W-Stat	988.5
WMW Test U-Stat	0
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	1

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
2
3
5
7
9
10
12
14
16
17
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5
4
5
6
7
8
10
11
12
13
14
0-20

Location	0-20
BG-1-2	6.8
BG-3-17	4
BG-4-2	6.4
BG-4-19	14
BG-1-10	3.8
BG-2-2	3.9
BG-2-10	3.4
BG-2-19	8.7
BG-3-2	5.9
BG-3-10	5.5
BG-4-10	9.4
BG-6-2	7.7
BG-6-9	3.6

Location	>20
BG-1-29	4.3
BG-1-40	0.76
BG-1-46	3.1
BG-1-92	2.4
BG-2-21	4.3
BG-2-32	3.5
BG-2-75	3.2
BG-3-29	3.6
BG-3-63	3.8
BG-3-65	5.5
BG-3-95	3.1
BG-3-105	5.4
BG-3-131	5.3
BG-3-136	11
BG-4-65	4
BG-4-82	7.3
BG-4-95	3.3
BG-4-117	2.7
BG-4-120	8.6
BG-6-58	3.6
BG-6-75	5.7
BG-6-98	6.5
BG-6-114	8.1
BG-6-127	13
BG-1-43	11
BG-1-55	2.7
BG-1-78	7.8
BG-2-30	11
BG-2-81	16
BG-3-22	6.6
BG-3-69	8.1
BG-4-40	12
BG-4-79	11
BG-4-161	6.7
BG-4-163	11
BG-6-28	10
BG-6-53	8.2
BG-6-87	18

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Lead.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	15
Minimum	2.7
Maximum	18
Mean of Raw Data	9.517
Standard Deviation of Raw Data	3.959
Kstar	4.631
Mean of Log Transformed Data	2.16
Standard Deviation of Log Transformed Data	0.47

Normal Distribution Test Results	
Correlation Coefficient R	0.982
Shapiro Wilk Test Statistic	0.966
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.699
Lilliefors Test Statistic	0.132
Lilliefors Critical (0.95) Value	0.209

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.986
A-D Test Statistic	0.295
A-D Critical (0.95) Value	0.743
K-S Test Statistic	0.132
K-S Critical(0.95) Value	0.204

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.967
Shapiro Wilk Test Statistic	0.942
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.3
Lilliefors Test Statistic	0.148
Lilliefors Critical (0.95) Value	0.209

Data appear Lognormal at (0.05) Significance Level

Non-Clay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	27
Minimum	0.76
Maximum	13
Mean of Raw Data	5.272
Standard Deviation of Raw Data	2.682
Kstar	3.738
Mean of Log Transformed Data	1.535
Standard Deviation of Log Transformed Data	0.538

Normal Distribution Test Results

Correlation Coefficient R	0.949
Shapiro Wilk Test Statistic	0.906
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.00792
Lilliefors Test Statistic	0.187
Lilliefors Critical (0.95) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.987
A-D Test Statistic	0.635
A-D Critical (0.95) Value	0.751
K-S Test Statistic	0.136
K-S Critical(0.95) Value	0.154

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.956
Shapiro Wilk Test Statistic	0.932
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.048
Lilliefors Test Statistic	0.136
Lilliefors Critical (0.95) Value	0.154

Data appear Lognormal at (0.05) Significance Level

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Lead.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Observations	33	18
Number of Distinct Observations	27	15
Minimum	0.76	2.7
Maximum	13	18
Mean	5.272	9.517
Median	4.3	9.1
SD	2.682	3.959
SE of Mean	0.467	0.933

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	667.5
WMW Test U-Stat	3.745
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	1.6676E-4

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

General Background Statistics for Full Data Sets

User Selected Options	
From File	Lead.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	15

Raw Statistics		Log-Transformed Statistics	
Minimum	2.7	Minimum	0.993
Maximum	18	Maximum	2.89
Second Largest	16	Second Largest	2.773
First Quartile	6.725	First Quartile	1.906
Median	9.1	Median	2.203
Third Quartile	11	Third Quartile	2.398
Mean	9.517	Mean	2.16
SD	3.959	SD	0.47
Coefficient of Variation	0.416		
Skewness	0.437		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.966	Shapiro Wilk Test Statistic	0.942
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	19.23	95% UTL with 95% Coverage	27.48
95% UPL (t)	16.59	95% UPL (t)	20.09
90% Percentile (z)	14.59	90% Percentile (z)	15.84
95% Percentile (z)	16.03	95% Percentile (z)	18.79
99% Percentile (z)	18.73	99% Percentile (z)	25.89

Gamma Distribution Test		Data Distribution Test	
k star	4.631	Data appear Normal at 5% Significance Level	
Theta Star	2.055		
MLE of Mean	9.517		
MLE of Standard Deviation	4.422		
nu star	166.7		
A-D Test Statistic	0.295	Nonparametric Statistics	
5% A-D Critical Value	0.743	90% Percentile	14.6
K-S Test Statistic	0.132	95% Percentile	16.3
5% K-S Critical Value	0.204	99% Percentile	17.66
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	18
90% Percentile	15.44	95% Percentile Bootstrap UTL with 95% Coverage	18
95% Percentile	17.76	95% BCA Bootstrap UTL with 95% Coverage	18
99% Percentile	22.68	95% UPL	18
		95% Chebyshev UPL	27.25
95% WH Approx. Gamma UPL	18.19	Upper Threshold Limit Based upon IQR	17.41
95% HW Approx. Gamma UPL	18.55		
95% WH Approx. Gamma UTL with 95% Coverage	22.8		
95% HW Approx. Gamma UTL with 95% Coverage	23.65		

Non-Clay

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	27
Raw Statistics		**Log-Transformed Statistics**	
Minimum	0.76	Minimum	-0.274
Maximum	13	Maximum	2.565
Second Largest	11	Second Largest	2.398
First Quartile	3.5	First Quartile	1.253
Median	4.3	Median	1.459
Third Quartile	6.5	Third Quartile	1.872
Mean	5.272	Mean	1.535
SD	2.682	SD	0.538
Coefficient of Variation	0.509		
Skewness	1.097		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.906	Shapiro Wilk Test Statistic	0.932
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	11.11	95% UTL with 95% Coverage	14.96
95% UPL (t)	9.883	95% UPL (t)	11.7
90% Percentile (z)	8.709	90% Percentile (z)	9.248
95% Percentile (z)	9.683	95% Percentile (z)	11.24
99% Percentile (z)	11.51	99% Percentile (z)	16.22
Gamma Distribution Test		**Data Distribution Test**	
k star	3.738	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.41		
MLE of Mean	5.272		
MLE of Standard Deviation	2.727		
nu star	246.7		
A-D Test Statistic	0.635	**Nonparametric Statistics**	
5% A-D Critical Value	0.751	90% Percentile	8.68
K-S Test Statistic	0.136	95% Percentile	10.04
5% K-S Critical Value	0.154	99% Percentile	12.36

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	13
90% Percentile	8.927	95% Percentile Bootstrap UTL with 95% Coverage	13
95% Percentile	10.41	95% BCA Bootstrap UTL with 95% Coverage	13
99% Percentile	13.57	95% UPL	11.6
		95% Chebyshev UPL	17.14
95% WH Approx. Gamma UPL	10.54	Upper Threshold Limit Based upon IQR	11
95% HW Approx. Gamma UPL	10.73		
95% WH Approx. Gamma UTL with 95% Coverage	12.56		
95% HW Approx. Gamma UTL with 95% Coverage	12.97		

Outlier Tests for Selected Variables

User Selected Options	
From File	Lead.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 18 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.345

For 10% significance level, 18 is not an outlier.

For 5% significance level, 18 is not an outlier.

For 1% significance level, 18 is not an outlier.

2. Data Value 2.7 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.327

For 10% significance level, 2.7 is not an outlier.

For 5% significance level, 2.7 is not an outlier.

For 1% significance level, 2.7 is not an outlier.

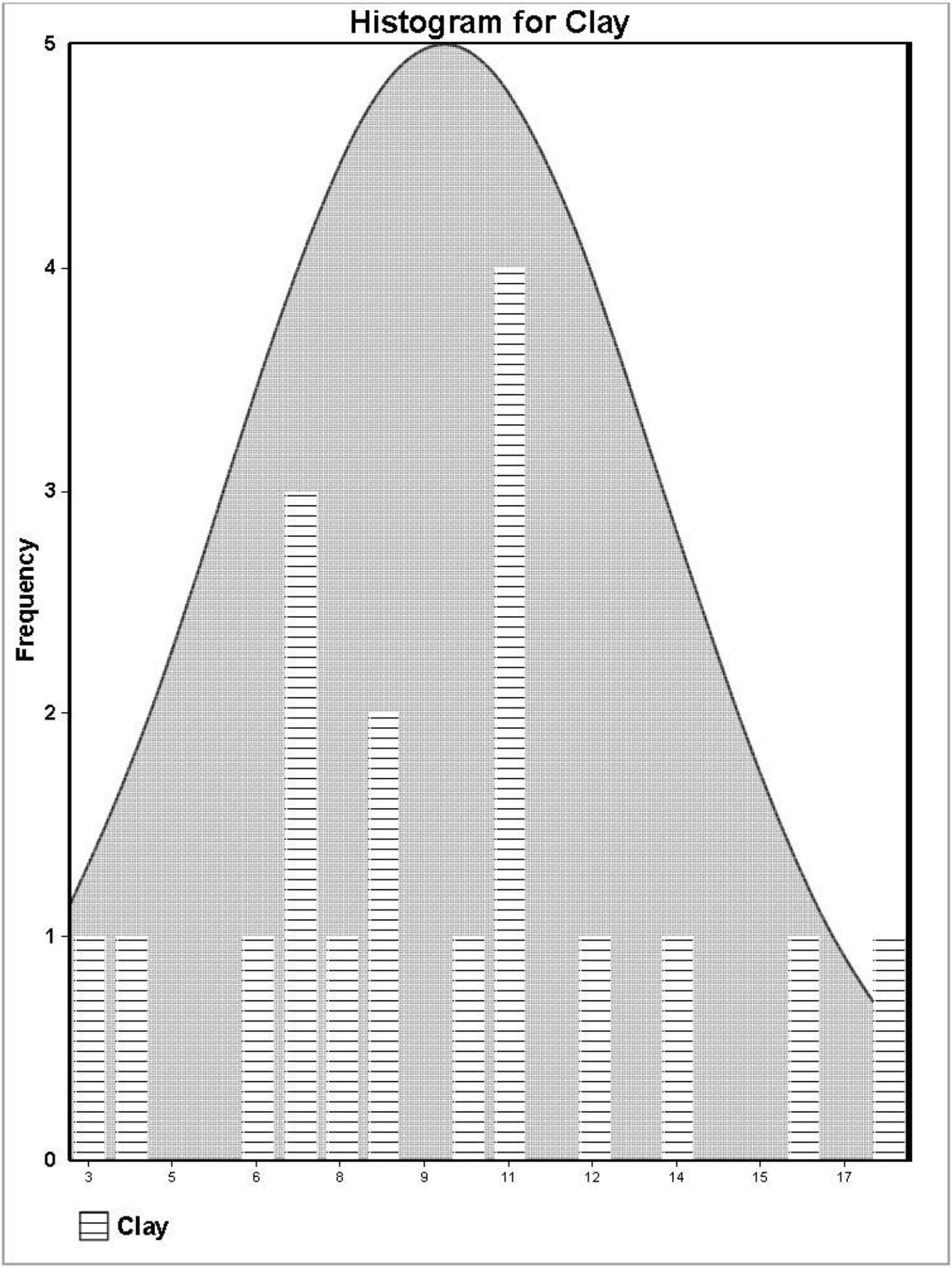
Rosner's Outlier Test for Non-Clay

Mean	5.272
Standard Deviation	2.682
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5.272	2.641	13	33	2.926	2.95	3.29

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier


Histogram for Clay
Frequency
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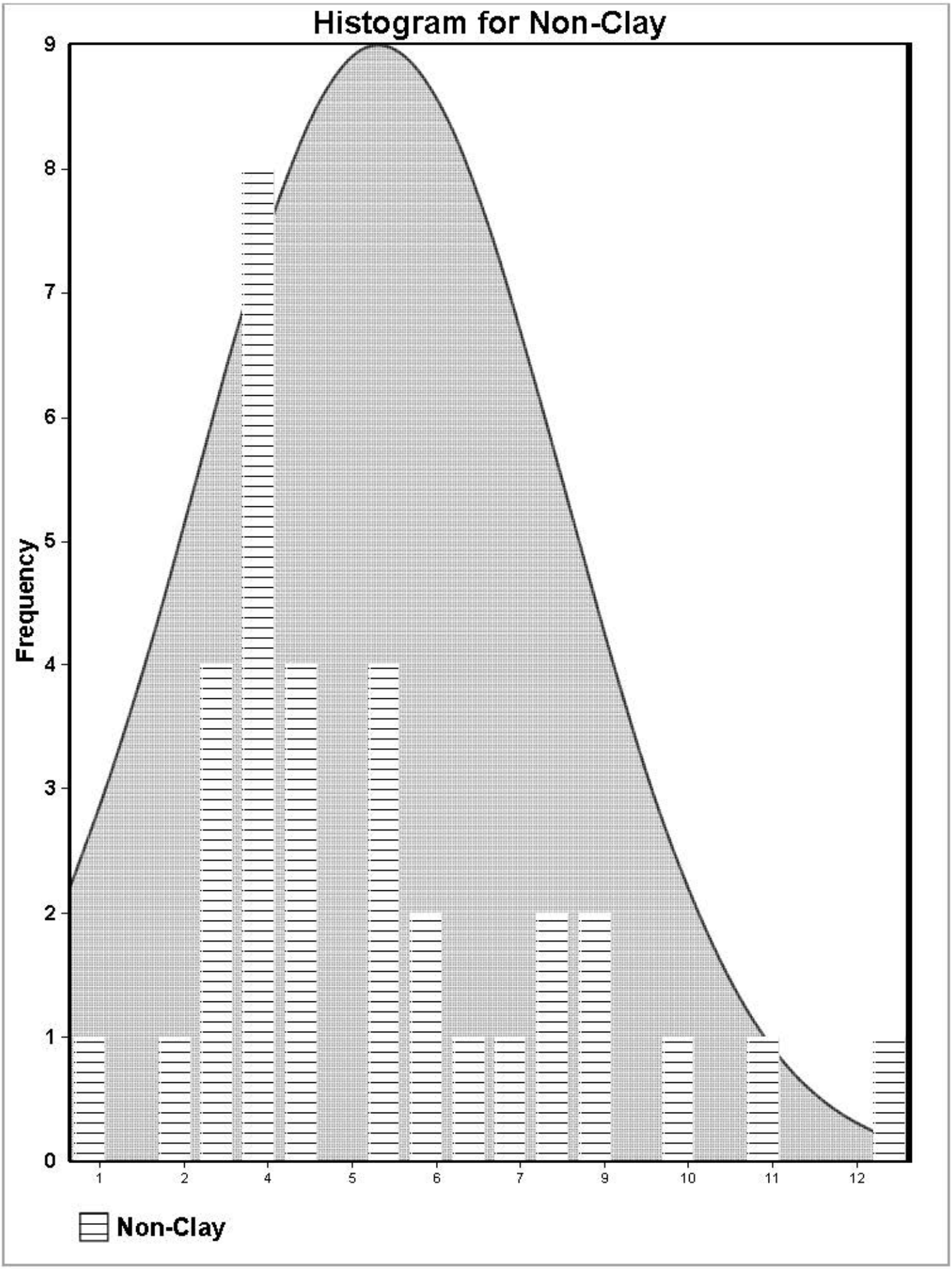
1
2
3
4
5
3
5
6
8
9
11
12
14
15
17
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
1
2
4
5
6
7
9
10
11
12
Non-Clay

Location	Clay
BG-1-2	6.8
BG-1-43	11
BG-1-55	2.7
BG-1-78	7.8
BG-2-30	11
BG-2-81	16
BG-3-17	4
BG-3-22	6.6
BG-3-69	8.1
BG-4-2	6.4
BG-4-19	14
BG-4-40	12
BG-4-79	11
BG-4-161	6.7
BG-4-163	11
BG-6-28	10
BG-6-53	8.2
BG-6-87	18

Location	Non-Clay
BG-1-10	3.8
BG-1-29	4.3
BG-1-40	0.76
BG-1-46	3.1
BG-1-92	2.4
BG-2-2	3.9
BG-2-10	3.4
BG-2-19	8.7
BG-2-21	4.3
BG-2-32	3.5
BG-2-75	3.2
BG-3-2	5.9
BG-3-10	5.5
BG-3-29	3.6
BG-3-63	3.8
BG-3-65	5.5
BG-3-95	3.1
BG-3-105	5.4
BG-3-131	5.3
BG-3-136	11
BG-4-10	9.4
BG-4-65	4
BG-4-82	7.3
BG-4-95	3.3
BG-4-117	2.7
BG-4-120	8.6
BG-6-2	7.7
BG-6-9	3.6
BG-6-58	3.6
BG-6-75	5.7
BG-6-98	6.5
BG-6-114	8.1
BG-6-127	13
Average	5.271515

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Lead.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	11
Minimum	0.76
Maximum	8.7
Mean of Raw Data	4.888
Standard Deviation of Raw Data	2.159
Kstar	2.991
Mean of Log Transformed Data	1.454
Standard Deviation of Log Transformed Data	0.627

Normal Distribution Test Results	
Correlation Coefficient R	0.975
Shapiro Wilk Test Statistic	0.958
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.652
Lilliefors Test Statistic	0.191
Lilliefors Critical (0.95) Value	0.256

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.965
A-D Test Statistic	0.541
A-D Critical (0.95) Value	0.736
K-S Test Statistic	0.224
K-S Critical(0.95) Value	0.246

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.879
Shapiro Wilk Test Statistic	0.798
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.00501
Lilliefors Test Statistic	0.274
Lilliefors Critical (0.95) Value	0.256

Data not Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	30
Minimum	2.4
Maximum	18
Mean of Raw Data	7.349
Standard Deviation of Raw Data	3.973
Kstar	3.321
Mean of Log Transformed Data	1.848
Standard Deviation of Log Transformed Data	0.558

Normal Distribution Test Results

Correlation Coefficient R	0.963
Shapiro Wilk Test Statistic	0.918
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.00849
Lilliefors Test Statistic	0.134
Lilliefors Critical (0.95) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.991
A-D Test Statistic	0.559
A-D Critical (0.95) Value	0.753
K-S Test Statistic	0.139
K-S Critical(0.95) Value	0.142

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.983
Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.102
Lilliefors Test Statistic	0.13
Lilliefors Critical (0.95) Value	0.142

Data appear Lognormal at (0.05) Significance Level

Outlier Tests for Selected Variables

User Selected Options	
From File	Lead.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12

10% critical value: 0.49

5% critical value: 0.546

1% critical value: 0.642

1. Data Value 8.7 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.358

For 10% significance level, 8.7 is not an outlier.

For 5% significance level, 8.7 is not an outlier.

For 1% significance level, 8.7 is not an outlier.

2. Data Value 0.76 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.409

For 10% significance level, 0.76 is not an outlier.

For 5% significance level, 0.76 is not an outlier.

For 1% significance level, 0.76 is not an outlier.

Rosner's Outlier Test for MC

Mean	7.349
Standard Deviation	3.973
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.349	3.921	18	36	2.716	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

General Background Statistics for Full Data Sets

User Selected Options	
From File	Lead.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-Transformed Statistics	
Minimum	0.76	Minimum	-0.274
Maximum	8.7	Maximum	2.163
Second Largest	7.7	Second Largest	2.041
First Quartile	3.75	First Quartile	1.321
Median	4.3	Median	1.459
Third Quartile	6.125	Third Quartile	1.81
Mean	4.888	Mean	1.454
SD	2.159	SD	0.627
Coefficient of Variation	0.442		
Skewness	0.0803		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Test Statistic	0.798
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	10.79	95% UTL with 95% Coverage	23.77
95% UPL (t)	8.923	95% UPL (t)	13.81
90% Percentile (z)	7.655	90% Percentile (z)	9.554
95% Percentile (z)	8.439	95% Percentile (z)	12
99% Percentile (z)	9.91	99% Percentile (z)	18.39

Gamma Distribution Test		Data Distribution Test	
k star	2.991	Data appear Normal at 5% Significance Level	
Theta Star	1.634		
MLE of Mean	4.888		
MLE of Standard Deviation	2.826		
nu star	71.8		
A-D Test Statistic	0.541	Nonparametric Statistics	
5% A-D Critical Value	0.736	90% Percentile	7.61
K-S Test Statistic	0.224	95% Percentile	8.15
5% K-S Critical Value	0.246	99% Percentile	8.59
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	8.7
90% Percentile	8.678	95% Percentile Bootstrap UTL with 95% Coverage	8.7
95% Percentile	10.27	95% BCA Bootstrap UTL with 95% Coverage	8.7
99% Percentile	13.71	95% UPL	8.7
		95% Chebyshev UPL	14.68
95% WH Approx. Gamma UPL	10.73	Upper Threshold Limit Based upon IQR	9.688
95% HW Approx. Gamma UPL	11.24		
95% WH Approx. Gamma UTL with 95% Coverage	14.92		
95% HW Approx. Gamma UTL with 95% Coverage	16.19		

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	30
Raw Statistics		**Log-Transformed Statistics**	
Minimum	2.4	Minimum	0.875
Maximum	18	Maximum	2.89
Second Largest	16	Second Largest	2.773
First Quartile	3.7	First Quartile	1.308
Median	6.6	Median	1.887
Third Quartile	10.5	Third Quartile	2.35
Mean	7.349	Mean	1.848
SD	3.973	SD	0.558
Coefficient of Variation	0.541		
Skewness	0.788		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.918	Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	15.79	95% UTL with 95% Coverage	20.76
95% UPL (t)	14.13	95% UPL (t)	16.45
90% Percentile (z)	12.44	90% Percentile (z)	12.97
95% Percentile (z)	13.88	95% Percentile (z)	15.89
99% Percentile (z)	16.59	99% Percentile (z)	23.23
Gamma Distribution Test		**Data Distribution Test**	
k star	3.321	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2.213		
MLE of Mean	7.349		
MLE of Standard Deviation	4.032		
nu star	259.1		
A-D Test Statistic	0.559	**Nonparametric Statistics**	
5% A-D Critical Value	0.753	90% Percentile	12.2
K-S Test Statistic	0.139	95% Percentile	14.2
5% K-S Critical Value	0.142	99% Percentile	17.24

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	18
90% Percentile	12.76	95% Percentile Bootstrap UTL with 95% Coverage	18
95% Percentile	14.98	95% BCA Bootstrap UTL with 95% Coverage	18
99% Percentile	19.79	95% UPL	16
		95% Chebyshev UPL	24.89
95% WH Approx. Gamma UPL	15.18	Upper Threshold Limit Based upon IQR	20.7
95% HW Approx. Gamma UPL	15.43		
95% WH Approx. Gamma UTL with 95% Coverage	18.01		
95% HW Approx. Gamma UTL with 95% Coverage	18.53		

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Lead.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Observations	39	12
Number of Distinct Observations	30	11
Minimum	2.4	0.76
Maximum	18	8.7
Mean	7.349	4.888
Median	6.6	4.3
SD	3.973	2.159
SE of Mean	0.636	0.623

Wilcoxon-Mann-Whitney (WMW) Test

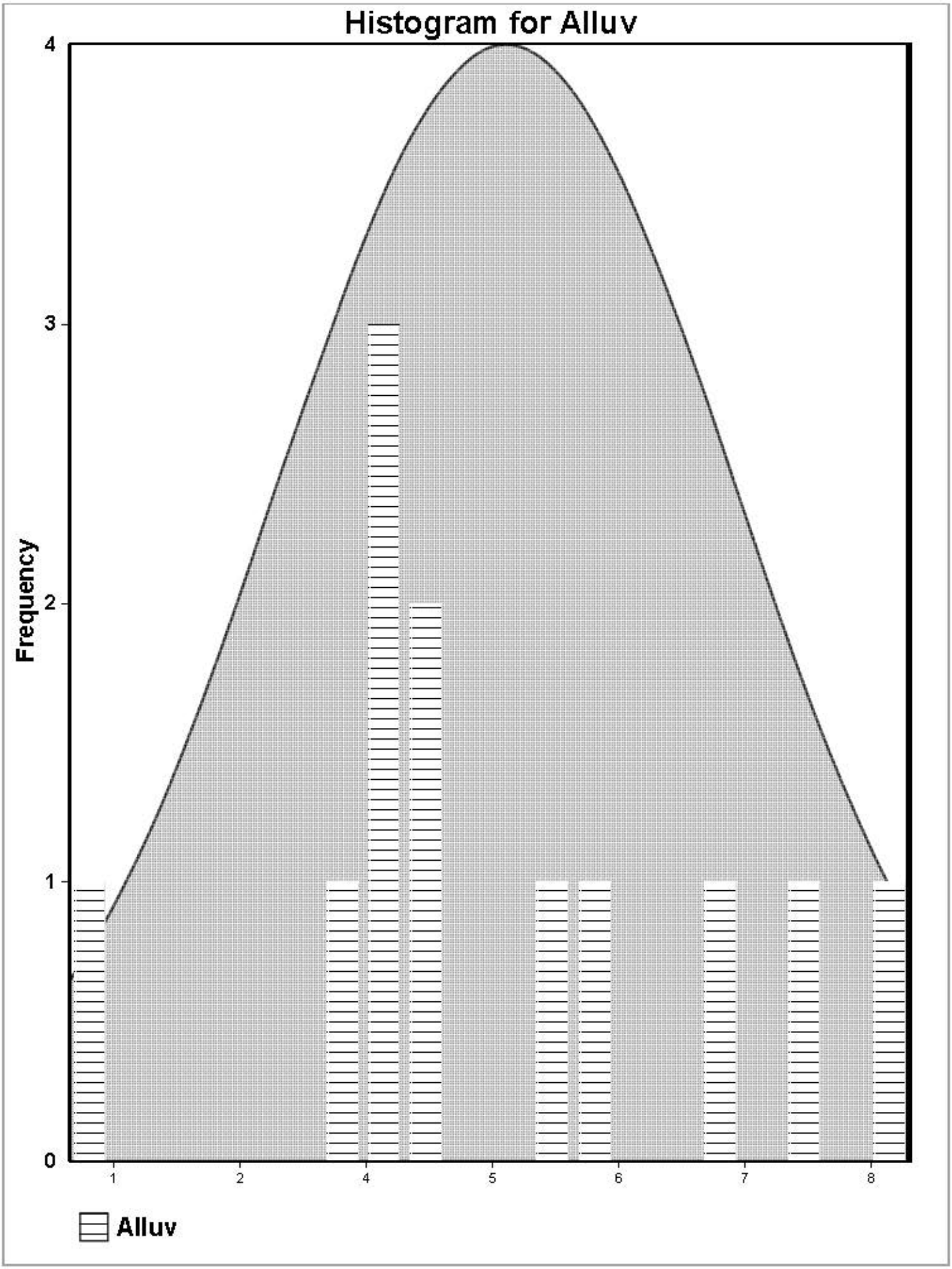
H0: Mean/Median of Site or AOC = Mean/Median of Background

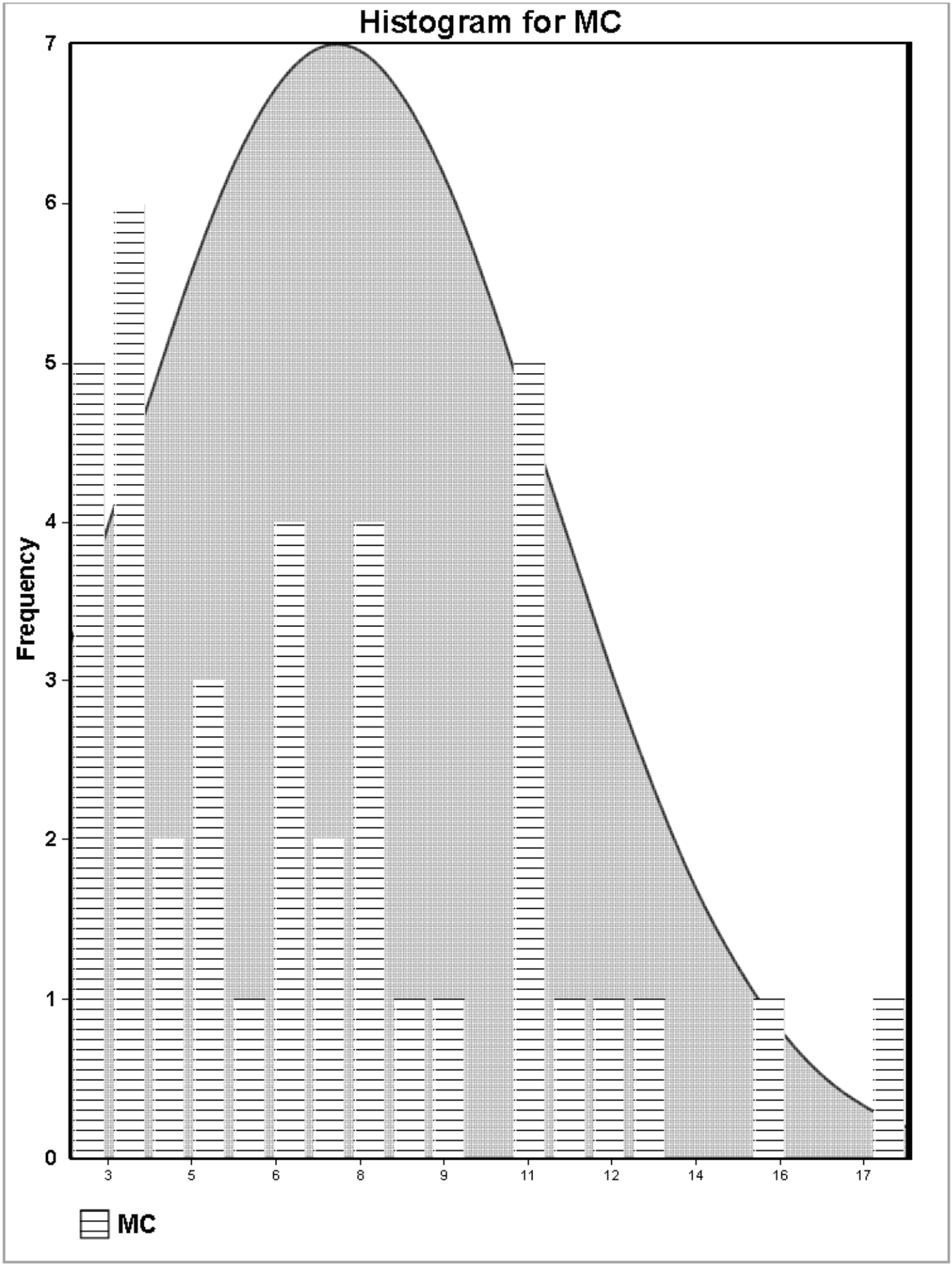
Site Rank Sum W-Stat	1082
WMW Test U-Stat	1.499
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.134

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
1
2
4
5
6
7
8
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
3
5
6
8
9
11
12
14
16
17
MC

Location	Alluv
BG-1-2	6.8
BG-1-10	3.8
BG-1-29	4.3
BG-1-40	0.76
BG-2-2	3.9
BG-2-10	3.4
BG-2-19	8.7
BG-2-21	4.3
BG-3-2	5.9
BG-3-10	5.5
BG-6-2	7.7
BG-6-9	3.6

Location	MC
BG-1-43	11
BG-1-46	3.1
BG-1-55	2.7
BG-1-78	7.8
BG-1-92	2.4
BG-2-30	11
BG-2-32	3.5
BG-2-75	3.2
BG-2-81	16
BG-3-17	4
BG-3-22	6.6
BG-3-29	3.6
BG-3-63	3.8
BG-3-65	5.5
BG-3-69	8.1
BG-3-95	3.1
BG-3-105	5.4
BG-3-131	5.3
BG-3-136	11
BG-4-1	6.4
BG-4-10	9.4
BG-4-19	14
BG-4-40	12
BG-4-65	4
BG-4-79	11
BG-4-82	7.3
BG-4-95	3.3
BG-4-117	2.7
BG-4-120	8.6
BG-4-161	6.7
BG-4-163	11
BG-6-28	10
BG-6-53	8.2
BG-6-58	3.6
BG-6-75	5.7
BG-6-87	18
BG-6-98	6.5
BG-6-114	8.1
BG-1-127	13

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Magnesium.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	37
Minimum	950
Maximum	30000
Mean of Raw Data	8016
Standard Deviation of Raw Data	5392
Kstar	2.002
Mean of Log Transformed Data	8.734
Standard Deviation of Log Transformed Data	0.79

Normal Distribution Test Results	
Correlation Coefficient R	0.94
Approximate Shapiro Wilk Test Statistic	0.895
Approximate Shapiro Wilk P Value	1.3281E-4
Lilliefors Test Statistic	0.0992
Lilliefors Critical (0.95) Value	0.124

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.973
A-D Test Statistic	0.613
A-D Critical (0.95) Value	0.762
K-S Test Statistic	0.0991
K-S Critical(0.95) Value	0.126

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.97
Approximate Shapiro Wilk Test Statistic	0.933
Approximate Shapiro Wilk P Value	0.00833
Lilliefors Test Statistic	0.122
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Magnesium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Total Number of Observations	51	Number of Distinct Observations	37

Raw Statistics		Log-Transformed Statistics	
Minimum	950	Minimum	6.856
Maximum	30000	Maximum	10.31
Second Largest	19000	Second Largest	9.852
First Quartile	3950	First Quartile	8.281
Median	6800	Median	8.825
Third Quartile	11500	Third Quartile	9.349
Mean	8016	Mean	8.734
SD	5392	SD	0.79
Coefficient of Variation	0.673		
Skewness	1.41		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.0992	Lilliefors Test Statistic	0.122
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	19089	95% UTL with 95% Coverage	31463
95% UPL (t)	17140	95% UPL (t)	23648
90% Percentile (z)	14926	90% Percentile (z)	17096
95% Percentile (z)	16884	95% Percentile (z)	22779
99% Percentile (z)	20559	99% Percentile (z)	39024

Gamma Distribution Test		Data Distribution Test	
k star	2.002	Data appear Normal at 5% Significance Level	
Theta Star	4004		
MLE of Mean	8016		
MLE of Standard Deviation	5666		
nu star	204.2		
A-D Test Statistic	0.613	Nonparametric Statistics	
5% A-D Critical Value	0.762	90% Percentile	13000
K-S Test Statistic	0.0991	95% Percentile	14500
5% K-S Critical Value	0.126	99% Percentile	24500
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	19000
90% Percentile	15587	95% Percentile Bootstrap UTL with 95% Coverage	24500
95% Percentile	19008	95% BCA Bootstrap UTL with 95% Coverage	24500
99% Percentile	26596	95% UPL	16600
		95% Chebyshev UPL	31747
95% WH Approx. Gamma UPL	19218	Upper Threshold Limit Based upon IQR	22825
95% HW Approx. Gamma UPL	19927		
95% WH Approx. Gamma UTL with 95% Coverage	23035		
95% HW Approx. Gamma UTL with 95% Coverage	24318		

Outlier Tests for Selected Variables

User Selected Options	
From File	Magnesium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for All Data

Mean	8016
Standard Deviation	5392
Number of data	51
Number of suspected outliers	1

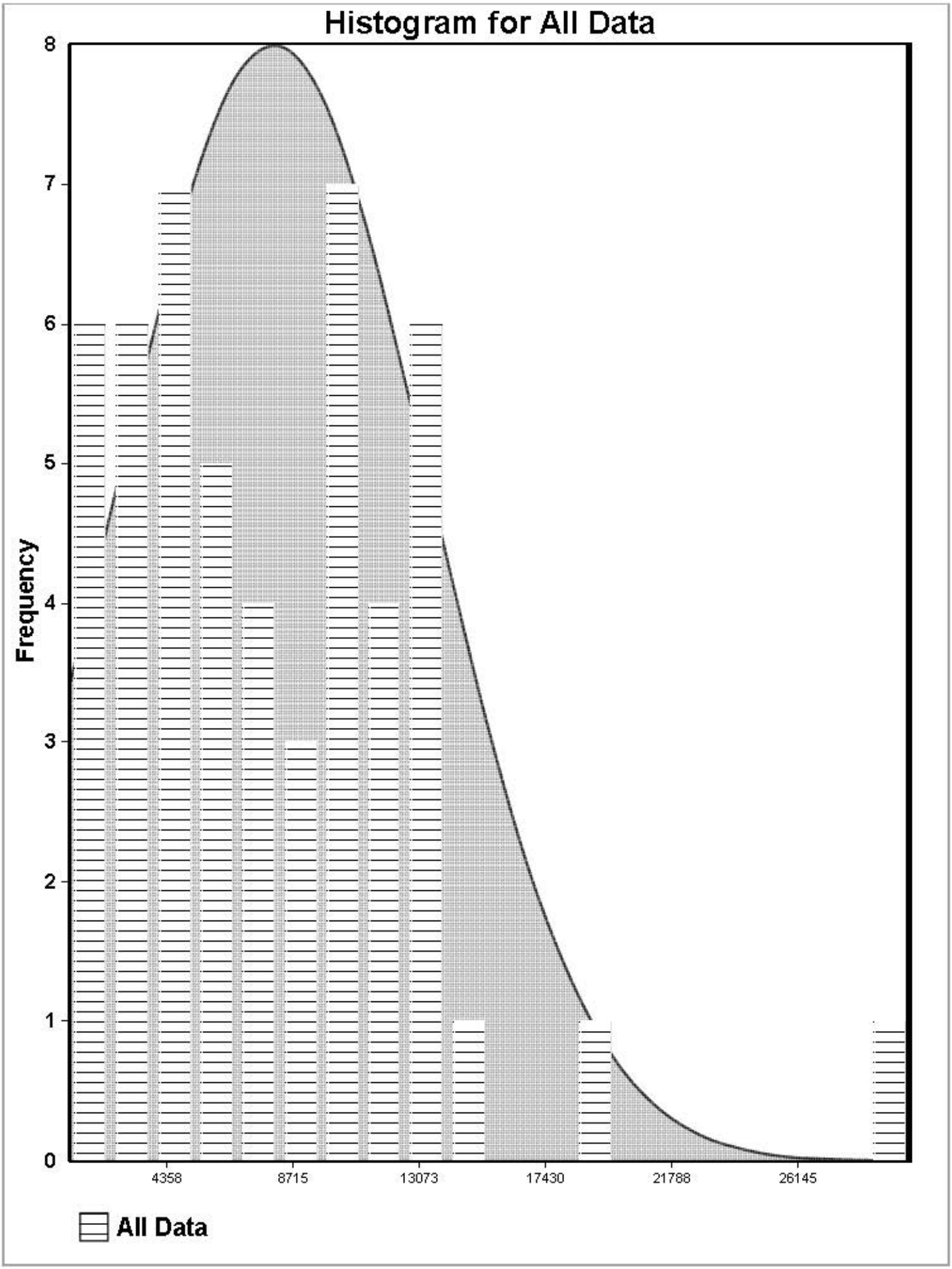
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	8016	5338	30000	50	4.118	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 30000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 30000 is a Potential Statistical Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
4358
8715
13073
17430
21788
26145
All Data

Location	All Data
BG-1-2	19000
BG-1-10	13000
BG-2-2	4000
BG-2-10	3100
BG-2-19	9200
BG-3-2	2600
BG-3-10	3700
BG-6-2	8500
BG-6-9	9900
BG-4-1	8100
BG-4-10	12000
BG-4-19	13000
BG-3-17	1600
BG-1-43	10000
BG-1-46	5500
BG-1-55	6000
BG-1-78	11000
BG-1-92	3600
BG-2-30	15000
BG-2-32	3900
BG-2-75	4400
BG-2-81	14000
BG-3-22	1400
BG-3-29	1300
BG-3-63	1500
BG-3-65	3800
BG-3-69	4300
BG-3-95	950
BG-3-105	3100
BG-3-131	970
BG-3-136	6300
BG-4-40	11000
BG-4-65	5300
BG-4-79	13000
BG-4-82	12000
BG-4-95	5500
BG-4-117	4500
BG-4-120	9500
BG-4-161	7800
BG-4-163	13000
BG-6-28	9700
BG-6-53	12000
BG-6-58	4000
BG-6-75	6800
BG-6-87	12000
BG-6-98	6800
BG-6-114	13000
BG-1-127	11000
BG-1-29	11000
BG-1-40	30000
BG-2-21	6200

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Magnesium.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	12
Minimum	1600
Maximum	19000
Mean of Raw Data	8285
Standard Deviation of Raw Data	5163
Kstar	1.874
Mean of Log Transformed Data	8.797
Standard Deviation of Log Transformed Data	0.753

Normal Distribution Test Results	
Correlation Coefficient R	0.97
Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.418
Lilliefors Test Statistic	0.181
Lilliefors Critical (0.95) Value	0.246

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.972
A-D Test Statistic	0.41
A-D Critical (0.95) Value	0.742
K-S Test Statistic	0.188
K-S Critical(0.95) Value	0.239

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.968
Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.36
Lilliefors Test Statistic	0.222
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

>20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	29
Minimum	950
Maximum	30000
Mean of Raw Data	7924
Standard Deviation of Raw Data	5532
Kstar	1.896
Mean of Log Transformed Data	8.713
Standard Deviation of Log Transformed Data	0.811

Normal Distribution Test Results

Correlation Coefficient R	0.921
Shapiro Wilk Test Statistic	0.866
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	1.7189E-4
Lilliefors Test Statistic	0.133
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.961
A-D Test Statistic	0.577
A-D Critical (0.95) Value	0.759
K-S Test Statistic	0.112
K-S Critical(0.95) Value	0.145

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.962
Shapiro Wilk Test Statistic	0.922
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.0136
Lilliefors Test Statistic	0.13
Lilliefors Critical (0.95) Value	0.144

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Magnesium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	12

Raw Statistics		Log-Transformed Statistics	
Minimum	1600	Minimum	7.378
Maximum	19000	Maximum	9.852
Second Largest	13000	Second Largest	9.473
First Quartile	3700	First Quartile	8.216
Median	8500	Median	9.048
Third Quartile	12000	Third Quartile	9.393
Mean	8285	Mean	8.797
SD	5163	SD	0.753
Coefficient of Variation	0.623		
Skewness	0.501		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.935	Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	22075	95% UTL with 95% Coverage	49432
95% UPL (t)	17834	95% UPL (t)	26626
90% Percentile (z)	14901	90% Percentile (z)	17358
95% Percentile (z)	16777	95% Percentile (z)	22822
99% Percentile (z)	20296	99% Percentile (z)	38130

Gamma Distribution Test		Data Distribution Test	
k star	1.874	Data appear Normal at 5% Significance Level	
Theta Star	4421		
MLE of Mean	8285		
MLE of Standard Deviation	6052		
nu star	48.73		
A-D Test Statistic	0.41	Nonparametric Statistics	
5% A-D Critical Value	0.742	90% Percentile	13000
K-S Test Statistic	0.188	95% Percentile	15400
5% K-S Critical Value	0.239	99% Percentile	18280
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	19000
90% Percentile	16362	95% Percentile Bootstrap UTL with 95% Coverage	19000
95% Percentile	20062	95% BCA Bootstrap UTL with 95% Coverage	19000
99% Percentile	28300	95% UPL	19000
		95% Chebyshev UPL	31639
95% WH Approx. Gamma UPL	21332	Upper Threshold Limit Based upon IQR	24450
95% HW Approx. Gamma UPL	22244		
95% WH Approx. Gamma UTL with 95% Coverage	31196		
95% HW Approx. Gamma UTL with 95% Coverage	33883		

>20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	29

Raw Statistics		Log-Transformed Statistics	
Minimum	950	Minimum	6.856
Maximum	30000	Maximum	10.31
Second Largest	15000	Second Largest	9.616
First Quartile	4075	First Quartile	8.312
Median	6550	Median	8.786
Third Quartile	11000	Third Quartile	9.306
Mean	7924	Mean	8.713
SD	5532	SD	0.811
Coefficient of Variation	0.698		
Skewness	1.68		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.866	Shapiro Wilk Test Statistic	0.922
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	19719	95% UTL with 95% Coverage	34259
95% UPL (t)	17379	95% UPL (t)	24313
90% Percentile (z)	15014	90% Percentile (z)	17190
95% Percentile (z)	17024	95% Percentile (z)	23078
99% Percentile (z)	20794	99% Percentile (z)	40103
Gamma Distribution Test		Data Distribution Test	
k star	1.896	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	4178		
MLE of Mean	7924		
MLE of Standard Deviation	5754		
nu star	144.1		
A-D Test Statistic	0.577	Nonparametric Statistics	
5% A-D Critical Value	0.759	90% Percentile	13000
K-S Test Statistic	0.112	95% Percentile	14150
5% K-S Critical Value	0.145	99% Percentile	24450

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	30000
90% Percentile	15606	95% Percentile Bootstrap UTL with 95% Coverage	30000
95% Percentile	19116	95% BCA Bootstrap UTL with 95% Coverage	30000
99% Percentile	26927	95% UPL	15750
		95% Chebyshev UPL	32353
95% WH Approx. Gamma UPL	19422	Upper Threshold Limit Based upon IQR	21388
95% HW Approx. Gamma UPL	20181		
95% WH Approx. Gamma UTL with 95% Coverage	24042		
95% HW Approx. Gamma UTL with 95% Coverage	25535		

Outlier Tests for Selected Variables

User Selected Options	
From File	Magnesium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 19000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.366

For 10% significance level, 19000 is not an outlier.
For 5% significance level, 19000 is not an outlier.
For 1% significance level, 19000 is not an outlier.

2. Data Value 1600 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.132

For 10% significance level, 1600 is not an outlier.
For 5% significance level, 1600 is not an outlier.
For 1% significance level, 1600 is not an outlier.

Rosner's Outlier Test for >20

Mean	7924
Standard Deviation	5532
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7924	5459	30000	37	4.044	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 30000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 30000 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Magnesium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Observations	38	13
Number of Distinct Observations	29	12
Minimum	950	1600
Maximum	30000	19000
Mean	7924	8285
Median	6550	8500
SD	5532	5163
SE of Mean	897.4	1432

Wilcoxon-Mann-Whitney (WMW) Test

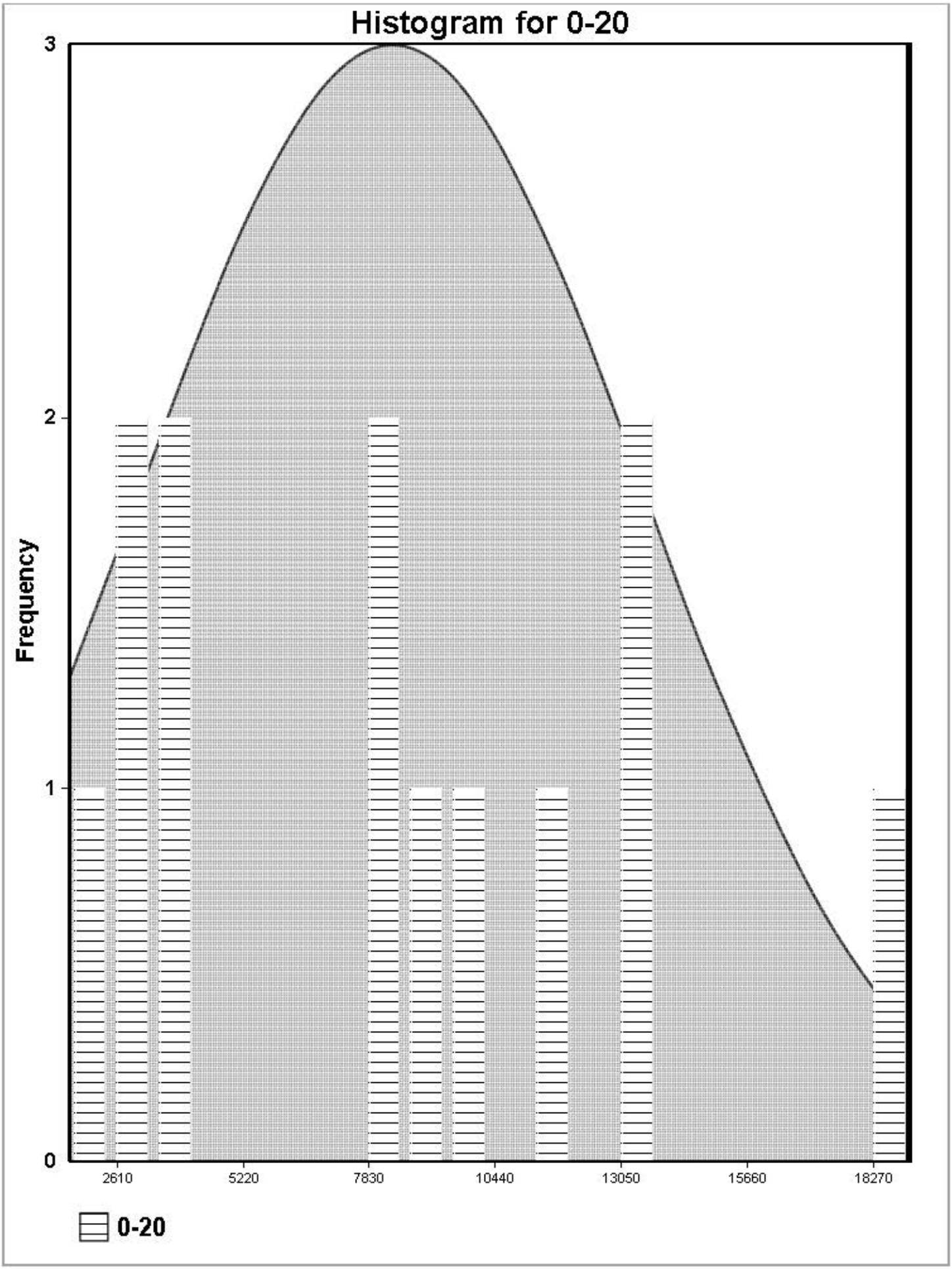
H0: Mean/Median of Site or AOC = Mean/Median of Background

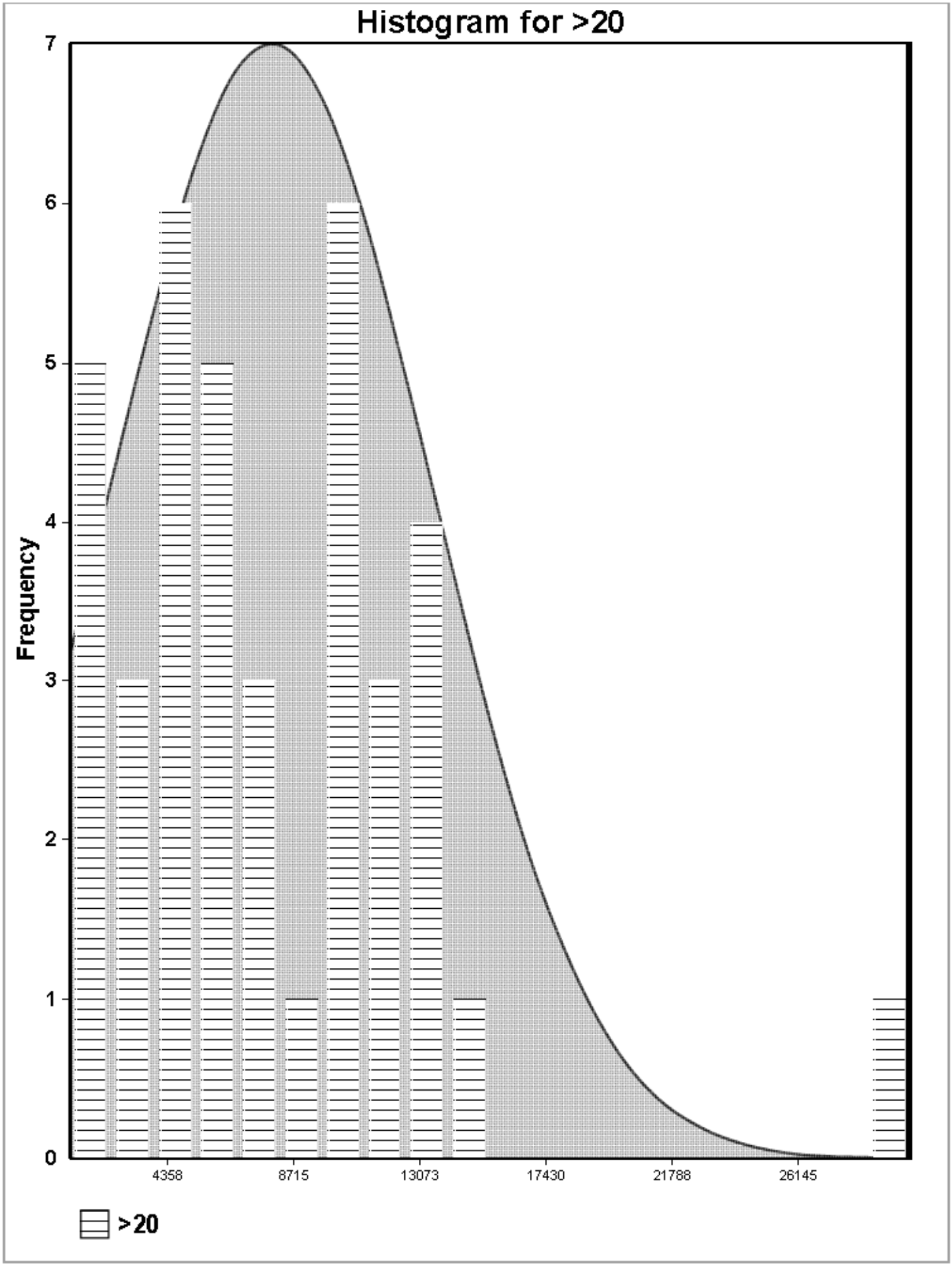
Site Rank Sum W-Stat	978.5
WMW Test U-Stat	0.195
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.829

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for 0-20
Frequency
3
2
1
0
2610
5220
7830
10440
13050
15660
18270
0-20


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
4358
8715
13073
17430
21788
26145
>20

Location	0-20
BG-1-2	19000
BG-1-10	13000
BG-2-2	4000
BG-2-10	3100
BG-2-19	9200
BG-3-2	2600
BG-3-10	3700
BG-6-2	8500
BG-6-9	9900
BG-4-1	8100
BG-4-10	12000
BG-4-19	13000
BG-3-17	1600

Location	>20
BG-1-43	10000
BG-1-46	5500
BG-1-55	6000
BG-1-78	11000
BG-1-92	3600
BG-2-30	15000
BG-2-32	3900
BG-2-75	4400
BG-2-81	14000
BG-3-22	1400
BG-3-29	1300
BG-3-63	1500
BG-3-65	3800
BG-3-69	4300
BG-3-95	950
BG-3-105	3100
BG-3-131	970
BG-3-136	6300
BG-4-40	11000
BG-4-65	5300
BG-4-79	13000
BG-4-82	12000
BG-4-95	5500
BG-4-117	4500
BG-4-120	9500
BG-4-161	7800
BG-4-163	13000
BG-6-28	9700
BG-6-53	12000
BG-6-58	4000
BG-6-75	6800
BG-6-87	12000
BG-6-98	6800
BG-6-114	13000
BG-1-127	11000
BG-1-29	11000
BG-1-40	30000
BG-2-21	6200

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Magnesium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	14
Minimum	1400
Maximum	19000
Mean of Raw Data	10106
Standard Deviation of Raw Data	4604
Kstar	2.582
Mean of Log Transformed Data	9.048
Standard Deviation of Log Transformed Data	0.72

Normal Distribution Test Results	
Correlation Coefficient R	0.977
Shapiro Wilk Test Statistic	0.956
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.518
Lilliefors Test Statistic	0.133
Lilliefors Critical (0.95) Value	0.209

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.926
A-D Test Statistic	1.107
A-D Critical (0.95) Value	0.746
K-S Test Statistic	0.215
K-S Critical(0.95) Value	0.205

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.882
Shapiro Wilk Test Statistic	0.782
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	5.1956E-4
Lilliefors Test Statistic	0.239
Lilliefors Critical (0.95) Value	0.209

Data not Lognormal at (0.05) Significance Level

Non-Clay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	26
Minimum	950
Maximum	30000
Mean of Raw Data	6846
Standard Deviation of Raw Data	5530
Kstar	1.794
Mean of Log Transformed Data	8.554
Standard Deviation of Log Transformed Data	0.789

Normal Distribution Test Results

Correlation Coefficient R	0.877
Shapiro Wilk Test Statistic	0.791
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	6.5174E-6
Lilliefors Test Statistic	0.17
Lilliefors Critical (0.95) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.954
A-D Test Statistic	0.301
A-D Critical (0.95) Value	0.76
K-S Test Statistic	0.0791
K-S Critical(0.95) Value	0.155

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.983
Shapiro Wilk Test Statistic	0.965
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.414
Lilliefors Test Statistic	0.0918
Lilliefors Critical (0.95) Value	0.154

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Magnesium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	14

Raw Statistics		Log-Transformed Statistics	
Minimum	1400	Minimum	7.244
Maximum	19000	Maximum	9.852
Second Largest	15000	Second Largest	9.616
First Quartile	7875	First Quartile	8.971
Median	11000	Median	9.306
Third Quartile	13000	Third Quartile	9.473
Mean	10106	Mean	9.048
SD	4604	SD	0.72
Coefficient of Variation	0.456		
Skewness	-0.402		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.956	Shapiro Wilk Test Statistic	0.782
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	21399	95% UTL with 95% Coverage	49732
95% UPL (t)	18334	95% UPL (t)	30794
90% Percentile (z)	16006	90% Percentile (z)	21396
95% Percentile (z)	17678	95% Percentile (z)	27793
99% Percentile (z)	20816	99% Percentile (z)	45397

Gamma Distribution Test		Data Distribution Test	
k star	2.582	Data appear Normal at 5% Significance Level	
Theta Star	3914		
MLE of Mean	10106		
MLE of Standard Deviation	6289		
nu star	92.96		
A-D Test Statistic	1.107	Nonparametric Statistics	
5% A-D Critical Value	0.746	90% Percentile	14300
K-S Test Statistic	0.215	95% Percentile	15600
5% K-S Critical Value	0.205	99% Percentile	18320
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	19000
90% Percentile	18532	95% Percentile Bootstrap UTL with 95% Coverage	19000
95% Percentile	22159	95% BCA Bootstrap UTL with 95% Coverage	19000
99% Percentile	30086	95% UPL	19000
		95% Chebyshev UPL	30724
95% WH Approx. Gamma UPL	22957	Upper Threshold Limit Based upon IQR	20688
95% HW Approx. Gamma UPL	24229		
95% WH Approx. Gamma UTL with 95% Coverage	30426		
95% HW Approx. Gamma UTL with 95% Coverage	33178		

Non-Clay

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	26

Raw Statistics		Log-Transformed Statistics	
Minimum	950	Minimum	6.856
Maximum	30000	Maximum	10.31
Second Largest	13000	Second Largest	9.473
First Quartile	3600	First Quartile	8.189
Median	5500	Median	8.613
Third Quartile	9500	Third Quartile	9.159
Mean	6846	Mean	8.554
SD	5530	SD	0.789
Coefficient of Variation	0.808		
Skewness	2.401		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.791	Shapiro Wilk Test Statistic	0.965
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	18881	95% UTL with 95% Coverage	28885
95% UPL (t)	16355	95% UPL (t)	20144
90% Percentile (z)	13934	90% Percentile (z)	14259
95% Percentile (z)	15943	95% Percentile (z)	18994
99% Percentile (z)	19712	99% Percentile (z)	32523
Gamma Distribution Test		Data Distribution Test	
k star	1.794	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3816		
MLE of Mean	6846		
MLE of Standard Deviation	5112		
nu star	118.4		
A-D Test Statistic	0.301	Nonparametric Statistics	
5% A-D Critical Value	0.76	90% Percentile	12000
K-S Test Statistic	0.0791	95% Percentile	13000
5% K-S Critical Value	0.155	99% Percentile	24560

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	30000
90% Percentile	13663	95% Percentile Bootstrap UTL with 95% Coverage	30000
95% Percentile	16814	95% BCA Bootstrap UTL with 95% Coverage	19800
99% Percentile	23849	95% UPL	18100
		95% Chebyshev UPL	31315
95% WH Approx. Gamma UPL	17065	Upper Threshold Limit Based upon IQR	18350
95% HW Approx. Gamma UPL	17526		
95% WH Approx. Gamma UTL with 95% Coverage	21564		
95% HW Approx. Gamma UTL with 95% Coverage	22636		

Outlier Tests for Selected Variables

User Selected Options	
From File	Magnesium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 19000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.340

For 10% significance level, 19000 is not an outlier.

For 5% significance level, 19000 is not an outlier.

For 1% significance level, 19000 is not an outlier.

2. Data Value 1400 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.230

For 10% significance level, 1400 is not an outlier.

For 5% significance level, 1400 is not an outlier.

For 1% significance level, 1400 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	6846
Standard Deviation	5530
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	6846	5446	30000	3	4.252	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 30000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 30000 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Magnesium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Observations	33	18
Number of Distinct Observations	26	14
Minimum	950	1400
Maximum	30000	19000
Mean	6846	10106
Median	5500	11000
SD	5530	4604
SE of Mean	962.7	1085

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

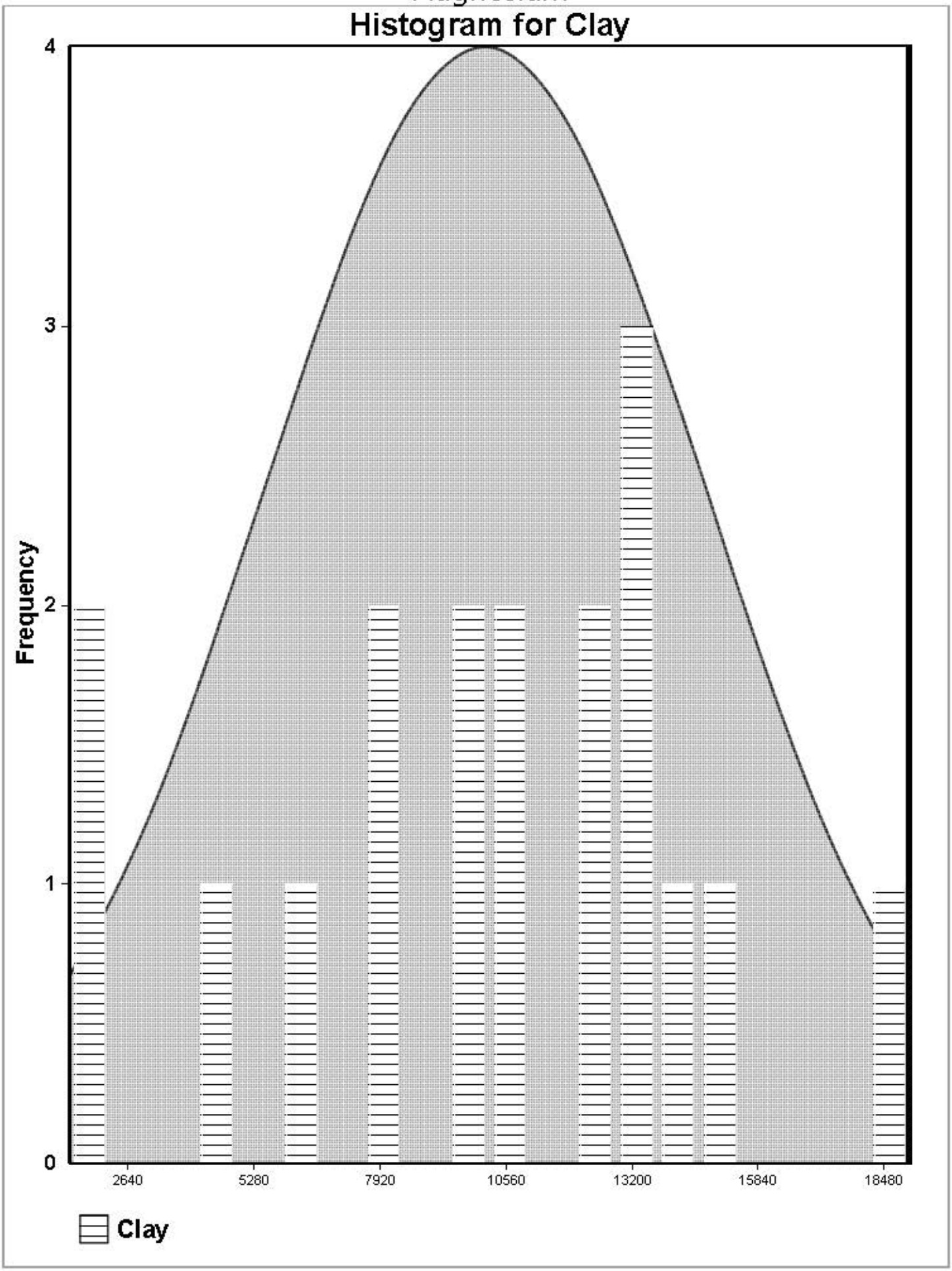
Site Rank Sum W-Stat	721
WMW Test U-Stat	2.69
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.00672

Conclusion with Alpha = 0.05

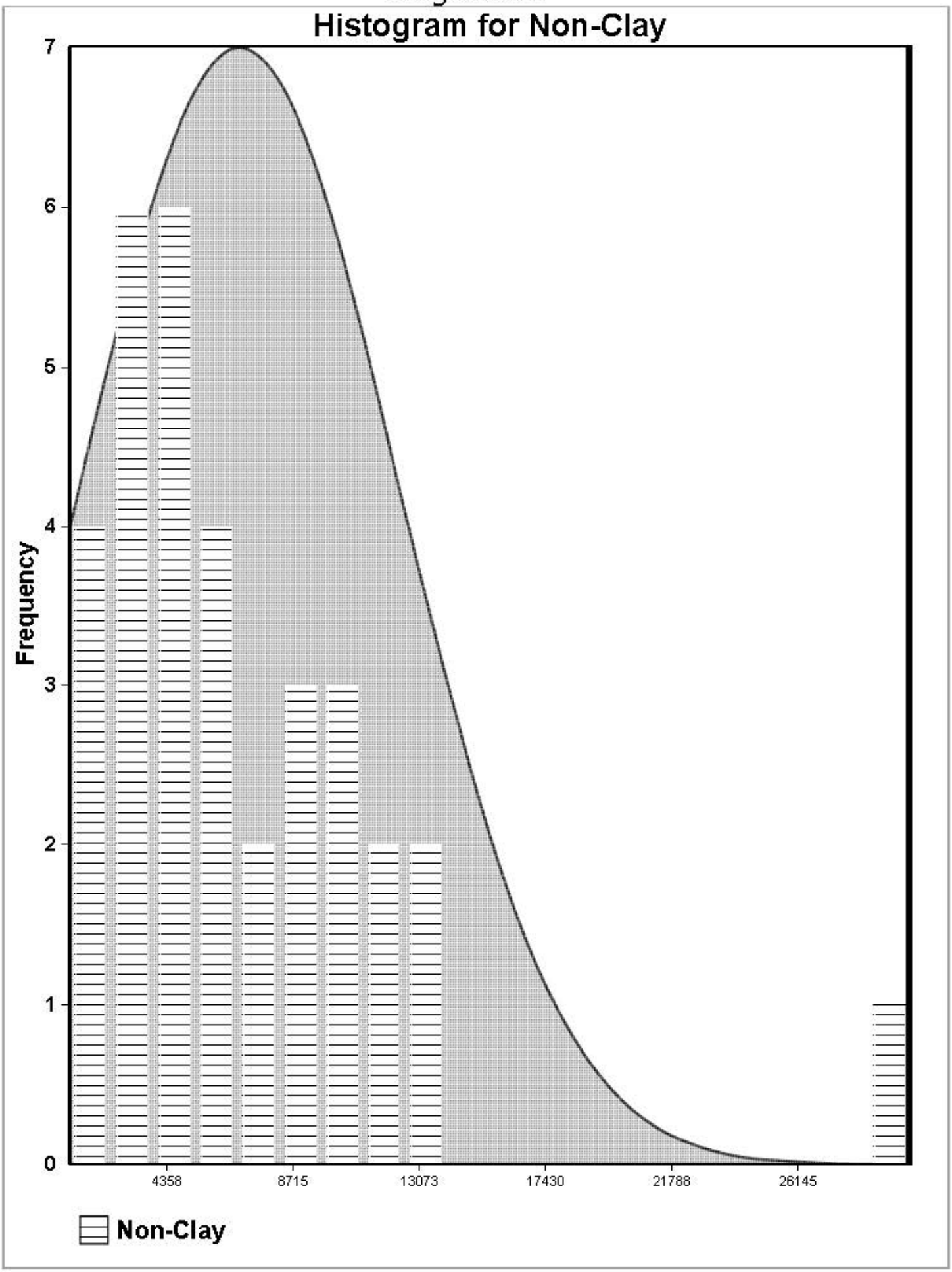
Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Magnesium


Histogram for Clay
Frequency
0
1
2
3
4
2640
5280
7920
10560
13200
15840
18480
Clay

Magnesium


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
4358
8715
13073
17430
21788
26145
Non-Clay

Location	Clay
BG-1-2	19000
BG-1-43	10000
BG-1-55	6000
BG-1-78	11000
BG-2-30	15000
BG-2-81	14000
BG-3-17	1600
BG-3-22	1400
BG-3-69	4300
BG-4-2	8100
BG-4-19	13000
BG-4-40	11000
BG-4-79	13000
BG-4-161	7800
BG-4-163	13000
BG-6-28	9700
BG-6-53	12000
BG-6-87	12000

Location	Non-Clay
BG-1-10	13000
BG-1-29	11000
BG-1-40	30000
BG-1-46	5500
BG-1-92	3600
BG-2-2	4000
BG-2-10	3100
BG-2-19	9200
BG-2-21	6200
BG-2-32	3900
BG-2-75	4400
BG-3-2	2600
BG-3-10	3700
BG-3-29	1300
BG-3-63	1500
BG-3-65	2800
BG-3-95	950
BG-3-105	3100
BG-3-131	970
BG-3-136	6300
BG-4-10	12000
BG-4-65	5300
BG-4-82	12000
BG-4-95	5500
BG-4-117	4500
BG-4-120	9500
BG-6-2	8500
BG-6-9	9900
BG-6-58	4000
BG-6-75	6800
BG-6-98	6800
BG-6-114	13000
BG-6-127	11000
Average	6846.060606

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Magnesium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	12
Minimum	2600
Maximum	30000
Mean of Raw Data	10017
Standard Deviation of Raw Data	7899
Kstar	1.628
Mean of Log Transformed Data	8.955
Standard Deviation of Log Transformed Data	0.75

Normal Distribution Test Results	
Correlation Coefficient R	0.909
Shapiro Wilk Test Statistic	0.835
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.0194
Lilliefors Test Statistic	0.2
Lilliefors Critical (0.95) Value	0.256

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.985
A-D Test Statistic	0.277
A-D Critical (0.95) Value	0.741
K-S Test Statistic	0.151
K-S Critical(0.95) Value	0.248

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.986
Shapiro Wilk Test Statistic	0.964
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.859
Lilliefors Test Statistic	0.144
Lilliefors Critical (0.95) Value	0.256

Data appear Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	29
Minimum	950
Maximum	15000
Mean of Raw Data	7401
Standard Deviation of Raw Data	4305
Kstar	2.058
Mean of Log Transformed Data	8.666
Standard Deviation of Log Transformed Data	0.799

Normal Distribution Test Results

Correlation Coefficient R	0.972
Shapiro Wilk Test Statistic	0.922
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.0117
Lilliefors Test Statistic	0.132
Lilliefors Critical (0.95) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.932
A-D Test Statistic	0.972
A-D Critical (0.95) Value	0.758
K-S Test Statistic	0.139
K-S Critical(0.95) Value	0.143

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.946
Shapiro Wilk Test Statistic	0.877
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	3.2353E-4
Lilliefors Test Statistic	0.142
Lilliefors Critical (0.95) Value	0.142

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Magnesium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-Transformed Statistics	
Minimum	2600	Minimum	7.863
Maximum	30000	Maximum	10.31
Second Largest	19000	Second Largest	9.852
First Quartile	3925	First Quartile	8.275
Median	8850	Median	9.087
Third Quartile	11500	Third Quartile	9.347
Mean	10017	Mean	8.955
SD	7899	SD	0.75
Coefficient of Variation	0.789		
Skewness	1.652		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.835	Shapiro Wilk Test Statistic	0.964
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	31629	95% UTL with 95% Coverage	60323
95% UPL (t)	24782	95% UPL (t)	31483
90% Percentile (z)	20140	90% Percentile (z)	20259
95% Percentile (z)	23010	95% Percentile (z)	26606
99% Percentile (z)	28393	99% Percentile (z)	44362

Gamma Distribution Test		Data Distribution Test
k star	1.628	Data appear Gamma Distributed at 5% Significance Level
Theta Star	6153	
MLE of Mean	10017	
MLE of Standard Deviation	7851	
nu star	39.07	
A-D Test Statistic	0.277	Nonparametric Statistics
5% A-D Critical Value	0.741	90% Percentile 18400
K-S Test Statistic	0.151	95% Percentile 23950
5% K-S Critical Value	0.248	99% Percentile 28790
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	30000
90% Percentile	20462	95% Percentile Bootstrap UTL with 95% Coverage	30000
95% Percentile	25393	95% BCA Bootstrap UTL with 95% Coverage	30000
99% Percentile	36469	95% UPL	30000
		95% Chebyshev UPL	45855
95% WH Approx. Gamma UPL	27120	Upper Threshold Limit Based upon IQR	22863
95% HW Approx. Gamma UPL	27860		
95% WH Approx. Gamma UTL with 95% Coverage	41179		
95% HW Approx. Gamma UTL with 95% Coverage	44071		

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	29
Raw Statistics		Log-Transformed Statistics	
Minimum	950	Minimum	6.856
Maximum	15000	Maximum	9.616
Second Largest	14000	Second Largest	9.547
First Quartile	3950	First Quartile	8.281
Median	6800	Median	8.825
Third Quartile	11500	Third Quartile	9.349
Mean	7401	Mean	8.666
SD	4305	SD	0.799
Coefficient of Variation	0.582		
Skewness	0.0859		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.922	Shapiro Wilk Test Statistic	0.877
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	16546	95% UTL with 95% Coverage	31677
95% UPL (t)	14751	95% UPL (t)	22702
90% Percentile (z)	12918	90% Percentile (z)	16156
95% Percentile (z)	14482	95% Percentile (z)	21596
99% Percentile (z)	17415	99% Percentile (z)	37220
Gamma Distribution Test		Data Distribution Test	
k star	2.058	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	3596		
MLE of Mean	7401		
MLE of Standard Deviation	5159		
nu star	160.5		
A-D Test Statistic	0.972	Nonparametric Statistics	
5% A-D Critical Value	0.758	90% Percentile	13000
K-S Test Statistic	0.139	95% Percentile	13100
5% K-S Critical Value	0.143	99% Percentile	14620

Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	15000
90% Percentile	14297	95% Percentile Bootstrap UTL with 95% Coverage	15000
95% Percentile	17397	95% BCA Bootstrap UTL with 95% Coverage	14100
99% Percentile	24260	95% UPL	14000
		95% Chebyshev UPL	26404
95% WH Approx. Gamma UPL	17743	Upper Threshold Limit Based upon IQR	22825
95% HW Approx. Gamma UPL	18560		
95% WH Approx. Gamma UTL with 95% Coverage	21767		
95% HW Approx. Gamma UTL with 95% Coverage	23275		

Outlier Tests for Selected Variables

User Selected Options	
From File	Magnesium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12

10% critical value: 0.49

5% critical value: 0.546

1% critical value: 0.642

1. Data Value 30000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.632

For 10% significance level, 30000 is an outlier.

For 5% significance level, 30000 is an outlier.

For 1% significance level, 30000 is not an outlier.

2. Data Value 2600 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.067

For 10% significance level, 2600 is not an outlier.

For 5% significance level, 2600 is not an outlier.

For 1% significance level, 2600 is not an outlier.

Rosner's Outlier Test for MC

Mean	7401
Standard Deviation	4305
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7401	4249	15000	6	1.788	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Magnesium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Observations	39	12
Number of Distinct Observations	29	12
Minimum	950	2600
Maximum	15000	30000
Mean	7401	10017
Median	6800	8850
SD	4305	7899
SE of Mean	689.3	2280

Wilcoxon-Mann-Whitney (WMW) Test

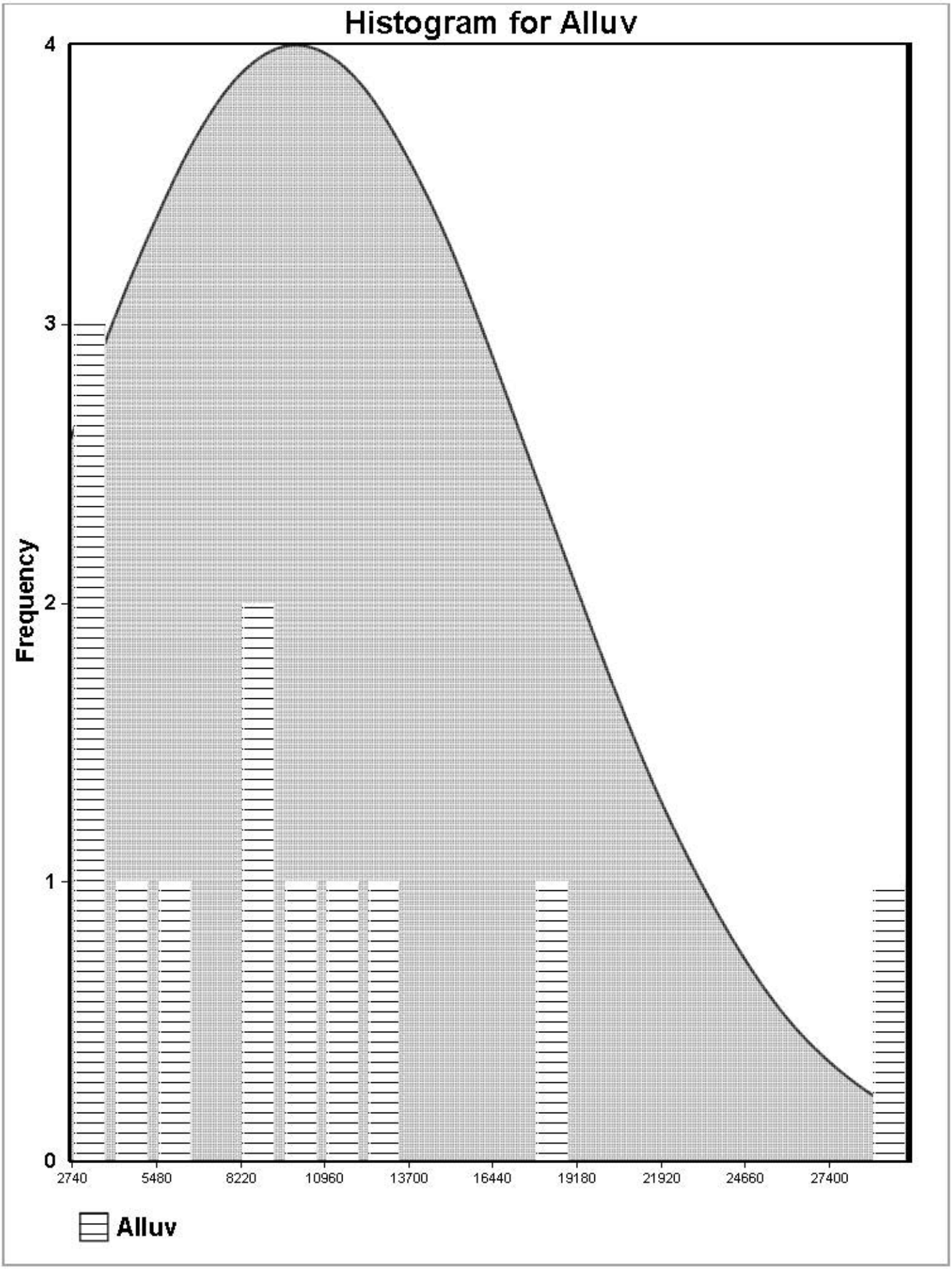
H0: Mean/Median of Site or AOC = Mean/Median of Background

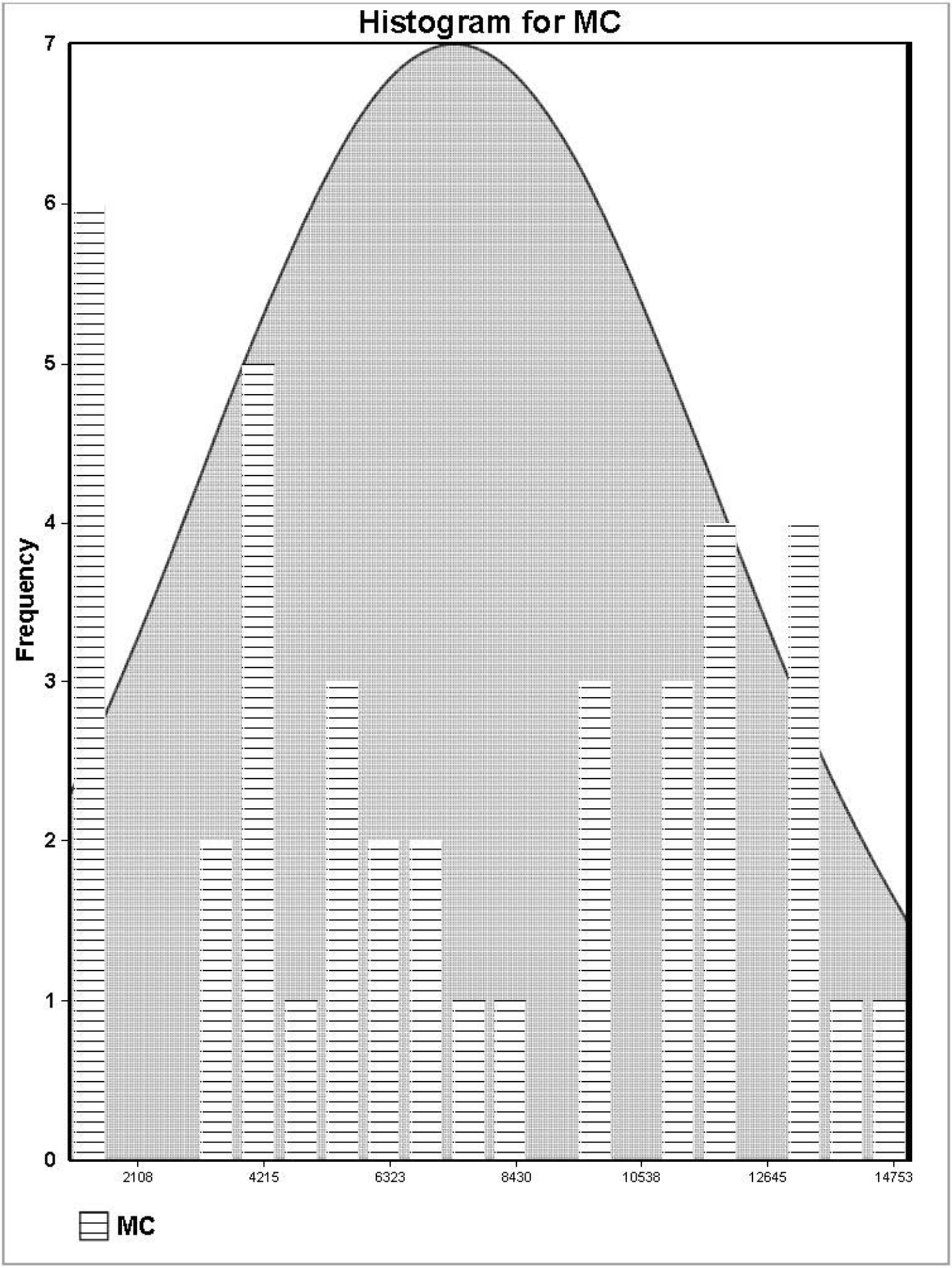
Site Rank Sum W-Stat	987.5
WMW Test U-Stat	0.577
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.549

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
2740
5480
8220
10960
13700
16440
19180
21920
24660
27400
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
2108
4215
6323
8430
10538
12645
14753
MC

Location	Alluv
BG-1-2	270
BG-1-10	140
BG-1-29	110
BG-1-40	68
BG-2-2	100
BG-2-10	85
BG-2-19	90
BG-2-21	520
BG-3-2	200
BG-3-10	180
BG-6-2	360
BG-6-9	140

Location	MC
BG-1-43	160
BG-1-46	300
BG-1-55	240
BG-1-78	450
BG-1-92	130
BG-2-30	270
BG-2-32	63
BG-2-75	69
BG-2-81	250
BG-3-17	160
BG-3-22	1200
BG-3-29	75
BG-3-63	69
BG-3-65	130
BG-3-69	170
BG-3-95	69
BG-3-105	110
BG-3-131	500
BG-3-136	180
BG-4-1	130
BG-4-10	200
BG-4-19	260
BG-4-40	260
BG-4-65	90
BG-4-79	360
BG-4-82	190
BG-4-95	79
BG-4-117	73
BG-4-120	170
BG-4-161	290
BG-4-163	360
BG-6-28	210
BG-6-53	190
BG-6-58	99
BG-6-75	270
BG-6-87	260
BG-6-98	150
BG-6-114	190
BG-1-127	210

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Manganese.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	31
Minimum	63
Maximum	1200
Mean of Raw Data	209.4
Standard Deviation of Raw Data	178.4
Kstar	2.36
Mean of Log Transformed Data	5.131
Standard Deviation of Log Transformed Data	0.623

Normal Distribution Test Results	
Correlation Coefficient R	0.794
Approximate Shapiro Wilk Test Statistic	0.666
Approximate Shapiro Wilk P Value	4.641E-14
Lilliefors Test Statistic	0.21
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.902
A-D Test Statistic	0.847
A-D Critical (0.95) Value	0.76
K-S Test Statistic	0.108
K-S Critical(0.95) Value	0.125

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.981
Approximate Shapiro Wilk Test Statistic	0.96
Approximate Shapiro Wilk P Value	0.149
Lilliefors Test Statistic	0.0693
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Manganese.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Total Number of Observations	51	Number of Distinct Observations	31

Raw Statistics		Log-Transformed Statistics	
Minimum	63	Minimum	4.143
Maximum	1200	Maximum	7.09
Second Largest	520	Second Largest	6.254
First Quartile	105	First Quartile	4.653
Median	170	Median	5.136
Third Quartile	260	Third Quartile	5.561
Mean	209.4	Mean	5.131
SD	178.4	SD	0.623
Coefficient of Variation	0.852		
Skewness	3.721		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.21	Lilliefors Test Statistic	0.0693
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	575.8	95% UTL with 95% Coverage	607.4
95% UPL (t)	511.3	95% UPL (t)	485
90% Percentile (z)	438	90% Percentile (z)	375.5
95% Percentile (z)	502.8	95% Percentile (z)	470.9
99% Percentile (z)	624.4	99% Percentile (z)	719.7

Gamma Distribution Test		Data Distribution Test	
k star	2.36	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	88.71		
MLE of Mean	209.4		
MLE of Standard Deviation	136.3		
nu star	240.8		
A-D Test Statistic	0.847	Nonparametric Statistics	
5% A-D Critical Value	0.76	90% Percentile	360
K-S Test Statistic	0.108	95% Percentile	475
5% K-S Critical Value	0.125	99% Percentile	860
Data follow Appx. Gamma Distribution at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	520
90% Percentile	391.9	95% Percentile Bootstrap UTL with 95% Coverage	860
95% Percentile	471.8	95% BCA Bootstrap UTL with 95% Coverage	860
99% Percentile	647.2	95% UPL	508
		95% Chebyshev UPL	994.6
95% WH Approx. Gamma UPL	470.7	Upper Threshold Limit Based upon IQR	492.5
95% HW Approx. Gamma UPL	471.4		
95% WH Approx. Gamma UTL with 95% Coverage	558		
95% HW Approx. Gamma UTL with 95% Coverage	564.9		

Outlier Tests for Selected Variables

User Selected Options	
From File	Manganese.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for All Data

Mean	209.4
Standard Deviation	178.4
Number of data	51
Number of suspected outliers	1

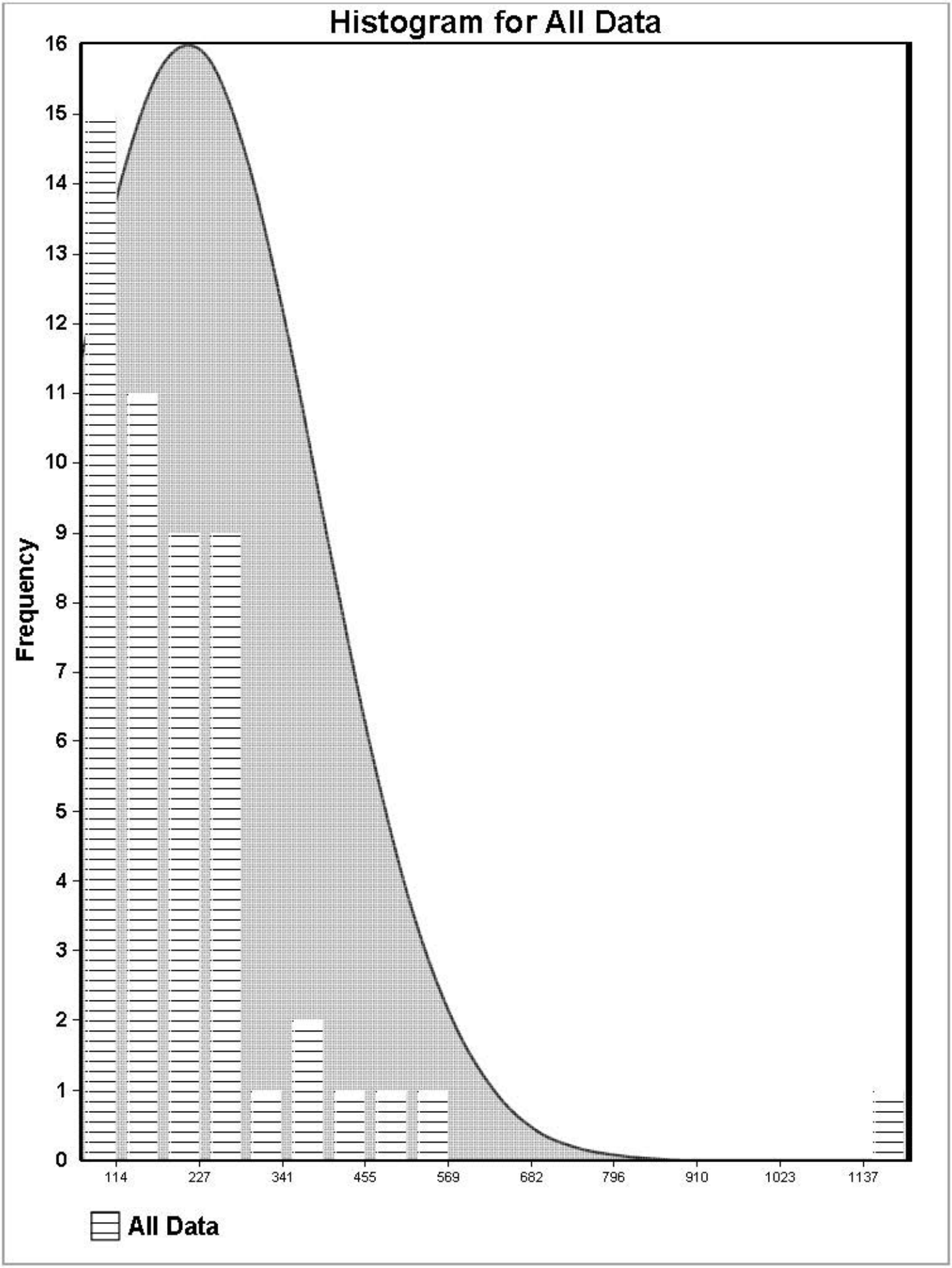
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	209.4	176.7	1200	8	5.608	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1200 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1200 is a Potential Statistical Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
114
227
341
455
569
682
796
910
1023
1137
All Data

Location	All Data
BG-1-2	270
BG-1-43	160
BG-1-55	240
BG-1-78	450
BG-2-30	270
BG-2-81	250
BG-3-17	160
BG-3-22	1200
BG-3-69	170
BG-4-2	130
BG-4-19	260
BG-4-40	260
BG-4-79	360
BG-4-161	290
BG-4-163	360
BG-6-28	210
BG-6-53	190
BG-6-87	260
BG-1-10	140
BG-1-29	110
BG-1-40	68
BG-1-46	300
BG-1-92	130
BG-2-2	100
BG-2-10	85
BG-2-19	90
BG-2-21	520
BG-2-32	63
BG-2-75	69
BG-3-2	200
BG-3-10	180
BG-3-29	75
BG-3-63	69
BG-3-65	130
BG-3-95	69
BG-3-105	110
BG-3-131	500
BG-3-136	180
BG-4-10	200
BG-4-65	90
BG-4-82	190
BG-4-95	79
BG-4-117	73
BG-4-120	170
BG-6-2	140
BG-6-9	140
BG-6-58	99
BG-6-75	270
BG-6-98	150
BG-6-114	190
BG-6-127	210

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Manganese.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	10
Minimum	85
Maximum	270
Mean of Raw Data	161.2
Standard Deviation of Raw Data	59.1
Kstar	6.375
Mean of Log Transformed Data	5.02
Standard Deviation of Log Transformed Data	0.369

Normal Distribution Test Results	
Correlation Coefficient R	0.97
Shapiro Wilk Test Statistic	0.928
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.373
Lilliefors Test Statistic	0.178
Lilliefors Critical (0.95) Value	0.246

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.982
A-D Test Statistic	0.275
A-D Critical (0.95) Value	0.735
K-S Test Statistic	0.147
K-S Critical(0.95) Value	0.237

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.984
Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.726
Lilliefors Test Statistic	0.123
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

>20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	27
Minimum	63
Maximum	1200
Mean of Raw Data	225.9
Standard Deviation of Raw Data	201.9
Kstar	1.986
Mean of Log Transformed Data	5.168
Standard Deviation of Log Transformed Data	0.688

Normal Distribution Test Results

Correlation Coefficient R	0.811
Shapiro Wilk Test Statistic	0.687
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	1.7683E-9
Lilliefors Test Statistic	0.21
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.922
A-D Test Statistic	0.669
A-D Critical (0.95) Value	0.759
K-S Test Statistic	0.0996
K-S Critical(0.95) Value	0.145

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.979
Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.162
Lilliefors Test Statistic	0.0876
Lilliefors Critical (0.95) Value	0.144

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Manganese.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	10

Raw Statistics		Log-Transformed Statistics	
Minimum	85	Minimum	4.443
Maximum	270	Maximum	5.598
Second Largest	260	Second Largest	5.561
First Quartile	130	First Quartile	4.868
Median	140	Median	4.942
Third Quartile	200	Third Quartile	5.298
Mean	161.2	Mean	5.02
SD	59.1	SD	0.369
Coefficient of Variation	0.367		
Skewness	0.616		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.928	Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	319	95% UTL with 95% Coverage	405.6
95% UPL (t)	270.5	95% UPL (t)	299.6
90% Percentile (z)	236.9	90% Percentile (z)	243
95% Percentile (z)	258.4	95% Percentile (z)	277.8
99% Percentile (z)	298.6	99% Percentile (z)	357.2

Gamma Distribution Test		Data Distribution Test	
k star	6.375	Data appear Normal at 5% Significance Level	
Theta Star	25.28		
MLE of Mean	161.2		
MLE of Standard Deviation	63.83		
nu star	165.7		
A-D Test Statistic	0.275	Nonparametric Statistics	
5% A-D Critical Value	0.735	90% Percentile	248
K-S Test Statistic	0.147	95% Percentile	264
5% K-S Critical Value	0.237	99% Percentile	268.8
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	270
90% Percentile	246.4	95% Percentile Bootstrap UTL with 95% Coverage	270
95% Percentile	278.4	95% BCA Bootstrap UTL with 95% Coverage	270
99% Percentile	345.3	95% UPL	270
		95% Chebyshev UPL	428.5
95% WH Approx. Gamma UPL	285.7	Upper Threshold Limit Based upon IQR	305
95% HW Approx. Gamma UPL	288.7		
95% WH Approx. Gamma UTL with 95% Coverage	362.1		
95% HW Approx. Gamma UTL with 95% Coverage	370.9		

>20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	27

Raw Statistics		Log-Transformed Statistics	
Minimum	63	Minimum	4.143
Maximum	1200	Maximum	7.09
Second Largest	520	Second Largest	6.254
First Quartile	101.8	First Quartile	4.621
Median	185	Median	5.22
Third Quartile	267.5	Third Quartile	5.589
Mean	225.9	Mean	5.168
SD	201.9	SD	0.688
Coefficient of Variation	0.894		
Skewness	3.279		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.687	Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	656.5	95% UTL with 95% Coverage	762.1
95% UPL (t)	571.1	95% UPL (t)	569.6
90% Percentile (z)	484.7	90% Percentile (z)	424.3
95% Percentile (z)	558.1	95% Percentile (z)	544.9
99% Percentile (z)	695.7	99% Percentile (z)	871.1
Gamma Distribution Test		Data Distribution Test	
k star	1.986	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	113.7		
MLE of Mean	225.9		
MLE of Standard Deviation	160.3		
nu star	150.9		
A-D Test Statistic	0.669	Nonparametric Statistics	
5% A-D Critical Value	0.759	90% Percentile	387
K-S Test Statistic	0.0996	95% Percentile	503
5% K-S Critical Value	0.145	99% Percentile	948.4

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	1200
90% Percentile	440.1	95% Percentile Bootstrap UTL with 95% Coverage	1200
95% Percentile	537	95% BCA Bootstrap UTL with 95% Coverage	1200
99% Percentile	752.1	95% UPL	554
		95% Chebyshev UPL	1118
95% WH Approx. Gamma UPL	539.2	Upper Threshold Limit Based upon IQR	516.1
95% HW Approx. Gamma UPL	542.6		
95% WH Approx. Gamma UTL with 95% Coverage	665.4		
95% HW Approx. Gamma UTL with 95% Coverage	680		

Outlier Tests for Selected Variables

User Selected Options	
From File	Manganese.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 270 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.389

For 10% significance level, 270 is not an outlier.
For 5% significance level, 270 is not an outlier.
For 1% significance level, 270 is not an outlier.

2. Data Value 85 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.086

For 10% significance level, 85 is not an outlier.
For 5% significance level, 85 is not an outlier.
For 1% significance level, 85 is not an outlier.

Rosner's Outlier Test for >20

Mean	225.9
Standard Deviation	201.9
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	225.9	199.3	1200	30	4.888	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1200 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1200 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Manganese.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Observations	38	13
Number of Distinct Observations	27	10
Minimum	63	85
Maximum	1200	270
Mean	225.9	161.2
Median	185	140
SD	201.9	59.1
SE of Mean	32.76	16.39

Wilcoxon-Mann-Whitney (WMW) Test

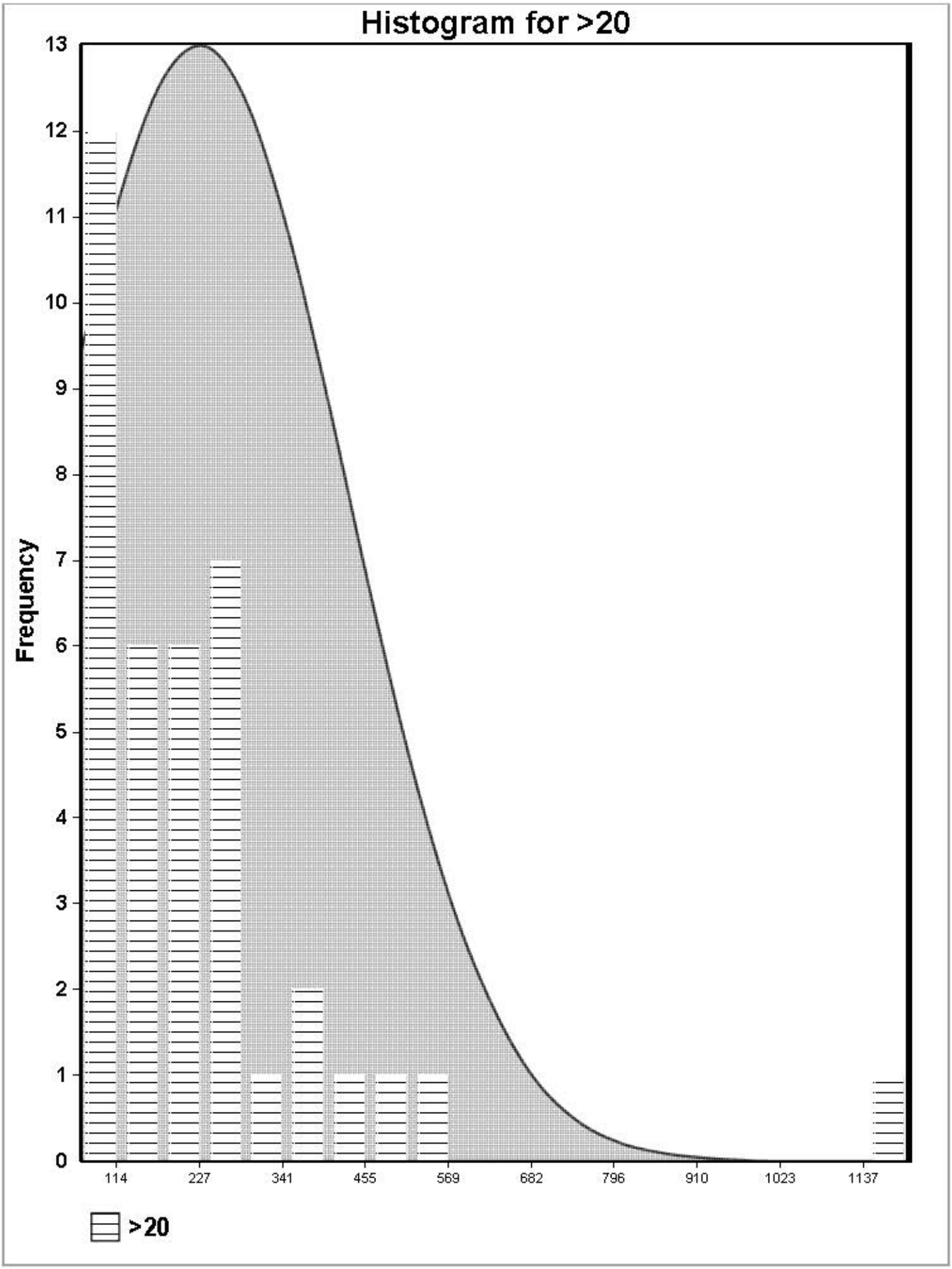
H0: Mean/Median of Site or AOC = Mean/Median of Background

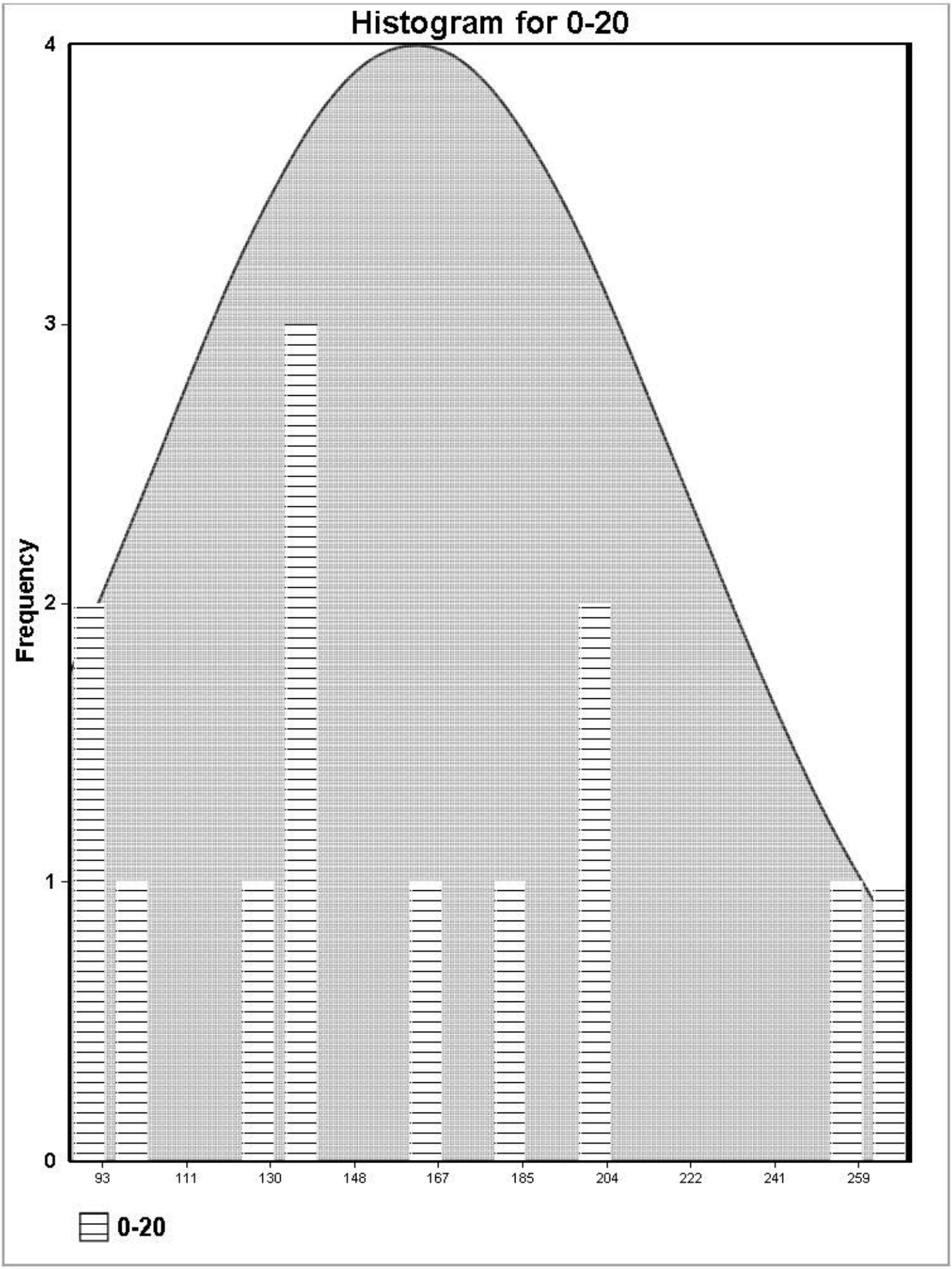
Site Rank Sum W-Stat	1020
WMW Test U-Stat	0.67
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.503

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
114
227
341
455
569
682
796
910
1023
1137
>20


Histogram for 0-20
Frequency
4
3
2
1
0
93
111
130
148
167
185
204
222
241
259
0-20

Location	0-20
BG-1-2	270
BG-3-17	160
BG-4-2	130
BG-4-19	260
BG-1-10	140
BG-2-2	100
BG-2-10	85
BG-2-19	90
BG-3-2	200
BG-3-10	180
BG-4-10	200
BG-6-2	140
BG-6-9	140

Location	>20
BG-1-29	110
BG-1-40	68
BG-1-46	300
BG-1-92	130
BG-2-21	520
BG-2-32	63
BG-2-75	69
BG-3-29	75
BG-3-63	69
BG-3-65	130
BG-3-95	69
BG-3-105	110
BG-3-131	500
BG-3-136	180
BG-4-65	90
BG-4-82	190
BG-4-95	79
BG-4-117	73
BG-4-120	170
BG-6-58	99
BG-6-75	270
BG-6-98	150
BG-6-114	190
BG-6-127	210
BG-1-43	160
BG-1-55	240
BG-1-78	450
BG-2-30	270
BG-2-81	250
BG-3-22	1200
BG-3-69	170
BG-4-40	260
BG-4-79	360
BG-4-161	290
BG-4-163	360
BG-6-28	210
BG-6-53	190
BG-6-87	260

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Manganese.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	13
Minimum	130
Maximum	1200
Mean of Raw Data	305
Standard Deviation of Raw Data	237.3
Kstar	2.951
Mean of Log Transformed Data	5.571
Standard Deviation of Log Transformed Data	0.494

Normal Distribution Test Results	
Correlation Coefficient R	0.728
Shapiro Wilk Test Statistic	0.561
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	3.8135E-7
Lilliefors Test Statistic	0.303
Lilliefors Critical (0.95) Value	0.209

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.833
A-D Test Statistic	1.314
A-D Critical (0.95) Value	0.744
K-S Test Statistic	0.243
K-S Critical(0.95) Value	0.205

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.917
Shapiro Wilk Test Statistic	0.861
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.00975
Lilliefors Test Statistic	0.2
Lilliefors Critical (0.95) Value	0.209

Data not Lognormal at (0.05) Significance Level

Non-Clay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	23
Minimum	63
Maximum	520
Mean of Raw Data	157.2
Standard Deviation of Raw Data	109
Kstar	2.88
Mean of Log Transformed Data	4.891
Standard Deviation of Log Transformed Data	0.555

Normal Distribution Test Results

Correlation Coefficient R	0.858
Shapiro Wilk Test Statistic	0.742
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	4.7705E-7
Lilliefors Test Statistic	0.196
Lilliefors Critical (0.95) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.944
A-D Test Statistic	0.964
A-D Critical (0.95) Value	0.753
K-S Test Statistic	0.113
K-S Critical(0.95) Value	0.154

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.969
Shapiro Wilk Test Statistic	0.928
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.0374
Lilliefors Test Statistic	0.0927
Lilliefors Critical (0.95) Value	0.154

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Manganese.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	13

Raw Statistics		Log-Transformed Statistics	
Minimum	130	Minimum	4.868
Maximum	1200	Maximum	7.09
Second Largest	450	Second Largest	6.109
First Quartile	195	First Quartile	5.272
Median	260	Median	5.561
Third Quartile	285	Third Quartile	5.652
Mean	305	Mean	5.571
SD	237.3	SD	0.494
Coefficient of Variation	0.778		
Skewness	3.483		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.561	Shapiro Wilk Test Statistic	0.861
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	887.1	95% UTL with 95% Coverage	882.2
95% UPL (t)	729.1	95% UPL (t)	634.9
90% Percentile (z)	609.1	90% Percentile (z)	494.6
95% Percentile (z)	695.3	95% Percentile (z)	591.8
99% Percentile (z)	857	99% Percentile (z)	828.7

Gamma Distribution Test		Data Distribution Test	
k star	2.951	Data do not follow a Discernable Distribution (0.05)	
Theta Star	103.4		
MLE of Mean	305		
MLE of Standard Deviation	177.5		
nu star	106.2		
A-D Test Statistic	1.314	Nonparametric Statistics	
5% A-D Critical Value	0.744	90% Percentile	387
K-S Test Statistic	0.243	95% Percentile	562.5
5% K-S Critical Value	0.205	99% Percentile	1073
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	1200
90% Percentile	543	95% Percentile Bootstrap UTL with 95% Coverage	1200
95% Percentile	643.1	95% BCA Bootstrap UTL with 95% Coverage	1200
99% Percentile	860.2	95% UPL	1200
		95% Chebyshev UPL	1368
95% WH Approx. Gamma UPL	654.1	Upper Threshold Limit Based upon IQR	420
95% HW Approx. Gamma UPL	647.7		
95% WH Approx. Gamma UTL with 95% Coverage	856.1		
95% HW Approx. Gamma UTL with 95% Coverage	858.5		

Non-Clay

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	23

Raw Statistics		Log-Transformed Statistics	
Minimum	63	Minimum	4.143
Maximum	520	Maximum	6.254
Second Largest	500	Second Largest	6.215
First Quartile	85	First Quartile	4.443
Median	130	Median	4.868
Third Quartile	190	Third Quartile	5.247
Mean	157.2	Mean	4.891
SD	109	SD	0.555
Coefficient of Variation	0.693		
Skewness	2.208		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.742	Shapiro Wilk Test Statistic	0.928
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	394.4	95% UTL with 95% Coverage	444.7
95% UPL (t)	344.6	95% UPL (t)	345.2
90% Percentile (z)	296.9	90% Percentile (z)	270.8
95% Percentile (z)	336.5	95% Percentile (z)	331.2
99% Percentile (z)	410.7	99% Percentile (z)	483.4
Gamma Distribution Test		Data Distribution Test	
k star	2.88	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	54.6		
MLE of Mean	157.2		
MLE of Standard Deviation	92.66		
nu star	190.1		
A-D Test Statistic	0.964	Nonparametric Statistics	
5% A-D Critical Value	0.753	90% Percentile	258
K-S Test Statistic	0.113	95% Percentile	380
5% K-S Critical Value	0.154	99% Percentile	513.6

Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	520
90% Percentile	281.5	95% Percentile Bootstrap UTL with 95% Coverage	520
95% Percentile	333.9	95% BCA Bootstrap UTL with 95% Coverage	520
99% Percentile	447.8	95% UPL	506
		95% Chebyshev UPL	639.4
95% WH Approx. Gamma UPL	337.3	Upper Threshold Limit Based upon IQR	347.5
95% HW Approx. Gamma UPL	338.2		
95% WH Approx. Gamma UTL with 95% Coverage	410.2		
95% HW Approx. Gamma UTL with 95% Coverage	416.2		

Outlier Tests for Selected Variables

User Selected Options	
From File	Manganese.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 1200 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.808

For 10% significance level, 1200 is an outlier.

For 5% significance level, 1200 is an outlier.

For 1% significance level, 1200 is an outlier.

2. Data Value 130 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.130

For 10% significance level, 130 is not an outlier.

For 5% significance level, 130 is not an outlier.

For 1% significance level, 130 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	157.2
Standard Deviation	109
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	157.2	107.3	520	9	3.381	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 520 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 520 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Manganese.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Observations	33	18
Number of Distinct Observations	23	13
Minimum	63	130
Maximum	520	1200
Mean	157.2	305
Median	130	260
SD	109	237.3
SE of Mean	18.97	55.93

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

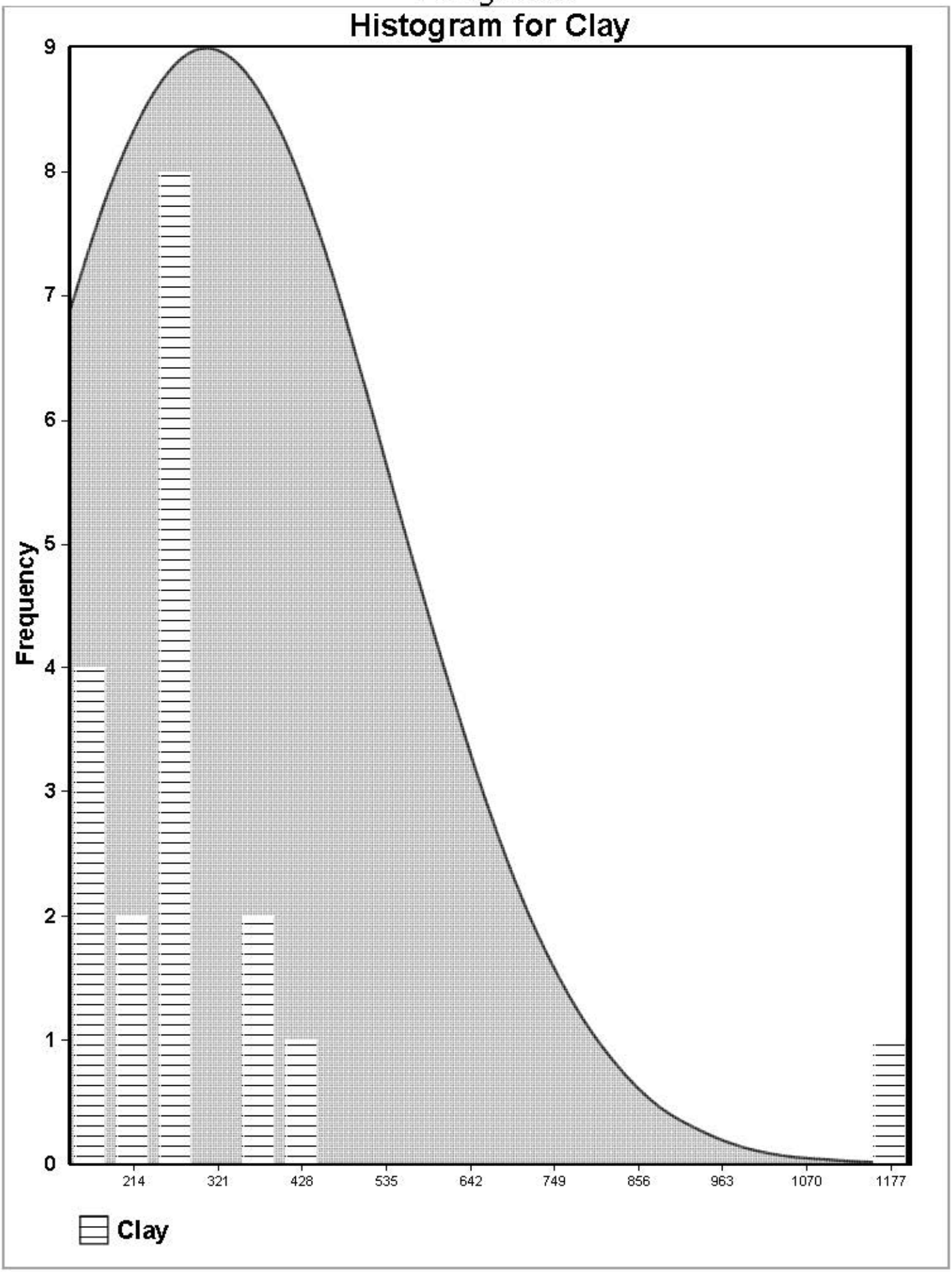
Site Rank Sum W-Stat	662
WMW Test U-Stat	3.853
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	1.0746E-4

Conclusion with Alpha = 0.05

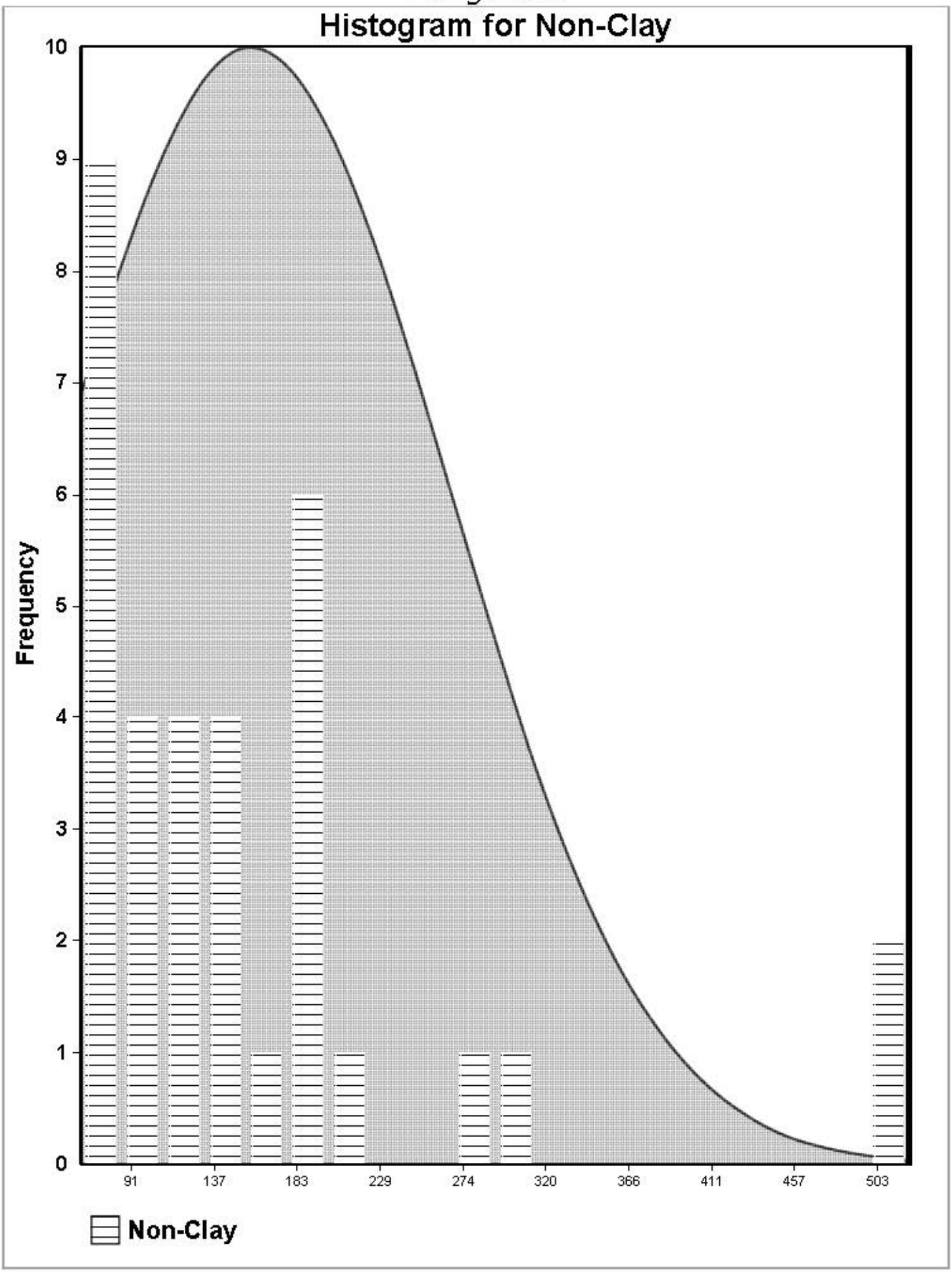
Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Manganese


Histogram for Clay
Frequency
0
1
2
3
4
5
6
7
8
9
214
321
428
535
642
749
856
963
1070
1177
Clay

Manganese


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
91
137
183
229
274
320
366
411
457
503
Non-Clay

Location	Clay
BG-1-2	270
BG-1-43	160
BG-1-55	240
BG-1-78	450
BG-2-30	270
BG-2-81	250
BG-3-17	160
BG-3-22	1200
BG-3-69	170
BG-4-2	130
BG-4-19	260
BG-4-40	260
BG-4-79	360
BG-4-161	290
BG-4-163	360
BG-6-28	210
BG-6-53	190
BG-6-87	260

Location	Non-Clay
BG-1-10	140
BG-1-29	110
BG-1-40	68
BG-1-46	300
BG-1-92	130
BG-2-2	100
BG-2-10	85
BG-2-19	90
BG-2-21	520
BG-2-32	63
BG-2-75	69
BG-3-2	200
BG-3-10	180
BG-3-29	75
BG-3-63	69
BG-3-65	130
BG-3-95	69
BG-3-105	110
BG-3-131	500
BG-3-136	180
BG-4-10	200
BG-4-65	90
BG-4-82	190
BG-4-95	79
BG-4-117	73
BG-4-120	170
BG-6-2	140
BG-6-9	140
BG-6-58	99
BG-6-75	270
BG-6-98	150
BG-6-114	190
BG-6-127	210

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Manganese.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	11
Minimum	68
Maximum	520
Mean of Raw Data	188.6
Standard Deviation of Raw Data	134.8
Kstar	2.134
Mean of Log Transformed Data	5.048
Standard Deviation of Log Transformed Data	0.621

Normal Distribution Test Results	
Correlation Coefficient R	0.9
Shapiro Wilk Test Statistic	0.815
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.0112
Lilliefors Test Statistic	0.224
Lilliefors Critical (0.95) Value	0.256

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.979
A-D Test Statistic	0.44
A-D Critical (0.95) Value	0.74
K-S Test Statistic	0.188
K-S Critical(0.95) Value	0.248

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.979
Shapiro Wilk Test Statistic	0.951
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.671
Lilliefors Test Statistic	0.152
Lilliefors Critical (0.95) Value	0.256

Data appear Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	26
Minimum	63
Maximum	1200
Mean of Raw Data	221.4
Standard Deviation of Raw Data	191.9
Kstar	2.256
Mean of Log Transformed Data	5.18
Standard Deviation of Log Transformed Data	0.639

Normal Distribution Test Results

Correlation Coefficient R	0.785
Shapiro Wilk Test Statistic	0.651
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	1.209E-10
Lilliefors Test Statistic	0.221
Lilliefors Critical (0.95) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.891
A-D Test Statistic	0.696
A-D Critical (0.95) Value	0.757
K-S Test Statistic	0.118
K-S Critical(0.95) Value	0.143

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.977
Shapiro Wilk Test Statistic	0.956
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.181
Lilliefors Test Statistic	0.0779
Lilliefors Critical (0.95) Value	0.142

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Manganese.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-Transformed Statistics	
Minimum	68	Minimum	4.22
Maximum	520	Maximum	6.254
Second Largest	360	Second Largest	5.886
First Quartile	97.5	First Quartile	4.579
Median	140	Median	4.942
Third Quartile	217.5	Third Quartile	5.373
Mean	188.6	Mean	5.048
SD	134.8	SD	0.621
Coefficient of Variation	0.715		
Skewness	1.638		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.815	Shapiro Wilk Test Statistic	0.951
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	557.3	95% UTL with 95% Coverage	850.8
95% UPL (t)	440.5	95% UPL (t)	496.9
90% Percentile (z)	361.3	90% Percentile (z)	345
95% Percentile (z)	410.3	95% Percentile (z)	432.3
99% Percentile (z)	502.1	99% Percentile (z)	659.8

Gamma Distribution Test		Data Distribution Test
k star	2.134	Data appear Gamma Distributed at 5% Significance Level
Theta Star	88.38	
MLE of Mean	188.6	
MLE of Standard Deviation	129.1	
nu star	51.21	
A-D Test Statistic	0.44	Nonparametric Statistics
5% A-D Critical Value	0.74	90% Percentile 351
K-S Test Statistic	0.188	95% Percentile 432
5% K-S Critical Value	0.248	99% Percentile 502.4
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	520
90% Percentile	361.3	95% Percentile Bootstrap UTL with 95% Coverage	520
95% Percentile	438.3	95% BCA Bootstrap UTL with 95% Coverage	520
99% Percentile	608.5	95% UPL	520
		95% Chebyshev UPL	800
95% WH Approx. Gamma UPL	462.4	Upper Threshold Limit Based upon IQR	397.5
95% HW Approx. Gamma UPL	468.7		
95% WH Approx. Gamma UTL with 95% Coverage	675.2		
95% HW Approx. Gamma UTL with 95% Coverage	705.5		

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	26

Raw Statistics		Log-Transformed Statistics	
Minimum	63	Minimum	4.143
Maximum	1200	Maximum	7.09
Second Largest	500	Second Largest	6.215
First Quartile	120	First Quartile	4.784
Median	190	Median	5.247
Third Quartile	260	Third Quartile	5.561
Mean	221.4	Mean	5.18
SD	191.9	SD	0.639
Coefficient of Variation	0.866		
Skewness	3.709		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.651	Shapiro Wilk Test Statistic	0.956
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	629	95% UTL with 95% Coverage	690.2
95% UPL (t)	549	95% UPL (t)	528.8
90% Percentile (z)	467.3	90% Percentile (z)	402.9
95% Percentile (z)	537	95% Percentile (z)	508.1
99% Percentile (z)	667.8	99% Percentile (z)	785.2
Gamma Distribution Test		Data Distribution Test	
k star	2.256	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	98.17		
MLE of Mean	221.4		
MLE of Standard Deviation	147.4		
nu star	175.9		
A-D Test Statistic	0.696	Nonparametric Statistics	
5% A-D Critical Value	0.757	90% Percentile	360
K-S Test Statistic	0.118	95% Percentile	455
5% K-S Critical Value	0.143	99% Percentile	934

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	1200
90% Percentile	418.8	95% Percentile Bootstrap UTL with 95% Coverage	1200
95% Percentile	505.9	95% BCA Bootstrap UTL with 95% Coverage	1200
99% Percentile	697.7	95% UPL	500
		95% Chebyshev UPL	1068
95% WH Approx. Gamma UPL	506.8	Upper Threshold Limit Based upon IQR	470
95% HW Approx. Gamma UPL	508.6		
95% WH Approx. Gamma UTL with 95% Coverage	617.5		
95% HW Approx. Gamma UTL with 95% Coverage	627.9		

Outlier Tests for Selected Variables

User Selected Options	
From File	Manganese.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 520 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.575

For 10% significance level, 520 is an outlier.
For 5% significance level, 520 is an outlier.
For 1% significance level, 520 is not an outlier.

2. Data Value 68 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.075

For 10% significance level, 68 is not an outlier.
For 5% significance level, 68 is not an outlier.
For 1% significance level, 68 is not an outlier.

Rosner's Outlier Test for MC

Mean	221.4
Standard Deviation	191.9
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	221.4	189.4	1200	11	5.167	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1200 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1200 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Manganese.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Observations	39	12
Number of Distinct Observations	26	11
Minimum	63	68
Maximum	1200	520
Mean	221.4	188.6
Median	190	140
SD	191.9	134.8
SE of Mean	30.72	38.9

Wilcoxon-Mann-Whitney (WMW) Test

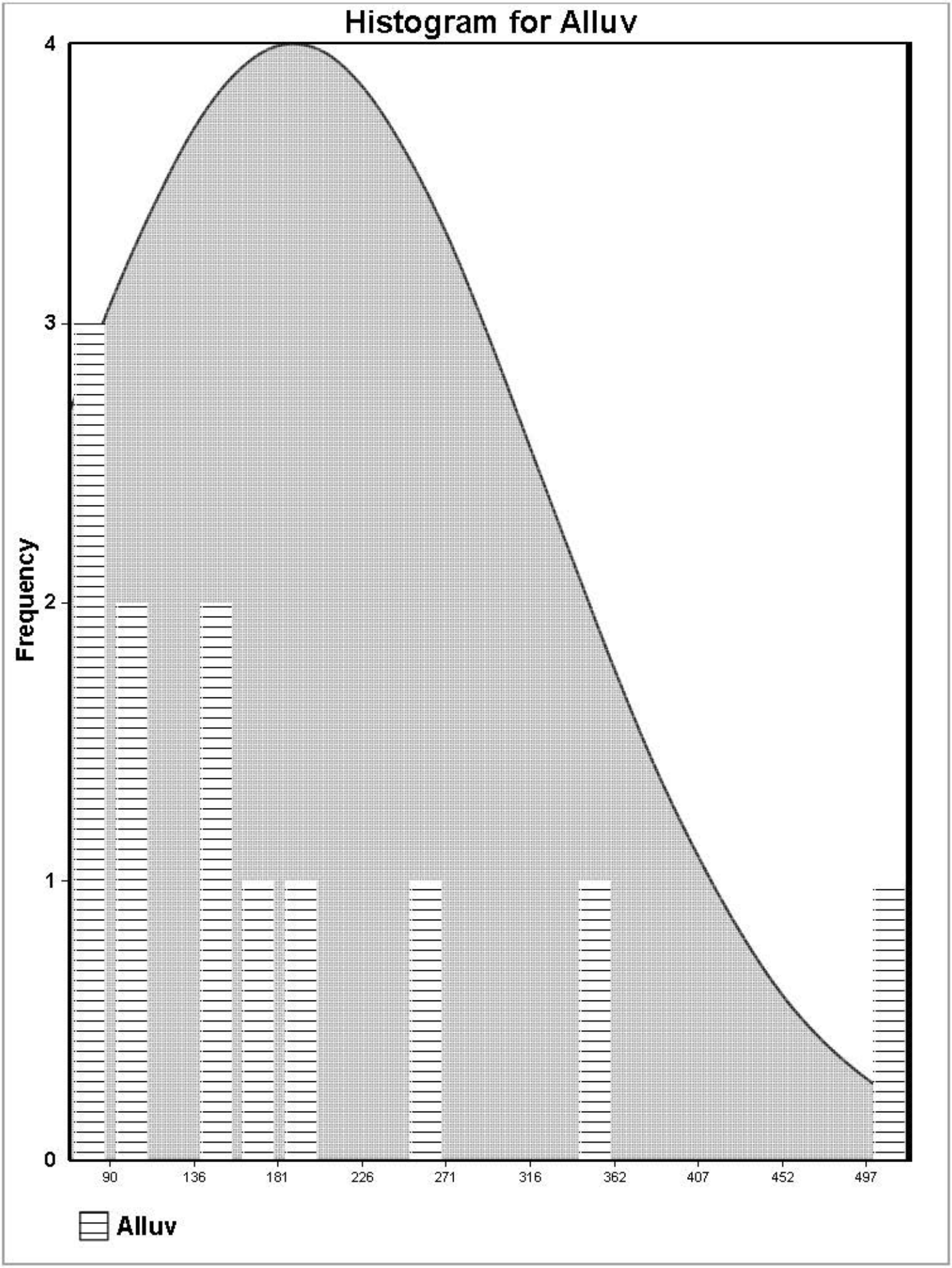
H0: Mean/Median of Site or AOC = Mean/Median of Background

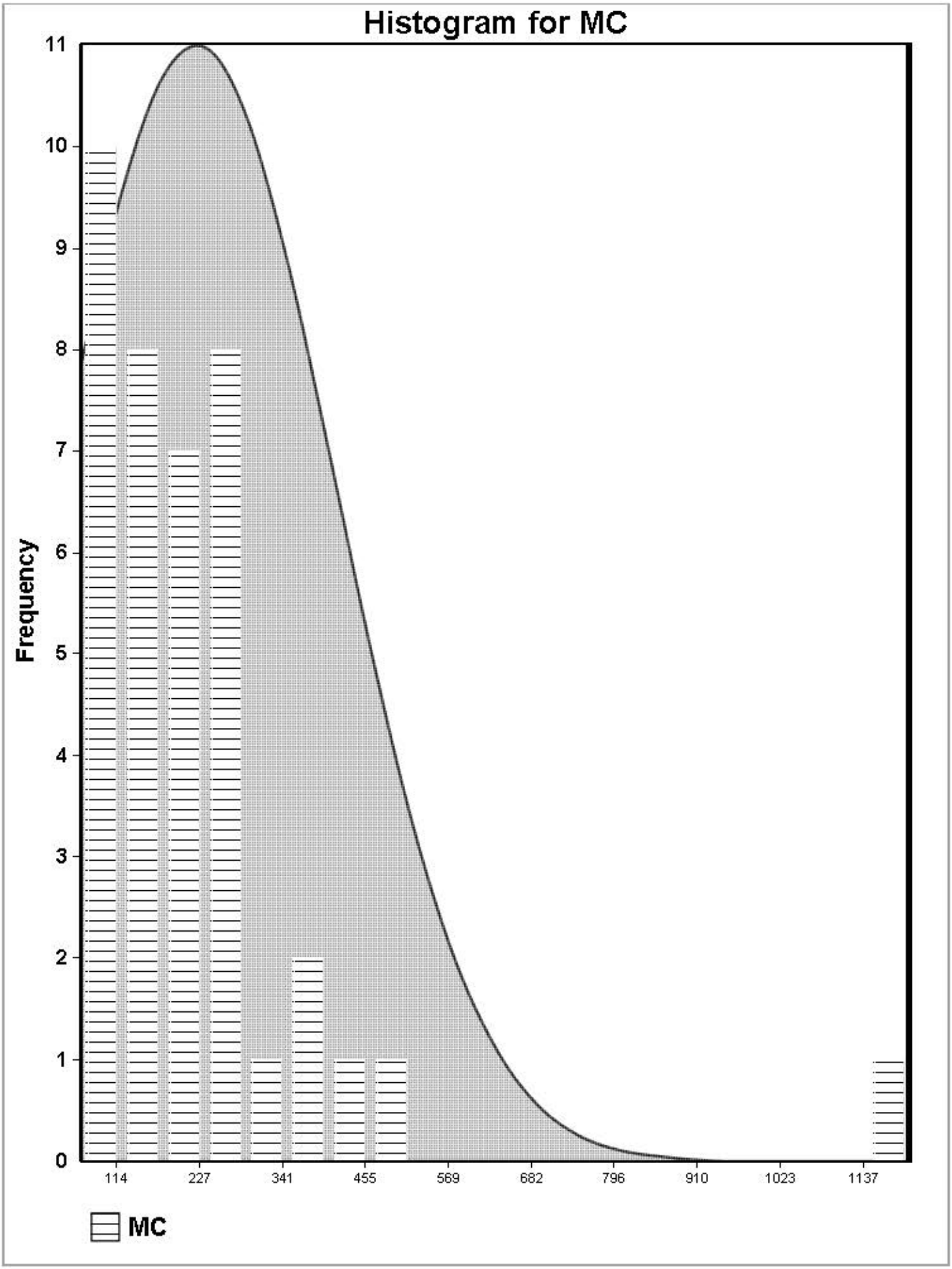
Site Rank Sum W-Stat	1043
WMW Test U-Stat	0.633
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.527

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
90
136
181
226
271
316
362
407
452
497
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
114
227
341
455
569
682
796
910
1023
1137
MC

Location	Alluv
BG-1-2	19000
BG-1-10	13000
BG-1-29	11000
BG-1-40	30000
BG-2-2	4000
BG-2-10	3100
BG-2-19	9200
BG-2-21	6200
BG-3-2	2600
BG-3-10	3700
BG-6-2	8500
BG-6-9	9900

Location	MC
BG-1-43	10000
BG-1-46	5500
BG-1-55	6000
BG-1-78	11000
BG-1-92	3600
BG-2-30	15000
BG-2-32	3900
BG-2-75	4400
BG-2-81	14000
BG-3-17	1600
BG-3-22	1400
BG-3-29	1300
BG-3-63	1500
BG-3-65	3800
BG-3-69	4300
BG-3-95	950
BG-3-105	3100
BG-3-131	970
BG-3-136	6300
BG-4-1	8100
BG-4-10	12000
BG-4-19	13000
BG-4-40	11000
BG-4-65	5300
BG-4-79	13000
BG-4-82	12000
BG-4-95	5500
BG-4-117	4500
BG-4-120	9500
BG-4-161	7800
BG-4-163	13000
BG-6-28	9700
BG-6-53	12000
BG-6-58	4000
BG-6-75	6800
BG-6-87	12000
BG-6-98	6800
BG-6-114	13000
BG-1-127	11000

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Mercury.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	8	10	55.56%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	10	0.02	0.025	0.0227	0.023	0.00177
Statistics (Detects Only)	8	0.0034	0.36	0.0564	0.0106	0.123
Statistics (All: NDs treated as DL value)	18	0.0034	0.36	0.0377	0.022	0.0809
Statistics (All: NDs treated as DL/2 value)	18	0.0034	0.36	0.0314	0.0115	0.0823
Statistics (Normal ROS Estimated Data)	18	-0.0278	0.36	0.0347	0.0203	0.0851
Statistics (Gamma ROS Estimated Data)	18	1.000E-12	0.36	0.0494	0.0225	0.0886
Statistics (Lognormal ROS Estimated Data)	18	0.0034	0.36	0.03	0.00807	0.0828

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.482	0.439	0.117	-4.201	1.5	-0.357
Statistics (NDs = DL)	0.85	0.746	0.0443	-3.972	0.987	-0.249
Statistics (NDs = DL/2)	0.679	0.603	0.0462	-4.357	0.975	-0.224
Statistics (Gamma ROS Estimates)	0.163	0.173	0.304	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.577	1.108	-0.242

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.68	0.558	0.53	0.706

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.491	0.818	Data Not Normal
Lilliefors (Detects Only)	0.441	0.313	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.343	0.897	Data Not Normal
Lilliefors (NDs = DL)	0.453	0.209	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.312	0.897	Data Not Normal
Lilliefors (NDs = DL/2)	0.444	0.209	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.53	0.897	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.327	0.209	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.929	0.772	0.784	0.953

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.066	0.765	
Kolmogorov-Smirnov (Detects Only)	0.294	0.31	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	2.557	0.773	
Kolmogorov-Smirnov (NDs = DL)	0.38	0.211	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	3.682	0.784	
Kolmogorov-Smirnov (NDs = DL/2)	0.424	0.212	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.565	0.899	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.351	0.227	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.927	0.885	0.824	0.889

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.869	0.818	Data Appear Lognormal
Lilliefors (Detects Only)	0.184	0.313	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.812	0.897	Data Not Lognormal
Lilliefors (NDs = DL)	0.276	0.209	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.712	0.897	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.344	0.209	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.806	0.897	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.167	0.209	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	17	16	48.48%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	16	0.02	0.025	0.0224	0.024	0.00203
Statistics (Detects Only)	17	0.001	0.026	0.00494	0.0032	0.00582
Statistics (All: NDs treated as DL value)	33	0.001	0.026	0.0134	0.02	0.00988
Statistics (All: NDs treated as DL/2 value)	33	0.001	0.026	0.00798	0.01	0.00525
Statistics (Normal ROS Estimated Data)	33	-0.00134	0.026	0.00466	0.0039	0.00469
Statistics (Gamma ROS Estimated Data)	33	0.001	0.026	0.00495	0.00488	0.00411
Statistics (Lognormal ROS Estimated Data)	33	0.001	0.026	0.0043	0.00322	0.00436

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.612	1.485	0.00307	-5.651	0.764	-0.135
Statistics (NDs = DL)	1.268	1.173	0.0106	-4.754	1.085	-0.228
Statistics (NDs = DL/2)	2.074	1.905	0.00385	-5.09	0.801	-0.157
Statistics (Gamma ROS Estimates)	3	2.747	0.00165	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.698	0.652	-0.114

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.739	0.899	0.918	0.835

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.575	0.892	Data Not Normal
Lilliefors (Detects Only)	0.319	0.215	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.782	0.931	Data Not Normal
Lilliefors (NDs = DL)	0.262	0.154	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.854	0.931	Data Not Normal

Lilliefors (NDs = DL/2)	0.165	0.154	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.731	0.931	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.208	0.154	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.888	0.812	0.923	0.942

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.869	0.754	
Kolmogorov-Smirnov (Detects Only)	0.213	0.213	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.623	0.77	
Kolmogorov-Smirnov (NDs = DL)	0.295	0.157	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.511	0.759	
Kolmogorov-Smirnov (NDs = DL/2)	0.229	0.155	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.768	0.753	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.316	0.154	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.965	0.918	0.946	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.945	0.892	Data Appear Lognormal
Lilliefors (Detects Only)	0.146	0.215	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.822	0.931	Data Not Lognormal
Lilliefors (NDs = DL)	0.296	0.154	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.891	0.931	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.243	0.154	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.965	0.931	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0881	0.154	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Mercury.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	25	26	50.98%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	26	0.02	0.025	0.0225	0.0235	0.0019
Statistics (Detects Only)	25	0.001	0.36	0.0215	0.0047	0.071
Statistics (All: NDs treated as DL value)	51	0.001	0.36	0.022	0.02	0.0492
Statistics (All: NDs treated as DL/2 value)	51	0.001	0.36	0.0163	0.01	0.0495
Statistics (Normal ROS Estimated Data)	51	-0.032	0.36	0.0169	0.0055	0.0519
Statistics (Gamma ROS Estimated Data)	51	0.001	0.36	0.0212	0.0159	0.0493
Statistics (Lognormal ROS Estimated Data)	51	9.8300E-4	0.36	0.0133	0.00439	0.0499

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.479	0.464	0.0449	-5.175	1.238	-0.239
Statistics (NDs = DL)	0.892	0.852	0.0247	-4.472	1.106	-0.247
Statistics (NDs = DL/2)	0.834	0.798	0.0195	-4.825	0.927	-0.192
Statistics (Gamma ROS Estimates)	0.877	0.838	0.0242	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.324	1.012	-0.19

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.503	0.492	0.427	0.609

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.283	0.918	Data Not Normal
Lilliefors (Detects Only)	0.395	0.177	Data Not Normal
Lilliefors (NDs = DL)	0.429	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.452	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.278	0.124	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.793	0.671	0.641	0.897

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	3.513	0.812	
Kolmogorov-Smirnov (Detects Only)	0.302	0.185	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.463	0.786	
Kolmogorov-Smirnov (NDs = DL)	0.264	0.128	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.752	0.789	
Kolmogorov-Smirnov (NDs = DL/2)	0.364	0.129	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.519	0.786	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.248	0.129	Data Not Gamma Distributed	

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.924	0.923	0.912	0.94

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.869	0.918	Data Not Lognormal
Lilliefors (Detects Only)	0.189	0.177	Data Not Lognormal
Lilliefors (NDs = DL)	0.282	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.238	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.119	0.124	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Mercury.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics			
Number of Valid Data	51	Number of Detected Data	25
Number of Distinct Detected Data	22	Number of Non-Detect Data	26
		Percent Non-Detects	50.98%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.001	Minimum Detected	-6.908
Maximum Detected	0.36	Maximum Detected	-1.022
Mean of Detected	0.0215	Mean of Detected	-5.175
SD of Detected	0.071	SD of Detected	1.238
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.025	Maximum Non-Detect	-3.689

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	48
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	3
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	94.12%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.283	Shapiro Wilk Test Statistic	0.869
5% Shapiro Wilk Critical Value	0.918	5% Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0163	Mean (Log Scale)	-4.825
SD	0.0495	SD (Log Scale)	0.927
95% UTL 95% Coverage	0.118	95% UTL 95% Coverage	0.0538
95% UPL (t)	0.1	95% UPL (t)	0.0385
90% Percentile (z)	0.0797	90% Percentile (z)	0.0263
95% Percentile (z)	0.0977	95% Percentile (z)	0.0368
99% Percentile (z)	0.131	99% Percentile (z)	0.0693
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.456	Mean in Original Scale	0.0133
SD	0.305	SD in Original Scale	0.0499
95% UTL with 95% Coverage	0.171	95% UTL with 95% Coverage	0.0389
		95% BCA UTL with 95% Coverage	0.193
		95% Bootstrap (%) UTL with 95% Coverage	0.193
95% UPL (t)	0.0604	95% UPL (t)	0.027

90% Percentile (z)	-0.0649	90% Percentile (z)	0.0178
95% Percentile (z)	0.0459	95% Percentile (z)	0.0257
99% Percentile (z)	0.254	99% Percentile (z)	0.0513
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.448	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0479		
nu star	22.41		
A-D Test Statistic	3.513	Nonparametric Statistics	
5% A-D Critical Value	0.812	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.302	Mean	0.013
5% K-S Critical Value	0.185	SD	0.0495
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00709
		95% KM UTL with 95% Coverage	0.115
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.231
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0968
Mean	0.0212	90% Percentile (z)	0.0765
Median	0.0159	95% Percentile (z)	0.0944
SD	0.0493	99% Percentile (z)	0.128
k star	0.838		
Theta star	0.0253	Gamma ROS Limits with Extrapolated Data	
Nu star	85.48	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0617
95% Percentile of Chisquare (2k)	5.347	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0609
		95% WH Approx. Gamma UTL with 95% Coverage	0.079
90% Percentile	0.051	95% HW Approx. Gamma UTL with 95% Coverage	0.0797
95% Percentile	0.0677		
99% Percentile	0.107		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Mercury.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for All Data

Mean	0.0163
Standard Deviation	0.0495
Number of data	51
Number of suspected outliers	1

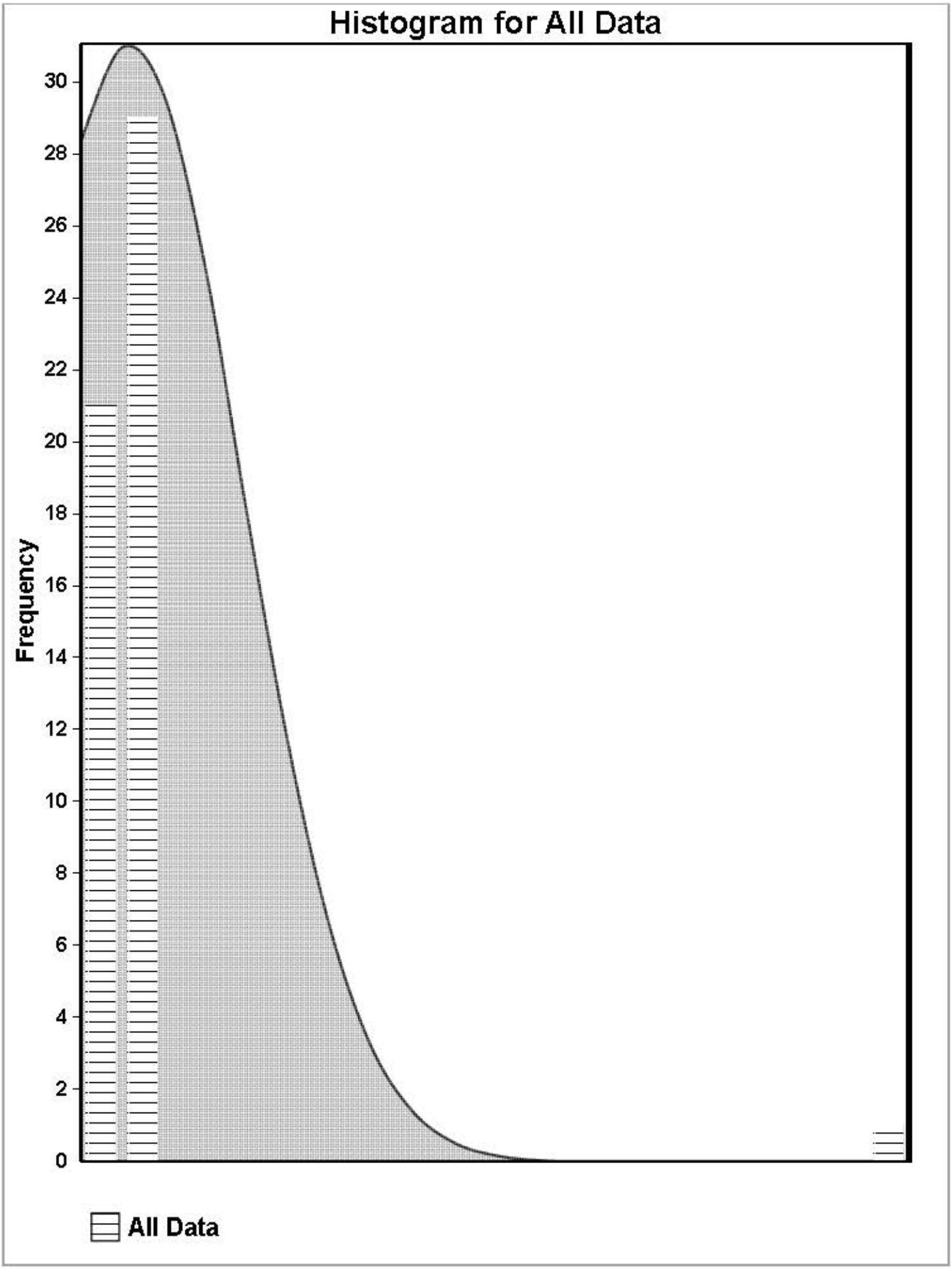
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0163	0.049	0.36	6	7.016	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.36 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.36 is a Potential Statistical Outlier


Histogram for All Data
Frequency
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
All Data

Location	All Data	D_All Data
BG-1-2	0.012	1
BG-1-43	0.0091	1
BG-1-55	0.0200	0
BG-1-78	0.0360	1
BG-2-30	0.0200	1
BG-2-81	0.3600	1
BG-3-17	0.0034	1
BG-3-22	0.0048	1
BG-3-69	0.0055	1
BG-4-2	0.0210	0
BG-4-19	0.0240	0
BG-4-40	0.0230	0
BG-4-79	0.0200	0
BG-4-161	0.0240	0
BG-4-163	0.0230	0
BG-6-28	0.0230	0
BG-6-53	0.0240	0
BG-6-87	0.0250	0
BG-1-10	0.0050	1
BG-1-29	0.0093	1
BG-1-40	0.0093	1
BG-1-46	0.0018	1
BG-1-92	0.0200	0
BG-2-2	0.0028	1
BG-2-10	0.0200	0
BG-2-19	0.0047	1
BG-2-21	0.0021	1
BG-2-32	0.0017	1
BG-2-75	0.0200	0
BG-3-2	0.0026	1
BG-3-10	0.0041	1
BG-3-29	0.0039	1
BG-3-63	0.0250	0
BG-3-65	0.0025	1
BG-3-95	0.0017	1
BG-3-105	0.0032	1
BG-3-131	0.0010	1
BG-3-136	0.0048	1
BG-4-10	0.0220	0
BG-4-65	0.0200	0
BG-4-82	0.0240	0
BG-4-95	0.0240	0
BG-4-117	0.0240	0
BG-4-120	0.0240	0
BG-6-2	0.0200	0
BG-6-9	0.0200	0
BG-6-58	0.0240	0
BG-6-75	0.0240	0
BG-6-98	0.0260	1
BG-6-114	0.0240	0
BG-6-127	0.0240	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Mercury.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	7	6	46.15%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	6	0.02	0.024	0.0212	0.0205	0.0016
Statistics (Detects Only)	7	0.0026	0.012	0.00494	0.0041	0.00324
Statistics (All: NDs treated as DL value)	13	0.0026	0.024	0.0124	0.012	0.00879
Statistics (All: NDs treated as DL/2 value)	13	0.0026	0.012	0.00755	0.01	0.00375
Statistics (Normal ROS Estimated Data)	13	0.0026	0.012	0.00494	0.00494	0.00247
Statistics (Gamma ROS Estimated Data)	13	0.0026	0.012	0.00503	0.005	0.00246
Statistics (Lognormal ROS Estimated Data)	13	0.0026	0.012	0.00472	0.00433	0.00242

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.948	3.088	0.00125	-5.442	0.513	-0.0942
Statistics (NDs = DL)	1.695	1.355	0.00733	-4.711	0.9	-0.191
Statistics (NDs = DL/2)	3.635	2.847	0.00208	-5.031	0.589	-0.117
Statistics (Gamma ROS Estimates)	5.859	4.558	8.5930E-4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.442	0.398	-0.0732

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.832	0.912	0.928	0.858

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.714	0.803	Data Not Normal
Lilliefors (Detects Only)	0.35	0.335	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.805	0.866	Data Not Normal
Lilliefors (NDs = DL)	0.267	0.246	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.834	0.866	Data Not Normal
Lilliefors (NDs = DL/2)	0.282	0.246	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.757	0.866	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.337	0.246	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.918	0.866	0.887	0.926

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.596	0.71	
Kolmogorov-Smirnov (Detects Only)	0.281	0.313	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.138	0.748	
Kolmogorov-Smirnov (NDs = DL)	0.283	0.24	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	1.004	0.738	
Kolmogorov-Smirnov (NDs = DL/2)	0.307	0.238	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.61	0.736	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.256	0.237	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.929	0.92	0.928	0.928

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.874	0.803	Data Appear Lognormal
Lilliefors (Detects Only)	0.247	0.335	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.819	0.866	Data Not Lognormal
Lilliefors (NDs = DL)	0.274	0.246	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.836	0.866	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.303	0.246	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.877	0.866	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.206	0.246	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

>20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	38	0	38	18	20	52.63%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	20	0.02	0.025	0.023	0.024	0.00182
Statistics (Detects Only)	18	0.001	0.36	0.0279	0.0048	0.0834
Statistics (All: NDs treated as DL value)	38	0.001	0.36	0.0253	0.02	0.0566
Statistics (All: NDs treated as DL/2 value)	38	0.001	0.36	0.0193	0.0108	0.0572
Statistics (Normal ROS Estimated Data)	38	-0.0402	0.36	0.0201	0.0073	0.0604
Statistics (Gamma ROS Estimated Data)	38	0.001	0.36	0.0286	0.0201	0.057
Statistics (Lognormal ROS Estimated Data)	38	8.0229E-4	0.36	0.0161	0.00451	0.0578

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.435	0.418	0.0642	-5.071	1.424	-0.281
Statistics (NDs = DL)	0.828	0.78	0.0306	-4.39	1.168	-0.266
Statistics (NDs = DL/2)	0.744	0.703	0.0259	-4.755	1.014	-0.213
Statistics (Gamma ROS Estimates)	0.807	0.761	0.0354	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.308	1.156	-0.218

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.552	0.507	0.456	0.656

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.335	0.897	Data Not Normal
Lilliefors (Detects Only)	0.406	0.209	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.298	0.938	Data Not Normal
Lilliefors (NDs = DL)	0.442	0.144	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.246	0.938	Data Not Normal

Lilliefors (NDs = DL/2)	0.442	0.144	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.477	0.938	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.266	0.144	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.845	0.7	0.688	0.929

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.252	0.814	
Kolmogorov-Smirnov (Detects Only)	0.311	0.217	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.072	0.785	
Kolmogorov-Smirnov (NDs = DL)	0.294	0.148	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	4.685	0.789	
Kolmogorov-Smirnov (NDs = DL/2)	0.374	0.149	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.383	0.786	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.159	0.148	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.94	0.914	0.907	0.95

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.893	0.897	Data Not Lognormal
Lilliefors (Detects Only)	0.169	0.209	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.849	0.938	Data Not Lognormal
Lilliefors (NDs = DL)	0.29	0.144	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.852	0.938	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.251	0.144	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.918	0.938	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.109	0.144	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Mercury.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Number of Valid Data	13	Number of Detected Data	7
Number of Distinct Detected Data	7	Number of Non-Detect Data	6
		Percent Non-Detects	46.15%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0026	Minimum Detected	-5.952
Maximum Detected	0.012	Maximum Detected	-4.423
Mean of Detected	0.00494	Mean of Detected	-5.442
SD of Detected	0.00324	SD of Detected	0.513
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.024	Maximum Non-Detect	-3.73

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	13
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 7 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.714	Shapiro Wilk Test Statistic	0.874
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00755	Mean (Log Scale)	-5.031
SD	0.00375	SD (Log Scale)	0.589
95% UTL 95% Coverage	0.0176	95% UTL 95% Coverage	0.0316
95% UPL (t)	0.0145	95% UPL (t)	0.0194
90% Percentile (z)	0.0124	90% Percentile (z)	0.0139
95% Percentile (z)	0.0137	95% Percentile (z)	0.0172
99% Percentile (z)	0.0163	99% Percentile (z)	0.0258

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00472
		SD in Original Scale	0.00242
		Mean in Log Scale	-5.442
		SD in Log Scale	0.398
		95% UTL 95% Coverage	0.0126
		95% UPL (t)	0.00905
		90% Percentile (z)	0.00722
		95% Percentile (z)	0.00834
		99% Percentile (z)	0.0109
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.351	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0021		
nu star	32.91		
A-D Test Statistic	0.596	Nonparametric Statistics	
5% A-D Critical Value	0.71	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.281	Mean	0.00494
5% K-S Critical Value	0.313	SD	0.003
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00123
		95% KM UTL with 95% Coverage	0.013
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0185
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0105
Mean	0.00503	90% Percentile (z)	0.00879
Median	0.005	95% Percentile (z)	0.00988
SD	0.00246	99% Percentile (z)	0.0119
k star	4.558		
Theta star	0.0011	Gamma ROS Limits with Extrapolated Data	
Nu star	118.5	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00972
95% Percentile of Chisquare (2k)	17.08	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00977
		95% WH Approx. Gamma UTL with 95% Coverage	0.0127
90% Percentile	0.00819	95% HW Approx. Gamma UTL with 95% Coverage	0.013
95% Percentile	0.00943		
99% Percentile	0.0121		

Note: DL/2 is not a recommended method.

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General Statistics			
Number of Valid Data	38	Number of Detected Data	18
Number of Distinct Detected Data	15	Number of Non-Detect Data	20
		Percent Non-Detects	52.63%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.001	Minimum Detected	-6.908
Maximum Detected	0.36	Maximum Detected	-1.022
Mean of Detected	0.0279	Mean of Detected	-5.071
SD of Detected	0.0834	SD of Detected	1.424
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.025	Maximum Non-Detect	-3.689

Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	35
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	3
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	92.11%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.335	Shapiro Wilk Test Statistic	0.893
5% Shapiro Wilk Critical Value	0.897	5% Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0193	Mean (Log Scale)	-4.755
SD	0.0572	SD (Log Scale)	1.014
95% UTL 95% Coverage	0.141	95% UTL 95% Coverage	0.0748
95% UPL (t)	0.117	95% UPL (t)	0.0487
90% Percentile (z)	0.0925	90% Percentile (z)	0.0316
95% Percentile (z)	0.113	95% Percentile (z)	0.0456
99% Percentile (z)	0.152	99% Percentile (z)	0.091
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.393	Mean in Original Scale	0.0161
SD	0.293	SD in Original Scale	0.0578
95% UTL with 95% Coverage	0.232	95% UTL with 95% Coverage	0.0583
		95% BCA UTL with 95% Coverage	0.36
		95% Bootstrap (%) UTL with 95% Coverage	0.36
95% UPL (t)	0.108	95% UPL (t)	0.0357
90% Percentile (z)	-0.0176	90% Percentile (z)	0.0218
95% Percentile (z)	0.0889	95% Percentile (z)	0.0332
99% Percentile (z)	0.288	99% Percentile (z)	0.073
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.4	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0699		
nu star	14.38		
A-D Test Statistic	2.252	Nonparametric Statistics	
5% A-D Critical Value	0.814	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.311	Mean	0.0158
5% K-S Critical Value	0.217	SD	0.057
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00955
		95% KM UTL with 95% Coverage	0.137
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.268
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.113
Mean	0.0286	90% Percentile (z)	0.0889
Median	0.0201	95% Percentile (z)	0.11
SD	0.057	99% Percentile (z)	0.149
k star	0.761		
Theta star	0.0376	Gamma ROS Limits with Extrapolated Data	
Nu star	57.8	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.089
95% Percentile of Chisquare (2k)	5.025	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0903

						95% WH Approx. Gamma UTL with				95% Coverage	0.12
				90% Percentile	0.0703	95% HW Approx. Gamma UTL with				95% Coverage	0.125
				95% Percentile	0.0944						
				99% Percentile	0.151						

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Mercury.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13

10% critical value: 0.467

5% critical value: 0.521

1% critical value: 0.615

1. Data Value 0.012 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.109

For 10% significance level, 0.012 is not an outlier.

For 5% significance level, 0.012 is not an outlier.

For 1% significance level, 0.012 is not an outlier.

2. Data Value 0.0026 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.085

For 10% significance level, 0.0026 is not an outlier.

For 5% significance level, 0.0026 is not an outlier.

For 1% significance level, 0.0026 is not an outlier.

Rosner's Outlier Test for >20

Mean	0.0193
Standard Deviation	0.0572
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0193	0.0564	0.36	29	6.041	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.36 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.36 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Mercury.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Data	38	13
Number of Non-Detect Data	20	6
Number of Detect Data	18	7
Minimum Non-Detect	0.02	0.02
Maximum Non-Detect	0.025	0.024
Percent Non detects	52.63%	46.15%
Minimum Detected	0.001	0.0026
Maximum Detected	0.36	0.012
Mean of Detected Data	0.0279	0.00494
Median of Detected Data	0.0048	0.0041
SD of Detected Data	0.0834	0.00324

Site vs Background Gehan Test

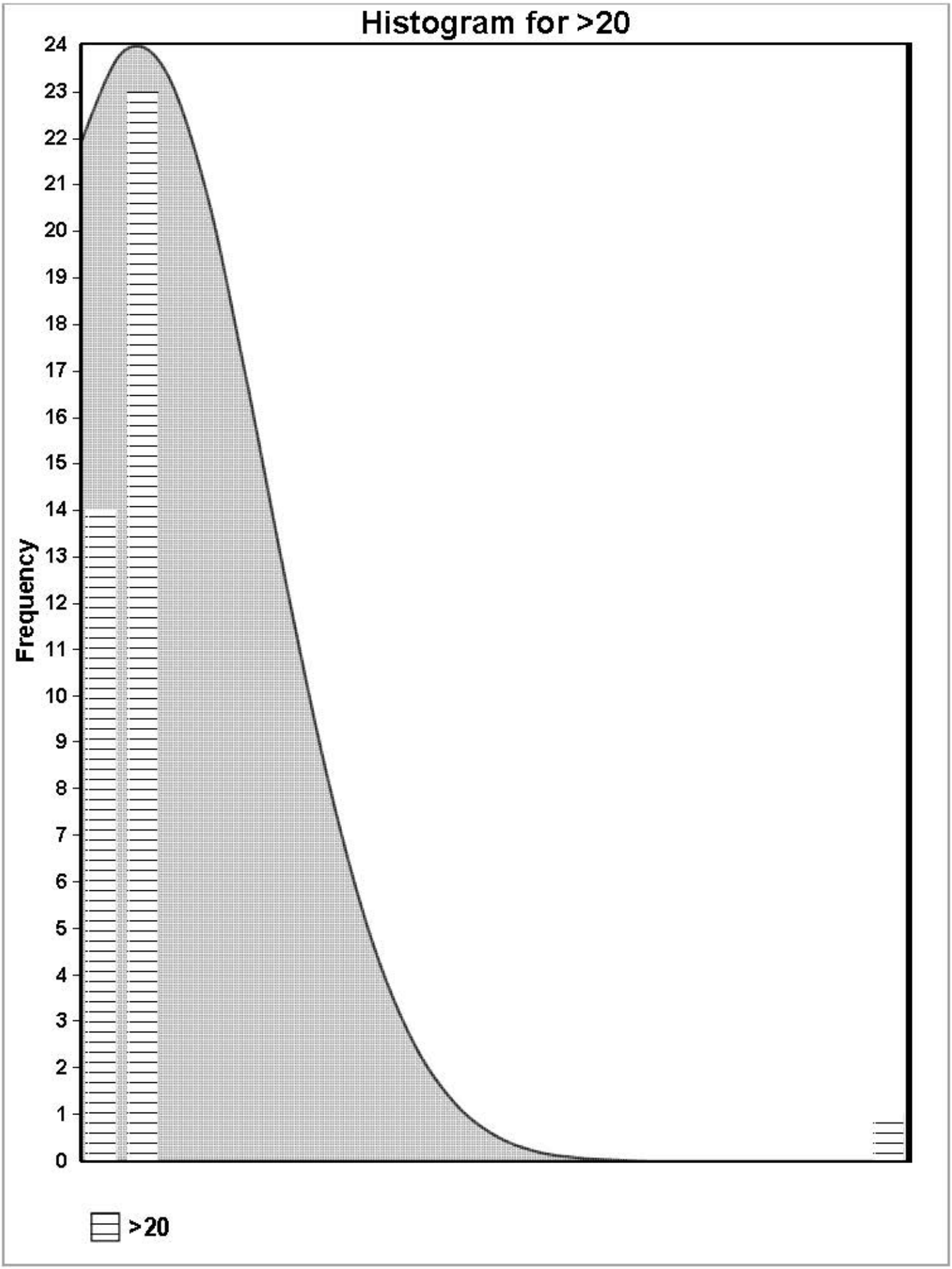
H0: Mu of Site or AOC = Mu of background

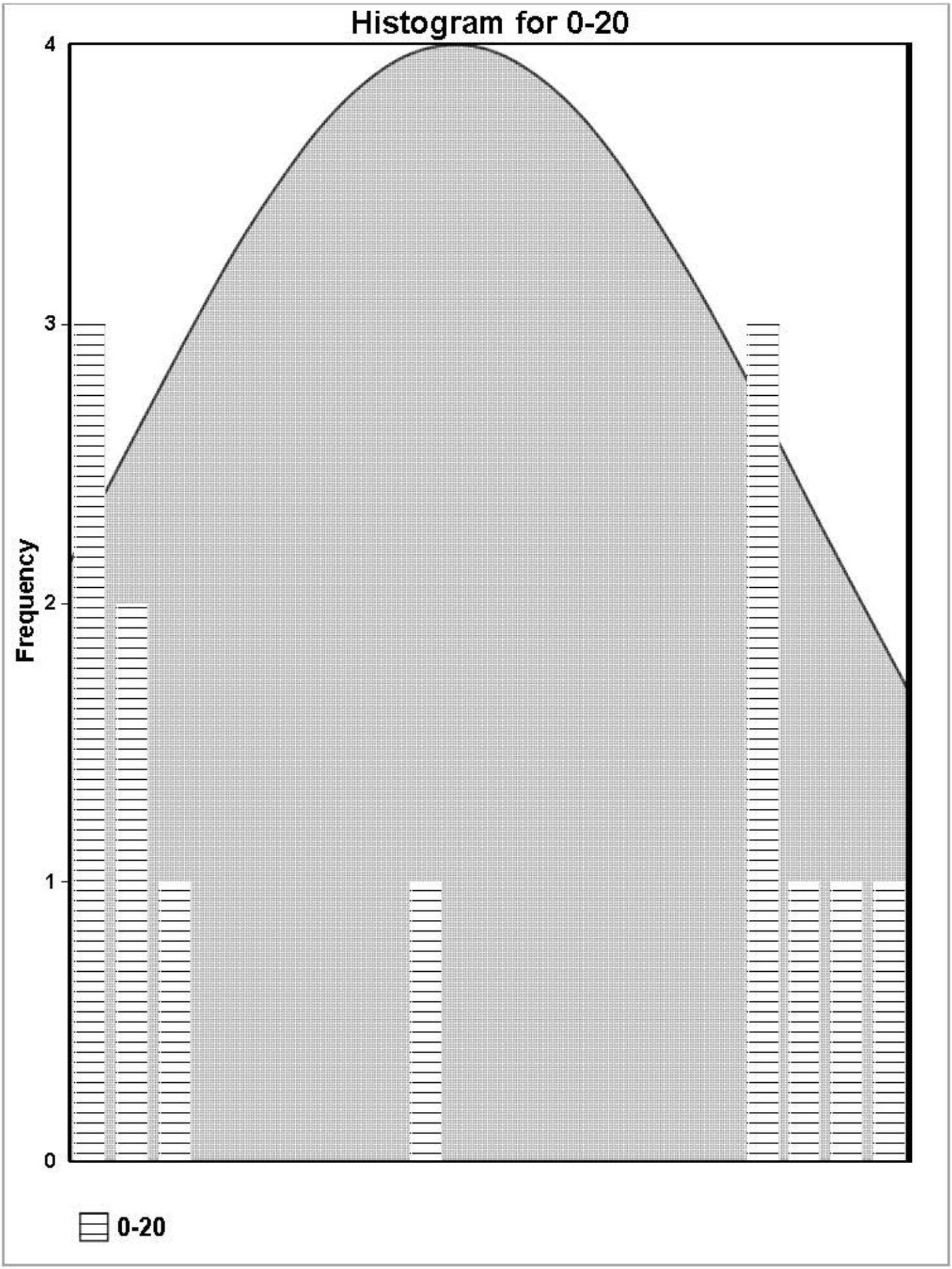
Gehan z Test Value	0.62
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.535

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
>20


Histogram for 0-20
Frequency
0
1
2
3
4
0-20

Location	0-20	D_0-20
BG-1-2	0.012	1
BG-3-17	0.0034	1
BG-4-2	0.0210	0
BG-4-19	0.0240	0
BG-1-10	0.0050	1
BG-2-2	0.0028	1
BG-2-10	0.0200	0
BG-2-19	0.0047	1
BG-3-2	0.0026	1
BG-3-10	0.0041	1
BG-4-10	0.0220	0
BG-6-2	0.0200	0
BG-6-9	0.0200	0

Location	>20	D_>20
BG-1-29	0.0093	1
BG-1-40	0.0093	1
BG-1-46	0.0018	1
BG-1-92	0.0200	0
BG-2-21	0.0021	1
BG-2-32	0.0017	1
BG-2-75	0.0200	0
BG-3-29	0.0039	1
BG-3-63	0.0250	0
BG-3-65	0.0025	1
BG-3-95	0.0017	1
BG-3-105	0.0032	1
BG-3-131	0.0010	1
BG-3-136	0.0048	1
BG-4-65	0.0200	0
BG-4-82	0.0240	0
BG-4-95	0.0240	0
BG-4-117	0.0240	0
BG-4-120	0.0240	0
BG-6-58	0.0240	0
BG-6-75	0.0240	0
BG-6-98	0.0260	1
BG-6-114	0.0240	0
BG-6-127	0.0240	0
BG-1-43	0.0091	1
BG-1-55	0.0200	0
BG-1-78	0.0360	1
BG-2-30	0.0200	1
BG-2-81	0.3600	1
BG-3-22	0.0048	1
BG-3-69	0.0055	1
BG-4-40	0.0230	0
BG-4-79	0.0200	0
BG-4-161	0.0240	0
BG-4-163	0.0230	0
BG-6-28	0.0230	0
BG-6-53	0.0240	0
BG-6-87	0.0250	0

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Mercury.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Number of Valid Data	18	Number of Detected Data	8
Number of Distinct Detected Data	8	Number of Non-Detect Data	10
		Percent Non-Detects	55.56%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0034	Minimum Detected	-5.684
Maximum Detected	0.36	Maximum Detected	-1.022
Mean of Detected	0.0564	Mean of Detected	-4.201
SD of Detected	0.123	SD of Detected	1.5
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.025	Maximum Non-Detect	-3.689

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	16
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	2
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	88.89%

Warning: There are only 8 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.491	Shapiro Wilk Test Statistic	0.869
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0314	Mean (Log Scale)	-4.357
SD	0.0823	SD (Log Scale)	0.975
95% UTL 95% Coverage	0.233	95% UTL 95% Coverage	0.14
95% UPL (t)	0.178	95% UPL (t)	0.0732
90% Percentile (z)	0.137	90% Percentile (z)	0.0447
95% Percentile (z)	0.167	95% Percentile (z)	0.0638
99% Percentile (z)	0.223	99% Percentile (z)	0.124

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.03
		SD in Original Scale	0.0828
		Mean in Log Scale	-4.577
		SD in Log Scale	1.108
		95% UTL 95% Coverage	0.156
		95% UPL (t)	0.0745
		90% Percentile (z)	0.0426
		95% Percentile (z)	0.0636
		99% Percentile (z)	0.135
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.385	Data follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.146		
nu star	6.156		
A-D Test Statistic	1.066	Nonparametric Statistics	
5% A-D Critical Value	0.765	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.294	Mean	0.0296
5% K-S Critical Value	0.31	SD	0.0805
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	0.0203
		95% KM UTL with 95% Coverage	0.227
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.39
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.174
Mean	0.0494	90% Percentile (z)	0.133
Median	0.0225	95% Percentile (z)	0.162
SD	0.0886	99% Percentile (z)	0.217
k star	0.173		
Theta star	0.286	Gamma ROS Limits with Extrapolated Data	
Nu star	6.219	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.22
95% Percentile of Chisquare (2k)	1.845	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.277
		95% WH Approx. Gamma UTL with 95% Coverage	0.387
90% Percentile	0.149	95% HW Approx. Gamma UTL with 95% Coverage	0.56
95% Percentile	0.264		
99% Percentile	0.59		

Note: DL/2 is not a recommended method.

Non-Clay

General Statistics			
Number of Valid Data	33	Number of Detected Data	17
Number of Distinct Detected Data	16	Number of Non-Detect Data	16
		Percent Non-Detects	48.48%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.001	Minimum Detected	-6.908
Maximum Detected	0.026	Maximum Detected	-3.65
Mean of Detected	0.00494	Mean of Detected	-5.651
SD of Detected	0.00582	SD of Detected	0.764
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.025	Maximum Non-Detect	-3.689

Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	32
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	96.97%
Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.575	Shapiro Wilk Test Statistic	0.945
5% Shapiro Wilk Critical Value	0.892	5% Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00798	Mean (Log Scale)	-5.09
SD	0.00525	SD (Log Scale)	0.801
95% UTL 95% Coverage	0.0194	95% UTL 95% Coverage	0.0351
95% UPL (t)	0.017	95% UPL (t)	0.0244
90% Percentile (z)	0.0147	90% Percentile (z)	0.0172
95% Percentile (z)	0.0166	95% Percentile (z)	0.023
99% Percentile (z)	0.0202	99% Percentile (z)	0.0396
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0043
		SD in Original Scale	0.00436
		Mean in Log Scale	-5.698
		SD in Log Scale	0.652
		95% UTL 95% Coverage	0.0138
		95% UPL (t)	0.0103
		90% Percentile (z)	0.00773
		95% Percentile (z)	0.00979
		99% Percentile (z)	0.0153
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.367	Data appear Lognormal at 5% Significance Level	
Theta Star	0.00362		
nu star	46.46		
A-D Test Statistic	0.869	Nonparametric Statistics	
5% A-D Critical Value	0.754	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.213	Mean	0.0043
5% K-S Critical Value	0.213	SD	0.00435
Data not Gamma Distributed at 5% Significance Level		SE of Mean	8.6454E-4
		95% KM UTL with 95% Coverage	0.0138
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0236
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0118
Mean	0.00495	90% Percentile (z)	0.00988
Median	0.00488	95% Percentile (z)	0.0115
SD	0.00411	99% Percentile (z)	0.0144
k star	2.747		
Theta star	0.0018	Gamma ROS Limits with Extrapolated Data	
Nu star	181.3	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0107
95% Percentile of Chisquare (2k)	11.83	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0107

						95% WH Approx. Gamma UTL with				95% Coverage	0.013
				90% Percentile	0.00895	95% HW Approx. Gamma UTL with				95% Coverage	0.0131
				95% Percentile	0.0106						
				99% Percentile	0.0144						

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Mercury.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 0.36 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.959

For 10% significance level, 0.36 is an outlier.

For 5% significance level, 0.36 is an outlier.

For 1% significance level, 0.36 is an outlier.

2. Data Value 0.0034 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.127

For 10% significance level, 0.0034 is not an outlier.

For 5% significance level, 0.0034 is not an outlier.

For 1% significance level, 0.0034 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	0.00798
Standard Deviation	0.00525
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00798	0.00517	0.026	31	3.485	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.026 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.026 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Mercury.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Data	33	18
Number of Non-Detect Data	16	10
Number of Detect Data	17	8
Minimum Non-Detect	0.02	0.02
Maximum Non-Detect	0.025	0.025
Percent Non detects	48.48%	55.56%
Minimum Detected	0.001	0.0034
Maximum Detected	0.026	0.36
Mean of Detected Data	0.00494	0.0564
Median of Detected Data	0.0032	0.0106
SD of Detected Data	0.00582	0.123

Site vs Background Gehan Test

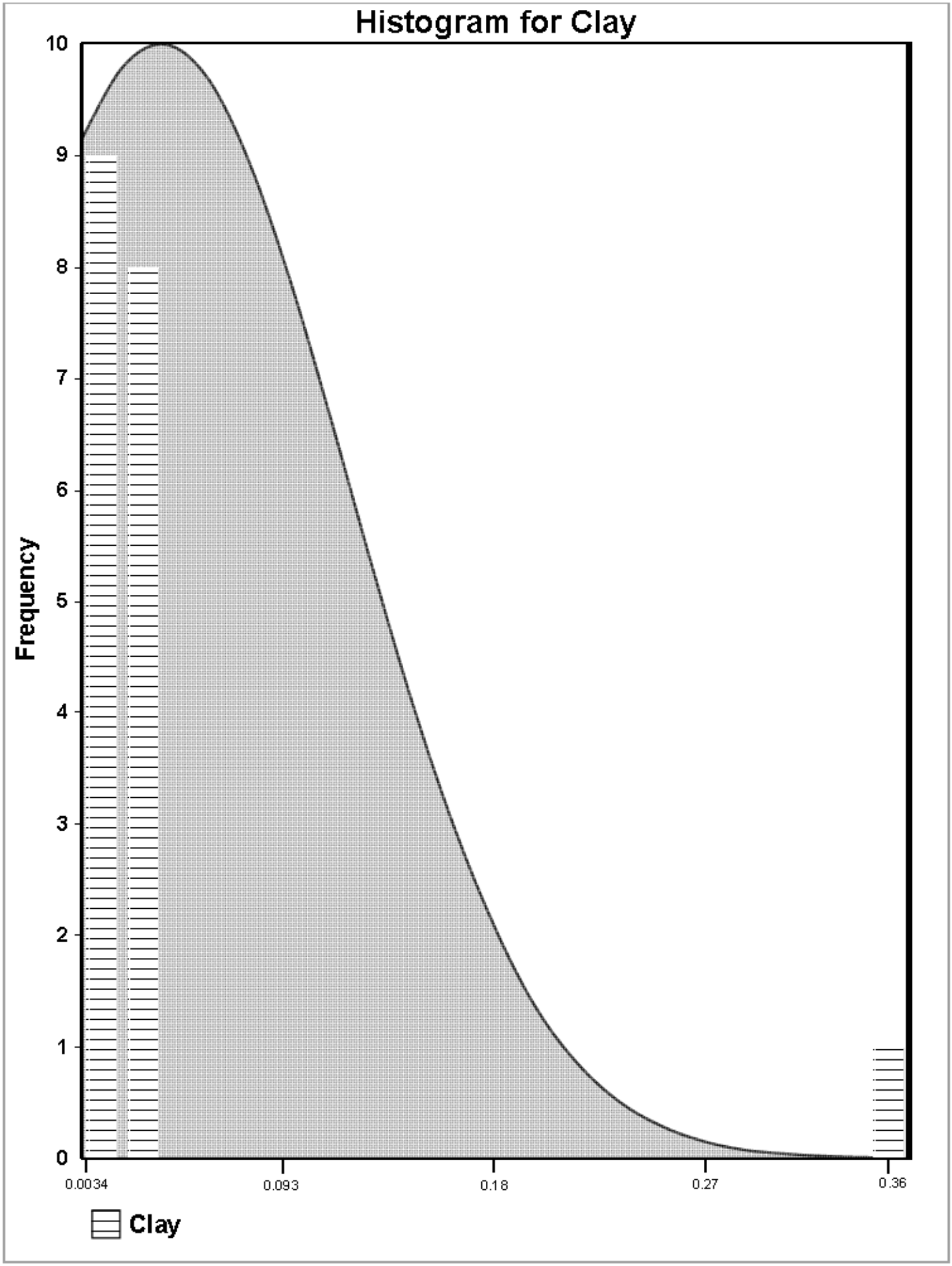
H0: Mu of Site or AOC = Mu of background

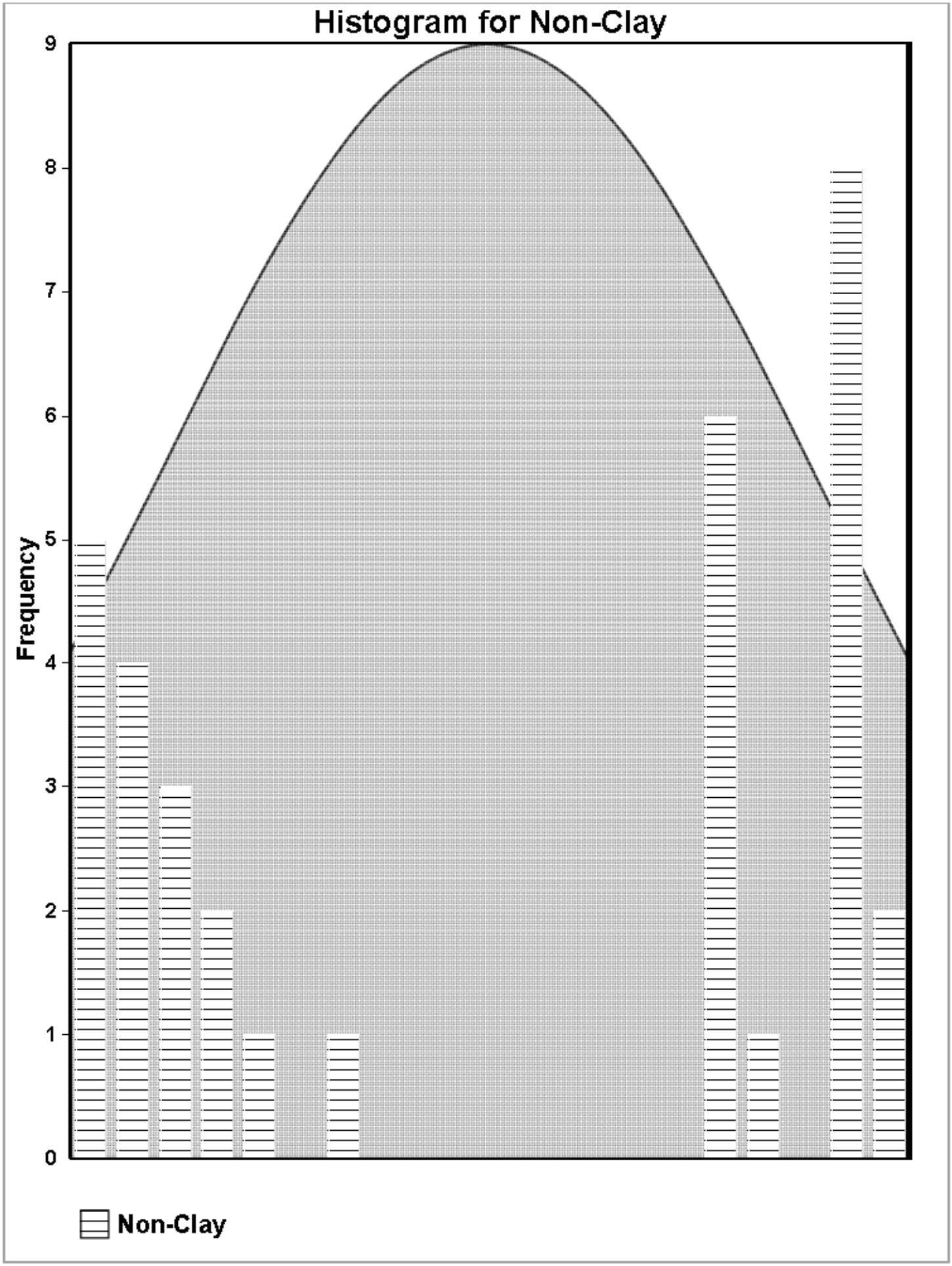
Gehan z Test Value	-2.456
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0141

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Clay
Frequency
10
9
8
7
6
5
4
3
2
1
0
0.0034
0.093
0.18
0.27
0.36
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
Non-Clay

Location	Clay	D_Clay
BG-1-2	0.012	1
BG-1-43	0.0091	1
BG-1-55	0.0200	0
BG-1-78	0.0360	1
BG-2-30	0.0200	1
BG-2-81	0.3600	1
BG-3-17	0.0034	1
BG-3-22	0.0048	1
BG-3-69	0.0055	1
BG-4-2	0.0210	0
BG-4-19	0.0240	0
BG-4-40	0.0230	0
BG-4-79	0.0200	0
BG-4-161	0.0240	0
BG-4-163	0.0230	0
BG-6-28	0.0230	0
BG-6-53	0.0240	0
BG-6-87	0.0250	0

Location	Non-Clay	D_Non-Clay
BG-1-10	0.0050	1
BG-1-29	0.0093	1
BG-1-40	0.0068	1
BG-1-46	0.0018	1
BG-1-92	0.0200	0
BG-2-2	0.0028	1
BG-2-10	0.0200	0
BG-2-19	0.0047	1
BG-2-21	0.0021	1
BG-2-32	0.0017	1
BG-2-75	0.0200	0
BG-3-2	0.0026	1
BG-3-10	0.0041	1
BG-3-29	0.0039	1
BG-3-63	0.0250	0
BG-3-65	0.0025	1
BG-3-95	0.0017	1
BG-3-105	0.0032	1
BG-3-131	0.0010	1
BG-3-136	0.0048	1
BG-4-10	0.0220	0
BG-4-65	0.0200	0
BG-4-82	0.0240	0
BG-4-95	0.0240	0
BG-4-117	0.0240	0
BG-4-120	0.0240	0
BG-6-2	0.0200	0
BG-6-9	0.0200	0
BG-6-58	0.0240	0
BG-6-75	0.0240	0
BG-6-98	0.0260	1
BG-6-114	0.0240	0
BG-6-127	0.0240	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Mercury.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	9	3	25.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	0.02	0.02	0.02	0.02	0
Statistics (Detects Only)	9	0.0021	0.012	0.00549	0.0047	0.00333
Statistics (All: NDs treated as DL value)	12	0.0021	0.02	0.00912	0.0059	0.00715
Statistics (All: NDs treated as DL/2 value)	12	0.0021	0.012	0.00662	0.0059	0.00349
Statistics (Normal ROS Estimated Data)	12	0.0021	0.012	0.00549	0.00485	0.00304
Statistics (Gamma ROS Estimated Data)	12	0.0021	0.012	0.00553	0.00485	0.00305
Statistics (Lognormal ROS Estimated Data)	12	0.0021	0.012	0.00538	0.0047	0.00302

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.377	2.589	0.00163	-5.36	0.589	-0.11
Statistics (NDs = DL)	1.812	1.415	0.00503	-4.998	0.825	-0.165
Statistics (NDs = DL/2)	3.418	2.619	0.00194	-5.172	0.607	-0.117
Statistics (Gamma ROS Estimates)	3.804	2.909	0.00145	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.36	0.542	-0.101

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.947	0.914	0.959	0.958

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.891	0.829	Data Appear Normal
Lilliefors (Detects Only)	0.225	0.295	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.811	0.859	Data Not Normal
Lilliefors (NDs = DL)	0.218	0.256	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.899	0.859	Data Appear Normal
Lilliefors (NDs = DL/2)	0.195	0.256	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.912	0.859	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.167	0.256	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.99	0.931	0.939	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.257	0.726	
Kolmogorov-Smirnov (Detects Only)	0.161	0.281	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.535	0.743	
Kolmogorov-Smirnov (NDs = DL)	0.183	0.249	Data Appear Gamma Distributed

Anderson-Darling (NDs = DL/2)	0.521	0.738	
Kolmogorov-Smirnov (NDs = DL/2)	0.217	0.247	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.221	0.736	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.156	0.247	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.988	0.969	0.961	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.963	0.829	Data Appear Lognormal
Lilliefors (Detects Only)	0.144	0.295	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.914	0.859	Data Appear Lognormal
Lilliefors (NDs = DL)	0.156	0.256	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.904	0.859	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.209	0.256	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.964	0.859	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.145	0.256	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	39	0	39	15	24	61.54%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	24	0.02	0.026	0.023	0.024	0.00184
Statistics (Detects Only)	15	0.001	0.36	0.0306	0.0039	0.0916
Statistics (All: NDs treated as DL value)	39	0.001	0.36	0.0259	0.022	0.0557
Statistics (All: NDs treated as DL/2 value)	39	0.001	0.36	0.0189	0.0115	0.0564
Statistics (Normal ROS Estimated Data)	39	-0.05	0.36	0.021	0.00666	0.0611
Statistics (Gamma ROS Estimated Data)	39	0.001	0.36	0.03	0.0257	0.0559
Statistics (Lognormal ROS Estimated Data)	39	6.6032E-4	0.36	0.0149	0.00386	0.0571

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.389	0.376	0.0788	-5.186	1.491	-0.288
Statistics (NDs = DL)	0.881	0.83	0.0294	-4.318	1.143	-0.265
Statistics (NDs = DL/2)	0.771	0.729	0.0245	-4.744	0.974	-0.205
Statistics (Gamma ROS Estimates)	0.865	0.815	0.0346	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.44	1.126	-0.207

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.565	0.501	0.443	0.702

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.35	0.881	Data Not Normal
Lilliefors (Detects Only)	0.413	0.229	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.292	0.939	Data Not Normal
Lilliefors (NDs = DL)	0.448	0.142	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.234	0.939	Data Not Normal

Lilliefors (NDs = DL/2)	0.464	0.142	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.539	0.939	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.246	0.142	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.869	0.686	0.67	0.962

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.376	0.817	
Kolmogorov-Smirnov (Detects Only)	0.341	0.237	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.78	0.783	
Kolmogorov-Smirnov (NDs = DL)	0.307	0.146	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.434	0.788	
Kolmogorov-Smirnov (NDs = DL/2)	0.389	0.147	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.276	0.784	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.264	0.146	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.909	0.893	0.886	0.935

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.841	0.881	Data Not Lognormal
Lilliefors (Detects Only)	0.238	0.229	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.814	0.939	Data Not Lognormal
Lilliefors (NDs = DL)	0.331	0.142	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.818	0.939	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.263	0.142	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.896	0.939	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.127	0.142	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Mercury.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Number of Valid Data	12	Number of Detected Data	9
Number of Distinct Detected Data	9	Number of Non-Detect Data	3
		Percent Non-Detects	25.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0021	Minimum Detected	-6.166
Maximum Detected	0.012	Maximum Detected	-4.423
Mean of Detected	0.00549	Mean of Detected	-5.36
SD of Detected	0.00333	SD of Detected	0.589
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.891	Shapiro Wilk Test Statistic	0.963
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00662	Mean (Log Scale)	-5.172
SD	0.00349	SD (Log Scale)	0.607
95% UTL 95% Coverage	0.0162	95% UTL 95% Coverage	0.0299
95% UPL (t)	0.0131	95% UPL (t)	0.0177
90% Percentile (z)	0.0111	90% Percentile (z)	0.0124
95% Percentile (z)	0.0124	95% Percentile (z)	0.0154
99% Percentile (z)	0.0147	99% Percentile (z)	0.0233
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00538
		SD in Original Scale	0.00302
		Mean in Log Scale	-5.36

		SD in Log Scale	0.542
		95% UTL 95% Coverage	0.0207
		95% UPL (t)	0.0129
		90% Percentile (z)	0.00941
		95% Percentile (z)	0.0115
		99% Percentile (z)	0.0166
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.326	Data appear Normal at 5% Significance Level	
Theta Star	0.00236		
nu star	41.86		
A-D Test Statistic	0.257	Nonparametric Statistics	
5% A-D Critical Value	0.726	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.161	Mean	0.00549
5% K-S Critical Value	0.281	SD	0.00314
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00111
		95% KM UTL with 95% Coverage	0.0141
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0197
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0114
Mean	0.00553	90% Percentile (z)	0.00951
Median	0.00485	95% Percentile (z)	0.0106
SD	0.00305	99% Percentile (z)	0.0128
k star	2.909		
Theta star	0.0019	Gamma ROS Limits with Extrapolated Data	
Nu star	69.81	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0123
95% Percentile of Chisquare (2k)	12.32	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0125
		95% WH Approx. Gamma UTL with 95% Coverage	0.0172
90% Percentile	0.00988	95% HW Approx. Gamma UTL with 95% Coverage	0.018
95% Percentile	0.0117		
99% Percentile	0.0157		

Note: DL/2 is not a recommended method.

MC

General Statistics			
Number of Valid Data	39	Number of Detected Data	15
Number of Distinct Detected Data	13	Number of Non-Detect Data	24
		Percent Non-Detects	61.54%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.001	Minimum Detected	-6.908
Maximum Detected	0.36	Maximum Detected	-1.022
Mean of Detected	0.0306	Mean of Detected	-5.186
SD of Detected	0.0916	SD of Detected	1.491
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.026	Maximum Non-Detect	-3.65
Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	37
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	2

Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	94.87%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.35	Shapiro Wilk Test Statistic	0.841
5% Shapiro Wilk Critical Value	0.881	5% Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0189	Mean (Log Scale)	-4.744
SD	0.0564	SD (Log Scale)	0.974
95% UTL 95% Coverage	0.139	95% UTL 95% Coverage	0.0689
95% UPL (t)	0.115	95% UPL (t)	0.0459
90% Percentile (z)	0.0911	90% Percentile (z)	0.0303
95% Percentile (z)	0.112	95% Percentile (z)	0.0432
99% Percentile (z)	0.15	99% Percentile (z)	0.0839
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0149
		SD in Original Scale	0.0571
		Mean in Log Scale	-5.44
		SD in Log Scale	1.126
		95% UTL 95% Coverage	0.0475
		95% UPL (t)	0.0297
		90% Percentile (z)	0.0184
		95% Percentile (z)	0.0277
		99% Percentile (z)	0.0596
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.356	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0861		
nu star	10.67		
A-D Test Statistic	2.376	**Nonparametric Statistics**	
5% A-D Critical Value	0.817	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.341	Mean	0.0144
5% K-S Critical Value	0.237	SD	0.0564
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00939
		95% KM UTL with 95% Coverage	0.134
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.264
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.111
Mean	0.03	90% Percentile (z)	0.0868
Median	0.0257	95% Percentile (z)	0.107
SD	0.0559	99% Percentile (z)	0.146
k star	0.815		
Theta star	0.0367	**Gamma ROS Limits with Extrapolated Data**	
Nu star	63.59	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.092
95% Percentile of Chisquare (2k)	5.254	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0943
		95% WH Approx. Gamma UTL with 95% Coverage	0.122
90% Percentile	0.0725	95% HW Approx. Gamma UTL with 95% Coverage	0.129
95% Percentile	0.0965		
99% Percentile	0.153		

Note: DL/2 is not a recommended method.											

Outlier Tests for Selected Variables

User Selected Options	
From File	Mercury.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 0.012 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.213

For 10% significance level, 0.012 is not an outlier.
For 5% significance level, 0.012 is not an outlier.
For 1% significance level, 0.012 is not an outlier.

2. Data Value 0.0021 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.089

For 10% significance level, 0.0021 is not an outlier.
For 5% significance level, 0.0021 is not an outlier.
For 1% significance level, 0.0021 is not an outlier.

Rosner's Outlier Test for MC

Mean	0.0189
Standard Deviation	0.0564
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0189	0.0557	0.36	9	6.129	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 0.36 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 0.36 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Mercury.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Data	39	12
Number of Non-Detect Data	24	3
Number of Detect Data	15	9
Minimum Non-Detect	0.02	0.02
Maximum Non-Detect	0.026	0.02
Percent Non detects	61.54%	25.00%
Minimum Detected	0.001	0.0021
Maximum Detected	0.36	0.012
Mean of Detected Data	0.0306	0.00549
Median of Detected Data	0.0039	0.0047
SD of Detected Data	0.0916	0.00333

Site vs Background Gehan Test

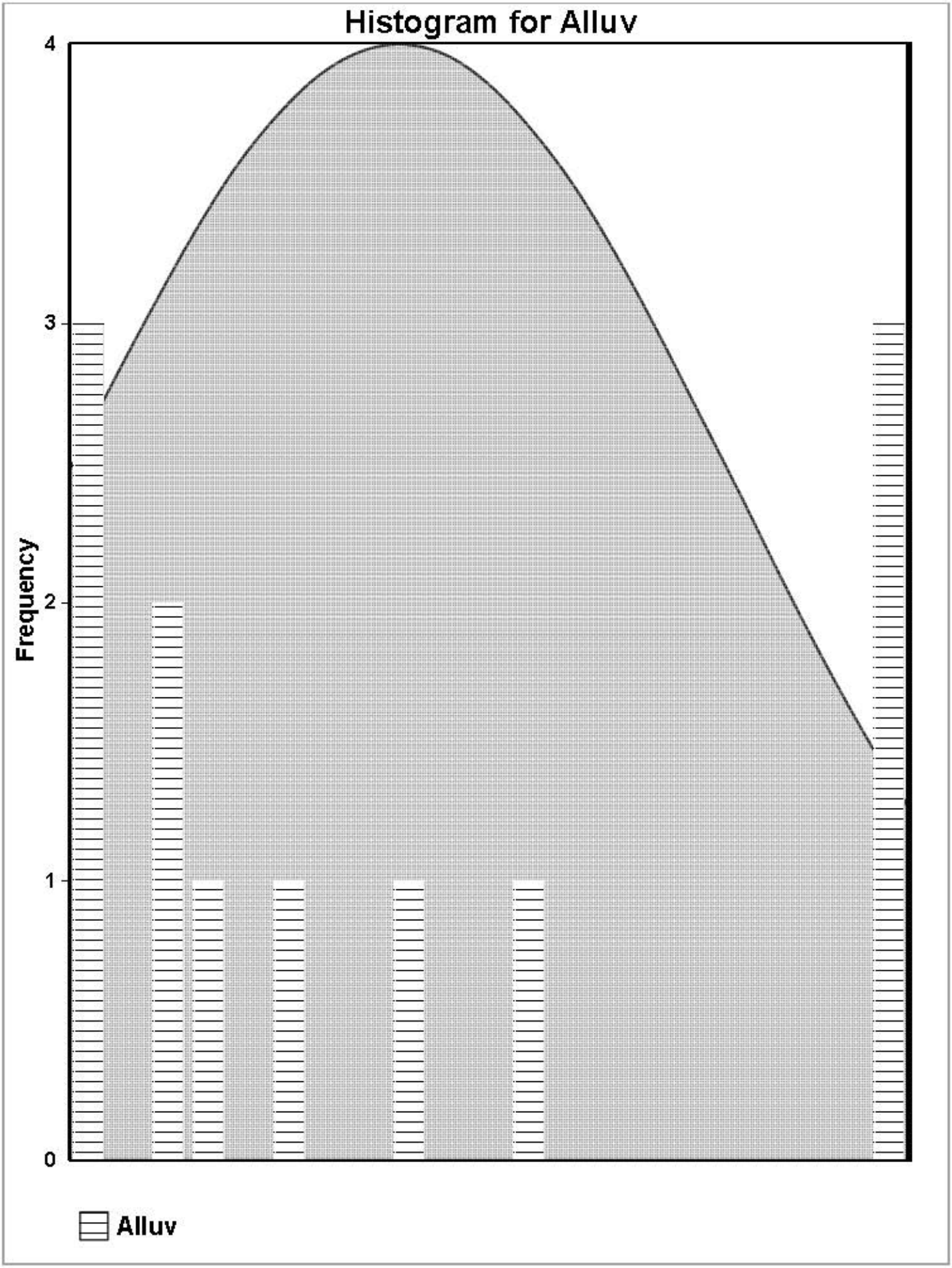
H0: Mu of Site or AOC = Mu of background

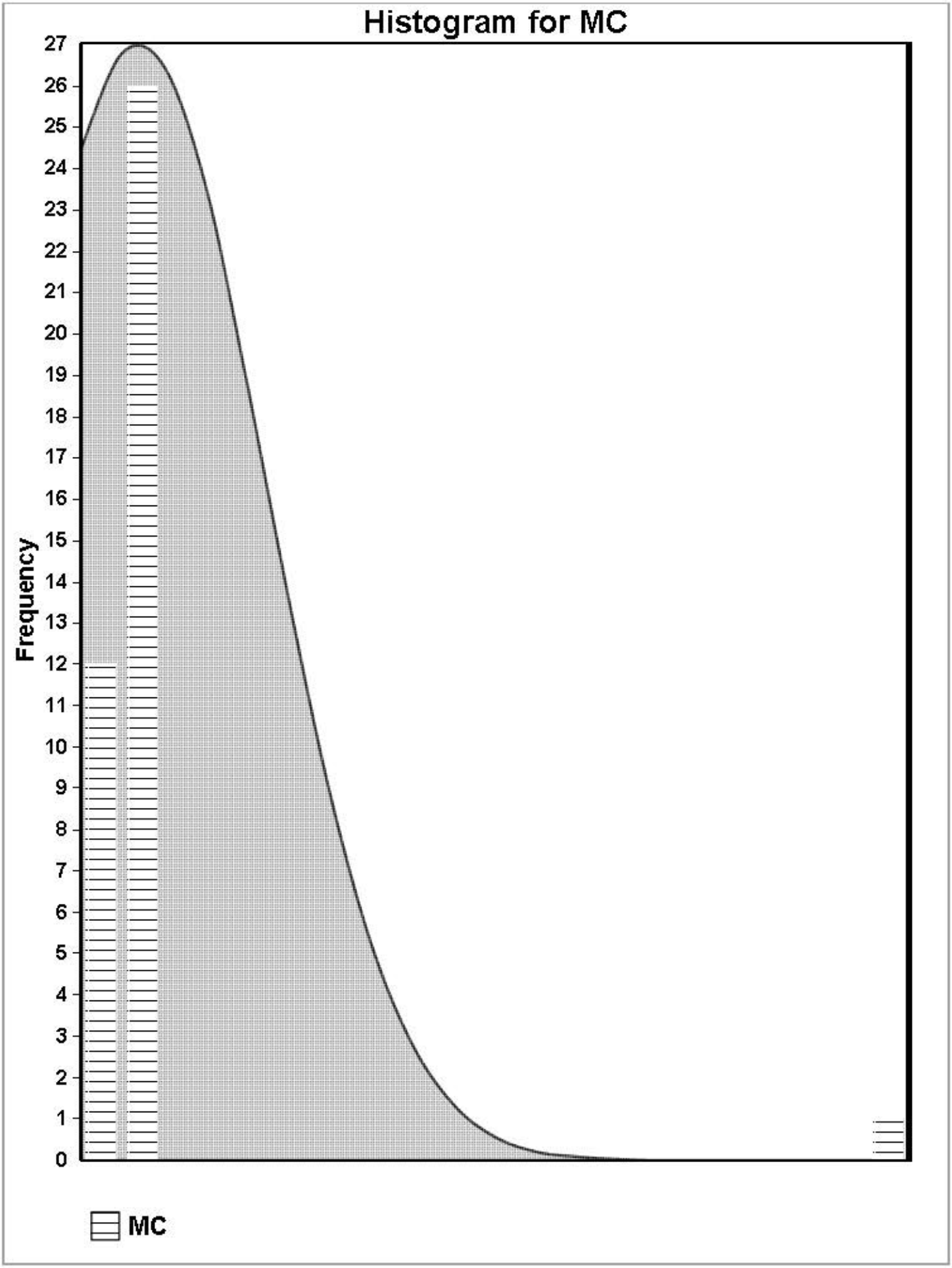
Gehan z Test Value	-0.148
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.882

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
Alluv


Histogram for MC
Frequency
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
MC

Location	Alluv	D_Alluv
BG-1-2	0.012	1
BG-1-10	0.005	1
BG-1-29	0.0093	1
BG-1-40	0.0068	1
BG-2-2	0.0028	1
BG-2-10	0.02	0
BG-2-19	0.0047	1
BG-2-21	0.0021	1
BG-3-2	0.0026	1
BG-3-10	0.0041	1
BG-6-2	0.02	0
BG-6-9	0.02	0

Location	MC	D_MC
BG-1-43	0.0091	1
BG-1-46	0.0018	1
BG-1-55	0.02	0
BG-1-78	0.036	1
BG-1-92	0.02	0
BG-2-30	0.02	1
BG-2-32	0.0017	1
BG-2-75	0.02	0
BG-2-81	0.36	1
BG-3-17	0.0034	1
BG-3-22	0.0048	1
BG-3-29	0.0039	1
BG-3-63	0.025	0
BG-3-65	0.0025	1
BG-3-69	0.0055	1
BG-3-95	0.0017	1
BG-3-105	0.0032	1
BG-3-131	0.001	1
BG-3-136	0.0048	1
BG-4-1	0.021	0
BG-4-10	0.022	0
BG-4-19	0.024	0
BG-4-40	0.023	0
BG-4-65	0.02	0
BG-4-79	0.02	0
BG-4-82	0.024	0
BG-4-95	0.024	0
BG-4-117	0.024	0
BG-4-120	0.024	0
BG-4-161	0.024	0
BG-4-163	0.023	0
BG-6-28	0.023	0
BG-6-53	0.024	0
BG-6-58	0.024	0
BG-6-75	0.024	0
BG-6-87	0.025	0
BG-6-98	0.026	0
BG-6-114	0.024	0
BG-1-127	0.024	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Molybdenum.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	47	4	7.84%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	4	0.25	1.3	0.513	0.25	0.525
Statistics (Detects Only)	47	0.14	12	1.407	0.41	2.516
Statistics (All: NDs treated as DL value)	51	0.14	12	1.336	0.4	2.429
Statistics (All: NDs treated as DL/2 value)	51	0.125	12	1.316	0.4	2.435
Statistics (Normal ROS Estimated Data)	51	-2.04	12	1.225	0.4	2.51
Statistics (Gamma ROS Estimated Data)	51	1.000E-12	12	1.31	0.4	2.438
Statistics (Lognormal ROS Estimated Data)	51	0.0906	12	1.312	0.4	2.436

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.763	0.731	1.844	-0.442	1.084	-2.453
Statistics (NDs = DL)	0.771	0.738	1.734	-0.484	1.069	-2.21
Statistics (NDs = DL/2)	0.738	0.708	1.784	-0.538	1.111	-2.064
Statistics (Gamma ROS Estimates)	0.299	0.294	4.386	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.546	1.111	-2.037

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.704	0.695	0.694	0.749

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.512	0.946	Data Not Normal
Lilliefors (Detects Only)	0.355	0.129	Data Not Normal
Lilliefors (NDs = DL)	0.348	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.365	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.347	0.124	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.926	0.921	0.922	0.969

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	5.089	0.791	
Kolmogorov-Smirnov (Detects Only)	0.309	0.134	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	5.427	0.792	
Kolmogorov-Smirnov (NDs = DL)	0.3	0.129	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.03	0.794	
Kolmogorov-Smirnov (NDs = DL/2)	0.299	0.129	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	6.715	0.863	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.352	0.135	Data Not Gamma Distributed	

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.921	0.921	0.938	0.936

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.842	0.946	Data Not Lognormal
Lilliefors (Detects Only)	0.231	0.129	Data Not Lognormal
Lilliefors (NDs = DL)	0.22	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.207	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.215	0.124	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Molybdenum.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics			
Number of Valid Data	51	Number of Detected Data	47
Number of Distinct Detected Data	34	Number of Non-Detect Data	4
		Percent Non-Detects	7.84%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.14	Minimum Detected	-1.966
Maximum Detected	12	Maximum Detected	2.485
Mean of Detected	1.407	Mean of Detected	-0.442
SD of Detected	2.516	SD of Detected	1.084
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	1.3	Maximum Non-Detect	0.262

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	39
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	12
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	76.47%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.512	Shapiro Wilk Test Statistic	0.842
5% Shapiro Wilk Critical Value	0.946	5% Shapiro Wilk Critical Value	0.946
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.316	Mean (Log Scale)	-0.538
SD	2.435	SD (Log Scale)	1.111
95% UTL 95% Coverage	6.316	95% UTL 95% Coverage	5.712
95% UPL (t)	5.436	95% UPL (t)	3.823
90% Percentile (z)	4.436	90% Percentile (z)	2.423
95% Percentile (z)	5.321	95% Percentile (z)	3.627
99% Percentile (z)	6.98	99% Percentile (z)	7.731
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-3.176	Mean in Original Scale	1.312
SD	5.967	SD in Original Scale	2.436
95% UTL with 95% Coverage	9.079	95% UTL with 95% Coverage	5.68
		95% BCA UTL with 95% Coverage	10.35
		95% Bootstrap (%) UTL with 95% Coverage	11
95% UPL (t)	6.922	95% UPL (t)	3.801

90% Percentile (z)	4.471	90% Percentile (z)	2.408
95% Percentile (z)	6.639	95% Percentile (z)	3.606
99% Percentile (z)	10.71	99% Percentile (z)	7.69
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.728	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.932		
nu star	68.44		
A-D Test Statistic	5.089	Nonparametric Statistics	
5% A-D Critical Value	0.791	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.309	Mean	1.316
5% K-S Critical Value	0.134	SD	2.41
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.341
		95% KM UTL with 95% Coverage	6.265
Assuming Gamma Distribution		95% KM Chebyshev UPL	11.92
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	5.394
Mean	1.31	90% Percentile (z)	4.405
Median	0.4	95% Percentile (z)	5.28
SD	2.438	99% Percentile (z)	6.923
k star	0.294		
Theta star	4.453	Gamma ROS Limits with Extrapolated Data	
Nu star	30.01	95% Wilson Hilferty (WH) Approx. Gamma UPL	4.468
95% Percentile of Chisquare (2k)	2.709	95% Hawkins Wixley (HW) Approx. Gamma UPL	4.907
		95% WH Approx. Gamma UTL with 95% Coverage	5.951
90% Percentile	3.873	95% HW Approx. Gamma UTL with 95% Coverage	6.869
95% Percentile	6.031		
99% Percentile	11.65		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Molybdenum.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for All Data

Mean	1.316
Standard Deviation	2.435
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.316	2.411	12	27	4.432	3.137	3.488

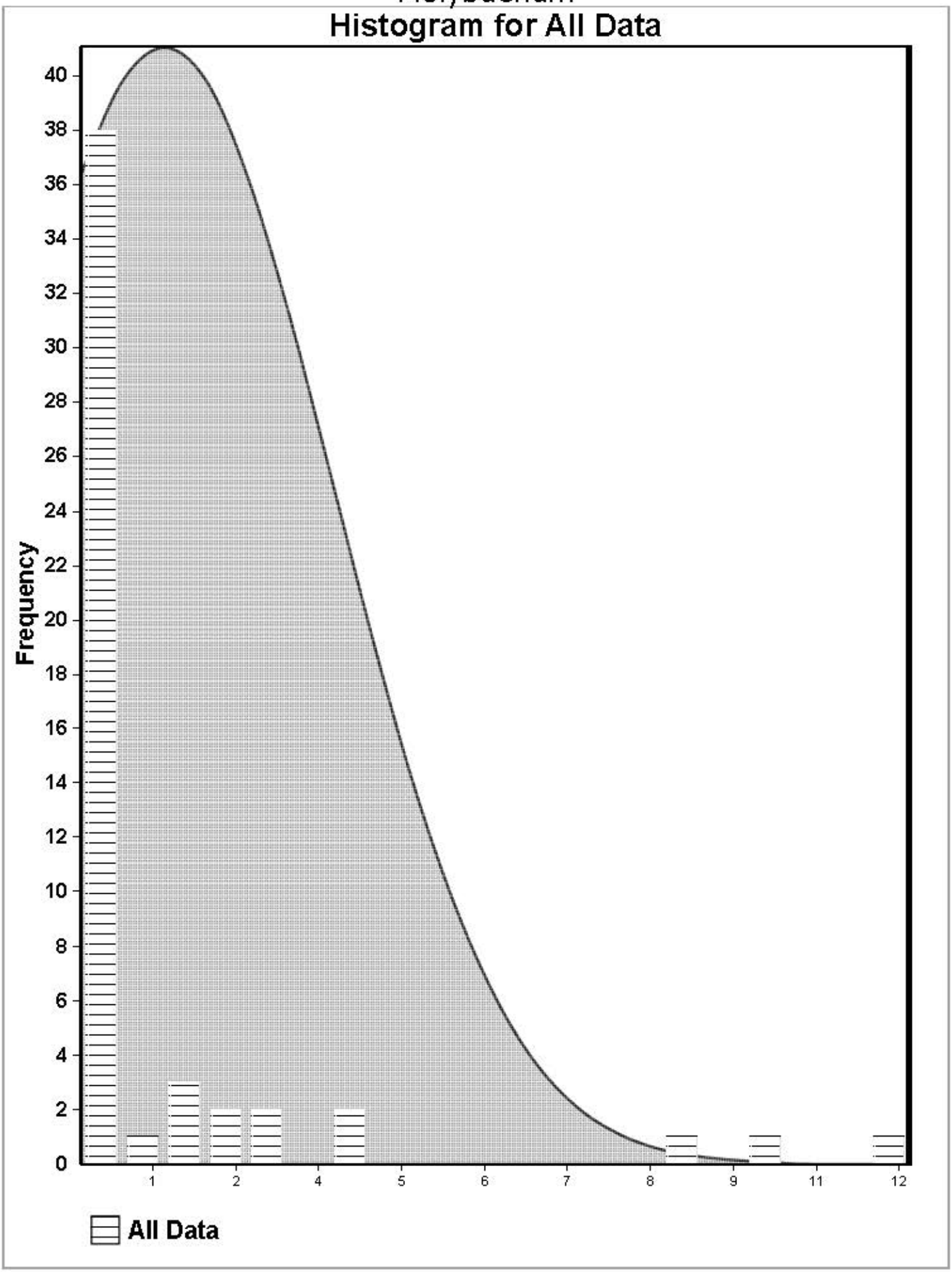
For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 12 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 12 is a Potential Statistical Outlier

Molybdenum


Histogram for All Data
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
1
2
4
5
6
7
8
9
11
12
All Data

Location	All Data	D_All Data
BG-1-2	0.39	1
BG-1-43	1.3	0
BG-1-55	0.18	1
BG-1-78	0.25	0
BG-2-30	10	1
BG-2-81	3.8	1
BG-3-17	1.7	1
BG-3-22	2.6	1
BG-3-69	2	1
BG-4-2	0.44	1
BG-4-19	0.24	1
BG-4-40	0.34	1
BG-4-79	0.27	1
BG-4-161	0.34	1
BG-4-163	0.34	1
BG-6-28	0.46	1
BG-6-53	0.23	1
BG-6-87	0.14	1
BG-1-10	0.41	1
BG-1-29	0.25	0
BG-1-40	0.61	1
BG-1-46	0.25	0
BG-1-92	0.24	1
BG-2-2	0.62	1
BG-2-10	0.63	1
BG-2-19	8.7	1
BG-2-21	12	1
BG-2-32	1.5	1
BG-2-75	3.7	1
BG-3-2	1.6	1
BG-3-10	2.6	1
BG-3-29	0.39	1
BG-3-63	0.62	1
BG-3-65	0.57	1
BG-3-95	0.48	1
BG-3-105	0.47	1
BG-3-131	2.3	1
BG-3-136	0.4	1
BG-4-10	0.38	1
BG-4-65	0.32	1
BG-4-82	0.43	1
BG-4-95	0.34	1
BG-4-117	0.38	1
BG-4-120	0.27	1
BG-6-2	0.7	1
BG-6-9	0.22	1
BG-6-58	0.4	1
BG-6-75	0.35	1
BG-6-98	0.35	1
BG-6-114	0.34	1
BG-6-127	0.32	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Molybdenum.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	13	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	13	0.22	8.7	1.433	0.62	2.296

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	0.903	0.746	1.588	-0.288	1.049	-3.647

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.723	0.723	0.723	0.723

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.55	0.866	Data Not Normal
Lilliefors (Full: no NDs)	0.318	0.246	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.92	0.92	0.92	0.92

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	1.081	0.762	
Kolmogorov-Smirnov (Full: no NDs)	0.287	0.244	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.946	0.946	0.946	0.946

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.898	0.866	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.219	0.246	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

>20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	38	0	38	34	4	10.53%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	4	0.25	1.3	0.513	0.25	0.525

Statistics (Detects Only)	34	0.14	12	1.396	0.395	2.629
Statistics (All: NDs treated as DL value)	38	0.14	12	1.303	0.385	2.502
Statistics (All: NDs treated as DL/2 value)	38	0.125	12	1.276	0.385	2.509
Statistics (Normal ROS Estimated Data)	38	-2.244	12	1.139	0.385	2.619
Statistics (Gamma ROS Estimated Data)	38	1.000E-12	12	1.27	0.385	2.513
Statistics (Lognormal ROS Estimated Data)	38	0.0794	12	1.269	0.383	2.511

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.721	0.681	1.937	-0.501	1.107	-2.21
Statistics (NDs = DL)	0.736	0.695	1.772	-0.551	1.082	-1.964
Statistics (NDs = DL/2)	0.697	0.659	1.832	-0.624	1.131	-1.814
Statistics (Gamma ROS Estimates)	0.247	0.245	5.133	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.645	1.145	-1.775

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.687	0.676	0.674	0.747

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.492	0.933	Data Not Normal
Lilliefors (Detects Only)	0.381	0.152	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.478	0.938	Data Not Normal
Lilliefors (NDs = DL)	0.371	0.144	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.476	0.938	Data Not Normal
Lilliefors (NDs = DL/2)	0.388	0.144	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.587	0.938	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.368	0.144	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.919	0.911	0.912	0.969

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	4.297	0.79	
Kolmogorov-Smirnov (Detects Only)	0.341	0.157	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.672	0.79	
Kolmogorov-Smirnov (NDs = DL)	0.326	0.149	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	4.286	0.794	
Kolmogorov-Smirnov (NDs = DL/2)	0.324	0.149	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	5.822	0.88	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.375	0.157	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.903	0.905	0.925	0.927

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.814	0.933	Data Not Lognormal
Lilliefors (Detects Only)	0.26	0.152	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.817	0.938	Data Not Lognormal

Lilliefors (NDs = DL)	0.251	0.144	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.852	0.938	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.223	0.144	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.861	0.938	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.242	0.144	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Molybdenum.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	13

Raw Statistics		Log-Transformed Statistics	
Minimum	0.22	Minimum	-1.514
Maximum	8.7	Maximum	2.163
Second Largest	2.6	Second Largest	0.956
First Quartile	0.39	First Quartile	-0.942
Median	0.62	Median	-0.478
Third Quartile	1.6	Third Quartile	0.47
Mean	1.433	Mean	-0.288
SD	2.296	SD	1.049
Coefficient of Variation	1.602		
Skewness	3.062		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.55	Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	7.565	95% UTL with 95% Coverage	12.36
95% UPL (t)	5.679	95% UPL (t)	5.222
90% Percentile (z)	4.375	90% Percentile (z)	2.877
95% Percentile (z)	5.209	95% Percentile (z)	4.212
99% Percentile (z)	6.773	99% Percentile (z)	8.611

Gamma Distribution Test		Data Distribution Test	
k star	0.746	Data appear Lognormal at 5% Significance Level	
Theta Star	1.922		
MLE of Mean	1.433		
MLE of Standard Deviation	1.66		
nu star	19.38		
A-D Test Statistic	1.081	Nonparametric Statistics	
5% A-D Critical Value	0.762	90% Percentile	2.42
K-S Test Statistic	0.287	95% Percentile	5.04
5% K-S Critical Value	0.244	99% Percentile	7.968
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	8.7
90% Percentile	3.544	95% Percentile Bootstrap UTL with 95% Coverage	8.7
95% Percentile	4.768	95% BCA Bootstrap UTL with 95% Coverage	8.7
99% Percentile	7.676	95% UPL	8.7
		95% Chebyshev UPL	11.82
95% WH Approx. Gamma UPL	5.004	Upper Threshold Limit Based upon IQR	3.415
95% HW Approx. Gamma UPL	4.993		
95% WH Approx. Gamma UTL with 95% Coverage	8.495		
95% HW Approx. Gamma UTL with 95% Coverage	8.976		

>20

General Statistics			
Number of Valid Data	38	Number of Detected Data	34
Number of Distinct Detected Data	26	Number of Non-Detect Data	4
		Percent Non-Detects	10.53%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.14	Minimum Detected	-1.966
Maximum Detected	12	Maximum Detected	2.485
Mean of Detected	1.396	Mean of Detected	-0.501
SD of Detected	2.629	SD of Detected	1.107
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	1.3	Maximum Non-Detect	0.262

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	30
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	8
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	78.95%

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.492	Shapiro Wilk Test Statistic	0.814
5% Shapiro Wilk Critical Value	0.933	5% Shapiro Wilk Critical Value	0.933
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.276	Mean (Log Scale)	-0.624
SD	2.509	SD (Log Scale)	1.131
95% UTL 95% Coverage	6.625	95% UTL 95% Coverage	5.979
95% UPL (t)	5.564	95% UPL (t)	3.705
90% Percentile (z)	4.492	90% Percentile (z)	2.284
95% Percentile (z)	5.403	95% Percentile (z)	3.445
99% Percentile (z)	7.113	99% Percentile (z)	7.449
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-4.207	Mean in Original Scale	1.269
SD	6.679	SD in Original Scale	2.511
95% UTL with 95% Coverage	10.03	95% UTL with 95% Coverage	6.023
		95% BCA UTL with 95% Coverage	12

		95% Bootstrap (%) UTL with 95% Coverage	12
95% UPL (t)	7.208	95% UPL (t)	3.712
90% Percentile (z)	4.352	90% Percentile (z)	2.275
95% Percentile (z)	6.779	95% Percentile (z)	3.448
99% Percentile (z)	11.33	99% Percentile (z)	7.523
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.677	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.063		
nu star	46.02		
A-D Test Statistic	4.297	Nonparametric Statistics	
5% A-D Critical Value	0.79	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.341	Mean	1.274
5% K-S Critical Value	0.157	SD	2.475
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.408
		95% KM UTL with 95% Coverage	6.552
Assuming Gamma Distribution		95% KM Chebyshev UPL	12.21
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	5.505
Mean	1.27	90% Percentile (z)	4.447
Median	0.385	95% Percentile (z)	5.346
SD	2.513	99% Percentile (z)	7.033
k star	0.245		
Theta star	5.175	Gamma ROS Limits with Extrapolated Data	
Nu star	18.66	95% Wilson Hilferty (WH) Approx. Gamma UPL	4.53
95% Percentile of Chisquare (2k)	2.389	95% Hawkins Wixley (HW) Approx. Gamma UPL	5.084
		95% WH Approx. Gamma UTL with 95% Coverage	6.39
90% Percentile	3.818	95% HW Approx. Gamma UTL with 95% Coverage	7.654
95% Percentile	6.182		
99% Percentile	12.49		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Molybdenum.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 8.7 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.827

For 10% significance level, 8.7 is an outlier.
For 5% significance level, 8.7 is an outlier.
For 1% significance level, 8.7 is an outlier.

2. Data Value 0.22 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.067

For 10% significance level, 0.22 is not an outlier.
For 5% significance level, 0.22 is not an outlier.
For 1% significance level, 0.22 is not an outlier.

Rosner's Outlier Test for >20

Mean	1.276
Standard Deviation	2.509
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.276	2.475	12	5	4.332	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 12 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 12 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Molybdenum.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: 0-20

Background Data: >20

Raw Statistics

	Site	Background
Number of Valid Data	13	38
Number of Non-Detect Data	0	4
Number of Detect Data	13	34
Minimum Non-Detect	N/A	0.25
Maximum Non-Detect	N/A	1.3
Percent Non detects	0.00%	10.53%
Minimum Detected	0.22	0.14
Maximum Detected	8.7	12
Mean of Detected Data	1.433	1.396
Median of Detected Data	0.62	0.395
SD of Detected Data	2.296	2.629

Site vs Background Gehan Test

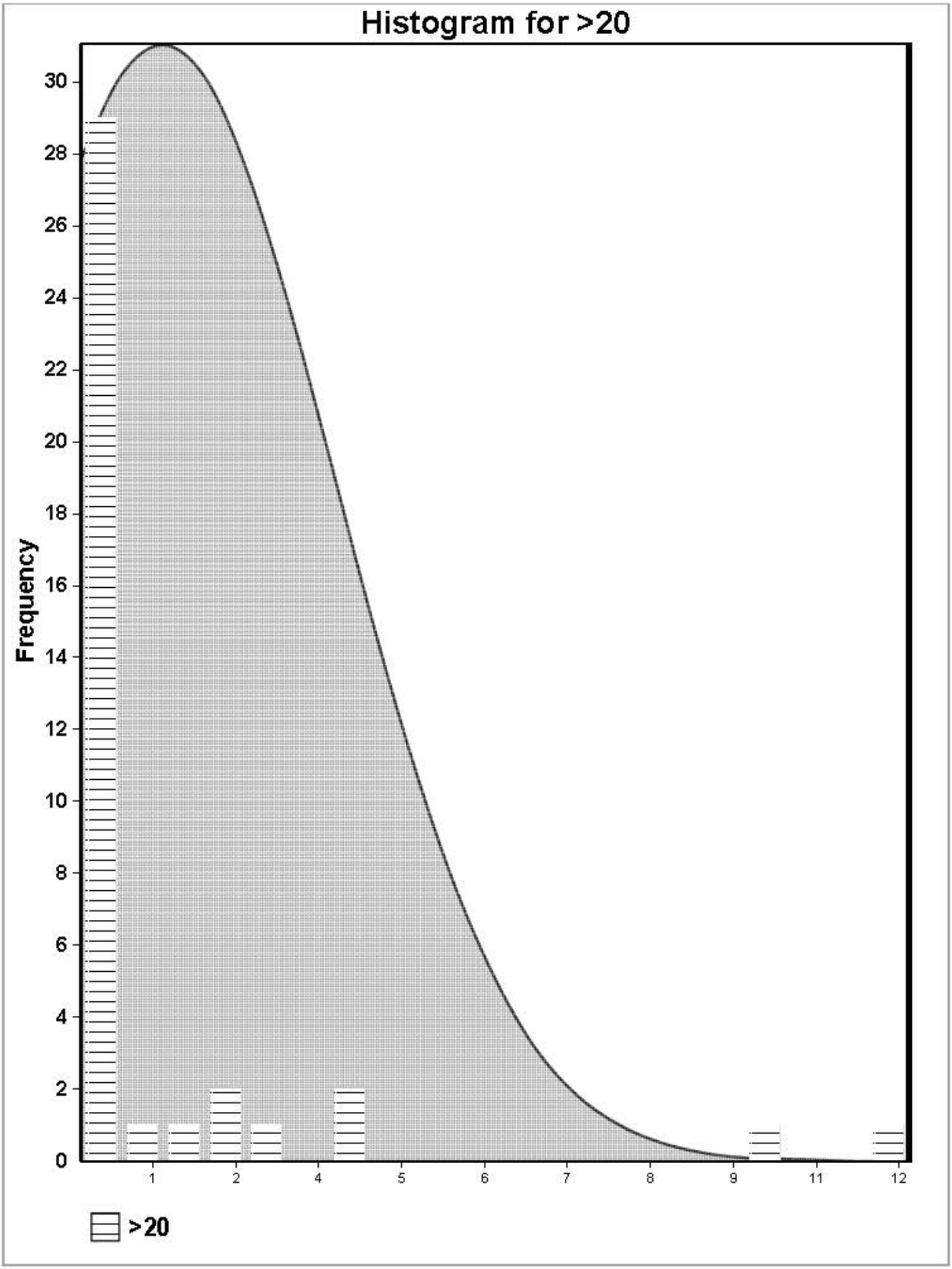
H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	1.421
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.155

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
30
28
26
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20
18
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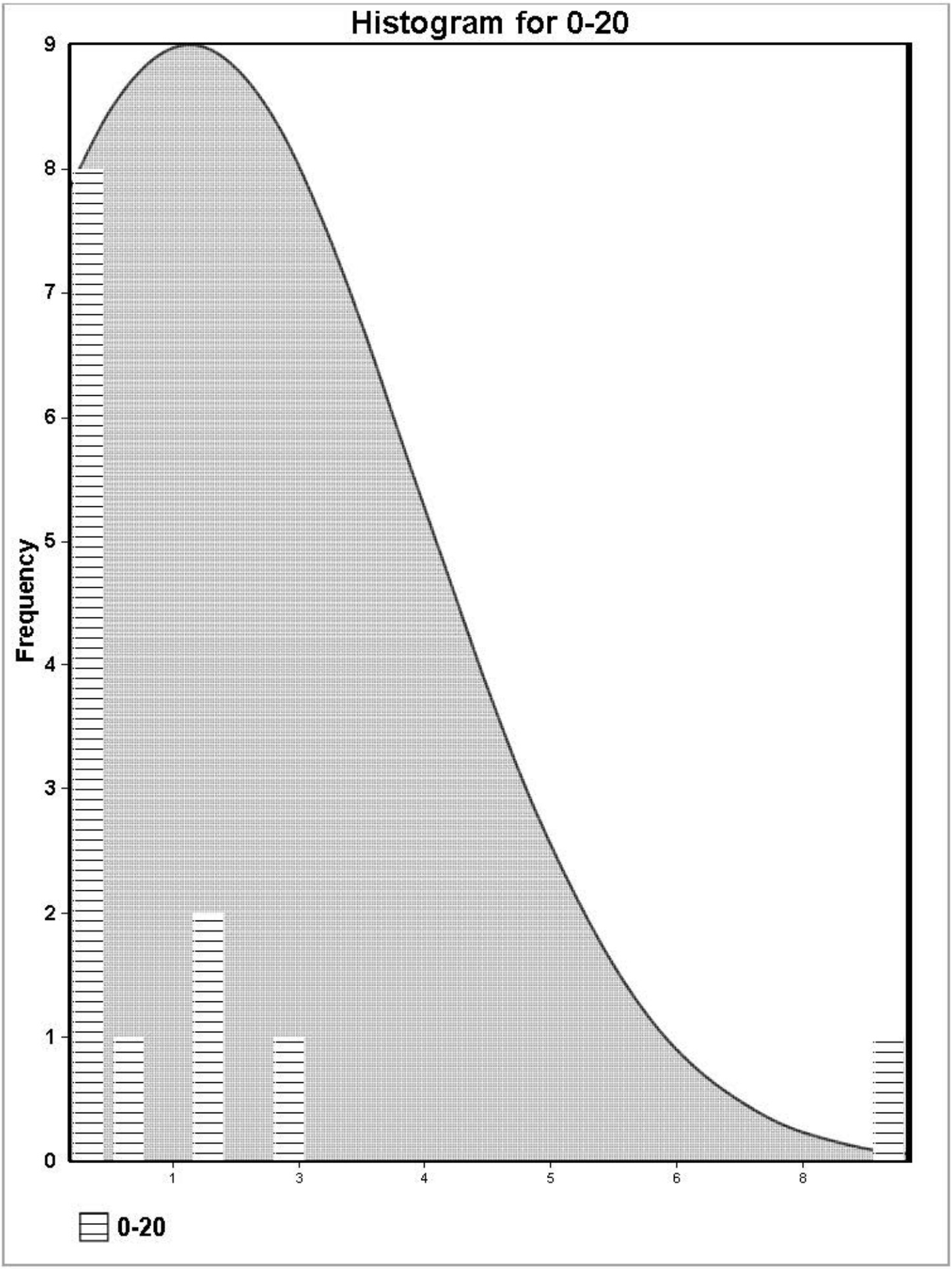
11
12
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5
6
7
8
9
1
3
4
5
6
8
0-20

Location	0-20	D_0-20
BG-1-2	0.39	1
BG-3-17	1.7	1
BG-4-2	0.44	1
BG-4-19	0.24	1
BG-1-10	0.41	1
BG-2-2	0.62	1
BG-2-10	0.63	1
BG-2-19	8.7	1
BG-3-2	1.6	1
BG-3-10	2.6	1
BG-4-10	0.38	1
BG-6-2	0.7	1
BG-6-9	0.22	1

Location	>20	D_>20
BG-1-29	0.25	0
BG-1-40	0.61	1
BG-1-46	0.25	0
BG-1-92	0.24	1
BG-2-21	12	1
BG-2-32	1.5	1
BG-2-75	3.7	1
BG-3-29	0.39	1
BG-3-63	0.62	1
BG-3-65	0.57	1
BG-3-95	0.48	1
BG-3-105	0.47	1
BG-3-131	2.3	1
BG-3-136	0.4	1
BG-4-65	0.32	1
BG-4-82	0.43	1
BG-4-95	0.34	1
BG-4-117	0.38	1
BG-4-120	0.27	1
BG-6-58	0.4	1
BG-6-75	0.35	1
BG-6-98	0.35	1
BG-6-114	0.34	1
BG-6-127	0.32	1
BG-1-43	1.3	0
BG-1-55	0.18	1
BG-1-78	0.25	0
BG-2-30	10	1
BG-2-81	3.8	1
BG-3-22	2.6	1
BG-3-69	2	1
BG-4-40	0.34	1
BG-4-79	0.27	1
BG-4-161	0.34	1
BG-4-163	0.34	1
BG-6-28	0.46	1
BG-6-53	0.23	1
BG-6-87	0.14	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Molybdenum.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	16	2	11.11%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	2	0.25	1.3	0.775	0.775	0.742
Statistics (Detects Only)	16	0.14	10	1.467	0.365	2.514
Statistics (All: NDs treated as DL value)	18	0.14	10	1.39	0.365	2.379
Statistics (All: NDs treated as DL/2 value)	18	0.125	10	1.347	0.365	2.389
Statistics (Normal ROS Estimated Data)	18	-0.765	10	1.293	0.365	2.426
Statistics (Gamma ROS Estimated Data)	18	1.000E-12	10	1.335	0.365	2.394
Statistics (Lognormal ROS Estimated Data)	18	0.14	10	1.331	0.342	2.395

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.693	0.614	2.117	-0.49	1.246	-2.541
Statistics (NDs = DL)	0.726	0.642	1.913	-0.498	1.204	-2.417
Statistics (NDs = DL/2)	0.693	0.615	1.943	-0.575	1.229	-2.136
Statistics (Gamma ROS Estimates)	0.301	0.288	4.44	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.602	1.224	-2.032

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.738	0.731	0.723	0.752

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.568	0.887	Data Not Normal
Lilliefors (Detects Only)	0.343	0.222	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.558	0.897	Data Not Normal
Lilliefors (NDs = DL)	0.319	0.209	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.547	0.897	Data Not Normal
Lilliefors (NDs = DL/2)	0.337	0.209	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.594	0.897	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.339	0.209	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.951	0.944	0.943	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.49	0.78	
Kolmogorov-Smirnov (Detects Only)	0.337	0.224	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	1.527	0.78	
Kolmogorov-Smirnov (NDs = DL)	0.315	0.212	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	1.534	0.783	
Kolmogorov-Smirnov (NDs = DL/2)	0.297	0.212	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.967	0.842	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.336	0.221	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.934	0.94	0.947	0.927

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.869	0.887	Data Not Lognormal
Lilliefors (Detects Only)	0.278	0.222	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.881	0.897	Data Not Lognormal
Lilliefors (NDs = DL)	0.258	0.209	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.894	0.897	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.232	0.209	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.857	0.897	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.279	0.209	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	31	2	6.06%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	2	0.25	0.25	0.25	0.25	0
Statistics (Detects Only)	31	0.22	12	1.375	0.43	2.558
Statistics (All: NDs treated as DL value)	33	0.22	12	1.307	0.41	2.492
Statistics (All: NDs treated as DL/2 value)	33	0.125	12	1.3	0.41	2.496
Statistics (Normal ROS Estimated Data)	33	-2.273	12	1.175	0.41	2.605
Statistics (Gamma ROS Estimated Data)	33	1.000E-12	12	1.292	0.41	2.5
Statistics (Lognormal ROS Estimated Data)	33	0.0963	12	1.299	0.41	2.496

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.806	0.753	1.707	-0.417	1.012	-2.427
Statistics (NDs = DL)	0.798	0.746	1.638	-0.476	1.008	-2.118
Statistics (NDs = DL/2)	0.765	0.716	1.698	-0.518	1.06	-2.046
Statistics (Gamma ROS Estimates)	0.297	0.29	4.346	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.523	1.068	-2.044

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.673	0.664	0.669	0.737

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.475	0.929	Data Not Normal
Lilliefors (Detects Only)	0.378	0.159	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.464	0.931	Data Not Normal
Lilliefors (NDs = DL)	0.384	0.154	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.47	0.931	Data Not Normal

Lilliefors (NDs = DL/2)	0.383	0.154	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.575	0.931	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.36	0.154	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.905	0.899	0.904	0.964

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	4.025	0.785	
Kolmogorov-Smirnov (Detects Only)	0.336	0.164	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.316	0.785	
Kolmogorov-Smirnov (NDs = DL)	0.333	0.159	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.803	0.787	
Kolmogorov-Smirnov (NDs = DL/2)	0.324	0.159	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	5.003	0.857	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.393	0.166	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.892	0.891	0.923	0.927

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.796	0.929	Data Not Lognormal
Lilliefors (Detects Only)	0.26	0.159	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.794	0.931	Data Not Lognormal
Lilliefors (NDs = DL)	0.252	0.154	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.855	0.931	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.237	0.154	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.866	0.931	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.235	0.154	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Molybdenum.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Number of Valid Data	18	Number of Detected Data	16
Number of Distinct Detected Data	14	Number of Non-Detect Data	2
		Percent Non-Detects	11.11%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.14	Minimum Detected	-1.966
Maximum Detected	10	Maximum Detected	2.303
Mean of Detected	1.467	Mean of Detected	-0.49
SD of Detected	2.514	SD of Detected	1.246
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	1.3	Maximum Non-Detect	0.262

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	13
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	5
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	72.22%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.568	Shapiro Wilk Test Statistic	0.869
5% Shapiro Wilk Critical Value	0.887	5% Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.347	Mean (Log Scale)	-0.575
SD	2.389	SD (Log Scale)	1.229
95% UTL 95% Coverage	7.207	95% UTL 95% Coverage	11.47
95% UPL (t)	5.616	95% UPL (t)	5.061
90% Percentile (z)	4.408	90% Percentile (z)	2.718
95% Percentile (z)	5.276	95% Percentile (z)	4.248
99% Percentile (z)	6.904	99% Percentile (z)	9.816
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-1.846	Mean in Original Scale	1.331
SD	5.041	SD in Original Scale	2.395
95% UTL with 95% Coverage	10.52	95% UTL with 95% Coverage	11.02
		95% BCA UTL with 95% Coverage	10
		95% Bootstrap (%) UTL with 95% Coverage	10
95% UPL (t)	7.164	95% UPL (t)	4.879

90% Percentile (z)	4.615	90% Percentile (z)	2.628
95% Percentile (z)	6.446	95% Percentile (z)	4.099
99% Percentile (z)	9.882	99% Percentile (z)	9.438

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.605	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.426		
nu star	19.35		
A-D Test Statistic	1.49	Nonparametric Statistics	
5% A-D Critical Value	0.78	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.337	Mean	1.331
5% K-S Critical Value	0.224	SD	2.327
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.566
		95% KM UTL with 95% Coverage	7.039
Assuming Gamma Distribution		95% KM Chebyshev UPL	11.75
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	5.49
Mean	1.335	90% Percentile (z)	4.313
Median	0.365	95% Percentile (z)	5.159
SD	2.394	99% Percentile (z)	6.745
k star	0.288		
Theta star	4.642	Gamma ROS Limits with Extrapolated Data	
Nu star	10.36	95% Wilson Hilferty (WH) Approx. Gamma UPL	5.179
95% Percentile of Chisquare (2k)	2.667	95% Hawkins Wixley (HW) Approx. Gamma UPL	5.785
		95% WH Approx. Gamma UTL with 95% Coverage	8.613
90% Percentile	3.958	95% HW Approx. Gamma UTL with 95% Coverage	10.56
95% Percentile	6.191		
99% Percentile	12.03		

Note: DL/2 is not a recommended method.

Non-Clay

General Statistics

Number of Valid Data	33	Number of Detected Data	31
Number of Distinct Detected Data	25	Number of Non-Detect Data	2
		Percent Non-Detects	6.06%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.22	Minimum Detected	-1.514
Maximum Detected	12	Maximum Detected	2.485
Mean of Detected	1.375	Mean of Detected	-0.417
SD of Detected	2.558	SD of Detected	1.012
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.25	Maximum Non-Detect	-1.386

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.475	Shapiro Wilk Test Statistic	0.796
5% Shapiro Wilk Critical Value	0.929	5% Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.3	Mean (Log Scale)	-0.518
SD	2.496	SD (Log Scale)	1.06
95% UTL 95% Coverage	6.73	95% UTL 95% Coverage	5.979
95% UPL (t)	5.591	95% UPL (t)	3.685
90% Percentile (z)	4.498	90% Percentile (z)	2.317
95% Percentile (z)	5.405	95% Percentile (z)	3.405
99% Percentile (z)	7.105	99% Percentile (z)	7.011
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.084	Mean in Original Scale	1.299
SD	2.669	SD in Original Scale	2.496
95% UTL with 95% Coverage	6.891	95% UTL with 95% Coverage	6.061
		95% BCA UTL with 95% Coverage	12
		95% Bootstrap (%) UTL with 95% Coverage	12
95% UPL (t)	5.672	95% UPL (t)	3.721
90% Percentile (z)	4.504	90% Percentile (z)	2.331
95% Percentile (z)	5.473	95% Percentile (z)	3.436
99% Percentile (z)	7.292	99% Percentile (z)	7.117
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.749	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.836		
nu star	46.45		
A-D Test Statistic	4.025	Nonparametric Statistics	
5% A-D Critical Value	0.785	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.336	Mean	1.306
5% K-S Critical Value	0.164	SD	2.455
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.434
		95% KM UTL with 95% Coverage	6.647
Assuming Gamma Distribution		95% KM Chebyshev UPL	12.17
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	5.526
Mean	1.292	90% Percentile (z)	4.452
Median	0.41	95% Percentile (z)	5.344
SD	2.5	99% Percentile (z)	7.016
k star	0.29		
Theta star	4.448	Gamma ROS Limits with Extrapolated Data	
Nu star	19.17	95% Wilson Hilferty (WH) Approx. Gamma UPL	4.483
95% Percentile of Chisquare (2k)	2.685	95% Hawkins Wixley (HW) Approx. Gamma UPL	4.948
		95% WH Approx. Gamma UTL with 95% Coverage	6.385
90% Percentile	3.825	95% HW Approx. Gamma UTL with 95% Coverage	7.497
95% Percentile	5.972		
99% Percentile	11.57		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Molybdenum.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 10 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.754

For 10% significance level, 10 is an outlier.

For 5% significance level, 10 is an outlier.

For 1% significance level, 10 is an outlier.

2. Data Value 0.125 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.022

For 10% significance level, 0.125 is not an outlier.

For 5% significance level, 0.125 is not an outlier.

For 1% significance level, 0.125 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	1.3
Standard Deviation	2.496
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.3	2.458	12	9	4.354	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 12 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 12 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Molybdenum.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Clay

Background Data: Non-Clay

Raw Statistics

	Site	Background
Number of Valid Data	18	33
Number of Non-Detect Data	2	2
Number of Detect Data	16	31
Minimum Non-Detect	0.25	0.25
Maximum Non-Detect	1.3	0.25
Percent Non detects	11.11%	6.06%
Minimum Detected	0.14	0.22
Maximum Detected	10	12
Mean of Detected Data	1.467	1.375
Median of Detected Data	0.365	0.43
SD of Detected Data	2.514	2.558

Site vs Background Gehan Test

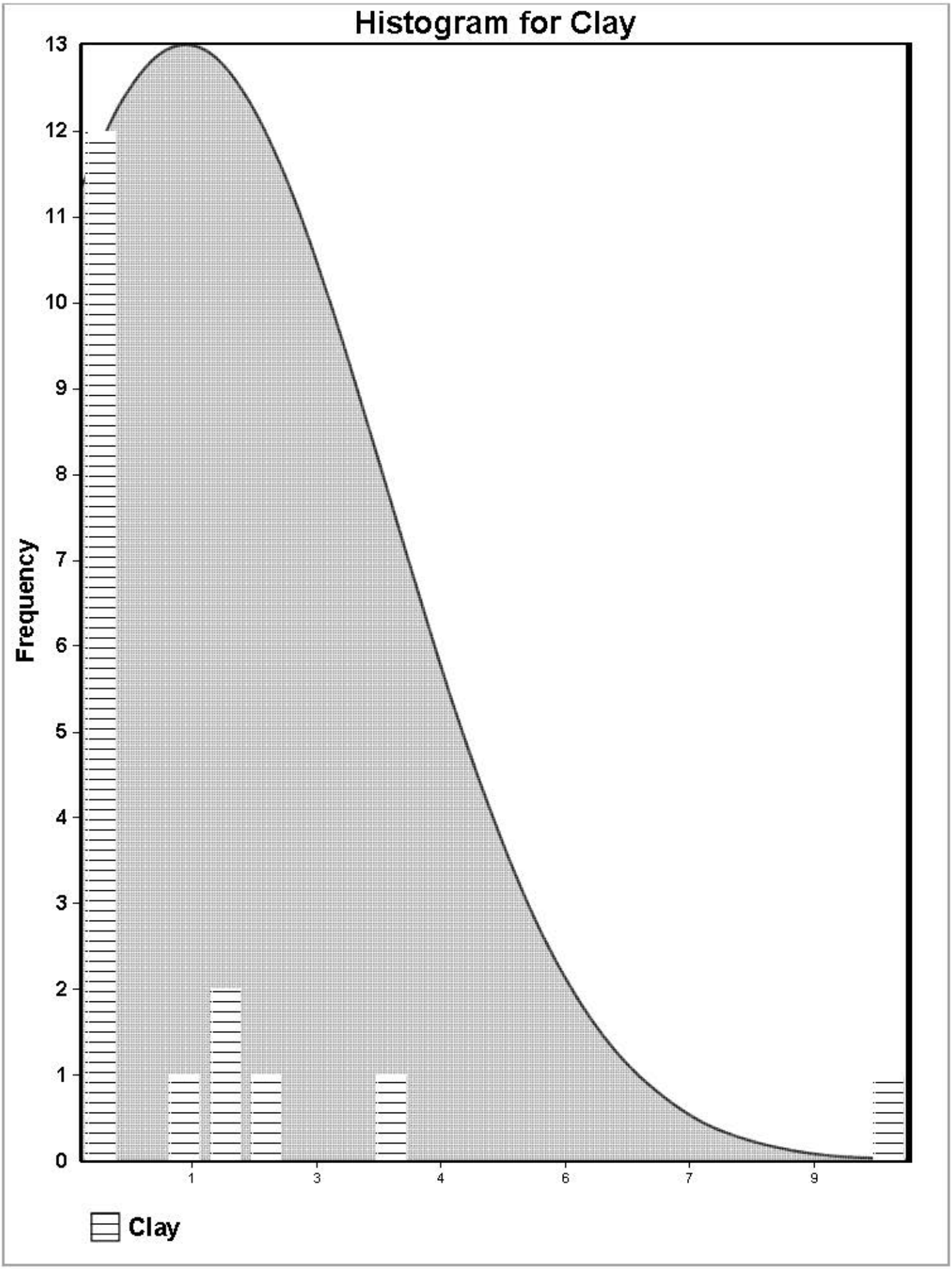
H0: Mu of Site or AOC = Mu of background

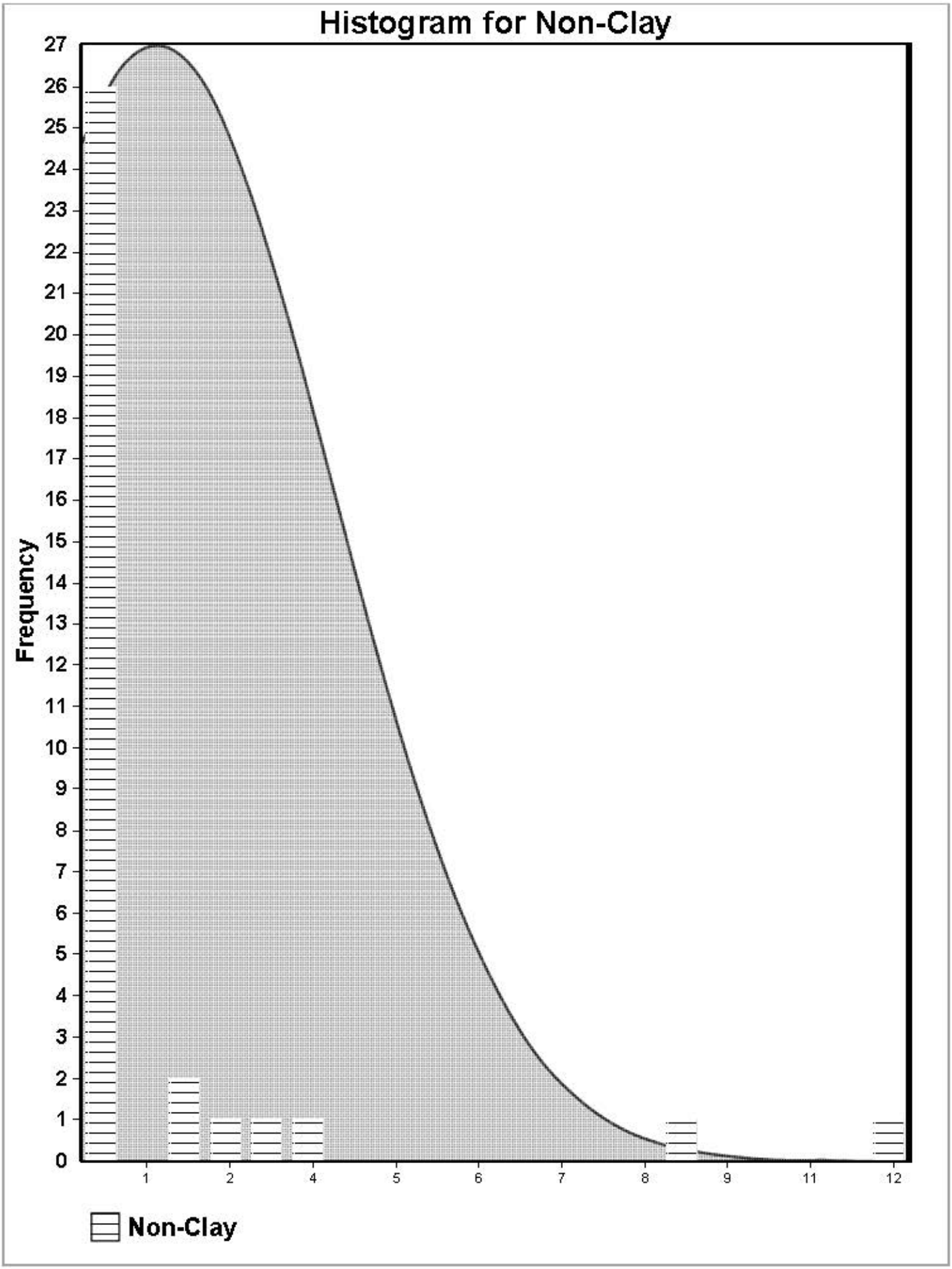
Gehan z Test Value	-1.085
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.278

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
1
3
4
6
7
9
Clay


Histogram for Non-Clay
Frequency
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1
2
4
5
6
7
8
9
11
12
Non-Clay

Location	Clay	D_Clay
BG-1-2	0.39	1
BG-1-43	1.3	0
BG-1-55	0.18	1
BG-1-78	0.25	0
BG-2-30	10	1
BG-2-81	3.8	1
BG-3-17	1.7	1
BG-3-22	2.6	1
BG-3-69	2	1
BG-4-2	0.44	1
BG-4-19	0.24	1
BG-4-40	0.34	1
BG-4-79	0.27	1
BG-4-161	0.34	1
BG-4-163	0.34	1
BG-6-28	0.46	1
BG-6-53	0.23	1
BG-6-87	0.14	1

Location	Non-Clay	D_Non-Clay
BG-1-10	0.41	1
BG-1-29	0.25	0
BG-1-40	0.61	1
BG-1-46	0.25	0
BG-1-92	0.24	1
BG-2-2	0.62	1
BG-2-10	0.63	1
BG-2-19	8.7	1
BG-2-21	12	1
BG-2-32	1.5	1
BG-2-75	3.7	1
BG-3-2	1.6	1
BG-3-10	2.6	1
BG-3-29	0.39	1
BG-3-63	0.62	1
BG-3-65	0.57	1
BG-3-95	0.48	1
BG-3-105	0.47	1
BG-3-131	2.3	1
BG-3-136	0.4	1
BG-4-10	0.38	1
BG-4-65	0.32	1
BG-4-82	0.43	1
BG-4-95	0.34	1
BG-4-117	0.38	1
BG-4-120	0.27	1
BG-6-2	0.7	1
BG-6-9	0.22	1
BG-6-58	0.4	1
BG-6-75	0.35	1
BG-6-98	0.35	1
BG-6-114	0.34	1
BG-6-127	0.32	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Molybenum.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	11	1	8.33%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	11	0.22	12	2.589	0.63	3.966
Statistics (All: NDs treated as DL value)	12	0.22	12	2.394	0.625	3.841
Statistics (All: NDs treated as DL/2 value)	12	0.125	12	2.384	0.625	3.848
Statistics (Normal ROS Estimated Data)	12	-3.072	12	2.117	0.625	4.119
Statistics (Gamma ROS Estimated Data)	12	1.000E-12	12	2.373	0.625	3.855
Statistics (Lognormal ROS Estimated Data)	12	0.118	12	2.383	0.625	3.848

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.698	0.579	3.71	0.085	1.292	15.2
Statistics (NDs = DL)	0.668	0.557	3.584	-0.0376	1.303	-34.68
Statistics (NDs = DL/2)	0.636	0.532	3.751	-0.0953	1.381	-14.49
Statistics (Gamma ROS Estimates)	0.233	0.23	10.2	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.1	1.389	-13.85

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.792	0.777	0.78	0.85

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.635	0.85	Data Not Normal
Lilliefors (Detects Only)	0.326	0.267	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.613	0.859	Data Not Normal
Lilliefors (NDs = DL)	0.337	0.256	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.619	0.859	Data Not Normal
Lilliefors (NDs = DL/2)	0.336	0.256	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.744	0.859	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.301	0.256	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.961	0.958	0.96	0.97

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.082	0.766	
Kolmogorov-Smirnov (Detects Only)	0.318	0.266	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	1.188	0.772	
Kolmogorov-Smirnov (NDs = DL)	0.322	0.256	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.019	0.774	

Kolmogorov-Smirnov (NDs = DL/2)	0.31	0.257	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.612	0.852	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.365	0.269	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.941	0.94	0.961	0.962

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.88	0.85	Data Appear Lognormal
Lilliefors (Detects Only)	0.27	0.267	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.875	0.859	Data Appear Lognormal
Lilliefors (NDs = DL)	0.263	0.256	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.921	0.859	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.242	0.256	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.924	0.859	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.24	0.256	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	39	0	39	36	3	7.69%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	0.25	1.3	0.6	0.25	0.606
Statistics (Detects Only)	36	0.14	10	1.045	0.385	1.804
Statistics (All: NDs treated as DL value)	39	0.14	10	1.011	0.38	1.741
Statistics (All: NDs treated as DL/2 value)	39	0.125	10	0.988	0.38	1.744
Statistics (Normal ROS Estimated Data)	39	-1.11	10	0.936	0.38	1.784
Statistics (Gamma ROS Estimated Data)	39	1.000E-12	10	0.983	0.38	1.747
Statistics (Lognormal ROS Estimated Data)	39	0.114	10	0.982	0.38	1.746

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.903	0.85	1.158	-0.603	0.977	-1.62
Statistics (NDs = DL)	0.922	0.868	1.096	-0.621	0.965	-1.553
Statistics (NDs = DL/2)	0.885	0.834	1.117	-0.674	0.995	-1.475
Statistics (Gamma ROS Estimates)	0.343	0.334	2.864	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.683	0.989	-1.449

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.682	0.679	0.676	0.719

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.496	0.935	Data Not Normal
Lilliefors (Detects Only)	0.371	0.148	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.495	0.939	Data Not Normal
Lilliefors (NDs = DL)	0.358	0.142	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.49	0.939	Data Not Normal
Lilliefors (NDs = DL/2)	0.372	0.142	Data Not Normal

Shapiro-Wilks (Normal ROS Estimates)	0.558	0.939	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.365	0.142	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.9	0.897	0.896	0.956

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	4.265	0.781	
Kolmogorov-Smirnov (Detects Only)	0.334	0.152	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.35	0.781	
Kolmogorov-Smirnov (NDs = DL)	0.324	0.146	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	4.083	0.783	
Kolmogorov-Smirnov (NDs = DL/2)	0.31	0.146	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	5.563	0.848	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.36	0.153	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.906	0.911	0.927	0.919

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.824	0.935	Data Not Lognormal
Lilliefors (Detects Only)	0.275	0.148	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.834	0.939	Data Not Lognormal
Lilliefors (NDs = DL)	0.265	0.142	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.861	0.939	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.242	0.142	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.848	0.939	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.264	0.142	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Molybenum.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Number of Valid Data	12	Number of Detected Data	11
Number of Distinct Detected Data	11	Number of Non-Detect Data	1
		Percent Non-Detects	8.33%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.22	Minimum Detected	-1.514
Maximum Detected	12	Maximum Detected	2.485
Mean of Detected	2.589	Mean of Detected	0.085
SD of Detected	3.966	SD of Detected	1.292
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.25	Maximum Non-Detect	-1.386

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.635	Shapiro Wilk Test Statistic	0.88
5% Shapiro Wilk Critical Value	0.85	5% Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.384	Mean (Log Scale)	-0.0953
SD	3.848	SD (Log Scale)	1.381
95% UTL 95% Coverage	12.91	95% UTL 95% Coverage	39.81
95% UPL (t)	9.576	95% UPL (t)	12.02
90% Percentile (z)	7.315	90% Percentile (z)	5.339
95% Percentile (z)	8.713	95% Percentile (z)	8.819
99% Percentile (z)	11.33	99% Percentile (z)	22.61
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.932	Mean in Original Scale	2.383
SD	4.173	SD in Original Scale	3.848
95% UTL with 95% Coverage	13.35	95% UTL with 95% Coverage	40.47
		95% BCA UTL with 95% Coverage	12
		95% Bootstrap (%) UTL with 95% Coverage	12
95% UPL (t)	9.732	95% UPL (t)	12.14
90% Percentile (z)	7.28	90% Percentile (z)	5.366
95% Percentile (z)	8.796	95% Percentile (z)	8.889
99% Percentile (z)	11.64	99% Percentile (z)	22.91

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.568	Data appear Lognormal at 5% Significance Level	
Theta Star	4.557		
nu star	12.5		
A-D Test Statistic	1.082	Nonparametric Statistics	
5% A-D Critical Value	0.766	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.318	Mean	2.392
5% K-S Critical Value	0.266	SD	3.679
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.114
		95% KM UTL with 95% Coverage	12.46
Assuming Gamma Distribution		95% KM Chebyshev UPL	19.08
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	9.269
Mean	2.373	90% Percentile (z)	7.107
Median	0.625	95% Percentile (z)	8.443
SD	3.855	99% Percentile (z)	10.95
k star	0.23		
Theta star	10.32	Gamma ROS Limits with Extrapolated Data	
Nu star	5.521	95% Wilson Hilferty (WH) Approx. Gamma UPL	10.71
95% Percentile of Chisquare (2k)	2.282	95% Hawkins Wixley (HW) Approx. Gamma UPL	12.73
		95% WH Approx. Gamma UTL with 95% Coverage	20.72
90% Percentile	7.158	95% HW Approx. Gamma UTL with 95% Coverage	28.36
95% Percentile	11.77		
99% Percentile	24.2		

Note: DL/2 is not a recommended method.

MC

General Statistics			
Number of Valid Data	39	Number of Detected Data	36
Number of Distinct Detected Data	26	Number of Non-Detect Data	3
		Percent Non-Detects	7.69%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.14	Minimum Detected	-1.966
Maximum Detected	10	Maximum Detected	2.303
Mean of Detected	1.045	Mean of Detected	-0.603
SD of Detected	1.804	SD of Detected	0.977
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	1.3	Maximum Non-Detect	0.262

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	31
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	8
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	79.49%

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.496	Shapiro Wilk Test Statistic	0.824
5% Shapiro Wilk Critical Value	0.935	5% Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.988	Mean (Log Scale)	-0.674
SD	1.744	SD (Log Scale)	0.995
95% UTL 95% Coverage	4.694	95% UTL 95% Coverage	4.215
95% UPL (t)	3.966	95% UPL (t)	2.784
90% Percentile (z)	3.223	90% Percentile (z)	1.823
95% Percentile (z)	3.857	95% Percentile (z)	2.616
99% Percentile (z)	5.046	99% Percentile (z)	5.152
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-2.459	Mean in Original Scale	0.982
SD	4.412	SD in Original Scale	1.746
95% UTL with 95% Coverage	6.914	95% UTL with 95% Coverage	4.131
		95% BCA UTL with 95% Coverage	10
		95% Bootstrap (%) UTL with 95% Coverage	10
95% UPL (t)	5.074	95% UPL (t)	2.735
90% Percentile (z)	3.195	90% Percentile (z)	1.795
95% Percentile (z)	4.798	95% Percentile (z)	2.571
99% Percentile (z)	7.805	99% Percentile (z)	5.045
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.846	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.236		
nu star	60.91		
A-D Test Statistic	4.265	Nonparametric Statistics	
5% A-D Critical Value	0.781	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.334	Mean	0.984
5% K-S Critical Value	0.152	SD	1.722
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.28
		95% KM UTL with 95% Coverage	4.643
Assuming Gamma Distribution		95% KM Chebyshev UPL	8.586
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	3.925
Mean	0.983	90% Percentile (z)	3.191
Median	0.38	95% Percentile (z)	3.817
SD	1.747	99% Percentile (z)	4.991
k star	0.334		
Theta star	2.944	Gamma ROS Limits with Extrapolated Data	
Nu star	26.05	95% Wilson Hilferty (WH) Approx. Gamma UPL	3.288
95% Percentile of Chisquare (2k)	2.95	95% Hawkins Wixley (HW) Approx. Gamma UPL	3.642
		95% WH Approx. Gamma UTL with 95% Coverage	4.484
90% Percentile	2.859	95% HW Approx. Gamma UTL with 95% Coverage	5.239
95% Percentile	4.342		
99% Percentile	8.149		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Molybenum.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12

10% critical value: 0.49

5% critical value: 0.546

1% critical value: 0.642

1. Data Value 12 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.798

For 10% significance level, 12 is an outlier.

For 5% significance level, 12 is an outlier.

For 1% significance level, 12 is an outlier.

2. Data Value 0.125 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.031

For 10% significance level, 0.125 is not an outlier.

For 5% significance level, 0.125 is not an outlier.

For 1% significance level, 0.125 is not an outlier.

Rosner's Outlier Test for MC

Mean	0.988
Standard Deviation	1.744
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.988	1.722	10	6	5.234	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 10 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 10 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Molybenum.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Data	39	12
Number of Non-Detect Data	3	1
Number of Detect Data	36	11
Minimum Non-Detect	0.25	0.25
Maximum Non-Detect	1.3	0.25
Percent Non detects	7.69%	8.33%
Minimum Detected	0.14	0.22
Maximum Detected	10	12
Mean of Detected Data	1.045	2.589
Median of Detected Data	0.385	0.63
SD of Detected Data	1.804	3.966

Site vs Background Gehan Test

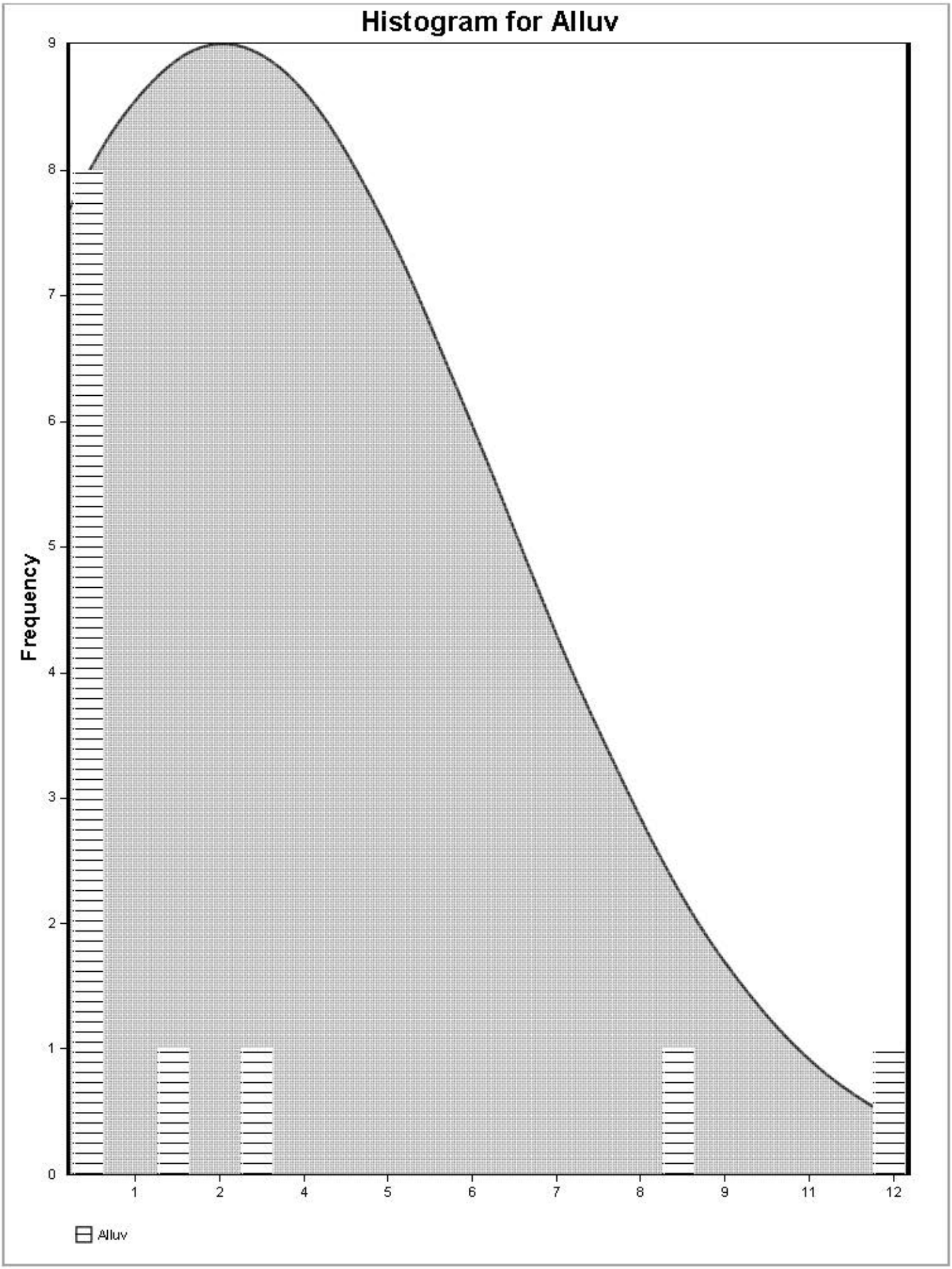
H0: Mu of Site or AOC = Mu of background

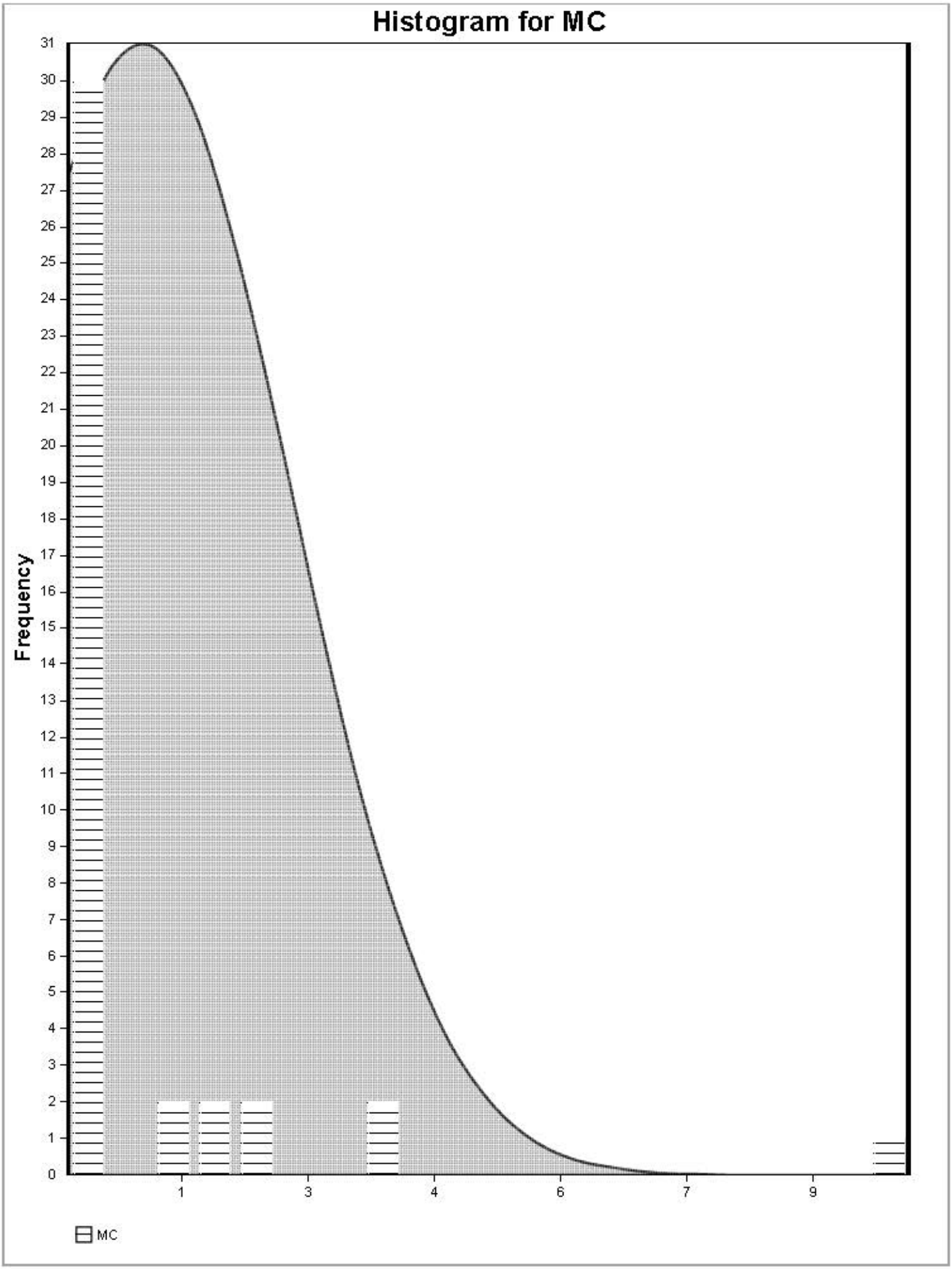
Gehan z Test Value	-1.912
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0558

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
7
8
9
1
2
4
5
6
7
8
9
11
12
Alluv


Histogram for MC
Frequency
31
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1
3
4
6
7
9
MC

Location	Alluv	D_Alluv
BG-1-2	0.39	1
BG-1-10	0.41	1
BG-1-29	0.25	0
BG-1-40	0.61	1
BG-2-2	0.62	1
BG-2-10	0.63	1
BG-2-19	8.7	1
BG-2-21	12	1
BG-3-2	1.6	1
BG-3-10	2.6	1
BG-6-2	0.7	1
BG-6-9	0.22	1

Location	MC	D_MC
BG-1-43	1.3	0
BG-1-46	0.25	0
BG-1-55	0.18	1
BG-1-78	0.25	0
BG-1-92	0.24	1
BG-2-30	10	1
BG-2-32	1.5	1
BG-2-75	3.7	1
BG-2-81	3.8	1
BG-3-17	1.7	1
BG-3-22	2.6	1
BG-3-29	0.39	1
BG-3-63	0.62	1
BG-3-65	0.57	1
BG-3-69	2	1
BG-3-95	0.48	1
BG-3-105	0.47	1
BG-3-131	2.3	1
BG-3-136	0.4	1
BG-4-1	0.44	1
BG-4-10	0.38	1
BG-4-19	0.24	1
BG-4-40	0.34	1
BG-4-65	0.32	1
BG-4-79	0.27	1
BG-4-82	0.43	1
BG-4-95	0.34	1
BG-4-117	0.38	1
BG-4-120	0.27	1
BG-4-161	0.34	1
BG-4-163	0.34	1
BG-6-28	0.46	1
BG-6-53	0.23	1
BG-6-58	0.4	1
BG-6-75	0.35	1
BG-6-87	0.14	1
BG-6-98	0.35	1
BG-6-114	0.34	1
BG-1-127	0.32	1

Outlier Tests for Selected Variables

User Selected Options	
From File	Nickel.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for All Data

Mean	8.829
Standard Deviation	6.528
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	8.829	6.464	28	18	2.966	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nickel.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	48	3	5.88%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	5	11	8.667	10	3.215
Statistics (Detects Only)	48	1.8	28	9.11	7.5	6.623
Statistics (All: NDs treated as DL value)	51	1.8	28	9.084	8	6.454
Statistics (All: NDs treated as DL/2 value)	51	1.8	28	8.829	6.5	6.528
Statistics (Normal ROS Estimated Data)	51	1.8	28	8.873	6.5	6.496
Statistics (Gamma ROS Estimated Data)	51	1.8	28	8.919	6.801	6.473
Statistics (Lognormal ROS Estimated Data)	51	1.8	28	8.826	6.5	6.524

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.978	1.875	4.606	1.936	0.769	0.397
Statistics (NDs = DL)	2.068	1.959	4.393	1.946	0.751	0.386
Statistics (NDs = DL/2)	1.981	1.877	4.457	1.905	0.761	0.399
Statistics (Gamma ROS Estimates)	2.048	1.941	4.354	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.907	0.755	0.396

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.946	0.949	0.94	0.941

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.884	0.947	Data Not Normal
Lilliefors (Detects Only)	0.167	0.128	Data Not Normal
Lilliefors (NDs = DL)	0.148	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.163	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.167	0.124	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.989	0.991	0.99	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.904	0.762	
Kolmogorov-Smirnov (Detects Only)	0.158	0.13	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.813	0.762	
Kolmogorov-Smirnov (NDs = DL)	0.142	0.126	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.957	0.763	
Kolmogorov-Smirnov (NDs = DL/2)	0.144	0.126	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.837	0.763	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.152	0.126	Data Not Gamma Distributed	

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.98	0.983	0.982	0.981

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.939	0.947	Data Not Lognormal
Lilliefors (Detects Only)	0.138	0.128	Data Not Lognormal
Lilliefors (NDs = DL)	0.124	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.124	0.124	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.134	0.124	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nickel.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Number of Valid Data	51	Number of Detected Data	48
Number of Distinct Detected Data	39	Number of Non-Detect Data	3
		Percent Non-Detects	5.88%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.8	Minimum Detected	0.588
Maximum Detected	28	Maximum Detected	3.332
Mean of Detected	9.11	Mean of Detected	1.936
SD of Detected	6.623	SD of Detected	0.769
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	11	Maximum Non-Detect	2.398

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	33
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	18
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	64.71%

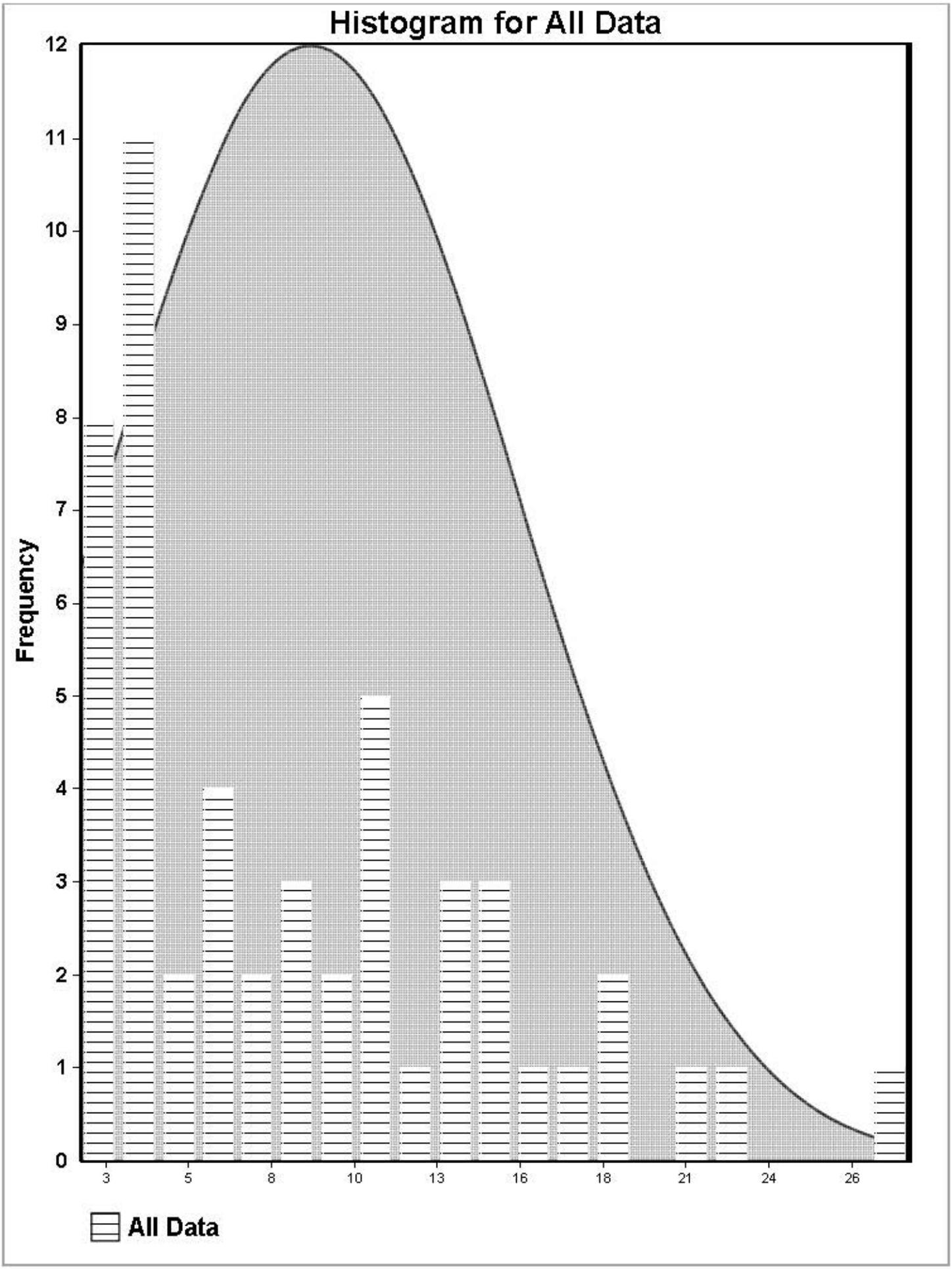
Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.884	Shapiro Wilk Test Statistic	0.939
5% Shapiro Wilk Critical Value	0.947	5% Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	8.829	Mean (Log Scale)	1.905
SD	6.528	SD (Log Scale)	0.761
95% UTL 95% Coverage	22.24	95% UTL 95% Coverage	32.05
95% UPL (t)	19.88	95% UPL (t)	24.34
90% Percentile (z)	17.2	90% Percentile (z)	17.81
95% Percentile (z)	19.57	95% Percentile (z)	23.48
99% Percentile (z)	24.02	99% Percentile (z)	39.44
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	7.821	Mean in Original Scale	8.826
SD	8.176	SD in Original Scale	6.524
95% UTL with 95% Coverage	24.61	95% UTL with 95% Coverage	31.74
		95% BCA UTL with 95% Coverage	25
		95% Bootstrap (%) UTL with 95% Coverage	26
95% UPL (t)	21.66	95% UPL (t)	24.16

90% Percentile (z)	18.3	90% Percentile (z)	17.72
95% Percentile (z)	21.27	95% Percentile (z)	23.31
99% Percentile (z)	26.84	99% Percentile (z)	38.99
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.868	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.876		
nu star	179.4		
A-D Test Statistic	0.904	Nonparametric Statistics	
5% A-D Critical Value	0.762	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.158	Mean	8.82
5% K-S Critical Value	0.13	SD	6.482
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.92
		95% KM UTL with 95% Coverage	22.13
Assuming Gamma Distribution		95% KM Chebyshev UPL	37.35
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	19.79
Mean	8.919	90% Percentile (z)	17.13
Median	6.801	95% Percentile (z)	19.48
SD	6.473	99% Percentile (z)	23.9
k star	1.941		
Theta star	4.595	Gamma ROS Limits with Extrapolated Data	
Nu star	198	95% Wilson Hilferty (WH) Approx. Gamma UPL	21.58
95% Percentile of Chisquare (2k)	9.296	95% Hawkins Wixley (HW) Approx. Gamma UPL	22.07
		95% WH Approx. Gamma UTL with 95% Coverage	25.95
90% Percentile	17.47	95% HW Approx. Gamma UTL with 95% Coverage	26.97
95% Percentile	21.36		
99% Percentile	30		

Note: DL/2 is not a recommended method.


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
3
5
8
10
13
16
18
21
24
26
All Data

Location	All Data	All Data
BG-1-2	14	1
BG-1-43	20	1
BG-1-55	2.7	1
BG-1-78	12	1
BG-2-30	24	1
BG-2-81	16	1
BG-3-17	4.2	1
BG-3-22	10	0
BG-3-69	14	1
BG-4-2	9	1
BG-4-19	22	1
BG-4-40	17	1
BG-4-79	15	1
BG-4-161	7	1
BG-4-163	13	1
BG-6-28	15	1
BG-6-53	11	1
BG-6-87	28	1
BG-1-10	5.9	1
BG-1-29	6.5	1
BG-1-40	5	0
BG-1-46	4.1	1
BG-1-92	3.3	1
BG-2-2	2.6	1
BG-2-10	2.2	1
BG-2-19	4.7	1
BG-2-21	2	1
BG-2-32	3.2	1
BG-2-75	3.6	1
BG-3-2	4	1
BG-3-10	11	1
BG-3-29	3.4	1
BG-3-63	4	1
BG-3-65	8.3	1
BG-3-95	2.6	1
BG-3-105	8.7	1
BG-3-131	11	0
BG-3-136	19	1
BG-4-10	11	1
BG-4-65	3.4	1
BG-4-82	8	1
BG-4-95	2.4	1
BG-4-117	1.8	1
BG-4-120	14	1
BG-6-2	5.8	1
BG-6-9	2.8	1
BG-6-58	3.9	1
BG-6-75	4	1
BG-6-98	9.2	1
BG-6-114	10	1
BG-6-127	18	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nickel.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	13	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	13	2.2	22	7.631	5.8	5.698

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	2.305	1.825	3.31	1.8	0.704	0.391

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.918	0.918	0.918	0.918

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.847	0.866	Data Not Normal
Lilliefors (Full: no NDs)	0.235	0.246	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.987	0.987	0.987	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.334	0.742	
Kolmogorov-Smirnov (Full: no NDs)	0.175	0.239	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.987	0.987	0.987	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.963	0.866	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.13	0.246	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

>20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	38	0	38	35	3	7.89%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	5	11	8.667	10	3.215

Statistics (Detects Only)	35	1.8	28	9.66	8.3	6.93
Statistics (All: NDs treated as DL value)	38	1.8	28	9.582	8.5	6.69
Statistics (All: NDs treated as DL/2 value)	38	1.8	28	9.239	7.5	6.811
Statistics (Normal ROS Estimated Data)	38	1.8	28	9.299	7.5	6.765
Statistics (Gamma ROS Estimated Data)	38	1.8	28	9.377	7.541	6.723
Statistics (Lognormal ROS Estimated Data)	38	1.8	28	9.234	7.5	6.806

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.925	1.791	5.017	1.986	0.795	0.4
Statistics (NDs = DL)	2.043	1.899	4.69	1.996	0.77	0.386
Statistics (NDs = DL/2)	1.919	1.785	4.815	1.941	0.785	0.404
Statistics (Gamma ROS Estimates)	2.017	1.875	4.65	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.944	0.777	0.4

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.953	0.956	0.945	0.946

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.898	0.934	Data Not Normal
Lilliefors (Detects Only)	0.189	0.15	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.904	0.938	Data Not Normal
Lilliefors (NDs = DL)	0.162	0.144	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.884	0.938	Data Not Normal
Lilliefors (NDs = DL/2)	0.169	0.144	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.886	0.938	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.174	0.144	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.985	0.989	0.988	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.781	0.761	
Kolmogorov-Smirnov (Detects Only)	0.184	0.151	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.667	0.759	
Kolmogorov-Smirnov (NDs = DL)	0.161	0.145	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL/2)	0.791	0.76	
Kolmogorov-Smirnov (NDs = DL/2)	0.164	0.145	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.666	0.759	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.154	0.145	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.975	0.979	0.979	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.933	0.934	Data Not Lognormal
Lilliefors (Detects Only)	0.165	0.15	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.941	0.938	Data Appear Lognormal

Lilliefors (NDs = DL)	0.145	0.144	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.94	0.938	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.145	0.144	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.937	0.938	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.148	0.144	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nickel.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	12

Raw Statistics		Log-Transformed Statistics	
Minimum	2.2	Minimum	0.788
Maximum	22	Maximum	3.091
Second Largest	14	Second Largest	2.639
First Quartile	4	First Quartile	1.386
Median	5.8	Median	1.758
Third Quartile	11	Third Quartile	2.398
Mean	7.631	Mean	1.8
SD	5.698	SD	0.704
Coefficient of Variation	0.747		
Skewness	1.479		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.847	Shapiro Wilk Test Statistic	0.963
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	22.85	95% UTL with 95% Coverage	39.63
95% UPL (t)	18.17	95% UPL (t)	22.23
90% Percentile (z)	14.93	90% Percentile (z)	14.91
95% Percentile (z)	17	95% Percentile (z)	19.25
99% Percentile (z)	20.89	99% Percentile (z)	31.1

Gamma Distribution Test		Data Distribution Test
k star	1.825	Data appear Gamma Distributed at 5% Significance Level
Theta Star	4.182	
MLE of Mean	7.631	
MLE of Standard Deviation	5.649	
nu star	47.44	
A-D Test Statistic	0.334	Nonparametric Statistics
5% A-D Critical Value	0.742	90% Percentile 13.4
K-S Test Statistic	0.175	95% Percentile 17.2
5% K-S Critical Value	0.239	99% Percentile 21.04
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	22
90% Percentile	15.17	95% Percentile Bootstrap UTL with 95% Coverage	22
95% Percentile	18.64	95% BCA Bootstrap UTL with 95% Coverage	22
99% Percentile	26.38	95% UPL	22
		95% Chebyshev UPL	33.41
95% WH Approx. Gamma UPL	19.72	Upper Threshold Limit Based upon IQR	21.5
95% HW Approx. Gamma UPL	20.17		
95% WH Approx. Gamma UTL with 95% Coverage	28.98		
95% HW Approx. Gamma UTL with 95% Coverage	30.69		

>20

General Statistics			
Number of Valid Data	38	Number of Detected Data	35
Number of Distinct Detected Data	31	Number of Non-Detect Data	3
		Percent Non-Detects	7.89%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.8	Minimum Detected	0.588
Maximum Detected	28	Maximum Detected	3.332
Mean of Detected	9.66	Mean of Detected	1.986
SD of Detected	6.93	SD of Detected	0.795
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	11	Maximum Non-Detect	2.398

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	24
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	14
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	63.16%

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.898	Shapiro Wilk Test Statistic	0.933
5% Shapiro Wilk Critical Value	0.934	5% Shapiro Wilk Critical Value	0.934
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	9.239	Mean (Log Scale)	1.941
SD	6.811	SD (Log Scale)	0.785
95% UTL 95% Coverage	23.76	95% UTL 95% Coverage	37.14
95% UPL (t)	20.88	95% UPL (t)	26.64
90% Percentile (z)	17.97	90% Percentile (z)	19.05
95% Percentile (z)	20.44	95% Percentile (z)	25.33
99% Percentile (z)	25.08	99% Percentile (z)	43.25
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	8.189	Mean in Original Scale	9.234
SD	8.445	SD in Original Scale	6.806
95% UTL with 95% Coverage	26.19	95% UTL with 95% Coverage	36.64
		95% BCA UTL with 95% Coverage	28

		95% Bootstrap (%) UTL with 95% Coverage	28
95% UPL (t)	22.62	95% UPL (t)	26.37
90% Percentile (z)	19.01	90% Percentile (z)	18.91
95% Percentile (z)	22.08	95% Percentile (z)	25.09
99% Percentile (z)	27.84	99% Percentile (z)	42.61
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.779	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.429		
nu star	124.6		
A-D Test Statistic	0.781	Nonparametric Statistics	
5% A-D Critical Value	0.761	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.184	Mean	9.226
5% K-S Critical Value	0.151	SD	6.747
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.115
		95% KM UTL with 95% Coverage	23.61
Assuming Gamma Distribution		95% KM Chebyshev UPL	39.02
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	20.76
Mean	9.377	90% Percentile (z)	17.87
Median	7.541	95% Percentile (z)	20.32
SD	6.723	99% Percentile (z)	24.92
k star	1.875		
Theta star	5.001	Gamma ROS Limits with Extrapolated Data	
Nu star	142.5	95% Wilson Hilferty (WH) Approx. Gamma UPL	23.1
95% Percentile of Chisquare (2k)	9.08	95% Hawkins Wixley (HW) Approx. Gamma UPL	23.72
		95% WH Approx. Gamma UTL with 95% Coverage	28.66
90% Percentile	18.52	95% HW Approx. Gamma UTL with 95% Coverage	30.02
95% Percentile	22.7		
99% Percentile	32.03		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Nickel.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 22 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.567

For 10% significance level, 22 is an outlier.
For 5% significance level, 22 is an outlier.
For 1% significance level, 22 is not an outlier.

2. Data Value 2.2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.051

For 10% significance level, 2.2 is not an outlier.
For 5% significance level, 2.2 is not an outlier.
For 1% significance level, 2.2 is not an outlier.

Rosner's Outlier Test for >20

Mean	9.239
Standard Deviation	6.811
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	9.239	6.72	28	38	2.792	3.01	3.36

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nickel.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: 0-20

Background Data: >20

Raw Statistics

	Site	Background
Number of Valid Data	13	38
Number of Non-Detect Data	0	3
Number of Detect Data	13	35
Minimum Non-Detect	N/A	5
Maximum Non-Detect	N/A	11
Percent Non detects	0.00%	7.89%
Minimum Detected	2.2	1.8
Maximum Detected	22	28
Mean of Detected Data	7.631	9.66
Median of Detected Data	5.8	8.3
SD of Detected Data	5.698	6.93

Site vs Background Gehan Test

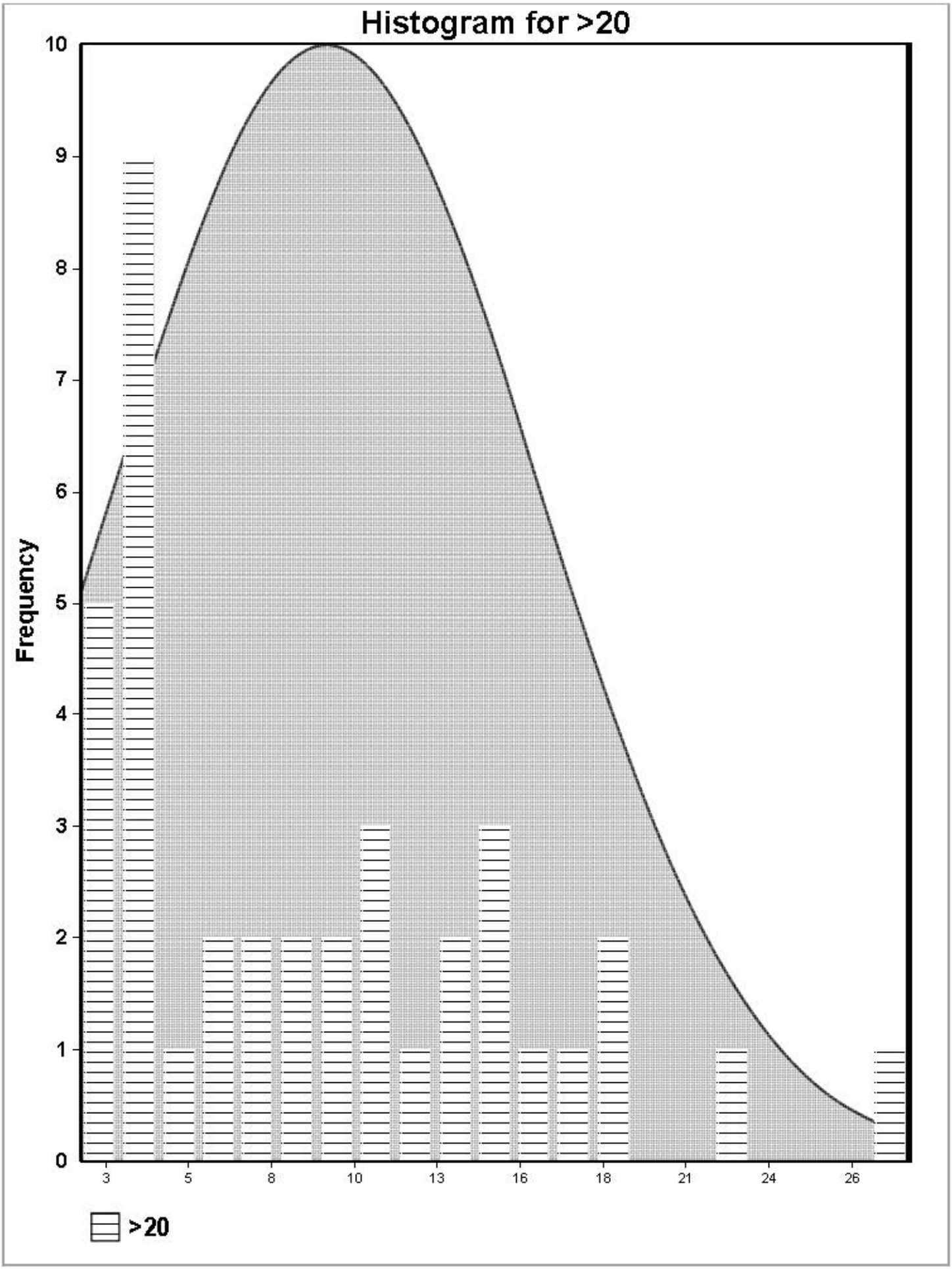
H0: Mu of Site or AOC = Mu of background

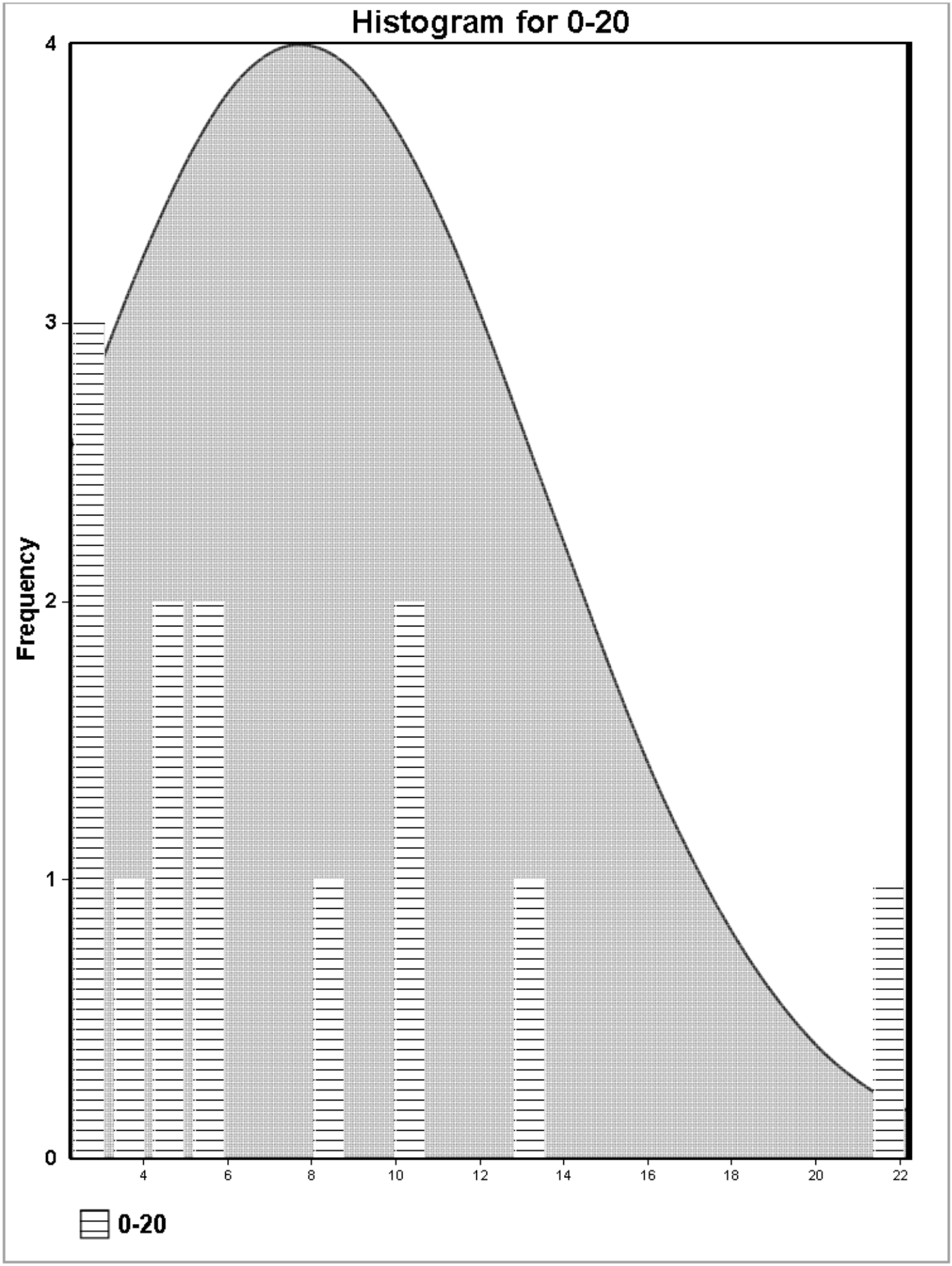
Gehan z Test Value	-0.556
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.578

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
10
3
5
8
10
13
16
18
21
24
26
>20


Histogram for 0-20
Frequency
0
1
2
3
4
4
6
8
10
12
14
16
18
20
22
0-20

Location	0-20	D_0-20
BG-1-2	14	1
BG-3-17	4.2	1
BG-4-2	9	1
BG-4-19	22	1
BG-1-10	5.9	1
BG-2-2	2.6	1
BG-2-10	2.2	1
BG-2-19	4.7	1
BG-3-2	4	1
BG-3-10	11	1
BG-4-10	11	1
BG-6-2	5.8	1
BG-6-9	2.8	1

Location	>20	D_>20
BG-1-29	6.5	1
BG-1-40	5	0
BG-1-46	4.1	1
BG-1-92	3.3	1
BG-2-21	2	1
BG-2-32	3.2	1
BG-2-75	3.6	1
BG-3-29	3.4	1
BG-3-63	4	1
BG-3-65	8.3	1
BG-3-95	2.6	1
BG-3-105	8.7	1
BG-3-131	11	0
BG-3-136	19	1
BG-4-65	3.4	1
BG-4-82	8	1
BG-4-95	2.4	1
BG-4-117	1.8	1
BG-4-120	14	1
BG-6-58	3.9	1
BG-6-75	4	1
BG-6-98	9.2	1
BG-6-114	10	1
BG-6-127	18	1
BG-1-43	20	1
BG-1-55	2.7	1
BG-1-78	12	1
BG-2-30	24	1
BG-2-81	16	1
BG-3-22	10	0
BG-3-69	14	1
BG-4-40	17	1
BG-4-79	15	1
BG-4-161	7	1
BG-4-163	13	1
BG-6-28	15	1
BG-6-53	11	1
BG-6-87	28	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nickel.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	17	1	5.56%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	17	2.7	28	14.35	14	6.711
Statistics (All: NDs treated as DL value)	18	2.7	28	14.11	14	6.591
Statistics (All: NDs treated as DL/2 value)	18	2.7	28	13.83	14	6.874
Statistics (Normal ROS Estimated Data)	18	2.7	28	13.87	14	6.817
Statistics (Gamma ROS Estimated Data)	18	2.7	28	13.9	14	6.776
Statistics (Lognormal ROS Estimated Data)	18	2.7	28	13.88	14	6.806

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.754	3.165	3.822	2.524	0.605	0.24
Statistics (NDs = DL)	3.879	3.269	3.637	2.512	0.59	0.235
Statistics (NDs = DL/2)	3.425	2.891	4.037	2.474	0.626	0.253
Statistics (Gamma ROS Estimates)	3.607	3.043	3.855	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.483	0.613	0.247

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.991	0.991	0.99	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.981	0.892	Data Appear Normal
Lilliefors (Detects Only)	0.111	0.215	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.981	0.897	Data Appear Normal
Lilliefors (NDs = DL)	0.113	0.209	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.976	0.897	Data Appear Normal
Lilliefors (NDs = DL/2)	0.1	0.209	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.978	0.897	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.101	0.209	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.979	0.984	0.98	0.981

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.399	0.743	
Kolmogorov-Smirnov (Detects Only)	0.142	0.21	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.325	0.743	
Kolmogorov-Smirnov (NDs = DL)	0.117	0.205	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.369	0.744	

Kolmogorov-Smirnov (NDs = DL/2)	0.139	0.205	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.312	0.744	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.131	0.205	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.944	0.95	0.958	0.96

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.897	0.892	Data Appear Lognormal
Lilliefors (Detects Only)	0.182	0.215	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.909	0.897	Data Appear Lognormal
Lilliefors (NDs = DL)	0.148	0.209	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.918	0.897	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.174	0.209	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.923	0.897	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.168	0.209	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	31	2	6.06%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	2	5	11	8	8	4.243
Statistics (Detects Only)	31	1.8	19	6.239	4	4.542
Statistics (All: NDs treated as DL value)	33	1.8	19	6.345	4.1	4.482
Statistics (All: NDs treated as DL/2 value)	33	1.8	19	6.103	4	4.447
Statistics (Normal ROS Estimated Data)	33	1.8	19	6.135	4	4.421
Statistics (Gamma ROS Estimated Data)	33	1.8	19	6.186	4.1	4.408
Statistics (Lognormal ROS Estimated Data)	33	1.8	19	6.095	4	4.436

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.45	2.248	2.546	1.613	0.653	0.405
Statistics (NDs = DL)	2.524	2.314	2.514	1.637	0.647	0.395
Statistics (NDs = DL/2)	2.49	2.284	2.451	1.595	0.644	0.404
Statistics (Gamma ROS Estimates)	2.582	2.368	2.395	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.597	0.636	0.399

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.907	0.915	0.903	0.902

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.818	0.929	Data Not Normal
Lilliefors (Detects Only)	0.23	0.159	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.832	0.931	Data Not Normal
Lilliefors (NDs = DL)	0.207	0.154	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.812	0.931	Data Not Normal
Lilliefors (NDs = DL/2)	0.219	0.154	Data Not Normal

Shapiro-Wilks (Normal ROS Estimates)	0.81	0.931	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.223	0.154	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.98	0.982	0.979	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.905	0.756	
Kolmogorov-Smirnov (Detects Only)	0.201	0.159	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.842	0.756	
Kolmogorov-Smirnov (NDs = DL)	0.181	0.155	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.93	0.756	
Kolmogorov-Smirnov (NDs = DL/2)	0.19	0.155	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.828	0.756	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.172	0.155	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.98	0.983	0.981	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.947	0.929	Data Appear Lognormal
Lilliefors (Detects Only)	0.17	0.159	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.951	0.931	Data Appear Lognormal
Lilliefors (NDs = DL)	0.152	0.154	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.947	0.931	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.158	0.154	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.943	0.931	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.161	0.154	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nickel.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Number of Valid Data	18	Number of Detected Data	17
Number of Distinct Detected Data	15	Number of Non-Detect Data	1
		Percent Non-Detects	5.56%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	2.7	Minimum Detected	0.993
Maximum Detected	28	Maximum Detected	3.332
Mean of Detected	14.35	Mean of Detected	2.524
SD of Detected	6.711	SD of Detected	0.605
Minimum Non-Detect	10	Minimum Non-Detect	2.303
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.981	Shapiro Wilk Test Statistic	0.897
5% Shapiro Wilk Critical Value	0.892	5% Shapiro Wilk Critical Value	0.892
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	13.83	Mean (Log Scale)	2.474
SD	6.874	SD (Log Scale)	0.626
95% UTL 95% Coverage	30.69	95% UTL 95% Coverage	55.07
95% UPL (t)	26.11	95% UPL (t)	36.31
90% Percentile (z)	22.64	90% Percentile (z)	26.46
95% Percentile (z)	25.13	95% Percentile (z)	33.21
99% Percentile (z)	29.82	99% Percentile (z)	50.87
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	13.89	Mean in Original Scale	13.88
SD	6.741	SD in Original Scale	6.806
95% UTL with 95% Coverage	30.43	95% UTL with 95% Coverage	53.88
		95% BCA UTL with 95% Coverage	28
		95% Bootstrap (%) UTL with 95% Coverage	28
95% UPL (t)	25.94	95% UPL (t)	35.83
90% Percentile (z)	22.53	90% Percentile (z)	26.28
95% Percentile (z)	24.98	95% Percentile (z)	32.83
99% Percentile (z)	29.57	99% Percentile (z)	49.86

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.131	Data appear Normal at 5% Significance Level	
Theta Star	4.582		
nu star	106.4		
A-D Test Statistic	0.399	Nonparametric Statistics	
5% A-D Critical Value	0.743	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.142	Mean	13.87
5% K-S Critical Value	0.21	SD	6.654
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.624
		95% KM UTL with 95% Coverage	30.19
Assuming Gamma Distribution		95% KM Chebyshev UPL	43.66
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	25.76
Mean	13.9	90% Percentile (z)	22.39
Median	14	95% Percentile (z)	24.81
SD	6.776	99% Percentile (z)	29.35
k star	3.043		
Theta star	4.57	Gamma ROS Limits with Extrapolated Data	
Nu star	109.5	95% Wilson Hilferty (WH) Approx. Gamma UPL	30.01
95% Percentile of Chisquare (2k)	12.72	95% Hawkins Wixley (HW) Approx. Gamma UPL	31.01
		95% WH Approx. Gamma UTL with 95% Coverage	39.16
90% Percentile	24.59	95% HW Approx. Gamma UTL with 95% Coverage	41.49
95% Percentile	29.06		
99% Percentile	38.74		

Note: DL/2 is not a recommended method.

Non-Clay

General Statistics

Number of Valid Data	33	Number of Detected Data	31
Number of Distinct Detected Data	26	Number of Non-Detect Data	2
		Percent Non-Detects	6.06%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.8	Minimum Detected	0.588
Maximum Detected	19	Maximum Detected	2.944
Mean of Detected	6.239	Mean of Detected	1.613
SD of Detected	4.542	SD of Detected	0.653
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	11	Maximum Non-Detect	2.398
Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	28
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	5
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	84.85%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.818	Shapiro Wilk Test Statistic	0.947
5% Shapiro Wilk Critical Value	0.929	5% Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6.103	Mean (Log Scale)	1.595
SD	4.447	SD (Log Scale)	0.644
95% UTL 95% Coverage	15.78	95% UTL 95% Coverage	20.02
95% UPL (t)	13.75	95% UPL (t)	14.92
90% Percentile (z)	11.8	90% Percentile (z)	11.25
95% Percentile (z)	13.42	95% Percentile (z)	14.22
99% Percentile (z)	16.45	99% Percentile (z)	22.05
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	3.608	Mean in Original Scale	6.095
SD	7.142	SD in Original Scale	4.436
95% UTL with 95% Coverage	19.15	95% UTL with 95% Coverage	19.72
		95% BCA UTL with 95% Coverage	19
		95% Bootstrap (%) UTL with 95% Coverage	19
95% UPL (t)	15.89	95% UPL (t)	14.75
90% Percentile (z)	12.76	90% Percentile (z)	11.16
95% Percentile (z)	15.36	95% Percentile (z)	14.06
99% Percentile (z)	20.22	99% Percentile (z)	21.7
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.235	Data appear Lognormal at 5% Significance Level	
Theta Star	2.792		
nu star	138.5		
A-D Test Statistic	0.905	Nonparametric Statistics	
5% A-D Critical Value	0.756	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.201	Mean	6.097
5% K-S Critical Value	0.159	SD	4.391
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.781
		95% KM UTL with 95% Coverage	15.65
Assuming Gamma Distribution		95% KM Chebyshev UPL	25.52
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	13.65
Mean	6.186	90% Percentile (z)	11.72
Median	4.1	95% Percentile (z)	13.32
SD	4.408	99% Percentile (z)	16.31
k star	2.368		
Theta star	2.612	Gamma ROS Limits with Extrapolated Data	
Nu star	156.3	95% Wilson Hilferty (WH) Approx. Gamma UPL	14.12
95% Percentile of Chisquare (2k)	10.66	95% Hawkins Wixley (HW) Approx. Gamma UPL	14.27
		95% WH Approx. Gamma UTL with 95% Coverage	17.45
90% Percentile	11.57	95% HW Approx. Gamma UTL with 95% Coverage	17.9
95% Percentile	13.92		
99% Percentile	19.09		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Nickel.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 28 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.261

For 10% significance level, 28 is not an outlier.

For 5% significance level, 28 is not an outlier.

For 1% significance level, 28 is not an outlier.

2. Data Value 2.7 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.119

For 10% significance level, 2.7 is not an outlier.

For 5% significance level, 2.7 is not an outlier.

For 1% significance level, 2.7 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	6.103
Standard Deviation	4.447
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	6.103	4.379	19	20	2.945	2.95	3.29

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nickel.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Clay

Background Data: Non-Clay

Raw Statistics

	Site	Background
Number of Valid Data	18	33
Number of Non-Detect Data	1	2
Number of Detect Data	17	31
Minimum Non-Detect	10	5
Maximum Non-Detect	10	11
Percent Non detects	5.56%	6.06%
Minimum Detected	2.7	1.8
Maximum Detected	28	19
Mean of Detected Data	14.35	6.239
Median of Detected Data	14	4
SD of Detected Data	6.711	4.542

Site vs Background Gehan Test

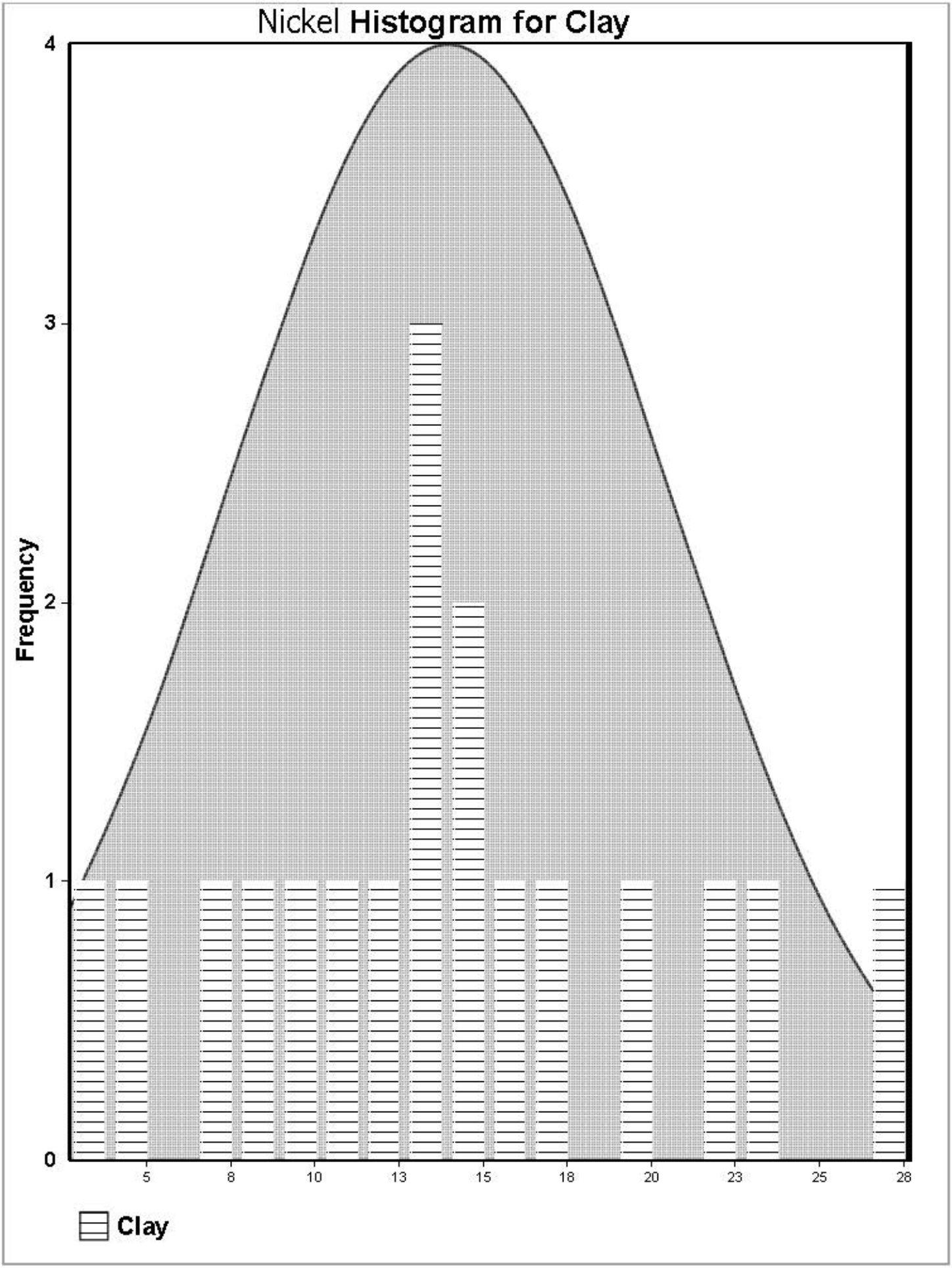
H0: Mu of Site or AOC = Mu of background

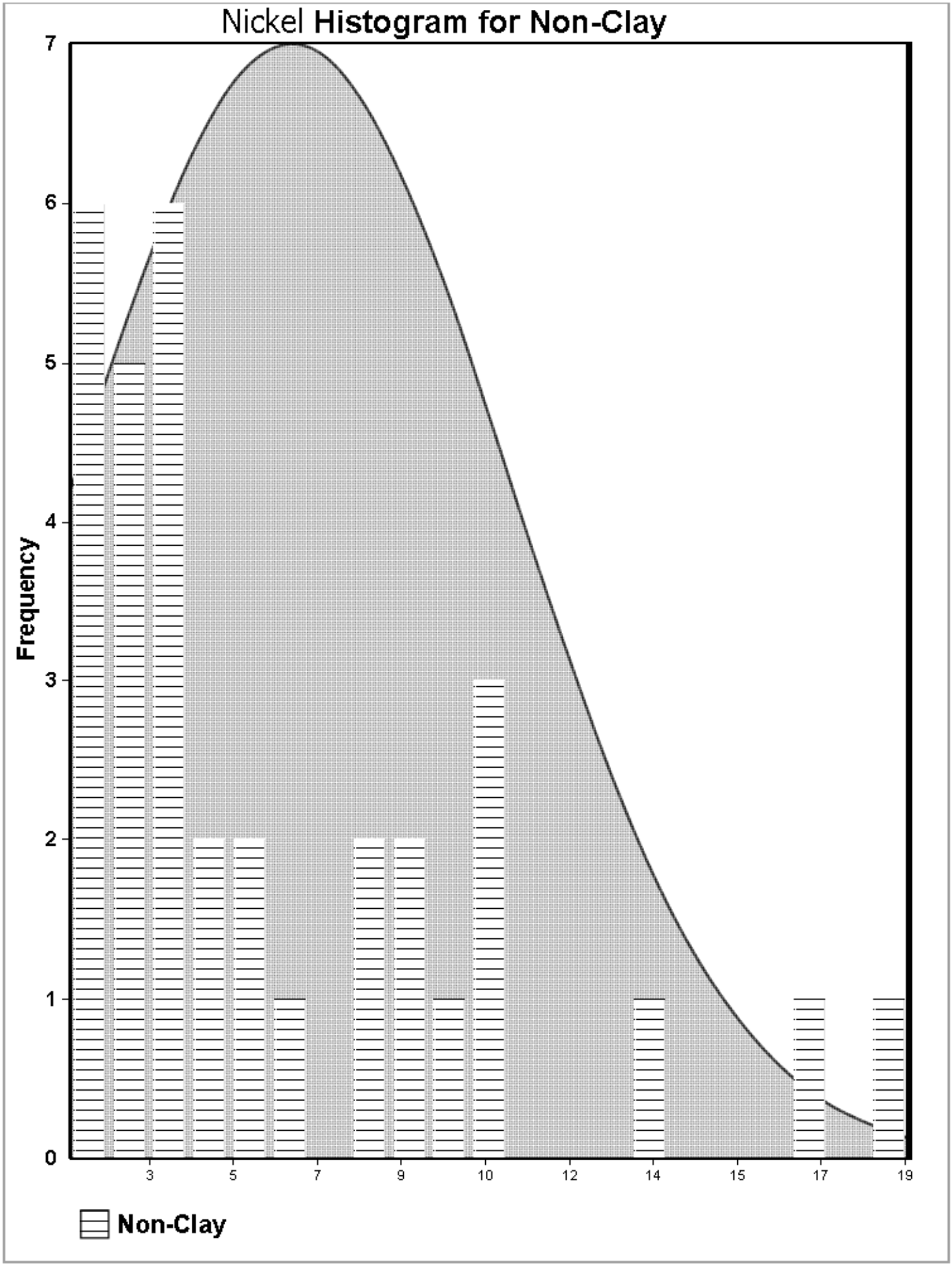
Gehan z Test Value	3.922
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	8.7740E-5

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Nickel Histogram for Clay
Frequency
0
1
2
3
4
5
8
10
13
15
18
20
23
25
28
Clay


Nickel Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
3
5
7
9
10
12
14
15
17
19
Non-Clay

Location	Clay	D_Clay
BG-1-2	14	1
BG-1-43	20	1
BG-1-55	2.7	1
BG-1-78	12	1
BG-2-30	24	1
BG-2-81	16	1
BG-3-17	4.2	1
BG-3-22	10	0
BG-3-69	14	1
BG-4-2	9	1
BG-4-19	22	1
BG-4-40	17	1
BG-4-79	15	1
BG-4-161	7	1
BG-4-163	13	1
BG-6-28	15	1
BG-6-53	11	1
BG-6-87	28	1

Location	Non-Clay	D_Non-Clay
BG-1-10	5.9	1
BG-1-29	6.5	1
BG-1-40	5	0
BG-1-46	4.1	1
BG-1-92	3.3	1
BG-2-2	2.6	1
BG-2-10	2.2	1
BG-2-19	4.7	1
BG-2-21	2	1
BG-2-32	3.2	1
BG-2-75	3.6	1
BG-3-2	4	1
BG-3-10	11	1
BG-3-29	3.4	1
BG-3-63	4	1
BG-3-65	8.3	1
BG-3-95	2.6	1
BG-3-105	8.7	1
BG-3-131	11	0
BG-3-136	19	1
BG-4-10	11	1
BG-4-65	3.4	1
BG-4-82	8	1
BG-4-95	2.4	1
BG-4-117	1.8	1
BG-4-120	14	1
BG-6-2	5.8	1
BG-6-9	2.8	1
BG-6-58	3.9	1
BG-6-75	4	1
BG-6-98	9.2	1
BG-6-114	10	1
BG-6-127	18	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nickel.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	11	1	8.33%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	11	2	14	5.591	4.7	3.813
Statistics (All: NDs treated as DL value)	12	2	14	5.542	4.85	3.64
Statistics (All: NDs treated as DL/2 value)	12	2	14	5.333	4.35	3.743
Statistics (Normal ROS Estimated Data)	12	2	14	5.393	4.35	3.7
Statistics (Gamma ROS Estimated Data)	12	2	14	5.446	4.35	3.67
Statistics (Lognormal ROS Estimated Data)	12	2	14	5.376	4.35	3.711

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.787	2.145	2.006	1.531	0.637	0.416
Statistics (NDs = DL)	3.019	2.32	1.836	1.538	0.608	0.396
Statistics (NDs = DL/2)	2.731	2.104	1.953	1.48	0.633	0.428
Statistics (Gamma ROS Estimates)	2.949	2.267	1.846	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.496	0.62	0.415

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.92	0.917	0.907	0.909

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.846	0.85	Data Not Normal
Lilliefors (Detects Only)	0.224	0.267	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.842	0.859	Data Not Normal
Lilliefors (NDs = DL)	0.229	0.256	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.822	0.859	Data Not Normal
Lilliefors (NDs = DL/2)	0.211	0.256	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.828	0.859	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.216	0.256	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.98	0.976	0.976	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.347	0.735	
Kolmogorov-Smirnov (Detects Only)	0.159	0.257	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.347	0.739	
Kolmogorov-Smirnov (NDs = DL)	0.151	0.247	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.464	0.74	

Kolmogorov-Smirnov (NDs = DL/2)	0.19	0.248	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.363	0.739	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.14	0.247	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.981	0.982	0.972	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.948	0.85	Data Appear Lognormal
Lilliefors (Detects Only)	0.148	0.267	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.954	0.859	Data Appear Lognormal
Lilliefors (NDs = DL)	0.132	0.256	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.931	0.859	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.178	0.256	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.944	0.859	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.153	0.256	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	39	0	39	37	2	5.13%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	2	10	11	10.5	10.5	0.707
Statistics (Detects Only)	37	1.8	28	10.16	9	6.951
Statistics (All: NDs treated as DL value)	39	1.8	28	10.17	9.2	6.767
Statistics (All: NDs treated as DL/2 value)	39	1.8	28	9.905	8.7	6.854
Statistics (Normal ROS Estimated Data)	39	1.8	28	9.941	8.7	6.83
Statistics (Gamma ROS Estimated Data)	39	1.8	28	9.978	8.7	6.81
Statistics (Lognormal ROS Estimated Data)	39	1.8	28	9.885	8.7	6.868

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.06	1.918	4.931	2.056	0.771	0.375
Statistics (NDs = DL)	2.163	2.014	4.704	2.071	0.753	0.364
Statistics (NDs = DL/2)	2.094	1.95	4.729	2.036	0.756	0.371
Statistics (Gamma ROS Estimates)	2.133	1.986	4.678	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.032	0.758	0.373

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.959	0.963	0.956	0.957

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.908	0.936	Data Not Normal
Lilliefors (Detects Only)	0.183	0.146	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.915	0.939	Data Not Normal
Lilliefors (NDs = DL)	0.17	0.142	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.902	0.939	Data Not Normal
Lilliefors (NDs = DL/2)	0.156	0.142	Data Not Normal

Shapiro-Wilks (Normal ROS Estimates)	0.905	0.939	Data Not Normal	
Lilliefors (Normal ROS Estimates)	0.159	0.142	Data Not Normal	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.985	0.987	0.987	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.807	0.759	
Kolmogorov-Smirnov (Detects Only)	0.183	0.147	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.76	0.758	
Kolmogorov-Smirnov (NDs = DL)	0.173	0.143	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.732	0.759	
Kolmogorov-Smirnov (NDs = DL/2)	0.159	0.143	Data appear Approximate Gamma Distribution
Anderson-Darling (Gamma ROS Estimates)	0.649	0.759	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.165	0.143	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.974	0.974	0.979	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.931	0.936	Data Not Lognormal
Lilliefors (Detects Only)	0.168	0.146	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.933	0.939	Data Not Lognormal
Lilliefors (NDs = DL)	0.16	0.142	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.941	0.939	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.146	0.142	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.939	0.939	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.143	0.142	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nickel.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Number of Valid Data	12	Number of Detected Data	11
Number of Distinct Detected Data	11	Number of Non-Detect Data	1
		Percent Non-Detects	8.33%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	2	Minimum Detected	0.693
Maximum Detected	14	Maximum Detected	2.639
Mean of Detected	5.591	Mean of Detected	1.531
SD of Detected	3.813	SD of Detected	0.637
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	5	Maximum Non-Detect	1.609

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.846	Shapiro Wilk Test Statistic	0.948
5% Shapiro Wilk Critical Value	0.85	5% Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.333	Mean (Log Scale)	1.48
SD	3.743	SD (Log Scale)	0.633
95% UTL 95% Coverage	15.58	95% UTL 95% Coverage	24.83
95% UPL (t)	12.33	95% UPL (t)	14.35
90% Percentile (z)	10.13	90% Percentile (z)	9.888
95% Percentile (z)	11.49	95% Percentile (z)	12.45
99% Percentile (z)	14.04	99% Percentile (z)	19.16
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	3.732	Mean in Original Scale	5.376
SD	5.362	SD in Original Scale	3.711
95% UTL with 95% Coverage	18.4	95% UTL with 95% Coverage	24.34
		95% BCA UTL with 95% Coverage	14
		95% Bootstrap (%) UTL with 95% Coverage	14
95% UPL (t)	13.76	95% UPL (t)	14.22
90% Percentile (z)	10.6	90% Percentile (z)	9.878
95% Percentile (z)	12.55	95% Percentile (z)	12.37
99% Percentile (z)	16.21	99% Percentile (z)	18.88

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.087	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2.679		
nu star	45.92		
A-D Test Statistic	0.347	Nonparametric Statistics	
5% A-D Critical Value	0.735	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.159	Mean	5.379
5% K-S Critical Value	0.257	SD	3.562
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.082
		95% KM UTL with 95% Coverage	15.12
Assuming Gamma Distribution		95% KM Chebyshev UPL	21.54
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	12.04
Mean	5.446	90% Percentile (z)	9.944
Median	4.35	95% Percentile (z)	11.24
SD	3.67	99% Percentile (z)	13.67
k star	2.267		
Theta star	2.402	Gamma ROS Limits with Extrapolated Data	
Nu star	54.42	95% Wilson Hilferty (WH) Approx. Gamma UPL	13.09
95% Percentile of Chisquare (2k)	10.34	95% Hawkins Wixley (HW) Approx. Gamma UPL	13.3
		95% WH Approx. Gamma UTL with 95% Coverage	18.95
90% Percentile	10.29	95% HW Approx. Gamma UTL with 95% Coverage	19.84
95% Percentile	12.42		
99% Percentile	17.12		

Note: DL/2 is not a recommended method.

MC

General Statistics			
Number of Valid Data	39	Number of Detected Data	37
Number of Distinct Detected Data	32	Number of Non-Detect Data	2
		Percent Non-Detects	5.13%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.8	Minimum Detected	0.588
Maximum Detected	28	Maximum Detected	3.332
Mean of Detected	10.16	Mean of Detected	2.056
SD of Detected	6.951	SD of Detected	0.771
Minimum Non-Detect	10	Minimum Non-Detect	2.303
Maximum Non-Detect	11	Maximum Non-Detect	2.398

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	23
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	16
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	58.97%

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.908	Shapiro Wilk Test Statistic	0.931
5% Shapiro Wilk Critical Value	0.936	5% Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	9.905	Mean (Log Scale)	2.036
SD	6.854	SD (Log Scale)	0.756
95% UTL 95% Coverage	24.47	95% UTL 95% Coverage	38.12
95% UPL (t)	21.61	95% UPL (t)	27.82
90% Percentile (z)	18.69	90% Percentile (z)	20.17
95% Percentile (z)	21.18	95% Percentile (z)	26.54
99% Percentile (z)	25.85	99% Percentile (z)	44.41
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	9.113	Mean in Original Scale	9.885
SD	8.157	SD in Original Scale	6.868
95% UTL with 95% Coverage	26.44	95% UTL with 95% Coverage	38.15
		95% BCA UTL with 95% Coverage	28
		95% Bootstrap (%) UTL with 95% Coverage	28
95% UPL (t)	23.04	95% UPL (t)	27.81
90% Percentile (z)	19.57	90% Percentile (z)	20.14
95% Percentile (z)	22.53	95% Percentile (z)	26.52
99% Percentile (z)	28.09	99% Percentile (z)	44.45
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.911	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.315		
nu star	141.4		
A-D Test Statistic	0.807	Nonparametric Statistics	
5% A-D Critical Value	0.759	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.183	Mean	9.89
5% K-S Critical Value	0.147	SD	6.8
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.108
		95% KM UTL with 95% Coverage	24.34
Assuming Gamma Distribution		95% KM Chebyshev UPL	39.91
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	21.5
Mean	9.978	90% Percentile (z)	18.6
Median	8.7	95% Percentile (z)	21.07
SD	6.81	99% Percentile (z)	25.71
k star	1.986		
Theta star	5.024	Gamma ROS Limits with Extrapolated Data	
Nu star	154.9	95% Wilson Hilferty (WH) Approx. Gamma UPL	24.13
95% Percentile of Chisquare (2k)	9.443	95% Hawkins Wixley (HW) Approx. Gamma UPL	24.81
		95% WH Approx. Gamma UTL with 95% Coverage	29.72
90% Percentile	19.44	95% HW Approx. Gamma UTL with 95% Coverage	31.15
95% Percentile	23.72		
99% Percentile	33.22		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nickel.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Alluv

Background Data: MC

Raw Statistics

	Site	Background
Number of Valid Data	12	39
Number of Non-Detect Data	1	2
Number of Detect Data	11	37
Minimum Non-Detect	5	10
Maximum Non-Detect	5	11
Percent Non detects	8.33%	5.13%
Minimum Detected	2	1.8
Maximum Detected	14	28
Mean of Detected Data	5.591	10.16
Median of Detected Data	4.7	9
SD of Detected Data	3.813	6.951

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-2.124
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0337

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Outlier Tests for Selected Variables

User Selected Options	
From File	Nickel.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 14 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.636

For 10% significance level, 14 is an outlier.
For 5% significance level, 14 is an outlier.
For 1% significance level, 14 is not an outlier.

2. Data Value 2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.056

For 10% significance level, 2 is not an outlier.
For 5% significance level, 2 is not an outlier.
For 1% significance level, 2 is not an outlier.

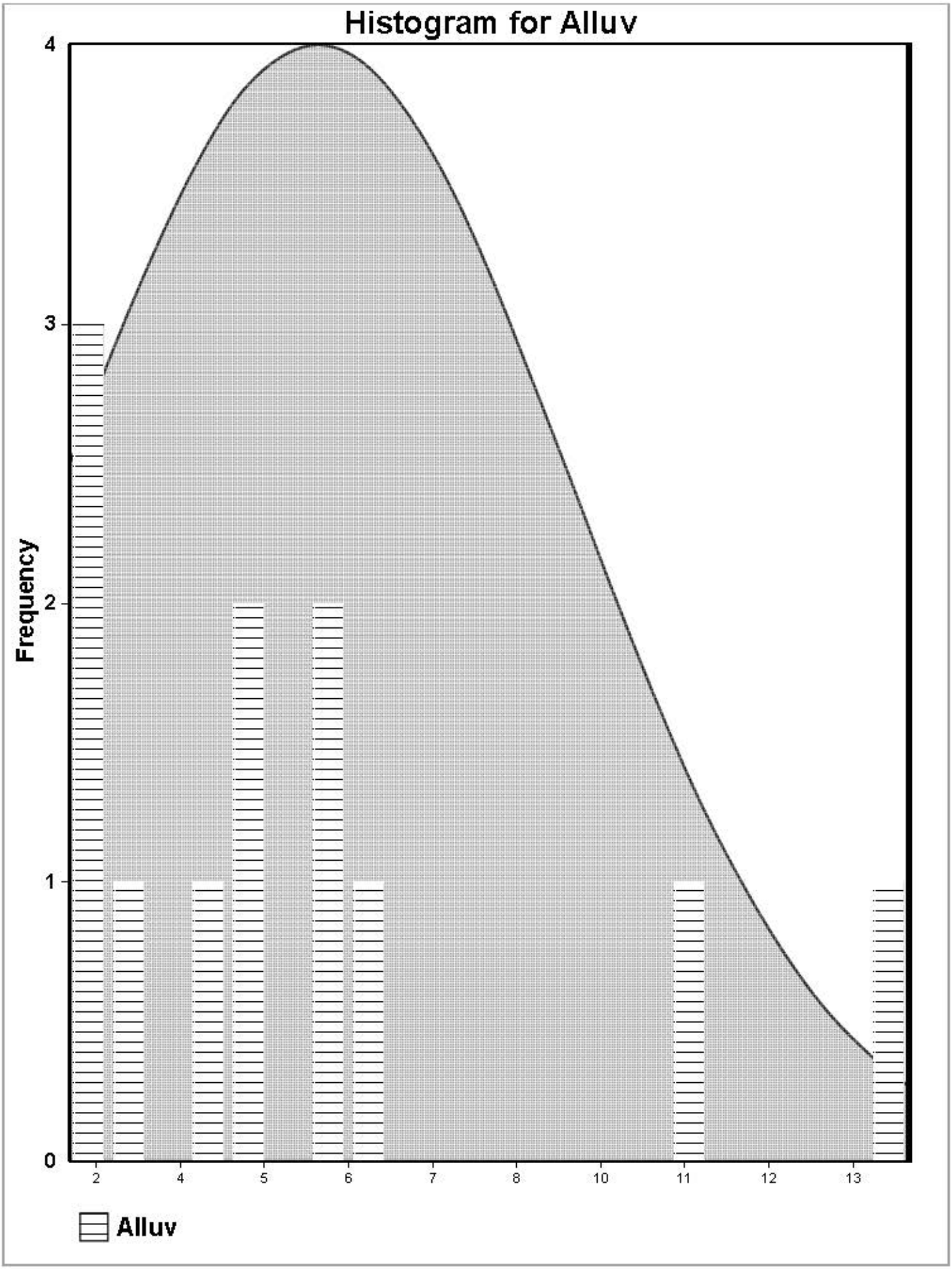
Rosner's Outlier Test for MC

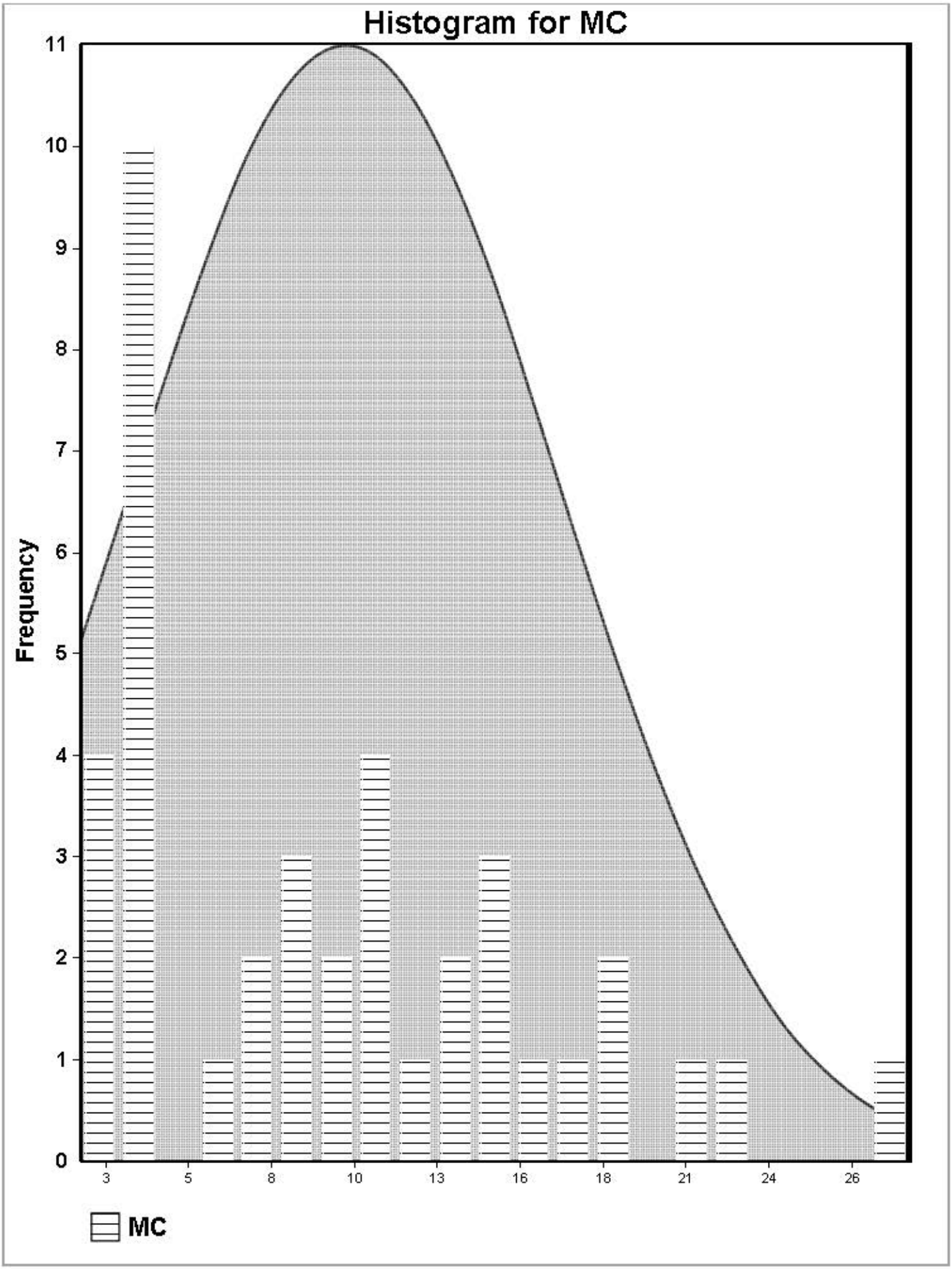
Mean	9.905
Standard Deviation	6.854
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	9.905	6.765	28	36	2.675	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier


Histogram for Alluv
Frequency
0
1
2
3
4
2
4
5
6
7
8
10
11
12
13
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
3
5
8
10
13
16
18
21
24
26
MC

Location	Alluv	D_Alluv
BG-1-2	14	1
BG-1-10	5.9	1
BG-1-29	6.5	1
BG-1-40	5	0
BG-2-2	2.6	1
BG-2-10	2.2	1
BG-2-19	4.7	1
BG-2-21	2	1
BG-3-2	4	1
BG-3-10	11	1
BG-6-2	5.8	1
BG-6-9	2.8	1

Location	MC	D_MC
BG-1-43	20	1
BG-1-46	4.1	1
BG-1-55	2.7	1
BG-1-78	12	1
BG-1-92	3.3	1
BG-2-30	24	1
BG-2-32	3.2	1
BG-2-75	3.6	1
BG-2-81	16	1
BG-3-17	4.2	1
BG-3-22	10	0
BG-3-29	3.4	1
BG-3-63	4	1
BG-3-65	8.3	1
BG-3-69	14	1
BG-3-95	2.6	1
BG-3-105	8.7	1
BG-3-131	11	0
BG-3-136	19	1
BG-4-1	9	1
BG-4-10	11	1
BG-4-19	22	1
BG-4-40	17	1
BG-4-65	3.4	1
BG-4-79	15	1
BG-4-82	8	1
BG-4-95	2.4	1
BG-4-117	1.8	1
BG-4-120	14	1
BG-4-161	7	1
BG-4-163	13	1
BG-6-28	15	1
BG-6-53	11	1
BG-6-58	3.9	1
BG-6-75	4	1
BG-6-87	28	1
BG-6-98	9.2	1
BG-6-114	10	1
BG-1-127	18	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nitrate.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	21	30	58.82%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	30	1	1.2	1.12	1.2	0.0961
Statistics (Detects Only)	21	0.25	150	10.17	0.54	32.87
Statistics (All: NDs treated as DL value)	51	0.25	150	4.847	1	21.27
Statistics (All: NDs treated as DL/2 value)	51	0.25	150	4.518	0.56	21.33
Statistics (Normal ROS Estimated Data)	51	-20.45	150	5.459	0.56	22.75
Statistics (Gamma ROS Estimated Data)	51	1.000E-12	150	9.767	7.609	20.98
Statistics (Lognormal ROS Estimated Data)	51	0.0648	150	4.613	0.515	21.32

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.296	0.292	34.36	-0.015	1.768	-117.7
Statistics (NDs = DL)	0.428	0.416	11.32	0.0583	1.122	19.24
Statistics (NDs = DL/2)	0.36	0.352	12.54	-0.349	1.155	-3.307
Statistics (Gamma ROS Estimates)	0.412	0.401	23.69	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.434	1.387	-3.197

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.556	0.42	0.414	0.681

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.335	0.908	Data Not Normal
Lilliefors (Detects Only)	0.422	0.193	Data Not Normal
Lilliefors (NDs = DL)	0.488	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.482	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.229	0.124	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.895	0.733	0.752	0.943

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	3.996	0.848	
Kolmogorov-Smirnov (Detects Only)	0.391	0.206	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	11.71	0.832	
Kolmogorov-Smirnov (NDs = DL)	0.49	0.133	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	14.59	0.848	
Kolmogorov-Smirnov (NDs = DL/2)	0.49	0.134	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.726	0.836	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.189	0.133	Data Not Gamma Distributed	

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.846	0.819	0.717	0.917

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.719	0.908	Data Not Lognormal
Lilliefors (Detects Only)	0.288	0.193	Data Not Lognormal
Lilliefors (NDs = DL)	0.358	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.413	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.145	0.124	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nitrate.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Number of Valid Data	51	Number of Detected Data	21
Number of Distinct Detected Data	19	Number of Non-Detect Data	30
		Percent Non-Detects	58.82%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.25	Minimum Detected	-1.386
Maximum Detected	150	Maximum Detected	5.011
Mean of Detected	10.17	Mean of Detected	-0.015
SD of Detected	32.87	SD of Detected	1.768
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1.2	Maximum Non-Detect	0.182

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	45
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	6
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	88.24%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.335	Shapiro Wilk Test Statistic	0.719
5% Shapiro Wilk Critical Value	0.908	5% Shapiro Wilk Critical Value	0.908
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	4.518	Mean (Log Scale)	-0.349
SD	21.33	SD (Log Scale)	1.155
95% UTL 95% Coverage	48.32	95% UTL 95% Coverage	7.565
95% UPL (t)	40.61	95% UPL (t)	4.982
90% Percentile (z)	31.85	90% Percentile (z)	3.1
95% Percentile (z)	39.6	95% Percentile (z)	4.717
99% Percentile (z)	54.14	99% Percentile (z)	10.37
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-103.3	Mean in Original Scale	4.613
SD	85.82	SD in Original Scale	21.32
95% UTL with 95% Coverage	72.99	95% UTL with 95% Coverage	11.19
		95% BCA UTL with 95% Coverage	87.5
		95% Bootstrap (%) UTL with 95% Coverage	87.5
95% UPL (t)	41.97	95% UPL (t)	6.776

90% Percentile (z)	6.72	90% Percentile (z)	3.833
95% Percentile (z)	37.9	95% Percentile (z)	6.344
99% Percentile (z)	96.38	99% Percentile (z)	16.33
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.285	Data do not follow a Discernable Distribution (0.05)	
Theta Star	35.63		
nu star	11.99		
A-D Test Statistic	3.996	Nonparametric Statistics	
5% A-D Critical Value	0.848	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.391	Mean	4.435
5% K-S Critical Value	0.206	SD	21.14
Data not Gamma Distributed at 5% Significance Level		SE of Mean	3.033
		95% KM UTL with 95% Coverage	47.84
Assuming Gamma Distribution		95% KM Chebyshev UPL	97.46
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	40.2
Mean	9.767	90% Percentile (z)	31.52
Median	7.609	95% Percentile (z)	39.2
SD	20.98	99% Percentile (z)	53.6
k star	0.401		
Theta star	24.35	Gamma ROS Limits with Extrapolated Data	
Nu star	40.91	95% Wilson Hilferty (WH) Approx. Gamma UPL	34.01
95% Percentile of Chisquare (2k)	3.33	95% Hawkins Wixley (HW) Approx. Gamma UPL	36.87
		95% WH Approx. Gamma UTL with 95% Coverage	45.42
90% Percentile	27.57	95% HW Approx. Gamma UTL with 95% Coverage	51.65
95% Percentile	40.54		
99% Percentile	73.14		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Nitrate.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for All Data

Mean	4.518
Standard Deviation	21.33
Number of data	51
Number of suspected outliers	1

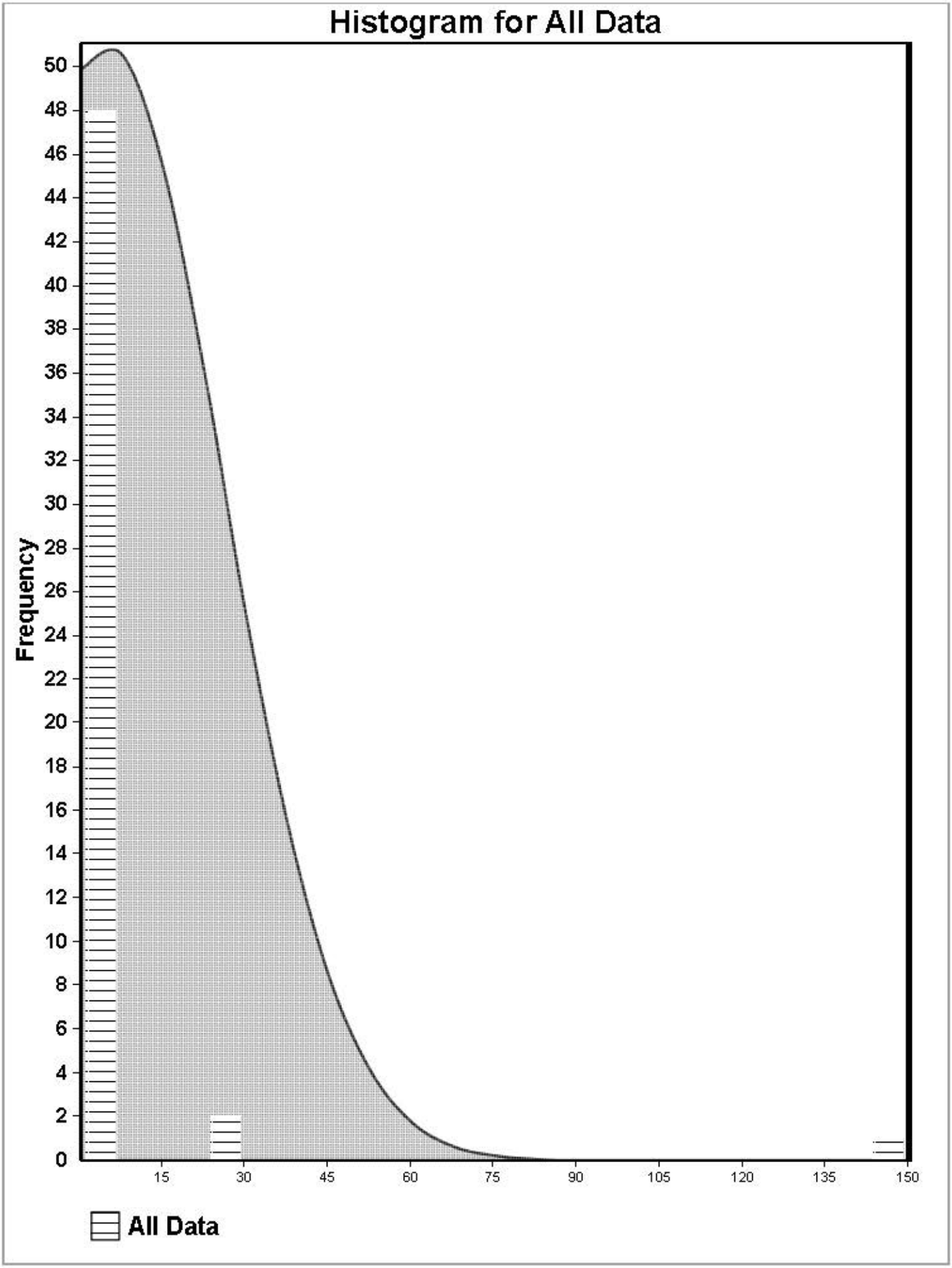
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4.518	21.12	150	45	6.889	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 150 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 150 is a Potential Statistical Outlier


Histogram for All Data
Frequency
50
48
46
44
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
15
30
45
60
75
90
105
120
135
150
All Data

Location	All Data	D_All Data
BG-1-2	0.4	1
BG-1-43	0.55	1
BG-1-55	1	0
BG-1-78	1	0
BG-2-30	1	0
BG-2-81	0.56	1
BG-3-17	0.36	1
BG-3-22	0.31	1
BG-3-69	1.1	0
BG-4-2	25	1
BG-4-19	1.2	0
BG-4-40	1.2	0
BG-4-79	1	0
BG-4-161	1.2	0
BG-4-163	1.2	0
BG-6-28	1.2	1
BG-6-53	1.2	0
BG-6-87	1.2	0
BG-1-10	0.3	1
BG-1-29	0.33	1
BG-1-40	0.32	1
BG-1-46	1	0
BG-1-92	1	0
BG-2-2	1.3	1
BG-2-10	0.54	1
BG-2-19	1	0
BG-2-21	1	0
BG-2-32	1	0
BG-2-75	1	0
BG-3-2	4.8	1
BG-3-10	0.71	1
BG-3-29	0.61	1
BG-3-63	0.28	1
BG-3-65	1.2	0
BG-3-95	0.47	1
BG-3-105	0.31	1
BG-3-131	0.25	1
BG-3-136	1.2	0
BG-4-10	1.1	0
BG-4-65	1	0
BG-4-82	1.2	0
BG-4-95	1.2	0
BG-4-117	1.2	0
BG-4-120	1.2	0
BG-6-2	150	1
BG-6-9	25	1
BG-6-58	1.2	0
BG-6-75	1.2	0
BG-6-98	1.2	0
BG-6-114	1.2	0
BG-6-127	1.2	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nitrate.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	10	3	23.08%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	1	1.2	1.1	1.1	0.1
Statistics (Detects Only)	10	0.3	150	20.84	1.005	46.47
Statistics (All: NDs treated as DL value)	13	0.3	150	16.29	1.1	41.16
Statistics (All: NDs treated as DL/2 value)	13	0.3	150	16.16	0.6	41.21
Statistics (Normal ROS Estimated Data)	13	-2.174	150	15.53	0.54	41.49
Statistics (Gamma ROS Estimated Data)	13	0.118	150	16.06	0.54	41.25
Statistics (Lognormal ROS Estimated Data)	13	0.3	150	16.15	0.54	41.22

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.322	0.299	64.78	0.918	2.205	2.402
Statistics (NDs = DL)	0.329	0.305	49.46	0.727	1.944	2.673
Statistics (NDs = DL/2)	0.31	0.29	52.17	0.567	2.023	3.565
Statistics (Gamma ROS Estimates)	0.273	0.261	58.79	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.557	2.029	3.644

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.697	0.645	0.644	0.66

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.513	0.842	Data Not Normal
Lilliefors (Detects Only)	0.364	0.28	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.445	0.866	Data Not Normal
Lilliefors (NDs = DL)	0.379	0.246	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.444	0.866	Data Not Normal
Lilliefors (NDs = DL/2)	0.378	0.246	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.465	0.866	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.371	0.246	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.96	0.937	0.941	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.974	0.81	
Kolmogorov-Smirnov (Detects Only)	0.284	0.287	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	1.629	0.824	
Kolmogorov-Smirnov (NDs = DL)	0.357	0.255	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	1.819	0.828	
Kolmogorov-Smirnov (NDs = DL/2)	0.339	0.256	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.395	0.84	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.303	0.258	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.936	0.921	0.892	0.889

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.861	0.842	Data Appear Lognormal
Lilliefors (Detects Only)	0.217	0.28	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.844	0.866	Data Not Lognormal
Lilliefors (NDs = DL)	0.287	0.246	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.792	0.866	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.289	0.246	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.786	0.866	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.287	0.246	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

>20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	38	0	38	11	27	71.05%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	27	1	1.2	1.122	1.2	0.0974
Statistics (Detects Only)	11	0.25	1.2	0.472	0.33	0.273
Statistics (All: NDs treated as DL value)	38	0.25	1.2	0.934	1	0.341
Statistics (All: NDs treated as DL/2 value)	38	0.25	1.2	0.535	0.555	0.153
Statistics (Normal ROS Estimated Data)	38	0.0465	1.2	0.436	0.416	0.217
Statistics (Gamma ROS Estimated Data)	38	0.25	1.2	0.469	0.463	0.143
Statistics (Lognormal ROS Estimated Data)	38	0.196	1.2	0.426	0.381	0.187

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.626	4.278	0.102	-0.863	0.465	-0.538
Statistics (NDs = DL)	5.051	4.67	0.185	-0.171	0.514	-3.016
Statistics (NDs = DL/2)	13.29	12.26	0.0403	-0.663	0.284	-0.428
Statistics (Gamma ROS Estimates)	15.25	14.07	0.0308	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.928	0.381	-0.411

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.85	0.868	0.837	0.964

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.741	0.85	Data Not Normal
Lilliefors (Detects Only)	0.244	0.267	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.732	0.938	Data Not Normal
Lilliefors (NDs = DL)	0.314	0.144	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.738	0.938	Data Not Normal

Lilliefors (NDs = DL/2)	0.287	0.144	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.946	0.938	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.09	0.144	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.926	0.78	0.842	0.96

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.714	0.732	
Kolmogorov-Smirnov (Detects Only)	0.26	0.256	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	4.859	0.751	
Kolmogorov-Smirnov (NDs = DL)	0.356	0.144	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.34	0.748	
Kolmogorov-Smirnov (NDs = DL/2)	0.255	0.143	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.342	0.747	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.275	0.143	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.936	0.839	0.879	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.881	0.85	Data Appear Lognormal
Lilliefors (Detects Only)	0.247	0.267	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.69	0.938	Data Not Lognormal
Lilliefors (NDs = DL)	0.367	0.144	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.798	0.938	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.274	0.144	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.977	0.938	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0938	0.144	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nitrate.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Number of Valid Data	13	Number of Detected Data	10
Number of Distinct Detected Data	9	Number of Non-Detect Data	3
		Percent Non-Detects	23.08%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.3	Minimum Detected	-1.204
Maximum Detected	150	Maximum Detected	5.011
Mean of Detected	20.84	Mean of Detected	0.918
SD of Detected	46.47	SD of Detected	2.205
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1.2	Maximum Non-Detect	0.182

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	8
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	5
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	61.54%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.513	Shapiro Wilk Test Statistic	0.861
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	16.16	Mean (Log Scale)	0.567
SD	41.21	SD (Log Scale)	2.023
95% UTL 95% Coverage	126.2	95% UTL 95% Coverage	391.6
95% UPL (t)	92.39	95% UPL (t)	74.35
90% Percentile (z)	68.98	90% Percentile (z)	23.57
95% Percentile (z)	83.95	95% Percentile (z)	49.14
99% Percentile (z)	112	99% Percentile (z)	195
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-28.36	Mean in Original Scale	16.15
SD	76.42	SD in Original Scale	41.22
95% UTL with 95% Coverage	175.8	95% UTL with 95% Coverage	394.2
		95% BCA UTL with 95% Coverage	150
		95% Bootstrap (%) UTL with 95% Coverage	150
95% UPL (t)	113	95% UPL (t)	74.44

90% Percentile (z)	69.58	90% Percentile (z)	23.51
95% Percentile (z)	97.34	95% Percentile (z)	49.13
99% Percentile (z)	149.4	99% Percentile (z)	195.9
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.292	Data follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	71.4		
nu star	5.837		
A-D Test Statistic	0.974	Nonparametric Statistics	
5% A-D Critical Value	0.81	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.284	Mean	16.14
5% K-S Critical Value	0.287	SD	39.6
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	11.58
		95% KM UTL with 95% Coverage	121.9
Assuming Gamma Distribution		95% KM Chebyshev UPL	195.3
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	89.39
Mean	16.06	90% Percentile (z)	66.89
Median	0.54	95% Percentile (z)	81.28
SD	41.25	99% Percentile (z)	108.3
k star	0.261		
Theta star	61.44	Gamma ROS Limits with Extrapolated Data	
Nu star	6.796	95% Wilson Hilferty (WH) Approx. Gamma UPL	70.29
95% Percentile of Chisquare (2k)	2.497	95% Hawkins Wixley (HW) Approx. Gamma UPL	70.06
		95% WH Approx. Gamma UTL with 95% Coverage	149.1
90% Percentile	48.04	95% HW Approx. Gamma UTL with 95% Coverage	171.5
95% Percentile	76.7		
99% Percentile	152.5		

Note: DL/2 is not a recommended method.

>20

General Statistics			
Number of Valid Data	38	Number of Detected Data	11
Number of Distinct Detected Data	10	Number of Non-Detect Data	27
		Percent Non-Detects	71.05%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.25	Minimum Detected	-1.386
Maximum Detected	1.2	Maximum Detected	0.182
Mean of Detected	0.472	Mean of Detected	-0.863
SD of Detected	0.273	SD of Detected	0.465
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1.2	Maximum Non-Detect	0.182
Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	37
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	97.37%
Background Statistics			

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.741	Shapiro Wilk Test Statistic	0.881
5% Shapiro Wilk Critical Value	0.85	5% Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.535	Mean (Log Scale)	-0.663
SD	0.153	SD (Log Scale)	0.284
95% UTL 95% Coverage	0.862	95% UTL 95% Coverage	0.944
95% UPL (t)	0.797	95% UPL (t)	0.837
90% Percentile (z)	0.732	90% Percentile (z)	0.741
95% Percentile (z)	0.787	95% Percentile (z)	0.822
99% Percentile (z)	0.892	99% Percentile (z)	0.998
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.426
		SD in Original Scale	0.187
		Mean in Log Scale	-0.928
		SD in Log Scale	0.381
		95% UTL 95% Coverage	0.892
		95% UPL (t)	0.759
		90% Percentile (z)	0.644
		95% Percentile (z)	0.74
		99% Percentile (z)	0.96
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.425	Data follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.138		
nu star	75.35		
A-D Test Statistic	0.714	Nonparametric Statistics	
5% A-D Critical Value	0.732	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.26	Mean	0.42
5% K-S Critical Value	0.256	SD	0.179
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	0.0465
		95% KM UTL with 95% Coverage	0.802
Assuming Gamma Distribution		95% KM Chebyshev UPL	1.212
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.727
Mean	0.469	90% Percentile (z)	0.65
Median	0.463	95% Percentile (z)	0.715
SD	0.143	99% Percentile (z)	0.837
k star	14.07		
Theta star	0.0334	Gamma ROS Limits with Extrapolated Data	
Nu star	1069	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.695
95% Percentile of Chisquare (2k)	41.5	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.694
		95% WH Approx. Gamma UTL with 95% Coverage	0.764
90% Percentile	0.635	95% HW Approx. Gamma UTL with 95% Coverage	0.765
95% Percentile	0.692		
99% Percentile	0.808		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Nitrate.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 150 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.835

For 10% significance level, 150 is an outlier.
For 5% significance level, 150 is an outlier.
For 1% significance level, 150 is an outlier.

2. Data Value 0.3 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.004

For 10% significance level, 0.3 is not an outlier.
For 5% significance level, 0.3 is not an outlier.
For 1% significance level, 0.3 is not an outlier.

Rosner's Outlier Test for >20

Mean	0.535
Standard Deviation	0.153
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.535	0.151	1.2	36	4.396	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1.2 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1.2 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nitrate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Data	38	13
Number of Non-Detect Data	27	3
Number of Detect Data	11	10
Minimum Non-Detect	1	1
Maximum Non-Detect	1.2	1.2
Percent Non detects	71.05%	23.08%
Minimum Detected	0.25	0.3
Maximum Detected	1.2	150
Mean of Detected Data	0.472	20.84
Median of Detected Data	0.33	1.005
SD of Detected Data	0.273	46.47

Site vs Background Gehan Test

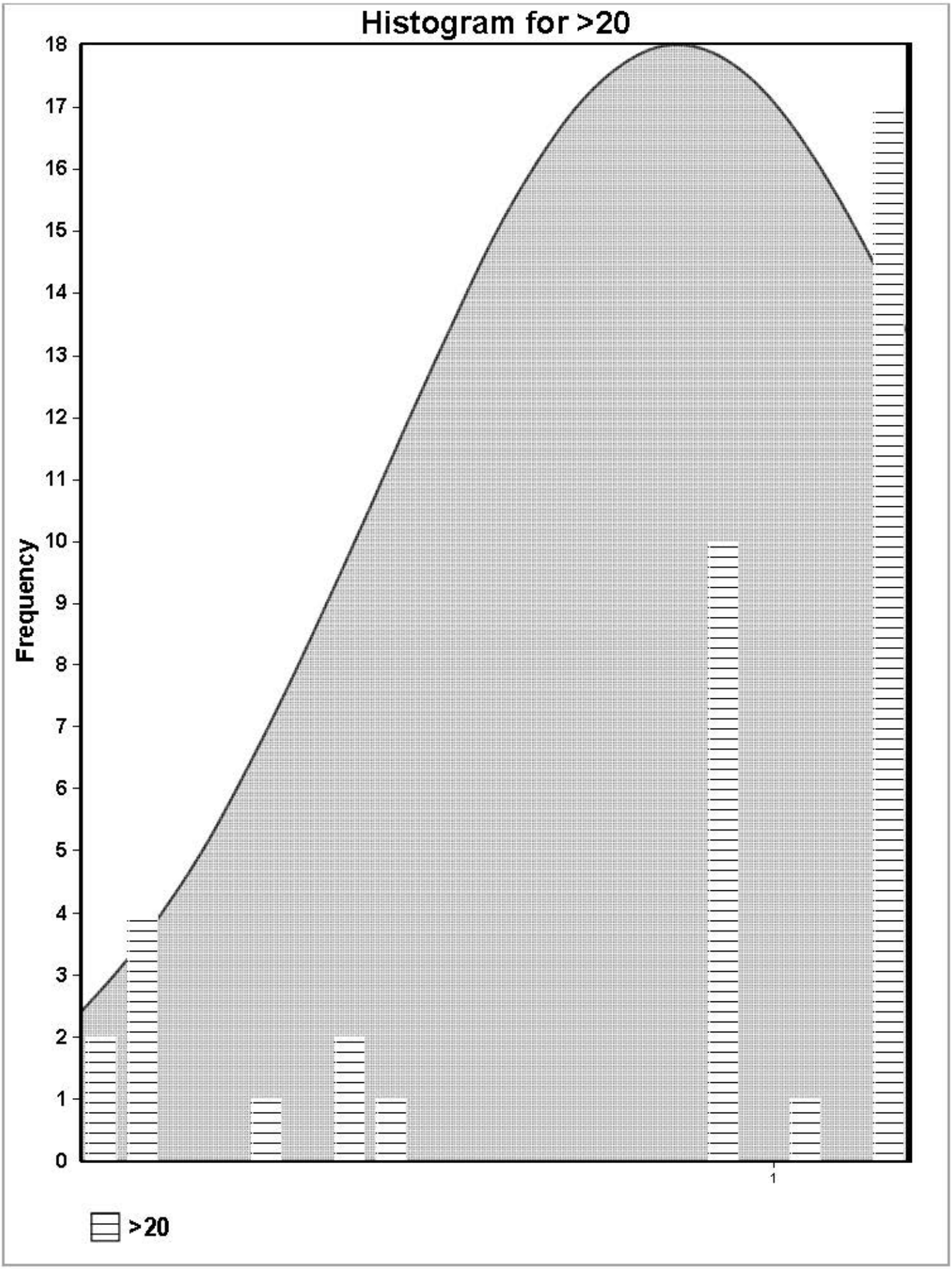
H0: Mu of Site or AOC = Mu of background

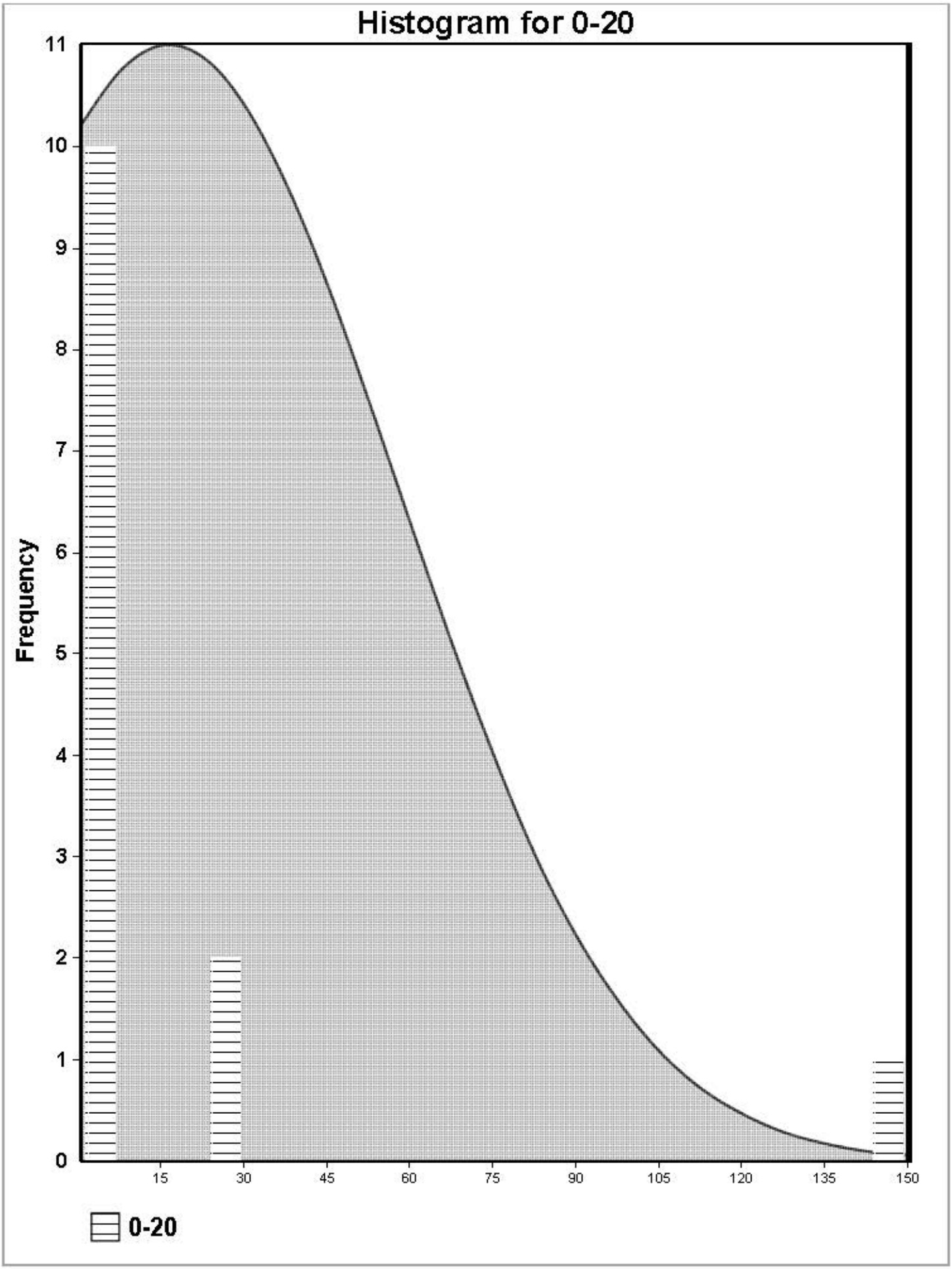
Gehan z Test Value	-3.604
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	3.1378E-4

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

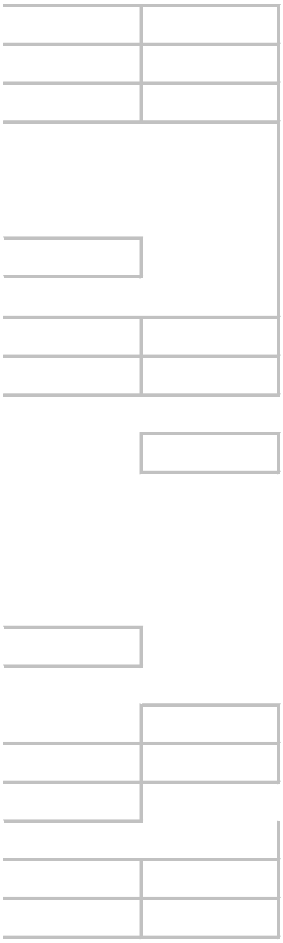
P-Value < alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
1
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
15
30
45
60
75
90
105
120
135
150
0-20

Location	0-20	D_0-20
BG-1-2	0.4	1
BG-3-17	0.36	1
BG-4-2	25	1
BG-4-19	1.2	0
BG-1-10	0.3	1
BG-2-2	1.3	1
BG-2-10	0.54	1
BG-2-19	1	0
BG-3-2	4.8	1
BG-3-10	0.71	1
BG-4-10	1.1	0
BG-6-2	150	1
BG-6-9	25	1

Location	>20	D_>20
BG-1-29	0.33	1
BG-1-40	0.32	1
BG-1-46	1	0
BG-1-92	1	0
BG-2-21	1	0
BG-2-32	1	0
BG-2-75	1	0
BG-3-29	0.61	1
BG-3-63	0.28	1
BG-3-65	1.2	0
BG-3-95	0.47	1
BG-3-105	0.31	1
BG-3-131	0.25	1
BG-3-136	1.2	0
BG-4-65	1	0
BG-4-82	1.2	0
BG-4-95	1.2	0
BG-4-117	1.2	0
BG-4-120	1.2	0
BG-6-58	1.2	0
BG-6-75	1.2	0
BG-6-98	1.2	0
BG-6-114	1.2	0
BG-6-127	1.2	0
BG-1-43	0.55	1
BG-1-55	1	0
BG-1-78	1	0
BG-2-30	1	0
BG-2-81	0.56	1
BG-3-22	0.31	1
BG-3-69	1.1	0
BG-4-40	1.2	0
BG-4-79	1	0
BG-4-161	1.2	0
BG-4-163	1.2	0
BG-6-28	1.2	1
BG-6-53	1.2	0
BG-6-87	1.2	0



Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nitrate.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	7	11	61.11%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	11	1	1.2	1.118	1.2	0.0982
Statistics (Detects Only)	7	0.31	25	4.054	0.55	9.241
Statistics (All: NDs treated as DL value)	18	0.31	25	2.26	1.05	5.685
Statistics (All: NDs treated as DL/2 value)	18	0.31	25	1.918	0.555	5.763
Statistics (Normal ROS Estimated Data)	18	-4.517	25	2.261	0.555	6.257
Statistics (Gamma ROS Estimated Data)	18	1.000E-12	25	3.832	2.89	5.675
Statistics (Lognormal ROS Estimated Data)	18	0.145	25	1.938	0.52	5.766

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.427	0.393	9.502	-0.127	1.54	-12.17
Statistics (NDs = DL)	0.75	0.662	3.014	0.0169	0.925	54.83
Statistics (NDs = DL/2)	0.586	0.525	3.274	-0.407	0.946	-2.326
Statistics (Gamma ROS Estimates)	0.311	0.296	12.32	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.504	1.112	-2.207

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.671	0.519	0.495	0.787

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.479	0.803	Data Not Normal
Lilliefors (Detects Only)	0.478	0.335	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.299	0.897	Data Not Normal
Lilliefors (NDs = DL)	0.518	0.209	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.274	0.897	Data Not Normal
Lilliefors (NDs = DL/2)	0.494	0.209	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.652	0.897	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.259	0.209	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.932	0.753	0.767	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.48	0.763	
Kolmogorov-Smirnov (Detects Only)	0.407	0.33	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.738	0.778	
Kolmogorov-Smirnov (NDs = DL)	0.481	0.211	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	5.179	0.793	
Kolmogorov-Smirnov (NDs = DL/2)	0.501	0.214	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.034	0.84	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.297	0.22	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.822	0.805	0.68	0.875

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.697	0.803	Data Not Lognormal
Lilliefors (Detects Only)	0.33	0.335	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.679	0.897	Data Not Lognormal
Lilliefors (NDs = DL)	0.373	0.209	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.496	0.897	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.433	0.209	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.792	0.897	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.2	0.209	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	14	19	57.58%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	19	1	1.2	1.121	1.2	0.0976
Statistics (Detects Only)	14	0.25	150	13.23	0.505	39.9
Statistics (All: NDs treated as DL value)	33	0.25	150	6.258	1	26.15
Statistics (All: NDs treated as DL/2 value)	33	0.25	150	5.935	0.6	26.22
Statistics (Normal ROS Estimated Data)	33	-23.12	150	7.213	0.61	27.92
Statistics (Gamma ROS Estimated Data)	33	0.25	150	12.76	8.801	25.71
Statistics (Lognormal ROS Estimated Data)	33	0.0669	150	6.037	0.503	26.2

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.275	0.27	48.08	0.0407	1.925	47.28
Statistics (NDs = DL)	0.379	0.364	16.52	0.0809	1.229	15.19
Statistics (NDs = DL/2)	0.324	0.315	18.3	-0.318	1.268	-3.986
Statistics (Gamma ROS Estimates)	0.521	0.494	24.48	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.414	1.504	-3.634

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.588	0.446	0.442	0.705

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.376	0.874	Data Not Normal
Lilliefors (Detects Only)	0.441	0.237	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.232	0.931	Data Not Normal
Lilliefors (NDs = DL)	0.484	0.154	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.228	0.931	Data Not Normal

Lilliefors (NDs = DL/2)	0.479	0.154	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.539	0.931	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.236	0.154	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.921	0.773	0.79	0.962

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.639	0.842	
Kolmogorov-Smirnov (Detects Only)	0.377	0.249	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	7.705	0.838	
Kolmogorov-Smirnov (NDs = DL)	0.489	0.165	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	9.373	0.85	
Kolmogorov-Smirnov (NDs = DL/2)	0.493	0.166	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.772	0.809	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.2	0.162	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.852	0.821	0.726	0.914

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.732	0.874	Data Not Lognormal
Lilliefors (Detects Only)	0.293	0.237	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.699	0.931	Data Not Lognormal
Lilliefors (NDs = DL)	0.35	0.154	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.553	0.931	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.404	0.154	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.853	0.931	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.156	0.154	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nitrate.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Number of Valid Data	18	Number of Detected Data	7
Number of Distinct Detected Data	7	Number of Non-Detect Data	11
		Percent Non-Detects	61.11%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.31	Minimum Detected	-1.171
Maximum Detected	25	Maximum Detected	3.219
Mean of Detected	4.054	Mean of Detected	-0.127
SD of Detected	9.241	SD of Detected	1.54
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1.2	Maximum Non-Detect	0.182

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	16
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	2
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	88.89%

Warning: There are only 7 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.479	Shapiro Wilk Test Statistic	0.697
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.918	Mean (Log Scale)	-0.407
SD	5.763	SD (Log Scale)	0.946
95% UTL 95% Coverage	16.06	95% UTL 95% Coverage	6.777
95% UPL (t)	12.22	95% UPL (t)	3.611
90% Percentile (z)	9.304	90% Percentile (z)	2.238
95% Percentile (z)	11.4	95% Percentile (z)	3.155
99% Percentile (z)	15.33	99% Percentile (z)	6.012

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	1.938
		SD in Original Scale	5.766
		Mean in Log Scale	-0.504
		SD in Log Scale	1.112
		95% UTL 95% Coverage	9.239
		95% UPL (t)	4.408
		90% Percentile (z)	2.512
		95% Percentile (z)	3.762
		99% Percentile (z)	8.025
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.339	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.96		
nu star	4.747		
A-D Test Statistic	1.48	Nonparametric Statistics	
5% A-D Critical Value	0.763	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.407	Mean	1.843
5% K-S Critical Value	0.33	SD	5.62
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.431
		95% KM UTL with 95% Coverage	15.63
Assuming Gamma Distribution		95% KM Chebyshev UPL	27.01
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	11.89
Mean	3.832	90% Percentile (z)	9.045
Median	2.89	95% Percentile (z)	11.09
SD	5.675	99% Percentile (z)	14.92
k star	0.296		
Theta star	12.94	Gamma ROS Limits with Extrapolated Data	
Nu star	10.66	95% Wilson Hilferty (WH) Approx. Gamma UPL	14.83
95% Percentile of Chisquare (2k)	2.721	95% Hawkins Wixley (HW) Approx. Gamma UPL	17.43
		95% WH Approx. Gamma UTL with 95% Coverage	24.09
90% Percentile	11.32	95% HW Approx. Gamma UTL with 95% Coverage	31.23
95% Percentile	17.6		
99% Percentile	33.95		

Note: DL/2 is not a recommended method.

Non-Clay

General Statistics

Number of Valid Data	33	Number of Detected Data	14
Number of Distinct Detected Data	14	Number of Non-Detect Data	19
		Percent Non-Detects	57.58%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.25	Minimum Detected	-1.386
Maximum Detected	150	Maximum Detected	5.011
Mean of Detected	13.23	Mean of Detected	0.0407
SD of Detected	39.9	SD of Detected	1.925
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1.2	Maximum Non-Detect	0.182

Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	29
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	87.88%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.376	Shapiro Wilk Test Statistic	0.732
5% Shapiro Wilk Critical Value	0.874	5% Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.935	Mean (Log Scale)	-0.318
SD	26.22	SD (Log Scale)	1.268
95% UTL 95% Coverage	62.99	95% UTL 95% Coverage	11.49
95% UPL (t)	51.01	95% UPL (t)	6.437
90% Percentile (z)	39.53	90% Percentile (z)	3.695
95% Percentile (z)	49.06	95% Percentile (z)	5.856
99% Percentile (z)	66.93	99% Percentile (z)	13.9
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-125.3	Mean in Original Scale	6.037
SD	106.1	SD in Original Scale	26.2
95% UTL with 95% Coverage	105.6	95% UTL with 95% Coverage	17.44
		95% BCA UTL with 95% Coverage	150
		95% Bootstrap (%) UTL with 95% Coverage	150
95% UPL (t)	57.1	95% UPL (t)	8.777
90% Percentile (z)	10.65	90% Percentile (z)	4.543
95% Percentile (z)	49.19	95% Percentile (z)	7.847
99% Percentile (z)	121.5	99% Percentile (z)	21.87
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.264	Data do not follow a Discernable Distribution (0.05)	
Theta Star	50.15		
nu star	7.386		
A-D Test Statistic	2.639	Nonparametric Statistics	
5% A-D Critical Value	0.842	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.377	Mean	5.85
5% K-S Critical Value	0.249	SD	25.84
Data not Gamma Distributed at 5% Significance Level		SE of Mean	4.667
		95% KM UTL with 95% Coverage	62.07
Assuming Gamma Distribution		95% KM Chebyshev UPL	120.2
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	50.27
Mean	12.76	90% Percentile (z)	38.96
Median	8.801	95% Percentile (z)	48.34
SD	25.71	99% Percentile (z)	65.95
k star	0.494		
Theta star	25.83	Gamma ROS Limits with Extrapolated Data	
Nu star	32.6	95% Wilson Hilferty (WH) Approx. Gamma UPL	46.58
95% Percentile of Chisquare (2k)	3.812	95% Hawkins Wixley (HW) Approx. Gamma UPL	49.79

						95% WH Approx. Gamma UTL with				95% Coverage	67.16
				90% Percentile	34.6	95% HW Approx. Gamma UTL with				95% Coverage	76.15
				95% Percentile	49.22						
				99% Percentile	85.21						

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Nitrate.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 25 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.992

For 10% significance level, 25 is an outlier.

For 5% significance level, 25 is an outlier.

For 1% significance level, 25 is an outlier.

2. Data Value 0.31 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.310

For 10% significance level, 0.31 is not an outlier.

For 5% significance level, 0.31 is not an outlier.

For 1% significance level, 0.31 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	5.935
Standard Deviation	26.22
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5.935	25.82	150	27	5.58	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 150 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 150 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nitrate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Data	33	18
Number of Non-Detect Data	19	11
Number of Detect Data	14	7
Minimum Non-Detect	1	1
Maximum Non-Detect	1.2	1.2
Percent Non detects	57.58%	61.11%
Minimum Detected	0.25	0.31
Maximum Detected	150	25
Mean of Detected Data	13.23	4.054
Median of Detected Data	0.505	0.55
SD of Detected Data	39.9	9.241

Site vs Background Gehan Test

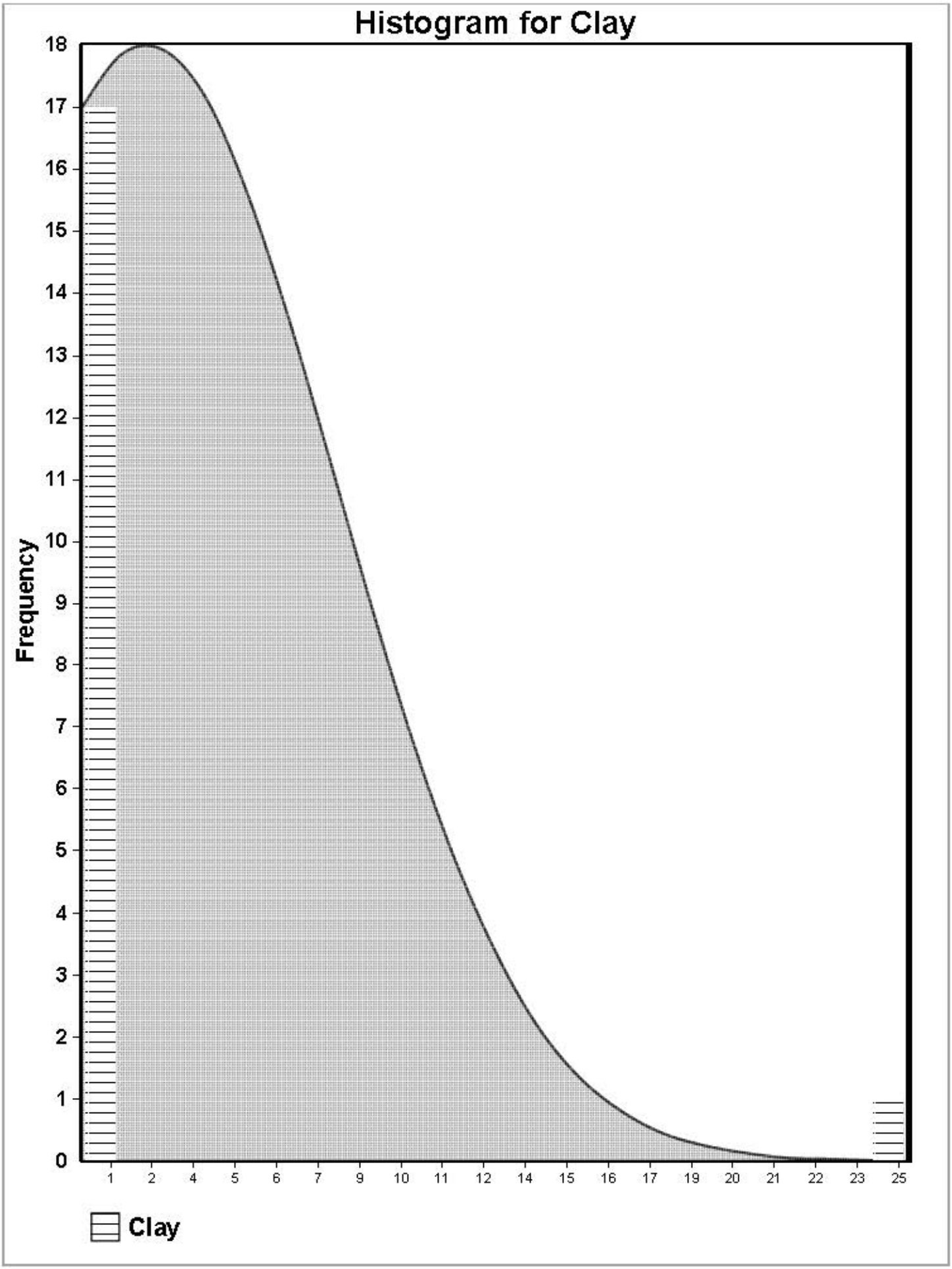
H0: Mu of Site or AOC = Mu of background

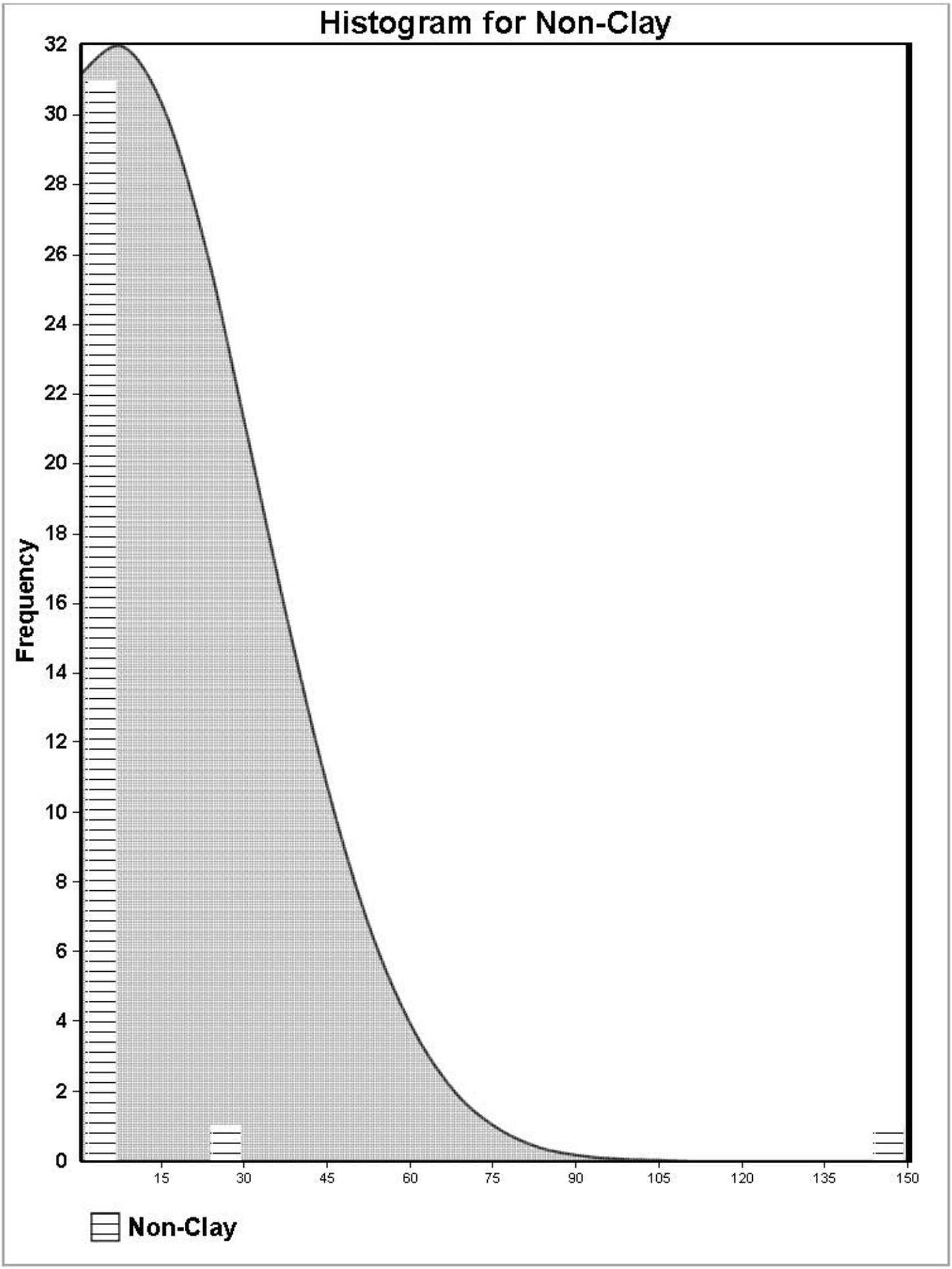
Gehan z Test Value	-0.102
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.919

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
1
2
4
5
6
7
9
10
11
12
14
15
16
17
19
20
21
22
23
25
Clay


Histogram for Non-Clay
Frequency
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
15
30
45
60
75
90
105
120
135
150
Non-Clay

Location	Clay	D_Clay
BG-1-2	0.4	1
BG-1-43	0.55	1
BG-1-55	1	0
BG-1-78	1	0
BG-2-30	1	0
BG-2-81	0.56	1
BG-3-17	0.36	1
BG-3-22	0.31	1
BG-3-69	1.1	0
BG-4-2	25	1
BG-4-19	1.2	0
BG-4-40	1.2	0
BG-4-79	1	0
BG-4-161	1.2	0
BG-4-163	1.2	0
BG-6-28	1.2	1
BG-6-53	1.2	0
BG-6-87	1.2	0

Location	Non-Clay	D_Non-Clay
BG-1-10	0.3	1
BG-1-29	0.33	1
BG-1-40	0.32	1
BG-1-46	1	0
BG-1-92	1	0
BG-2-2	1.3	1
BG-2-10	0.54	1
BG-2-19	1	0
BG-2-21	1	0
BG-2-32	1	0
BG-2-75	1	0
BG-3-2	4.8	1
BG-3-10	0.71	1
BG-3-29	0.61	1
BG-3-63	0.28	1
BG-3-65	1.2	0
BG-3-95	0.47	1
BG-3-105	0.31	1
BG-3-131	0.25	1
BG-3-136	1.2	0
BG-4-10	1.1	0
BG-4-65	1	0
BG-4-82	1.2	0
BG-4-95	1.2	0
BG-4-117	1.2	0
BG-4-120	1.2	0
BG-6-2	150	1
BG-6-9	25	1
BG-6-58	1.2	0
BG-6-75	1.2	0
BG-6-98	1.2	0
BG-6-114	1.2	0
BG-6-127	1.2	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nitrate.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	10	2	16.67%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	2	1	1	1	1	0
Statistics (Detects Only)	10	0.3	150	18.37	0.625	46.88
Statistics (All: NDs treated as DL value)	12	0.3	150	15.48	0.855	42.94
Statistics (All: NDs treated as DL/2 value)	12	0.3	150	15.39	0.52	42.97
Statistics (Normal ROS Estimated Data)	12	-9.717	150	15.35	0.625	43.19
Statistics (Gamma ROS Estimated Data)	12	1.000E-12	150	15.63	0.625	42.89
Statistics (Lognormal ROS Estimated Data)	12	0.254	150	15.41	0.625	42.96

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.285	0.269	64.4	0.473	2.136	4.513
Statistics (NDs = DL)	0.295	0.277	52.47	0.394	1.941	4.921
Statistics (NDs = DL/2)	0.283	0.268	54.29	0.279	1.985	7.116
Statistics (Gamma ROS Estimates)	0.167	0.18	93.86	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.275	2.006	7.291

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.654	0.618	0.617	0.665

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.457	0.842	Data Not Normal
Lilliefors (Detects Only)	0.414	0.28	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.412	0.859	Data Not Normal
Lilliefors (NDs = DL)	0.432	0.256	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.411	0.859	Data Not Normal
Lilliefors (NDs = DL/2)	0.431	0.256	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.476	0.859	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.38	0.256	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.954	0.933	0.936	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.461	0.82	
Kolmogorov-Smirnov (Detects Only)	0.337	0.289	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	1.942	0.826	
Kolmogorov-Smirnov (NDs = DL)	0.378	0.266	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	2.097	0.831	
Kolmogorov-Smirnov (NDs = DL/2)	0.366	0.266	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.067	0.877	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.331	0.272	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.896	0.89	0.865	0.886

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.799	0.842	Data Not Lognormal
Lilliefors (Detects Only)	0.249	0.28	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.793	0.859	Data Not Lognormal
Lilliefors (NDs = DL)	0.277	0.256	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.75	0.859	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.29	0.256	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.787	0.859	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.253	0.256	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	39	0	39	10	29	74.36%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	29	1	1.2	1.124	1.2	0.0951
Statistics (Detects Only)	10	0.25	1.2	0.49	0.415	0.281
Statistics (All: NDs treated as DL value)	39	0.25	1.2	0.962	1.1	0.323
Statistics (All: NDs treated as DL/2 value)	39	0.25	1.2	0.544	0.56	0.146
Statistics (Normal ROS Estimated Data)	39	0.0364	1.2	0.447	0.435	0.221
Statistics (Gamma ROS Estimated Data)	39	0.25	1.2	0.487	0.477	0.139
Statistics (Lognormal ROS Estimated Data)	39	0.195	1.2	0.437	0.397	0.189

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.568	4.233	0.107	-0.827	0.475	-0.575
Statistics (NDs = DL)	5.817	5.386	0.165	-0.128	0.482	-3.774
Statistics (NDs = DL/2)	15.09	13.95	0.036	-0.643	0.266	-0.414
Statistics (Gamma ROS Estimates)	16.76	15.48	0.029	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.904	0.386	-0.427

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.869	0.858	0.821	0.972

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.773	0.842	Data Not Normal
Lilliefors (Detects Only)	0.235	0.28	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.719	0.939	Data Not Normal
Lilliefors (NDs = DL)	0.317	0.142	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.716	0.939	Data Not Normal

Lilliefors (NDs = DL/2)	0.299	0.142	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.958	0.939	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0795	0.142	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.938	0.77	0.826	0.898

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.505	0.729	
Kolmogorov-Smirnov (Detects Only)	0.18	0.268	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	5.271	0.751	
Kolmogorov-Smirnov (NDs = DL)	0.362	0.142	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.657	0.747	
Kolmogorov-Smirnov (NDs = DL/2)	0.268	0.141	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.605	0.747	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.278	0.141	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.954	0.823	0.864	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.914	0.842	Data Appear Lognormal
Lilliefors (Detects Only)	0.166	0.28	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.669	0.939	Data Not Lognormal
Lilliefors (NDs = DL)	0.374	0.142	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.777	0.939	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.272	0.142	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.982	0.939	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0663	0.142	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nitrate.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Number of Valid Data	12	Number of Detected Data	10
Number of Distinct Detected Data	10	Number of Non-Detect Data	2
		Percent Non-Detects	16.67%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.3	Minimum Detected	-1.204
Maximum Detected	150	Maximum Detected	5.011
Mean of Detected	18.37	Mean of Detected	0.473
SD of Detected	46.88	SD of Detected	2.136
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.457	Shapiro Wilk Test Statistic	0.799
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	15.39	Mean (Log Scale)	0.279
SD	42.97	SD (Log Scale)	1.985
95% UTL 95% Coverage	133	95% UTL 95% Coverage	301.8
95% UPL (t)	95.71	95% UPL (t)	54.01
90% Percentile (z)	70.46	90% Percentile (z)	16.82
95% Percentile (z)	86.07	95% Percentile (z)	34.6
99% Percentile (z)	115.3	99% Percentile (z)	133.8
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-43.29	Mean in Original Scale	15.41
SD	87.52	SD in Original Scale	42.96
95% UTL with 95% Coverage	196.1	95% UTL with 95% Coverage	318.9
		95% BCA UTL with 95% Coverage	150
		95% Bootstrap (%) UTL with 95% Coverage	150
95% UPL (t)	120.3	95% UPL (t)	56.02
90% Percentile (z)	68.86	90% Percentile (z)	17.23
95% Percentile (z)	100.7	95% Percentile (z)	35.72
99% Percentile (z)	160.3	99% Percentile (z)	140.2

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.266	Data do not follow a Discernable Distribution (0.05)	
Theta Star	68.97		
nu star	5.327		
A-D Test Statistic	1.461	Nonparametric Statistics	
5% A-D Critical Value	0.82	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.337	Mean	15.38
5% K-S Critical Value	0.289	SD	41.14
Data not Gamma Distributed at 5% Significance Level		SE of Mean	12.52
		95% KM UTL with 95% Coverage	127.9
Assuming Gamma Distribution		95% KM Chebyshev UPL	202
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	92.29
Mean	15.63	90% Percentile (z)	68.11
Median	0.625	95% Percentile (z)	83.05
SD	42.89	99% Percentile (z)	111.1
k star	0.18		
Theta star	86.61	Gamma ROS Limits with Extrapolated Data	
Nu star	4.331	95% Wilson Hilferty (WH) Approx. Gamma UPL	68.37
95% Percentile of Chisquare (2k)	1.908	95% Hawkins Wixley (HW) Approx. Gamma UPL	69.8
		95% WH Approx. Gamma UTL with 95% Coverage	151
90% Percentile	47.14	95% HW Approx. Gamma UTL with 95% Coverage	181.5
95% Percentile	82.63		
99% Percentile	182.1		

Note: DL/2 is not a recommended method.

MC

General Statistics

Number of Valid Data	39	Number of Detected Data	10
Number of Distinct Detected Data	9	Number of Non-Detect Data	29
		Percent Non-Detects	74.36%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.25	Minimum Detected	-1.386
Maximum Detected	1.2	Maximum Detected	0.182
Mean of Detected	0.49	Mean of Detected	-0.827
SD of Detected	0.281	SD of Detected	0.475
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1.2	Maximum Non-Detect	0.182
Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	38
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	97.44%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.773	Shapiro Wilk Test Statistic	0.914
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.544	Mean (Log Scale)	-0.643
SD	0.146	SD (Log Scale)	0.266
95% UTL 95% Coverage	0.854	95% UTL 95% Coverage	0.926
95% UPL (t)	0.793	95% UPL (t)	0.829
90% Percentile (z)	0.731	90% Percentile (z)	0.74
95% Percentile (z)	0.784	95% Percentile (z)	0.815
99% Percentile (z)	0.884	99% Percentile (z)	0.977
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.437
		SD in Original Scale	0.189
		Mean in Log Scale	-0.904
		SD in Log Scale	0.386
		95% UTL 95% Coverage	0.92
		95% UPL (t)	0.783
		90% Percentile (z)	0.664
		95% Percentile (z)	0.764
		99% Percentile (z)	0.994
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.264	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.15		
nu star	65.28		
A-D Test Statistic	0.505	Nonparametric Statistics	
5% A-D Critical Value	0.729	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.18	Mean	0.431
5% K-S Critical Value	0.268	SD	0.179
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.049
		95% KM UTL with 95% Coverage	0.811
Assuming Gamma Distribution		95% KM Chebyshev UPL	1.219
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.736
Mean	0.487	90% Percentile (z)	0.66
Median	0.477	95% Percentile (z)	0.725
SD	0.139	99% Percentile (z)	0.847
k star	15.48		
Theta star	0.0314	Gamma ROS Limits with Extrapolated Data	
Nu star	1208	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.709
95% Percentile of Chisquare (2k)	44.95	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.709
		95% WH Approx. Gamma UTL with 95% Coverage	0.775
90% Percentile	0.65	95% HW Approx. Gamma UTL with 95% Coverage	0.777
95% Percentile	0.706		
99% Percentile	0.819		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Nitrate.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 150 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.970

For 10% significance level, 150 is an outlier.
For 5% significance level, 150 is an outlier.
For 1% significance level, 150 is an outlier.

2. Data Value 0.3 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.001

For 10% significance level, 0.3 is not an outlier.
For 5% significance level, 0.3 is not an outlier.
For 1% significance level, 0.3 is not an outlier.

Rosner's Outlier Test for MC

Mean	0.544
Standard Deviation	0.146
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.544	0.144	1.2	32	4.547	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1.2 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1.2 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nitrate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Data	39	12
Number of Non-Detect Data	29	2
Number of Detect Data	10	10
Minimum Non-Detect	1	1
Maximum Non-Detect	1.2	1
Percent Non detects	74.36%	16.67%
Minimum Detected	0.25	0.3
Maximum Detected	1.2	150
Mean of Detected Data	0.49	18.37
Median of Detected Data	0.415	0.625
SD of Detected Data	0.281	46.88

Site vs Background Gehan Test

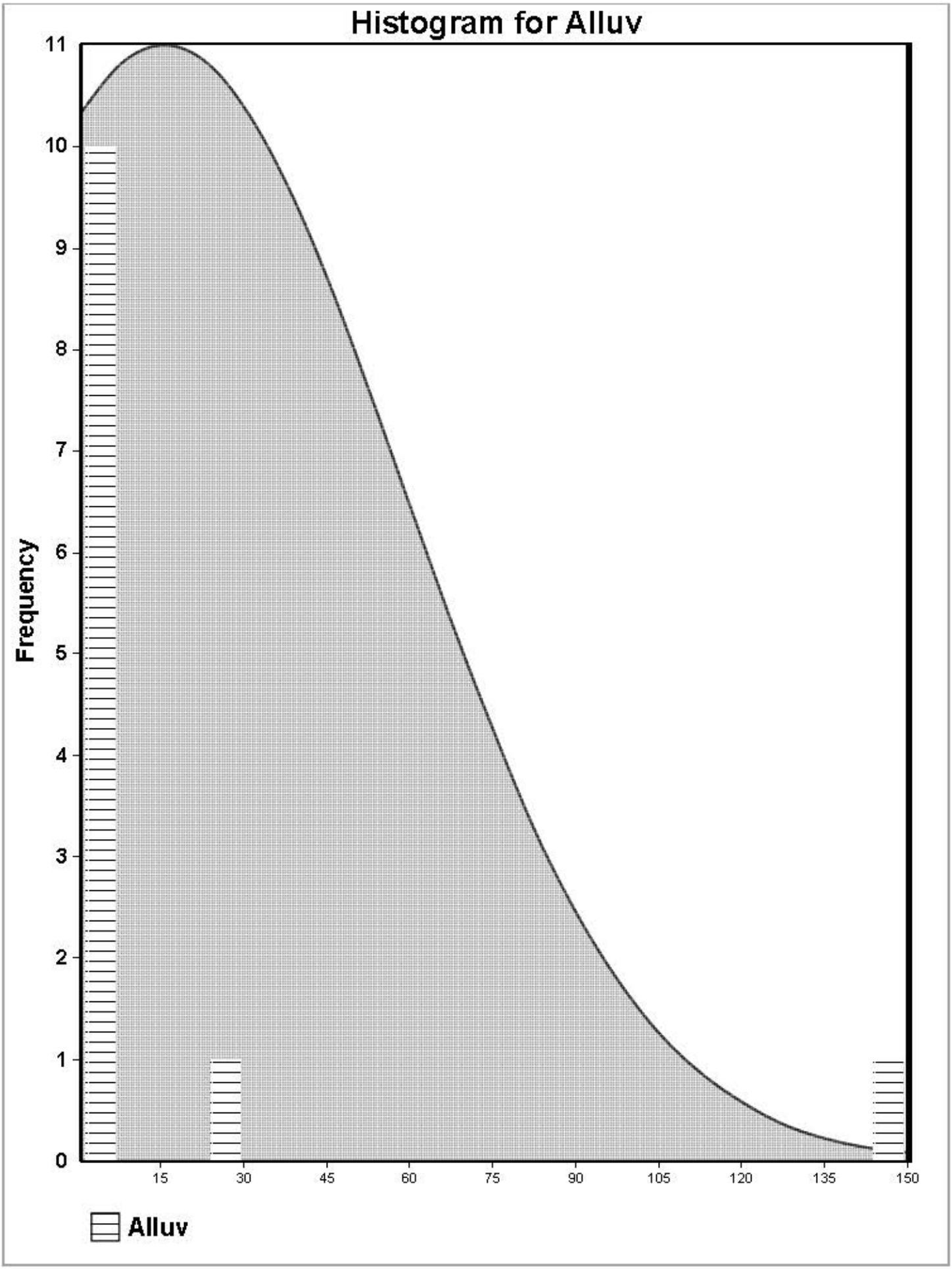
H0: Mu of Site or AOC = Mu of background

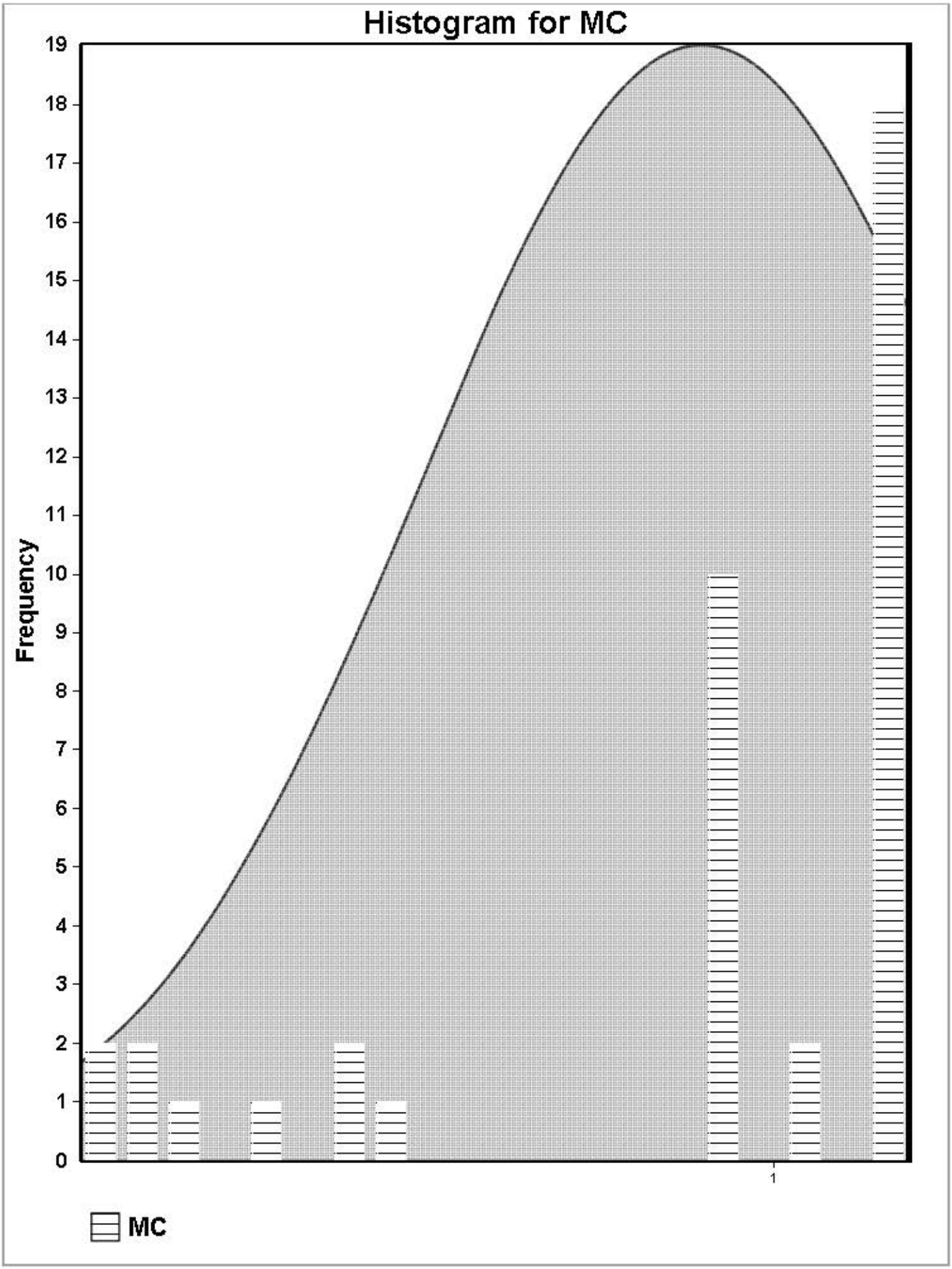
Gehan z Test Value	-3.166
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.00154

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
15
30
45
60
75
90
105
120
135
150
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
1
MC

Location	Alluv	D_Alluv
BG-1-2	0.4	1
BG-1-10	0.3	1
BG-1-29	0.33	1
BG-1-40	0.32	1
BG-2-2	1.3	1
BG-2-10	0.54	1
BG-2-19	1	0
BG-2-21	1	0
BG-3-2	4.8	1
BG-3-10	0.71	1
BG-6-2	150	1
BG-6-9	25	1

Location	MC	D_MC
BG-1-43	0.55	1
BG-1-46	1	0
BG-1-55	1	0
BG-1-78	1	0
BG-1-92	1	0
BG-2-30	1	0
BG-2-32	1	0
BG-2-75	1	0
BG-2-81	0.56	1
BG-3-17	0.36	1
BG-3-22	0.31	1
BG-3-29	0.61	1
BG-3-63	0.28	1
BG-3-65	1.2	0
BG-3-69	1.1	0
BG-3-95	0.47	1
BG-3-105	0.31	1
BG-3-131	0.25	1
BG-3-136	1.2	0
BG-4-1	1	0
BG-4-10	1.1	0
BG-4-19	1.2	0
BG-4-40	1.2	0
BG-4-65	1	0
BG-4-79	1	0
BG-4-82	1.2	0
BG-4-95	1.2	0
BG-4-117	1.2	0
BG-4-120	1.2	0
BG-4-161	1.2	0
BG-4-163	1.2	0
BG-6-28	1.2	1
BG-6-53	1.2	0
BG-6-58	1.2	0
BG-6-75	1.2	0
BG-6-87	1.2	0
BG-6-98	1.2	0
BG-6-114	1.2	0
BG-1-127	1.2	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Phosphorous.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	7	44	86.27%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	44	1	1.2	1.102	1.1	0.0976
Statistics (Detects Only)	7	0.38	0.72	0.56	0.6	0.158
Statistics (All: NDs treated as DL value)	51	0.38	1.2	1.028	1	0.216
Statistics (All: NDs treated as DL/2 value)	51	0.38	0.72	0.552	0.55	0.0712
Statistics (Normal ROS Estimated Data)	51	0.247	0.873	0.56	0.56	0.158
Statistics (Gamma ROS Estimated Data)	51	0.162	0.751	0.553	0.588	0.157
Statistics (Lognormal ROS Estimated Data)	51	0.301	0.968	0.563	0.54	0.166

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	13.86	13.05	0.0404	-0.616	0.296	-0.48
Statistics (NDs = DL)	16.1	15.17	0.0638	-0.00392	0.28	-71.42
Statistics (NDs = DL/2)	60	56.48	0.00921	-0.602	0.132	-0.219
Statistics (Gamma ROS Estimates)	9.538	8.99	0.058	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.616	0.295	-0.478

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.918	0.856	0.926	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.807	0.803	Data Appear Normal
Lilliefors (Detects Only)	0.257	0.335	Data Appear Normal
Lilliefors (NDs = DL)	0.311	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.239	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0602	0.124	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.901	0.805	0.925	0.921

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.726	0.708	
Kolmogorov-Smirnov (Detects Only)	0.273	0.312	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	5.976	0.749	
Kolmogorov-Smirnov (NDs = DL)	0.352	0.124	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.499	0.748	
Kolmogorov-Smirnov (NDs = DL/2)	0.246	0.124	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.825	0.75	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.147	0.124	Data Not Gamma Distributed	

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.915	0.798	0.922	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.802	0.803	Data Not Lognormal
Lilliefors (Detects Only)	0.252	0.335	Data Appear Lognormal
Lilliefors (NDs = DL)	0.368	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.246	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0601	0.124	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Phosphorous.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Number of Valid Data	51	Number of Detected Data	7
Number of Distinct Detected Data	6	Number of Non-Detect Data	44
		Percent Non-Detects	86.27%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.38	Minimum Detected	-0.968
Maximum Detected	0.72	Maximum Detected	-0.329
Mean of Detected	0.56	Mean of Detected	-0.616
SD of Detected	0.158	SD of Detected	0.296
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1.2	Maximum Non-Detect	0.182

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	51
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 7 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.807	Shapiro Wilk Test Statistic	0.802
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.552	Mean (Log Scale)	-0.602
SD	0.0712	SD (Log Scale)	0.132
95% UTL 95% Coverage	0.698	95% UTL 95% Coverage	0.718
95% UPL (t)	0.673	95% UPL (t)	0.685
90% Percentile (z)	0.644	90% Percentile (z)	0.649
95% Percentile (z)	0.669	95% Percentile (z)	0.68
99% Percentile (z)	0.718	99% Percentile (z)	0.744

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.563
		SD in Original Scale	0.166
		Mean in Log Scale	-0.616
		SD in Log Scale	0.295
		95% UTL 95% Coverage	0.989
		95% UPL (t)	0.889
		90% Percentile (z)	0.788
		95% Percentile (z)	0.877
		99% Percentile (z)	1.071
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	8.013	Data appear Normal at 5% Significance Level	
Theta Star	0.0699		
nu star	112.2		
A-D Test Statistic	0.726	Nonparametric Statistics	
5% A-D Critical Value	0.708	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.273	Mean	0.56
5% K-S Critical Value	0.312	SD	0.146
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	0.0598
		95% KM UTL with 95% Coverage	0.861
Assuming Gamma Distribution		95% KM Chebyshev UPL	1.205
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.808
Mean	0.553	90% Percentile (z)	0.748
Median	0.588	95% Percentile (z)	0.801
SD	0.157	99% Percentile (z)	0.901
k star	8.99		
Theta star	0.0615	Gamma ROS Limits with Extrapolated Data	
Nu star	917	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.892
95% Percentile of Chisquare (2k)	28.84	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.907
		95% WH Approx. Gamma UTL with 95% Coverage	0.985
90% Percentile	0.798	95% HW Approx. Gamma UTL with 95% Coverage	1.007
95% Percentile	0.887		
99% Percentile	1.069		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Phosphorous.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

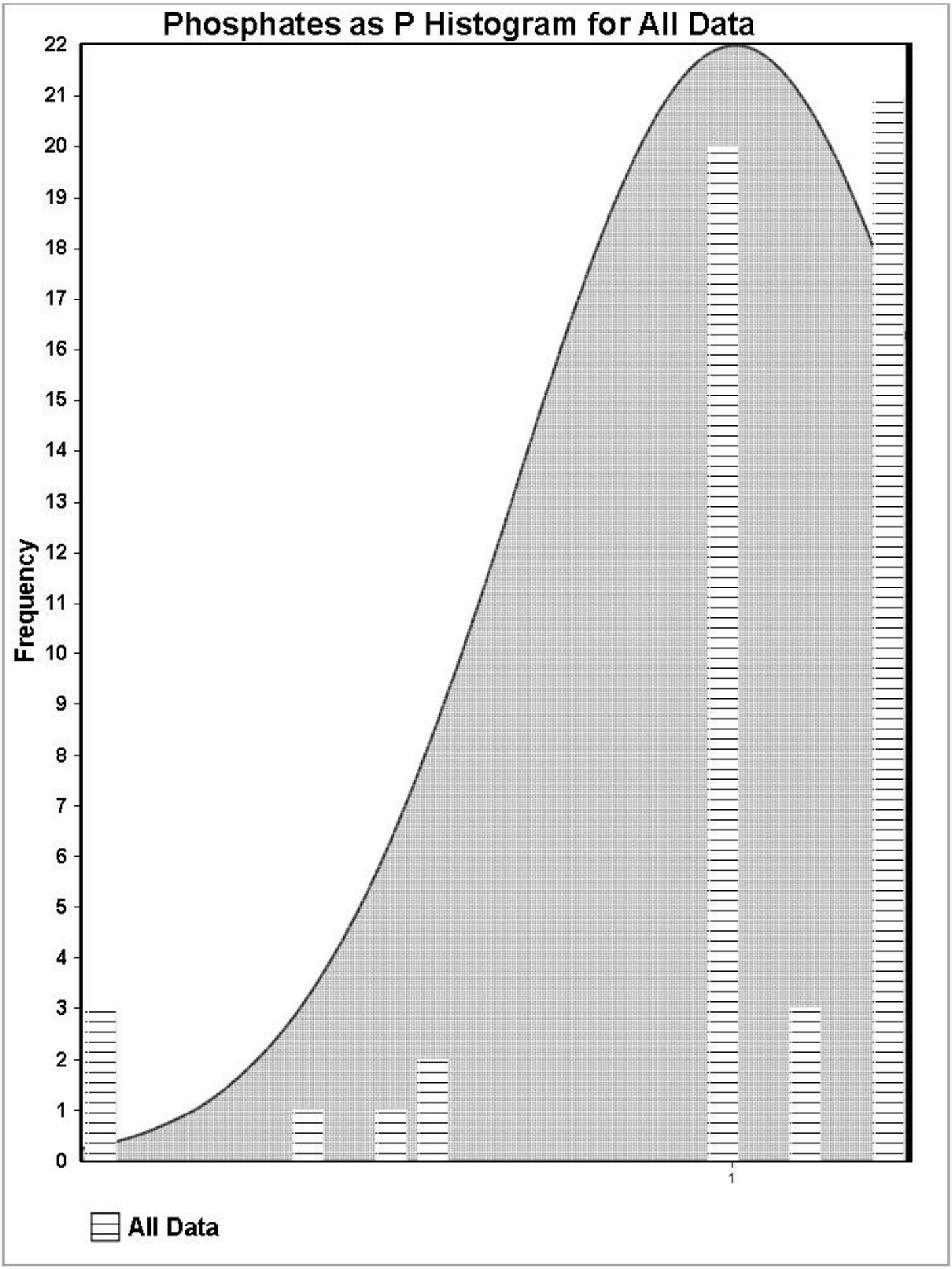
Rosner's Outlier Test for All Data

Mean	0.552
Standard Deviation	0.0712
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.552	0.0704	0.38	9	2.446	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier


Phosphates as P Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
1
All Data

Location	All Data	D_All Data
BG-1-2	1	0
BG-1-43	1	0
BG-1-55	1	0
BG-1-78	1	0
BG-2-30	0.72	1
BG-2-81	1	0
BG-3-17	0.6	1
BG-3-22	1	0
BG-3-69	0.38	1
BG-4-2	1	0
BG-4-19	1.2	0
BG-4-40	1.2	0
BG-4-79	1.2	0
BG-4-161	1.2	0
BG-4-163	1.2	0
BG-6-28	1.2	0
BG-6-53	1.2	0
BG-6-87	1.2	0
BG-1-10	0.4	1
BG-1-29	1	0
BG-1-40	1	0
BG-1-46	1	0
BG-1-92	1	0
BG-2-2	0.72	1
BG-2-10	0.41	1
BG-2-19	1	0
BG-2-21	1	0
BG-2-32	1	0
BG-2-75	1	0
BG-3-2	1	0
BG-3-10	0.69	1
BG-3-29	1	0
BG-3-63	1.2	0
BG-3-65	1.2	0
BG-3-95	1.1	0
BG-3-105	1.2	0
BG-3-131	1.1	0
BG-3-136	1.2	0
BG-4-10	1.1	0
BG-4-65	1	0
BG-4-82	1.2	0
BG-4-95	1.2	0
BG-4-117	1.2	0
BG-4-120	1.2	0
BG-6-2	1	0
BG-6-9	1	0
BG-6-58	1.2	0
BG-6-75	1.2	0
BG-6-98	1.2	0
BG-6-114	1.2	0
BG-6-127	1.2	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Phosphorous.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	5	8	61.54%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	8	1	1.2	1.038	1	0.0744
Statistics (Detects Only)	5	0.4	0.72	0.564	0.6	0.152
Statistics (All: NDs treated as DL value)	13	0.4	1.2	0.855	1	0.262
Statistics (All: NDs treated as DL/2 value)	13	0.4	0.72	0.536	0.5	0.0949
Statistics (Normal ROS Estimated Data)	13	0.359	0.769	0.564	0.564	0.13
Statistics (Gamma ROS Estimated Data)	13	0.332	0.732	0.566	0.585	0.13
Statistics (Lognormal ROS Estimated Data)	13	0.375	0.798	0.561	0.547	0.132

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	16.32	12.6	0.0346	-0.604	0.282	-0.468
Statistics (NDs = DL)	9.319	7.219	0.0918	-0.211	0.366	-1.735
Statistics (NDs = DL/2)	35.79	27.58	0.015	-0.637	0.173	-0.272
Statistics (Gamma ROS Estimates)	18.53	14.3	0.0306	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.604	0.24	-0.398

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.94	0.93	0.947	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.852	0.762	Data Appear Normal
Lilliefors (Detects Only)	0.245	0.396	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.856	0.866	Data Not Normal
Lilliefors (NDs = DL)	0.325	0.246	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.896	0.866	Data Appear Normal
Lilliefors (NDs = DL/2)	0.264	0.246	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.959	0.866	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.115	0.246	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.926	0.892	0.957	0.952

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.507	0.679	
Kolmogorov-Smirnov (Detects Only)	0.273	0.357	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.118	0.734	
Kolmogorov-Smirnov (NDs = DL)	0.34	0.237	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	0.663	0.733	
Kolmogorov-Smirnov (NDs = DL/2)	0.255	0.236	Data appear Approximate Gamma Distribution
Anderson-Darling (Gamma ROS Estimates)	0.493	0.733	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.203	0.236	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.931	0.904	0.955	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.835	0.762	Data Appear Lognormal
Lilliefors (Detects Only)	0.246	0.396	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.809	0.866	Data Not Lognormal
Lilliefors (NDs = DL)	0.333	0.246	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.912	0.866	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.241	0.246	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.958	0.866	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.116	0.246	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

>20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	38	0	38	2	36	94.74%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	36	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	38	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	38	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	38	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Shapiro-Wilks (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	
Shapiro-Wilks (NDs = DL/2)	N/A	N/A	
Lilliefors (NDs = DL/2)	N/A	N/A	
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A	
Lilliefors (Normal ROS Estimates)	N/A	N/A	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A	
Anderson-Darling (NDs = DL/2)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A	
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A	
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A	

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Phosphorous.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Number of Valid Data	13	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	8
		Percent Non-Detects	61.54%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.4	Minimum Detected	-0.916
Maximum Detected	0.72	Maximum Detected	-0.329
Mean of Detected	0.564	Mean of Detected	-0.604
SD of Detected	0.152	SD of Detected	0.282
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1.2	Maximum Non-Detect	0.182

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	13
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 5 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.852	Shapiro Wilk Test Statistic	0.835
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.536	Mean (Log Scale)	-0.637
SD	0.0949	SD (Log Scale)	0.173
95% UTL 95% Coverage	0.79	95% UTL 95% Coverage	0.84
95% UPL (t)	0.712	95% UPL (t)	0.729
90% Percentile (z)	0.658	90% Percentile (z)	0.66
95% Percentile (z)	0.692	95% Percentile (z)	0.703
99% Percentile (z)	0.757	99% Percentile (z)	0.791

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.561
		SD in Original Scale	0.132
		Mean in Log Scale	-0.604
		SD in Log Scale	0.24
		95% UTL 95% Coverage	1.039
		95% UPL (t)	0.853
		90% Percentile (z)	0.744
		95% Percentile (z)	0.812
		99% Percentile (z)	0.956
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	6.66	Data appear Normal at 5% Significance Level	
Theta Star	0.0847		
nu star	66.6		
A-D Test Statistic	0.507	Nonparametric Statistics	
5% A-D Critical Value	0.679	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.273	Mean	0.564
5% K-S Critical Value	0.357	SD	0.136
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0679
		95% KM UTL with 95% Coverage	0.927
Assuming Gamma Distribution		95% KM Chebyshev UPL	1.178
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.815
Mean	0.566	90% Percentile (z)	0.738
Median	0.585	95% Percentile (z)	0.787
SD	0.13	99% Percentile (z)	0.88
k star	14.3		
Theta star	0.0396	Gamma ROS Limits with Extrapolated Data	
Nu star	371.9	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.846
95% Percentile of Chisquare (2k)	42.07	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.853
		95% WH Approx. Gamma UTL with 95% Coverage	1.002
90% Percentile	0.765	95% HW Approx. Gamma UTL with 95% Coverage	1.018
95% Percentile	0.833		
99% Percentile	0.972		

Note: DL/2 is not a recommended method.

>20

General Statistics			
Number of Valid Data	38	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	36
		Percent Non-Detects	94.74%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.38	Minimum Detected	-0.968
Maximum Detected	0.72	Maximum Detected	-0.329
Mean of Detected	0.55	Mean of Detected	-0.648
SD of Detected	0.24	SD of Detected	0.452
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1.2	Maximum Non-Detect	0.182

Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	38
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.55	Mean (Log Scale)	-0.604
SD	0.0621	SD (Log Scale)	0.115
95% UTL 95% Coverage	0.682	95% UTL 95% Coverage	0.699
95% UPL (t)	0.656	95% UPL (t)	0.665
90% Percentile (z)	0.63	90% Percentile (z)	0.633
95% Percentile (z)	0.652	95% Percentile (z)	0.661
99% Percentile (z)	0.695	99% Percentile (z)	0.714
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		95% UTL 95% Coverage	N/A
		95% UPL (t)	N/A
		90% Percentile (z)	N/A
		95% Percentile (z)	N/A
		99% Percentile (z)	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	

5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.55
5% K-S Critical Value	N/A	SD	0.17
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.17
		95% KM UTL with 95% Coverage	0.912
Assuming Gamma Distribution		95% KM Chebyshev UPL	1.301
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.841
Mean	N/A	90% Percentile (z)	0.768
Median	N/A	95% Percentile (z)	0.83
SD	N/A	99% Percentile (z)	0.945
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Phosphorous.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 0.72 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.387

For 10% significance level, 0.72 is not an outlier.
For 5% significance level, 0.72 is not an outlier.
For 1% significance level, 0.72 is not an outlier.

2. Data Value 0.4 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.345

For 10% significance level, 0.4 is not an outlier.
For 5% significance level, 0.4 is not an outlier.
For 1% significance level, 0.4 is not an outlier.

Rosner's Outlier Test for >20

Mean	0.55
Standard Deviation	0.0621
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.55	0.0613	0.38	31	2.773	3.01	3.36

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Phosphorous.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Data	38	13
Number of Non-Detect Data	36	8
Number of Detect Data	2	5
Minimum Non-Detect	1	1
Maximum Non-Detect	1.2	1.2
Percent Non detects	94.74%	61.54%
Minimum Detected	0.38	0.4
Maximum Detected	0.72	0.72
Mean of Detected Data	0.55	0.564
Median of Detected Data	0.55	0.6
SD of Detected Data	0.24	0.152

Site vs Background Gehan Test

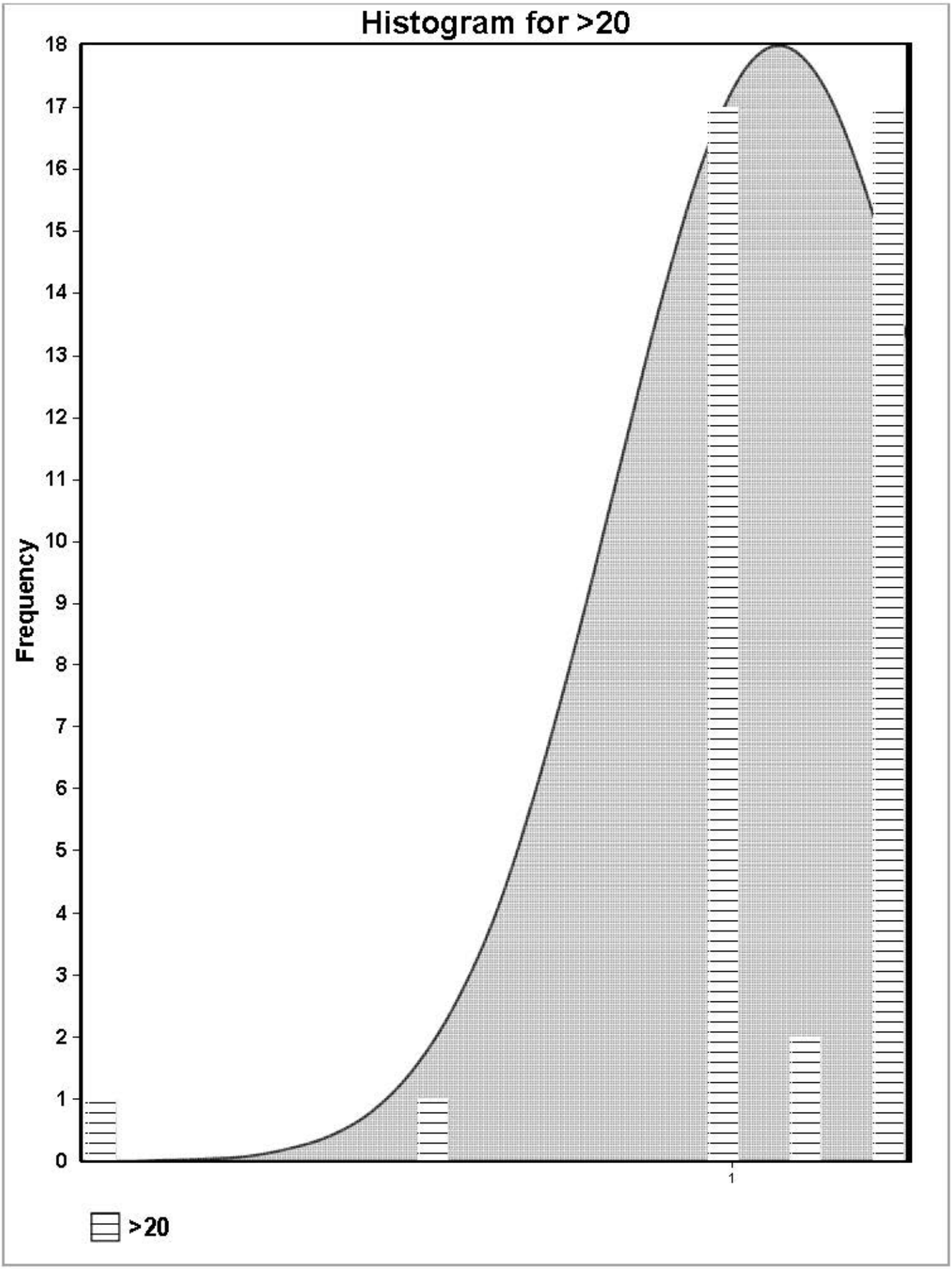
H0: Mu of Site or AOC = Mu of background

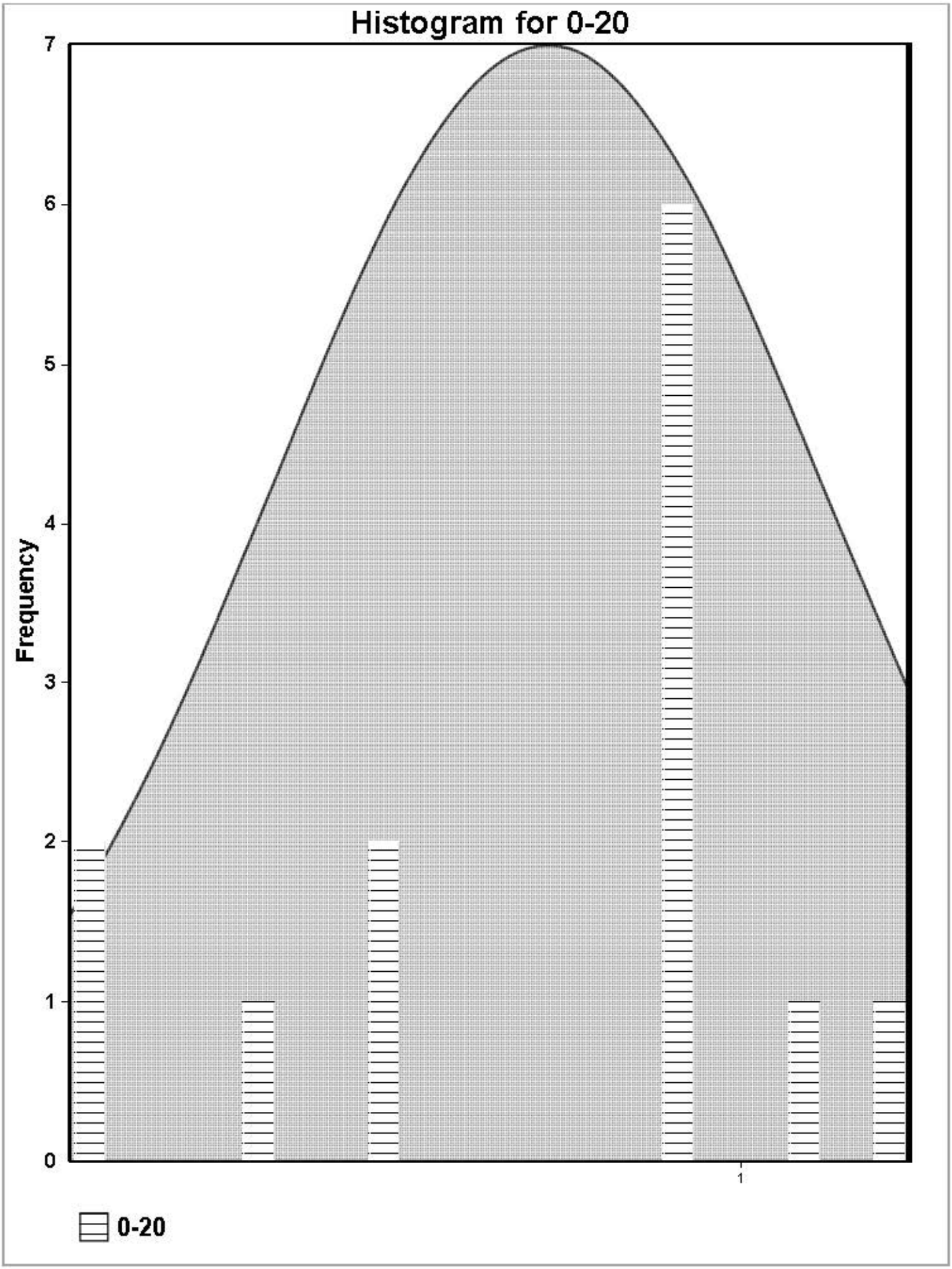
Gehan z Test Value	-0.429
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.668

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
1
>20


Histogram for 0-20
Frequency
7
6
5
4
3
2
1
0
1
0-20

Location	0-20	D_0-20
BG-1-2	1	0
BG-3-17	0.6	1
BG-4-2	1	0
BG-4-19	1.2	0
BG-1-10	0.4	1
BG-2-2	0.72	1
BG-2-10	0.41	1
BG-2-19	1	0
BG-3-2	1	0
BG-3-10	0.69	1
BG-4-10	1.1	0
BG-6-2	1	0
BG-6-9	1	0

Location	>20	D_>20
BG-1-29	1	0
BG-1-40	1	0
BG-1-46	1	0
BG-1-92	1	0
BG-2-21	1	0
BG-2-32	1	0
BG-2-75	1	0
BG-3-29	1	0
BG-3-63	1	0
BG-3-65	1	0
BG-3-95	1.1	0
BG-3-105	1.2	0
BG-3-131	1.1	0
BG-3-136	1.2	0
BG-4-65	1	0
BG-4-82	1.2	0
BG-4-95	1.2	0
BG-4-117	1.2	0
BG-4-120	1.2	0
BG-6-58	1.2	0
BG-6-75	1.2	0
BG-6-98	1.2	0
BG-6-114	1.2	0
BG-6-127	1.2	0
BG-1-43	1	0
BG-1-55	1	0
BG-1-78	1	0
BG-2-30	0.72	1
BG-2-81	1	0
BG-3-22	1	0
BG-3-69	0.38	1
BG-4-40	1.2	0
BG-4-79	1	0
BG-4-161	1.2	0
BG-4-163	1.2	0
BG-6-28	1.2	0
BG-6-53	1.2	0
BG-6-87	1.2	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Phosphorous.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	3	15	83.33%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	15	1	1.2	1.093	1	0.103
Statistics (Detects Only)	3	0.38	0.72	0.567	0.6	0.172
Statistics (All: NDs treated as DL value)	18	0.38	1.2	1.006	1	0.23
Statistics (All: NDs treated as DL/2 value)	18	0.38	0.72	0.55	0.55	0.0758
Statistics (Normal ROS Estimated Data)	18	0.259	0.874	0.567	0.583	0.186
Statistics (Gamma ROS Estimated Data)	18	1.000E-12	0.72	0.0944	1.000E-12	0.225
Statistics (Lognormal ROS Estimated Data)	18	0.307	0.976	0.58	0.566	0.201

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	14.73	12.31	0.0385	-0.602	0.329	-0.547
Statistics (NDs = DL)	14.44	12.07	0.0696	-0.0295	0.299	-10.15
Statistics (NDs = DL/2)	54.12	45.14	0.0102	-0.607	0.142	-0.233
Statistics (Gamma ROS Estimates)	0.0427	0.0726	2.211	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.602	0.35	-0.581

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.986	0.873	0.908	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.972	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.243	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.766	0.897	Data Not Normal
Lilliefors (NDs = DL)	0.324	0.209	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.844	0.897	Data Not Normal
Lilliefors (NDs = DL/2)	0.245	0.209	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.969	0.897	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0975	0.209	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.825	0.909	0.874

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	2.02	0.739	
Kolmogorov-Smirnov (NDs = DL)	0.36	0.203	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	1.525	0.738	
Kolmogorov-Smirnov (NDs = DL/2)	0.256	0.203	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.987	1.214	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.529	0.255	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.971	0.819	0.901	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.942	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.276	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.684	0.897	Data Not Lognormal
Lilliefors (NDs = DL)	0.373	0.209	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.834	0.897	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.252	0.209	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.969	0.897	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0971	0.209	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	4	29	87.88%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	29	1	1.2	1.086	1	0.0953
Statistics (Detects Only)	4	0.4	0.72	0.555	0.55	0.174
Statistics (All: NDs treated as DL value)	33	0.4	1.2	1.022	1	0.204
Statistics (All: NDs treated as DL/2 value)	33	0.4	0.72	0.545	0.5	0.0695
Statistics (Normal ROS Estimated Data)	33	0.217	0.893	0.555	0.555	0.176
Statistics (Gamma ROS Estimated Data)	33	0.166	0.777	0.546	0.575	0.17
Statistics (Lognormal ROS Estimated Data)	33	0.287	0.995	0.562	0.534	0.182

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	13.3	12.11	0.0417	-0.627	0.321	-0.511
Statistics (NDs = DL)	17.94	16.33	0.057	-0.00655	0.266	-40.71
Statistics (NDs = DL/2)	63.69	57.92	0.00855	-0.616	0.128	-0.207
Statistics (Gamma ROS Estimates)	8.315	7.579	0.0656	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.627	0.324	-0.517

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.904	0.852	0.929	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.787	0.748	Data Appear Normal
Lilliefors (Detects Only)	0.298	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.728	0.931	Data Not Normal
Lilliefors (NDs = DL)	0.336	0.154	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.872	0.931	Data Not Normal

Lilliefors (NDs = DL/2)	0.254	0.154	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.975	0.931	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0982	0.154	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.896	0.81	0.935	0.935

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.611	0.657	
Kolmogorov-Smirnov (Detects Only)	0.331	0.395	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	3.939	0.746	
Kolmogorov-Smirnov (NDs = DL)	0.374	0.153	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.104	0.745	
Kolmogorov-Smirnov (NDs = DL/2)	0.251	0.153	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.995	0.748	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.151	0.153	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.902	0.785	0.93	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.783	0.748	Data Appear Lognormal
Lilliefors (Detects Only)	0.296	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.626	0.931	Data Not Lognormal
Lilliefors (NDs = DL)	0.389	0.154	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.873	0.931	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.243	0.154	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.975	0.931	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0961	0.154	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Phosphorous.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Number of Valid Data	18	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	15
		Percent Non-Detects	83.33%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.38	Minimum Detected	-0.968
Maximum Detected	0.72	Maximum Detected	-0.329
Mean of Detected	0.567	Mean of Detected	-0.602
SD of Detected	0.172	SD of Detected	0.329
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1.2	Maximum Non-Detect	0.182

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	18
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.972	Shapiro Wilk Test Statistic	0.942
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.55	Mean (Log Scale)	-0.607
SD	0.0758	SD (Log Scale)	0.142
95% UTL 95% Coverage	0.736	95% UTL 95% Coverage	0.771
95% UPL (t)	0.686	95% UPL (t)	0.702
90% Percentile (z)	0.647	90% Percentile (z)	0.653
95% Percentile (z)	0.675	95% Percentile (z)	0.688

99% Percentile (z)	0.726	99% Percentile (z)	0.758
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.58
		SD in Original Scale	0.201
		Mean in Log Scale	-0.602
		SD in Log Scale	0.35
		95% UTL 95% Coverage	1.292
		95% UPL (t)	1.024
		90% Percentile (z)	0.858
		95% Percentile (z)	0.974
		99% Percentile (z)	1.236
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.567
5% K-S Critical Value	N/A	SD	0.141
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0996
		95% KM UTL with 95% Coverage	0.912
Assuming Gamma Distribution		95% KM Chebyshev UPL	1.197
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.818
Mean	N/A	90% Percentile (z)	0.747
Median	N/A	95% Percentile (z)	0.798
SD	N/A	99% Percentile (z)	0.894
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

Non-Clay

General Statistics

Number of Valid Data	33	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	29
		Percent Non-Detects	87.88%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.4	Minimum Detected	-0.916
Maximum Detected	0.72	Maximum Detected	-0.329
Mean of Detected	0.555	Mean of Detected	-0.627
SD of Detected	0.174	SD of Detected	0.321

Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1.2	Maximum Non-Detect	0.182

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	33
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.787	Shapiro Wilk Test Statistic	0.783
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.545	Mean (Log Scale)	-0.616
SD	0.0695	SD (Log Scale)	0.128
95% UTL 95% Coverage	0.696	95% UTL 95% Coverage	0.713
95% UPL (t)	0.664	95% UPL (t)	0.673
90% Percentile (z)	0.634	90% Percentile (z)	0.636
95% Percentile (z)	0.659	95% Percentile (z)	0.666
99% Percentile (z)	0.706	99% Percentile (z)	0.727
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.562
		SD in Original Scale	0.182
		Mean in Log Scale	-0.627
		SD in Log Scale	0.324
		95% UTL 95% Coverage	1.081
		95% UPL (t)	0.933
		90% Percentile (z)	0.809
		95% Percentile (z)	0.91
		99% Percentile (z)	1.135

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.491	Data appear Normal at 5% Significance Level	
Theta Star	0.159		
nu star	27.92		
A-D Test Statistic	0.611	Nonparametric Statistics	
5% A-D Critical Value	0.657	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.331	Mean	0.555
5% K-S Critical Value	0.395	SD	0.15
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0868
		95% KM UTL with 95% Coverage	0.882

Assuming Gamma Distribution		95% KM Chebyshev UPL	1.221
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.814
Mean	0.546	90% Percentile (z)	0.748
Median	0.575	95% Percentile (z)	0.802
SD	0.17	99% Percentile (z)	0.905
k star	7.579		
Theta star	0.072	Gamma ROS Limits with Extrapolated Data	
Nu star	500.2	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.916
95% Percentile of Chisquare (2k)	25.2	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.932
		95% WH Approx. Gamma UTL with 95% Coverage	1.046
90% Percentile	0.81	95% HW Approx. Gamma UTL with 95% Coverage	1.073
95% Percentile	0.907		
99% Percentile	1.109		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Phosphorous.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 0.72 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.545

For 10% significance level, 0.72 is an outlier.

For 5% significance level, 0.72 is an outlier.

For 1% significance level, 0.72 is not an outlier.

2. Data Value 0.38 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.545

For 10% significance level, 0.38 is an outlier.

For 5% significance level, 0.38 is an outlier.

For 1% significance level, 0.38 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	0.545
Standard Deviation	0.0695
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.545	0.0684	0.72	6	2.563	2.95	3.29

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Phosphorous.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Clay

Background Data: Non-Clay

Raw Statistics

	Site	Background
Number of Valid Data	18	33
Number of Non-Detect Data	15	29
Number of Detect Data	3	4
Minimum Non-Detect	1	1
Maximum Non-Detect	1.2	1.2
Percent Non detects	83.33%	87.88%
Minimum Detected	0.38	0.4
Maximum Detected	0.72	0.72
Mean of Detected Data	0.567	0.555
Median of Detected Data	0.6	0.55
SD of Detected Data	0.172	0.174

Site vs Background Gehan Test

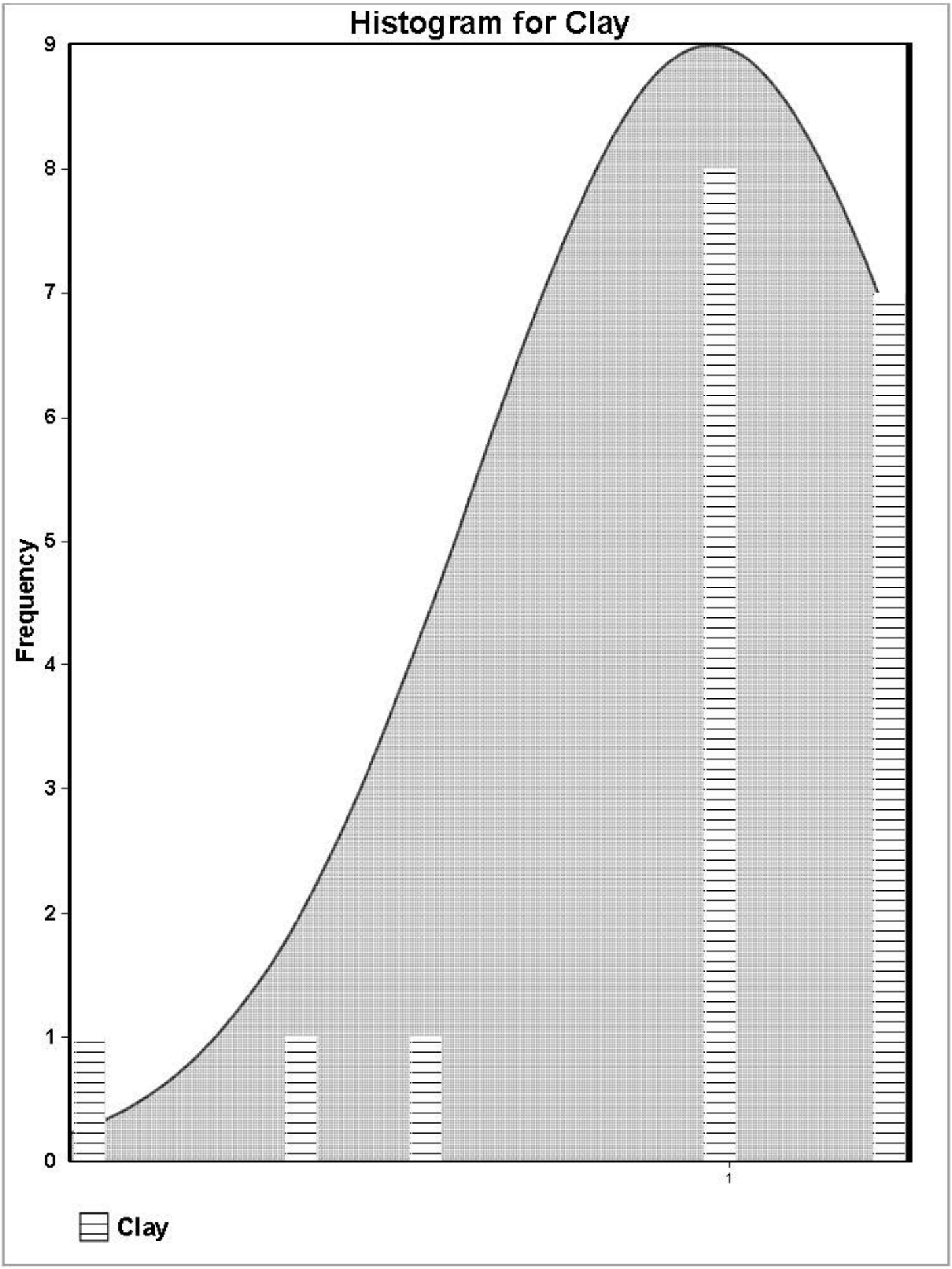
H0: Mu of Site or AOC = Mu of background

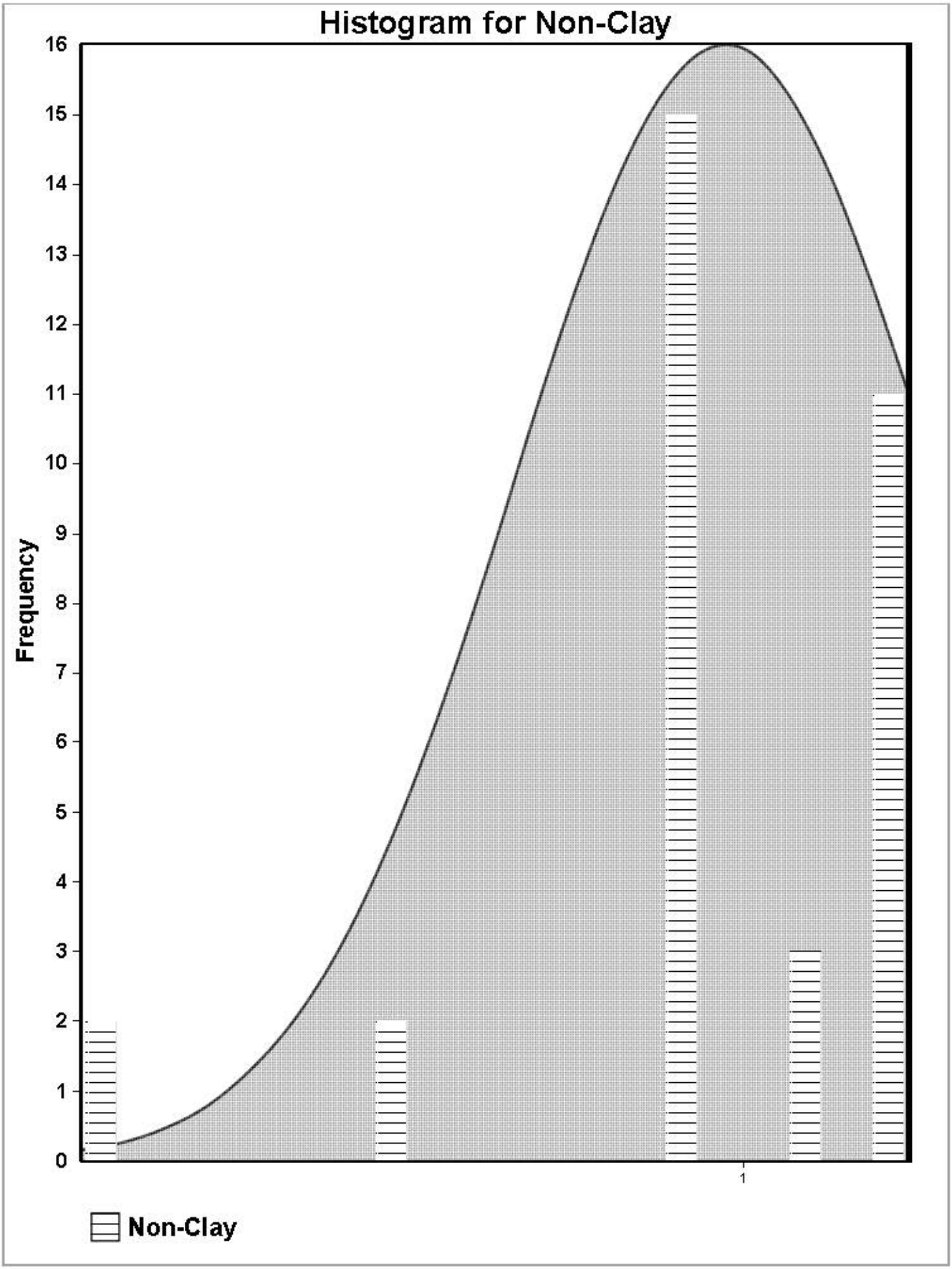
Gehan z Test Value	-0.392
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.695

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
5
6
7
8
9
1
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
1
Non-Clay

Location	Clay	D_Clay
BG-1-2	1	0
BG-1-43	1	0
BG-1-55	1	0
BG-1-78	1	0
BG-2-30	0.72	1
BG-2-81	1	0
BG-3-17	0.6	1
BG-3-22	1	0
BG-3-69	0.38	1
BG-4-2	1	0
BG-4-19	1.2	0
BG-4-40	1.2	0
BG-4-79	1	0
BG-4-161	1.2	0
BG-4-163	1.2	0
BG-6-28	1.2	0
BG-6-53	1.2	0
BG-6-87	1.2	0

Location	Non-Clay	D_Non-Clay
BG-1-10	0.4	1
BG-1-29	1	0
BG-1-40	1	0
BG-1-46	1	0
BG-1-92	1	0
BG-2-2	0.72	1
BG-2-10	0.41	1
BG-2-19	1	0
BG-2-21	1	0
BG-2-32	1	0
BG-2-75	1	0
BG-3-2	1	0
BG-3-10	0.69	1
BG-3-29	1	0
BG-3-63	1	0
BG-3-65	1	0
BG-3-95	1.1	0
BG-3-105	1.2	0
BG-3-131	1.1	0
BG-3-136	1.2	0
BG-4-10	1.1	0
BG-4-65	1	0
BG-4-82	1.2	0
BG-4-95	1.2	0
BG-4-117	1.2	0
BG-4-120	1.2	0
BG-6-2	1	0
BG-6-9	1	0
BG-6-58	1.2	0
BG-6-75	1.2	0
BG-6-98	1.2	0
BG-6-114	1.2	0
BG-6-127	1.2	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Phosphorous.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	4	8	66.67%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	8	1	1	1	1	0
Statistics (Detects Only)	4	0.4	0.72	0.555	0.55	0.174
Statistics (All: NDs treated as DL value)	12	0.4	1	0.852	1	0.237
Statistics (All: NDs treated as DL/2 value)	12	0.4	0.72	0.518	0.5	0.0947
Statistics (Normal ROS Estimated Data)	12	0.286	0.824	0.555	0.555	0.168
Statistics (Gamma ROS Estimated Data)	12	0.256	0.762	0.55	0.572	0.165
Statistics (Lognormal ROS Estimated Data)	12	0.326	0.876	0.558	0.535	0.172

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	13.3	10.03	0.0417	-0.627	0.321	-0.511
Statistics (NDs = DL)	10.5	7.927	0.0811	-0.209	0.351	-1.68
Statistics (NDs = DL/2)	36.1	27.13	0.0144	-0.671	0.171	-0.254
Statistics (Gamma ROS Estimates)	10.59	8	0.0519	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.627	0.31	-0.495

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.904	0.823	0.847	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.787	0.748	Data Appear Normal
Lilliefors (Detects Only)	0.298	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.666	0.859	Data Not Normal
Lilliefors (NDs = DL)	0.401	0.256	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.73	0.859	Data Not Normal
Lilliefors (NDs = DL/2)	0.41	0.256	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.954	0.859	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.139	0.256	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.896	0.756	0.866	0.946

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.611	0.657	
Kolmogorov-Smirnov (Detects Only)	0.331	0.395	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.01	0.73	
Kolmogorov-Smirnov (NDs = DL)	0.404	0.245	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	1.643	0.731	
Kolmogorov-Smirnov (NDs = DL/2)	0.397	0.245	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.447	0.73	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.18	0.245	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.902	0.809	0.867	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.783	0.748	Data Appear Lognormal
Lilliefors (Detects Only)	0.296	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.648	0.859	Data Not Lognormal
Lilliefors (NDs = DL)	0.391	0.256	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.765	0.859	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.385	0.256	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.953	0.859	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.137	0.256	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	39	0	39	3	36	92.31%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	36	1	1.2	1.125	1.2	0.0937
Statistics (Detects Only)	3	0.38	0.72	0.567	0.6	0.172
Statistics (All: NDs treated as DL value)	39	0.38	1.2	1.082	1.2	0.18
Statistics (All: NDs treated as DL/2 value)	39	0.38	0.72	0.563	0.6	0.0599
Statistics (Normal ROS Estimated Data)	39	0.141	0.993	0.567	0.567	0.208
Statistics (Gamma ROS Estimated Data)	39	1.000E-12	0.72	0.0436	1.000E-12	0.158
Statistics (Lognormal ROS Estimated Data)	39	0.246	1.22	0.589	0.548	0.232

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	14.73	13.62	0.0385	-0.602	0.329	-0.547
Statistics (NDs = DL)	25.57	23.62	0.0423	0.0592	0.223	3.773
Statistics (NDs = DL/2)	85.49	78.93	0.00658	-0.581	0.112	-0.192
Statistics (Gamma ROS Estimates)	0.0398	0.0538	1.095	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.602	0.39	-0.648

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.986	0.81	0.876	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.972	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.243	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.669	0.939	Data Not Normal
Lilliefors (NDs = DL)	0.282	0.142	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.793	0.939	Data Not Normal

Lilliefors (NDs = DL/2)	0.322	0.142	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.985	0.939	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0506	0.142	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.766	0.869	0.926

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	5.092	0.747	
Kolmogorov-Smirnov (NDs = DL)	0.295	0.141	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	4.094	0.746	
Kolmogorov-Smirnov (NDs = DL/2)	0.327	0.141	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	13.97	1.803	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.584	0.2	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.971	0.743	0.866	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.942	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.276	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.576	0.939	Data Not Lognormal
Lilliefors (NDs = DL)	0.319	0.142	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.778	0.939	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.324	0.142	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.986	0.939	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0504	0.142	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Phosphorous.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Number of Valid Data	12	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	8
		Percent Non-Detects	66.67%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.4	Minimum Detected	-0.916
Maximum Detected	0.72	Maximum Detected	-0.329
Mean of Detected	0.555	Mean of Detected	-0.627
SD of Detected	0.174	SD of Detected	0.321
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1	Maximum Non-Detect	0

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.787	Shapiro Wilk Test Statistic	0.783
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.518	Mean (Log Scale)	-0.671
SD	0.0947	SD (Log Scale)	0.171
95% UTL 95% Coverage	0.777	95% UTL 95% Coverage	0.815
95% UPL (t)	0.695	95% UPL (t)	0.703
90% Percentile (z)	0.64	90% Percentile (z)	0.636
95% Percentile (z)	0.674	95% Percentile (z)	0.677
99% Percentile (z)	0.739	99% Percentile (z)	0.76
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.558
		SD in Original Scale	0.172
		Mean in Log Scale	-0.627

		SD in Log Scale	0.31
		95% UTL 95% Coverage	1.248
		95% UPL (t)	0.954
		90% Percentile (z)	0.795
		95% Percentile (z)	0.89
		99% Percentile (z)	1.099
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.491	Data appear Normal at 5% Significance Level	
Theta Star	0.159		
nu star	27.92		
A-D Test Statistic	0.611	Nonparametric Statistics	
5% A-D Critical Value	0.657	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.331	Mean	0.555
5% K-S Critical Value	0.395	SD	0.15
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0868
		95% KM UTL with 95% Coverage	0.967
Assuming Gamma Distribution		95% KM Chebyshev UPL	1.237
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.836
Mean	0.55	90% Percentile (z)	0.748
Median	0.572	95% Percentile (z)	0.802
SD	0.165	99% Percentile (z)	0.905
k star	8		
Theta star	0.0688	Gamma ROS Limits with Extrapolated Data	
Nu star	192	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.926
95% Percentile of Chisquare (2k)	26.3	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.939
		95% WH Approx. Gamma UTL with 95% Coverage	1.16
90% Percentile	0.809	95% HW Approx. Gamma UTL with 95% Coverage	1.192
95% Percentile	0.904		
99% Percentile	1.1		

Note: DL/2 is not a recommended method.

MC

General Statistics			
Number of Valid Data	39	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	36
		Percent Non-Detects	92.31%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.38	Minimum Detected	-0.968
Maximum Detected	0.72	Maximum Detected	-0.329
Mean of Detected	0.567	Mean of Detected	-0.602
SD of Detected	0.172	SD of Detected	0.329
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	1.2	Maximum Non-Detect	0.182
Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	39
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	0

Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.972	Shapiro Wilk Test Statistic	0.942
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.563	Mean (Log Scale)	-0.581
SD	0.0599	SD (Log Scale)	0.112
95% UTL 95% Coverage	0.69	95% UTL 95% Coverage	0.709
95% UPL (t)	0.665	95% UPL (t)	0.677
90% Percentile (z)	0.64	90% Percentile (z)	0.646
95% Percentile (z)	0.661	95% Percentile (z)	0.672
99% Percentile (z)	0.702	99% Percentile (z)	0.725
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.589
		SD in Original Scale	0.232
		Mean in Log Scale	-0.602
		SD in Log Scale	0.39
		95% UTL 95% Coverage	1.255
		95% UPL (t)	1.067
		90% Percentile (z)	0.903
		95% Percentile (z)	1.041
		99% Percentile (z)	1.358
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.567
5% K-S Critical Value	N/A	SD	0.141
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0996
		95% KM UTL with 95% Coverage	0.866
Assuming Gamma Distribution		95% KM Chebyshev UPL	1.188
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.807
Mean	N/A	90% Percentile (z)	0.747
Median	N/A	95% Percentile (z)	0.798

SD	N/A	99% Percentile (z)	0.894
k star	N/A		
Theta star	N/A	**Gamma ROS Limits with Extrapolated Data**	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Phosphorous.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 0.72 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.710

For 10% significance level, 0.72 is an outlier.
For 5% significance level, 0.72 is an outlier.
For 1% significance level, 0.72 is an outlier.

2. Data Value 0.4 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.345

For 10% significance level, 0.4 is not an outlier.
For 5% significance level, 0.4 is not an outlier.
For 1% significance level, 0.4 is not an outlier.

Rosner's Outlier Test for MC

Mean	0.563
Standard Deviation	0.0599
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.563	0.0591	0.38	15	3.091	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 0.38 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Phosphorous.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Data	39	12
Number of Non-Detect Data	36	8
Number of Detect Data	3	4
Minimum Non-Detect	1	1
Maximum Non-Detect	1.2	1
Percent Non detects	92.31%	66.67%
Minimum Detected	0.38	0.4
Maximum Detected	0.72	0.72
Mean of Detected Data	0.567	0.555
Median of Detected Data	0.6	0.55
SD of Detected Data	0.172	0.174

Site vs Background Gehan Test

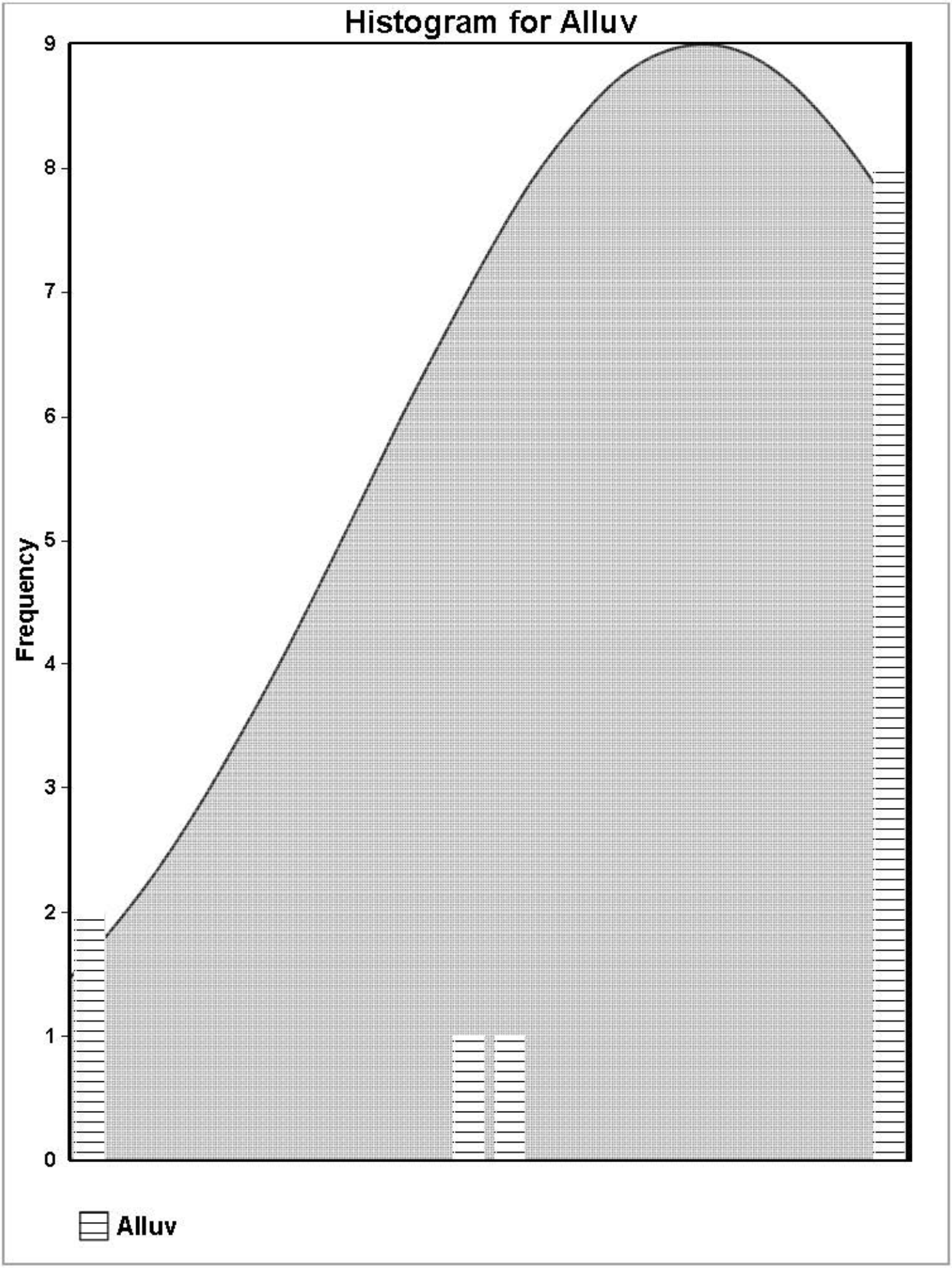
H0: Mu of Site or AOC = Mu of background

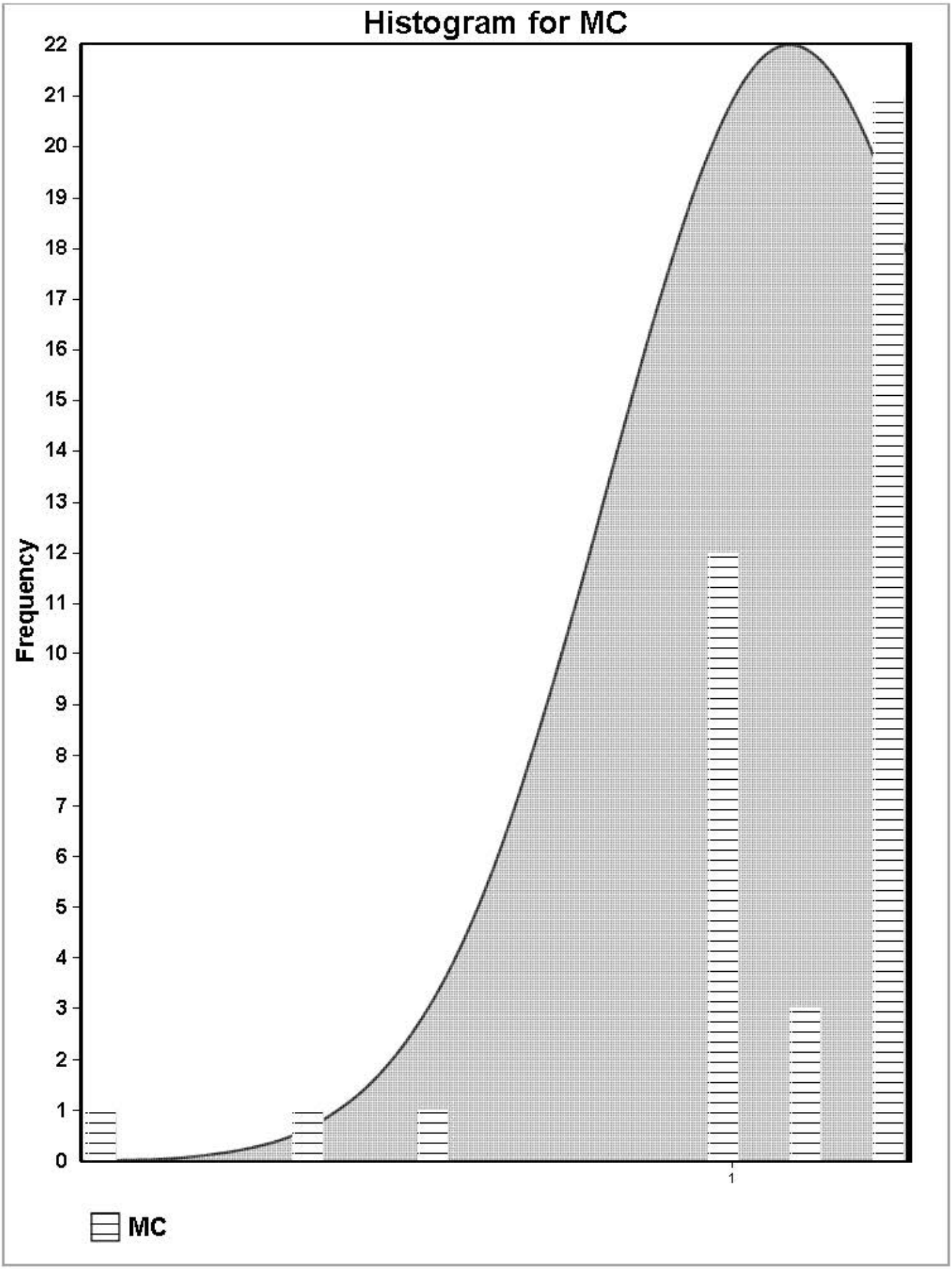
Gehan z Test Value	-0.441
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.659

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
7
8
9
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
1
MC

Location	Alluv	D_Alluv
BG-1-2	1	0
BG-1-10	0.4	1
BG-1-29	1	0
BG-1-40	1	0
BG-2-2	0.72	1
BG-2-10	0.41	1
BG-2-19	1	0
BG-2-21	1	0
BG-3-2	1	0
BG-3-10	0.69	1
BG-6-2	1	0
BG-6-9	1	0

Location	MC	D_MC
BG-1-43	1	0
BG-1-46	1	0
BG-1-55	1	0
BG-1-78	1	0
BG-1-92	1	0
BG-2-30	0.72	1
BG-2-32	1	0
BG-2-75	1	0
BG-2-81	1	0
BG-3-17	0.6	1
BG-3-22	1	0
BG-3-29	1	0
BG-3-63	1.2	0
BG-3-65	1.2	0
BG-3-69	0.38	1
BG-3-95	1.1	0
BG-3-105	1.2	0
BG-3-131	1.1	0
BG-3-136	1.2	0
BG-4-1	1	0
BG-4-10	1.1	0
BG-4-19	1.2	0
BG-4-40	1.2	0
BG-4-65	1	0
BG-4-79	1.2	0
BG-4-82	1.2	0
BG-4-95	1.2	0
BG-4-117	1.2	0
BG-4-120	1.2	0
BG-4-161	1.2	0
BG-4-163	1.2	0
BG-6-28	1.2	0
BG-6-53	1.2	0
BG-6-58	1.2	0
BG-6-75	1.2	0
BG-6-87	1.2	0
BG-6-98	1.2	0
BG-6-114	1.2	0
BG-1-127	1.2	0

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Potassium.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	35
Minimum	590
Maximum	7500
Mean of Raw Data	2795
Standard Deviation of Raw Data	1938
Kstar	2.11
Mean of Log Transformed Data	7.695
Standard Deviation of Log Transformed Data	0.717

Normal Distribution Test Results	
Correlation Coefficient R	0.942
Approximate Shapiro Wilk Test Statistic	0.87
Approximate Shapiro Wilk P Value	8.2656E-6
Lilliefors Test Statistic	0.169
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.978
A-D Test Statistic	0.683
A-D Critical (0.95) Value	0.762
K-S Test Statistic	0.115
K-S Critical(0.95) Value	0.126

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.987
Approximate Shapiro Wilk Test Statistic	0.95
Approximate Shapiro Wilk P Value	0.0554
Lilliefors Test Statistic	0.101
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Potassium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Total Number of Observations	51	Number of Distinct Observations	35

Raw Statistics		Log-Transformed Statistics	
Minimum	590	Minimum	6.38
Maximum	7500	Maximum	8.923
Second Largest	6800	Second Largest	8.825
First Quartile	1200	First Quartile	7.09
Median	2200	Median	7.696
Third Quartile	4100	Third Quartile	8.316
Mean	2795	Mean	7.695
SD	1938	SD	0.717
Coefficient of Variation	0.693		
Skewness	0.942		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.169	Lilliefors Test Statistic	0.101
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	6775	95% UTL with 95% Coverage	9577
95% UPL (t)	6074	95% UPL (t)	7391
90% Percentile (z)	5279	90% Percentile (z)	5506
95% Percentile (z)	5983	95% Percentile (z)	7144
99% Percentile (z)	7303	99% Percentile (z)	11645

Gamma Distribution Test		Data Distribution Test
k star	2.11	Data appear Gamma Distributed at 5% Significance Level
Theta Star	1325	
MLE of Mean	2795	
MLE of Standard Deviation	1924	
nu star	215.3	
A-D Test Statistic	0.683	Nonparametric Statistics
5% A-D Critical Value	0.762	90% Percentile 6300
K-S Test Statistic	0.115	95% Percentile 6650
5% K-S Critical Value	0.126	99% Percentile 7150
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	6800
90% Percentile	5368	95% Percentile Bootstrap UTL with 95% Coverage	7150
95% Percentile	6519	95% BCA Bootstrap UTL with 95% Coverage	6800
99% Percentile	9063	95% UPL	6740
		95% Chebyshev UPL	11324
95% WH Approx. Gamma UPL	6587	Upper Threshold Limit Based upon IQR	8450
95% HW Approx. Gamma UPL	6729		
95% WH Approx. Gamma UTL with 95% Coverage	7873		
95% HW Approx. Gamma UTL with 95% Coverage	8166		

Outlier Tests for Selected Variables

User Selected Options	
From File	Potassium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

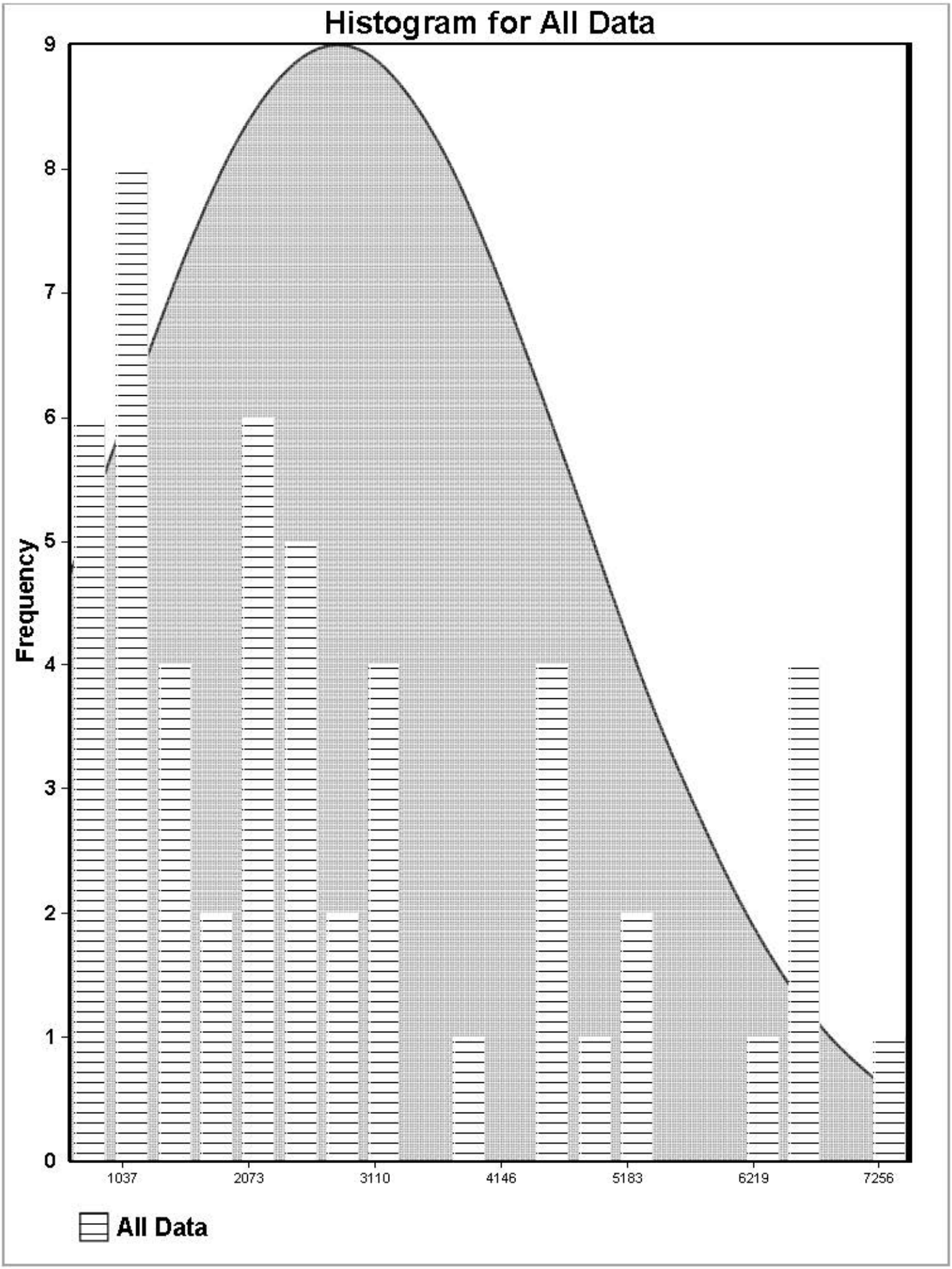
Rosner's Outlier Test for All Data

Mean	2795
Standard Deviation	1938
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2795	1919	7500	11	2.452	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
1037
2073
3110
4146
5183
6219
7256
All Data

Location	All Data
BG-1-2	5100
BG-1-43	6700
BG-1-55	620
BG-1-78	4400
BG-2-30	6800
BG-2-81	6600
BG-3-17	1000
BG-3-22	930
BG-3-69	2800
BG-4-2	3100
BG-4-19	7500
BG-4-40	6300
BG-4-79	4900
BG-4-161	2400
BG-4-163	3800
BG-6-28	4600
BG-6-53	3200
BG-6-87	6600
BG-1-10	2000
BG-1-29	2400
BG-1-40	670
BG-1-46	2100
BG-1-92	1000
BG-2-2	1800
BG-2-10	1300
BG-2-19	2100
BG-2-21	2000
BG-2-32	2200
BG-2-75	1400
BG-3-2	1100
BG-3-10	2200
BG-3-29	940
BG-3-63	1200
BG-3-65	1700
BG-3-95	770
BG-3-105	2400
BG-3-131	740
BG-3-136	4500
BG-4-10	3100
BG-4-65	1200
BG-4-82	2800
BG-4-95	1100
BG-4-117	590
BG-4-120	4400
BG-6-2	2400
BG-6-9	1300
BG-6-58	1300
BG-6-75	1200
BG-6-98	3300
BG-6-114	2600
BG-6-127	5400

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Potassium.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	11
Minimum	1000
Maximum	7500
Mean of Raw Data	2615
Standard Deviation of Raw Data	1835
Kstar	2.36
Mean of Log Transformed Data	7.693
Standard Deviation of Log Transformed Data	0.589

Normal Distribution Test Results	
Correlation Coefficient R	0.88
Shapiro Wilk Test Statistic	0.785
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.00326
Lilliefors Test Statistic	0.242
Lilliefors Critical (0.95) Value	0.246

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.962
A-D Test Statistic	0.482
A-D Critical (0.95) Value	0.739
K-S Test Statistic	0.173
K-S Critical(0.95) Value	0.238

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.974
Shapiro Wilk Test Statistic	0.947
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.543
Lilliefors Test Statistic	0.132
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

>20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	31
Minimum	590
Maximum	6800
Mean of Raw Data	2857
Standard Deviation of Raw Data	1992
Kstar	1.914
Mean of Log Transformed Data	7.695
Standard Deviation of Log Transformed Data	0.763

Normal Distribution Test Results

Correlation Coefficient R	0.948
Shapiro Wilk Test Statistic	0.875
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	3.4744E-4
Lilliefors Test Statistic	0.143
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.966
A-D Test Statistic	0.626
A-D Critical (0.95) Value	0.759
K-S Test Statistic	0.117
K-S Critical(0.95) Value	0.145

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.979
Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.0358
Lilliefors Test Statistic	0.108
Lilliefors Critical (0.95) Value	0.144

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Potassium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	11

Raw Statistics		Log-Transformed Statistics	
Minimum	1000	Minimum	6.908
Maximum	7500	Maximum	8.923
Second Largest	5100	Second Largest	8.537
First Quartile	1300	First Quartile	7.17
Median	2100	Median	7.65
Third Quartile	3100	Third Quartile	8.039
Mean	2615	Mean	7.693
SD	1835	SD	0.589
Coefficient of Variation	0.702		
Skewness	1.895		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.785	Shapiro Wilk Test Statistic	0.947
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	7516	95% UTL with 95% Coverage	10575
95% UPL (t)	6009	95% UPL (t)	6519
90% Percentile (z)	4967	90% Percentile (z)	4666
95% Percentile (z)	5633	95% Percentile (z)	5779
99% Percentile (z)	6884	99% Percentile (z)	8633

Gamma Distribution Test		Data Distribution Test
k star	2.36	Data appear Gamma Distributed at 5% Significance Level
Theta Star	1108	
MLE of Mean	2615	
MLE of Standard Deviation	1702	
nu star	61.36	
A-D Test Statistic	0.482	Nonparametric Statistics
5% A-D Critical Value	0.739	90% Percentile 4700
K-S Test Statistic	0.173	95% Percentile 6060
5% K-S Critical Value	0.238	99% Percentile 7212
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	7500
90% Percentile	4895	95% Percentile Bootstrap UTL with 95% Coverage	7500
95% Percentile	5893	95% BCA Bootstrap UTL with 95% Coverage	7500
99% Percentile	8084	95% UPL	7500
		95% Chebyshev UPL	10915
95% WH Approx. Gamma UPL	6162	Upper Threshold Limit Based upon IQR	5800
95% HW Approx. Gamma UPL	6224		
95% WH Approx. Gamma UTL with 95% Coverage	8739		
95% HW Approx. Gamma UTL with 95% Coverage	9060		

>20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	31

Raw Statistics		Log-Transformed Statistics	
Minimum	590	Minimum	6.38
Maximum	6800	Maximum	8.825
Second Largest	6700	Second Largest	8.81
First Quartile	1200	First Quartile	7.09
Median	2400	Median	7.783
Third Quartile	4400	Third Quartile	8.389
Mean	2857	Mean	7.695
SD	1992	SD	0.763
Coefficient of Variation	0.697		
Skewness	0.741		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.875	Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	7103	95% UTL with 95% Coverage	11181
95% UPL (t)	6261	95% UPL (t)	8097
90% Percentile (z)	5409	90% Percentile (z)	5843
95% Percentile (z)	6133	95% Percentile (z)	7710
99% Percentile (z)	7490	99% Percentile (z)	12967
Gamma Distribution Test		Data Distribution Test	
k star	1.914	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1493		
MLE of Mean	2857		
MLE of Standard Deviation	2065		
nu star	145.4		
A-D Test Statistic	0.626	Nonparametric Statistics	
5% A-D Critical Value	0.759	90% Percentile	6390
K-S Test Statistic	0.117	95% Percentile	6615
5% K-S Critical Value	0.145	99% Percentile	6763

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	6800
90% Percentile	5614	95% Percentile Bootstrap UTL with 95% Coverage	6800
95% Percentile	6872	95% BCA Bootstrap UTL with 95% Coverage	6715
99% Percentile	9669	95% UPL	6705
		95% Chebyshev UPL	11652
95% WH Approx. Gamma UPL	6996	Upper Threshold Limit Based upon IQR	9200
95% HW Approx. Gamma UPL	7191		
95% WH Approx. Gamma UTL with 95% Coverage	8666		
95% HW Approx. Gamma UTL with 95% Coverage	9085		

Outlier Tests for Selected Variables

User Selected Options	
From File	Potassium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 7500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.688

For 10% significance level, 7500 is an outlier.
For 5% significance level, 7500 is an outlier.
For 1% significance level, 7500 is an outlier.

2. Data Value 1000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.073

For 10% significance level, 1000 is not an outlier.
For 5% significance level, 1000 is not an outlier.
For 1% significance level, 1000 is not an outlier.

Rosner's Outlier Test for >20

Mean	2857
Standard Deviation	1992
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2857	1965	6800	28	2.006	3.01	3.36

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Potassium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Observations	38	13
Number of Distinct Observations	31	11
Minimum	590	1000
Maximum	6800	7500
Mean	2857	2615
Median	2400	2100
SD	1992	1835
SE of Mean	323.1	508.9

Wilcoxon-Mann-Whitney (WMW) Test

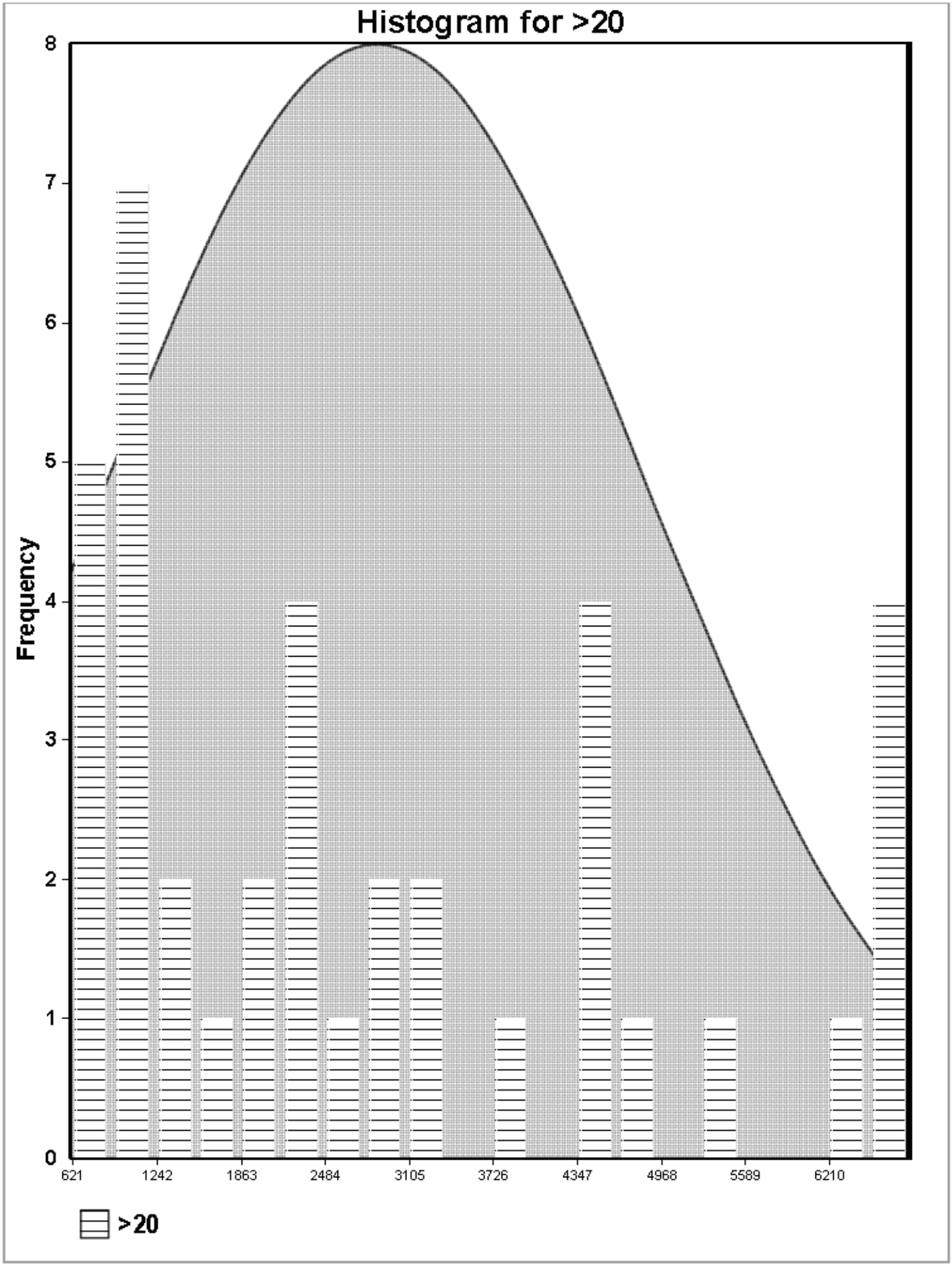
H0: Mean/Median of Site or AOC = Mean/Median of Background

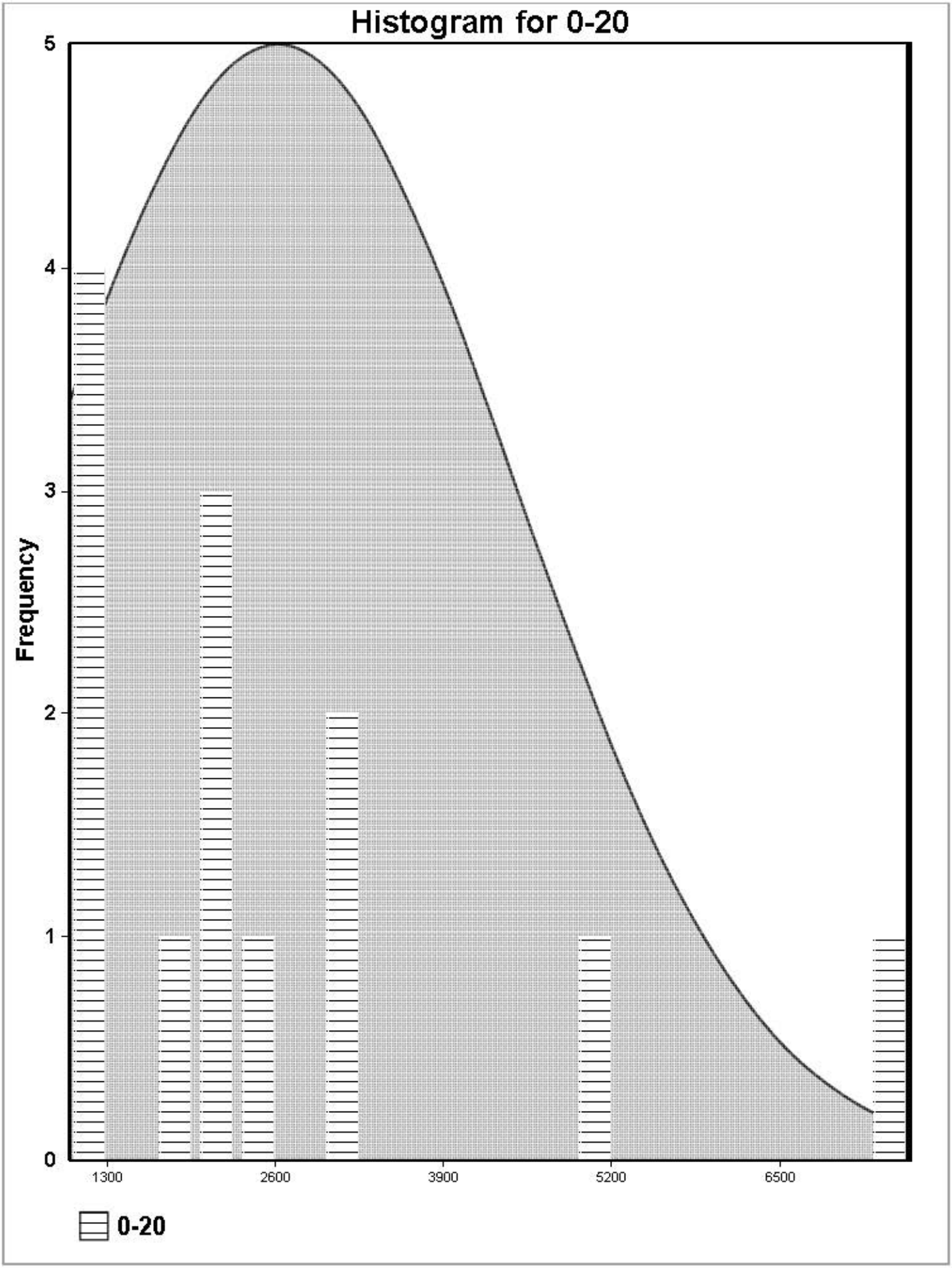
Site Rank Sum W-Stat	992
WMW Test U-Stat	0.0756
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.94

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
621
1242
1863
2484
3105
3726
4347
4968
5589
6210
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5
1300
2600
3900
5200
6500
0-20

Location	0-20
BG-1-2	5100
BG-3-17	1000
BG-4-2	3100
BG-4-19	7500
BG-1-10	2000
BG-2-2	1800
BG-2-10	1300
BG-2-19	2100
BG-3-2	1100
BG-3-10	2200
BG-4-10	3100
BG-6-2	2400
BG-6-9	1300

Location	>20
BG-1-29	2400
BG-1-40	670
BG-1-46	2100
BG-1-92	1000
BG-2-21	2000
BG-2-32	2200
BG-2-75	1400
BG-3-29	940
BG-3-63	1200
BG-3-65	1700
BG-3-95	770
BG-3-105	2400
BG-3-131	740
BG-3-136	4500
BG-4-65	1200
BG-4-82	2800
BG-4-95	1100
BG-4-117	590
BG-4-120	4400
BG-6-58	1300
BG-6-75	1200
BG-6-98	3300
BG-6-114	2600
BG-6-127	5400
BG-1-43	6700
BG-1-55	620
BG-1-78	4400
BG-2-30	6800
BG-2-81	6600
BG-3-22	930
BG-3-69	2800
BG-4-40	6300
BG-4-79	4900
BG-4-161	2400
BG-4-163	3800
BG-6-28	4600
BG-6-53	3200
BG-6-87	6600

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Potassium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	17
Minimum	620
Maximum	7500
Mean of Raw Data	4297
Standard Deviation of Raw Data	2203
Kstar	2.258
Mean of Log Transformed Data	8.167
Standard Deviation of Log Transformed Data	0.748

Normal Distribution Test Results	
Correlation Coefficient R	0.976
Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.288
Lilliefors Test Statistic	0.152
Lilliefors Critical (0.95) Value	0.209

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.916
A-D Test Statistic	0.764
A-D Critical (0.95) Value	0.748
K-S Test Statistic	0.152
K-S Critical(0.95) Value	0.205

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.92
Shapiro Wilk Test Statistic	0.841
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.00553
Lilliefors Test Statistic	0.173
Lilliefors Critical (0.95) Value	0.209

Data not Lognormal at (0.05) Significance Level

Non-Clay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	23
Minimum	590
Maximum	5400
Mean of Raw Data	1976
Standard Deviation of Raw Data	1153
Kstar	3.168
Mean of Log Transformed Data	7.438
Standard Deviation of Log Transformed Data	0.559

Normal Distribution Test Results

Correlation Coefficient R	0.938
Shapiro Wilk Test Statistic	0.879
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.00135
Lilliefors Test Statistic	0.146
Lilliefors Critical (0.95) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.987
A-D Test Statistic	0.385
A-D Critical (0.95) Value	0.752
K-S Test Statistic	0.131
K-S Critical(0.95) Value	0.154

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.992
Shapiro Wilk Test Statistic	0.975
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.704
Lilliefors Test Statistic	0.108
Lilliefors Critical (0.95) Value	0.154

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Potassium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	17

Raw Statistics		Log-Transformed Statistics	
Minimum	620	Minimum	6.43
Maximum	7500	Maximum	8.923
Second Largest	6800	Second Largest	8.825
First Quartile	2875	First Quartile	7.963
Median	4500	Median	8.412
Third Quartile	6525	Third Quartile	8.783
Mean	4297	Mean	8.167
SD	2203	SD	0.748
Coefficient of Variation	0.513		
Skewness	-0.257		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.935	Shapiro Wilk Test Statistic	0.841
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	9700	95% UTL with 95% Coverage	22072
95% UPL (t)	8234	95% UPL (t)	13412
90% Percentile (z)	7120	90% Percentile (z)	9187
95% Percentile (z)	7920	95% Percentile (z)	12057
99% Percentile (z)	9421	99% Percentile (z)	20077

Gamma Distribution Test		Data Distribution Test	
k star	2.258	Data appear Normal at 5% Significance Level	
Theta Star	1903		
MLE of Mean	4297		
MLE of Standard Deviation	2859		
nu star	81.3		
A-D Test Statistic	0.764	Nonparametric Statistics	
5% A-D Critical Value	0.748	90% Percentile	6730
K-S Test Statistic	0.152	95% Percentile	6905
5% K-S Critical Value	0.205	99% Percentile	7381
Data follow Appx. Gamma Distribution at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	7500
90% Percentile	8124	95% Percentile Bootstrap UTL with 95% Coverage	7500
95% Percentile	9813	95% BCA Bootstrap UTL with 95% Coverage	7500
99% Percentile	13533	95% UPL	7500
		95% Chebyshev UPL	14161
95% WH Approx. Gamma UPL	10218	Upper Threshold Limit Based upon IQR	12000
95% HW Approx. Gamma UPL	10748		
95% WH Approx. Gamma UTL with 95% Coverage	13759		
95% HW Approx. Gamma UTL with 95% Coverage	14966		

Non-Clay

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	23

Raw Statistics		Log-Transformed Statistics	
Minimum	590	Minimum	6.38
Maximum	5400	Maximum	8.594
Second Largest	4500	Second Largest	8.412
First Quartile	1200	First Quartile	7.09
Median	1800	Median	7.496
Third Quartile	2400	Third Quartile	7.783
Mean	1976	Mean	7.438
SD	1153	SD	0.559
Coefficient of Variation	0.583		
Skewness	1.321		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.879	Shapiro Wilk Test Statistic	0.975
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	4484	95% UTL with 95% Coverage	5729
95% UPL (t)	3958	95% UPL (t)	4439
90% Percentile (z)	3453	90% Percentile (z)	3476
95% Percentile (z)	3872	95% Percentile (z)	4258
99% Percentile (z)	4657	99% Percentile (z)	6231
Gamma Distribution Test		Data Distribution Test	
k star	3.168	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	623.8		
MLE of Mean	1976		
MLE of Standard Deviation	1110		
nu star	209.1		
A-D Test Statistic	0.385	Nonparametric Statistics	
5% A-D Critical Value	0.752	90% Percentile	3260
K-S Test Statistic	0.131	95% Percentile	4440
5% K-S Critical Value	0.154	99% Percentile	5112

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	5400
90% Percentile	3465	95% Percentile Bootstrap UTL with 95% Coverage	5400
95% Percentile	4083	95% BCA Bootstrap UTL with 95% Coverage	5400
99% Percentile	5420	95% UPL	4770
		95% Chebyshev UPL	7076
95% WH Approx. Gamma UPL	4142	Upper Threshold Limit Based upon IQR	4200
95% HW Approx. Gamma UPL	4196		
95% WH Approx. Gamma UTL with 95% Coverage	5002		
95% HW Approx. Gamma UTL with 95% Coverage	5134		

Outlier Tests for Selected Variables

User Selected Options	
From File	Potassium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 7500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.123

For 10% significance level, 7500 is not an outlier.

For 5% significance level, 7500 is not an outlier.

For 1% significance level, 7500 is not an outlier.

2. Data Value 620 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.063

For 10% significance level, 620 is not an outlier.

For 5% significance level, 620 is not an outlier.

For 1% significance level, 620 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	1976
Standard Deviation	1153
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1976	1135	5400	33	3.017	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 5400 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Potassium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Observations	33	18
Number of Distinct Observations	23	17
Minimum	590	620
Maximum	5400	7500
Mean	1976	4297
Median	1800	4500
SD	1153	2203
SE of Mean	200.6	519.2

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

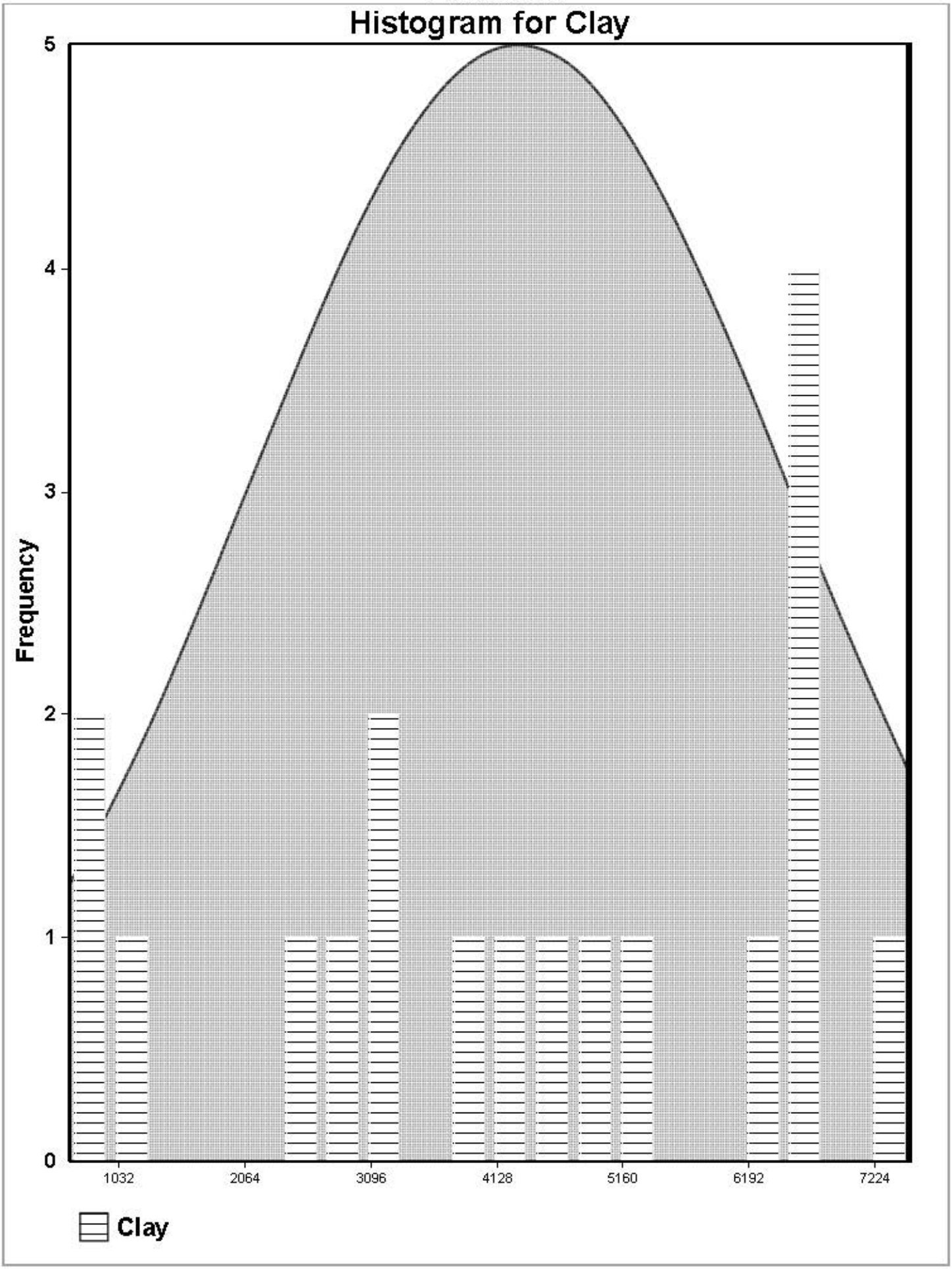
Site Rank Sum W-Stat	680.5
WMW Test U-Stat	3.489
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	4.5072E-4

Conclusion with Alpha = 0.05

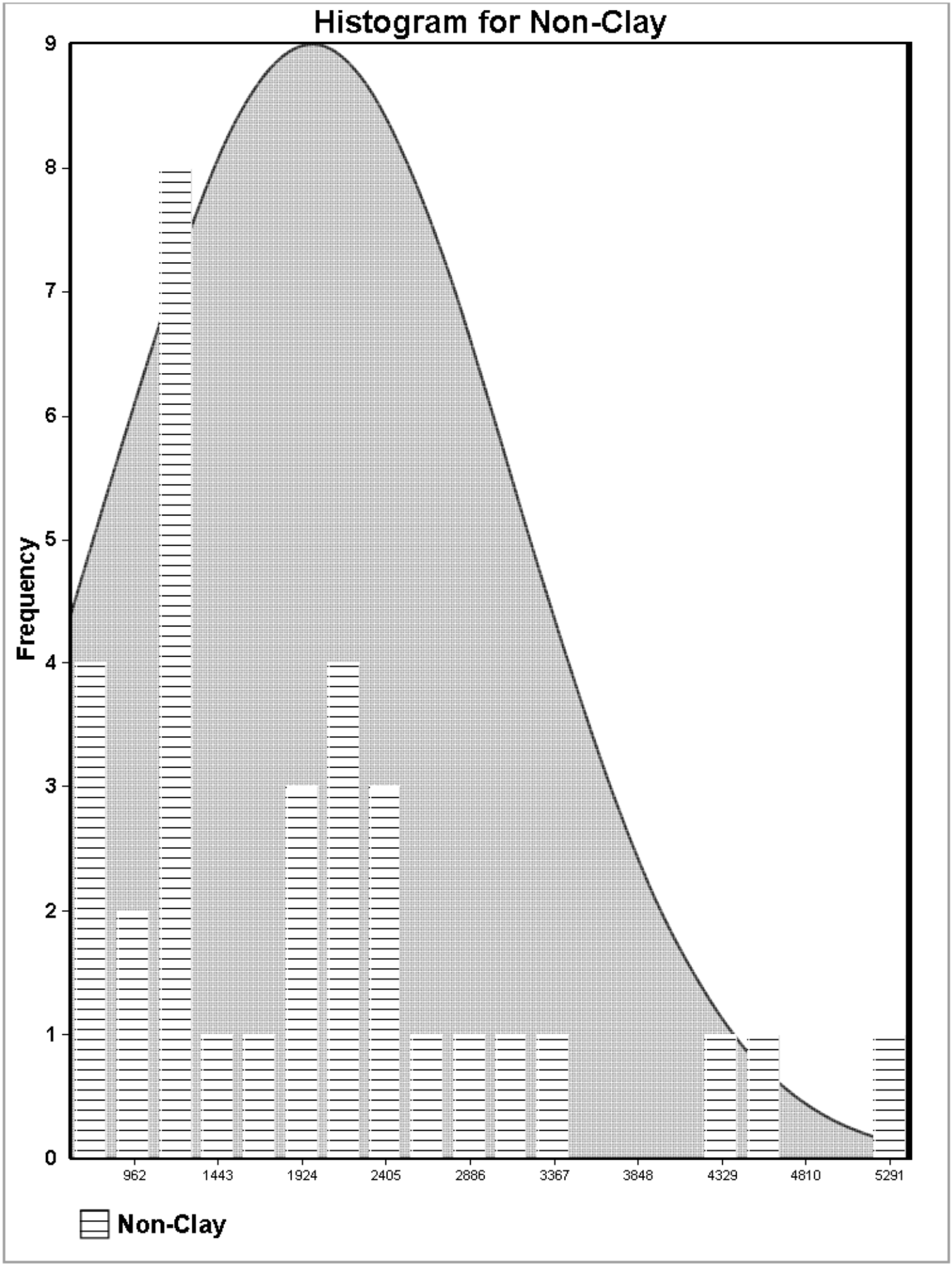
Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Potassium


Histogram for Clay
Frequency
0
1
2
3
4
5
1032
2064
3096
4128
5160
6192
7224
Clay

Potassium


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
962
1443
1924
2405
2886
3367
3848
4329
4810
5291
Non-Clay

Location	Clay
BG-1-2	5100
BG-1-43	6700
BG-1-55	620
BG-1-78	4400
BG-2-30	6800
BG-2-81	6600
BG-3-17	1000
BG-3-22	930
BG-3-69	2800
BG-4-2	3100
BG-4-19	7500
BG-4-40	6300
BG-4-79	4900
BG-4-161	2400
BG-4-163	3800
BG-6-28	4600
BG-6-53	3200
BG-6-87	6600

Location	Non-Clay
BG-1-10	2000
BG-1-29	2400
BG-1-40	670
BG-1-46	2100
BG-1-92	1000
BG-2-2	1800
BG-2-10	1300
BG-2-19	2100
BG-2-21	2000
BG-2-32	2200
BG-2-75	1400
BG-3-2	1100
BG-3-10	2200
BG-3-29	940
BG-3-63	1200
BG-3-65	1700
BG-3-95	770
BG-3-105	2400
BG-3-131	740
BG-3-136	4500
BG-4-10	3100
BG-4-65	1200
BG-4-82	2800
BG-4-95	1100
BG-4-117	590
BG-4-120	4400
BG-6-2	2400
BG-6-9	1300
BG-6-58	1300
BG-6-75	1200
BG-6-98	3300
BG-6-114	2600
BG-6-127	5400
Average	1976.061

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Potassium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	9
Minimum	670
Maximum	5100
Mean of Raw Data	2031
Standard Deviation of Raw Data	1111
Kstar	3.396
Mean of Log Transformed Data	7.5
Standard Deviation of Log Transformed Data	0.502

Normal Distribution Test Results	
Correlation Coefficient R	0.876
Shapiro Wilk Test Statistic	0.796
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.00444
Lilliefors Test Statistic	0.286
Lilliefors Critical (0.95) Value	0.256

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.924
A-D Test Statistic	0.492
A-D Critical (0.95) Value	0.734
K-S Test Statistic	0.219
K-S Critical(0.95) Value	0.246

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.957
Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.325
Lilliefors Test Statistic	0.203
Lilliefors Critical (0.95) Value	0.256

Data appear Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	31
Minimum	590
Maximum	7500
Mean of Raw Data	3031
Standard Deviation of Raw Data	2084
Kstar	1.921
Mean of Log Transformed Data	7.755
Standard Deviation of Log Transformed Data	0.767

Normal Distribution Test Results

Correlation Coefficient R	0.953
Shapiro Wilk Test Statistic	0.888
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	7.5947E-4
Lilliefors Test Statistic	0.142
Lilliefors Critical (0.95) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.969
A-D Test Statistic	0.672
A-D Critical (0.95) Value	0.759
K-S Test Statistic	0.128
K-S Critical(0.95) Value	0.143

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.978
Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.0293
Lilliefors Test Statistic	0.115
Lilliefors Critical (0.95) Value	0.142

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Potassium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-Transformed Statistics	
Minimum	670	Minimum	6.507
Maximum	5100	Maximum	8.537
Second Largest	2400	Second Largest	7.783
First Quartile	1300	First Quartile	7.17
Median	2000	Median	7.601
Third Quartile	2250	Third Quartile	7.718
Mean	2031	Mean	7.5
SD	1111	SD	0.502
Coefficient of Variation	0.547		
Skewness	1.983		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.796	Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	5069	95% UTL with 95% Coverage	7130
95% UPL (t)	4107	95% UPL (t)	4616
90% Percentile (z)	3454	90% Percentile (z)	3438
95% Percentile (z)	3858	95% Percentile (z)	4125
99% Percentile (z)	4614	99% Percentile (z)	5806

Gamma Distribution Test		Data Distribution Test	
k star	3.396	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	597.9		
MLE of Mean	2031		
MLE of Standard Deviation	1102		
nu star	81.51		
A-D Test Statistic	0.492	Nonparametric Statistics	
5% A-D Critical Value	0.734	90% Percentile	2400
K-S Test Statistic	0.219	95% Percentile	3615
5% K-S Critical Value	0.246	99% Percentile	4803
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	5100
90% Percentile	3508	95% Percentile Bootstrap UTL with 95% Coverage	5100
95% Percentile	4115	95% BCA Bootstrap UTL with 95% Coverage	5100
99% Percentile	5422	95% UPL	5100
		95% Chebyshev UPL	7069
95% WH Approx. Gamma UPL	4279	Upper Threshold Limit Based upon IQR	3675
95% HW Approx. Gamma UPL	4339		
95% WH Approx. Gamma UTL with 95% Coverage	5873		
95% HW Approx. Gamma UTL with 95% Coverage	6090		

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	31
Raw Statistics		**Log-Transformed Statistics**	
Minimum	590	Minimum	6.38
Maximum	7500	Maximum	8.923
Second Largest	6800	Second Largest	8.825
First Quartile	1200	First Quartile	7.09
Median	2600	Median	7.863
Third Quartile	4450	Third Quartile	8.401
Mean	3031	Mean	7.755
SD	2084	SD	0.767
Coefficient of Variation	0.688		
Skewness	0.687		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.888	Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	7458	95% UTL with 95% Coverage	11891
95% UPL (t)	6588	95% UPL (t)	8637
90% Percentile (z)	5701	90% Percentile (z)	6231
95% Percentile (z)	6458	95% Percentile (z)	8233
99% Percentile (z)	7878	99% Percentile (z)	13881
Gamma Distribution Test		**Data Distribution Test**	
k star	1.921	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1578		
MLE of Mean	3031		
MLE of Standard Deviation	2187		
nu star	149.8		
A-D Test Statistic	0.672	**Nonparametric Statistics**	
5% A-D Critical Value	0.759	90% Percentile	6600
K-S Test Statistic	0.128	95% Percentile	6710

5% K-S Critical Value	0.143	99% Percentile	7234
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	7500
90% Percentile	5950	95% Percentile Bootstrap UTL with 95% Coverage	7500
95% Percentile	7281	95% BCA Bootstrap UTL with 95% Coverage	7500
99% Percentile	10240	95% UPL	6800
		95% Chebyshev UPL	12229
95% WH Approx. Gamma UPL	7412	Upper Threshold Limit Based upon IQR	9325
95% HW Approx. Gamma UPL	7629		
95% WH Approx. Gamma UTL with 95% Coverage	9153		
95% HW Approx. Gamma UTL with 95% Coverage	9609		

Outlier Tests for Selected Variables

User Selected Options	
From File	Potassium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12

10% critical value: 0.49

5% critical value: 0.546

1% critical value: 0.642

1. Data Value 5100 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.675

For 10% significance level, 5100 is an outlier.

For 5% significance level, 5100 is an outlier.

For 1% significance level, 5100 is an outlier.

2. Data Value 670 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.364

For 10% significance level, 670 is not an outlier.

For 5% significance level, 670 is not an outlier.

For 1% significance level, 670 is not an outlier.

Rosner's Outlier Test for MC

Mean	3031
Standard Deviation	2084
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3031	2057	7500	22	2.173	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Potassium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Observations	39	12
Number of Distinct Observations	31	9
Minimum	590	670
Maximum	7500	5100
Mean	3031	2031
Median	2600	2000
SD	2084	1111
SE of Mean	333.7	320.6

Wilcoxon-Mann-Whitney (WMW) Test

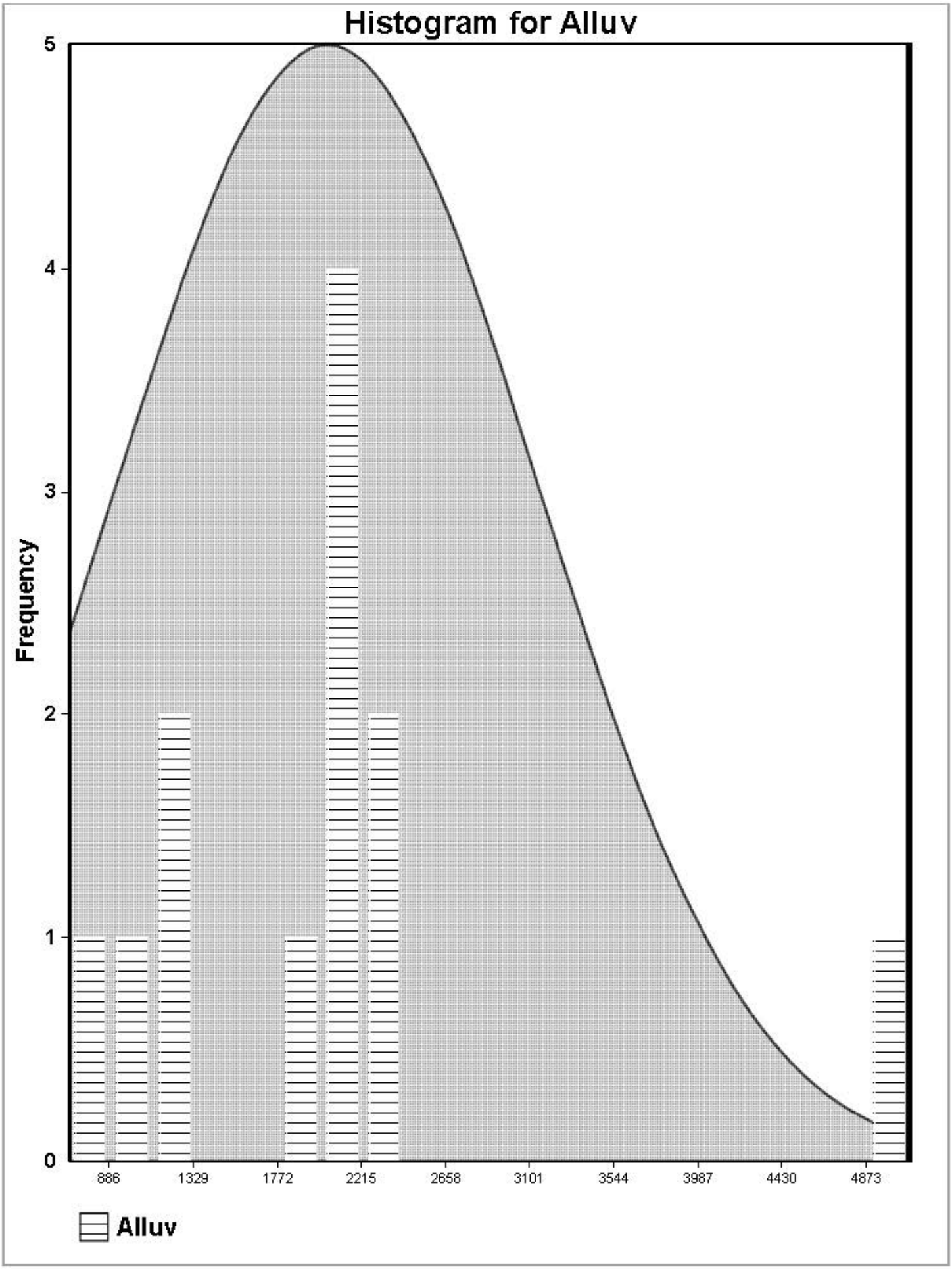
H0: Mean/Median of Site or AOC = Mean/Median of Background

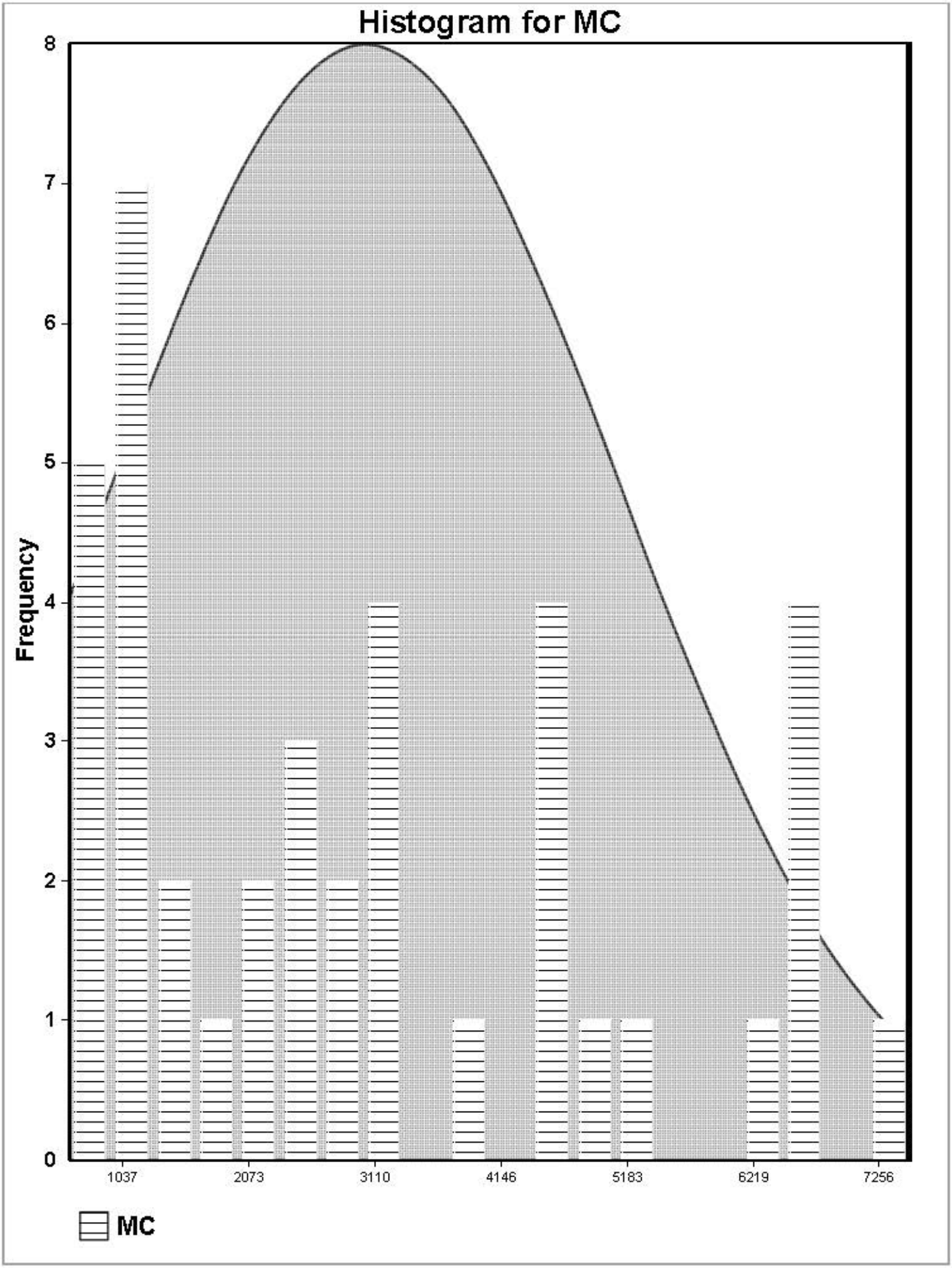
Site Rank Sum W-Stat	1068
WMW Test U-Stat	1.177
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.239

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
886
1329
1772
2215
2658
3101
3544
3987
4430
4873
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
1037
2073
3110
4146
5183
6219
7256
MC

Location	Alluv
BG-1-2	5100
BG-1-10	2000
BG-1-29	2400
BG-1-40	670
BG-2-2	1800
BG-2-10	1300
BG-2-19	2100
BG-2-21	2000
BG-3-2	1100
BG-3-10	2200
BG-6-2	2400
BG-6-9	1300

Location	MC
BG-1-43	6700
BG-1-46	2100
BG-1-55	620
BG-1-78	4400
BG-1-92	1000
BG-2-30	6800
BG-2-32	2200
BG-2-75	1400
BG-2-81	6600
BG-3-17	1000
BG-3-22	930
BG-3-29	940
BG-3-63	1200
BG-3-65	1700
BG-3-69	2800
BG-3-95	770
BG-3-105	2400
BG-3-131	740
BG-3-136	4500
BG-4-1	3100
BG-4-10	3100
BG-4-19	7500
BG-4-40	6300
BG-4-65	1200
BG-4-79	4900
BG-4-82	2800
BG-4-95	1100
BG-4-117	590
BG-4-120	4400
BG-4-161	2400
BG-4-163	3800
BG-6-28	4600
BG-6-53	3200
BG-6-58	1300
BG-6-75	1200
BG-6-87	6600
BG-6-98	3300
BG-6-114	2600
BG-1-127	5400

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Selenium.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	6	45	88.24%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	45	1	12	5.224	5.4	3.556
Statistics (Detects Only)	6	0.66	11	2.662	1.1	4.095
Statistics (All: NDs treated as DL value)	51	0.66	12	4.923	5.2	3.674
Statistics (All: NDs treated as DL/2 value)	51	0.5	11	2.618	2.6	2.111
Statistics (Normal ROS Estimated Data)	51	-3.525	11	0.251	0.119	2.069
Statistics (Gamma ROS Estimated Data)	51	0.66	11	2.929	2.954	1.334
Statistics (Lognormal ROS Estimated Data)	51	0.217	11	0.915	0.66	1.471

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.939	0.897	2.834	0.36	1.04	2.891
Statistics (NDs = DL)	1.486	1.411	3.314	1.221	0.956	0.783
Statistics (NDs = DL/2)	1.562	1.483	1.676	0.609	0.906	1.487
Statistics (Gamma ROS Estimates)	6.533	6.161	0.448	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.375	0.592	-1.578

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.733	0.934	0.911	0.87

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.561	0.788	Data Not Normal
Lilliefors (Detects Only)	0.454	0.362	Data Not Normal
Lilliefors (NDs = DL)	0.184	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.223	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.143	0.124	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.923	0.931	0.968	0.922

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.059	0.717	
Kolmogorov-Smirnov (Detects Only)	0.413	0.341	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.81	0.768	
Kolmogorov-Smirnov (NDs = DL)	0.224	0.126	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.95	0.767	
Kolmogorov-Smirnov (NDs = DL/2)	0.192	0.126	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	5.641	0.752	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.291	0.124	Data Not Gamma Distributed	

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.856	0.928	0.944	0.916

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.751	0.788	Data Not Lognormal
Lilliefors (Detects Only)	0.342	0.362	Data Appear Lognormal
Lilliefors (NDs = DL)	0.266	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.24	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0958	0.124	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Selenium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Number of Valid Data	51	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	45
		Percent Non-Detects	88.24%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.66	Minimum Detected	-0.416
Maximum Detected	11	Maximum Detected	2.398
Mean of Detected	2.662	Mean of Detected	0.36
SD of Detected	4.095	SD of Detected	1.04
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	12	Maximum Non-Detect	2.485

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	51
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 6 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.561	Shapiro Wilk Test Statistic	0.751
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.618	Mean (Log Scale)	0.609
SD	2.111	SD (Log Scale)	0.906
95% UTL 95% Coverage	6.954	95% UTL 95% Coverage	11.82
95% UPL (t)	6.191	95% UPL (t)	8.521
90% Percentile (z)	5.324	90% Percentile (z)	5.873
95% Percentile (z)	6.091	95% Percentile (z)	8.162
99% Percentile (z)	7.53	99% Percentile (z)	15.13

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.915
		SD in Original Scale	1.471
		Mean in Log Scale	-0.375
		SD in Log Scale	0.592
		95% UTL 95% Coverage	2.317
		95% UPL (t)	1.871
		90% Percentile (z)	1.467
		95% Percentile (z)	1.819
		99% Percentile (z)	2.722
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.581	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.583		
nu star	6.969		
A-D Test Statistic	1.059	Nonparametric Statistics	
5% A-D Critical Value	0.717	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.413	Mean	0.994
5% K-S Critical Value	0.341	SD	1.489
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.242
		95% KM UTL with 95% Coverage	4.053
Assuming Gamma Distribution		95% KM Chebyshev UPL	7.549
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	3.515
Mean	2.929	90% Percentile (z)	2.903
Median	2.954	95% Percentile (z)	3.444
SD	1.334	99% Percentile (z)	4.459
k star	6.161		
Theta star	0.475	Gamma ROS Limits with Extrapolated Data	
Nu star	628.5	95% Wilson Hilferty (WH) Approx. Gamma UPL	5.108
95% Percentile of Chisquare (2k)	21.46	95% Hawkins Wixley (HW) Approx. Gamma UPL	5.165
		95% WH Approx. Gamma UTL with 95% Coverage	5.732
90% Percentile	4.506	95% HW Approx. Gamma UTL with 95% Coverage	5.834
95% Percentile	5.101		
99% Percentile	6.345		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Selenium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for All Data

Mean	2.618
Standard Deviation	2.111
Number of data	51
Number of suspected outliers	1

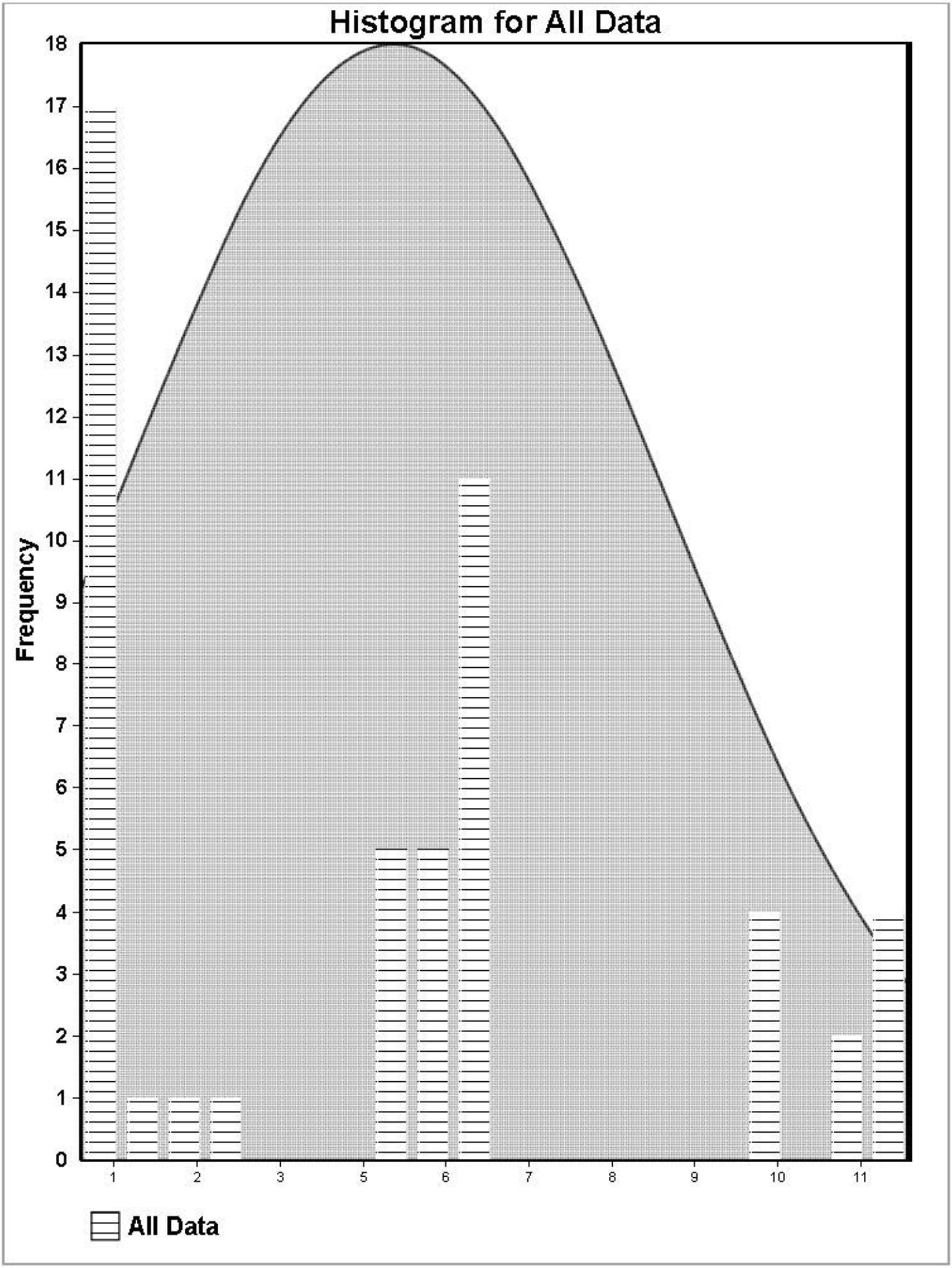
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2.618	2.091	11	6	4.009	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 11 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 11 is a Potential Statistical Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
1
2
3
5
6
7
8
9
10
11
All Data

Location	All Data	D_All Data
BG-1-2	0.71	1
BG-1-43	1.4	1
BG-1-55	1	0
BG-1-78	1	1
BG-2-30	5	0
BG-2-81	11	1
BG-3-17	5.2	0
BG-3-22	10	0
BG-3-69	5.7	0
BG-4-2	5.3	0
BG-4-19	5.9	0
BG-4-40	5.8	0
BG-4-79	5.9	0
BG-4-161	6	0
BG-4-163	12	0
BG-6-28	5.8	0
BG-6-53	6	0
BG-6-87	1.2	1
BG-1-10	0.66	1
BG-1-29	1	0
BG-1-40	1	0
BG-1-46	1	0
BG-1-92	1	0
BG-2-2	1	0
BG-2-10	1	0
BG-2-19	10	0
BG-2-21	5	0
BG-2-32	1	0
BG-2-75	1	0
BG-3-2	10	0
BG-3-10	5.4	0
BG-3-29	5.1	0
BG-3-63	1.2	0
BG-3-65	2.4	0
BG-3-95	2.3	0
BG-3-105	1.2	0
BG-3-131	11	0
BG-3-136	1.2	0
BG-4-10	5.4	0
BG-4-65	5.1	0
BG-4-82	12	0
BG-4-95	6.1	0
BG-4-117	5.9	0
BG-4-120	6	0
BG-6-2	10	0
BG-6-9	5.1	0
BG-6-58	6	0
BG-6-75	12	0
BG-6-98	5.9	0
BG-6-114	12	0
BG-6-127	1.2	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Selenium.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	2	11	84.62%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	11	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	13	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	13	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	13	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Shapiro-Wilks (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	
Shapiro-Wilks (NDs = DL/2)	N/A	N/A	
Lilliefors (NDs = DL/2)	N/A	N/A	
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A	
Lilliefors (Normal ROS Estimates)	N/A	N/A	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A	
Anderson-Darling (NDs = DL/2)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A	
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A	
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A	

Note: Substitution methods such as DL or DL/2 are not recommended.

>20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs

Raw Statistics	38	0	38	4	34	89.47%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	34	1	12	5.024	5.4	3.694
Statistics (Detects Only)	4	1	11	3.65	1.3	4.903
Statistics (All: NDs treated as DL value)	38	1	12	4.879	5.1	3.781
Statistics (All: NDs treated as DL/2 value)	38	0.5	11	2.632	2.55	2.262
Statistics (Normal ROS Estimated Data)	38	-16.67	11	-6.521	-6.986	5.269
Statistics (Gamma ROS Estimated Data)	38	1.000E-12	66.76	19.45	18.31	17.89
Statistics (Lognormal ROS Estimated Data)	38	0.0166	11	0.565	0.166	1.769

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.018	0.956	3.584	0.729	1.121	1.537
Statistics (NDs = DL)	1.483	1.383	3.29	1.211	0.941	0.777
Statistics (NDs = DL/2)	1.472	1.374	1.787	0.591	0.927	1.568
Statistics (Gamma ROS Estimates)	0.474	0.454	41.05	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.686	1.248	-0.74

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.805	0.922	0.899	0.97

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.661	0.748	Data Not Normal
Lilliefors (Detects Only)	0.427	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.827	0.938	Data Not Normal
Lilliefors (NDs = DL)	0.19	0.144	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.817	0.938	Data Not Normal
Lilliefors (NDs = DL/2)	0.242	0.144	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.956	0.938	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.121	0.144	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.97	0.931	0.969	0.964

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.774	0.666	
Kolmogorov-Smirnov (Detects Only)	0.435	0.402	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.228	0.767	
Kolmogorov-Smirnov (NDs = DL)	0.204	0.146	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.4	0.767	
Kolmogorov-Smirnov (NDs = DL/2)	0.165	0.146	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.275	0.819	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.2	0.152	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.855	0.922	0.949	0.973

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.743	0.748	Data Not Lognormal
Lilliefors (Detects Only)	0.387	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.822	0.938	Data Not Lognormal
Lilliefors (NDs = DL)	0.243	0.144	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.882	0.938	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.216	0.144	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.96	0.938	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.121	0.144	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Selenium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Number of Valid Data	13	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	11
		Percent Non-Detects	84.62%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.66	Minimum Detected	-0.416
Maximum Detected	0.71	Maximum Detected	-0.342
Mean of Detected	0.685	Mean of Detected	-0.379
SD of Detected	0.0354	SD of Detected	0.0516
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	13
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.578	Mean (Log Scale)	0.663

SD	1.673	SD (Log Scale)	0.875
95% UTL 95% Coverage	7.046	95% UTL 95% Coverage	20.09
95% UPL (t)	5.672	95% UPL (t)	9.792
90% Percentile (z)	4.722	90% Percentile (z)	5.957
95% Percentile (z)	5.33	95% Percentile (z)	8.186
99% Percentile (z)	6.47	99% Percentile (z)	14.86
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		95% UTL 95% Coverage	N/A
		95% UPL (t)	N/A
		90% Percentile (z)	N/A
		95% Percentile (z)	N/A
		99% Percentile (z)	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.685
5% K-S Critical Value	N/A	SD	0.025
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.025
		95% KM UTL with 95% Coverage	0.752
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.798
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.731
Mean	N/A	90% Percentile (z)	0.717
Median	N/A	95% Percentile (z)	0.726
SD	N/A	99% Percentile (z)	0.743
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

>20

General Statistics

Number of Valid Data	38	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	34
		Percent Non-Detects	89.47%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1	Minimum Detected	0
Maximum Detected	11	Maximum Detected	2.398
Mean of Detected	3.65	Mean of Detected	0.729
SD of Detected	4.903	SD of Detected	1.121
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	12	Maximum Non-Detect	2.485

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	38
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.661	Shapiro Wilk Test Statistic	0.743
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.632	Mean (Log Scale)	0.591
SD	2.262	SD (Log Scale)	0.927
95% UTL 95% Coverage	7.454	95% UTL 95% Coverage	13.03
95% UPL (t)	6.498	95% UPL (t)	8.806
90% Percentile (z)	5.53	90% Percentile (z)	5.924
95% Percentile (z)	6.352	95% Percentile (z)	8.297
99% Percentile (z)	7.894	99% Percentile (z)	15.61
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.565
		SD in Original Scale	1.769
		Mean in Log Scale	-1.686
		SD in Log Scale	1.248
		95% UTL 95% Coverage	2.651
		95% UPL (t)	1.564
		90% Percentile (z)	0.917
		95% Percentile (z)	1.443
		99% Percentile (z)	3.379

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only
k star (bias corrected)	0.421	Data do not follow a Discernable Distribution (0.05)
Theta Star	8.664	
nu star	3.37	
A-D Test Statistic	0.774	Nonparametric Statistics

5% A-D Critical Value	0.666	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.435	Mean	1.336
5% K-S Critical Value	0.402	SD	1.686
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.335
		95% KM UTL with 95% Coverage	4.93
Assuming Gamma Distribution		95% KM Chebyshev UPL	8.781
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	4.217
Mean	19.45	90% Percentile (z)	3.496
Median	18.31	95% Percentile (z)	4.109
SD	17.89	99% Percentile (z)	5.258
k star	0.454		
Theta star	42.84	Gamma ROS Limits with Extrapolated Data	
Nu star	34.51	95% Wilson Hilferty (WH) Approx. Gamma UPL	65.51
95% Percentile of Chisquare (2k)	3.61	95% Hawkins Wixley (HW) Approx. Gamma UPL	75.25
		95% WH Approx. Gamma UTL with 95% Coverage	87.82
90% Percentile	53.66	95% HW Approx. Gamma UTL with 95% Coverage	106.5
95% Percentile	77.32		
99% Percentile	136.1		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Selenium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.000

For 10% significance level, 5 is not an outlier.
For 5% significance level, 5 is not an outlier.
For 1% significance level, 5 is not an outlier.

2. Data Value 0.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.036

For 10% significance level, 0.5 is not an outlier.
For 5% significance level, 0.5 is not an outlier.
For 1% significance level, 0.5 is not an outlier.

Rosner's Outlier Test for >20

Mean	2.632
Standard Deviation	2.262
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2.632	2.232	11	29	3.749	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 11 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 11 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Selenium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Data	38	13
Number of Non-Detect Data	34	11
Number of Detect Data	4	2
Minimum Non-Detect	1	1
Maximum Non-Detect	12	10
Percent Non detects	89.47%	84.62%
Minimum Detected	1	0.66
Maximum Detected	11	0.71
Mean of Detected Data	3.65	0.685
Median of Detected Data	1.3	0.685
SD of Detected Data	4.903	0.0354

Site vs Background Gehan Test

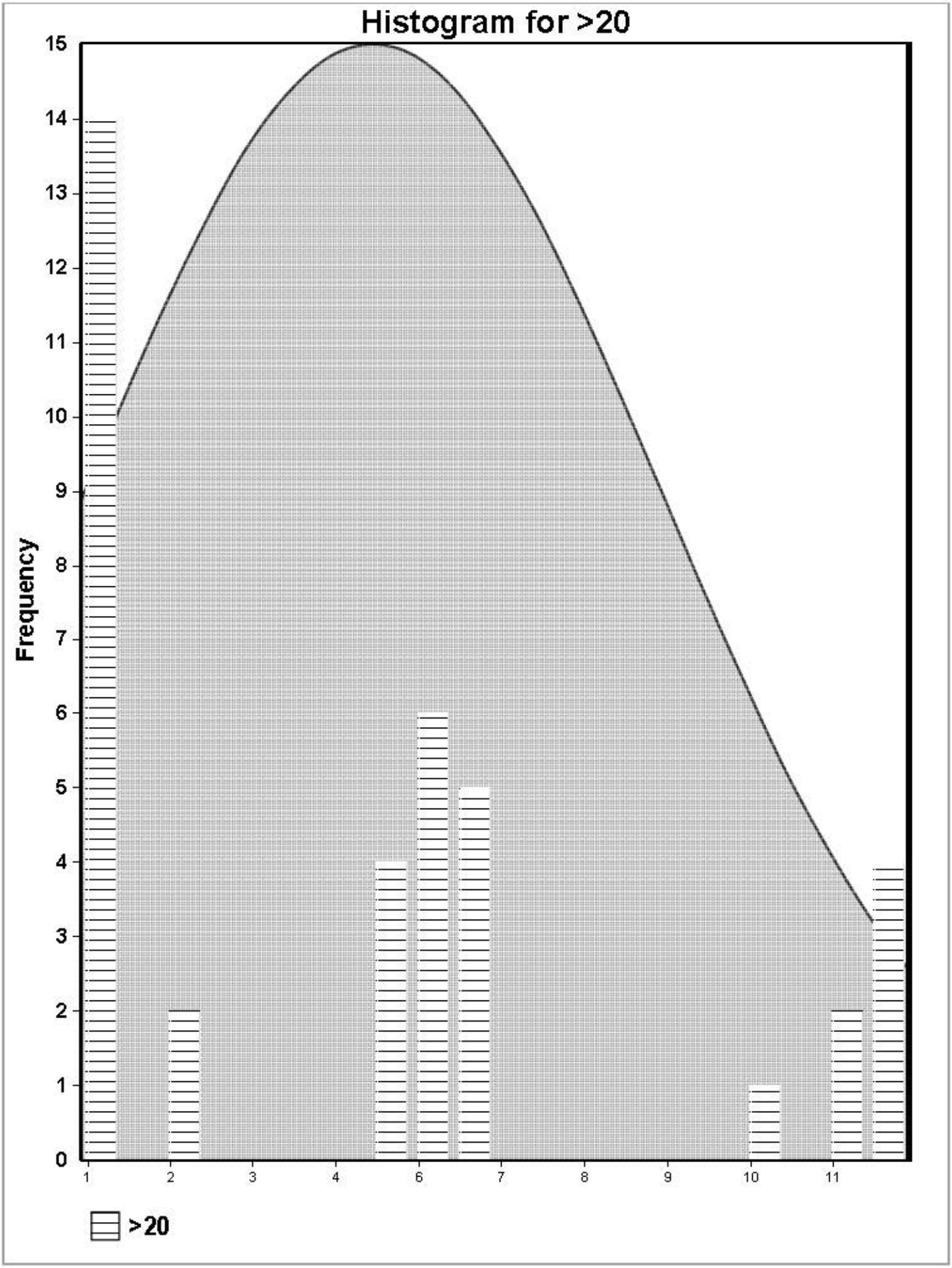
H0: Mu of Site or AOC = Mu of background

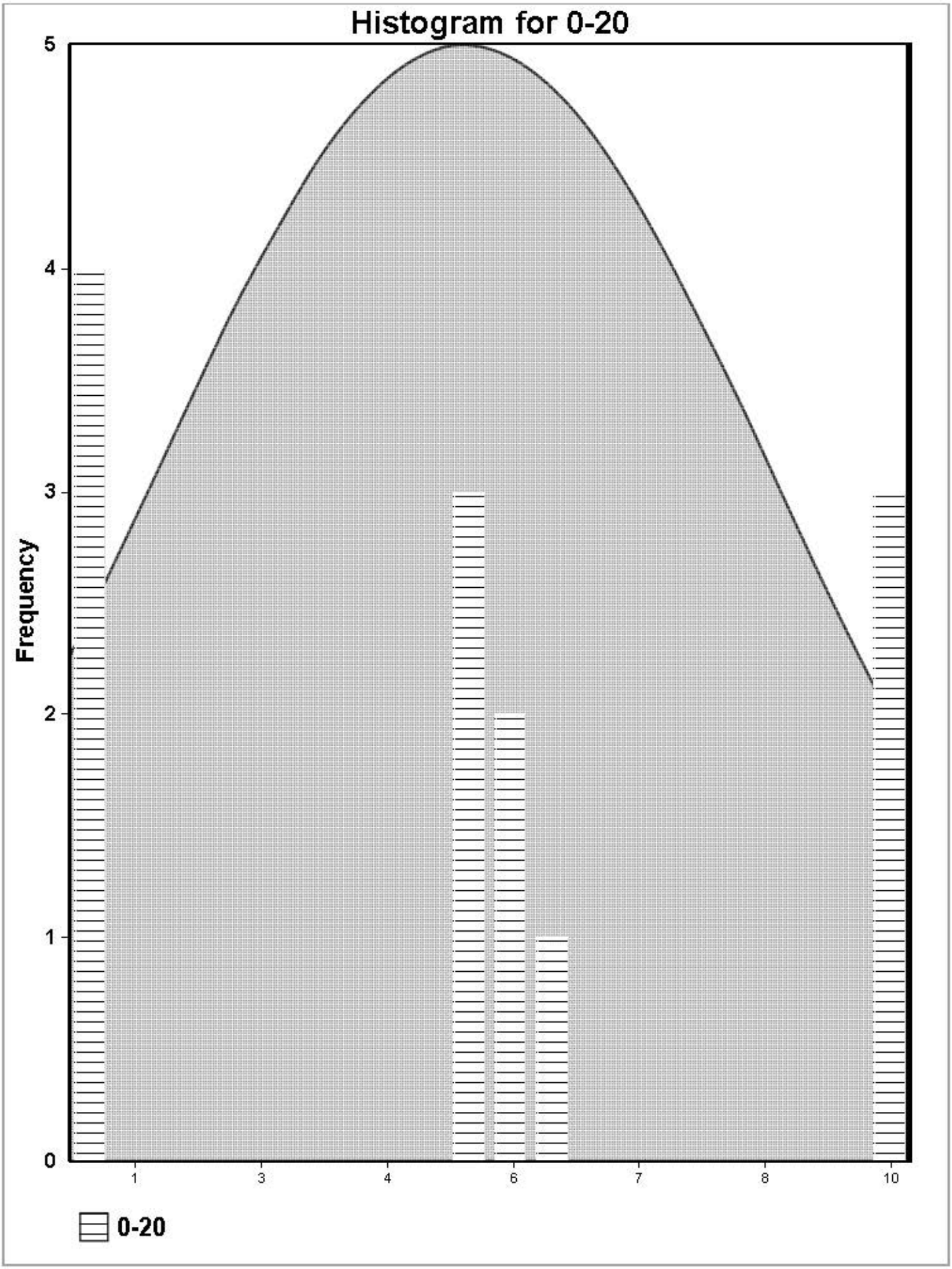
Gehan z Test Value	1.06
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.289

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1
2
3
4
6
7
8
9
10
11
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5
1
3
4
6
7
8
10
0-20

Location	0-20	D_0-20
BG-1-2	0.71	1
BG-3-17	5.2	0
BG-4-2	5.3	0
BG-4-19	5.9	0
BG-1-10	0.66	1
BG-2-2	1	0
BG-2-10	1	0
BG-2-19	10	0
BG-3-2	10	0
BG-3-10	5.4	0
BG-4-10	5.4	0
BG-6-2	10	0
BG-6-9	5.1	0

Location	>20	D_>20
BG-1-29	1	0
BG-1-40	1	0
BG-1-46	1	0
BG-1-92	1	0
BG-2-21	5	0
BG-2-32	1	0
BG-2-75	1	0
BG-3-29	5.1	0
BG-3-63	1.2	0
BG-3-65	2.4	0
BG-3-95	2.3	0
BG-3-105	1.2	0
BG-3-131	11	0
BG-3-136	1.2	0
BG-4-65	5.1	0
BG-4-82	12	0
BG-4-95	6.1	0
BG-4-117	5.9	0
BG-4-120	6	0
BG-6-58	6	0
BG-6-75	12	0
BG-6-98	5.9	0
BG-6-114	12	0
BG-6-127	1.2	0
BG-1-43	1.4	1
BG-1-55	1	0
BG-1-78	1	1
BG-2-30	5	0
BG-2-81	11	1
BG-3-22	10	0
BG-3-69	5.7	0
BG-4-40	5.8	0
BG-4-79	5.9	0
BG-4-161	6	0
BG-4-163	12	0
BG-6-28	5.8	0
BG-6-53	6	0
BG-6-87	1.2	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Selenium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	5	13	72.22%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	13	1	12	6.123	5.8	2.568
Statistics (Detects Only)	5	0.71	11	3.062	1.2	4.445
Statistics (All: NDs treated as DL value)	18	0.71	12	5.273	5.75	3.361
Statistics (All: NDs treated as DL/2 value)	18	0.5	11	3.062	2.875	2.411
Statistics (Normal ROS Estimated Data)	18	-1.716	11	1.539	1.165	2.605
Statistics (Gamma ROS Estimated Data)	18	1.000E-12	11	2.5	2.286	2.556
Statistics (Lognormal ROS Estimated Data)	18	0.46	11	1.572	1.002	2.372

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.96	0.837	3.19	0.515	1.083	2.103
Statistics (NDs = DL)	1.864	1.59	2.829	1.371	0.897	0.654
Statistics (NDs = DL/2)	2.163	1.84	1.415	0.87	0.747	0.858
Statistics (Gamma ROS Estimates)	0.361	0.338	6.929	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.103	0.657	6.369

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.767	0.939	0.851	0.781

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.609	0.762	Data Not Normal
Lilliefors (Detects Only)	0.446	0.396	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.875	0.897	Data Not Normal
Lilliefors (NDs = DL)	0.248	0.209	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.746	0.897	Data Not Normal
Lilliefors (NDs = DL/2)	0.344	0.209	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.646	0.897	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.295	0.209	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.945	0.928	0.934	0.963

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.887	0.692	
Kolmogorov-Smirnov (Detects Only)	0.425	0.365	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	1.383	0.754	
Kolmogorov-Smirnov (NDs = DL)	0.292	0.207	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	0.829	0.752	
Kolmogorov-Smirnov (NDs = DL/2)	0.254	0.206	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.053	0.829	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.399	0.219	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.867	0.908	0.955	0.828

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.772	0.762	Data Appear Lognormal
Lilliefors (Detects Only)	0.365	0.396	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.816	0.897	Data Not Lognormal
Lilliefors (NDs = DL)	0.327	0.209	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.922	0.897	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.247	0.209	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.718	0.897	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.278	0.209	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	1	32	96.97%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Non-Clay was not processed!

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Selenium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Number of Valid Data	18	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	13
		Percent Non-Detects	72.22%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.71	Minimum Detected	-0.342
Maximum Detected	11	Maximum Detected	2.398
Mean of Detected	3.062	Mean of Detected	0.515
SD of Detected	4.445	SD of Detected	1.083
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	12	Maximum Non-Detect	2.485

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	18
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 5 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.609	Shapiro Wilk Test Statistic	0.772
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	3.062	Mean (Log Scale)	0.87
SD	2.411	SD (Log Scale)	0.747
95% UTL 95% Coverage	8.975	95% UTL 95% Coverage	14.91
95% UPL (t)	7.37	95% UPL (t)	9.071
90% Percentile (z)	6.151	90% Percentile (z)	6.218
95% Percentile (z)	7.027	95% Percentile (z)	8.156
99% Percentile (z)	8.67	99% Percentile (z)	13.57

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	1.572
		SD in Original Scale	2.372
		Mean in Log Scale	0.103
		SD in Log Scale	0.657
		95% UTL 95% Coverage	5.556
		95% UPL (t)	3.588
		90% Percentile (z)	2.573
		95% Percentile (z)	3.267
		99% Percentile (z)	5.113
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.517	Data appear Lognormal at 5% Significance Level	
Theta Star	5.919		
nu star	5.173		
A-D Test Statistic	0.887	Nonparametric Statistics	
5% A-D Critical Value	0.692	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.425	Mean	1.592
5% K-S Critical Value	0.365	SD	2.367
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.65
		95% KM UTL with 95% Coverage	7.397
Assuming Gamma Distribution		95% KM Chebyshev UPL	12.19
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	5.822
Mean	2.5	90% Percentile (z)	4.625
Median	2.286	95% Percentile (z)	5.485
SD	2.556	99% Percentile (z)	7.098
k star	0.338		
Theta star	7.403	Gamma ROS Limits with Extrapolated Data	
Nu star	12.16	95% Wilson Hilferty (WH) Approx. Gamma UPL	8.647
95% Percentile of Chisquare (2k)	2.972	95% Hawkins Wixley (HW) Approx. Gamma UPL	10.58
		95% WH Approx. Gamma UTL with 95% Coverage	13.25
90% Percentile	7.258	95% HW Approx. Gamma UTL with 95% Coverage	17.82
95% Percentile	11		
99% Percentile	20.6		

Note: DL/2 is not a recommended method.

Non-Clay

General Statistics

Number of Valid Data	33	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	32

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Non-Clay was not processed!

Outlier Tests for Selected Variables

User Selected Options	
From File	Selenium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 11 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.600

For 10% significance level, 11 is an outlier.

For 5% significance level, 11 is an outlier.

For 1% significance level, 11 is an outlier.

2. Data Value 0.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.111

For 10% significance level, 0.5 is not an outlier.

For 5% significance level, 0.5 is not an outlier.

For 1% significance level, 0.5 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	2.376
Standard Deviation	1.925
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2.376	1.896	6	23	1.911	2.95	3.29

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Selenium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Clay

Background Data: Non-Clay

Raw Statistics

	Site	Background
Number of Valid Data	18	33
Number of Non-Detect Data	13	32
Number of Detect Data	5	1
Minimum Non-Detect	1	1
Maximum Non-Detect	12	12
Percent Non detects	72.22%	96.97%
Minimum Detected	0.71	0.66
Maximum Detected	11	0.66
Mean of Detected Data	3.062	0.66
Median of Detected Data	1.2	0.66
SD of Detected Data	4.445	N/A

Site vs Background Gehan Test

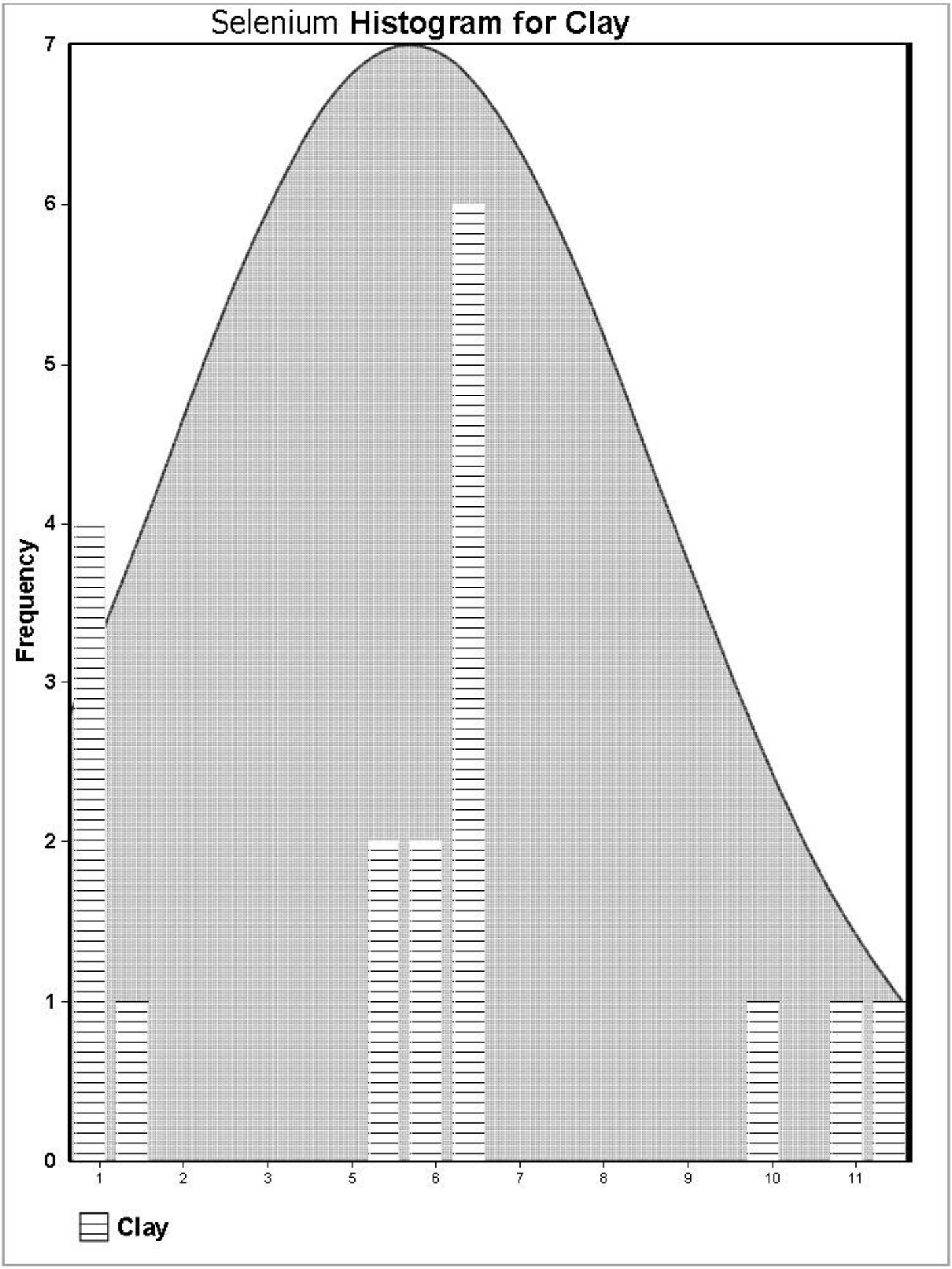
H0: Mu of Site or AOC = Mu of background

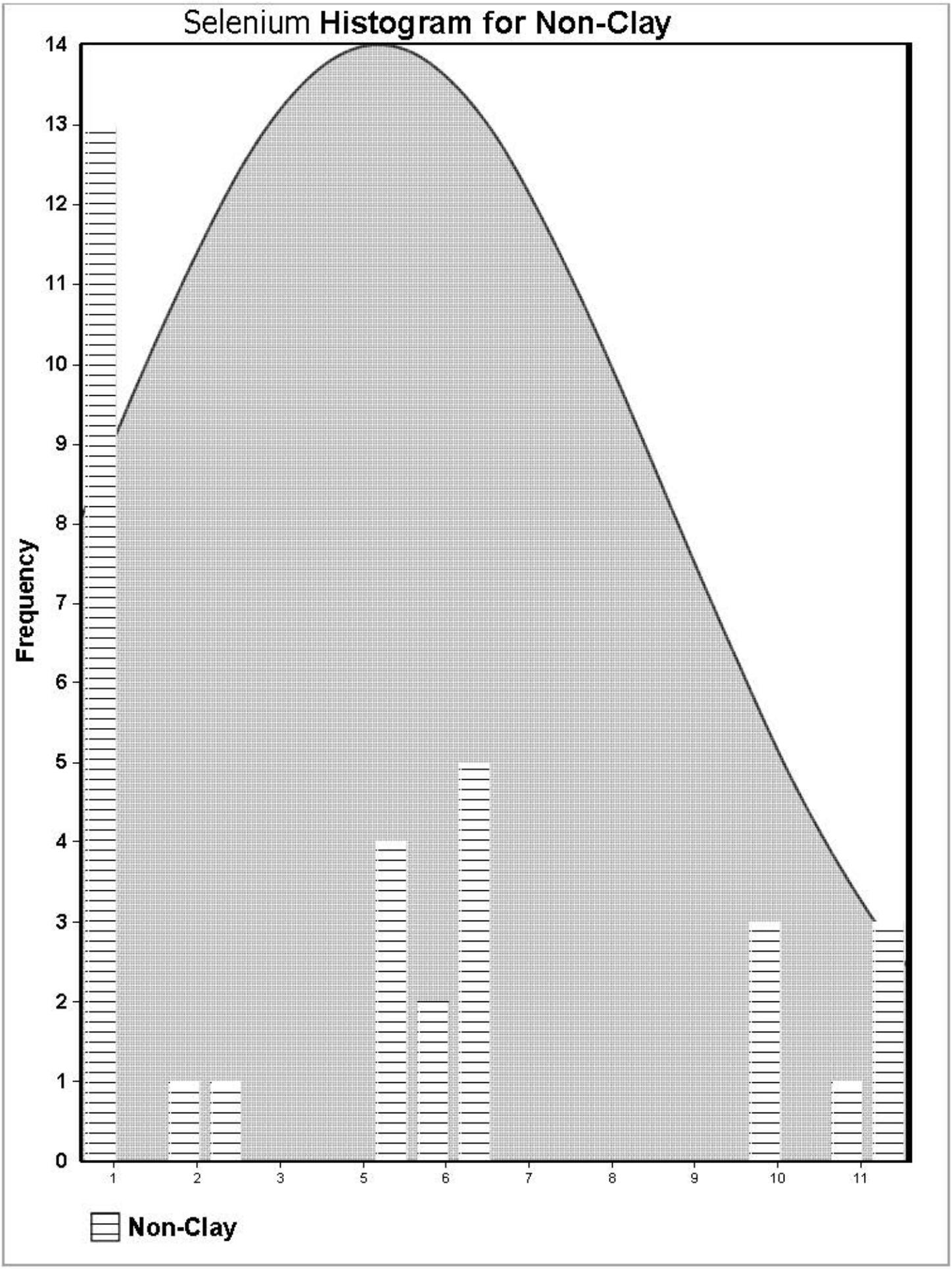
Gehan z Test Value	2.551
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0107

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Selenium Histogram for Clay
Frequency
0
1
2
3
4
5
6
7
1
2
3
5
6
7
8
9
10
11
Clay


Selenium Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
1
2
3
5
6
7
8
9
10
11
Non-Clay

Location	Clay	D_Clay
BG-1-2	0.71	1
BG-1-43	1.4	1
BG-1-55	1	0
BG-1-78	1	1
BG-2-30	5	0
BG-2-81	11	1
BG-3-17	5.2	0
BG-3-22	10	0
BG-3-69	5.7	0
BG-4-2	5.3	0
BG-4-19	5.9	0
BG-4-40	5.8	0
BG-4-79	5.9	0
BG-4-161	6	0
BG-4-163	12	0
BG-6-28	5.8	0
BG-6-53	6	0
BG-6-87	1.2	1

Location	Non-Clay	D_Non-Clay
BG-1-10	0.66	1
BG-1-29	1	0
BG-1-40	1	0
BG-1-46	1	0
BG-1-92	1	0
BG-2-2	1	0
BG-2-10	1	0
BG-2-19	10	0
BG-2-21	5	0
BG-2-32	1	0
BG-2-75	1	0
BG-3-2	10	0
BG-3-10	5.4	0
BG-3-29	5.1	0
BG-3-63	1.2	0
BG-3-65	2.4	0
BG-3-95	2.3	0
BG-3-105	1.2	0
BG-3-131	11	0
BG-3-136	1.2	0
BG-4-10	5.4	0
BG-4-65	5.1	0
BG-4-82	12	0
BG-4-95	6.1	0
BG-4-117	5.9	0
BG-4-120	6	0
BG-6-2	10	0
BG-6-9	5.1	0
BG-6-58	6	0
BG-6-75	12	0
BG-6-98	5.9	0
BG-6-114	12	0
BG-6-127	1.2	0
Average	4.732121	

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Selenium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	2	10	83.33%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	10	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	12	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	12	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	12	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Shapiro-Wilks (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	
Shapiro-Wilks (NDs = DL/2)	N/A	N/A	
Lilliefors (NDs = DL/2)	N/A	N/A	
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A	
Lilliefors (Normal ROS Estimates)	N/A	N/A	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A	
Anderson-Darling (NDs = DL/2)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A	
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A	
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A	

Note: Substitution methods such as DL or DL/2 are not recommended.

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs

Raw Statistics	39	0	39	4	35	89.74%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	35	1	12	5.303	5.7	3.498
Statistics (Detects Only)	4	1	11	3.65	1.3	4.903
Statistics (All: NDs treated as DL value)	39	1	12	5.133	5.4	3.62
Statistics (All: NDs treated as DL/2 value)	39	0.5	11	2.754	2.7	2.175
Statistics (Normal ROS Estimated Data)	39	-13.65	11	-5.222	-5.641	4.596
Statistics (Gamma ROS Estimated Data)	39	1.000E-12	40.05	11.57	11.65	10.45
Statistics (Lognormal ROS Estimated Data)	39	0.034	11	0.612	0.228	1.739

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.018	0.957	3.584	0.729	1.121	1.537
Statistics (NDs = DL)	1.695	1.582	3.028	1.313	0.891	0.679
Statistics (NDs = DL/2)	1.699	1.585	1.621	0.691	0.869	1.258
Statistics (Gamma ROS Estimates)	0.478	0.459	24.19	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.38	1.089	-0.789

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.805	0.93	0.901	0.955

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.661	0.748	Data Not Normal
Lilliefors (Detects Only)	0.427	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.843	0.939	Data Not Normal
Lilliefors (NDs = DL)	0.215	0.142	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.823	0.939	Data Not Normal
Lilliefors (NDs = DL/2)	0.266	0.142	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.929	0.939	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.177	0.142	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.97	0.929	0.962	0.963

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.774	0.666	
Kolmogorov-Smirnov (Detects Only)	0.435	0.402	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.25	0.763	
Kolmogorov-Smirnov (NDs = DL)	0.23	0.144	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.462	0.763	
Kolmogorov-Smirnov (NDs = DL/2)	0.195	0.144	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.824	0.818	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.239	0.15	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.855	0.922	0.949	0.958

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.743	0.748	Data Not Lognormal
Lilliefors (Detects Only)	0.387	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.824	0.939	Data Not Lognormal
Lilliefors (NDs = DL)	0.271	0.142	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.885	0.939	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.243	0.142	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.934	0.939	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.177	0.142	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Selenium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Number of Valid Data	12	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	10
		Percent Non-Detects	83.33%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.66	Minimum Detected	-0.416
Maximum Detected	0.71	Maximum Detected	-0.342
Mean of Detected	0.685	Mean of Detected	-0.379
SD of Detected	0.0354	SD of Detected	0.0516
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	10	Maximum Non-Detect	2.303

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	12
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.177	Mean (Log Scale)	0.345

SD	1.91	SD (Log Scale)	1.011
95% UTL 95% Coverage	7.402	95% UTL 95% Coverage	22.48
95% UPL (t)	5.747	95% UPL (t)	9.356
90% Percentile (z)	4.624	90% Percentile (z)	5.163
95% Percentile (z)	5.318	95% Percentile (z)	7.456
99% Percentile (z)	6.62	99% Percentile (z)	14.86
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		95% UTL 95% Coverage	N/A
		95% UPL (t)	N/A
		90% Percentile (z)	N/A
		95% Percentile (z)	N/A
		99% Percentile (z)	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.685
5% K-S Critical Value	N/A	SD	0.025
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.025
		95% KM UTL with 95% Coverage	0.753
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.798
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.732
Mean	N/A	90% Percentile (z)	0.717
Median	N/A	95% Percentile (z)	0.726
SD	N/A	99% Percentile (z)	0.743
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

MC

General Statistics

Number of Valid Data	39	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	35
		Percent Non-Detects	89.74%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1	Minimum Detected	0
Maximum Detected	11	Maximum Detected	2.398
Mean of Detected	3.65	Mean of Detected	0.729
SD of Detected	4.903	SD of Detected	1.121
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	12	Maximum Non-Detect	2.485

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	39
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.661	Shapiro Wilk Test Statistic	0.743
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.754	Mean (Log Scale)	0.691
SD	2.175	SD (Log Scale)	0.869
95% UTL 95% Coverage	7.374	95% UTL 95% Coverage	12.64
95% UPL (t)	6.467	95% UPL (t)	8.795
90% Percentile (z)	5.541	90% Percentile (z)	6.075
95% Percentile (z)	6.331	95% Percentile (z)	8.33
99% Percentile (z)	7.813	99% Percentile (z)	15.06
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.612
		SD in Original Scale	1.739
		Mean in Log Scale	-1.38
		SD in Log Scale	1.089
		95% UTL 95% Coverage	2.543
		95% UPL (t)	1.615
		90% Percentile (z)	1.016
		95% Percentile (z)	1.508
		99% Percentile (z)	3.168
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.421	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.664		
nu star	3.37		
A-D Test Statistic	0.774	Nonparametric Statistics	

5% A-D Critical Value	0.666	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.435	Mean	1.334
5% K-S Critical Value	0.402	SD	1.662
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.326
		95% KM UTL with 95% Coverage	4.865
Assuming Gamma Distribution		95% KM Chebyshev UPL	8.67
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	4.172
Mean	11.57	90% Percentile (z)	3.464
Median	11.65	95% Percentile (z)	4.068
SD	10.45	99% Percentile (z)	5.2
k star	0.459		
Theta star	25.23	Gamma ROS Limits with Extrapolated Data	
Nu star	35.78	95% Wilson Hilferty (WH) Approx. Gamma UPL	38.95
95% Percentile of Chisquare (2k)	3.634	95% Hawkins Wixley (HW) Approx. Gamma UPL	45.36
		95% WH Approx. Gamma UTL with 95% Coverage	51.95
90% Percentile	31.86	95% HW Approx. Gamma UTL with 95% Coverage	63.98
95% Percentile	45.83		
99% Percentile	80.48		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Selenium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.000

For 10% significance level, 5 is not an outlier.
For 5% significance level, 5 is not an outlier.
For 1% significance level, 5 is not an outlier.

2. Data Value 0.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.000

For 10% significance level, 0.5 is not an outlier.
For 5% significance level, 0.5 is not an outlier.
For 1% significance level, 0.5 is not an outlier.

Rosner's Outlier Test for MC

Mean	2.754
Standard Deviation	2.175
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2.754	2.147	11	9	3.841	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 11 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 11 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Selenium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Alluv

Background Data: MC

Raw Statistics

	Site	Background
Number of Valid Data	12	39
Number of Non-Detect Data	10	35
Number of Detect Data	2	4
Minimum Non-Detect	1	1
Maximum Non-Detect	10	12
Percent Non detects	83.33%	89.74%
Minimum Detected	0.66	1
Maximum Detected	0.71	11
Mean of Detected Data	0.685	3.65
Median of Detected Data	0.685	1.3
SD of Detected Data	0.0354	4.903

Site vs Background Gehan Test

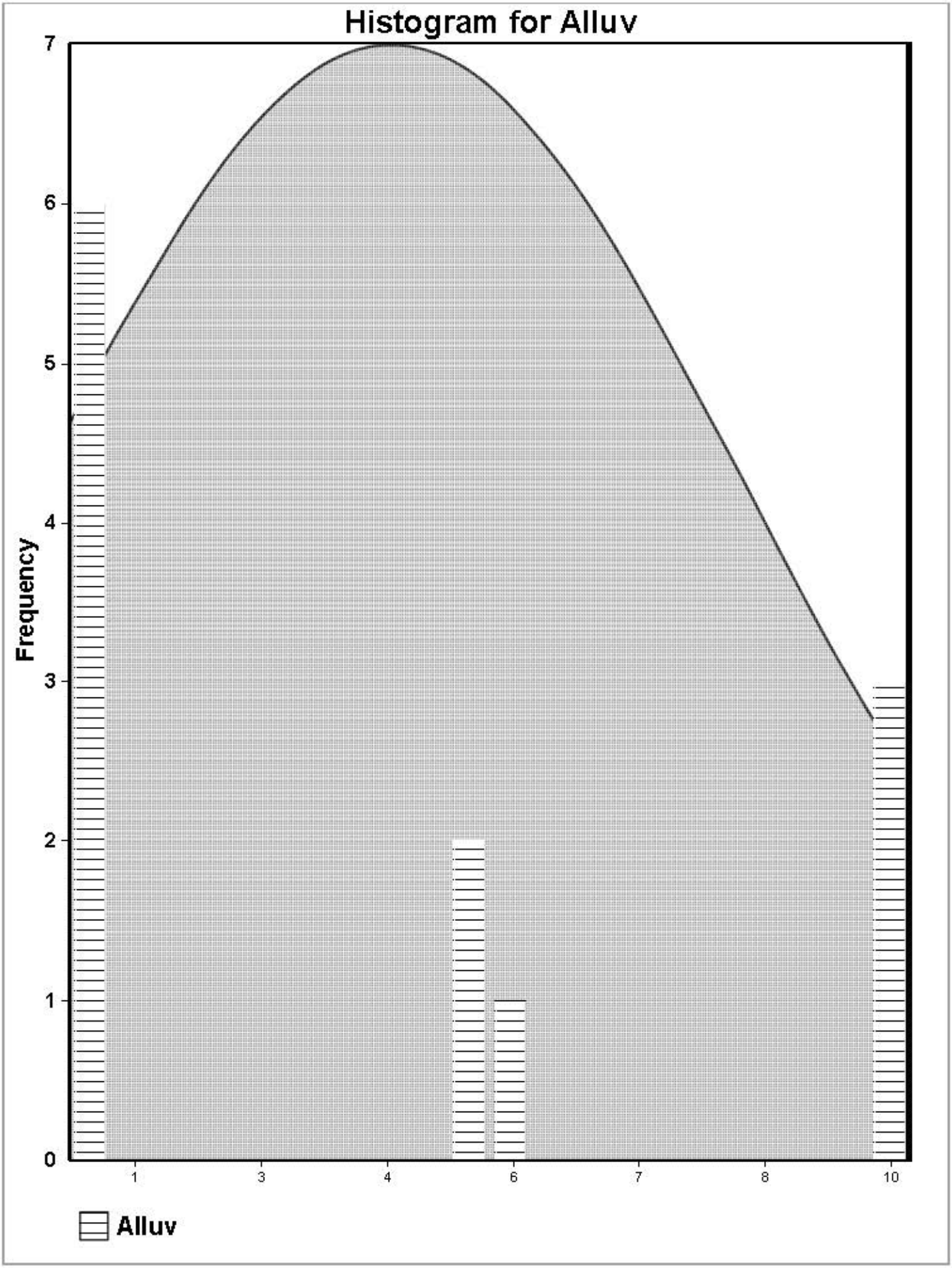
H0: Mu of Site or AOC = Mu of background

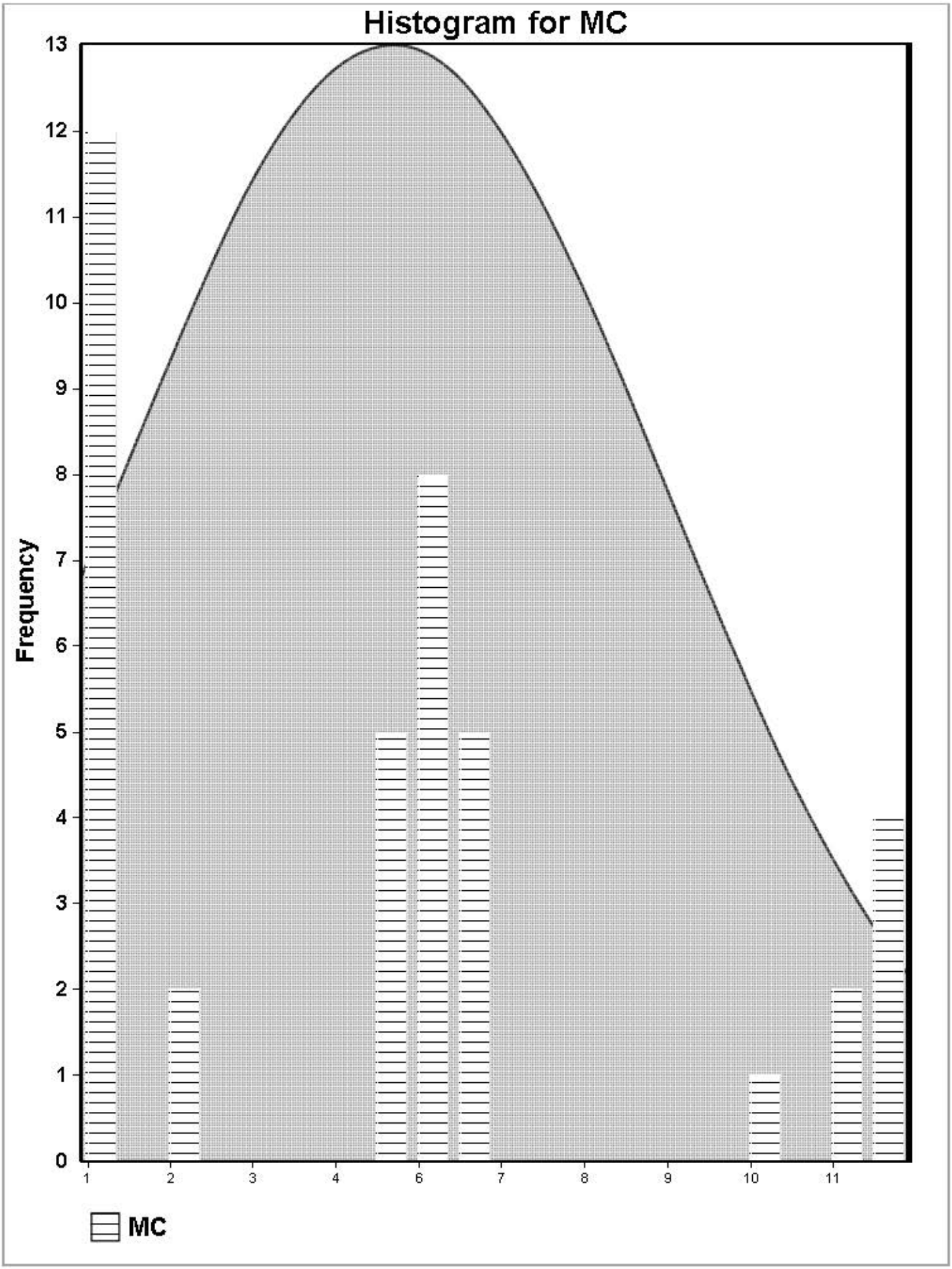
Gehan z Test Value	-1.306
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.191

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
7
1
3
4
6
7
8
10
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
1
2
3
4
6
7
8
9
10
11
MC

Location	Alluv	D_Alluv
BG-1-2	0.71	1
BG-1-10	0.66	1
BG-1-29	1	0
BG-1-40	1	0
BG-2-2	1	0
BG-2-10	1	0
BG-2-19	10	0
BG-2-21	5	0
BG-3-2	10	0
BG-3-10	5.4	0
BG-6-2	10	0
BG-6-9	5.1	0

Location	MC	D_MC
BG-1-43	1.4	1
BG-1-46	1	0
BG-1-55	1	0
BG-1-78	1	1
BG-1-92	1	0
BG-2-30	5	0
BG-2-32	1	0
BG-2-75	1	0
BG-2-81	11	1
BG-3-17	5.2	0
BG-3-22	10	0
BG-3-29	5.1	0
BG-3-63	1.2	0
BG-3-65	2.4	0
BG-3-69	5.7	0
BG-3-95	2.3	0
BG-3-105	1.2	0
BG-3-131	11	0
BG-3-136	1.2	0
BG-4-1	5.3	0
BG-4-10	5.4	0
BG-4-19	5.9	0
BG-4-40	5.8	0
BG-4-65	5.1	0
BG-4-79	5.9	0
BG-4-82	12	0
BG-4-95	6.1	0
BG-4-117	5.9	0
BG-4-120	6	0
BG-4-161	6	0
BG-4-163	12	0
BG-6-28	5.8	0
BG-6-53	6	0
BG-6-58	6	0
BG-6-75	12	0
BG-6-87	1.2	1
BG-6-98	5.9	0
BG-6-114	12	0
BG-1-127	1.2	0

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Silica.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	33
Minimum	390
Maximum	1300
Mean of Raw Data	710.8
Standard Deviation of Raw Data	195.2
Kstar	13.26
Mean of Log Transformed Data	6.53
Standard Deviation of Log Transformed Data	0.271

Normal Distribution Test Results	
Correlation Coefficient R	0.976
Approximate Shapiro Wilk Test Statistic	0.95
Approximate Shapiro Wilk P Value	0.0561
Lilliefors Test Statistic	0.101
Lilliefors Critical (0.95) Value	0.124

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.99
A-D Test Statistic	0.397
A-D Critical (0.95) Value	0.749
K-S Test Statistic	0.086
K-S Critical(0.95) Value	0.124

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.992
Approximate Shapiro Wilk Test Statistic	0.975
Approximate Shapiro Wilk P Value	0.55
Lilliefors Test Statistic	0.0842
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Silica.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Total Number of Observations	51	Number of Distinct Observations	33

Raw Statistics		Log-Transformed Statistics	
Minimum	390	Minimum	5.966
Maximum	1300	Maximum	7.17
Second Largest	1100	Second Largest	7.003
First Quartile	540	First Quartile	6.291
Median	720	Median	6.579
Third Quartile	825	Third Quartile	6.715
Mean	710.8	Mean	6.53
SD	195.2	SD	0.271
Coefficient of Variation	0.275		
Skewness	0.721		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.101	Lilliefors Test Statistic	0.0842
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	1112	95% UTL with 95% Coverage	1196
95% UPL (t)	1041	95% UPL (t)	1084
90% Percentile (z)	960.9	90% Percentile (z)	970
95% Percentile (z)	1032	95% Percentile (z)	1070
99% Percentile (z)	1165	99% Percentile (z)	1287

Gamma Distribution Test		Data Distribution Test
k star	13.26	Data appear Normal at 5% Significance Level
Theta Star	53.62	
MLE of Mean	710.8	
MLE of Standard Deviation	195.2	
nu star	1352	
A-D Test Statistic	0.397	Nonparametric Statistics
5% A-D Critical Value	0.749	90% Percentile 940
K-S Test Statistic	0.086	95% Percentile 1100
5% K-S Critical Value	0.124	99% Percentile 1200
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	1100
90% Percentile	969.6	95% Percentile Bootstrap UTL with 95% Coverage	1200
95% Percentile	1059	95% BCA Bootstrap UTL with 95% Coverage	1100
99% Percentile	1242	95% UPL	1100
		95% Chebyshev UPL	1570
95% WH Approx. Gamma UPL	1064	Upper Threshold Limit Based upon IQR	1253
95% HW Approx. Gamma UPL	1068		
95% WH Approx. Gamma UTL with 95% Coverage	1157		
95% HW Approx. Gamma UTL with 95% Coverage	1165		

Outlier Tests for Selected Variables

User Selected Options	
From File	Silica.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

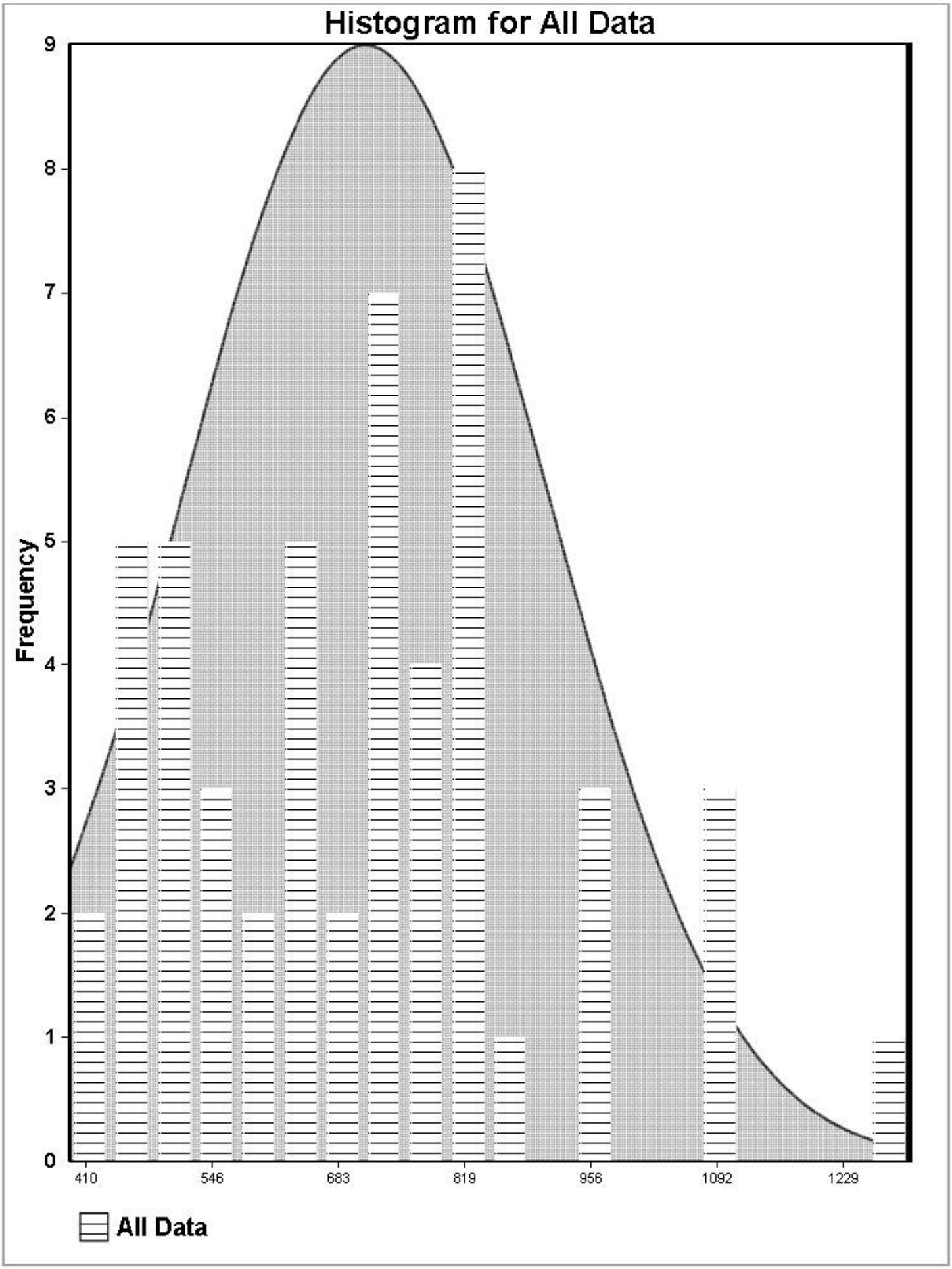
Rosner's Outlier Test for All Data

Mean	710.8
Standard Deviation	195.2
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	710.8	193.3	1300	2	3.049	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
410
546
683
819
956
1092
1229
All Data

Location	All Data
BG-1-2	830
BG-1-43	1300
BG-1-55	750
BG-1-78	940
BG-2-30	1100
BG-2-81	1100
BG-3-17	460
BG-3-22	520
BG-3-69	940
BG-4-2	670
BG-4-19	840
BG-4-40	830
BG-4-79	730
BG-4-161	810
BG-4-163	780
BG-6-28	630
BG-6-53	630
BG-6-87	840
BG-1-10	740
BG-1-29	720
BG-1-40	550
BG-1-46	760
BG-1-92	850
BG-2-2	600
BG-2-10	530
BG-2-19	570
BG-2-21	520
BG-2-32	630
BG-2-75	700
BG-3-2	520
BG-3-10	730
BG-3-29	470
BG-3-63	790
BG-3-65	820
BG-3-95	720
BG-3-105	840
BG-3-131	520
BG-3-136	950
BG-4-10	810
BG-4-65	480
BG-4-82	770
BG-4-95	600
BG-4-117	480
BG-4-120	1100
BG-6-2	420
BG-6-9	390
BG-6-58	620
BG-6-75	520
BG-6-98	470
BG-6-114	650
BG-6-127	710

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Silica.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	13
Minimum	390
Maximum	840
Mean of Raw Data	623.8
Standard Deviation of Raw Data	157.3
Kstar	12.65
Mean of Log Transformed Data	6.405
Standard Deviation of Log Transformed Data	0.262

Normal Distribution Test Results	
Correlation Coefficient R	0.979
Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.528
Lilliefors Test Statistic	0.135
Lilliefors Critical (0.95) Value	0.246

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.969
A-D Test Statistic	0.32
A-D Critical (0.95) Value	0.733
K-S Test Statistic	0.153
K-S Critical(0.95) Value	0.236

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.978
Shapiro Wilk Test Statistic	0.936
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.525
Lilliefors Test Statistic	0.148
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

>20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	26
Minimum	470
Maximum	1300
Mean of Raw Data	740.5
Standard Deviation of Raw Data	199.7
Kstar	13.69
Mean of Log Transformed Data	6.573
Standard Deviation of Log Transformed Data	0.263

Normal Distribution Test Results

Correlation Coefficient R	0.972
Shapiro Wilk Test Statistic	0.938
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.046
Lilliefors Test Statistic	0.108
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.987
A-D Test Statistic	0.379
A-D Critical (0.95) Value	0.747
K-S Test Statistic	0.0949
K-S Critical(0.95) Value	0.143

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.987
Shapiro Wilk Test Statistic	0.961
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.265
Lilliefors Test Statistic	0.098
Lilliefors Critical (0.95) Value	0.144

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Silica.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	13

Raw Statistics		Log-Transformed Statistics	
Minimum	390	Minimum	5.966
Maximum	840	Maximum	6.733
Second Largest	830	Second Largest	6.721
First Quartile	520	First Quartile	6.254
Median	600	Median	6.397
Third Quartile	740	Third Quartile	6.607
Mean	623.8	Mean	6.405
SD	157.3	SD	0.262
Coefficient of Variation	0.252		
Skewness	0.0101		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.935	Shapiro Wilk Test Statistic	0.936
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	1044	95% UTL with 95% Coverage	1218
95% UPL (t)	914.8	95% UPL (t)	982.2
90% Percentile (z)	825.4	90% Percentile (z)	846.3
95% Percentile (z)	882.6	95% Percentile (z)	930.9
99% Percentile (z)	989.8	99% Percentile (z)	1113

Gamma Distribution Test		Data Distribution Test	
k star	12.65	Data appear Normal at 5% Significance Level	
Theta Star	49.33		
MLE of Mean	623.8		
MLE of Standard Deviation	175.4		
nu star	328.8		
A-D Test Statistic	0.32	Nonparametric Statistics	
5% A-D Critical Value	0.733	90% Percentile	826
K-S Test Statistic	0.153	95% Percentile	834
5% K-S Critical Value	0.236	99% Percentile	838.8
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	840
90% Percentile	856.6	95% Percentile Bootstrap UTL with 95% Coverage	840
95% Percentile	937.6	95% BCA Bootstrap UTL with 95% Coverage	840
99% Percentile	1103	95% UPL	840
		95% Chebyshev UPL	1335
95% WH Approx. Gamma UPL	953.5	Upper Threshold Limit Based upon IQR	1070
95% HW Approx. Gamma UPL	960		
95% WH Approx. Gamma UTL with 95% Coverage	1139		
95% HW Approx. Gamma UTL with 95% Coverage	1156		

>20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	26

Raw Statistics		Log-Transformed Statistics	
Minimum	470	Minimum	6.153
Maximum	1300	Maximum	7.17
Second Largest	1100	Second Largest	7.003
First Quartile	605	First Quartile	6.405
Median	725	Median	6.586
Third Quartile	837.5	Third Quartile	6.73
Mean	740.5	Mean	6.573
SD	199.7	SD	0.263
Coefficient of Variation	0.27		
Skewness	0.753		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.938	Shapiro Wilk Test Statistic	0.961
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	1166	95% UTL with 95% Coverage	1255
95% UPL (t)	1082	95% UPL (t)	1123
90% Percentile (z)	996.5	90% Percentile (z)	1003
95% Percentile (z)	1069	95% Percentile (z)	1104
99% Percentile (z)	1205	99% Percentile (z)	1321
Gamma Distribution Test		Data Distribution Test	
k star	13.69	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	54.09		
MLE of Mean	740.5		
MLE of Standard Deviation	200.1		
nu star	1040		
A-D Test Statistic	0.379	Nonparametric Statistics	
5% A-D Critical Value	0.747	90% Percentile	995
K-S Test Statistic	0.0949	95% Percentile	1100
5% K-S Critical Value	0.143	99% Percentile	1226

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	1300
90% Percentile	1006	95% Percentile Bootstrap UTL with 95% Coverage	1300
95% Percentile	1098	95% BCA Bootstrap UTL with 95% Coverage	1100
99% Percentile	1284	95% UPL	1110
		95% Chebyshev UPL	1623
95% WH Approx. Gamma UPL	1104	Upper Threshold Limit Based upon IQR	1186
95% HW Approx. Gamma UPL	1108		
95% WH Approx. Gamma UTL with 95% Coverage	1215		
95% HW Approx. Gamma UTL with 95% Coverage	1224		

Outlier Tests for Selected Variables

User Selected Options	
From File	Silica.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 840 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.071

For 10% significance level, 840 is not an outlier.
For 5% significance level, 840 is not an outlier.
For 1% significance level, 840 is not an outlier.

2. Data Value 390 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.159

For 10% significance level, 390 is not an outlier.
For 5% significance level, 390 is not an outlier.
For 1% significance level, 390 is not an outlier.

Rosner's Outlier Test for >20

Mean	740.5
Standard Deviation	199.7
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	740.5	197.1	1300	25	2.839	3.01	3.36

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Silica.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Observations	38	13
Number of Distinct Observations	26	13
Minimum	470	390
Maximum	1300	840
Mean	740.5	623.8
Median	725	600
SD	199.7	157.3
SE of Mean	32.4	43.63

Wilcoxon-Mann-Whitney (WMW) Test

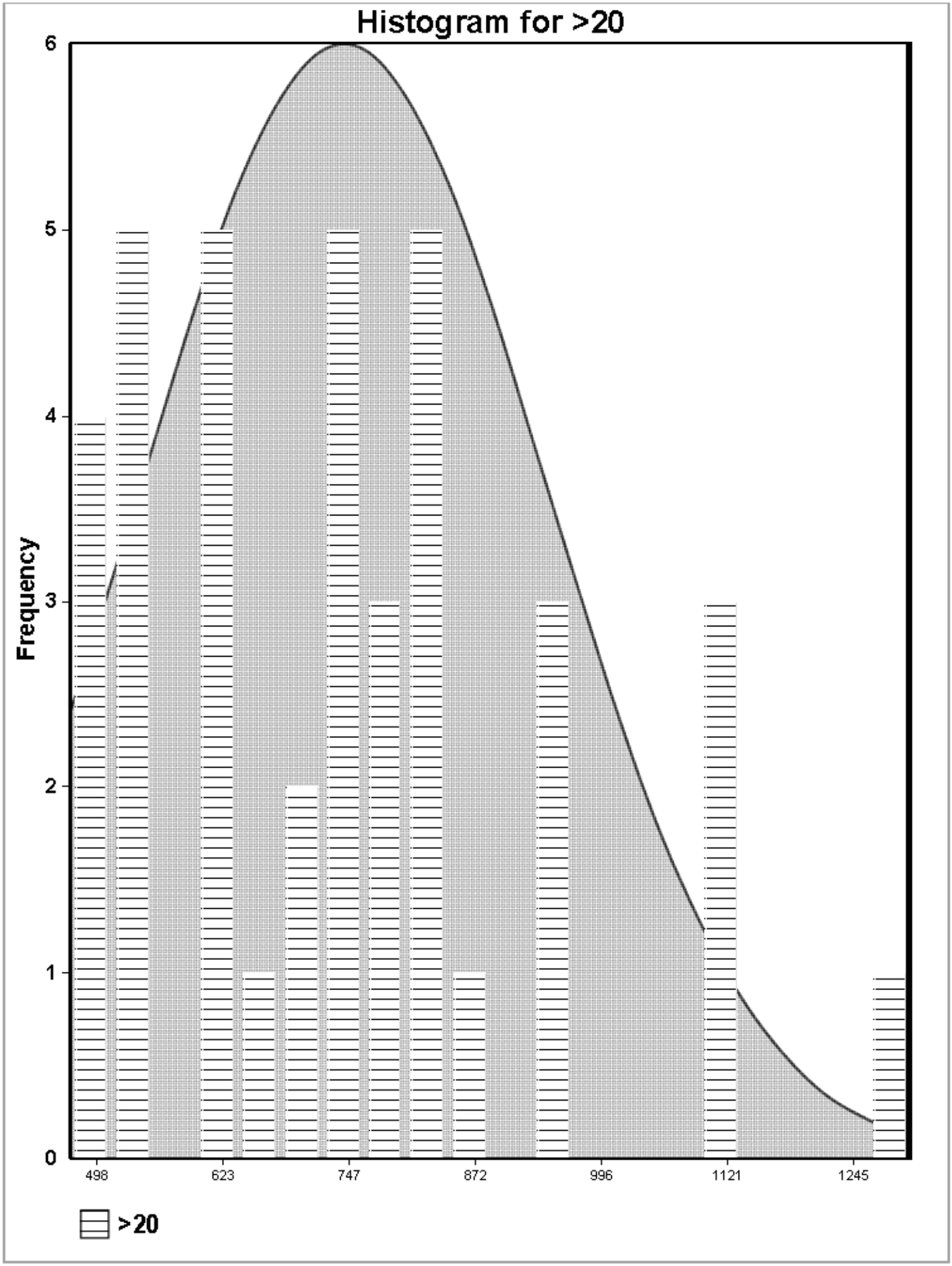
H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1066
WMW Test U-Stat	1.675
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.0939

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
498
623
747
872
996
1121
1245
>20

Histogram for 0-20
Frequency
3
2
1
0
405
450
495
540
585
630
675
720
765
810
0-20

Location	0-20
BG-1-2	830
BG-3-17	460
BG-4-2	670
BG-4-19	840
BG-1-10	740
BG-2-2	600
BG-2-10	530
BG-2-19	570
BG-3-2	520
BG-3-10	730
BG-4-10	810
BG-6-2	420
BG-6-9	390

Location	>20
BG-1-29	720
BG-1-40	550
BG-1-46	760
BG-1-92	850
BG-2-21	520
BG-2-32	630
BG-2-75	700
BG-3-29	470
BG-3-63	790
BG-3-65	820
BG-3-95	720
BG-3-105	840
BG-3-131	520
BG-3-136	950
BG-4-65	480
BG-4-82	770
BG-4-95	600
BG-4-117	480
BG-4-120	1100
BG-6-58	620
BG-6-75	520
BG-6-98	470
BG-6-114	650
BG-6-127	710
BG-1-43	1300
BG-1-55	750
BG-1-78	940
BG-2-30	1100
BG-2-81	1100
BG-3-22	520
BG-3-69	940
BG-4-40	830
BG-4-79	730
BG-4-161	810
BG-4-163	780
BG-6-28	630
BG-6-53	630
BG-6-87	840

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Silica.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	13
Minimum	460
Maximum	1300
Mean of Raw Data	816.7
Standard Deviation of Raw Data	209.5
Kstar	13.49
Mean of Log Transformed Data	6.674
Standard Deviation of Log Transformed Data	0.26

Normal Distribution Test Results	
Correlation Coefficient R	0.98
Shapiro Wilk Test Statistic	0.965
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.666
Lilliefors Test Statistic	0.178
Lilliefors Critical (0.95) Value	0.209

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.988
A-D Test Statistic	0.244
A-D Critical (0.95) Value	0.739
K-S Test Statistic	0.144
K-S Critical(0.95) Value	0.203

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.986
Shapiro Wilk Test Statistic	0.977
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.876
Lilliefors Test Statistic	0.132
Lilliefors Critical (0.95) Value	0.209

Data appear Lognormal at (0.05) Significance Level

Non-Clay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	26
Minimum	390
Maximum	1100
Mean of Raw Data	653
Standard Deviation of Raw Data	162.7
Kstar	15.58
Mean of Log Transformed Data	6.452
Standard Deviation of Log Transformed Data	0.246

Normal Distribution Test Results

Correlation Coefficient R	0.979
Shapiro Wilk Test Statistic	0.958
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.281
Lilliefors Test Statistic	0.109
Lilliefors Critical (0.95) Value	0.154

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.99
A-D Test Statistic	0.345
A-D Critical (0.95) Value	0.746
K-S Test Statistic	0.107
K-S Critical(0.95) Value	0.153

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.991
Shapiro Wilk Test Statistic	0.977
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.75
Lilliefors Test Statistic	0.111
Lilliefors Critical (0.95) Value	0.154

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Silica.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	13

Raw Statistics		Log-Transformed Statistics	
Minimum	460	Minimum	6.131
Maximum	1300	Maximum	7.17
Second Largest	1100	Second Largest	7.003
First Quartile	685	First Quartile	6.529
Median	820	Median	6.709
Third Quartile	915	Third Quartile	6.818
Mean	816.7	Mean	6.674
SD	209.5	SD	0.26
Coefficient of Variation	0.256		
Skewness	0.53		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.965	Shapiro Wilk Test Statistic	0.977
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	1330	95% UTL with 95% Coverage	1497
95% UPL (t)	1191	95% UPL (t)	1259
90% Percentile (z)	1085	90% Percentile (z)	1104
95% Percentile (z)	1161	95% Percentile (z)	1213
99% Percentile (z)	1304	99% Percentile (z)	1448

Gamma Distribution Test		Data Distribution Test	
k star	13.49	Data appear Normal at 5% Significance Level	
Theta Star	60.54		
MLE of Mean	816.7		
MLE of Standard Deviation	222.4		
nu star	485.6		
A-D Test Statistic	0.244	Nonparametric Statistics	
5% A-D Critical Value	0.739	90% Percentile	1100
K-S Test Statistic	0.144	95% Percentile	1130
5% K-S Critical Value	0.203	99% Percentile	1266
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	1300
90% Percentile	1111	95% Percentile Bootstrap UTL with 95% Coverage	1300
95% Percentile	1213	95% BCA Bootstrap UTL with 95% Coverage	1300
99% Percentile	1421	95% UPL	1300
		95% Chebyshev UPL	1755
95% WH Approx. Gamma UPL	1228	Upper Threshold Limit Based upon IQR	1260
95% HW Approx. Gamma UPL	1235		
95% WH Approx. Gamma UTL with 95% Coverage	1420		
95% HW Approx. Gamma UTL with 95% Coverage	1437		

Non-Clay

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	26

Raw Statistics		Log-Transformed Statistics	
Minimum	390	Minimum	5.966
Maximum	1100	Maximum	7.003
Second Largest	950	Second Largest	6.856
First Quartile	520	First Quartile	6.254
Median	630	Median	6.446
Third Quartile	760	Third Quartile	6.633
Mean	653	Mean	6.452
SD	162.7	SD	0.246
Coefficient of Variation	0.249		
Skewness	0.609		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Test Statistic	0.977
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	1007	95% UTL with 95% Coverage	1084
95% UPL (t)	932.8	95% UPL (t)	968.7
90% Percentile (z)	861.5	90% Percentile (z)	869.6
95% Percentile (z)	920.7	95% Percentile (z)	951
99% Percentile (z)	1032	99% Percentile (z)	1125
Gamma Distribution Test		Data Distribution Test	
k star	15.58	Data appear Normal at 5% Significance Level	
Theta Star	41.91		
MLE of Mean	653		
MLE of Standard Deviation	165.4		
nu star	1028		
A-D Test Statistic	0.345	Nonparametric Statistics	
5% A-D Critical Value	0.746	90% Percentile	836
K-S Test Statistic	0.107	95% Percentile	890
5% K-S Critical Value	0.153	99% Percentile	1052

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	1100
90% Percentile	872	95% Percentile Bootstrap UTL with 95% Coverage	1100
95% Percentile	946.8	95% BCA Bootstrap UTL with 95% Coverage	1100
99% Percentile	1098	95% UPL	995
		95% Chebyshev UPL	1373
95% WH Approx. Gamma UPL	952.7	Upper Threshold Limit Based upon IQR	1120
95% HW Approx. Gamma UPL	956.3		
95% WH Approx. Gamma UTL with 95% Coverage	1050		
95% HW Approx. Gamma UTL with 95% Coverage	1058		

Outlier Tests for Selected Variables

User Selected Options	
From File	Silica.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 1300 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.299

For 10% significance level, 1300 is not an outlier.

For 5% significance level, 1300 is not an outlier.

For 1% significance level, 1300 is not an outlier.

2. Data Value 460 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.266

For 10% significance level, 460 is not an outlier.

For 5% significance level, 460 is not an outlier.

For 1% significance level, 460 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	653
Standard Deviation	162.7
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	653	160.2	1100	26	2.79	2.95	3.29

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

t-Test Site vs Background Comparison for Full Data Sets without NDs

User Selected Options	
From File	Silica.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean Equal to Background Mean (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean Not Equal to Background Mean

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Observations	33	18
Number of Distinct Observations	26	13
Minimum	390	460
Maximum	1100	1300
Mean	653	816.7
Median	630	820
SD	162.7	209.5
SE of Mean	28.32	49.37

Site vs Background Two-Sample t-Test

H0: Mu of Site = Mu of Background

Method	DF	t-Test Value	Critical t (0.050)	P-Value
Pooled (Equal Variance)	49	-3.097	2.011	0.003
Welch-Satterthwaite (Unequal Vari	28.4	-2.875	2.048	0.008

Pooled SD: 180.300

Conclusion with Alpha = 0.050

* Student t (Pooled): Reject H0, Conclude Site <> Background
* Welch-Satterthwaite: Reject H0, Conclude Site <> Background

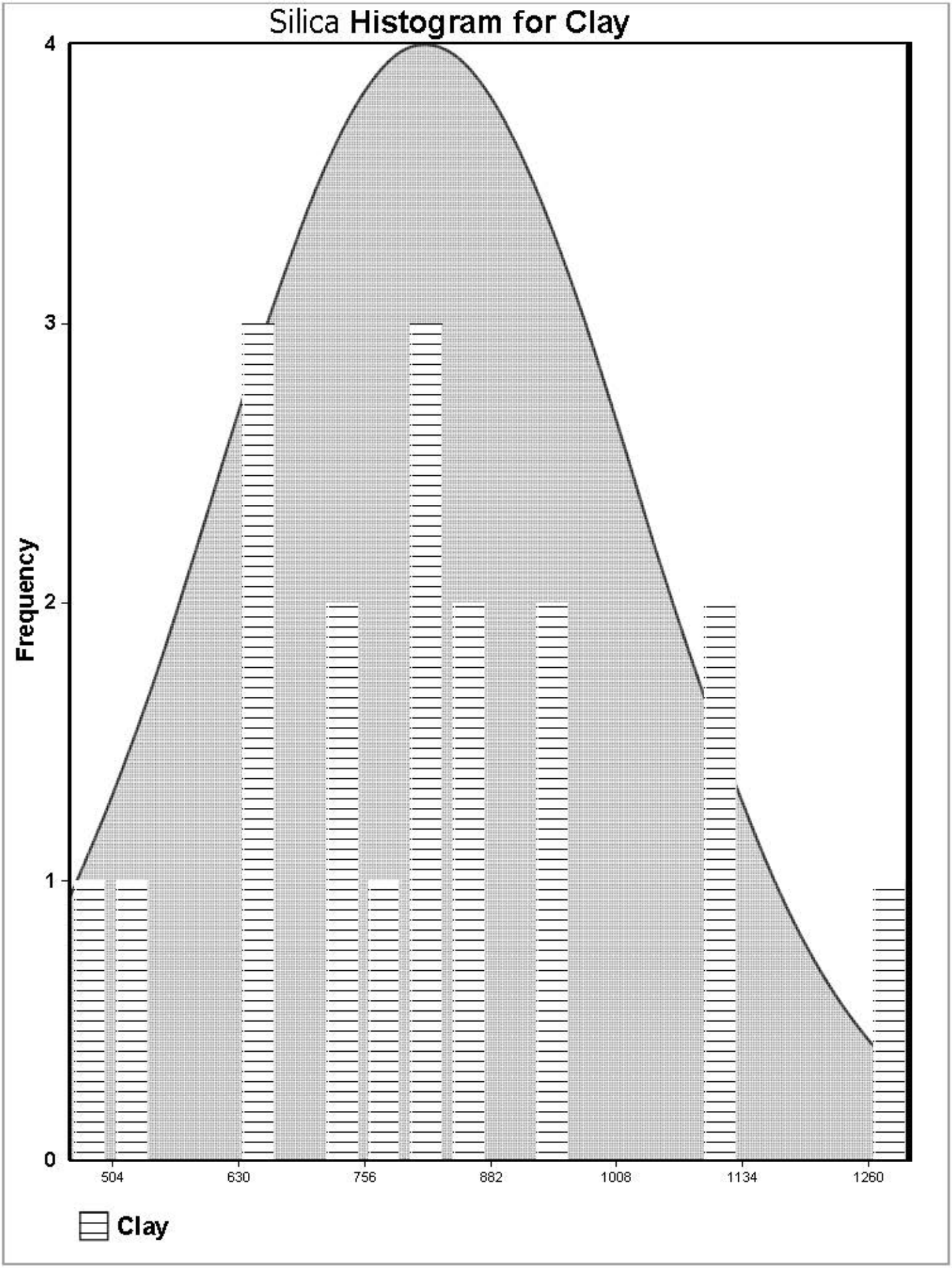
Test of Equality of Variances

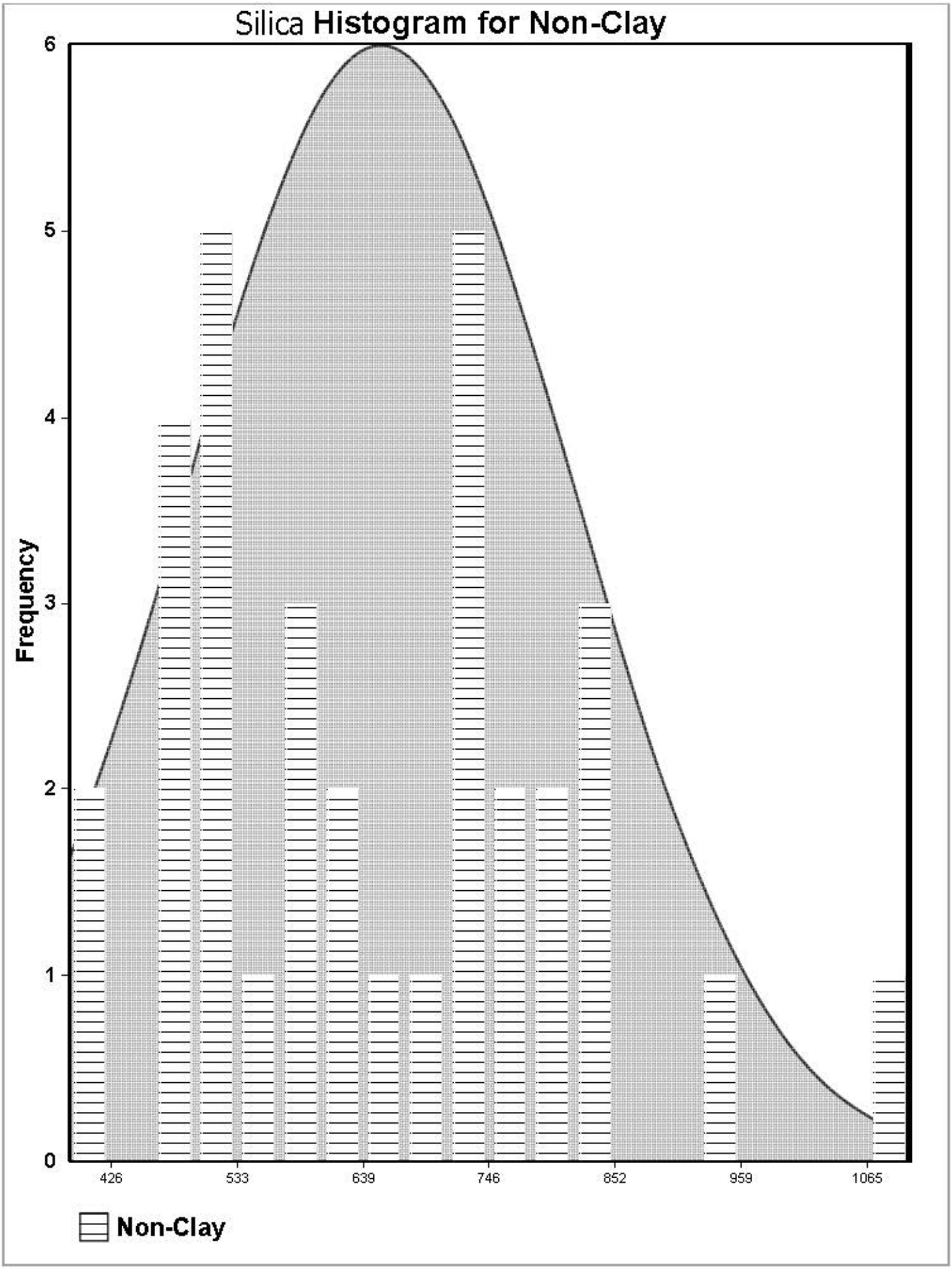
Variance of Site	26472
Variance of Background	43871

Numerator DF	Denominator DF	F-Test Value	P-Value
17	32	1.657	0.213

Conclusion with Alpha = 0.05

* Two variances appear to be equal


Silica Histogram for Clay
Frequency
0
1
2
3
4
504
630
756
882
1008
1134
1260
Clay


Silica Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
426
533
639
746
852
959
1065
Non-Clay

Location	Clay
BG-1-2	830
BG-1-43	1300
BG-1-55	750
BG-1-78	940
BG-2-30	1100
BG-2-81	1100
BG-3-17	460
BG-3-22	520
BG-3-69	940
BG-4-2	670
BG-4-19	840
BG-4-40	830
BG-4-79	730
BG-4-161	810
BG-4-163	780
BG-6-28	630
BG-6-53	630
BG-6-87	840

Location	Non-Clay
BG-1-10	740
BG-1-29	720
BG-1-40	550
BG-1-46	760
BG-1-92	850
BG-2-2	600
BG-2-10	530
BG-2-19	570
BG-2-21	520
BG-2-32	630
BG-2-75	700
BG-3-2	520
BG-3-10	730
BG-3-29	470
BG-3-63	790
BG-3-65	820
BG-3-95	720
BG-3-105	840
BG-3-131	520
BG-3-136	950
BG-4-10	810
BG-4-65	480
BG-4-82	770
BG-4-95	600
BG-4-117	480
BG-4-120	1100
BG-6-2	420
BG-6-9	390
BG-6-58	620
BG-6-75	520
BG-6-98	470
BG-6-114	650
BG-6-127	710

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Silica.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	11
Minimum	390
Maximum	830
Mean of Raw Data	593.3
Standard Deviation of Raw Data	135.1
Kstar	15.74
Mean of Log Transformed Data	6.362
Standard Deviation of Log Transformed Data	0.231

Normal Distribution Test Results	
Correlation Coefficient R	0.975
Shapiro Wilk Test Statistic	0.944
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.574
Lilliefors Test Statistic	0.159
Lilliefors Critical (0.95) Value	0.256

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.977
A-D Test Statistic	0.35
A-D Critical (0.95) Value	0.732
K-S Test Statistic	0.171
K-S Critical(0.95) Value	0.245

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.978
Shapiro Wilk Test Statistic	0.95
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.652
Lilliefors Test Statistic	0.161
Lilliefors Critical (0.95) Value	0.256

Data appear Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	27
Minimum	460
Maximum	1300
Mean of Raw Data	746.9
Standard Deviation of Raw Data	197.8
Kstar	13.9
Mean of Log Transformed Data	6.582
Standard Deviation of Log Transformed Data	0.263

Normal Distribution Test Results

Correlation Coefficient R	0.975
Shapiro Wilk Test Statistic	0.946
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.0823
Lilliefors Test Statistic	0.122
Lilliefors Critical (0.95) Value	0.142

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.987
A-D Test Statistic	0.406
A-D Critical (0.95) Value	0.747
K-S Test Statistic	0.0969
K-S Critical(0.95) Value	0.141

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.986
Shapiro Wilk Test Statistic	0.959
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.234
Lilliefors Test Statistic	0.0992
Lilliefors Critical (0.95) Value	0.142

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Silica.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-Transformed Statistics	
Minimum	390	Minimum	5.966
Maximum	830	Maximum	6.721
Second Largest	740	Second Largest	6.607
First Quartile	520	First Quartile	6.254
Median	560	Median	6.328
Third Quartile	722.5	Third Quartile	6.583
Mean	593.3	Mean	6.362
SD	135.1	SD	0.231
Coefficient of Variation	0.228		
Skewness	0.276		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.944	Shapiro Wilk Test Statistic	0.95
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	963.1	95% UTL with 95% Coverage	1089
95% UPL (t)	845.9	95% UPL (t)	891.5
90% Percentile (z)	766.5	90% Percentile (z)	778.4
95% Percentile (z)	815.6	95% Percentile (z)	846.5
99% Percentile (z)	907.7	99% Percentile (z)	990.6

Gamma Distribution Test		Data Distribution Test	
k star	15.74	Data appear Normal at 5% Significance Level	
Theta Star	37.71		
MLE of Mean	593.3		
MLE of Standard Deviation	149.6		
nu star	377.6		
A-D Test Statistic	0.35	Nonparametric Statistics	
5% A-D Critical Value	0.732	90% Percentile	739
K-S Test Statistic	0.171	95% Percentile	780.5
5% K-S Critical Value	0.245	99% Percentile	820.1
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	830
90% Percentile	791.3	95% Percentile Bootstrap UTL with 95% Coverage	830
95% Percentile	858.9	95% BCA Bootstrap UTL with 95% Coverage	830
99% Percentile	995.5	95% UPL	830
		95% Chebyshev UPL	1206
95% WH Approx. Gamma UPL	872.3	Upper Threshold Limit Based upon IQR	1026
95% HW Approx. Gamma UPL	876.6		
95% WH Approx. Gamma UTL with 95% Coverage	1033		
95% HW Approx. Gamma UTL with 95% Coverage	1045		

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	27

Raw Statistics		Log-Transformed Statistics	
Minimum	460	Minimum	6.131
Maximum	1300	Maximum	7.17
Second Largest	1100	Second Largest	7.003
First Quartile	625	First Quartile	6.438
Median	750	Median	6.62
Third Quartile	840	Third Quartile	6.733
Mean	746.9	Mean	6.582
SD	197.8	SD	0.263
Coefficient of Variation	0.265		
Skewness	0.639		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.946	Shapiro Wilk Test Statistic	0.959
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	1167	95% UTL with 95% Coverage	1263
95% UPL (t)	1085	95% UPL (t)	1132
90% Percentile (z)	1000	90% Percentile (z)	1012
95% Percentile (z)	1072	95% Percentile (z)	1113
99% Percentile (z)	1207	99% Percentile (z)	1332
Gamma Distribution Test		Data Distribution Test	
k star	13.9	Data appear Normal at 5% Significance Level	
Theta Star	53.75		
MLE of Mean	746.9		
MLE of Standard Deviation	200.4		
nu star	1084		
A-D Test Statistic	0.406	Nonparametric Statistics	
5% A-D Critical Value	0.747	90% Percentile	980
K-S Test Statistic	0.0969	95% Percentile	1100
5% K-S Critical Value	0.141	99% Percentile	1224

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	1300
90% Percentile	1012	95% Percentile Bootstrap UTL with 95% Coverage	1300
95% Percentile	1104	95% BCA Bootstrap UTL with 95% Coverage	1100
99% Percentile	1290	95% UPL	1100
		95% Chebyshev UPL	1620
95% WH Approx. Gamma UPL	1110	Upper Threshold Limit Based upon IQR	1163
95% HW Approx. Gamma UPL	1115		
95% WH Approx. Gamma UTL with 95% Coverage	1220		
95% HW Approx. Gamma UTL with 95% Coverage	1229		

Outlier Tests for Selected Variables

User Selected Options	
From File	Silica.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 830 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.244

For 10% significance level, 830 is not an outlier.
For 5% significance level, 830 is not an outlier.
For 1% significance level, 830 is not an outlier.

2. Data Value 390 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.371

For 10% significance level, 390 is not an outlier.
For 5% significance level, 390 is not an outlier.
For 1% significance level, 390 is not an outlier.

Rosner's Outlier Test for MC

Mean	746.9
Standard Deviation	197.8
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	746.9	195.3	1300	1	2.832	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

t-Test Site vs Background Comparison for Full Data Sets without NDs

User Selected Options	
From File	Silica.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean Equal to Background Mean (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean Not Equal to Background Mean

Area of Concern Data: Alluv

Background Data: MC

Raw Statistics

	Site	Background
Number of Valid Observations	12	39
Number of Distinct Observations	11	27
Minimum	390	460
Maximum	830	1300
Mean	593.3	746.9
Median	560	750
SD	135.1	197.8
SE of Mean	39.01	31.68

Site vs Background Two-Sample t-Test

H0: Mu of Site = Mu of Background

Method	DF	t-Test Value	Critical t (0.050)	P-Value
Pooled (Equal Variance)	49	-2.507	2.011	0.016
Welch-Satterthwaite (Unequal Vari	26.9	-3.056	2.052	0.005

Pooled SD: 185.621

Conclusion with Alpha = 0.050

* Student t (Pooled): Reject H0, Conclude Site <> Background
* Welch-Satterthwaite: Reject H0, Conclude Site <> Background

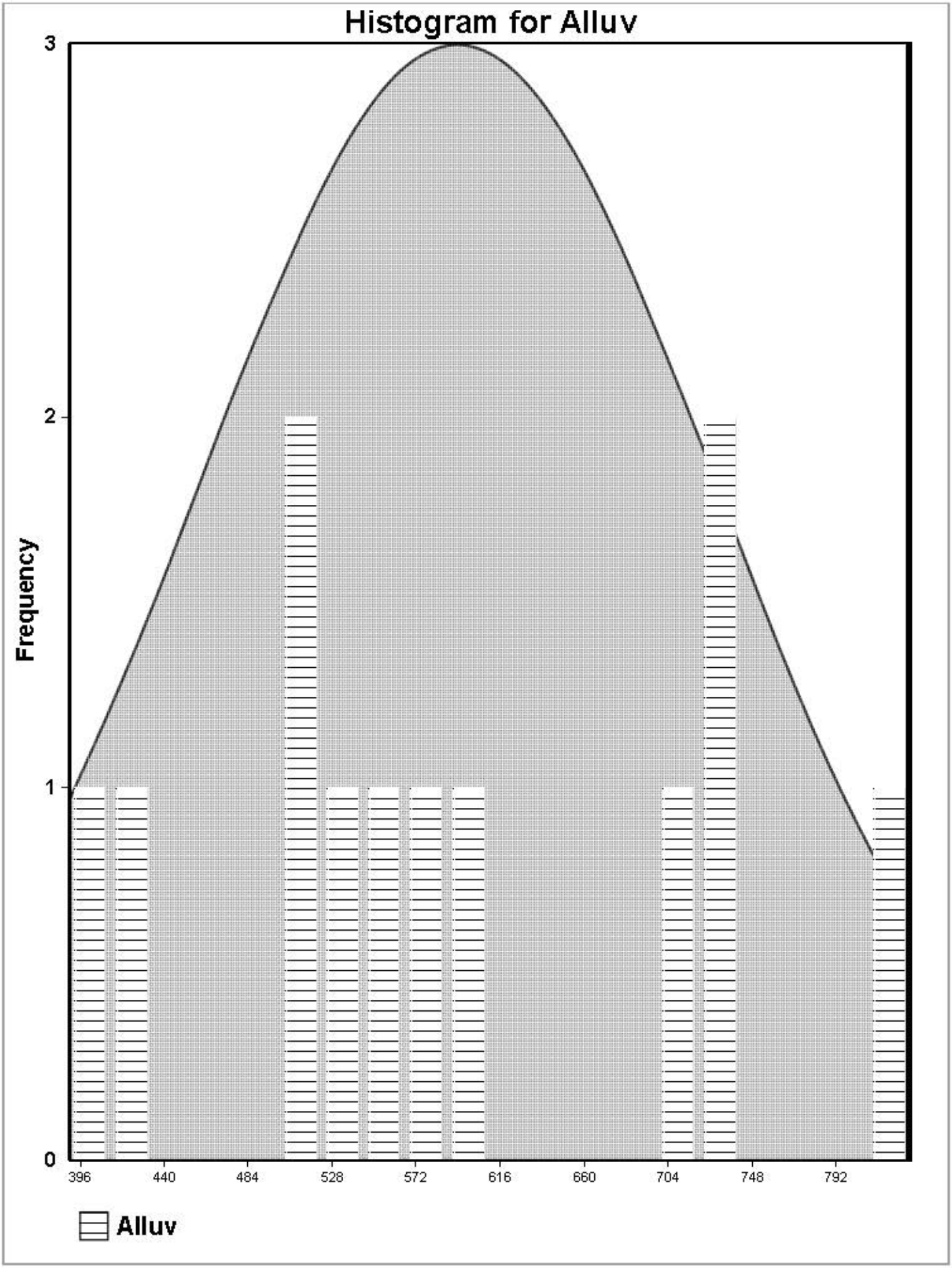
Test of Equality of Variances

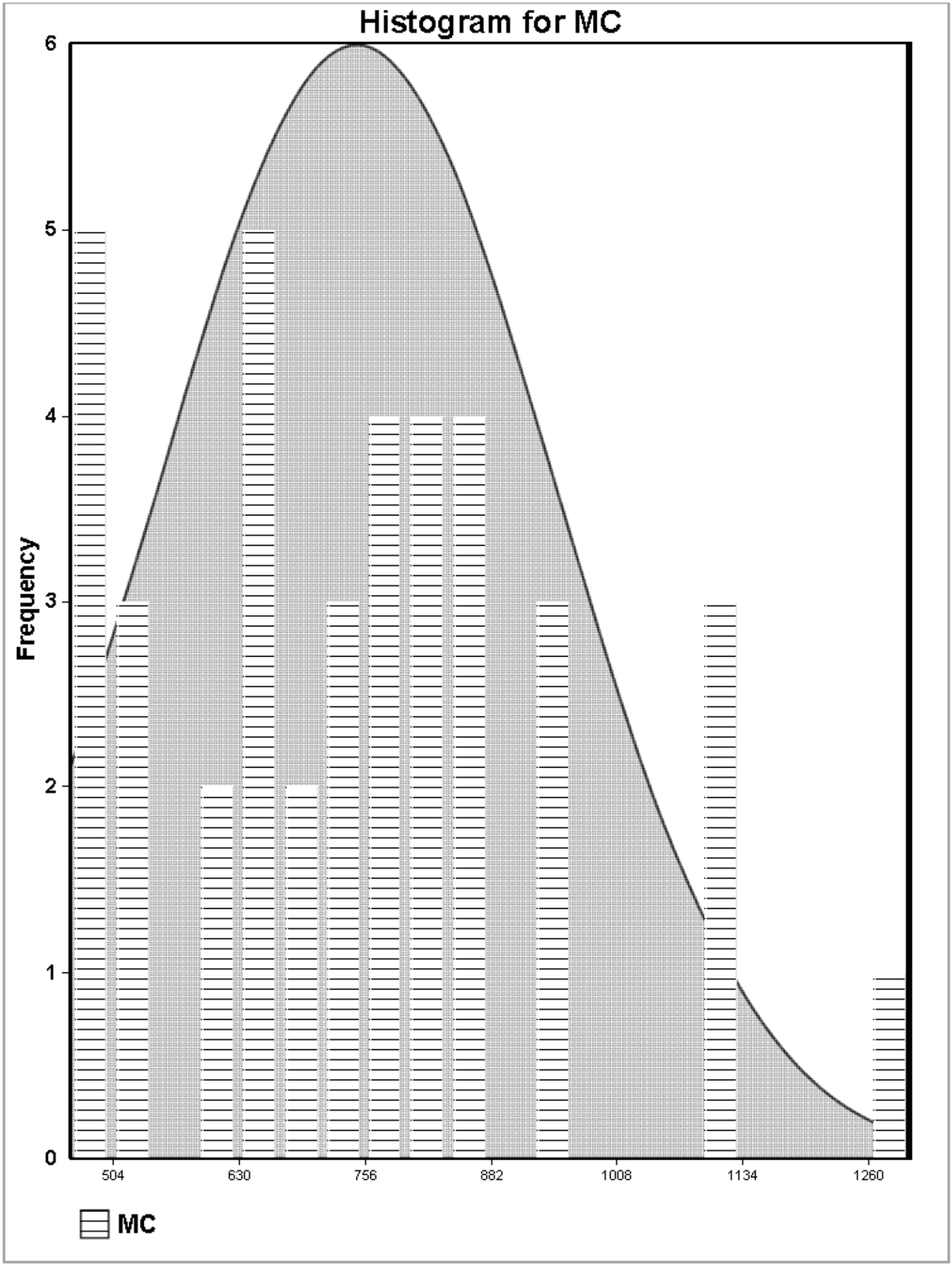
Variance of Site	18261
Variance of Background	39143

Numerator DF	Denominator DF	F-Test Value	P-Value
38	11	2.144	0.175

Conclusion with Alpha = 0.05

* Two variances appear to be equal


Histogram for Alluv
Frequency
3
2
1
0
396
440
484
528
572
616
660
704
748
792
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
504
630
756
882
1008
1134
1260
MC

Location	Alluv
BG-1-2	830
BG-1-10	740
BG-1-29	720
BG-1-40	550
BG-2-2	600
BG-2-10	530
BG-2-19	570
BG-2-21	520
BG-3-2	520
BG-3-10	730
BG-6-2	420
BG-6-9	390

Location	MC
BG-1-43	1300
BG-1-46	760
BG-1-55	750
BG-1-78	940
BG-1-92	850
BG-2-30	1100
BG-2-32	630
BG-2-75	700
BG-2-81	1100
BG-3-17	460
BG-3-22	520
BG-3-29	470
BG-3-63	790
BG-3-65	820
BG-3-69	940
BG-3-95	720
BG-3-105	840
BG-3-131	520
BG-3-136	950
BG-4-1	670
BG-4-10	810
BG-4-19	840
BG-4-40	830
BG-4-65	480
BG-4-79	730
BG-4-82	770
BG-4-95	600
BG-4-117	480
BG-4-120	1100
BG-4-161	810
BG-4-163	780
BG-6-28	630
BG-6-53	630
BG-6-58	620
BG-6-75	520
BG-6-87	840
BG-6-98	470
BG-6-114	650
BG-1-127	710
Average	746.9231

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Silver.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	6	45	88.24%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	45	0.5	0.63	0.552	0.56	0.0438
Statistics (Detects Only)	6	0.2	0.79	0.41	0.37	0.214
Statistics (All: NDs treated as DL value)	51	0.2	0.79	0.536	0.54	0.0918
Statistics (All: NDs treated as DL/2 value)	51	0.2	0.79	0.292	0.285	0.0831
Statistics (Normal ROS Estimated Data)	51	0.0897	0.79	0.347	0.339	0.132
Statistics (Gamma ROS Estimated Data)	51	0.2	0.79	0.397	0.39	0.0764
Statistics (Lognormal ROS Estimated Data)	51	0.176	0.79	0.334	0.314	0.111

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.915	4.639	0.0834	-0.997	0.496	-0.497
Statistics (NDs = DL)	25.97	24.46	0.0206	-0.644	0.217	-0.337
Statistics (NDs = DL/2)	20.96	19.74	0.0139	-1.255	0.198	-0.158
Statistics (Gamma ROS Estimates)	30.99	29.18	0.0128	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.143	0.305	-0.267

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.946	0.886	0.676	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.9	0.788	Data Appear Normal
Lilliefors (Detects Only)	0.205	0.362	Data Appear Normal
Lilliefors (NDs = DL)	0.251	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.336	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.11	0.124	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.987	0.867	0.727	0.943

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.227	0.698	
Kolmogorov-Smirnov (Detects Only)	0.169	0.333	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	4.381	0.748	
Kolmogorov-Smirnov (NDs = DL)	0.291	0.124	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.713	0.748	
Kolmogorov-Smirnov (NDs = DL/2)	0.285	0.124	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.148	0.748	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.149	0.124	Data Not Gamma Distributed	

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.989	0.811	0.797	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.976	0.788	Data Appear Lognormal
Lilliefors (Detects Only)	0.138	0.362	Data Appear Lognormal
Lilliefors (NDs = DL)	0.312	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.261	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.11	0.124	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Silver.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Number of Valid Data	51	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	45
		Percent Non-Detects	88.24%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.2	Minimum Detected	-1.609
Maximum Detected	0.79	Maximum Detected	-0.236
Mean of Detected	0.41	Mean of Detected	-0.997
SD of Detected	0.214	SD of Detected	0.496
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.63	Maximum Non-Detect	-0.462

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	50
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	98.04%

Warning: There are only 6 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.9	Shapiro Wilk Test Statistic	0.976
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.292	Mean (Log Scale)	-1.255
SD	0.0831	SD (Log Scale)	0.198
95% UTL 95% Coverage	0.463	95% UTL 95% Coverage	0.428
95% UPL (t)	0.433	95% UPL (t)	0.399
90% Percentile (z)	0.398	90% Percentile (z)	0.367
95% Percentile (z)	0.429	95% Percentile (z)	0.395
99% Percentile (z)	0.485	99% Percentile (z)	0.452

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.334
		SD in Original Scale	0.111
		Mean in Log Scale	-1.143
		SD in Log Scale	0.305
		95% UTL 95% Coverage	0.596
		95% UPL (t)	0.534
		90% Percentile (z)	0.471
		95% Percentile (z)	0.526
		99% Percentile (z)	0.648
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.569	Data appear Normal at 5% Significance Level	
Theta Star	0.16		
nu star	30.82		
A-D Test Statistic	0.227	Nonparametric Statistics	
5% A-D Critical Value	0.698	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.169	Mean	0.343
5% K-S Critical Value	0.333	SD	0.122
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0518
		95% KM UTL with 95% Coverage	0.594
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.882
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.55
Mean	0.397	90% Percentile (z)	0.5
Median	0.39	95% Percentile (z)	0.544
SD	0.0764	99% Percentile (z)	0.628
k star	29.18		
Theta star	0.0136	Gamma ROS Limits with Extrapolated Data	
Nu star	2977	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.526
95% Percentile of Chisquare (2k)	77.2	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.527
		95% WH Approx. Gamma UTL with 95% Coverage	0.558
90% Percentile	0.493	95% HW Approx. Gamma UTL with 95% Coverage	0.56
95% Percentile	0.525		
99% Percentile	0.587		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Silver.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for All Data

Mean	0.292
Standard Deviation	0.0831
Number of data	51
Number of suspected outliers	1

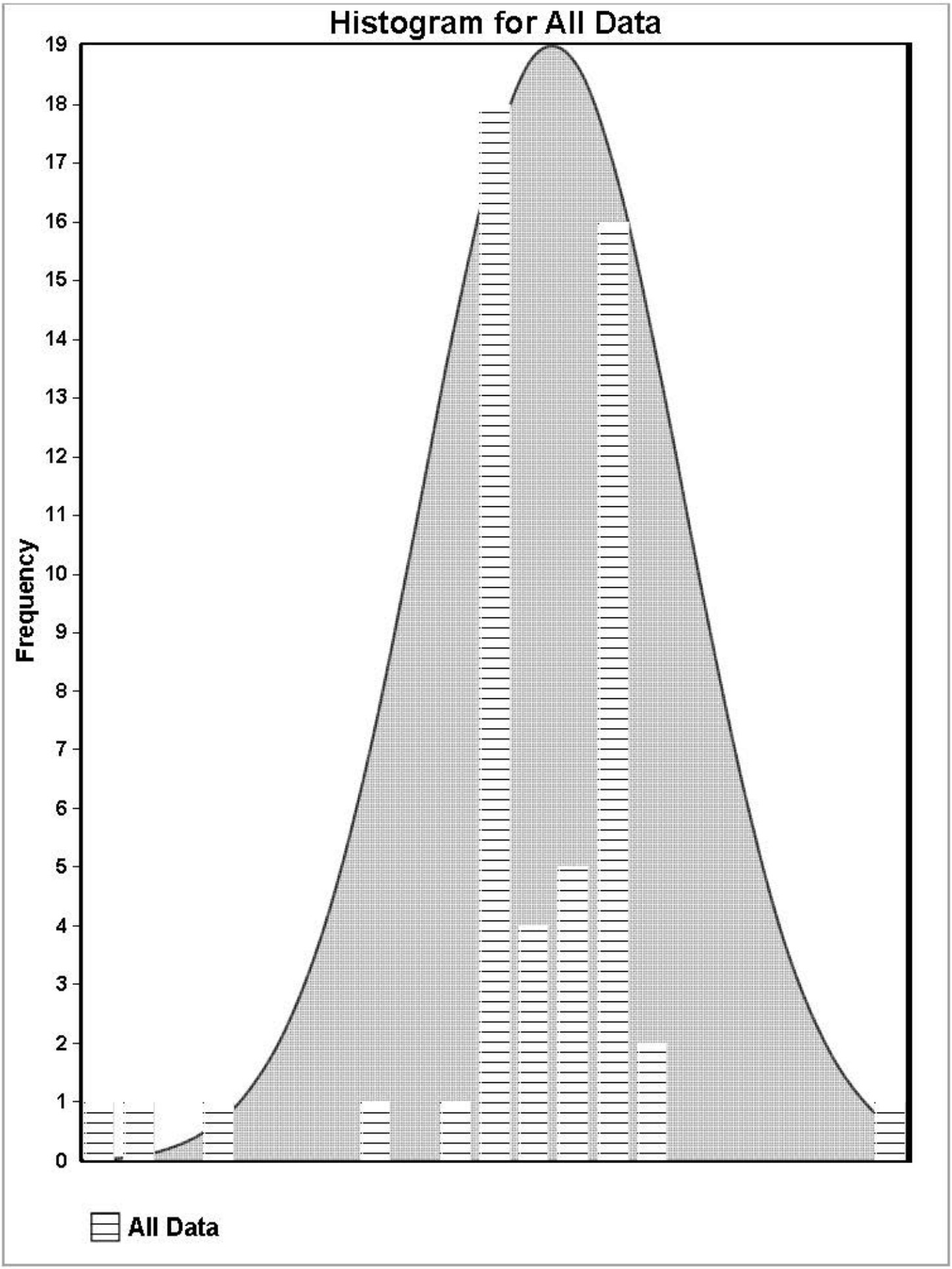
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.292	0.0823	0.79	5	6.053	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.79 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.79 is a Potential Statistical Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
All Data

Location	All Data	D_All Data
BG-1-2	0.5	0
BG-1-43	0.5	0
BG-1-55	0.5	0
BG-1-78	0.5	0
BG-2-30	0.79	1
BG-2-81	0.5	0
BG-3-17	0.52	0
BG-3-22	0.51	0
BG-3-69	0.57	0
BG-4-2	0.53	0
BG-4-19	0.59	0
BG-4-40	0.58	0
BG-4-79	0.59	0
BG-4-161	0.6	0
BG-4-163	0.59	0
BG-6-28	0.58	0
BG-6-53	0.6	0
BG-6-87	0.62	0
BG-1-10	0.5	0
BG-1-29	0.5	0
BG-1-40	0.5	0
BG-1-46	0.5	0
BG-1-92	0.5	0
BG-2-2	0.25	1
BG-2-10	0.2	1
BG-2-19	0.5	0
BG-2-21	0.48	1
BG-2-32	0.31	1
BG-2-75	0.43	1
BG-3-2	0.51	0
BG-3-10	0.54	0
BG-3-29	0.51	0
BG-3-63	0.63	0
BG-3-65	0.59	0
BG-3-95	0.57	0
BG-3-105	0.59	0
BG-3-131	0.55	0
BG-3-136	0.56	0
BG-4-10	0.54	0
BG-4-65	0.51	0
BG-4-82	0.6	0
BG-4-95	0.61	0
BG-4-117	0.59	0
BG-4-120	0.6	0
BG-6-2	0.51	0
BG-6-9	0.51	0
BG-6-58	0.6	0
BG-6-75	0.59	0
BG-6-98	0.59	0
BG-6-114	0.59	0
BG-6-127	0.59	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Silver.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	2	11	84.62%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	11	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	13	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	13	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	13	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Shapiro-Wilks (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	
Shapiro-Wilks (NDs = DL/2)	N/A	N/A	
Lilliefors (NDs = DL/2)	N/A	N/A	
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A	
Lilliefors (Normal ROS Estimates)	N/A	N/A	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A	
Anderson-Darling (NDs = DL/2)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A	
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A	
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A	

Note: Substitution methods such as DL or DL/2 are not recommended.

>20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs

Raw Statistics	38	0	38	4	34	89.47%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	34	0.5	0.63	0.563	0.59	0.0446
Statistics (Detects Only)	4	0.31	0.79	0.503	0.455	0.205
Statistics (All: NDs treated as DL value)	38	0.31	0.79	0.557	0.585	0.0743
Statistics (All: NDs treated as DL/2 value)	38	0.25	0.79	0.305	0.295	0.0925
Statistics (Normal ROS Estimated Data)	38	0.206	0.79	0.42	0.412	0.118
Statistics (Gamma ROS Estimated Data)	38	0.31	0.79	0.469	0.456	0.0933
Statistics (Lognormal ROS Estimated Data)	38	0.271	0.79	0.416	0.399	0.0998

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	8.776	8.101	0.0573	-0.746	0.388	-0.52
Statistics (NDs = DL)	52.71	48.57	0.0106	-0.595	0.144	-0.242
Statistics (NDs = DL/2)	18.48	17.04	0.0165	-1.215	0.211	-0.174
Statistics (Gamma ROS Estimates)	28.24	26.03	0.0166	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.902	0.223	-0.247

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.949	0.91	0.672	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.912	0.748	Data Appear Normal
Lilliefors (Detects Only)	0.294	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.867	0.938	Data Not Normal
Lilliefors (NDs = DL)	0.176	0.144	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.487	0.938	Data Not Normal
Lilliefors (NDs = DL/2)	0.377	0.144	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.969	0.938	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0808	0.144	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.982	0.906	0.728	0.969

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.286	0.658	
Kolmogorov-Smirnov (Detects Only)	0.259	0.395	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.213	0.745	
Kolmogorov-Smirnov (NDs = DL)	0.191	0.143	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.103	0.747	
Kolmogorov-Smirnov (NDs = DL/2)	0.335	0.143	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.297	0.746	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.114	0.143	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.979	0.885	0.776	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.97	0.748	Data Appear Lognormal
Lilliefors (Detects Only)	0.237	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.823	0.938	Data Not Lognormal
Lilliefors (NDs = DL)	0.195	0.144	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.63	0.938	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.312	0.144	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.976	0.938	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0808	0.144	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Silver.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Number of Valid Data	13	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	11
		Percent Non-Detects	84.62%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.2	Minimum Detected	-1.609
Maximum Detected	0.25	Maximum Detected	-1.386
Mean of Detected	0.225	Mean of Detected	-1.498
SD of Detected	0.0354	SD of Detected	0.158
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.59	Maximum Non-Detect	-0.528

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	13
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.256	Mean (Log Scale)	-1.367

SD	0.021	SD (Log Scale)	0.0867
95% UTL 95% Coverage	0.312	95% UTL 95% Coverage	0.321
95% UPL (t)	0.295	95% UPL (t)	0.299
90% Percentile (z)	0.283	90% Percentile (z)	0.285
95% Percentile (z)	0.29	95% Percentile (z)	0.294
99% Percentile (z)	0.305	99% Percentile (z)	0.312
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		95% UTL 95% Coverage	N/A
		95% UPL (t)	N/A
		90% Percentile (z)	N/A
		95% Percentile (z)	N/A
		99% Percentile (z)	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.225
5% K-S Critical Value	N/A	SD	0.025
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.025
		95% KM UTL with 95% Coverage	0.292
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.338
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.271
Mean	N/A	90% Percentile (z)	0.257
Median	N/A	95% Percentile (z)	0.266
SD	N/A	99% Percentile (z)	0.283
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

>20

General Statistics			
Number of Valid Data	38	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	34
		Percent Non-Detects	89.47%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.31	Minimum Detected	-1.171
Maximum Detected	0.79	Maximum Detected	-0.236
Mean of Detected	0.503	Mean of Detected	-0.746
SD of Detected	0.205	SD of Detected	0.388
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.63	Maximum Non-Detect	-0.462

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	37
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	97.37%

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.912	Shapiro Wilk Test Statistic	0.97
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.305	Mean (Log Scale)	-1.215
SD	0.0925	SD (Log Scale)	0.211
95% UTL 95% Coverage	0.502	95% UTL 95% Coverage	0.465
95% UPL (t)	0.463	95% UPL (t)	0.426
90% Percentile (z)	0.423	90% Percentile (z)	0.389
95% Percentile (z)	0.457	95% Percentile (z)	0.42
99% Percentile (z)	0.52	99% Percentile (z)	0.485
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.416
		SD in Original Scale	0.0998
		Mean in Log Scale	-0.902
		SD in Log Scale	0.223
		95% UTL 95% Coverage	0.652
		95% UPL (t)	0.594
		90% Percentile (z)	0.54
		95% Percentile (z)	0.585
		99% Percentile (z)	0.681

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only
k star (bias corrected)	2.361	Data appear Normal at 5% Significance Level
Theta Star	0.213	
nu star	18.89	
A-D Test Statistic	0.286	Nonparametric Statistics

5% A-D Critical Value	0.658	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.259	Mean	0.417
5% K-S Critical Value	0.395	SD	0.0934
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0477
		95% KM UTL with 95% Coverage	0.616
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.829
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.576
Mean	0.469	90% Percentile (z)	0.536
Median	0.456	95% Percentile (z)	0.57
SD	0.0933	99% Percentile (z)	0.634
k star	26.03		
Theta star	0.018	Gamma ROS Limits with Extrapolated Data	
Nu star	1978	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.633
95% Percentile of Chisquare (2k)	69.9	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.633
		95% WH Approx. Gamma UTL with 95% Coverage	0.68
90% Percentile	0.59	95% HW Approx. Gamma UTL with 95% Coverage	0.682
95% Percentile	0.63		
99% Percentile	0.709		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Silver.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 0.295 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.556

For 10% significance level, 0.295 is an outlier.
For 5% significance level, 0.295 is an outlier.
For 1% significance level, 0.295 is not an outlier.

2. Data Value 0.2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.714

For 10% significance level, 0.2 is an outlier.
For 5% significance level, 0.2 is an outlier.
For 1% significance level, 0.2 is an outlier.

Rosner's Outlier Test for >20

Mean	0.305
Standard Deviation	0.0925
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.305	0.0913	0.79	6	5.316	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 0.79 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 0.79 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Silver.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Data	38	13
Number of Non-Detect Data	34	11
Number of Detect Data	4	2
Minimum Non-Detect	0.5	0.5
Maximum Non-Detect	0.63	0.59
Percent Non detects	89.47%	84.62%
Minimum Detected	0.31	0.2
Maximum Detected	0.79	0.25
Mean of Detected Data	0.503	0.225
Median of Detected Data	0.455	0.225
SD of Detected Data	0.205	0.0354

Site vs Background Gehan Test

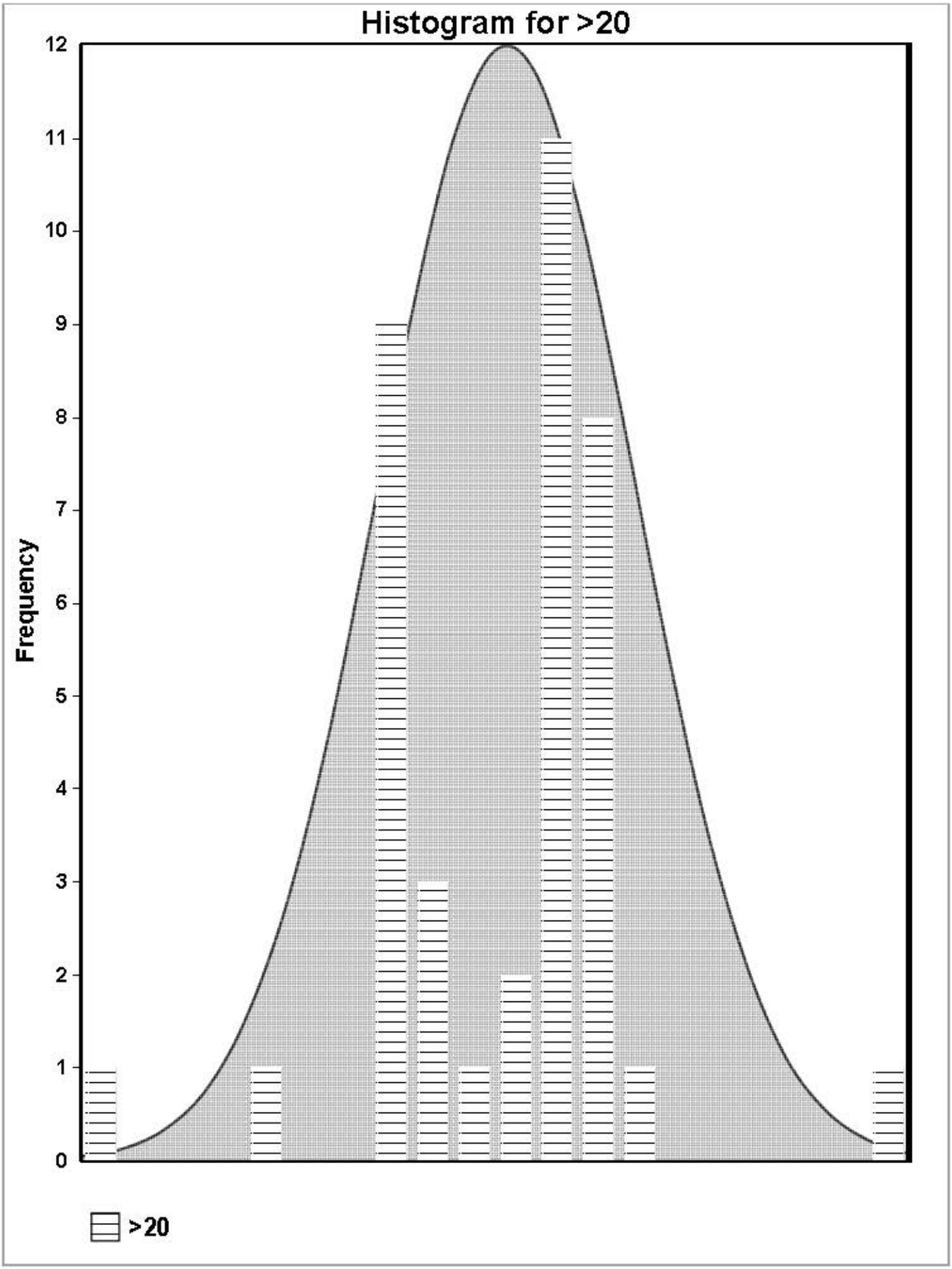
H0: Mu of Site or AOC = Mu of background

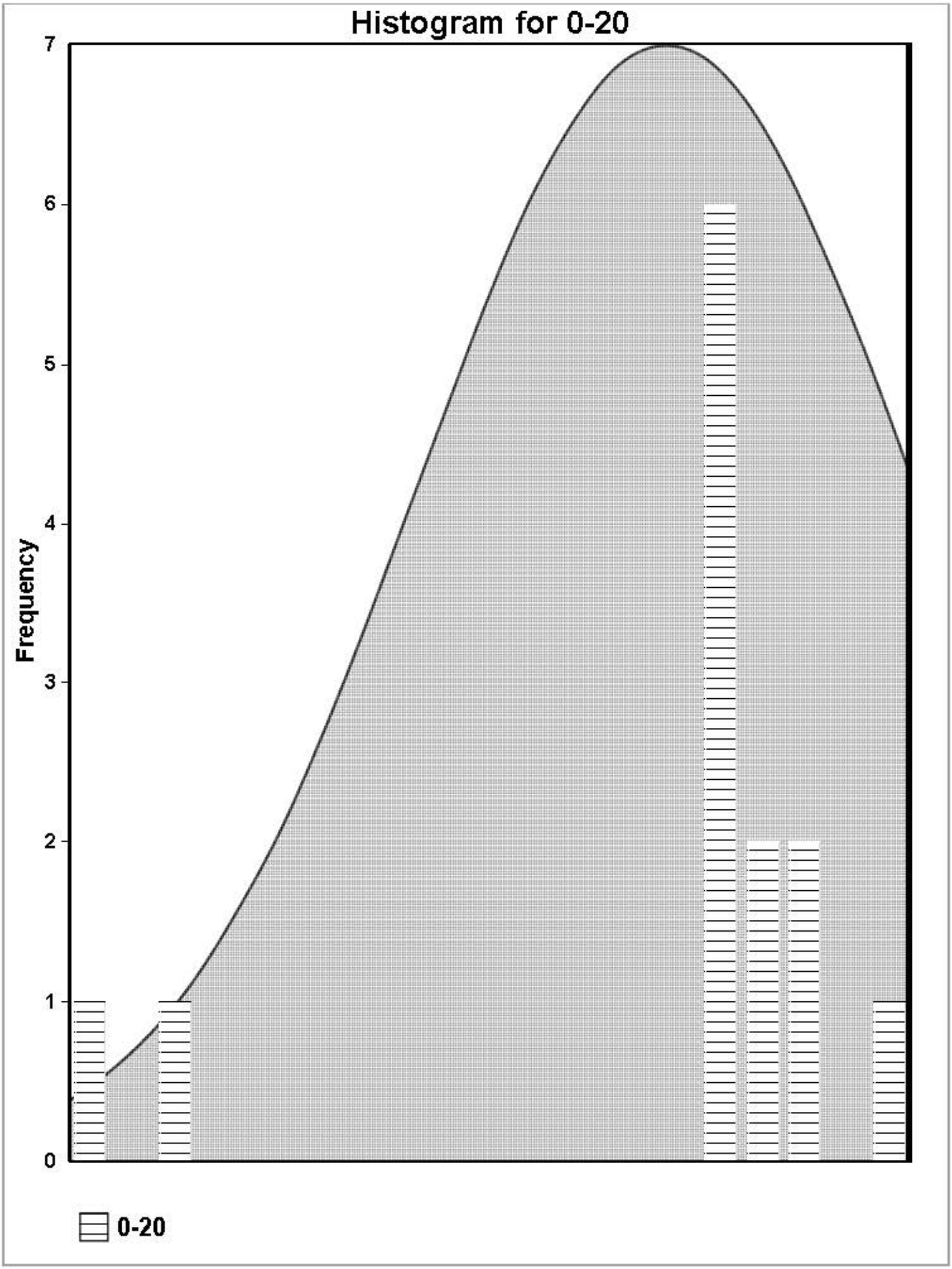
Gehan z Test Value	0.848
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.396

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5
6
7
0-20

Location	0-20	D_0-20
BG-1-2	0.5	0
BG-1-10	0.5	0
BG-2-2	0.25	1
BG-2-10	0.2	1
BG-2-19	0.5	0
BG-3-2	0.51	0
BG-3-10	0.54	0
BG-6-2	0.51	0
BG-6-9	0.51	0
BG-3-17	0.52	0
BG-4-1	0.53	0
BG-4-10	0.54	0
BG-4-19	0.59	0

Location	>20	D_>20
BG-1-43	0.5	0
BG-1-46	0.5	0
BG-1-55	0.5	0
BG-1-78	0.5	0
BG-1-92	0.5	0
BG-2-30	0.79	1
BG-2-32	0.31	1
BG-2-75	0.43	1
BG-2-81	0.5	0
BG-3-22	0.51	0
BG-3-29	0.51	0
BG-3-63	0.63	0
BG-3-65	0.59	0
BG-3-69	0.57	0
BG-3-95	0.57	0
BG-3-105	0.59	0
BG-3-131	0.55	0
BG-3-136	0.6	0
BG-4-40	0.58	0
BG-4-65	0.51	0
BG-4-79	0.59	0
BG-4-82	0.6	0
BG-4-95	0.61	0
BG-4-117	0.59	0
BG-4-120	0.6	0
BG-4-161	0.6	0
BG-4-163	0.59	0
BG-6-28	0.58	0
BG-6-53	0.6	0
BG-6-58	0.6	0
BG-6-75	0.59	0
BG-6-87	0.62	0
BG-6-98	0.59	0
BG-6-114	0.59	0
BG-1-127	0.59	0
BG-1-29	0.5	0
BG-1-40	0.5	0
BG-2-21	0.48	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Silver.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	1	17	94.44%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Clay was not processed!

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	5	28	84.85%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	28	0.5	0.63	0.553	0.555	0.044
Statistics (Detects Only)	5	0.2	0.48	0.334	0.31	0.118
Statistics (All: NDs treated as DL value)	33	0.2	0.63	0.52	0.54	0.0987
Statistics (All: NDs treated as DL/2 value)	33	0.2	0.48	0.285	0.28	0.051
Statistics (Normal ROS Estimated Data)	33	0.155	0.513	0.334	0.334	0.0975
Statistics (Gamma ROS Estimated Data)	33	0.134	0.48	0.337	0.351	0.0961
Statistics (Lognormal ROS Estimated Data)	33	0.182	0.552	0.331	0.317	0.1

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	9.714	8.851	0.0344	-1.149	0.365	-0.318
Statistics (NDs = DL)	20.14	18.33	0.0258	-0.68	0.25	-0.368
Statistics (NDs = DL/2)	38.83	35.32	0.00734	-1.268	0.157	-0.124
Statistics (Gamma ROS Estimates)	10.57	9.633	0.0318	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.149	0.302	-0.263

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.979	0.873	0.841	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.939	0.762	Data Appear Normal
Lilliefors (Detects Only)	0.191	0.396	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.77	0.931	Data Not Normal
Lilliefors (NDs = DL)	0.269	0.154	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.735	0.931	Data Not Normal
Lilliefors (NDs = DL/2)	0.234	0.154	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.965	0.931	Data Appear Normal

Lilliefors (Normal ROS Estimates)	0.136	0.154	Data Appear Normal	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.975	0.833	0.868	0.954

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.261	0.679	
Kolmogorov-Smirnov (Detects Only)	0.223	0.358	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	3.41	0.746	
Kolmogorov-Smirnov (NDs = DL)	0.31	0.153	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.158	0.745	
Kolmogorov-Smirnov (NDs = DL/2)	0.203	0.153	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.842	0.747	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.199	0.153	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.984	0.804	0.892	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.951	0.762	Data Appear Lognormal
Lilliefors (Detects Only)	0.198	0.396	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.661	0.931	Data Not Lognormal
Lilliefors (NDs = DL)	0.327	0.154	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.824	0.931	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.195	0.154	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.963	0.931	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.136	0.154	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Silver.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Number of Valid Data	18	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	17

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Clay was not processed!

Non-Clay

General Statistics

Number of Valid Data	33	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	28
		Percent Non-Detects	84.85%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.2	Minimum Detected	-1.609
Maximum Detected	0.48	Maximum Detected	-0.734
Mean of Detected	0.334	Mean of Detected	-1.149
SD of Detected	0.118	SD of Detected	0.365
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.63	Maximum Non-Detect	-0.462

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	33
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 5 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.939	Shapiro Wilk Test Statistic	0.951

5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.285	Mean (Log Scale)	-1.268
SD	0.051	SD (Log Scale)	0.157
95% UTL 95% Coverage	0.396	95% UTL 95% Coverage	0.396
95% UPL (t)	0.373	95% UPL (t)	0.369
90% Percentile (z)	0.351	90% Percentile (z)	0.344
95% Percentile (z)	0.369	95% Percentile (z)	0.364
99% Percentile (z)	0.404	99% Percentile (z)	0.406
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.331
		SD in Original Scale	0.1
		Mean in Log Scale	-1.149
		SD in Log Scale	0.302
		95% UTL 95% Coverage	0.611
		95% UPL (t)	0.533
		90% Percentile (z)	0.467
		95% Percentile (z)	0.521
		99% Percentile (z)	0.64
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	4.019	Data appear Normal at 5% Significance Level	
Theta Star	0.0831		
nu star	40.19		
A-D Test Statistic	0.261	Nonparametric Statistics	
5% A-D Critical Value	0.679	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.223	Mean	0.334
5% K-S Critical Value	0.358	SD	0.106
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.053
		95% KM UTL with 95% Coverage	0.565
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.803
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.516
Mean	0.337	90% Percentile (z)	0.47
Median	0.351	95% Percentile (z)	0.508
SD	0.0961	99% Percentile (z)	0.58
k star	9.633		
Theta star	0.0349	Gamma ROS Limits with Extrapolated Data	
Nu star	635.8	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.537
95% Percentile of Chisquare (2k)	30.48	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.544
		95% WH Approx. Gamma UTL with 95% Coverage	0.606
90% Percentile	0.481	95% HW Approx. Gamma UTL with 95% Coverage	0.617
95% Percentile	0.533		
99% Percentile	0.639		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Silver.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 0.79 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.907

For 10% significance level, 0.79 is an outlier.

For 5% significance level, 0.79 is an outlier.

For 1% significance level, 0.79 is an outlier.

2. Data Value 0.25 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.000

For 10% significance level, 0.25 is not an outlier.

For 5% significance level, 0.25 is not an outlier.

For 1% significance level, 0.25 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	0.285
Standard Deviation	0.051
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.285	0.0502	0.48	9	3.88	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.48 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.48 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Silver.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Data	33	18
Number of Non-Detect Data	28	17
Number of Detect Data	5	1
Minimum Non-Detect	0.5	0.5
Maximum Non-Detect	0.63	0.62
Percent Non detects	84.85%	94.44%
Minimum Detected	0.2	0.79
Maximum Detected	0.48	0.79
Mean of Detected Data	0.334	0.79
Median of Detected Data	0.31	0.79
SD of Detected Data	0.118	N/A

Site vs Background Gehan Test

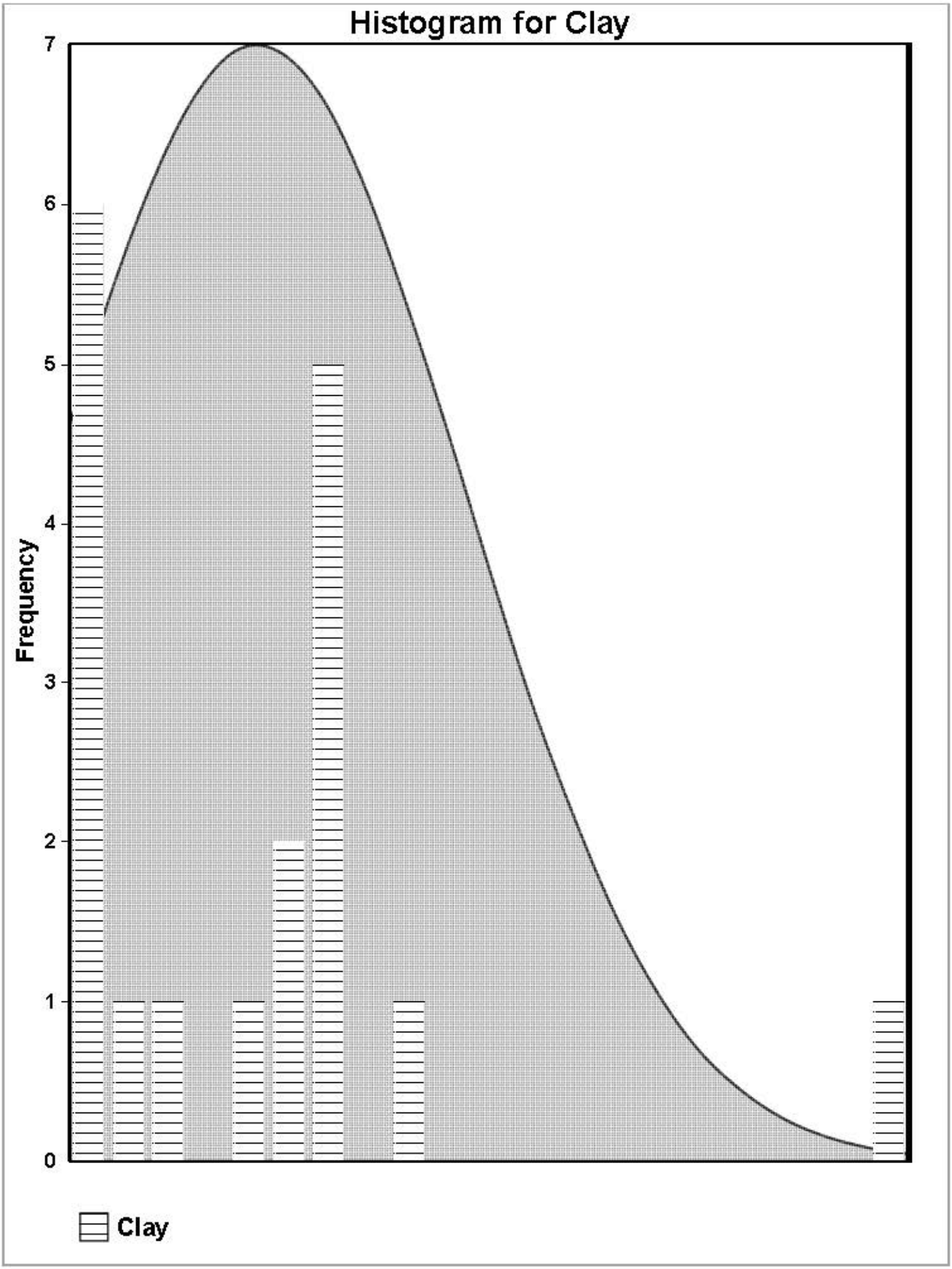
H0: Mu of Site or AOC = Mu of background

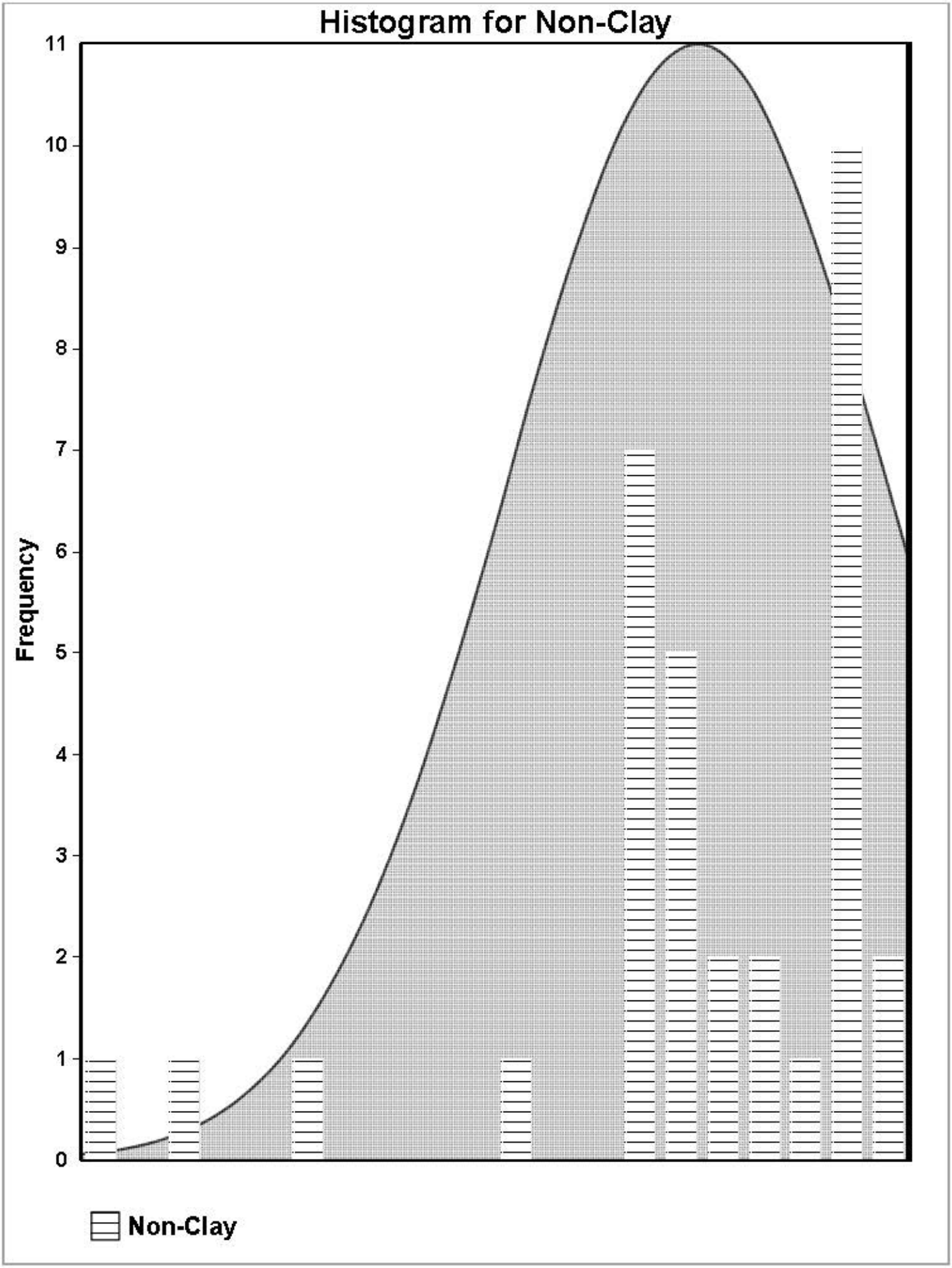
Gehan z Test Value	-1.344
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.179

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
5
6
7
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
Non-Clay

Location	Clay	D_Clay
BG-1-2	0.5	0
BG-1-43	0.5	0
BG-1-55	0.5	0
BG-1-78	0.5	0
BG-2-30	0.79	1
BG-2-81	0.5	0
BG-3-17	0.52	0
BG-3-22	0.51	0
BG-3-69	0.57	0
BG-4-2	0.53	0
BG-4-19	0.59	0
BG-4-40	0.58	0
BG-4-79	0.59	0
BG-4-161	0.6	0
BG-4-163	0.59	0
BG-6-28	0.58	0
BG-6-53	0.6	0
BG-6-87	0.62	0

Location	Non-Clay	D_Non-Clay
BG-1-10	0.5	0
BG-1-29	0.5	0
BG-1-40	0.5	0
BG-1-46	0.5	0
BG-1-92	0.5	0
BG-2-2	0.25	1
BG-2-10	0.2	1
BG-2-19	0.5	0
BG-2-21	0.48	1
BG-2-32	0.31	1
BG-2-75	0.43	1
BG-3-2	0.51	0
BG-3-10	0.54	0
BG-3-29	0.51	0
BG-3-63	0.63	0
BG-3-65	0.59	0
BG-3-95	0.57	0
BG-3-105	0.59	0
BG-3-131	0.55	0
BG-3-136	0.56	0
BG-4-10	0.54	0
BG-4-65	0.51	0
BG-4-82	0.6	0
BG-4-95	0.61	0
BG-4-117	0.59	0
BG-4-120	0.6	0
BG-6-2	0.51	0
BG-6-9	0.51	0
BG-6-58	0.6	0
BG-6-75	0.59	0
BG-6-98	0.59	0
BG-6-114	0.59	0
BG-6-127	0.59	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Silver.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	3	9	75.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	9	0.5	0.54	0.508	0.5	0.013
Statistics (Detects Only)	3	0.2	0.48	0.31	0.25	0.149
Statistics (All: NDs treated as DL value)	12	0.2	0.54	0.458	0.5	0.11
Statistics (All: NDs treated as DL/2 value)	12	0.2	0.48	0.268	0.25	0.0688
Statistics (Normal ROS Estimated Data)	12	0.109	0.511	0.31	0.31	0.128
Statistics (Gamma ROS Estimated Data)	12	1.000E-12	0.48	0.0775	1.000E-12	0.154
Statistics (Lognormal ROS Estimated Data)	12	0.154	0.54	0.31	0.288	0.125

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	7.102	5.382	0.0436	-1.243	0.455	-0.366
Statistics (NDs = DL)	12.94	9.758	0.0354	-0.819	0.322	-0.393
Statistics (NDs = DL/2)	22.8	17.16	0.0117	-1.339	0.204	-0.152
Statistics (Gamma ROS Estimates)	0.0476	0.0912	1.629	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.243	0.398	-0.32

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.938	0.761	0.681	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.879	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.323	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.59	0.859	Data Not Normal
Lilliefors (NDs = DL)	0.411	0.256	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.507	0.859	Data Not Normal
Lilliefors (NDs = DL/2)	0.408	0.256	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.957	0.859	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.167	0.256	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.701	0.728	0.928

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	2.673	0.731	
Kolmogorov-Smirnov (NDs = DL)	0.436	0.245	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	2.544	0.732	
Kolmogorov-Smirnov (NDs = DL/2)	0.398	0.245	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.725	1.005	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.481	0.29	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.962	0.739	0.731	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.926	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.29	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.56	0.859	Data Not Lognormal
Lilliefors (NDs = DL)	0.438	0.256	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.581	0.859	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.387	0.256	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.96	0.859	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.167	0.256	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	39	0	39	3	36	92.31%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	36	0.5	0.63	0.565	0.59	0.0421
Statistics (Detects Only)	3	0.31	0.79	0.51	0.43	0.25
Statistics (All: NDs treated as DL value)	39	0.31	0.79	0.561	0.59	0.0716
Statistics (All: NDs treated as DL/2 value)	39	0.25	0.79	0.3	0.295	0.0864
Statistics (Normal ROS Estimated Data)	39	0.135	0.79	0.383	0.374	0.126
Statistics (Gamma ROS Estimated Data)	39	1.000E-12	0.79	0.0392	1.000E-12	0.149
Statistics (Lognormal ROS Estimated Data)	39	0.231	0.79	0.382	0.364	0.101

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	6.66	6.165	0.0766	-0.75	0.475	-0.633
Statistics (NDs = DL)	56.73	52.38	0.00988	-0.588	0.139	-0.237
Statistics (NDs = DL/2)	21.74	20.09	0.0138	-1.228	0.192	-0.156
Statistics (Gamma ROS Estimates)	0.0399	0.054	0.982	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.992	0.239	-0.241

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.961	0.902	0.616	0.976

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.923	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.292	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.856	0.939	Data Not Normal
Lilliefors (NDs = DL)	0.188	0.142	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.42	0.939	Data Not Normal

Lilliefors (NDs = DL/2)	0.379	0.142	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.965	0.939	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.119	0.142	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.897	0.666	0.975

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	2.333	0.746	
Kolmogorov-Smirnov (NDs = DL)	0.184	0.141	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.506	0.747	
Kolmogorov-Smirnov (NDs = DL/2)	0.333	0.141	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	13.96	1.797	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.584	0.2	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.985	0.872	0.735	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.971	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.245	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.805	0.939	Data Not Lognormal
Lilliefors (NDs = DL)	0.188	0.142	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.576	0.939	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.307	0.142	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.969	0.939	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.119	0.142	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Silver.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Number of Valid Data	12	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	9
		Percent Non-Detects	75.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.2	Minimum Detected	-1.609
Maximum Detected	0.48	Maximum Detected	-0.734
Mean of Detected	0.31	Mean of Detected	-1.243
SD of Detected	0.149	SD of Detected	0.455
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.54	Maximum Non-Detect	-0.616

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	12
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.879	Shapiro Wilk Test Statistic	0.926
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.268	Mean (Log Scale)	-1.339
SD	0.0688	SD (Log Scale)	0.204
95% UTL 95% Coverage	0.456	95% UTL 95% Coverage	0.457
95% UPL (t)	0.396	95% UPL (t)	0.383
90% Percentile (z)	0.356	90% Percentile (z)	0.34
95% Percentile (z)	0.381	95% Percentile (z)	0.366

99% Percentile (z)	0.428	99% Percentile (z)	0.421
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.31
		SD in Original Scale	0.125
		Mean in Log Scale	-1.243
		SD in Log Scale	0.398
		95% UTL 95% Coverage	0.857
		95% UPL (t)	0.607
		90% Percentile (z)	0.48
		95% Percentile (z)	0.555
		99% Percentile (z)	0.728
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.31
5% K-S Critical Value	N/A	SD	0.122
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0862
		95% KM UTL with 95% Coverage	0.644
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.863
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.538
Mean	N/A	90% Percentile (z)	0.466
Median	N/A	95% Percentile (z)	0.511
SD	N/A	99% Percentile (z)	0.594
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

MC

General Statistics			
Number of Valid Data	39	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	36
		Percent Non-Detects	92.31%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.31	Minimum Detected	-1.171
Maximum Detected	0.79	Maximum Detected	-0.236
Mean of Detected	0.51	Mean of Detected	-0.75
SD of Detected	0.25	SD of Detected	0.475

Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.63	Maximum Non-Detect	-0.462

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	38
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	97.44%

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.923	Shapiro Wilk Test Statistic	0.971
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.3	Mean (Log Scale)	-1.228
SD	0.0864	SD (Log Scale)	0.192
95% UTL 95% Coverage	0.483	95% UTL 95% Coverage	0.44
95% UPL (t)	0.447	95% UPL (t)	0.406
90% Percentile (z)	0.411	90% Percentile (z)	0.375
95% Percentile (z)	0.442	95% Percentile (z)	0.401
99% Percentile (z)	0.501	99% Percentile (z)	0.457
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.382
		SD in Original Scale	0.101
		Mean in Log Scale	-0.992
		SD in Log Scale	0.239
		95% UTL 95% Coverage	0.616
		95% UPL (t)	0.558
		90% Percentile (z)	0.504
		95% Percentile (z)	0.549
		99% Percentile (z)	0.647

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.381
5% K-S Critical Value	N/A	SD	0.089

Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0523
		95% KM UTL with 95% Coverage	0.57
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.773
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.533
Mean	N/A	90% Percentile (z)	0.495
Median	N/A	95% Percentile (z)	0.527
SD	N/A	99% Percentile (z)	0.588
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Silver.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 0.48 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.978

For 10% significance level, 0.48 is an outlier.
For 5% significance level, 0.48 is an outlier.
For 1% significance level, 0.48 is an outlier.

2. Data Value 0.2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.714

For 10% significance level, 0.2 is an outlier.
For 5% significance level, 0.2 is an outlier.
For 1% significance level, 0.2 is an outlier.

Rosner's Outlier Test for MC

Mean	0.3
Standard Deviation	0.0864
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.3	0.0853	0.79	6	5.746	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 0.79 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 0.79 is a Potential Statistical Outlier

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Silver.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Data	39	12
Number of Non-Detect Data	36	9
Number of Detect Data	3	3
Minimum Non-Detect	0.5	0.5
Maximum Non-Detect	0.63	0.54
Percent Non detects	92.31%	75.00%
Minimum Detected	0.31	0.2
Maximum Detected	0.79	0.48
Mean of Detected Data	0.51	0.31
Median of Detected Data	0.43	0.25
SD of Detected Data	0.25	0.149

Site vs Background Gehan Test

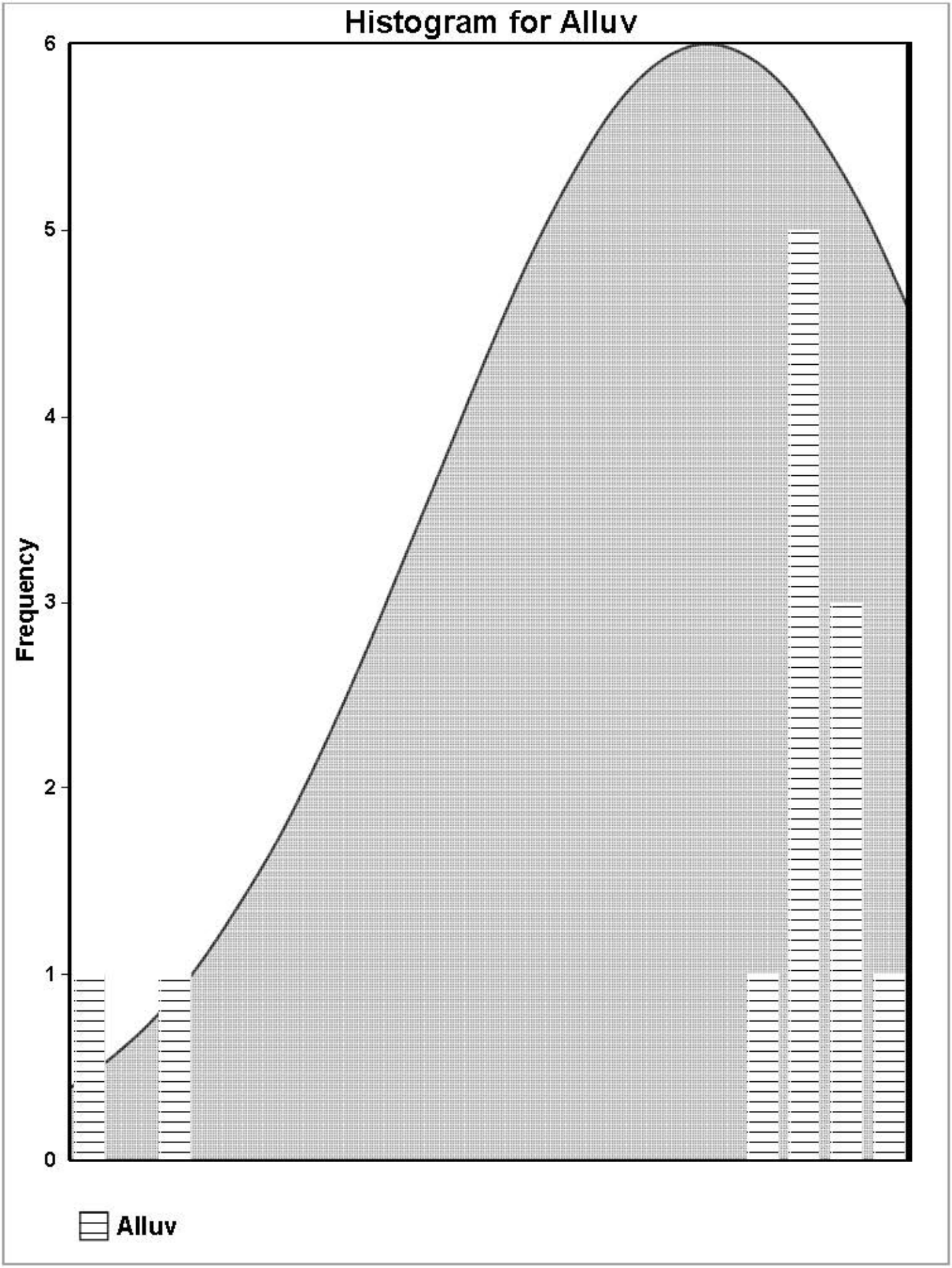
H0: Mu of Site or AOC = Mu of background

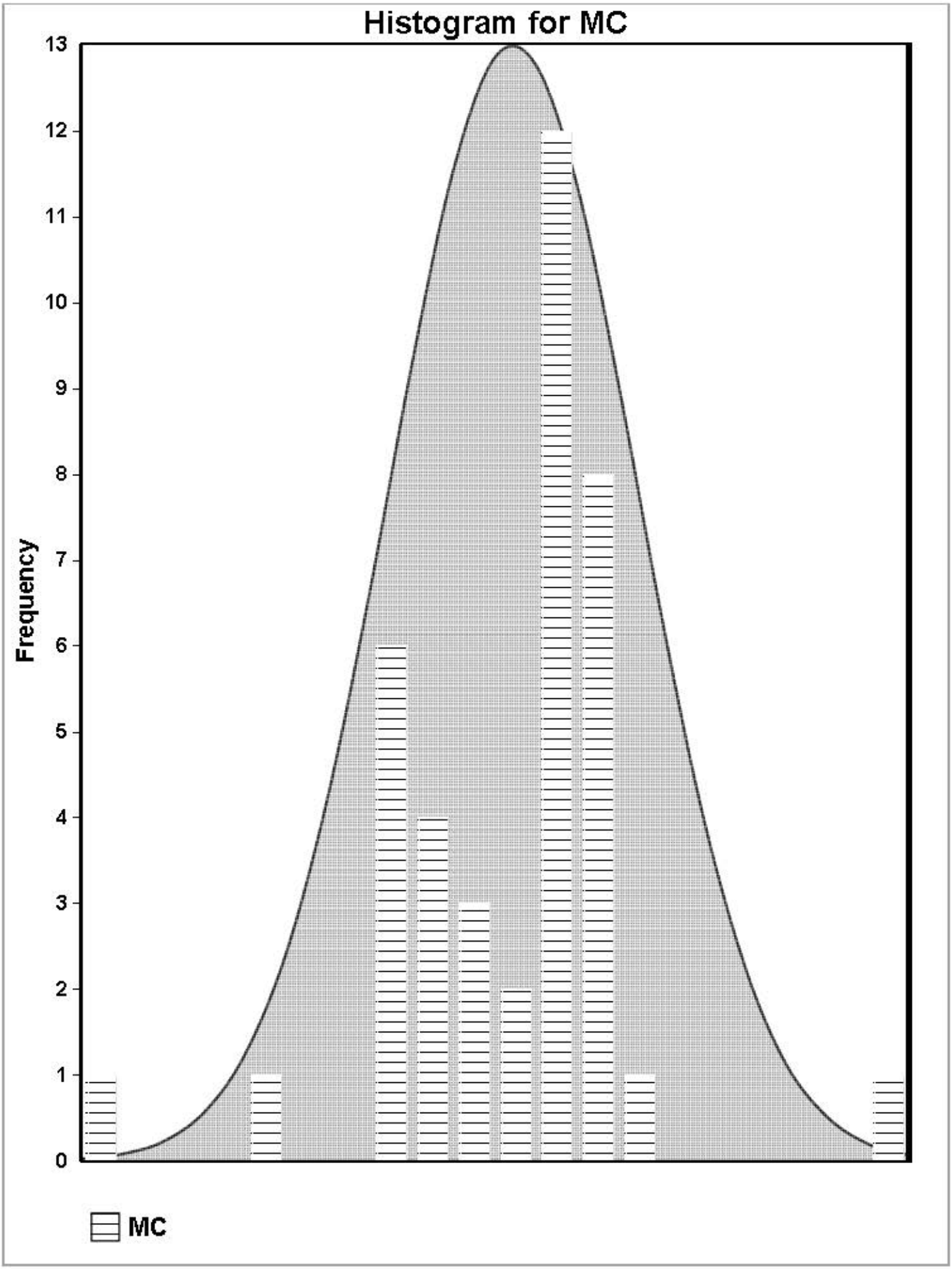
Gehan z Test Value	0.642
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.521

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
MC

Location	Alluv	D_Alluv
BG-1-2	0.5	0
BG-1-10	0.5	0
BG-1-29	0.5	0
BG-1-40	0.5	0
BG-2-2	0.25	1
BG-2-10	0.2	1
BG-2-19	0.5	0
BG-2-21	0.48	1
BG-3-2	0.51	0
BG-3-10	0.54	0
BG-6-2	0.51	0
BG-6-9	0.51	0

Location	MC	D_MC
BG-1-43	0.5	0
BG-1-46	0.5	0
BG-1-55	0.5	0
BG-1-78	0.5	0
BG-1-92	0.5	0
BG-2-30	0.79	1
BG-2-32	0.31	1
BG-2-75	0.43	1
BG-2-81	0.5	0
BG-3-17	0.52	0
BG-3-22	0.51	0
BG-3-29	0.51	0
BG-3-63	0.63	0
BG-3-65	0.59	0
BG-3-69	0.57	0
BG-3-95	0.57	0
BG-3-105	0.59	0
BG-3-131	0.55	0
BG-3-136	0.6	0
BG-4-1	0.53	0
BG-4-10	0.54	0
BG-4-19	0.59	0
BG-4-40	0.58	0
BG-4-65	0.51	0
BG-4-79	0.59	0
BG-4-82	0.6	0
BG-4-95	0.61	0
BG-4-117	0.59	0
BG-4-120	0.6	0
BG-4-161	0.6	0
BG-4-163	0.59	0
BG-6-28	0.58	0
BG-6-53	0.6	0
BG-6-58	0.6	0
BG-6-75	0.59	0
BG-6-87	0.62	0
BG-6-98	0.59	0
BG-6-114	0.59	0
BG-1-127	0.59	0

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Sodium.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	38
Minimum	60
Maximum	6100
Mean of Raw Data	557.2
Standard Deviation of Raw Data	1120
Kstar	0.85
Mean of Log Transformed Data	5.664
Standard Deviation of Log Transformed Data	0.942

Normal Distribution Test Results	
Correlation Coefficient R	0.614
Approximate Shapiro Wilk Test Statistic	0.403
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.365
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.839
A-D Test Statistic	4.661
A-D Critical (0.95) Value	0.786
K-S Test Statistic	0.264
K-S Critical(0.95) Value	0.128

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.947
Approximate Shapiro Wilk Test Statistic	0.901
Approximate Shapiro Wilk P Value	2.3788E-4
Lilliefors Test Statistic	0.15
Lilliefors Critical (0.95) Value	0.124

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Sodium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Total Number of Observations	51	Number of Distinct Observations	38

Raw Statistics		Log-Transformed Statistics	
Minimum	60	Minimum	4.094
Maximum	6100	Maximum	8.716
Second Largest	5400	Second Largest	8.594
First Quartile	165	First Quartile	5.105
Median	260	Median	5.561
Third Quartile	390	Third Quartile	5.966
Mean	557.2	Mean	5.664
SD	1120	SD	0.942
Coefficient of Variation	2.011		
Skewness	4.257		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.365	Lilliefors Test Statistic	0.15
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	2858	95% UTL with 95% Coverage	1995
95% UPL (t)	2453	95% UPL (t)	1420
90% Percentile (z)	1993	90% Percentile (z)	964.2
95% Percentile (z)	2400	95% Percentile (z)	1358
99% Percentile (z)	3164	99% Percentile (z)	2579

Gamma Distribution Test		Data Distribution Test
k star	0.85	Data do not follow a Discernable Distribution (0.05)
Theta Star	655.6	
MLE of Mean	557.2	
MLE of Standard Deviation	604.4	
nu star	86.69	
A-D Test Statistic	4.661	Nonparametric Statistics
5% A-D Critical Value	0.786	90% Percentile 750
K-S Test Statistic	0.264	95% Percentile 1750
5% K-S Critical Value	0.128	99% Percentile 5750
Data not Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	5400
90% Percentile	1335	95% Percentile Bootstrap UTL with 95% Coverage	5750
95% Percentile	1769	95% BCA Bootstrap UTL with 95% Coverage	5400
99% Percentile	2788	95% UPL	3540
		95% Chebyshev UPL	5489
95% WH Approx. Gamma UPL	1616	Upper Threshold Limit Based upon IQR	727.5
95% HW Approx. Gamma UPL	1545		
95% WH Approx. Gamma UTL with 95% Coverage	2072		
95% HW Approx. Gamma UTL with 95% Coverage	2016		

Outlier Tests for Selected Variables

User Selected Options	
From File	Sodium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for All Data

Mean	557.2
Standard Deviation	1120
Number of data	51
Number of suspected outliers	1

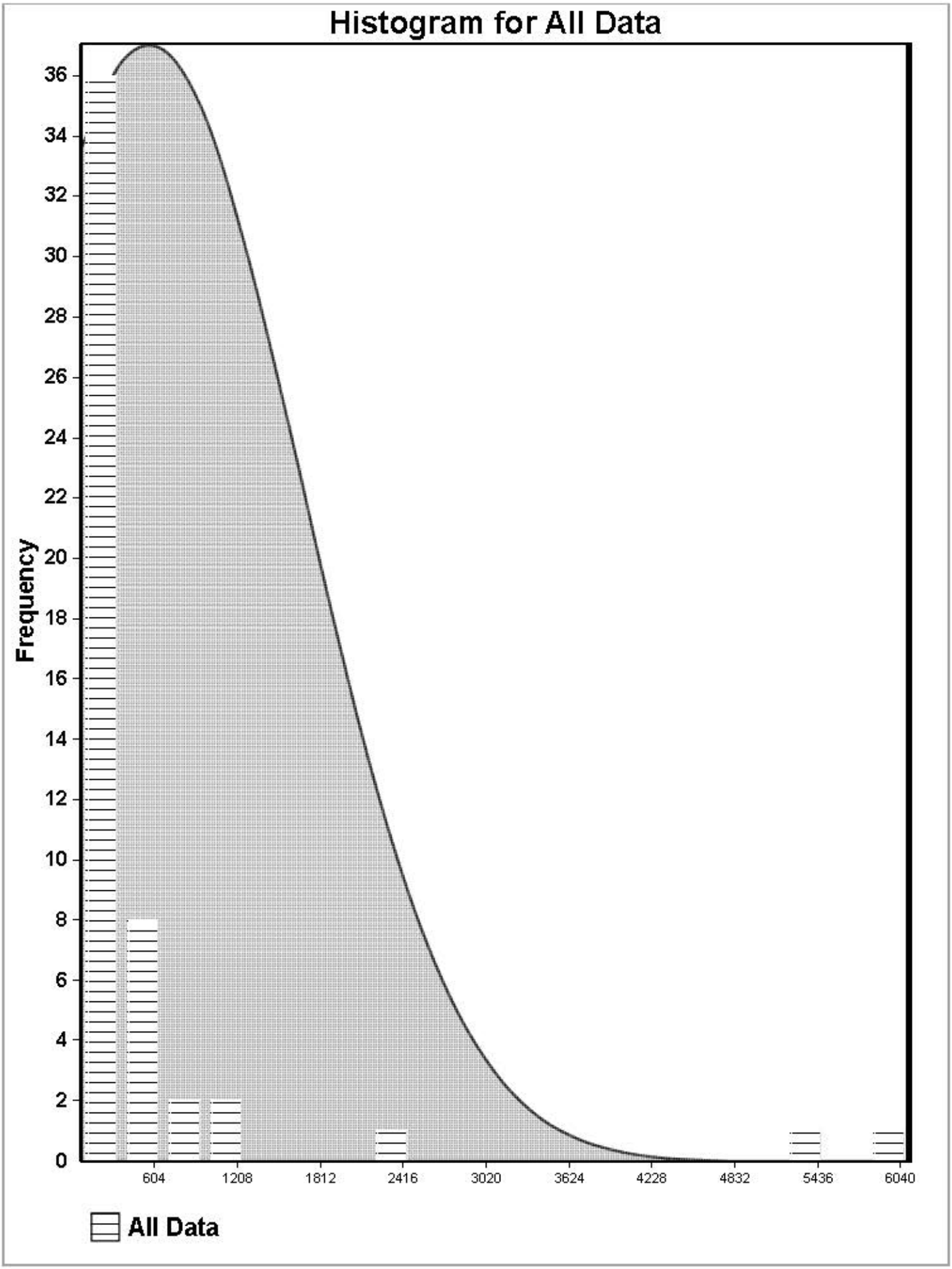
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	557.2	1109	6100	1	4.996	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 6100 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 6100 is a Potential Statistical Outlier


Histogram for All Data
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
604
1208
1812
2416
3020
3624
4228
4832
5436
6040
All Data

Location	All Data
BG-1-2	6100
BG-3-17	390
BG-4-2	5400
BG-4-19	740
BG-1-10	2300
BG-2-2	160
BG-2-10	220
BG-2-19	260
BG-3-2	240
BG-3-10	980
BG-4-10	1200
BG-6-2	430
BG-6-9	400
BG-1-29	370
BG-1-40	350
BG-1-46	130
BG-1-92	100
BG-2-21	330
BG-2-32	180
BG-2-75	72
BG-3-29	320
BG-3-63	99
BG-3-65	150
BG-3-95	150
BG-3-105	280
BG-3-131	77
BG-3-136	290
BG-4-65	60
BG-4-82	170
BG-4-95	130
BG-4-117	110
BG-4-120	330
BG-6-58	180
BG-6-75	190
BG-6-98	180
BG-6-114	180
BG-6-127	300
BG-1-43	440
BG-1-55	110
BG-1-78	250
BG-2-30	520
BG-2-81	230
BG-3-22	250
BG-3-69	300
BG-4-40	390
BG-4-79	220
BG-4-161	130
BG-4-163	290
BG-6-28	750
BG-6-53	340
BG-6-87	650

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Sodium.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	13
Minimum	160
Maximum	6100
Mean of Raw Data	1448
Standard Deviation of Raw Data	2001
Kstar	0.678
Mean of Log Transformed Data	6.551
Standard Deviation of Log Transformed Data	1.198

Normal Distribution Test Results	
Correlation Coefficient R	0.813
Shapiro Wilk Test Statistic	0.663
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	1.3362E-4
Lilliefors Test Statistic	0.318
Lilliefors Critical (0.95) Value	0.246

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.956
A-D Test Statistic	0.904
A-D Critical (0.95) Value	0.767
K-S Test Statistic	0.236
K-S Critical(0.95) Value	0.245

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.961
Shapiro Wilk Test Statistic	0.909
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.219
Lilliefors Test Statistic	0.196
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

>20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	27
Minimum	60
Maximum	750
Mean of Raw Data	252.6
Standard Deviation of Raw Data	153.7
Kstar	2.861
Mean of Log Transformed Data	5.361
Standard Deviation of Log Transformed Data	0.602

Normal Distribution Test Results

Correlation Coefficient R	0.94
Shapiro Wilk Test Statistic	0.886
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	7.9038E-4
Lilliefors Test Statistic	0.132
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.989
A-D Test Statistic	0.263
A-D Critical (0.95) Value	0.754
K-S Test Statistic	0.0908
K-S Critical(0.95) Value	0.144

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.994
Shapiro Wilk Test Statistic	0.981
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.809
Lilliefors Test Statistic	0.0964
Lilliefors Critical (0.95) Value	0.144

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Sodium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	13

Raw Statistics		Log-Transformed Statistics	
Minimum	160	Minimum	5.075
Maximum	6100	Maximum	8.716
Second Largest	5400	Second Largest	8.594
First Quartile	260	First Quartile	5.561
Median	430	Median	6.064
Third Quartile	1200	Third Quartile	7.09
Mean	1448	Mean	6.551
SD	2001	SD	1.198
Coefficient of Variation	1.382		
Skewness	1.865		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.663	Shapiro Wilk Test Statistic	0.909
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	6793	95% UTL with 95% Coverage	17171
95% UPL (t)	5149	95% UPL (t)	6419
90% Percentile (z)	4012	90% Percentile (z)	3250
95% Percentile (z)	4739	95% Percentile (z)	5023
99% Percentile (z)	6103	99% Percentile (z)	11363

Gamma Distribution Test		Data Distribution Test
k star	0.678	Data Follow Appr. Gamma Distribution at 5% Significance Level
Theta Star	2135	
MLE of Mean	1448	
MLE of Standard Deviation	1758	
nu star	17.63	

		Nonparametric Statistics	
A-D Test Statistic	0.904		
5% A-D Critical Value	0.767	90% Percentile	4780
K-S Test Statistic	0.236	95% Percentile	5680
5% K-S Critical Value	0.245	99% Percentile	6016
Data follow Appx. Gamma Distribution at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	6100
90% Percentile	3661	95% Percentile Bootstrap UTL with 95% Coverage	6100
95% Percentile	4984	95% BCA Bootstrap UTL with 95% Coverage	6100
99% Percentile	8151	95% UPL	6100
		95% Chebyshev UPL	10500
95% WH Approx. Gamma UPL	5370	Upper Threshold Limit Based upon IQR	2610
95% HW Approx. Gamma UPL	5509		
95% WH Approx. Gamma UTL with 95% Coverage	9289		
95% HW Approx. Gamma UTL with 95% Coverage	10221		

>20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	27

Raw Statistics		Log-Transformed Statistics	
Minimum	60	Minimum	4.094
Maximum	750	Maximum	6.62
Second Largest	650	Second Largest	6.477
First Quartile	135	First Quartile	4.903
Median	225	Median	5.416
Third Quartile	327.5	Third Quartile	5.791
Mean	252.6	Mean	5.361
SD	153.7	SD	0.602
Coefficient of Variation	0.608		
Skewness	1.395		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.886	Shapiro Wilk Test Statistic	0.981
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	580.3	95% UTL with 95% Coverage	768.3
95% UPL (t)	515.3	95% UPL (t)	595.6
90% Percentile (z)	449.5	90% Percentile (z)	460.5
95% Percentile (z)	505.4	95% Percentile (z)	573
99% Percentile (z)	610.1	99% Percentile (z)	863.5
Gamma Distribution Test		Data Distribution Test	
k star	2.861	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	88.28		
MLE of Mean	252.6		
MLE of Standard Deviation	149.3		
nu star	217.4		
A-D Test Statistic	0.263	Nonparametric Statistics	
5% A-D Critical Value	0.754	90% Percentile	405
K-S Test Statistic	0.0908	95% Percentile	539.5
5% K-S Critical Value	0.144	99% Percentile	713

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	750
90% Percentile	452.8	95% Percentile Bootstrap UTL with 95% Coverage	750
95% Percentile	537.4	95% BCA Bootstrap UTL with 95% Coverage	750
99% Percentile	721.2	95% UPL	655
		95% Chebyshev UPL	931.3
95% WH Approx. Gamma UPL	544.2	Upper Threshold Limit Based upon IQR	616.3
95% HW Approx. Gamma UPL	553.4		
95% WH Approx. Gamma UTL with 95% Coverage	653.5		
95% HW Approx. Gamma UTL with 95% Coverage	673.7		

Outlier Tests for Selected Variables

User Selected Options	
From File	Sodium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13

10% critical value: 0.467

5% critical value: 0.521

1% critical value: 0.615

1. Data Value 6100 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.646

For 10% significance level, 6100 is an outlier.

For 5% significance level, 6100 is an outlier.

For 1% significance level, 6100 is an outlier.

2. Data Value 160 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.015

For 10% significance level, 160 is not an outlier.

For 5% significance level, 160 is not an outlier.

For 1% significance level, 160 is not an outlier.

Rosner's Outlier Test for >20

Mean	252.6
Standard Deviation	153.7
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	252.6	151.7	750	36	3.28	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 750 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Sodium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: 0-20

Background Data: >20

Raw Statistics

	Site	Background
Number of Valid Observations	13	38
Number of Distinct Observations	13	27
Minimum	160	60
Maximum	6100	750
Mean	1448	252.6
Median	430	225
SD	2001	153.7
SE of Mean	555	24.93

Wilcoxon-Mann-Whitney (WMW) Test

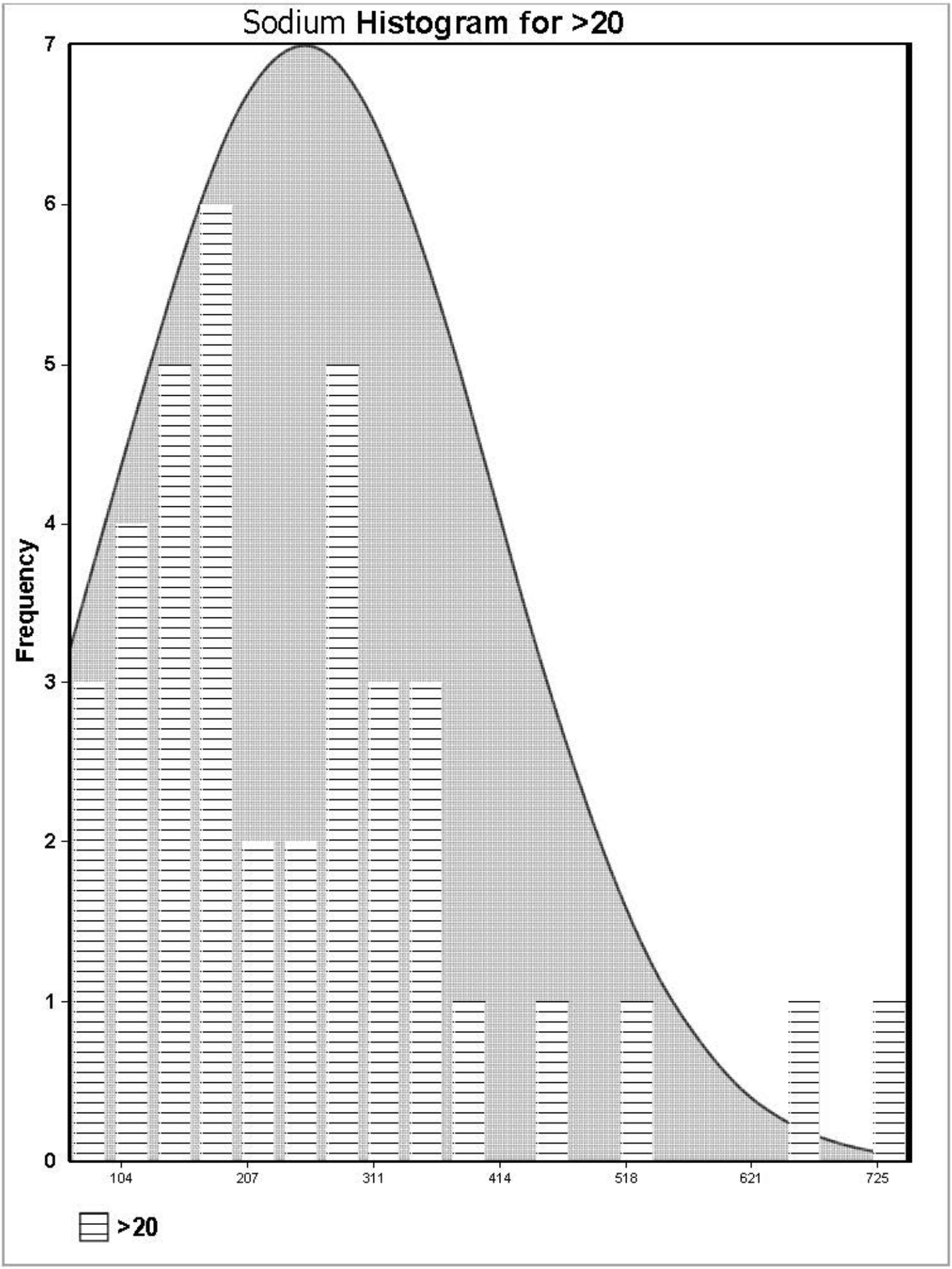
H0: Mean/Median of Site or AOC = Mean/Median of Background

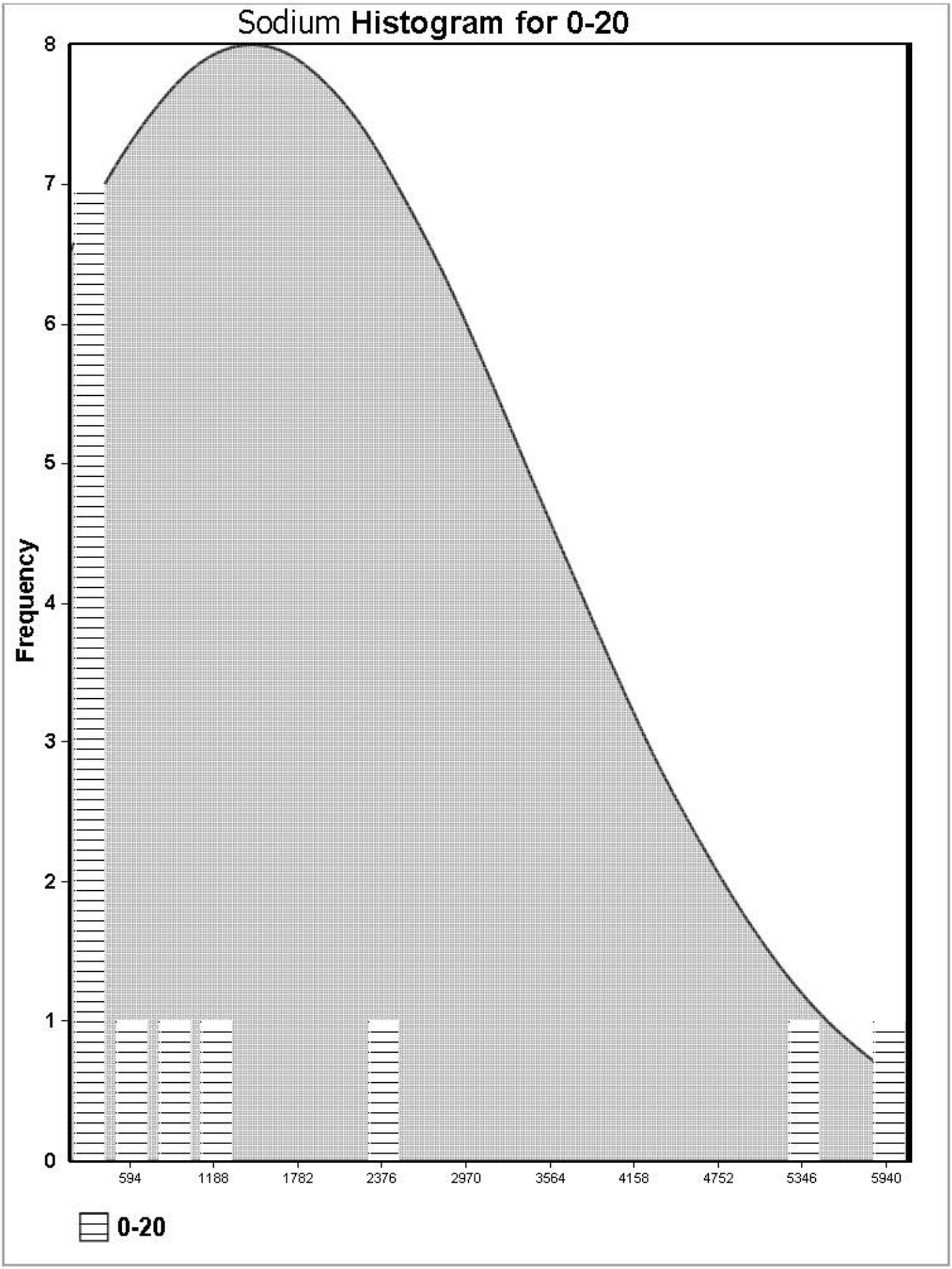
Site Rank Sum W-Stat	492
WMW Test U-Stat	3.318
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	9.0770E-4

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Sodium Histogram for >20
Frequency
0
1
2
3
4
5
6
7
104
207
311
414
518
621
725
>20


Sodium Histogram for 0-20
Frequency
0
1
2
3
4
5
6
7
8
594
1188
1782
2376
2970
3564
4158
4752
5346
5940
0-20

Location	0-20
BG-1-2	6100
BG-3-17	390
BG-4-2	5400
BG-4-19	740
BG-1-10	2300
BG-2-2	160
BG-2-10	220
BG-2-19	260
BG-3-2	240
BG-3-10	980
BG-4-10	1200
BG-6-2	430
BG-6-9	400

Location	>20
BG-1-29	370
BG-1-40	350
BG-1-46	130
BG-1-92	100
BG-2-21	330
BG-2-32	180
BG-2-75	72
BG-3-29	320
BG-3-63	99
BG-3-65	150
BG-3-95	150
BG-3-105	280
BG-3-131	77
BG-3-136	290
BG-4-65	60
BG-4-82	170
BG-4-95	130
BG-4-117	110
BG-4-120	330
BG-6-58	180
BG-6-75	190
BG-6-98	180
BG-6-114	180
BG-6-127	300
BG-1-43	440
BG-1-55	110
BG-1-78	250
BG-2-30	520
BG-2-81	230
BG-3-22	250
BG-3-69	300
BG-4-40	390
BG-4-79	220
BG-4-161	130
BG-4-163	290
BG-6-28	750
BG-6-53	340
BG-6-87	650

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Sodium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	16
Minimum	110
Maximum	6100
Mean of Raw Data	972.2
Standard Deviation of Raw Data	1752
Kstar	0.68
Mean of Log Transformed Data	6.107
Standard Deviation of Log Transformed Data	1.065

Normal Distribution Test Results	
Correlation Coefficient R	0.681
Shapiro Wilk Test Statistic	0.478
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	4.3167E-8
Lilliefors Test Statistic	0.439
Lilliefors Critical (0.95) Value	0.209

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.882
A-D Test Statistic	2.398
A-D Critical (0.95) Value	0.777
K-S Test Statistic	0.321
K-S Critical(0.95) Value	0.211

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.911
Shapiro Wilk Test Statistic	0.835
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.00382
Lilliefors Test Statistic	0.204
Lilliefors Critical (0.95) Value	0.209

Data not Lognormal at (0.05) Significance Level

Non-Clay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	27
Minimum	60
Maximum	2300
Mean of Raw Data	330.8
Standard Deviation of Raw Data	424.8
Kstar	1.352
Mean of Log Transformed Data	5.423
Standard Deviation of Log Transformed Data	0.782

Normal Distribution Test Results

Correlation Coefficient R	0.717
Shapiro Wilk Test Statistic	0.543
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	6.077E-11
Lilliefors Test Statistic	0.317
Lilliefors Critical (0.95) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.882
A-D Test Statistic	1.816
A-D Critical (0.95) Value	0.766
K-S Test Statistic	0.188
K-S Critical(0.95) Value	0.156

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.965
Shapiro Wilk Test Statistic	0.937
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.0672
Lilliefors Test Statistic	0.115
Lilliefors Critical (0.95) Value	0.154

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Sodium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	16

Raw Statistics		Log-Transformed Statistics	
Minimum	110	Minimum	4.7
Maximum	6100	Maximum	8.716
Second Largest	5400	Second Largest	8.594
First Quartile	250	First Quartile	5.521
Median	365	Median	5.898
Third Quartile	617.5	Third Quartile	6.421
Mean	972.2	Mean	6.107
SD	1752	SD	1.065
Coefficient of Variation	1.802		
Skewness	2.672		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.478	Shapiro Wilk Test Statistic	0.835
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	5271	95% UTL with 95% Coverage	6127
95% UPL (t)	4104	95% UPL (t)	3015
90% Percentile (z)	3218	90% Percentile (z)	1759
95% Percentile (z)	3855	95% Percentile (z)	2590
99% Percentile (z)	5049	99% Percentile (z)	5354

Gamma Distribution Test		Data Distribution Test	
k star	0.68	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1429		
MLE of Mean	972.2		
MLE of Standard Deviation	1179		
nu star	24.5		
A-D Test Statistic	2.398	Nonparametric Statistics	
5% A-D Critical Value	0.777	90% Percentile	2145
K-S Test Statistic	0.321	95% Percentile	5505
5% K-S Critical Value	0.211	99% Percentile	5981
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	6100
90% Percentile	2457	95% Percentile Bootstrap UTL with 95% Coverage	6100
95% Percentile	3343	95% BCA Bootstrap UTL with 95% Coverage	6100
99% Percentile	5464	95% UPL	6100
		95% Chebyshev UPL	8820
95% WH Approx. Gamma UPL	3291	Upper Threshold Limit Based upon IQR	1169
95% HW Approx. Gamma UPL	3196		
95% WH Approx. Gamma UTL with 95% Coverage	5228		
95% HW Approx. Gamma UTL with 95% Coverage	5316		

Non-Clay

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	27
Raw Statistics		**Log-Transformed Statistics**	
Minimum	60	Minimum	4.094
Maximum	2300	Maximum	7.741
Second Largest	1200	Second Largest	7.09
First Quartile	150	First Quartile	5.011
Median	190	Median	5.247
Third Quartile	330	Third Quartile	5.799
Mean	330.8	Mean	5.423
SD	424.8	SD	0.782
Coefficient of Variation	1.284		
Skewness	3.655		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.543	Shapiro Wilk Test Statistic	0.937
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	1255	95% UTL with 95% Coverage	1243
95% UPL (t)	1061	95% UPL (t)	869.8
90% Percentile (z)	875.2	90% Percentile (z)	617.5
95% Percentile (z)	1030	95% Percentile (z)	820.6
99% Percentile (z)	1319	99% Percentile (z)	1399
Gamma Distribution Test		**Data Distribution Test**	
k star	1.352	Data appear Lognormal at 5% Significance Level	
Theta Star	244.8		
MLE of Mean	330.8		
MLE of Standard Deviation	284.6		
nu star	89.21		
A-D Test Statistic	1.816	**Nonparametric Statistics**	
5% A-D Critical Value	0.766	90% Percentile	424
K-S Test Statistic	0.188	95% Percentile	1068
5% K-S Critical Value	0.156	99% Percentile	1948

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 95% Coverage	2300
90% Percentile	707.2	95% Percentile Bootstrap UTL with 95% Coverage	2300
95% Percentile	892.7	95% BCA Bootstrap UTL with 95% Coverage	2300
99% Percentile	1314	95% UPL	1530
		95% Chebyshev UPL	2210
95% WH Approx. Gamma UPL	880.9	Upper Threshold Limit Based upon IQR	600
95% HW Approx. Gamma UPL	870.5		
95% WH Approx. Gamma UTL with 95% Coverage	1143		
95% HW Approx. Gamma UTL with 95% Coverage	1150		

Outlier Tests for Selected Variables

User Selected Options	
From File	Sodium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 6100 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.910

For 10% significance level, 6100 is an outlier.

For 5% significance level, 6100 is an outlier.

For 1% significance level, 6100 is an outlier.

2. Data Value 110 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.172

For 10% significance level, 110 is not an outlier.

For 5% significance level, 110 is not an outlier.

For 1% significance level, 110 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	330.8
Standard Deviation	424.8
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	330.8	418.3	2300	1	4.707	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 2300 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 2300 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Sodium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Observations	33	18
Number of Distinct Observations	27	16
Minimum	60	110
Maximum	2300	6100
Mean	330.8	972.2
Median	190	365
SD	424.8	1752
SE of Mean	73.95	413

Wilcoxon-Mann-Whitney (WMW) Test

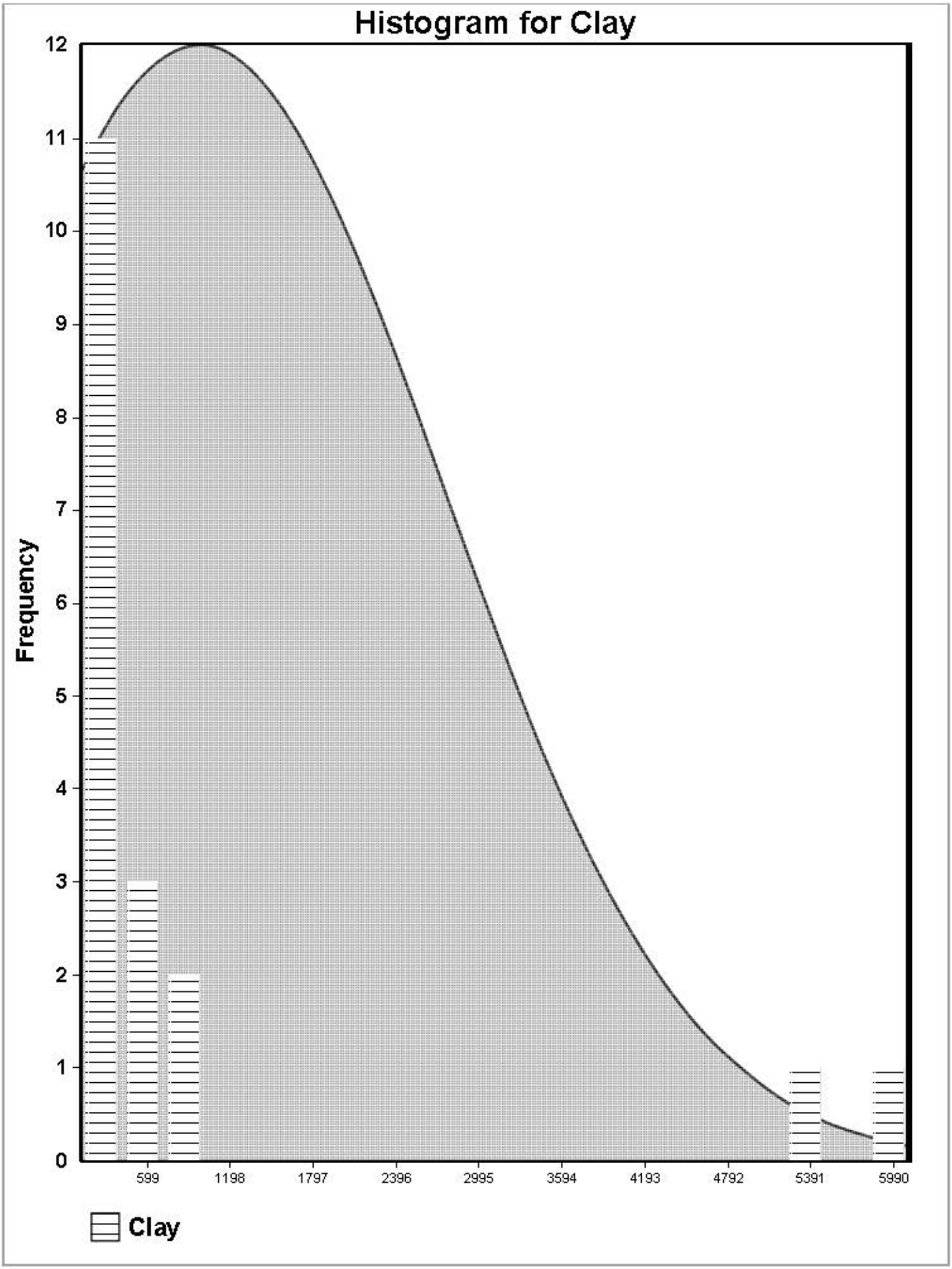
H0: Mean/Median of Site or AOC = Mean/Median of Background

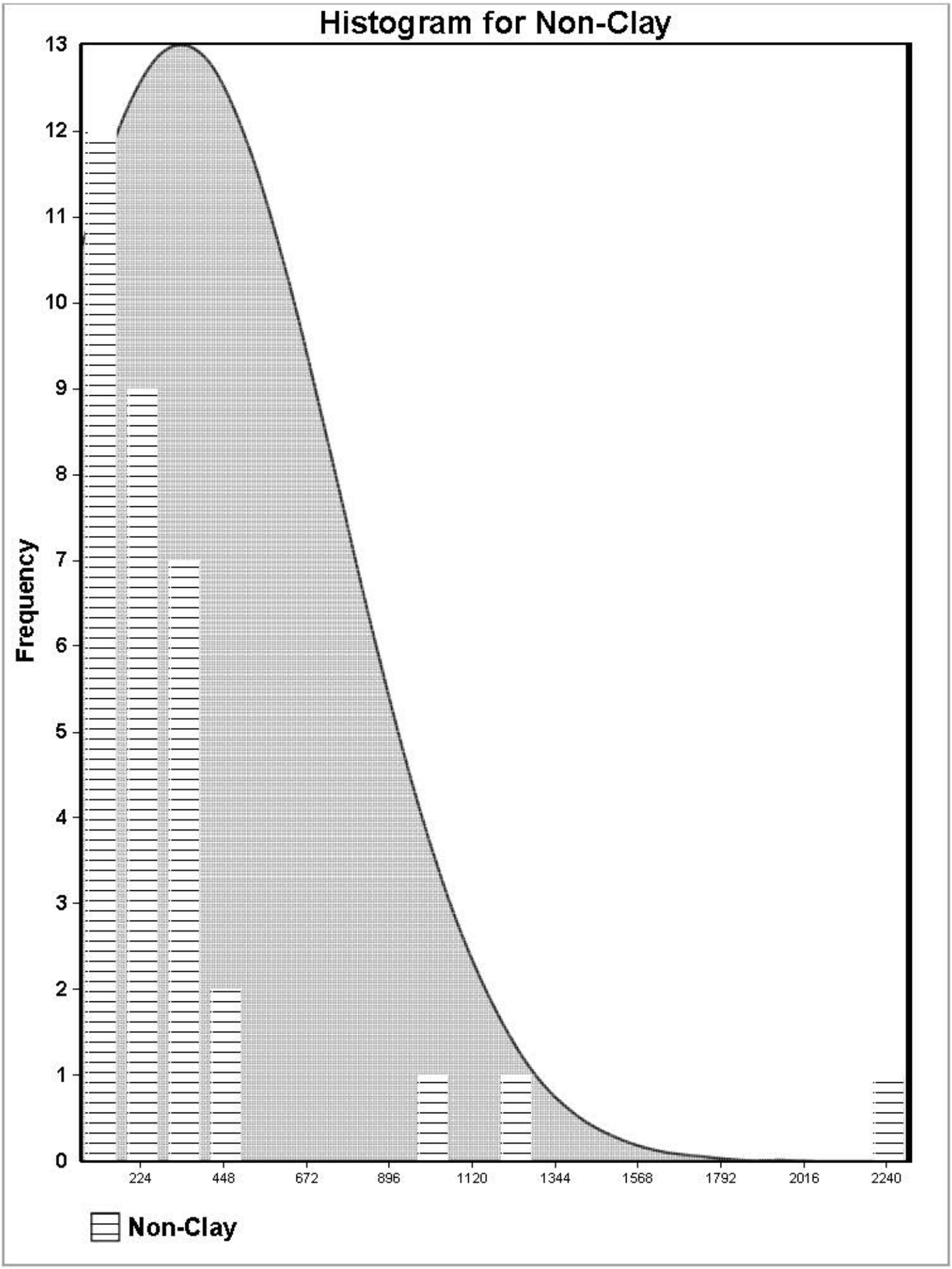
Site Rank Sum W-Stat	727
WMW Test U-Stat	2.572
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.00954

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
599
1198
1797
2396
2995
3594
4193
4792
5391
5990
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
224
448
672
896
1120
1344
1568
1792
2016
2240
Non-Clay

Location	Clay
BG-1-2	6100
BG-1-43	440
BG-1-55	110
BG-1-78	250
BG-2-30	520
BG-2-81	230
BG-3-17	390
BG-3-22	250
BG-3-69	300
BG-4-2	5400
BG-4-19	740
BG-4-40	390
BG-4-79	220
BG-4-161	130
BG-4-163	290
BG-6-28	750
BG-6-53	340
BG-6-87	650

Location	Non-Clay
BG-1-10	2300
BG-1-29	370
BG-1-40	350
BG-1-46	130
BG-1-92	100
BG-2-2	160
BG-2-10	220
BG-2-19	260
BG-2-21	330
BG-2-32	180
BG-2-75	72
BG-3-2	240
BG-3-10	980
BG-3-29	320
BG-3-63	99
BG-3-65	150
BG-3-95	150
BG-3-105	280
BG-3-131	77
BG-3-136	290
BG-4-10	1200
BG-4-65	60
BG-4-82	170
BG-4-95	130
BG-4-117	110
BG-4-120	330
BG-6-2	430
BG-6-9	400
BG-6-58	180
BG-6-75	190
BG-6-98	180
BG-6-114	180
BG-6-127	300

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Sodium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	12
Minimum	160
Maximum	6100
Mean of Raw Data	1012
Standard Deviation of Raw Data	1708
Kstar	0.677
Mean of Log Transformed Data	6.207
Standard Deviation of Log Transformed Data	1.063

Normal Distribution Test Results	
Correlation Coefficient R	0.715
Shapiro Wilk Test Statistic	0.537
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	6.8086E-6
Lilliefors Test Statistic	0.383
Lilliefors Critical (0.95) Value	0.256

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.927
A-D Test Statistic	1.528
A-D Critical (0.95) Value	0.763
K-S Test Statistic	0.366
K-S Critical(0.95) Value	0.254

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.904
Shapiro Wilk Test Statistic	0.825
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.0144
Lilliefors Test Statistic	0.303
Lilliefors Critical (0.95) Value	0.256

Data not Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	28
Minimum	60
Maximum	5400
Mean of Raw Data	417.4
Standard Deviation of Raw Data	849.7
Kstar	1.003
Mean of Log Transformed Data	5.498
Standard Deviation of Log Transformed Data	0.847

Normal Distribution Test Results

Correlation Coefficient R	0.559
Shapiro Wilk Test Statistic	0.353
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	1.110E-16
Lilliefors Test Statistic	0.337
Lilliefors Critical (0.95) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.762
A-D Test Statistic	2.747
A-D Critical (0.95) Value	0.776
K-S Test Statistic	0.219
K-S Critical(0.95) Value	0.145

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.954
Shapiro Wilk Test Statistic	0.926
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.0167
Lilliefors Test Statistic	0.117
Lilliefors Critical (0.95) Value	0.142

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Sodium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-Transformed Statistics	
Minimum	160	Minimum	5.075
Maximum	6100	Maximum	8.716
Second Largest	2300	Second Largest	7.741
First Quartile	255	First Quartile	5.541
Median	360	Median	5.886
Third Quartile	567.5	Third Quartile	6.27
Mean	1012	Mean	6.207
SD	1708	SD	1.063
Coefficient of Variation	1.688		
Skewness	2.859		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.537	Shapiro Wilk Test Statistic	0.825
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	5685	95% UTL with 95% Coverage	9102
95% UPL (t)	4204	95% UPL (t)	3621
90% Percentile (z)	3201	90% Percentile (z)	1938
95% Percentile (z)	3821	95% Percentile (z)	2852
99% Percentile (z)	4985	99% Percentile (z)	5888

Gamma Distribution Test		Data Distribution Test
k star	0.677	Data do not follow a Discernable Distribution (0.05)
Theta Star	1494	
MLE of Mean	1012	
MLE of Standard Deviation	1229	
nu star	16.25	
A-D Test Statistic	1.528	Nonparametric Statistics
5% A-D Critical Value	0.763	90% Percentile 2168
K-S Test Statistic	0.366	95% Percentile 4010
5% K-S Critical Value	0.254	99% Percentile 5682
Data not Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	6100
90% Percentile	2559	95% Percentile Bootstrap UTL with 95% Coverage	6100
95% Percentile	3485	95% BCA Bootstrap UTL with 95% Coverage	6100
99% Percentile	5700	95% UPL	6100
		95% Chebyshev UPL	8761
95% WH Approx. Gamma UPL	3681	Upper Threshold Limit Based upon IQR	1036
95% HW Approx. Gamma UPL	3640		
95% WH Approx. Gamma UTL with 95% Coverage	6515		
95% HW Approx. Gamma UTL with 95% Coverage	6858		

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	28

Raw Statistics		Log-Transformed Statistics	
Minimum	60	Minimum	4.094
Maximum	5400	Maximum	8.594
Second Largest	1200	Second Largest	7.09
First Quartile	140	First Quartile	4.939
Median	230	Median	5.438
Third Quartile	335	Third Quartile	5.814
Mean	417.4	Mean	5.498
SD	849.7	SD	0.847
Coefficient of Variation	2.036		
Skewness	5.597		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.353	Shapiro Wilk Test Statistic	0.926
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	2223	95% UTL with 95% Coverage	1477
95% UPL (t)	1868	95% UPL (t)	1037
90% Percentile (z)	1506	90% Percentile (z)	723.2
95% Percentile (z)	1815	95% Percentile (z)	983.9
99% Percentile (z)	2394	99% Percentile (z)	1753
Gamma Distribution Test		Data Distribution Test	
k star	1.003	Data do not follow a Discernable Distribution (0.05)	
Theta Star	416.1		
MLE of Mean	417.4		
MLE of Standard Deviation	416.8		
nu star	78.23		
A-D Test Statistic	2.747	Nonparametric Statistics	
5% A-D Critical Value	0.776	90% Percentile	668
K-S Test Statistic	0.219	95% Percentile	795
5% K-S Critical Value	0.145	99% Percentile	3804

Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	5400
90% Percentile	960.4	95% Percentile Bootstrap UTL with 95% Coverage	5400
95% Percentile	1249	95% BCA Bootstrap UTL with 95% Coverage	5400
99% Percentile	1919	95% UPL	1200
		95% Chebyshev UPL	4168
95% WH Approx. Gamma UPL	1161	Upper Threshold Limit Based upon IQR	627.5
95% HW Approx. Gamma UPL	1112		
95% WH Approx. Gamma UTL with 95% Coverage	1513		
95% HW Approx. Gamma UTL with 95% Coverage	1474		

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Sodium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Observations	39	12
Number of Distinct Observations	28	12
Minimum	60	160
Maximum	5400	6100
Mean	417.4	1012
Median	230	360
SD	849.7	1708
SE of Mean	136.1	493.1

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	909
WMW Test U-Stat	2.321
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.0191

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Outlier Tests for Selected Variables

User Selected Options	
From File	Sodium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 6100 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.871

For 10% significance level, 6100 is an outlier.
For 5% significance level, 6100 is an outlier.
For 1% significance level, 6100 is an outlier.

2. Data Value 160 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.037

For 10% significance level, 160 is not an outlier.
For 5% significance level, 160 is not an outlier.
For 1% significance level, 160 is not an outlier.

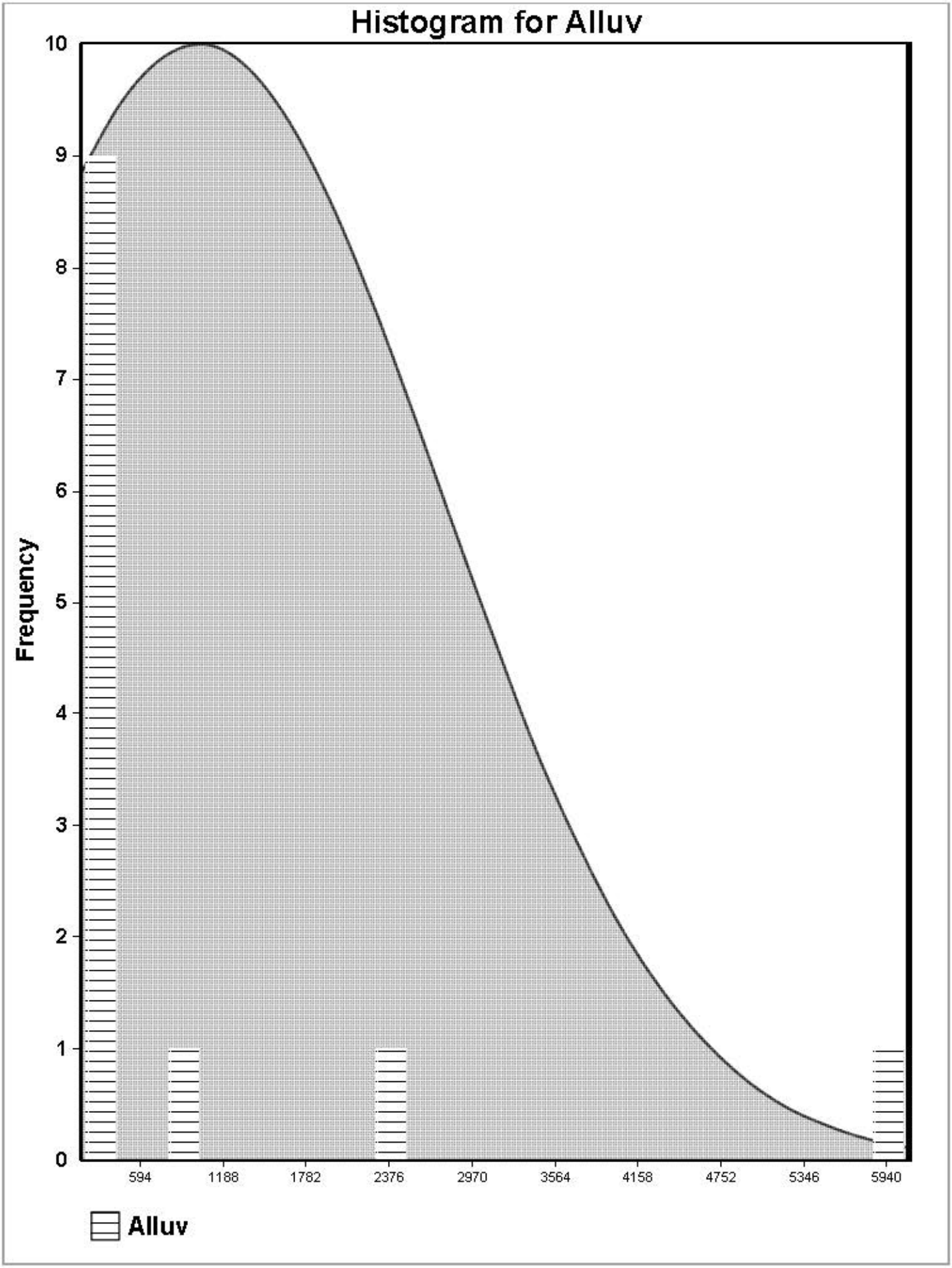
Rosner's Outlier Test for MC

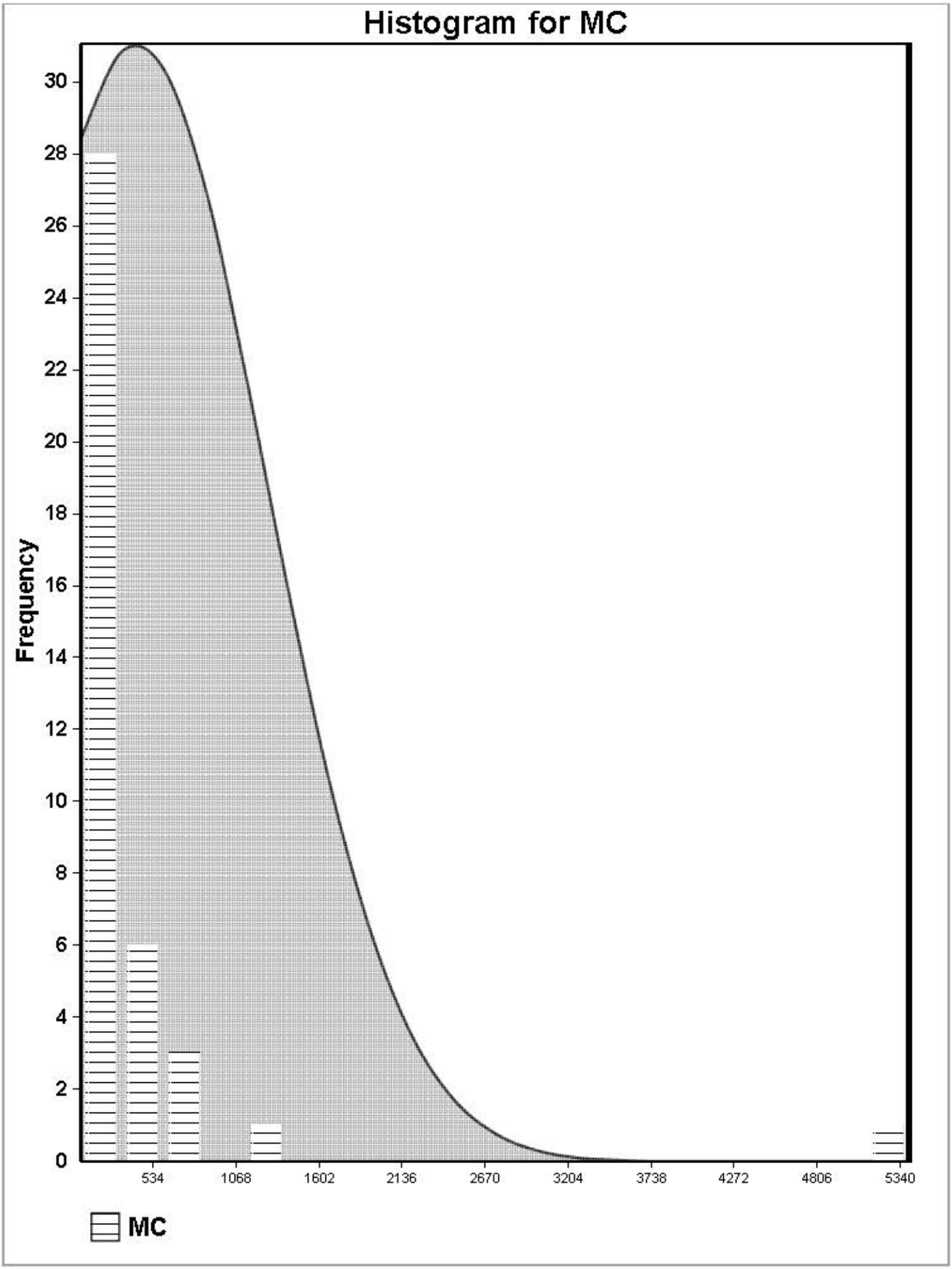
Mean	417.4
Standard Deviation	849.7
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	417.4	838.7	5400	20	5.941	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 5400 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 5400 is a Potential Statistical Outlier


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
7
8
9
10
594
1188
1782
2376
2970
3564
4158
4752
5346
5940
Alluv


Histogram for MC
Frequency
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
534
1068
1602
2136
2670
3204
3738
4272
4806
5340
MC

Location	Alluv
BG-1-2	6100
BG-1-10	2300
BG-1-29	370
BG-1-40	350
BG-2-2	160
BG-2-10	220
BG-2-19	260
BG-2-21	330
BG-3-2	240
BG-3-10	980
BG-6-2	430
BG-6-9	400

Location	MC
BG-1-43	440
BG-1-46	130
BG-1-55	110
BG-1-78	250
BG-1-92	100
BG-2-30	520
BG-2-32	180
BG-2-75	72
BG-2-81	230
BG-3-17	390
BG-3-22	250
BG-3-29	320
BG-3-63	99
BG-3-65	150
BG-3-69	300
BG-3-95	150
BG-3-105	280
BG-3-131	77
BG-3-136	290
BG-4-1	5400
BG-4-10	1200
BG-4-19	740
BG-4-40	390
BG-4-65	60
BG-4-79	220
BG-4-82	170
BG-4-95	130
BG-4-117	110
BG-4-120	330
BG-4-161	130
BG-4-163	290
BG-6-28	750
BG-6-53	340
BG-6-58	180
BG-6-75	190
BG-6-87	650
BG-6-98	180
BG-6-114	180
BG-1-127	300
Average	417.3846

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	50	1	1.96%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	50	58	16000	1402	195	3591
Statistics (All: NDs treated as DL value)	51	51	16000	1375	190	3560
Statistics (All: NDs treated as DL/2 value)	51	25.5	16000	1375	190	3560
Statistics (Normal ROS Estimated Data)	51	-4601	16000	1284	190	3653
Statistics (Gamma ROS Estimated Data)	51	1.000E-12	16000	1374	190	3560
Statistics (Lognormal ROS Estimated Data)	51	9.867	16000	1375	190	3560

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.42	0.409	3335	5.692	1.43	0.251
Statistics (NDs = DL)	0.417	0.405	3300	5.658	1.437	0.254
Statistics (NDs = DL/2)	0.414	0.402	3323	5.644	1.457	0.258
Statistics (Gamma ROS Estimates)	0.313	0.308	4389	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	5.626	1.494	0.266

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.631	0.627	0.628	0.67

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.413	0.947	Data Not Normal
Lilliefors (Detects Only)	0.424	0.125	Data Not Normal
Lilliefors (NDs = DL)	0.425	0.124	Data Not Normal
Lilliefors (NDs = DL/2)	0.425	0.124	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.413	0.124	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.917	0.916	0.916	0.933

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	7.872	0.833	
Kolmogorov-Smirnov (Detects Only)	0.336	0.134	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	7.948	0.834	
Kolmogorov-Smirnov (NDs = DL)	0.335	0.133	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.777	0.835	
Kolmogorov-Smirnov (NDs = DL/2)	0.334	0.133	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	6.399	0.859	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.268	0.135	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.898	0.902	0.912	0.918

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.798	0.947	Data Not Lognormal
Lilliefors (Detects Only)	0.219	0.125	Data Not Lognormal
Lilliefors (NDs = DL)	0.214	0.124	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.211	0.124	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.207	0.124	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Number of Valid Data	51	Number of Detected Data	50
Number of Distinct Detected Data	35	Number of Non-Detect Data	1
		Percent Non-Detects	1.96%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	58	Minimum Detected	4.06
Maximum Detected	16000	Maximum Detected	9.68
Mean of Detected	1402	Mean of Detected	5.692
SD of Detected	3591	SD of Detected	1.43
Minimum Non-Detect	51	Minimum Non-Detect	3.932
Maximum Non-Detect	51	Maximum Non-Detect	3.932

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.413	Shapiro Wilk Test Statistic	0.798
5% Shapiro Wilk Critical Value	0.947	5% Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1375	Mean (Log Scale)	5.644
SD	3560	SD (Log Scale)	1.457
95% UTL 95% Coverage	8686	95% UTL 95% Coverage	5633
95% UPL (t)	7400	95% UPL (t)	3327
90% Percentile (z)	5937	90% Percentile (z)	1829
95% Percentile (z)	7231	95% Percentile (z)	3105
99% Percentile (z)	9657	99% Percentile (z)	8379
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1328	Mean in Original Scale	1375
SD	3569	SD in Original Scale	3560
95% UTL with 95% Coverage	8657	95% UTL with 95% Coverage	5965
		95% BCA UTL with 95% Coverage	16000
		95% Bootstrap (%) UTL with 95% Coverage	16000
95% UPL (t)	7367	95% UPL (t)	3476
90% Percentile (z)	5902	90% Percentile (z)	1882
95% Percentile (z)	7198	95% Percentile (z)	3238
99% Percentile (z)	9630	99% Percentile (z)	8963

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.408	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3432		
nu star	40.84		
A-D Test Statistic	7.872	Nonparametric Statistics	
5% A-D Critical Value	0.833	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.336	Mean	1376
5% K-S Critical Value	0.134	SD	3525
Data not Gamma Distributed at 5% Significance Level		SE of Mean	498.6
		95% KM UTL with 95% Coverage	8615
Assuming Gamma Distribution		95% KM Chebyshev UPL	16890
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	7340
Mean	1374	90% Percentile (z)	5893
Median	190	95% Percentile (z)	7173
SD	3560	99% Percentile (z)	9576
k star	0.308		
Theta star	4465	Gamma ROS Limits with Extrapolated Data	
Nu star	31.39	95% Wilson Hilferty (WH) Approx. Gamma UPL	4511
95% Percentile of Chisquare (2k)	2.793	95% Hawkins Wixley (HW) Approx. Gamma UPL	4262
		95% WH Approx. Gamma UTL with 95% Coverage	6276
90% Percentile	4041	95% HW Approx. Gamma UTL with 95% Coverage	6188
95% Percentile	6236		
99% Percentile	11921		

Note: DL/2 is not a recommended method.

Outlier Tests for Selected Variables

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for All Data

Mean	1375
Standard Deviation	3560
Number of data	51
Number of suspected outliers	1

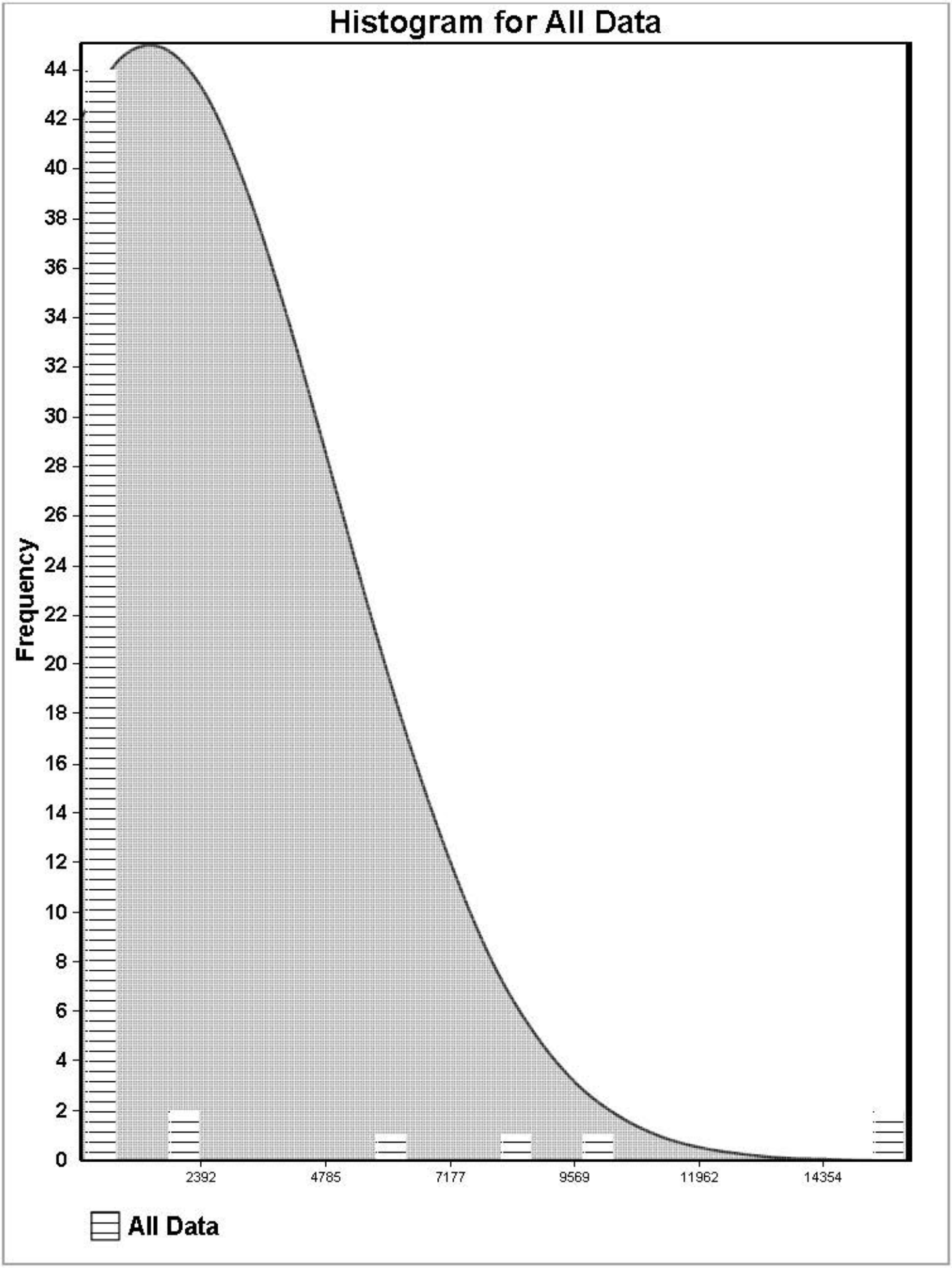
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1375	3525	16000	5	4.149	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 16000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 16000 is a Potential Statistical Outlier


Histogram for All Data
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
2392
4785
7177
9569
11962
14354
All Data

Location	All Data	D_All Data
BG-1-2	6400	1
BG-1-10	1700	1
BG-2-2	62	1
BG-2-10	220	1
BG-2-19	16000	1
BG-3-2	10000	1
BG-3-10	2300	1
BG-3-17	480	1
BG-4-2	8100	1
BG-4-10	230	1
BG-4-19	250	1
BG-6-2	820	1
BG-6-9	83	1
BG-1-29	170	1
BG-1-40	58	1
BG-1-43	140	1
BG-1-46	88	1
BG-1-55	120	1
BG-1-78	120	1
BG-1-92	110	1
BG-2-21	16000	1
BG-2-30	350	1
BG-2-32	410	1
BG-2-75	320	1
BG-2-81	190	1
BG-3-22	650	1
BG-3-29	160	1
BG-3-63	160	1
BG-3-65	120	1
BG-3-69	110	1
BG-3-95	95	1
BG-3-105	110	1
BG-3-131	63	1
BG-3-136	95	1
BG-4-40	71	1
BG-4-65	51	0
BG-4-79	140	1
BG-4-82	200	1
BG-4-95	200	1
BG-4-117	300	1
BG-4-120	210	1
BG-4-161	160	1
BG-4-163	130	1
BG-6-28	750	1
BG-6-53	290	1
BG-6-58	300	1
BG-6-75	270	1
BG-6-87	190	1
BG-6-98	190	1
BG-6-114	250	1
BG-6-127	160	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	13	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	13	62	16000	3588	820	5037

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	0.493	0.43	7281	6.894	1.886	0.274

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.864	0.864	0.864	0.864

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.747	0.866	Data Not Normal
Lilliefors (Full: no NDs)	0.293	0.246	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.983	0.983	0.983	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.517	0.791	
Kolmogorov-Smirnov (Full: no NDs)	0.173	0.25	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.978	0.978	0.978	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.936	0.866	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.151	0.246	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

>20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	38	0	38	37	1	2.63%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	37	58	16000	633.8	160	2600

Statistics (All: NDs treated as DL value)	38	51	16000	618.5	160	2567
Statistics (All: NDs treated as DL/2 value)	38	25.5	16000	617.8	160	2567
Statistics (Normal ROS Estimated Data)	38	-2098	16000	561.9	160	2603
Statistics (Gamma ROS Estimated Data)	38	1.000E-12	16000	617.1	160	2567
Statistics (Lognormal ROS Estimated Data)	38	24.46	16000	617.8	160	2567

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.533	0.508	1190	5.271	0.946	0.179
Statistics (NDs = DL)	0.528	0.504	1170	5.236	0.958	0.183
Statistics (NDs = DL/2)	0.522	0.498	1184	5.217	0.989	0.19
Statistics (Gamma ROS Estimates)	0.335	0.326	1841	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	5.216	0.992	0.19

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.411	0.409	0.409	0.452

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.204	0.936	Data Not Normal
Lilliefors (Detects Only)	0.455	0.146	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.202	0.938	Data Not Normal
Lilliefors (NDs = DL)	0.453	0.144	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.203	0.938	Data Not Normal
Lilliefors (NDs = DL/2)	0.453	0.144	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.248	0.938	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.445	0.144	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.687	0.685	0.686	0.732

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	7.394	0.809	
Kolmogorov-Smirnov (Detects Only)	0.36	0.153	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	7.371	0.81	
Kolmogorov-Smirnov (NDs = DL)	0.356	0.151	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.172	0.811	
Kolmogorov-Smirnov (NDs = DL/2)	0.353	0.151	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	6.674	0.849	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.322	0.155	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.851	0.863	0.877	0.877

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.758	0.936	Data Not Lognormal
Lilliefors (Detects Only)	0.171	0.146	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.779	0.938	Data Not Lognormal
Lilliefors (NDs = DL)	0.164	0.144	Data Not Lognormal

Shapiro-Wilks (NDs = DL/2)	0.811	0.938	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.158	0.144	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.812	0.938	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.158	0.144	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	13

Raw Statistics		Log-Transformed Statistics	
Minimum	62	Minimum	4.127
Maximum	16000	Maximum	9.68
Second Largest	10000	Second Largest	9.21
First Quartile	230	First Quartile	5.438
Median	820	Median	6.709
Third Quartile	6400	Third Quartile	8.764
Mean	3588	Mean	6.894
SD	5037	SD	1.886
Coefficient of Variation	1.404		
Skewness	1.564		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.747	Shapiro Wilk Test Statistic	0.936
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	17042	95% UTL with 95% Coverage	151714
95% UPL (t)	12904	95% UPL (t)	32239
90% Percentile (z)	10043	90% Percentile (z)	11047
95% Percentile (z)	11873	95% Percentile (z)	21915
99% Percentile (z)	15306	99% Percentile (z)	79213

Gamma Distribution Test		Data Distribution Test
k star	0.43	Data appear Gamma Distributed at 5% Significance Level
Theta Star	8338	
MLE of Mean	3588	
MLE of Standard Deviation	5470	
nu star	11.19	
A-D Test Statistic	0.517	Nonparametric Statistics
5% A-D Critical Value	0.791	90% Percentile 9620
K-S Test Statistic	0.173	95% Percentile 12400
5% K-S Critical Value	0.25	99% Percentile 15280
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	16000
90% Percentile	10000	95% Percentile Bootstrap UTL with 95% Coverage	16000
95% Percentile	14534	95% BCA Bootstrap UTL with 95% Coverage	16000
99% Percentile	25847	95% UPL	16000
		95% Chebyshev UPL	26373
95% WH Approx. Gamma UPL	16064	Upper Threshold Limit Based upon IQR	15655
95% HW Approx. Gamma UPL	17611		
95% WH Approx. Gamma UTL with 95% Coverage	30254		
95% HW Approx. Gamma UTL with 95% Coverage	37141		

>20

General Statistics			
Number of Valid Data	38	Number of Detected Data	37
Number of Distinct Detected Data	24	Number of Non-Detect Data	1
		Percent Non-Detects	2.63%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	58	Minimum Detected	4.06
Maximum Detected	16000	Maximum Detected	9.68
Mean of Detected	633.8	Mean of Detected	5.271
SD of Detected	2600	SD of Detected	0.946
Minimum Non-Detect	51	Minimum Non-Detect	3.932
Maximum Non-Detect	51	Maximum Non-Detect	3.932

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.204	Shapiro Wilk Test Statistic	0.758
5% Shapiro Wilk Critical Value	0.936	5% Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	617.8	Mean (Log Scale)	5.217
SD	2567	SD (Log Scale)	0.989
95% UTL 95% Coverage	6091	95% UTL 95% Coverage	1520
95% UPL (t)	5005	95% UPL (t)	1000
90% Percentile (z)	3908	90% Percentile (z)	655.3
95% Percentile (z)	4840	95% Percentile (z)	938.7
99% Percentile (z)	6590	99% Percentile (z)	1842
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	569.1	Mean in Original Scale	617.8
SD	2572	SD in Original Scale	2567
95% UTL with 95% Coverage	6054	95% UTL with 95% Coverage	1526
		95% BCA UTL with 95% Coverage	16000
		95% Bootstrap (%) UTL with 95% Coverage	16000
95% UPL (t)	4966	95% UPL (t)	1003
90% Percentile (z)	3866	90% Percentile (z)	656.5
95% Percentile (z)	4800	95% Percentile (z)	941.2

99% Percentile (z)	6554	99% Percentile (z)	1850
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.507	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1249		
nu star	37.55		
A-D Test Statistic	7.394	Nonparametric Statistics	
5% A-D Critical Value	0.809	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.36	Mean	618.7
5% K-S Critical Value	0.153	SD	2533
Data not Gamma Distributed at 5% Significance Level		SE of Mean	416.5
		95% KM UTL with 95% Coverage	6019
Assuming Gamma Distribution		95% KM Chebyshev UPL	11803
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	4948
Mean	617.1	90% Percentile (z)	3865
Median	160	95% Percentile (z)	4785
SD	2567	99% Percentile (z)	6511
k star	0.326		
Theta star	1891	Gamma ROS Limits with Extrapolated Data	
Nu star	24.8	95% Wilson Hilferty (WH) Approx. Gamma UPL	1746
95% Percentile of Chisquare (2k)	2.905	95% Hawkins Wixley (HW) Approx. Gamma UPL	1578
		95% WH Approx. Gamma UTL with 95% Coverage	2476
90% Percentile	1800	95% HW Approx. Gamma UTL with 95% Coverage	2307
95% Percentile	2747		
99% Percentile	5182		

Note: DL/2 is not a recommended method.

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Data	38	13
Number of Non-Detect Data	1	0
Number of Detect Data	37	13
Minimum Non-Detect	51	N/A
Maximum Non-Detect	51	N/A
Percent Non detects	2.63%	0.00%
Minimum Detected	58	62
Maximum Detected	16000	16000
Mean of Detected Data	633.8	3588
Median of Detected Data	160	820
SD of Detected Data	2600	5037

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	853
WMW Test U-Stat	2.907
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.0034

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Outlier Tests for Selected Variables

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 16000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.496

For 10% significance level, 16000 is an outlier.
For 5% significance level, 16000 is not an outlier.
For 1% significance level, 16000 is not an outlier.

2. Data Value 62 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.016

For 10% significance level, 62 is not an outlier.
For 5% significance level, 62 is not an outlier.
For 1% significance level, 62 is not an outlier.

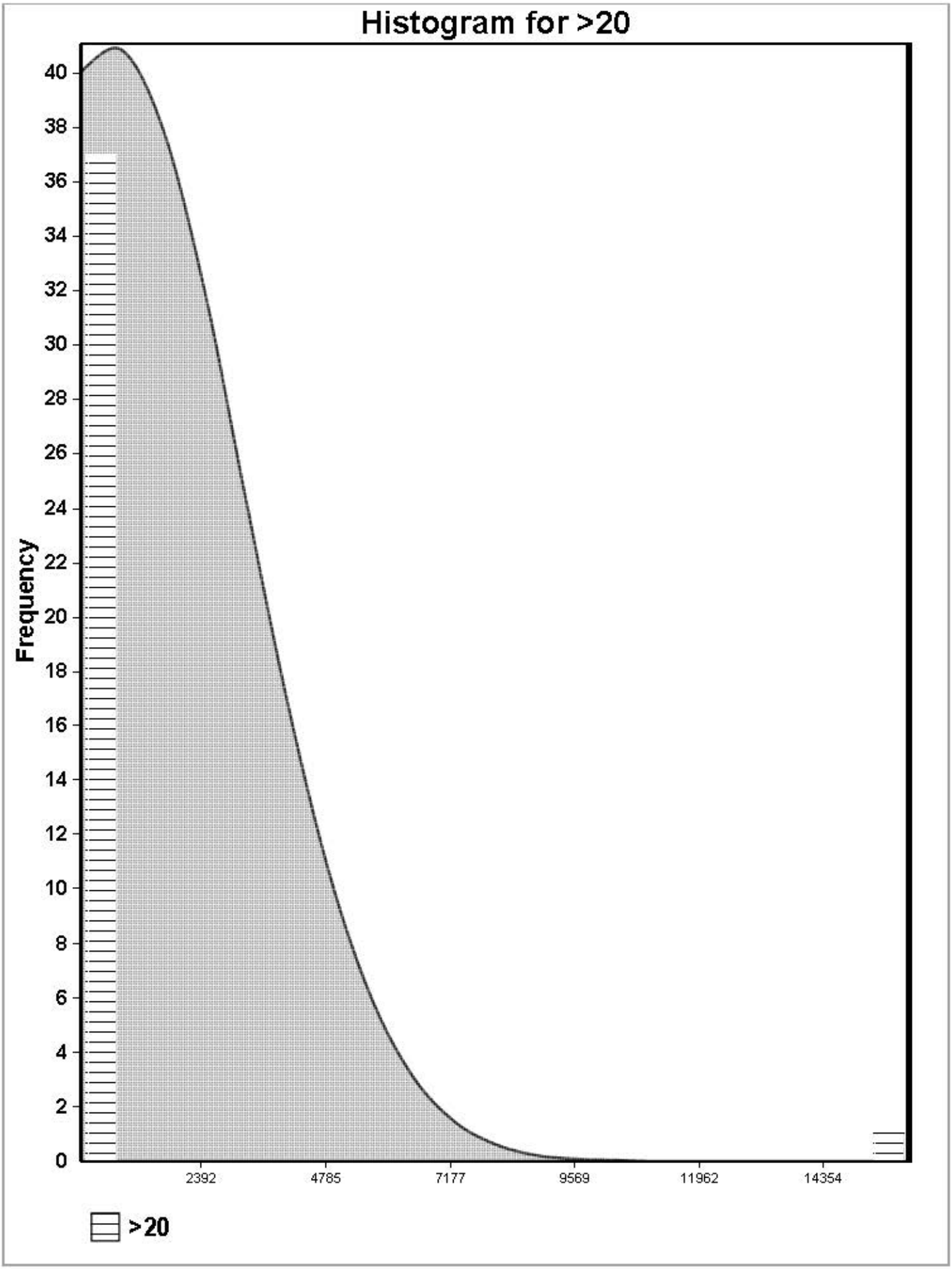
Rosner's Outlier Test for >20

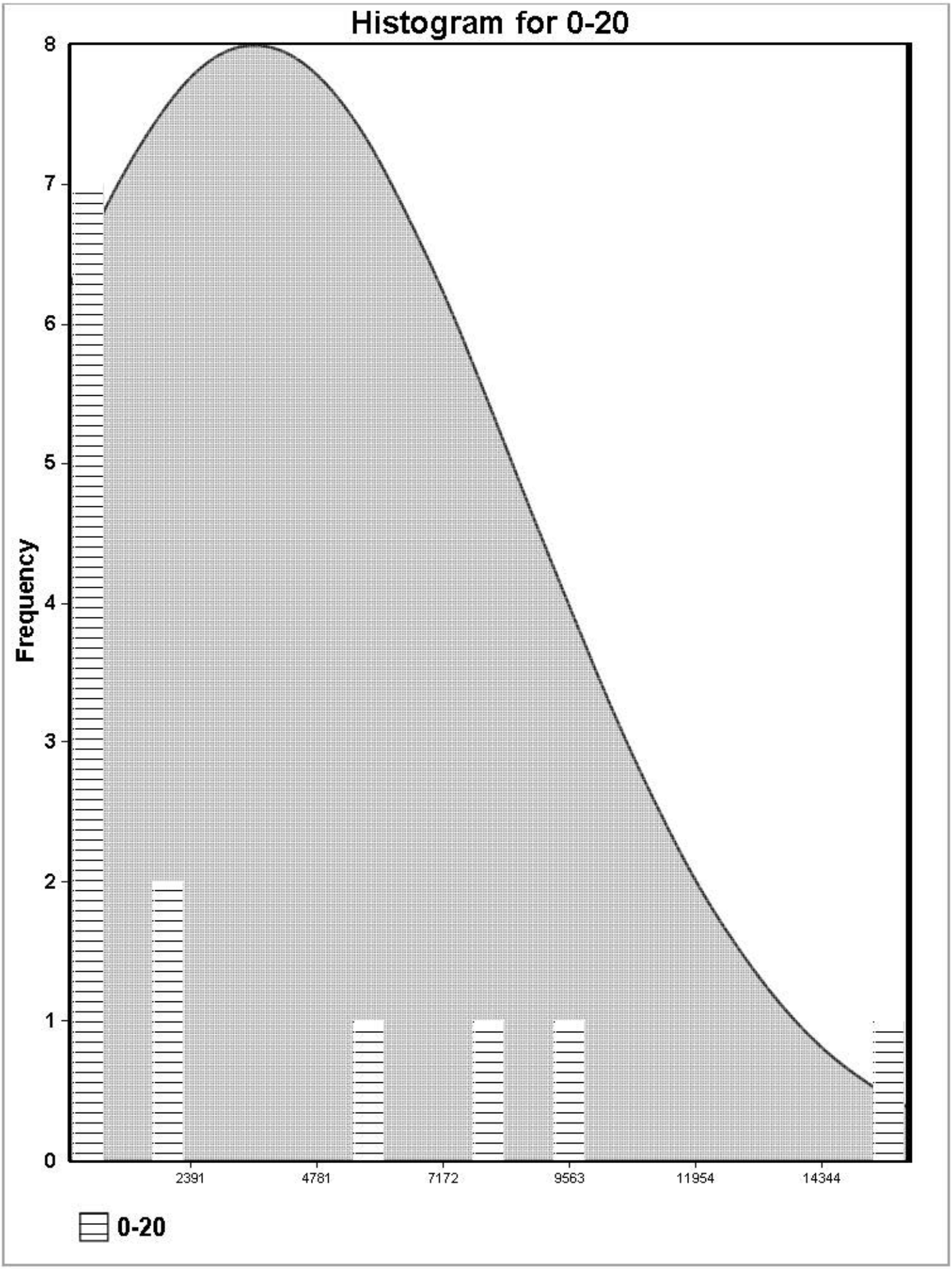
Mean	617.8
Standard Deviation	2567
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	617.8	2533	16000	8	6.073	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 16000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 16000 is a Potential Statistical Outlier


Histogram for >20
Frequency
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
2392
4785
7177
9569
11962
14354
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5
6
7
8
2391
4781
7172
9563
11954
14344
0-20

Location	0-20	D_0-20	Location	>20	D_>20			
BG-1-2	6400	1	BG-1-29	170	1			
BG-1-10	1700	1	BG-1-40	58	1			
BG-2-2	62	1	BG-1-43	140	1			
BG-2-10	220	1	BG-1-46	88	1			
BG-2-19	16000	1	BG-1-55	120	1			
BG-3-2	10000	1	BG-1-78	120	1			
BG-3-10	2300	1	BG-1-92	110	1			
BG-3-17	480	1	BG-2-21	16000	1			
BG-4-2	8100	1	BG-2-30	350	1			
BG-4-10	230	1	BG-2-32	410	1			
BG-4-19	250	1	BG-2-75	320	1			
BG-6-2	820	1	BG-2-81	190	1			
BG-6-9	83	1	BG-3-22	650	1			
			BG-3-29	160	1			
			BG-3-63	160	1			
			BG-3-65	120	1			
			BG-3-69	110	1			
			BG-3-95	95	1			
			BG-3-105	110	1			
			BG-3-131	63	1			
			BG-3-136	95	1			
			BG-4-40	72	1			
			BG-4-65	51	0			
			BG-4-79	140	1			
			BG-4-82	200	1			
			BG-4-95	200	1			
			BG-4-117	300	1			
			BG-4-120	210	1			
			BG-4-161	160	1			
			BG-4-163	130	1			
			BG-6-28	750	1			
			BG-6-53	290	1			
			BG-6-58	300	1			
			BG-6-75	270	1			
			BG-6-87	190	1			
			BG-6-98	190	1			
			BG-6-114	250	1			
			BG-6-127	160	1			

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	18	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	18	72	8100	1036	190	2287

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	0.517	0.468	2004	5.72	1.314	0.23

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.659	0.659	0.659	0.659

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.451	0.897	Data Not Normal
Lilliefors (Full: no NDs)	0.439	0.209	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.905	0.905	0.905	0.905

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	2.771	0.799	
Kolmogorov-Smirnov (Full: no NDs)	0.29	0.215	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.892	0.892	0.892	0.892

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.799	0.897	Data Not Lognormal
Lilliefors (Full: no NDs)	0.196	0.209	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	32	1	3.03%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	32	58	16000	1608	200	4170

Statistics (All: NDs treated as DL value)	33	51	16000	1561	200	4114
Statistics (All: NDs treated as DL/2 value)	33	25.5	16000	1560	200	4114
Statistics (Normal ROS Estimated Data)	33	-5154	16000	1403	200	4270
Statistics (Gamma ROS Estimated Data)	33	1.000E-12	16000	1559	200	4114
Statistics (Lognormal ROS Estimated Data)	33	9.008	16000	1559	200	4114

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.388	0.373	4146	5.677	1.512	0.266
Statistics (NDs = DL)	0.383	0.369	4071	5.625	1.518	0.27
Statistics (NDs = DL/2)	0.379	0.365	4111	5.604	1.547	0.276
Statistics (Gamma ROS Estimates)	0.263	0.259	5938	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	5.572	1.606	0.288

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.626	0.621	0.621	0.679

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.405	0.93	Data Not Normal
Lilliefors (Detects Only)	0.426	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.399	0.931	Data Not Normal
Lilliefors (NDs = DL)	0.428	0.154	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.399	0.931	Data Not Normal
Lilliefors (NDs = DL/2)	0.428	0.154	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.487	0.931	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.41	0.154	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.904	0.902	0.903	0.921

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	5.319	0.835	
Kolmogorov-Smirnov (Detects Only)	0.373	0.167	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	5.43	0.837	
Kolmogorov-Smirnov (NDs = DL)	0.372	0.164	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.264	0.838	
Kolmogorov-Smirnov (NDs = DL/2)	0.37	0.165	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.199	0.872	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.297	0.168	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.89	0.895	0.908	0.918

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.788	0.93	Data Not Lognormal
Lilliefors (Detects Only)	0.257	0.157	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.797	0.931	Data Not Lognormal
Lilliefors (NDs = DL)	0.25	0.154	Data Not Lognormal

			Shapiro-Wilks (NDs = DL/2)	0.827	0.931	Data Not Lognormal					
			Lilliefors (NDs = DL/2)	0.245	0.154	Data Not Lognormal					
			Shapiro-Wilks (Lognormal ROS Estimates)	0.853	0.931	Data Not Lognormal					
			Lilliefors (Lognormal ROS Estimates)	0.239	0.154	Data Not Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.											

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	15

Raw Statistics		Log-Transformed Statistics	
Minimum	72	Minimum	4.277
Maximum	8100	Maximum	9
Second Largest	6400	Second Largest	8.764
First Quartile	132.5	First Quartile	4.886
Median	190	Median	5.247
Third Quartile	447.5	Third Quartile	6.095
Mean	1036	Mean	5.72
SD	2287	SD	1.314
Coefficient of Variation	2.209		
Skewness	2.754		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.451	Shapiro Wilk Test Statistic	0.799
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	6647	95% UTL with 95% Coverage	7647
95% UPL (t)	5124	95% UPL (t)	3189
90% Percentile (z)	3967	90% Percentile (z)	1641
95% Percentile (z)	4798	95% Percentile (z)	2645
99% Percentile (z)	6357	99% Percentile (z)	6475

Gamma Distribution Test		Data Distribution Test	
k star	0.468	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2215		
MLE of Mean	1036		
MLE of Standard Deviation	1514		
nu star	16.83		
A-D Test Statistic	2.771	Nonparametric Statistics	
5% A-D Critical Value	0.799	90% Percentile	2445
K-S Test Statistic	0.29	95% Percentile	6655
5% K-S Critical Value	0.215	99% Percentile	7811
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	8100
90% Percentile	2840	95% Percentile Bootstrap UTL with 95% Coverage	8100
95% Percentile	4074	95% BCA Bootstrap UTL with 95% Coverage	8100
99% Percentile	7128	95% UPL	8100
		95% Chebyshev UPL	11279
95% WH Approx. Gamma UPL	3784	Upper Threshold Limit Based upon IQR	920
95% HW Approx. Gamma UPL	3606		
95% WH Approx. Gamma UTL with 95% Coverage	6420		
95% HW Approx. Gamma UTL with 95% Coverage	6512		

Non-Clay

General Statistics			
Number of Valid Data	33	Number of Detected Data	32
Number of Distinct Detected Data	25	Number of Non-Detect Data	1
		Percent Non-Detects	3.03%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	58	Minimum Detected	4.06
Maximum Detected	16000	Maximum Detected	9.68
Mean of Detected	1608	Mean of Detected	5.677
SD of Detected	4170	SD of Detected	1.512
Minimum Non-Detect	51	Minimum Non-Detect	3.932
Maximum Non-Detect	51	Maximum Non-Detect	3.932

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.405	Shapiro Wilk Test Statistic	0.788
5% Shapiro Wilk Critical Value	0.93	5% Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1560	Mean (Log Scale)	5.604
SD	4114	SD (Log Scale)	1.547
95% UTL 95% Coverage	10512	95% UTL 95% Coverage	7865
95% UPL (t)	8633	95% UPL (t)	3880
90% Percentile (z)	6832	90% Percentile (z)	1971
95% Percentile (z)	8327	95% Percentile (z)	3458
99% Percentile (z)	11130	99% Percentile (z)	9924
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1475	Mean in Original Scale	1559
SD	4130	SD in Original Scale	4114
95% UTL with 95% Coverage	10462	95% UTL with 95% Coverage	8668
		95% BCA UTL with 95% Coverage	16000
		95% Bootstrap (%) UTL with 95% Coverage	16000
95% UPL (t)	8576	95% UPL (t)	4162
90% Percentile (z)	6768	90% Percentile (z)	2060
95% Percentile (z)	8268	95% Percentile (z)	3693

99% Percentile (z)	11082	99% Percentile (z)	11035
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.372	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4319		
nu star	23.83		
A-D Test Statistic	5.319	Nonparametric Statistics	
5% A-D Critical Value	0.835	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.373	Mean	1561
5% K-S Critical Value	0.167	SD	4051
Data not Gamma Distributed at 5% Significance Level		SE of Mean	716.4
		95% KM UTL with 95% Coverage	10376
Assuming Gamma Distribution		95% KM Chebyshev UPL	19483
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	8526
Mean	1559	90% Percentile (z)	6752
Median	200	95% Percentile (z)	8224
SD	4114	99% Percentile (z)	10984
k star	0.259		
Theta star	6023	Gamma ROS Limits with Extrapolated Data	
Nu star	17.09	95% Wilson Hilferty (WH) Approx. Gamma UPL	5322
95% Percentile of Chisquare (2k)	2.48	95% Hawkins Wixley (HW) Approx. Gamma UPL	5060
		95% WH Approx. Gamma UTL with 95% Coverage	8117
90% Percentile	4668	95% HW Approx. Gamma UTL with 95% Coverage	8201
95% Percentile	7468		
99% Percentile	14888		

Note: DL/2 is not a recommended method.

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Clay

Background Data: Non-Clay

Raw Statistics

	Site	Background
Number of Valid Data	18	33
Number of Non-Detect Data	0	1
Number of Detect Data	18	32
Minimum Non-Detect	N/A	51
Maximum Non-Detect	N/A	51
Percent Non detects	0.00%	3.03%
Minimum Detected	72	58
Maximum Detected	8100	16000
Mean of Detected Data	1036	1608
Median of Detected Data	190	200
SD of Detected Data	2287	4170

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	493
WMW Test U-Stat	0.483
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.629

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Outlier Tests for Selected Variables

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 8100 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.921

For 10% significance level, 8100 is an outlier.

For 5% significance level, 8100 is an outlier.

For 1% significance level, 8100 is an outlier.

2. Data Value 72 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.071

For 10% significance level, 72 is not an outlier.

For 5% significance level, 72 is not an outlier.

For 1% significance level, 72 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	1560
Standard Deviation	4114
Number of data	33
Number of suspected outliers	1

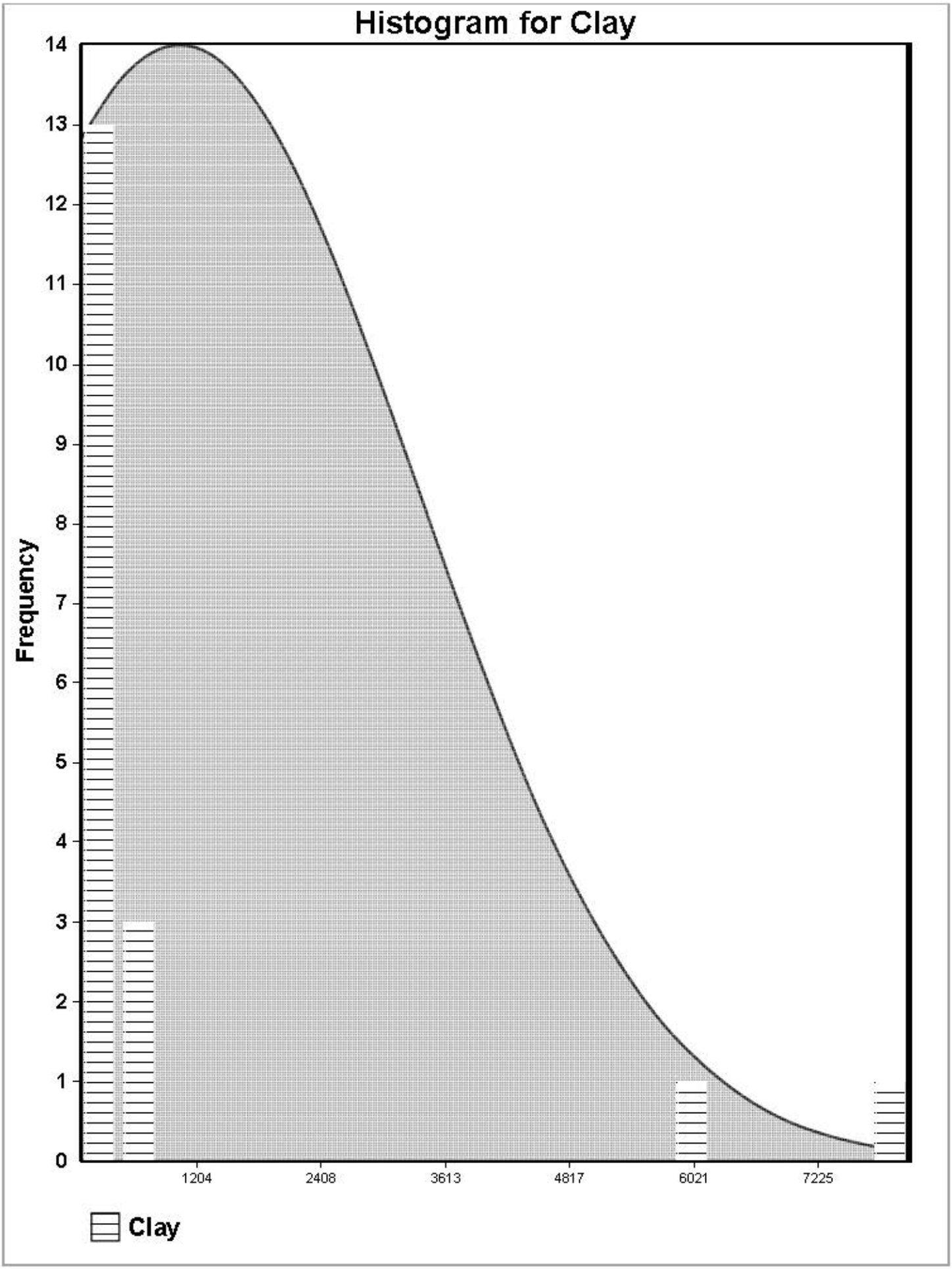
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1560	4051	16000	8	3.564	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 16000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 16000 is a Potential Statistical Outlier


Histogram for Clay
Frequency
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1
2
3
4
5
6
7
8
9
10
11
12
13
14
1204
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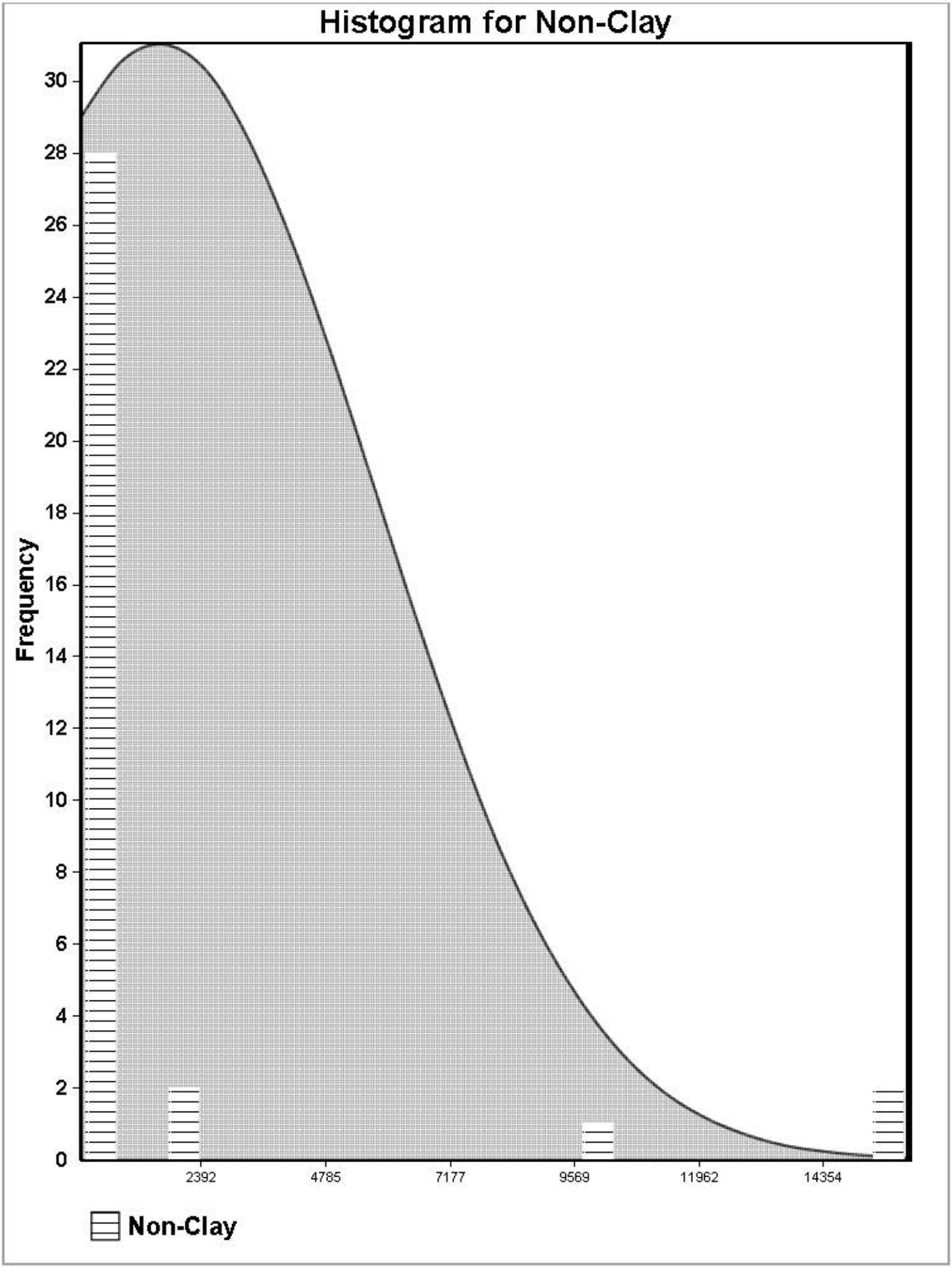
3613
4817
6021
7225
Clay


Histogram for Non-Clay
Frequency
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
2392
4785
7177
9569
11962
14354
Non-Clay

Location	Clay	D_Clay
BG-1-2	6400	1
BG-1-43	140	1
BG-1-55	120	1
BG-1-78	120	1
BG-2-30	350	1
BG-2-81	190	1
BG-3-17	480	1
BG-3-22	650	1
BG-3-69	110	1
BG-4-2	8100	1
BG-4-19	250	1
BG-4-40	72	1
BG-4-79	140	1
BG-4-161	160	1
BG-4-163	130	1
BG-6-28	750	1
BG-6-53	290	1
BG-6-87	190	1

Location	Non-Clay	D_Non-Clay
BG-1-10	1700	1
BG-1-29	170	1
BG-1-40	58	1
BG-1-46	88	1
BG-1-92	110	1
BG-2-2	62	1
BG-2-10	220	1
BG-2-19	16000	1
BG-2-21	16000	1
BG-2-32	410	1
BG-2-75	320	1
BG-3-2	10000	1
BG-3-10	2300	1
BG-3-29	160	1
BG-3-63	160	1
BG-3-65	120	1
BG-3-95	95	1
BG-3-105	110	1
BG-3-131	63	1
BG-3-136	95	1
BG-4-10	230	1
BG-4-65	51	0
BG-4-82	200	1
BG-4-95	200	1
BG-4-117	300	1
BG-4-120	210	1
BG-6-2	820	1
BG-6-9	83	1
BG-6-58	300	1
BG-6-75	270	1
BG-6-98	190	1
BG-6-114	250	1
BG-6-127	160	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	12	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	12	58	16000	4484	1260	6183

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	0.422	0.372	10621	6.863	2.186	0.319

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.865	0.865	0.865	0.865

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.733	0.859	Data Not Normal
Lilliefors (Full: no NDs)	0.305	0.256	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.926	0.926	0.926	0.926

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.53	0.8	
Kolmogorov-Smirnov (Full: no NDs)	0.198	0.261	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.962	0.962	0.962	0.962

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.895	0.859	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.166	0.256	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	39	0	39	38	1	2.56%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	38	11	8100	425.6	190	1288

Statistics (All: NDs treated as DL value)	39	11	8100	416	190	1272
Statistics (All: NDs treated as DL/2 value)	39	11	8100	415.4	190	1272
Statistics (Normal ROS Estimated Data)	39	-854.9	8100	392.8	190	1287
Statistics (Gamma ROS Estimated Data)	39	1.000E-12	8100	414.7	190	1272
Statistics (Lognormal ROS Estimated Data)	39	11	8100	415.4	190	1272

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.755	0.714	563.8	5.261	0.958	0.182
Statistics (NDs = DL)	0.746	0.705	557.9	5.227	0.969	0.185
Statistics (NDs = DL/2)	0.733	0.693	566.9	5.209	1	0.192
Statistics (Gamma ROS Estimates)	0.408	0.393	1018	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	5.212	0.994	0.191

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.458	0.457	0.458	0.492

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.248	0.938	Data Not Normal
Lilliefors (Detects Only)	0.404	0.144	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.247	0.939	Data Not Normal
Lilliefors (NDs = DL)	0.403	0.142	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.248	0.939	Data Not Normal
Lilliefors (NDs = DL/2)	0.403	0.142	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.287	0.939	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.396	0.142	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.695	0.693	0.695	0.75

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	4.736	0.788	
Kolmogorov-Smirnov (Detects Only)	0.279	0.149	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.632	0.789	
Kolmogorov-Smirnov (NDs = DL)	0.275	0.147	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	4.482	0.79	
Kolmogorov-Smirnov (NDs = DL/2)	0.272	0.147	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	5.454	0.834	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.305	0.151	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.909	0.919	0.924	0.924

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.874	0.938	Data Not Lognormal
Lilliefors (Detects Only)	0.141	0.144	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.89	0.939	Data Not Lognormal
Lilliefors (NDs = DL)	0.135	0.142	Data Appear Lognormal

Shapiro-Wilks (NDs = DL/2)	0.895	0.939	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.134	0.142	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.895	0.939	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.134	0.142	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-Transformed Statistics	
Minimum	58	Minimum	4.06
Maximum	16000	Maximum	9.68
Second Largest	16000	Second Largest	9.68
First Quartile	148.3	First Quartile	4.957
Median	1260	Median	7.074
Third Quartile	7300	Third Quartile	8.876
Mean	4484	Mean	6.863
SD	6183	SD	2.186
Coefficient of Variation	1.379		
Skewness	1.26		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.733	Shapiro Wilk Test Statistic	0.895
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	21402	95% UTL with 95% Coverage	378893
95% UPL (t)	16043	95% UPL (t)	56951
90% Percentile (z)	12409	90% Percentile (z)	15759
95% Percentile (z)	14655	95% Percentile (z)	34872
99% Percentile (z)	18869	99% Percentile (z)	154722

Gamma Distribution Test		Data Distribution Test
k star	0.372	Data appear Gamma Distributed at 5% Significance Level
Theta Star	12048	
MLE of Mean	4484	
MLE of Standard Deviation	7350	
nu star	8.933	
A-D Test Statistic	0.53	Nonparametric Statistics
5% A-D Critical Value	0.8	90% Percentile 15400
K-S Test Statistic	0.198	95% Percentile 16000
5% K-S Critical Value	0.261	99% Percentile 16000
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	16000
90% Percentile	12824	95% Percentile Bootstrap UTL with 95% Coverage	16000
95% Percentile	19099	95% BCA Bootstrap UTL with 95% Coverage	16000
99% Percentile	35001	95% UPL	16000
		95% Chebyshev UPL	32538
95% WH Approx. Gamma UPL	21691	Upper Threshold Limit Based upon IQR	18028
95% HW Approx. Gamma UPL	24516		
95% WH Approx. Gamma UTL with 95% Coverage	43141		
95% HW Approx. Gamma UTL with 95% Coverage	55832		

MC

General Statistics			
Number of Valid Data	39	Number of Detected Data	38
Number of Distinct Detected Data	26	Number of Non-Detect Data	1
		Percent Non-Detects	2.56%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	11	Minimum Detected	2.398
Maximum Detected	8100	Maximum Detected	9
Mean of Detected	425.6	Mean of Detected	5.261
SD of Detected	1288	SD of Detected	0.958
Minimum Non-Detect	51	Minimum Non-Detect	3.932
Maximum Non-Detect	51	Maximum Non-Detect	3.932

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.248	Shapiro Wilk Test Statistic	0.874
5% Shapiro Wilk Critical Value	0.938	5% Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	415.4	Mean (Log Scale)	5.209
SD	1272	SD (Log Scale)	1
95% UTL 95% Coverage	3118	95% UTL 95% Coverage	1530
95% UPL (t)	2587	95% UPL (t)	1008
90% Percentile (z)	2046	90% Percentile (z)	658.8
95% Percentile (z)	2508	95% Percentile (z)	947.3
99% Percentile (z)	3375	99% Percentile (z)	1872
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	369.6	Mean in Original Scale	415.4
SD	1296	SD in Original Scale	1272
95% UTL with 95% Coverage	3122	95% UTL with 95% Coverage	1517
		95% BCA UTL with 95% Coverage	8100
		95% Bootstrap (%) UTL with 95% Coverage	8100
95% UPL (t)	2582	95% UPL (t)	1002
90% Percentile (z)	2030	90% Percentile (z)	656.2
95% Percentile (z)	2501	95% Percentile (z)	941.8

99% Percentile (z)	3384	99% Percentile (z)	1855
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.713	Data do not follow a Discernable Distribution (0.05)	
Theta Star	597		
nu star	54.18		
A-D Test Statistic	4.736	Nonparametric Statistics	
5% A-D Critical Value	0.788	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.279	Mean	415
5% K-S Critical Value	0.149	SD	1256
Data not Gamma Distributed at 5% Significance Level		SE of Mean	203.8
		95% KM UTL with 95% Coverage	3083
Assuming Gamma Distribution		95% KM Chebyshev UPL	5959
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	2559
Mean	414.7	90% Percentile (z)	2024
Median	190	95% Percentile (z)	2481
SD	1272	99% Percentile (z)	3336
k star	0.393		
Theta star	1054	Gamma ROS Limits with Extrapolated Data	
Nu star	30.68	95% Wilson Hilferty (WH) Approx. Gamma UPL	1240
95% Percentile of Chisquare (2k)	3.287	95% Hawkins Wixley (HW) Approx. Gamma UPL	1228
		95% WH Approx. Gamma UTL with 95% Coverage	1690
90% Percentile	1175	95% HW Approx. Gamma UTL with 95% Coverage	1732
95% Percentile	1733		
99% Percentile	3140		

Note: DL/2 is not a recommended method.

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Alluv

Background Data: MC

Raw Statistics

	Site	Background
Number of Valid Data	12	39
Number of Non-Detect Data	0	1
Number of Detect Data	12	38
Minimum Non-Detect	N/A	51
Maximum Non-Detect	N/A	51
Percent Non detects	0.00%	2.56%
Minimum Detected	58	11
Maximum Detected	16000	8100
Mean of Detected Data	4484	425.6
Median of Detected Data	1260	190
SD of Detected Data	6183	1288

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 51 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	399
WMW Test U-Stat	1.921
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.0548

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Outlier Tests for Selected Variables

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 16000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.376

For 10% significance level, 16000 is not an outlier.
For 5% significance level, 16000 is not an outlier.
For 1% significance level, 16000 is not an outlier.

2. Data Value 58 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.002

For 10% significance level, 58 is not an outlier.
For 5% significance level, 58 is not an outlier.
For 1% significance level, 58 is not an outlier.

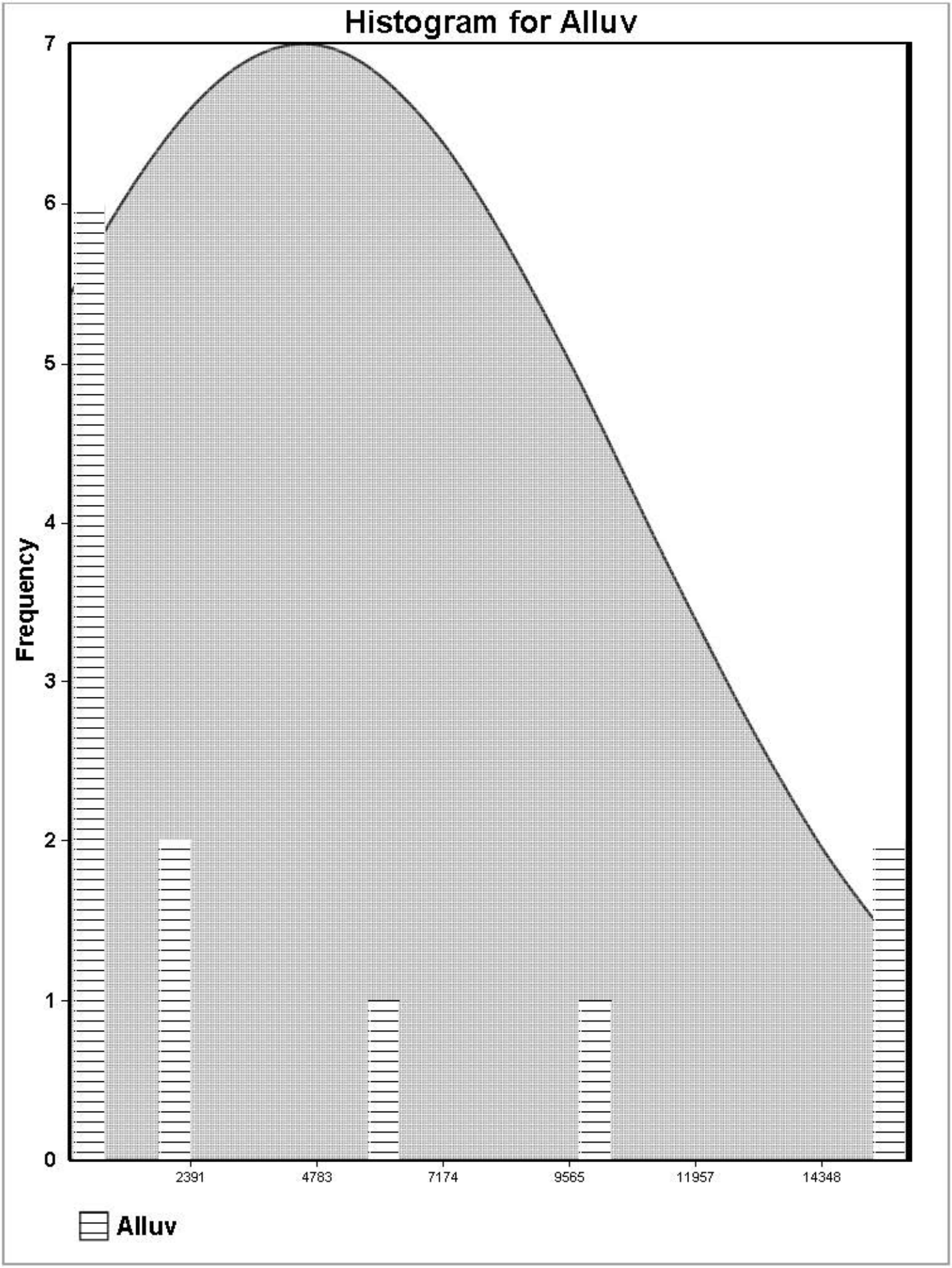
Rosner's Outlier Test for MC

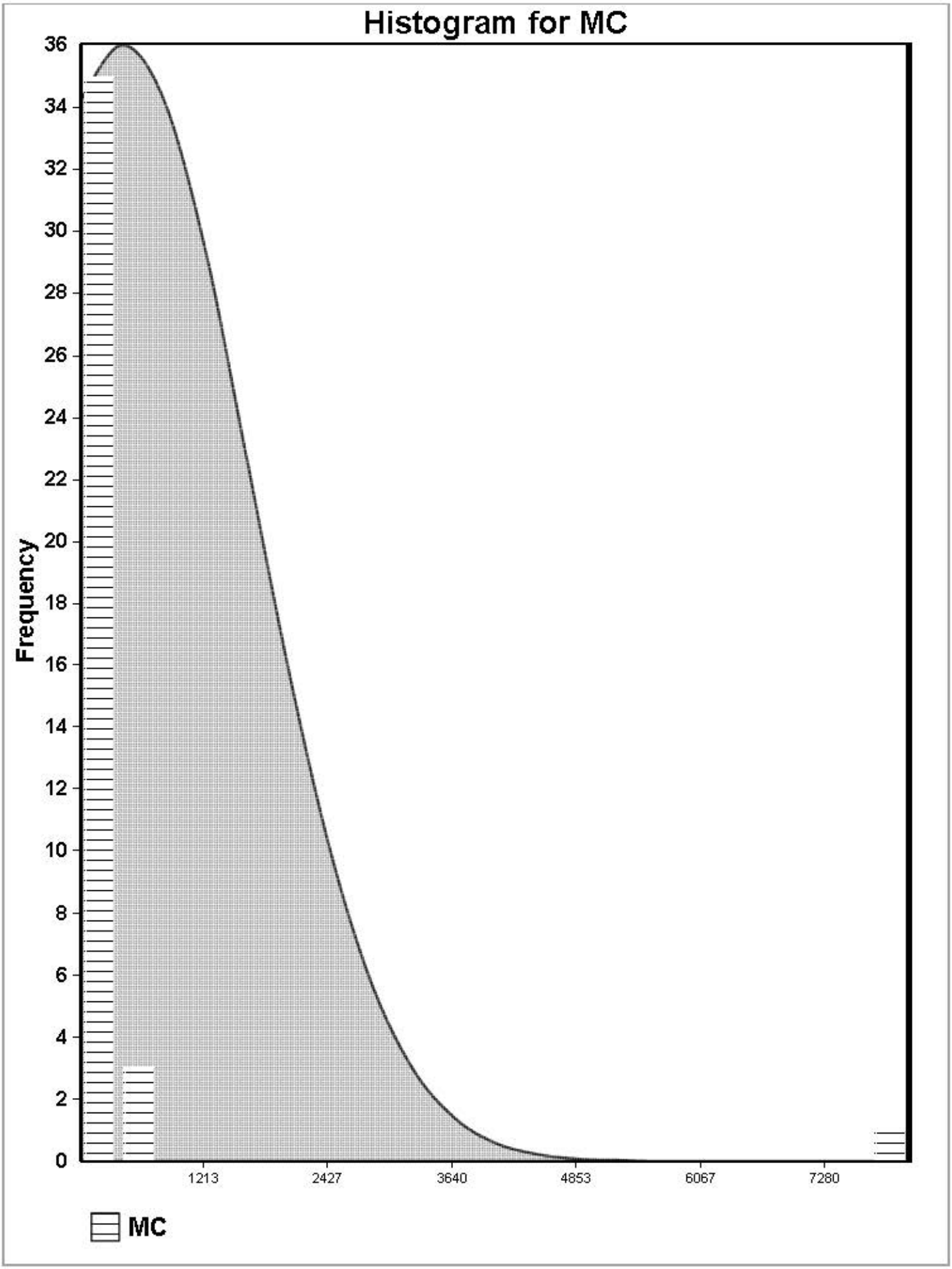
Mean	415.4
Standard Deviation	1272
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	415.4	1256	8100	20	6.12	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 8100 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 8100 is a Potential Statistical Outlier


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
7
2391
4783
7174
9565
11957
14348
Alluv


Histogram for MC
Frequency
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
1213
2427
3640
4853
6067
7280
MC

Location	Alluv	D_Alluv
BG-1-2	6400	1
BG-1-10	1700	1
BG-1-29	170	1
BG-1-40	58	1
BG-2-2	62	1
BG-2-10	220	1
BG-2-19	16000	1
BG-2-21	16000	1
BG-3-2	10000	1
BG-3-10	2300	1
BG-6-2	820	1
BG-6-9	83	1

Location	MC	D_MC
BG-1-43	140	1
BG-1-46	88	1
BG-1-55	120	1
BG-1-78	120	1
BG-1-92	11	1
BG-2-30	350	1
BG-2-32	410	1
BG-2-75	320	1
BG-2-81	190	1
BG-3-17	480	1
BG-3-22	650	1
BG-3-29	160	1
BG-3-63	160	1
BG-3-65	120	1
BG-3-69	110	1
BG-3-95	95	1
BG-3-105	110	1
BG-3-131	63	1
BG-3-136	95	1
BG-4-1	8100	1
BG-4-10	230	1
BG-4-19	250	1
BG-4-40	72	1
BG-4-65	51	0
BG-4-79	140	1
BG-4-82	200	1
BG-4-95	200	1
BG-4-117	300	1
BG-4-120	210	1
BG-4-161	160	1
BG-4-163	130	1
BG-6-28	750	1
BG-6-53	290	1
BG-6-58	300	1
BG-6-75	270	1
BG-6-87	190	1
BG-6-98	190	1
BG-6-114	240	1
BG-1-127	160	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Thallium.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	51	0	51	1	50	98.04%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable All Data was not processed!

Outlier Tests for Selected Variables

User Selected Options	
From File	Thallium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for All Data

Mean	2.888
Standard Deviation	3.433
Number of data	51
Number of suspected outliers	1

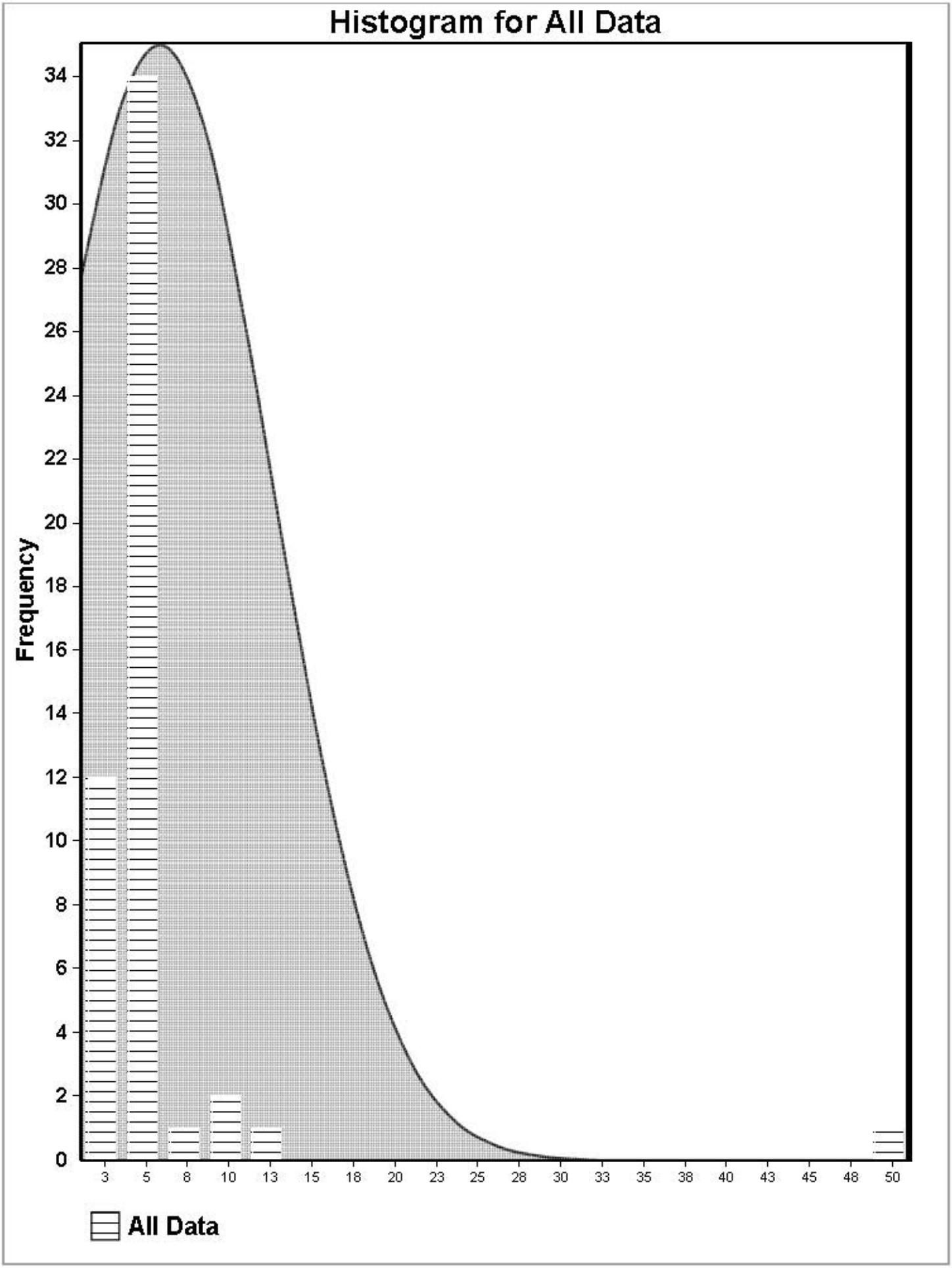
#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2.888	3.399	25.5	43	6.652	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 25.5 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 25.5 is a Potential Statistical Outlier


Histogram for All Data
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
3
5
8
10
13
15
18
20
23
25
28
30
33
35
38
40
43
45
48
50
All Data

Location	All Data	D_All Data
BG-1-2	5	0
BG-3-17	5.2	0
BG-4-2	5.3	0
BG-4-19	5.9	0
BG-1-10	5	0
BG-2-2	1	0
BG-2-10	1	0
BG-2-19	10	0
BG-3-2	5.1	0
BG-3-10	5.4	0
BG-4-10	5.4	0
BG-6-2	5.1	0
BG-6-9	5.1	0
BG-1-29	5	0
BG-1-40	1.6	1
BG-1-46	5	0
BG-1-92	1	0
BG-2-21	5	0
BG-2-32	1	0
BG-2-75	1	0
BG-3-29	5.1	0
BG-3-63	1.2	0
BG-3-65	2.4	0
BG-3-95	2.3	0
BG-3-105	2.4	0
BG-3-131	11	0
BG-3-136	6	0
BG-4-65	5.1	0
BG-4-82	6	0
BG-4-95	1.2	0
BG-4-117	1.2	0
BG-4-120	6	0
BG-6-58	6	0
BG-6-75	5.9	0
BG-6-98	5.9	0
BG-6-114	5.9	0
BG-6-127	5.9	0
BG-1-43	5	0
BG-1-55	5	0
BG-1-78	5	0
BG-2-30	5	0
BG-2-81	5	0
BG-3-22	51	0
BG-3-69	5.7	0
BG-4-40	5.8	0
BG-4-79	5.9	0
BG-4-161	6	0
BG-4-163	12	0
BG-6-28	5.8	0
BG-6-53	6	0
BG-6-87	6.2	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Thallium.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	13	0	13	0	13	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 0-20 was not processed!

>20

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	38	0	38	1	37	97.37%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable >20 was not processed!

Outlier Tests for Selected Variables

User Selected Options	
From File	Thallium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.511

For 10% significance level, 5 is an outlier.
For 5% significance level, 5 is not an outlier.
For 1% significance level, 5 is not an outlier.

2. Data Value 0.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.816

For 10% significance level, 0.5 is an outlier.
For 5% significance level, 0.5 is an outlier.
For 1% significance level, 0.5 is an outlier.

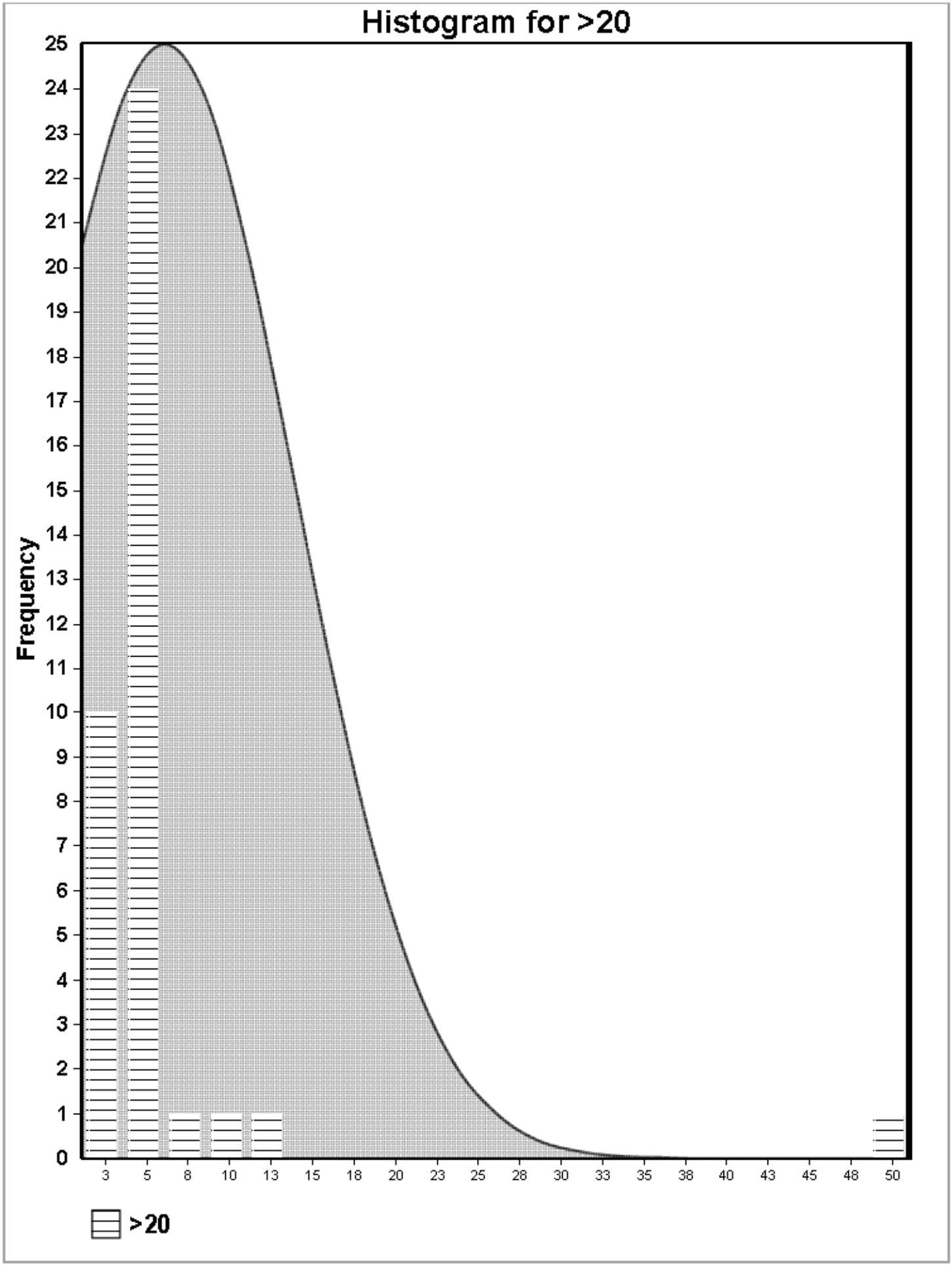
Rosner's Outlier Test for >20

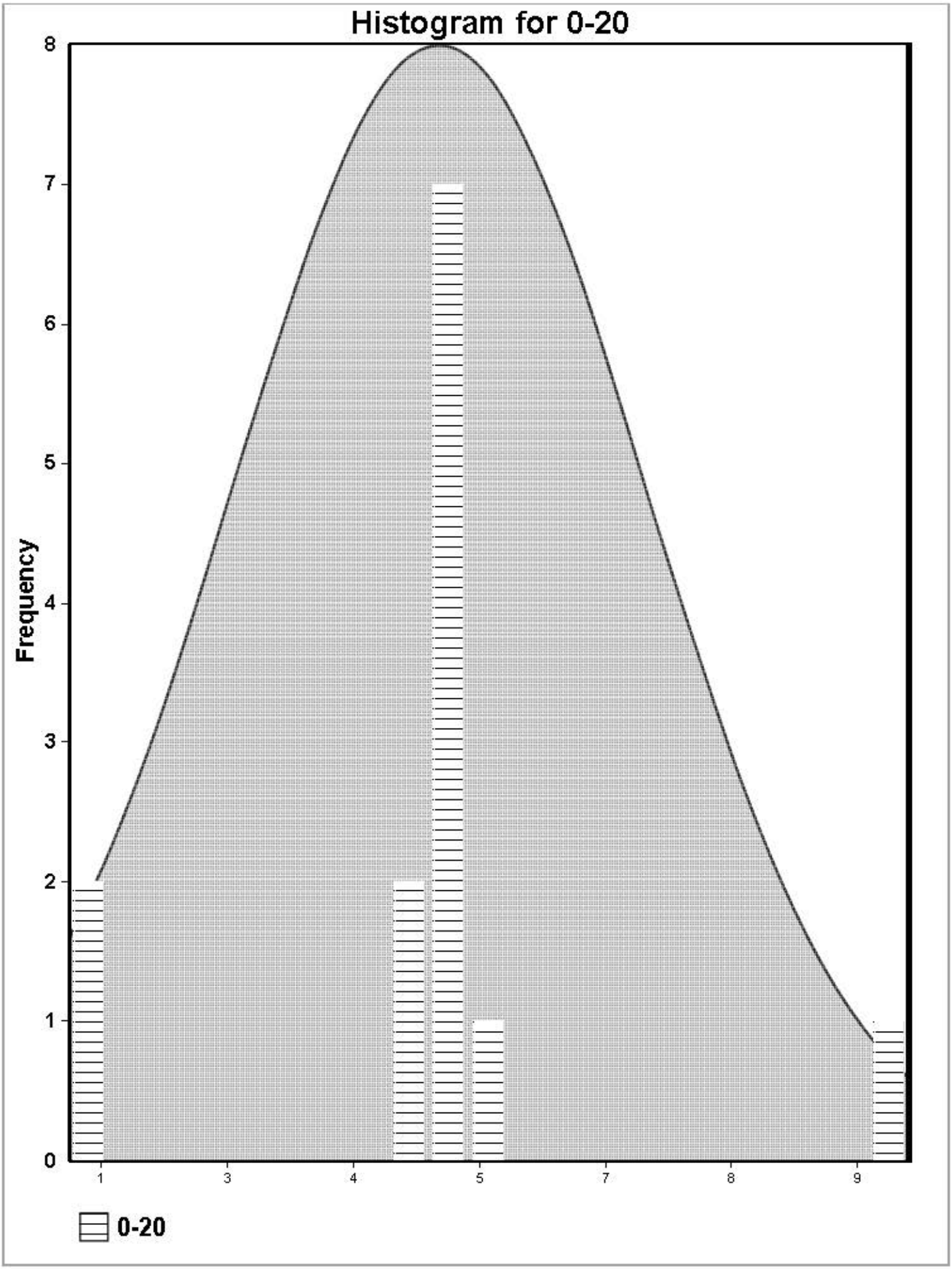
Mean	3.028
Standard Deviation	3.931
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3.028	3.879	25.5	30	5.793	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 25.5 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 25.5 is a Potential Statistical Outlier


Histogram for >20
Frequency
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
3
5
8
10
13
15
18
20
23
25
28
30
33
35
38
40
43
45
48
50
>20


Histogram for 0-20
Frequency
0
1
2
3
4
5
6
7
8
1
3
4
5
7
8
9
0-20

Location	0-20	D_0-20
BG-1-2	5	0
BG-3-17	5.2	0
BG-4-2	5.3	0
BG-4-19	5.9	0
BG-1-10	5	0
BG-2-2	1	0
BG-2-10	1	0
BG-2-19	10	0
BG-3-2	5.1	0
BG-3-10	5.4	0
BG-4-10	5.4	0
BG-6-2	5.1	0
BG-6-9	5.1	0

Location	>20	D_>20
BG-1-29	5	0
BG-1-40	1.6	1
BG-1-46	5	0
BG-1-92	1	0
BG-2-21	5	0
BG-2-32	1	0
BG-2-75	1	0
BG-3-29	5.1	0
BG-3-63	1.2	0
BG-3-65	2.4	0
BG-3-95	2.3	0
BG-3-105	2.4	0
BG-3-131	11	0
BG-3-136	6	0
BG-4-65	5.1	0
BG-4-82	6	0
BG-4-95	1.2	0
BG-4-117	1.2	0
BG-4-120	6	0
BG-6-58	6	0
BG-6-75	5.9	0
BG-6-98	5.9	0
BG-6-114	5.9	0
BG-6-127	5.9	0
BG-1-43	5	0
BG-1-55	5	0
BG-1-78	5	0
BG-2-30	5	0
BG-2-81	5	0
BG-3-22	51	0
BG-3-69	5.7	0
BG-4-40	5.8	0
BG-4-79	5.9	0
BG-4-161	6	0
BG-4-163	12	0
BG-6-28	5.8	0
BG-6-53	6	0
BG-6-87	6.2	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Thallium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	18	0	18	0	18	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Clay was not processed!

Non-Clay

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	33	0	33	1	32	96.97%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Non-Clay was not processed!

Outlier Tests for Selected Variables

User Selected Options	
From File	Thallium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 25.5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.974

For 10% significance level, 25.5 is an outlier.

For 5% significance level, 25.5 is an outlier.

For 1% significance level, 25.5 is an outlier.

2. Data Value 2.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.000

For 10% significance level, 2.5 is not an outlier.

For 5% significance level, 2.5 is not an outlier.

For 1% significance level, 2.5 is not an outlier.

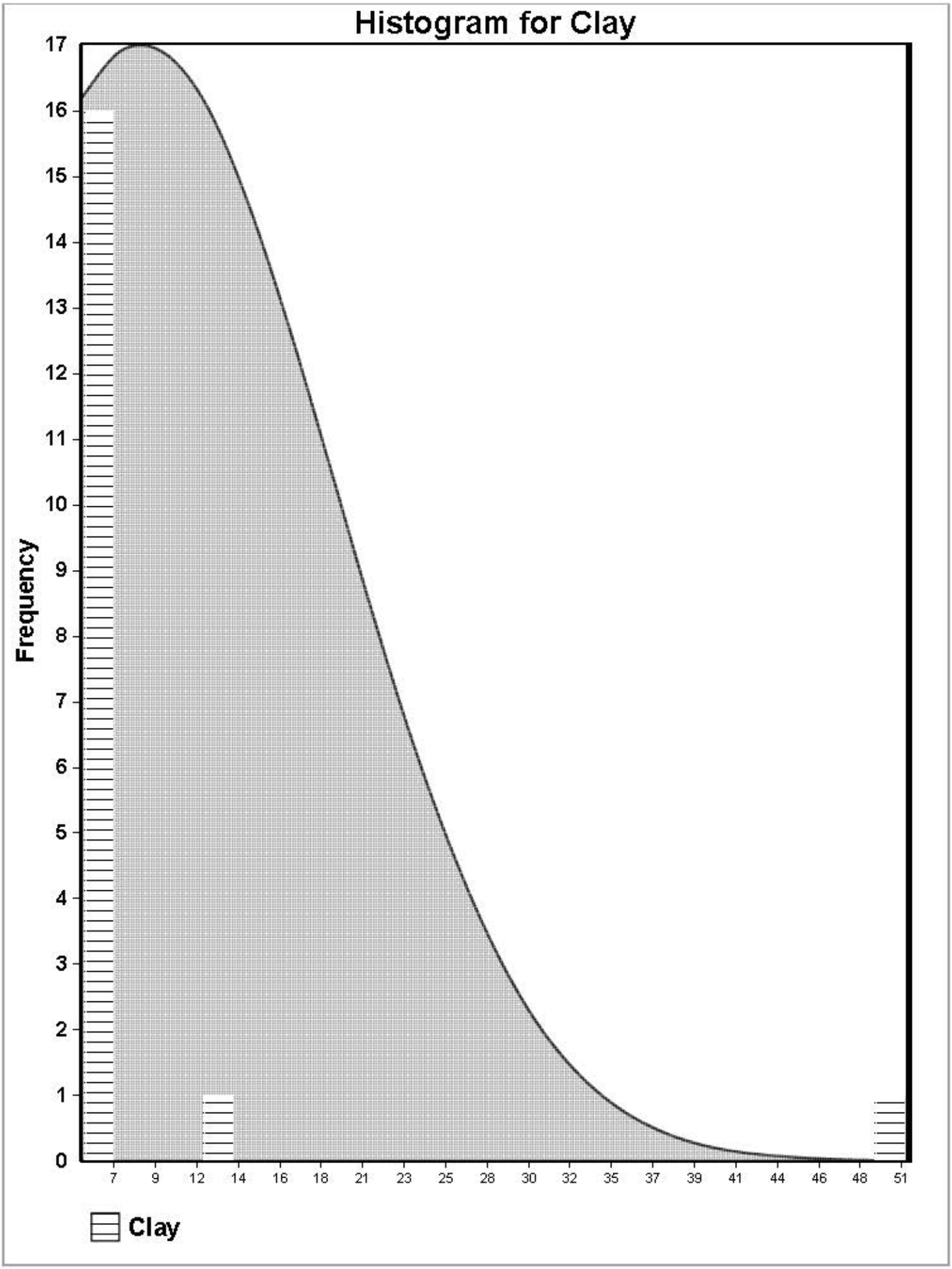
Rosner's Outlier Test for Non-Clay

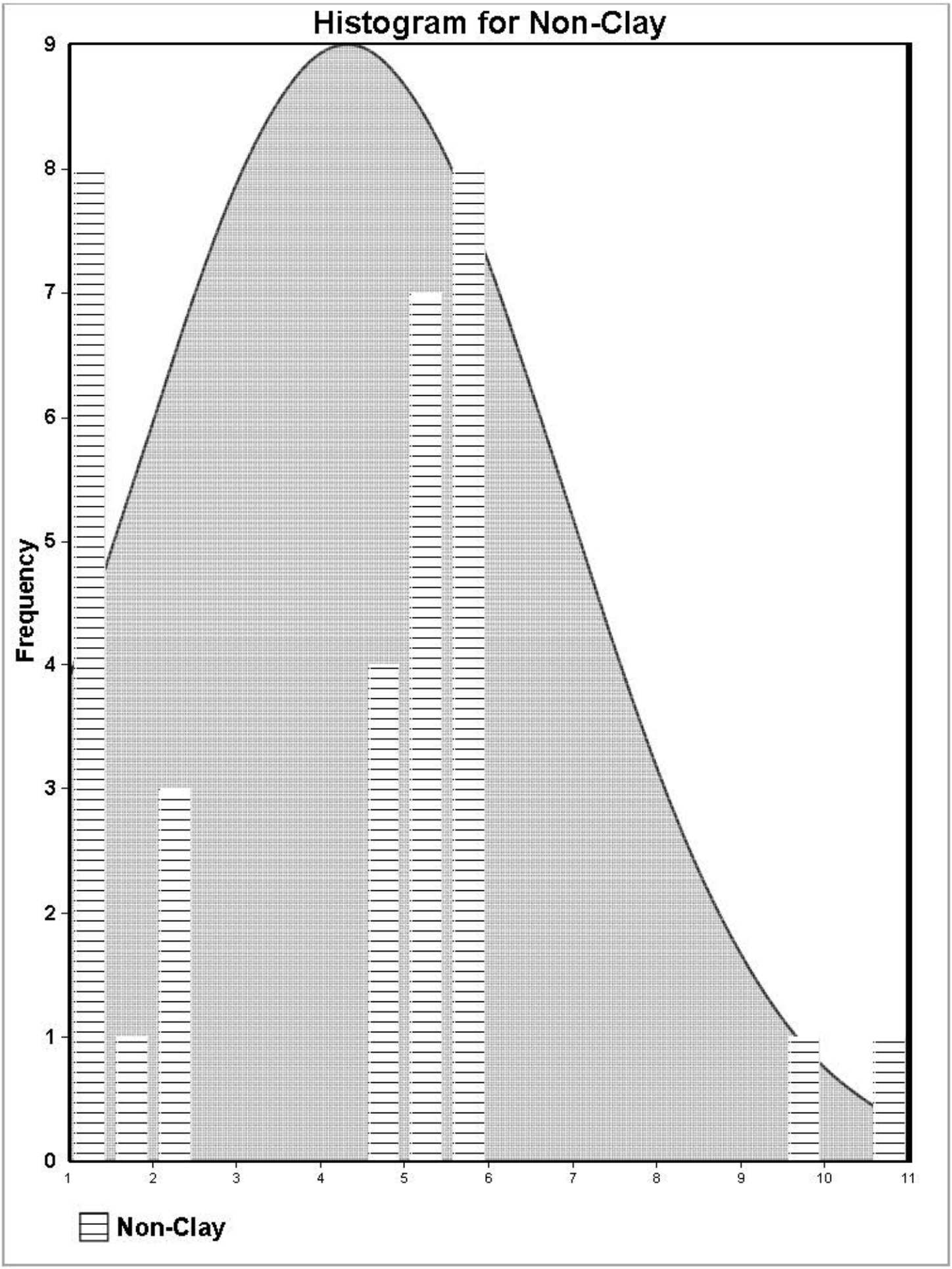
Mean	2.179
Standard Deviation	1.257
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2.179	1.238	5.5	19	2.682	2.95	3.29

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier


Histogram for Clay
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
7
9
12
14
16
18
21
23
25
28
30
32
35
37
39
41
44
46
48
51
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
9
1
2
3
4
5
6
7
8
9
10
11
Non-Clay

Location	Clay	D_Clay
BG-1-2	5	0
BG-1-43	5	0
BG-1-55	5	0
BG-1-78	5	0
BG-2-30	5	0
BG-2-81	5	0
BG-3-17	5.2	0
BG-3-22	51	0
BG-3-69	5.7	0
BG-4-2	5.3	0
BG-4-19	5.9	0
BG-4-40	5.8	0
BG-4-79	5.9	0
BG-4-161	6	0
BG-4-163	12	0
BG-6-28	5.8	0
BG-6-53	6	0
BG-6-87	6.2	0

Location	Non-Clay	D_Non-Clay
BG-1-10	5	0
BG-1-29	5	0
BG-1-40	1.6	1
BG-1-46	5	0
BG-1-92	1	0
BG-2-2	1	0
BG-2-10	1	0
BG-2-19	10	0
BG-2-21	5	0
BG-2-32	1	0
BG-2-75	1	0
BG-3-2	5.1	0
BG-3-10	5.4	0
BG-3-29	5.1	0
BG-3-63	1.2	0
BG-3-65	2.4	0
BG-3-95	2.3	0
BG-3-105	2.4	0
BG-3-131	11	0
BG-3-136	6	0
BG-4-10	5.4	0
BG-4-65	5.1	0
BG-4-82	6	0
BG-4-95	1.2	0
BG-4-117	1.2	0
BG-4-120	6	0
BG-6-2	5.1	0
BG-6-9	5.1	0
BG-6-58	6	0
BG-6-75	5.9	0
BG-6-98	5.9	0
BG-6-114	5.9	0
BG-6-127	5.9	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Thallium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	12	0	12	1	11	91.67%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Alluv was not processed!

MC

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	39	0	39	0	39	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable MC was not processed!

Outlier Tests for Selected Variables

User Selected Options	
From File	Thallium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.544

For 10% significance level, 5 is an outlier.
For 5% significance level, 5 is not an outlier.
For 1% significance level, 5 is not an outlier.

2. Data Value 0.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.500

For 10% significance level, 0.5 is an outlier.
For 5% significance level, 0.5 is not an outlier.
For 1% significance level, 0.5 is not an outlier.

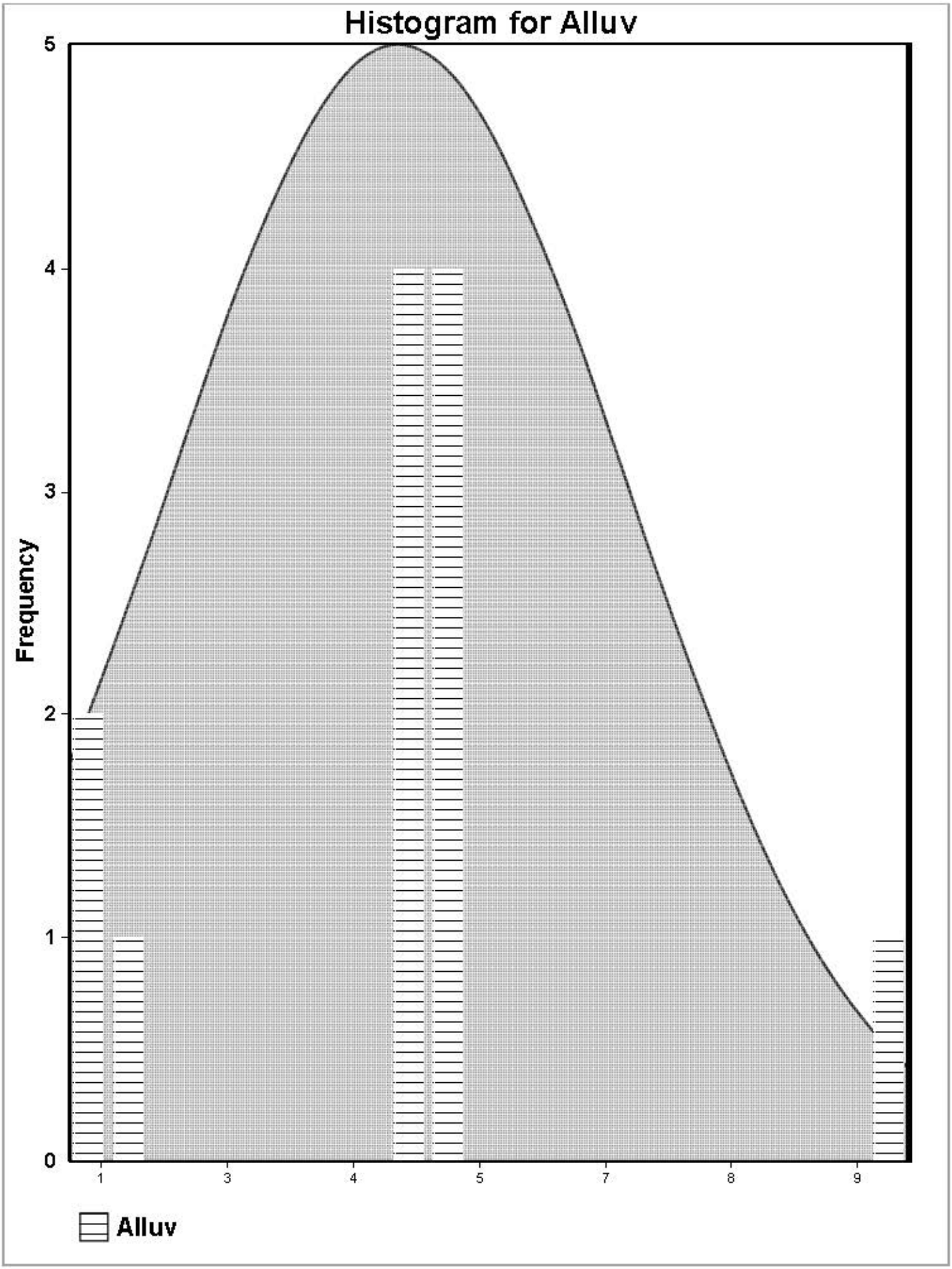
Rosner's Outlier Test for MC

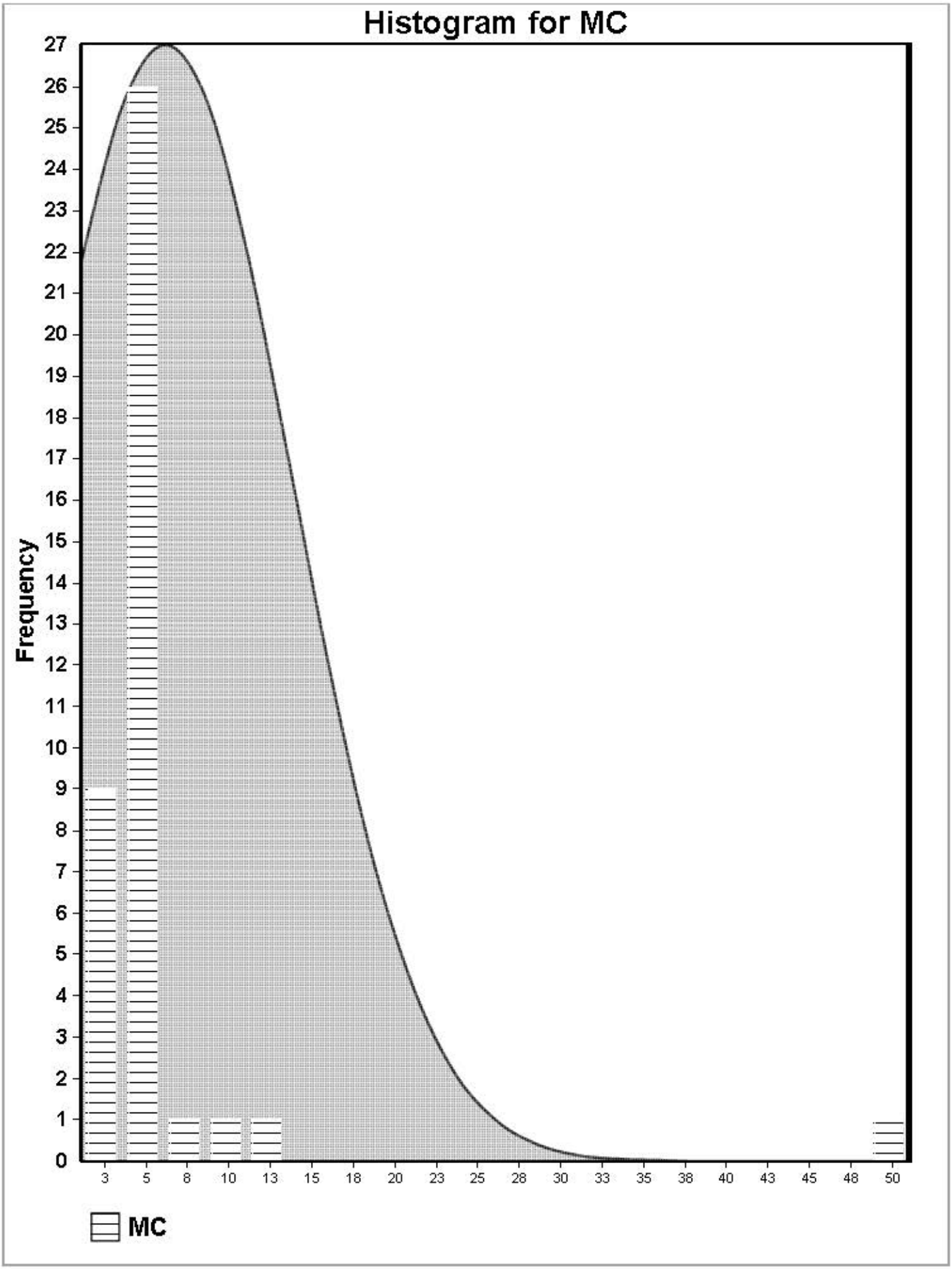
Mean	3.06
Standard Deviation	3.872
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3.06	3.822	25.5	11	5.872	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 25.5 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 25.5 is a Potential Statistical Outlier


Histogram for Alluv
Frequency
0
1
2
3
4
5
1
3
4
5
7
8
9
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
3
5
8
10
13
15
18
20
23
25
28
30
33
35
38
40
43
45
48
50
MC

Location	Alluv	D_Alluv
BG-1-2	5	0
BG-1-10	5	0
BG-1-29	5	0
BG-1-40	1.6	1
BG-2-2	1	0
BG-2-10	1	0
BG-2-19	10	0
BG-2-21	5	0
BG-3-2	5.1	0
BG-3-10	5.4	0
BG-6-2	5.1	0
BG-6-9	5.1	0

Location	MC	D_MC
BG-1-43	5	0
BG-1-46	5	0
BG-1-55	5	0
BG-1-78	5	0
BG-1-92	1	0
BG-2-30	5	0
BG-2-32	1	0
BG-2-75	1	0
BG-2-81	5	0
BG-3-17	5.2	0
BG-3-22	51	0
BG-3-29	5.1	0
BG-3-63	1.2	0
BG-3-65	2.4	0
BG-3-69	5.7	0
BG-3-95	2.3	0
BG-3-105	2.4	0
BG-3-131	11	0
BG-3-136	6	0
BG-4-2	5.3	0
BG-4-10	5.4	0
BG-4-19	5.9	0
BG-4-40	5.8	0
BG-4-65	5.1	0
BG-4-79	5.9	0
BG-4-82	6	0
BG-4-95	1.2	0
BG-4-117	1.2	0
BG-4-120	6	0
BG-4-161	6	0
BG-4-163	12	0
BG-6-28	5.8	0
BG-6-53	6	0
BG-6-58	6	0
BG-6-75	5.9	0
BG-6-87	6.2	0
BG-6-98	5.9	0
BG-6-114	5.9	0
BG-1-127	5.9	0

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Titanium.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	37
Minimum	21
Maximum	300
Mean of Raw Data	95.71
Standard Deviation of Raw Data	71.58
Kstar	2.039
Mean of Log Transformed Data	4.311
Standard Deviation of Log Transformed Data	0.709

Normal Distribution Test Results	
Correlation Coefficient R	0.921
Approximate Shapiro Wilk Test Statistic	0.838
Approximate Shapiro Wilk P Value	2.9849E-7
Lilliefors Test Statistic	0.19
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.986
A-D Test Statistic	1.054
A-D Critical (0.95) Value	0.762
K-S Test Statistic	0.142
K-S Critical(0.95) Value	0.126

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.986
Approximate Shapiro Wilk Test Statistic	0.953
Approximate Shapiro Wilk P Value	0.0746
Lilliefors Test Statistic	0.115
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Titanium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Total Number of Observations	51	Number of Distinct Observations	37

Raw Statistics		Log-Transformed Statistics	
Minimum	21	Minimum	3.045
Maximum	300	Maximum	5.704
Second Largest	280	Second Largest	5.635
First Quartile	43	First Quartile	3.761
Median	63	Median	4.143
Third Quartile	130	Third Quartile	4.865
Mean	95.71	Mean	4.311
SD	71.58	SD	0.709
Coefficient of Variation	0.748		
Skewness	1.281		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.19	Lilliefors Test Statistic	0.115
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	242.7	95% UTL with 95% Coverage	319.8
95% UPL (t)	216.8	95% UPL (t)	247.5
90% Percentile (z)	187.4	90% Percentile (z)	185
95% Percentile (z)	213.4	95% Percentile (z)	239.3
99% Percentile (z)	262.2	99% Percentile (z)	388

Gamma Distribution Test		Data Distribution Test	
k star	2.039	Data appear Lognormal at 5% Significance Level	
Theta Star	46.94		
MLE of Mean	95.71		
MLE of Standard Deviation	67.03		
nu star	208		
A-D Test Statistic	1.054	Nonparametric Statistics	
5% A-D Critical Value	0.762	90% Percentile	190
K-S Test Statistic	0.142	95% Percentile	250
5% K-S Critical Value	0.126	99% Percentile	290
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	280
90% Percentile	185.3	95% Percentile Bootstrap UTL with 95% Coverage	290
95% Percentile	225.6	95% BCA Bootstrap UTL with 95% Coverage	290
99% Percentile	315	95% UPL	268
		95% Chebyshev UPL	410.8
95% WH Approx. Gamma UPL	227.4	Upper Threshold Limit Based upon IQR	260.5
95% HW Approx. Gamma UPL	230.9		
95% WH Approx. Gamma UTL with 95% Coverage	272.5		
95% HW Approx. Gamma UTL with 95% Coverage	280.7		

Outlier Tests for Selected Variables

User Selected Options	
From File	Titanium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

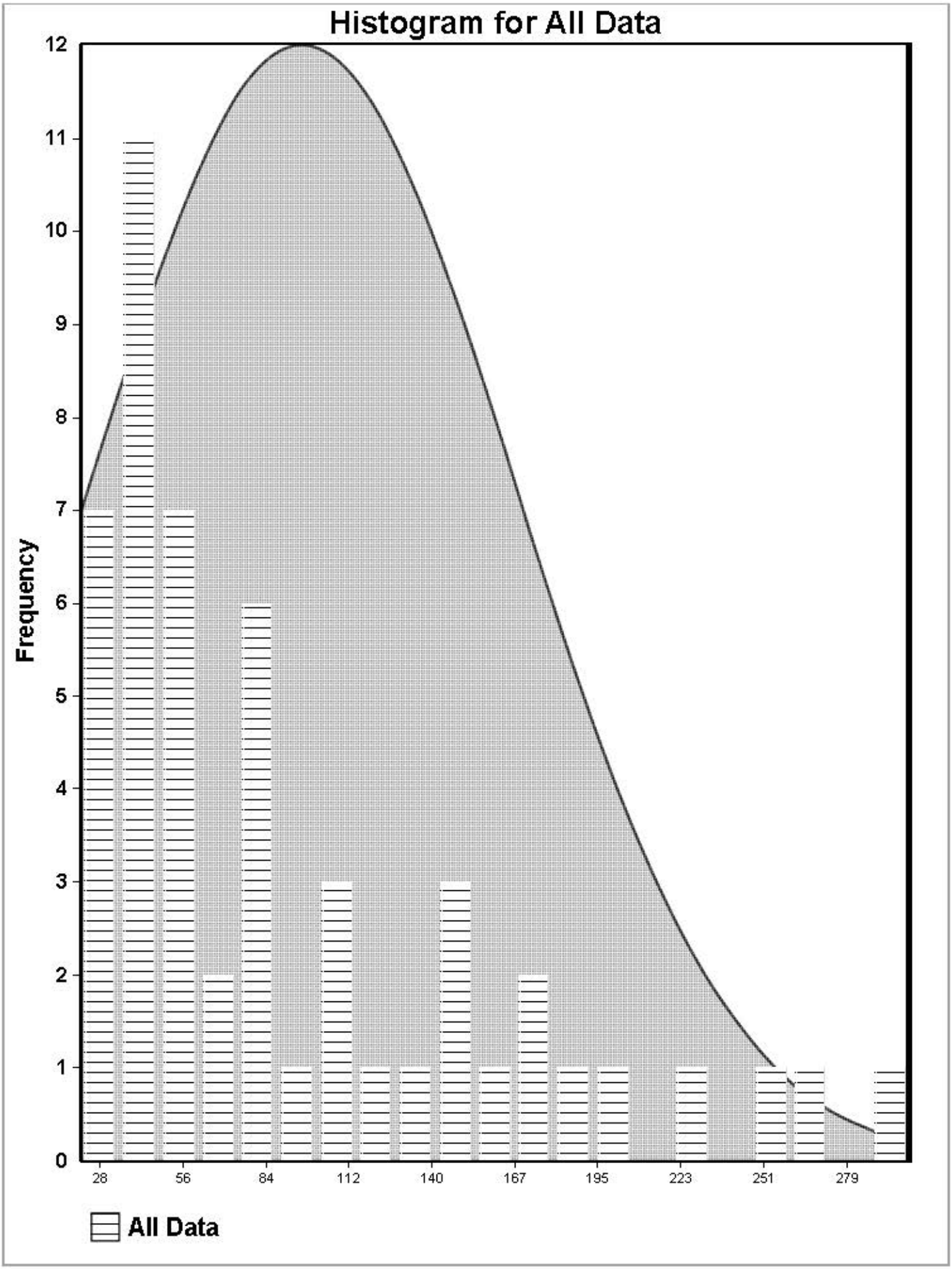
Rosner's Outlier Test for All Data

Mean	95.71
Standard Deviation	71.58
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	95.71	70.88	300	41	2.882	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
28
56
84
112
140
167
195
223
251
279
All Data

Location	All Data
BG-1-2	260
BG-1-43	21
BG-1-55	36
BG-1-78	59
BG-2-30	150
BG-2-81	84
BG-3-17	44
BG-3-22	30
BG-3-69	63
BG-4-2	62
BG-4-19	56
BG-4-40	88
BG-4-79	110
BG-4-161	59
BG-4-163	110
BG-6-28	56
BG-6-53	100
BG-6-87	38
BG-1-46	34
BG-1-92	26
BG-2-32	210
BG-2-75	35
BG-3-29	42
BG-3-63	34
BG-3-65	75
BG-3-95	44
BG-3-105	85
BG-3-131	23
BG-3-136	120
BG-4-10	84
BG-4-65	40
BG-4-82	140
BG-4-95	43
BG-4-117	30
BG-4-120	43
BG-6-58	45
BG-6-75	61
BG-6-98	86
BG-6-114	110
BG-1-127	44
BG-1-10	300
BG-1-29	280
BG-1-40	160
BG-2-2	180
BG-2-10	170
BG-2-19	190
BG-2-21	160
BG-3-2	56
BG-3-10	85
BG-6-2	240
BG-6-9	180

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Titanium.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	11
Minimum	44
Maximum	300
Mean of Raw Data	146.7
Standard Deviation of Raw Data	87.36
Kstar	2.172
Mean of Log Transformed Data	4.796
Standard Deviation of Log Transformed Data	0.673

Normal Distribution Test Results	
Correlation Coefficient R	0.957
Shapiro Wilk Test Statistic	0.899
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.173
Lilliefors Test Statistic	0.221
Lilliefors Critical (0.95) Value	0.246

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.959
A-D Test Statistic	0.621
A-D Critical (0.95) Value	0.74
K-S Test Statistic	0.212
K-S Critical(0.95) Value	0.239

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.957
Shapiro Wilk Test Statistic	0.896
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.166
Lilliefors Test Statistic	0.232
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

>20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	30
Minimum	21
Maximum	280
Mean of Raw Data	78.26
Standard Deviation of Raw Data	56.77
Kstar	2.306
Mean of Log Transformed Data	4.146
Standard Deviation of Log Transformed Data	0.65

Normal Distribution Test Results

Correlation Coefficient R	0.907
Shapiro Wilk Test Statistic	0.828
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	1.1268E-5
Lilliefors Test Statistic	0.185
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.985
A-D Test Statistic	0.789
A-D Critical (0.95) Value	0.757
K-S Test Statistic	0.166
K-S Critical(0.95) Value	0.145

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.987
Shapiro Wilk Test Statistic	0.962
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.302
Lilliefors Test Statistic	0.146
Lilliefors Critical (0.95) Value	0.144

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Titanium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	11

Raw Statistics		Log-Transformed Statistics	
Minimum	44	Minimum	3.784
Maximum	300	Maximum	5.704
Second Largest	260	Second Largest	5.561
First Quartile	62	First Quartile	4.127
Median	170	Median	5.136
Third Quartile	190	Third Quartile	5.247
Mean	146.7	Mean	4.796
SD	87.36	SD	0.673
Coefficient of Variation	0.596		
Skewness	0.351		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.899	Shapiro Wilk Test Statistic	0.896
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	380	95% UTL with 95% Coverage	729.7
95% UPL (t)	308.3	95% UPL (t)	419.9
90% Percentile (z)	258.7	90% Percentile (z)	286.6
95% Percentile (z)	290.4	95% Percentile (z)	365.9
99% Percentile (z)	349.9	99% Percentile (z)	578.7

Gamma Distribution Test		Data Distribution Test	
k star	2.172	Data appear Normal at 5% Significance Level	
Theta Star	67.55		
MLE of Mean	146.7		
MLE of Standard Deviation	99.55		
nu star	56.46		
A-D Test Statistic	0.621	Nonparametric Statistics	
5% A-D Critical Value	0.74	90% Percentile	256
K-S Test Statistic	0.212	95% Percentile	276
5% K-S Critical Value	0.239	99% Percentile	295.2
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	300
90% Percentile	279.9	95% Percentile Bootstrap UTL with 95% Coverage	300
95% Percentile	339.1	95% BCA Bootstrap UTL with 95% Coverage	300
99% Percentile	469.8	95% UPL	300
		95% Chebyshev UPL	541.9
95% WH Approx. Gamma UPL	358.5	Upper Threshold Limit Based upon IQR	382
95% HW Approx. Gamma UPL	370		
95% WH Approx. Gamma UTL with 95% Coverage	514.3		
95% HW Approx. Gamma UTL with 95% Coverage	549.5		

>20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	30

Raw Statistics		Log-Transformed Statistics	
Minimum	21	Minimum	3.045
Maximum	280	Maximum	5.635
Second Largest	210	Second Largest	5.347
First Quartile	38.5	First Quartile	3.65
Median	59	Median	4.078
Third Quartile	107.5	Third Quartile	4.677
Mean	78.26	Mean	4.146
SD	56.77	SD	0.65
Coefficient of Variation	0.725		
Skewness	1.701		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.828	Shapiro Wilk Test Statistic	0.962
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	199.3	95% UTL with 95% Coverage	252.3
95% UPL (t)	175.3	95% UPL (t)	191.7
90% Percentile (z)	151	90% Percentile (z)	145.2
95% Percentile (z)	171.6	95% Percentile (z)	183.8
99% Percentile (z)	210.3	99% Percentile (z)	286.2
Gamma Distribution Test		Data Distribution Test	
k star	2.306	Data appear Lognormal at 5% Significance Level	
Theta Star	33.94		
MLE of Mean	78.26		
MLE of Standard Deviation	51.54		
nu star	175.2		
A-D Test Statistic	0.789	Nonparametric Statistics	
5% A-D Critical Value	0.757	90% Percentile	153
K-S Test Statistic	0.166	95% Percentile	167.5
5% K-S Critical Value	0.145	99% Percentile	254.1

Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	280
90% Percentile	147.3	95% Percentile Bootstrap UTL with 95% Coverage	280
95% Percentile	177.6	95% BCA Bootstrap UTL with 95% Coverage	220.5
99% Percentile	244.3	95% UPL	213.5
		95% Chebyshev UPL	329
95% WH Approx. Gamma UPL	179.6	Upper Threshold Limit Based upon IQR	211
95% HW Approx. Gamma UPL	181.7		
95% WH Approx. Gamma UTL with 95% Coverage	219.2		
95% HW Approx. Gamma UTL with 95% Coverage	225		

Outlier Tests for Selected Variables

User Selected Options	
From File	Titanium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 300 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.246

For 10% significance level, 300 is not an outlier.
For 5% significance level, 300 is not an outlier.
For 1% significance level, 300 is not an outlier.

2. Data Value 44 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.056

For 10% significance level, 44 is not an outlier.
For 5% significance level, 44 is not an outlier.
For 1% significance level, 44 is not an outlier.

Rosner's Outlier Test for >20

Mean	78.26
Standard Deviation	56.77
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	78.26	56.02	280	22	3.601	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 280 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 280 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Titanium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Observations	38	13
Number of Distinct Observations	30	11
Minimum	21	44
Maximum	280	300
Mean	78.26	146.7
Median	59	170
SD	56.77	87.36
SE of Mean	9.21	24.23

Wilcoxon-Mann-Whitney (WMW) Test

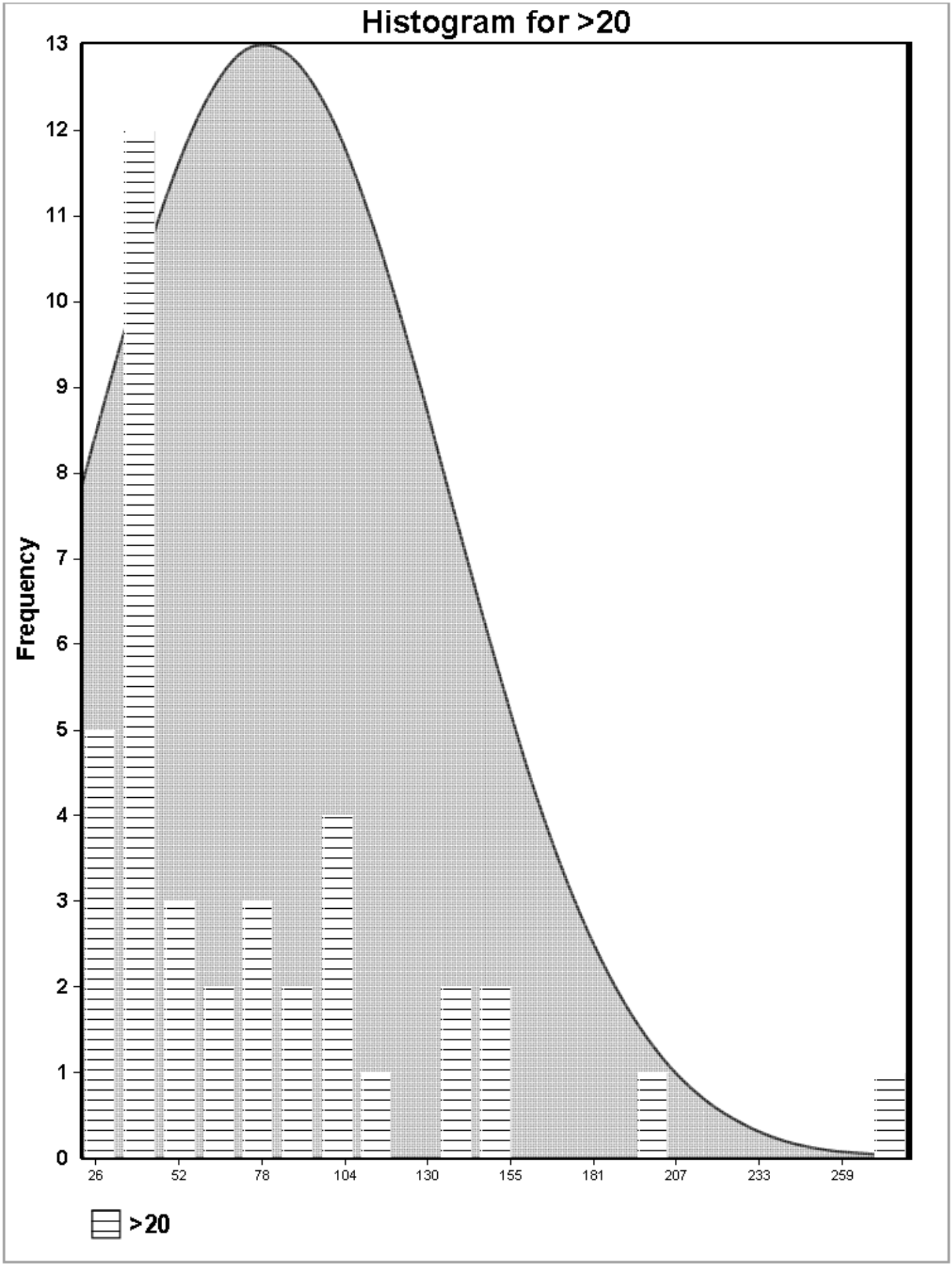
H0: Mean/Median of Site or AOC = Mean/Median of Background

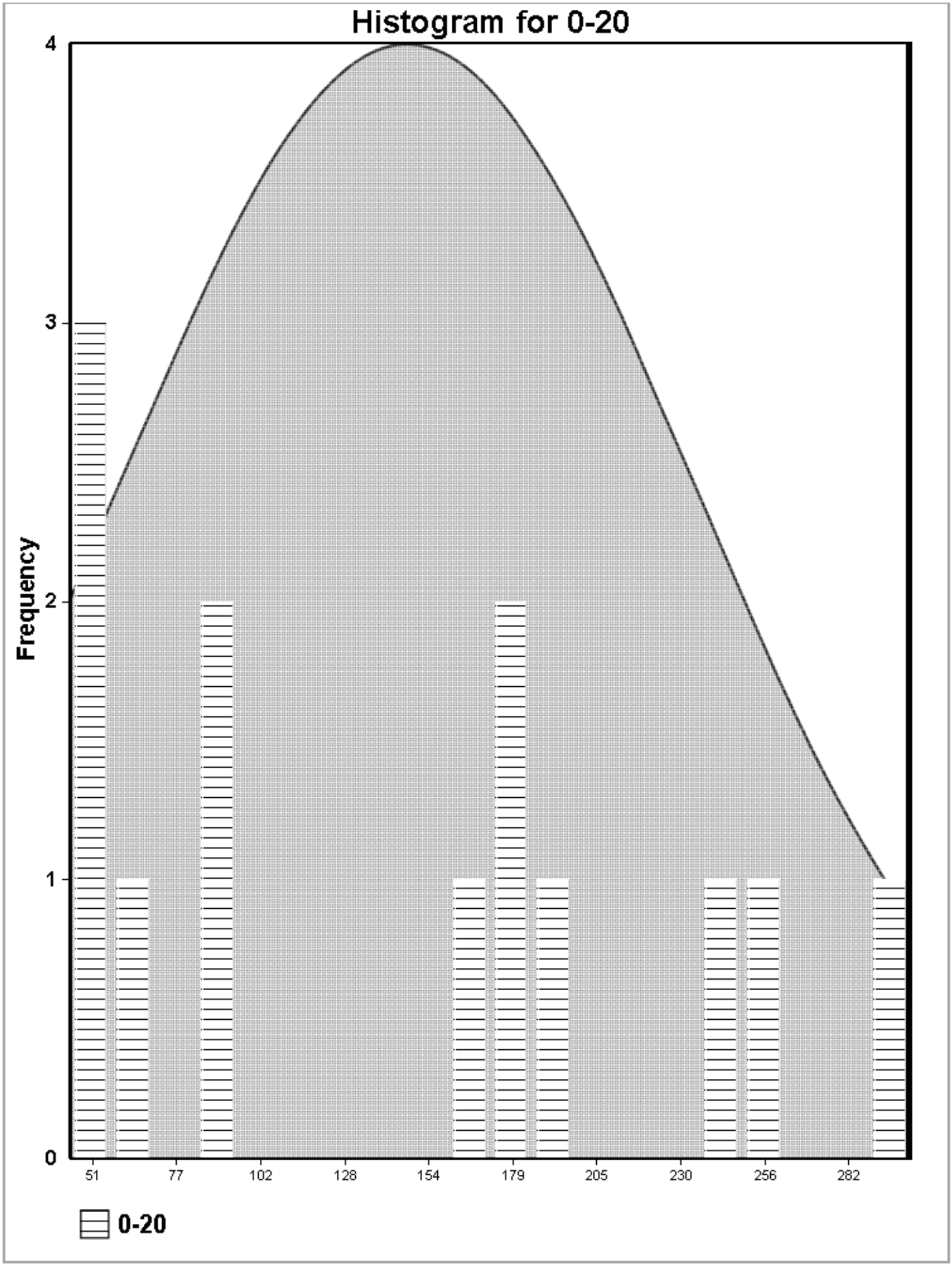
Site Rank Sum W-Stat	860
WMW Test U-Stat	2.756
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.00548

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
26
52
78
104
130
155
181
207
233
259
>20


Histogram for 0-20
Frequency
0
1
2
3
4
51
77
102
128
154
179
205
230
256
282
0-20

Location	0-20
BG-1-2	260
BG-3-17	44
BG-4-2	62
BG-4-19	56
BG-4-10	84
BG-1-10	300
BG-2-2	180
BG-2-10	170
BG-2-19	190
BG-3-2	56
BG-3-10	85
BG-6-2	240
BG-6-9	180

Location	>20
BG-1-46	34
BG-1-92	26
BG-2-32	210
BG-2-75	35
BG-3-29	42
BG-3-63	34
BG-3-65	75
BG-3-95	44
BG-3-105	85
BG-3-131	23
BG-3-136	120
BG-4-65	40
BG-4-82	140
BG-4-95	43
BG-4-117	30
BG-4-120	43
BG-6-58	45
BG-6-75	61
BG-6-98	86
BG-6-114	110
BG-1-127	44
BG-1-29	280
BG-1-40	160
BG-2-21	160
BG-1-43	21
BG-1-55	36
BG-1-78	59
BG-2-30	150
BG-2-81	84
BG-3-22	30
BG-3-69	63
BG-4-40	88
BG-4-79	110
BG-4-161	59
BG-4-163	110
BG-6-28	56
BG-6-53	100
BG-6-87	38

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Titanium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	15
Minimum	21
Maximum	260
Mean of Raw Data	79.22
Standard Deviation of Raw Data	55.94
Kstar	2.448
Mean of Log Transformed Data	4.19
Standard Deviation of Log Transformed Data	0.606

Normal Distribution Test Results	
Correlation Coefficient R	0.877
Shapiro Wilk Test Statistic	0.787
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	5.7070E-4
Lilliefors Test Statistic	0.225
Lilliefors Critical (0.95) Value	0.209

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.957
A-D Test Statistic	0.384
A-D Critical (0.95) Value	0.747
K-S Test Statistic	0.18
K-S Critical(0.95) Value	0.205

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.987
Shapiro Wilk Test Statistic	0.982
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.938
Lilliefors Test Statistic	0.142
Lilliefors Critical (0.95) Value	0.209

Data appear Lognormal at (0.05) Significance Level

Nonclay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	27
Minimum	23
Maximum	300
Mean of Raw Data	104.7
Standard Deviation of Raw Data	78.15
Kstar	1.82
Mean of Log Transformed Data	4.378
Standard Deviation of Log Transformed Data	0.76

Normal Distribution Test Results

Correlation Coefficient R	0.934
Shapiro Wilk Test Statistic	0.861
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	4.1262E-4
Lilliefors Test Statistic	0.201
Lilliefors Critical (0.95) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.982
A-D Test Statistic	0.919
A-D Critical (0.95) Value	0.759
K-S Test Statistic	0.179
K-S Critical(0.95) Value	0.155

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.976
Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.0539
Lilliefors Test Statistic	0.168
Lilliefors Critical (0.95) Value	0.154

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Titanium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	15

Raw Statistics		Log-Transformed Statistics	
Minimum	21	Minimum	3.045
Maximum	260	Maximum	5.561
Second Largest	150	Second Largest	5.011
First Quartile	47	First Quartile	3.844
Median	60.5	Median	4.102
Third Quartile	97	Third Quartile	4.573
Mean	79.22	Mean	4.19
SD	55.94	SD	0.606
Coefficient of Variation	0.706		
Skewness	2.181		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.787	Shapiro Wilk Test Statistic	0.982
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	216.4	95% UTL with 95% Coverage	291.8
95% UPL (t)	179.2	95% UPL (t)	195
90% Percentile (z)	150.9	90% Percentile (z)	143.5
95% Percentile (z)	171.2	95% Percentile (z)	178.8
99% Percentile (z)	209.4	99% Percentile (z)	270.3

Gamma Distribution Test		Data Distribution Test	
k star	2.448	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	32.36		
MLE of Mean	79.22		
MLE of Standard Deviation	50.63		
nu star	88.13		
A-D Test Statistic	0.384	Nonparametric Statistics	
5% A-D Critical Value	0.747	90% Percentile	122
K-S Test Statistic	0.18	95% Percentile	166.5
5% K-S Critical Value	0.205	99% Percentile	241.3
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	260
90% Percentile	147	95% Percentile Bootstrap UTL with 95% Coverage	260
95% Percentile	176.5	95% BCA Bootstrap UTL with 95% Coverage	260
99% Percentile	241.1	95% UPL	260
		95% Chebyshev UPL	329.7
95% WH Approx. Gamma UPL	181.8	Upper Threshold Limit Based upon IQR	172
95% HW Approx. Gamma UPL	183.9		
95% WH Approx. Gamma UTL with 95% Coverage	243		
95% HW Approx. Gamma UTL with 95% Coverage	251.2		

Nonclay

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	27
Raw Statistics		**Log-Transformed Statistics**	
Minimum	23	Minimum	3.135
Maximum	300	Maximum	5.704
Second Largest	280	Second Largest	5.635
First Quartile	43	First Quartile	3.761
Median	84	Median	4.431
Third Quartile	160	Third Quartile	5.075
Mean	104.7	Mean	4.378
SD	78.15	SD	0.76
Coefficient of Variation	0.746		
Skewness	0.991		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.861	Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	274.8	95% UTL with 95% Coverage	416.4
95% UPL (t)	239.1	95% UPL (t)	294.3
90% Percentile (z)	204.9	90% Percentile (z)	211
95% Percentile (z)	233.2	95% Percentile (z)	278.1
99% Percentile (z)	286.5	99% Percentile (z)	466.8
Gamma Distribution Test		**Data Distribution Test**	
k star	1.82	Data appear Lognormal at 5% Significance Level	
Theta Star	57.52		
MLE of Mean	104.7		
MLE of Standard Deviation	77.6		
nu star	120.1		
A-D Test Statistic	0.919	**Nonparametric Statistics**	
5% A-D Critical Value	0.759	90% Percentile	206
K-S Test Statistic	0.179	95% Percentile	256
5% K-S Critical Value	0.155	99% Percentile	293.6

Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	300
90% Percentile	208.2	95% Percentile Bootstrap UTL with 95% Coverage	300
95% Percentile	255.9	95% BCA Bootstrap UTL with 95% Coverage	300
99% Percentile	362.4	95% UPL	286
		95% Chebyshev UPL	450.5
95% WH Approx. Gamma UPL	261.1	Upper Threshold Limit Based upon IQR	335.5
95% HW Approx. Gamma UPL	267		
95% WH Approx. Gamma UTL with 95% Coverage	329.9		
95% HW Approx. Gamma UTL with 95% Coverage	344.6		

Outlier Tests for Selected Variables

User Selected Options	
From File	Titanium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 260 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.670

For 10% significance level, 260 is an outlier.

For 5% significance level, 260 is an outlier.

For 1% significance level, 260 is an outlier.

2. Data Value 21 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.169

For 10% significance level, 21 is not an outlier.

For 5% significance level, 21 is not an outlier.

For 1% significance level, 21 is not an outlier.

Rosner's Outlier Test for Nonclay

Mean	104.7
Standard Deviation	78.15
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	104.7	76.96	300	23	2.538	2.95	3.29

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Titanium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Nonclay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Observations	33	18
Number of Distinct Observations	27	15
Minimum	23	21
Maximum	300	260
Mean	104.7	79.22
Median	84	60.5
SD	78.15	55.94
SE of Mean	13.6	13.18

Wilcoxon-Mann-Whitney (WMW) Test

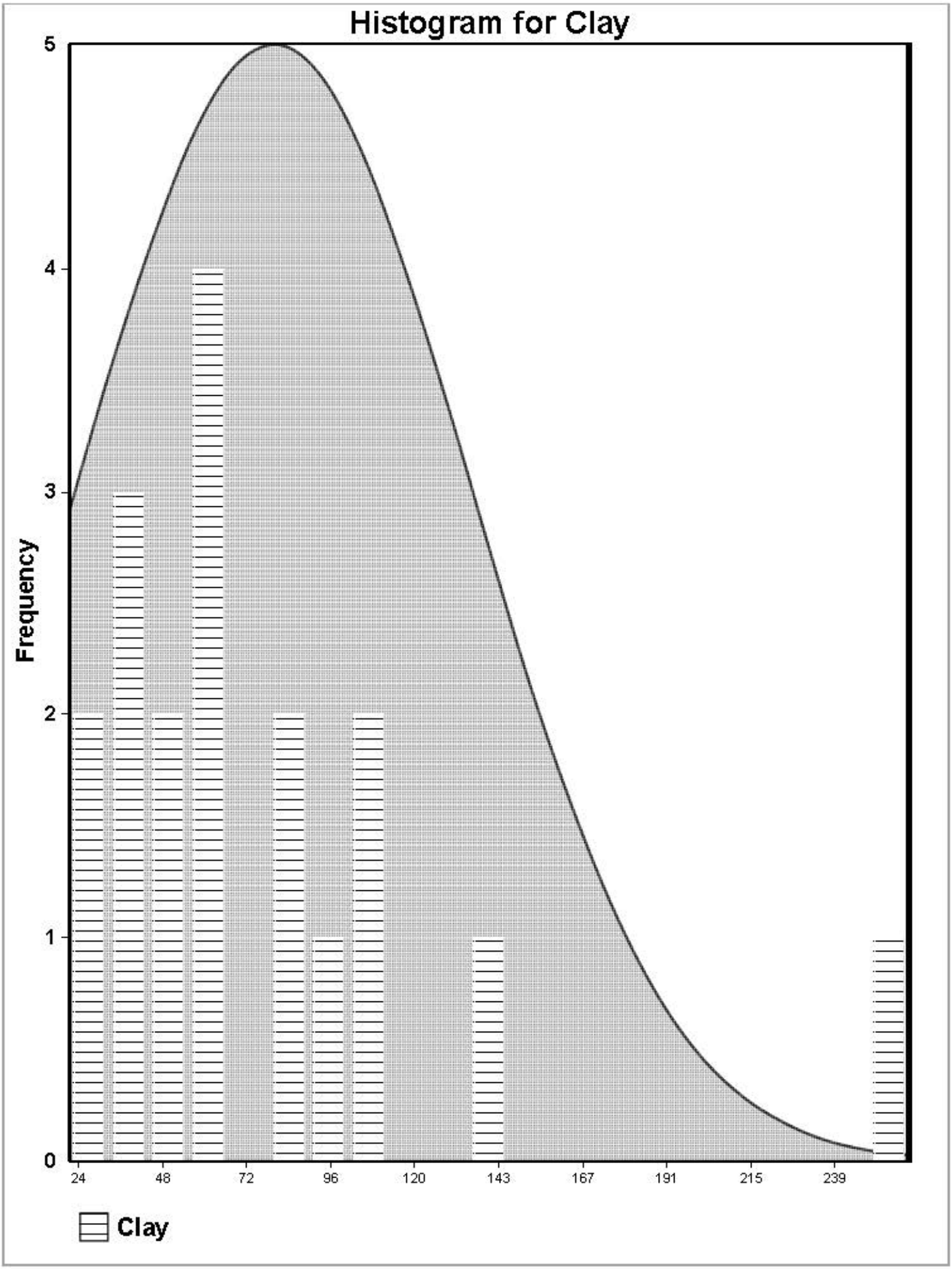
H0: Mean/Median of Site or AOC = Mean/Median of Background

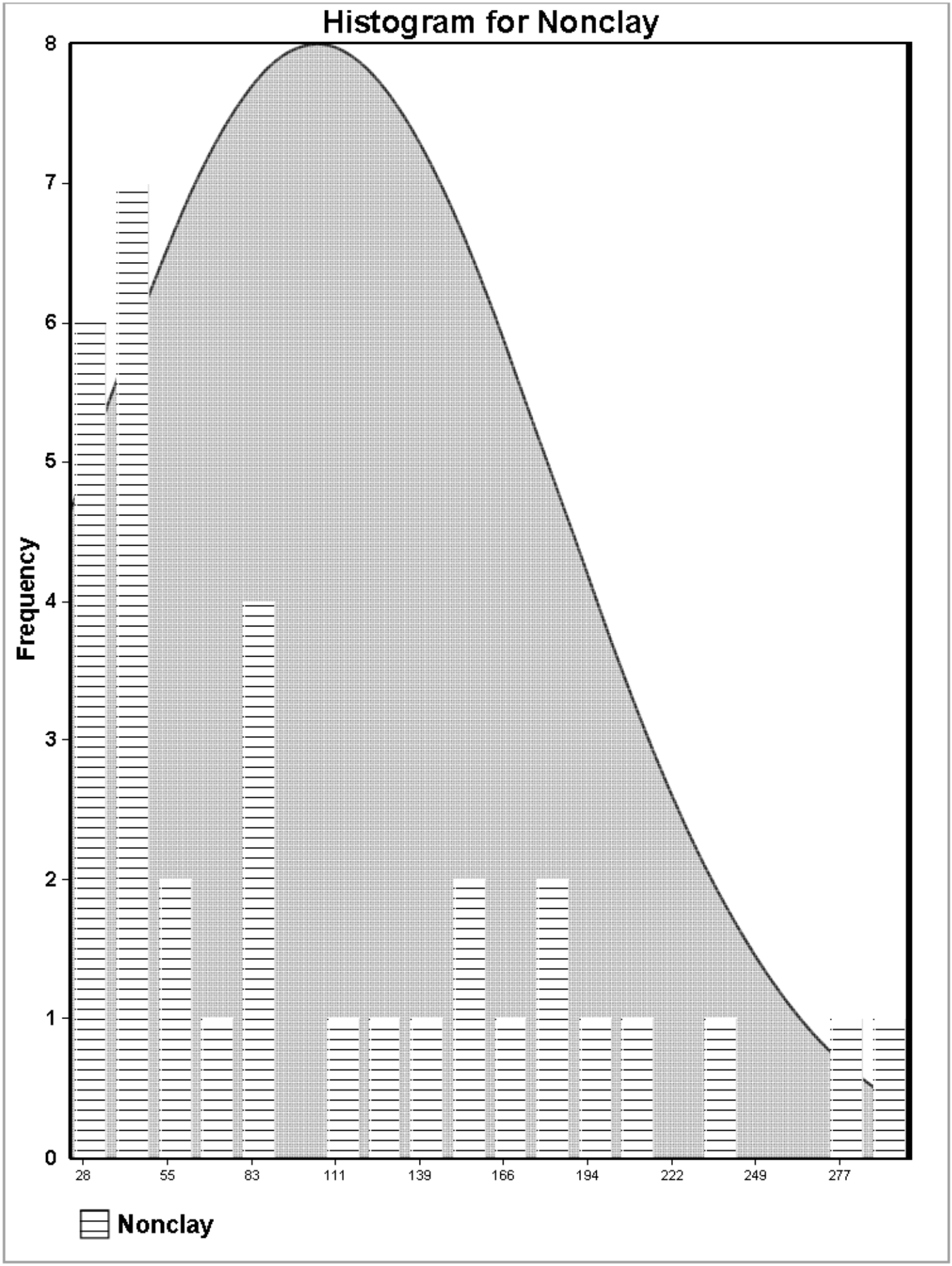
Site Rank Sum W-Stat	893
WMW Test U-Stat	0.68
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.496

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
5
24
48
72
96
120
143
167
191
215
239
Clay


Histogram for Nonclay
Frequency
0
1
2
3
4
5
6
7
8
28
55
83
111
139
166
194
222
249
277
Nonclay

Location	Clay
BG-1-2	260
BG-1-43	21
BG-1-55	36
BG-1-78	59
BG-2-30	150
BG-2-81	84
BG-3-17	44
BG-3-22	30
BG-3-69	63
BG-4-2	62
BG-4-19	56
BG-4-40	88
BG-4-79	110
BG-4-161	59
BG-4-163	110
BG-6-28	56
BG-6-53	100
BG-6-87	38

Location	Nonclay
BG-1-46	34
BG-1-92	26
BG-2-32	210
BG-2-75	35
BG-3-29	42
BG-3-63	34
BG-3-65	75
BG-3-95	44
BG-3-105	85
BG-3-131	23
BG-3-136	120
BG-4-10	84
BG-4-65	40
BG-4-82	140
BG-4-95	43
BG-4-117	30
BG-4-120	43
BG-6-58	45
BG-6-75	61
BG-6-98	86
BG-6-114	110
BG-1-127	44
BG-1-10	300
BG-1-29	280
BG-1-40	160
BG-2-2	180
BG-2-10	170
BG-2-19	190
BG-2-21	160
BG-3-2	56
BG-3-10	85
BG-6-2	240
BG-6-9	180

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Titanium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	10
Minimum	56
Maximum	300
Mean of Raw Data	188.4
Standard Deviation of Raw Data	73.21
Kstar	4.279
Mean of Log Transformed Data	5.147
Standard Deviation of Log Transformed Data	0.487

Normal Distribution Test Results	
Correlation Coefficient R	0.976
Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.607
Lilliefors Test Statistic	0.182
Lilliefors Critical (0.95) Value	0.256

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.952
A-D Test Statistic	0.521
A-D Critical (0.95) Value	0.732
K-S Test Statistic	0.241
K-S Critical(0.95) Value	0.246

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.928
Shapiro Wilk Test Statistic	0.867
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.0513
Lilliefors Test Statistic	0.275
Lilliefors Critical (0.95) Value	0.256

Data appear Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	29
Minimum	21
Maximum	210
Mean of Raw Data	67.18
Standard Deviation of Raw Data	40.52
Kstar	3.175
Mean of Log Transformed Data	4.054
Standard Deviation of Log Transformed Data	0.552

Normal Distribution Test Results

Correlation Coefficient R	0.925
Shapiro Wilk Test Statistic	0.862
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	9.4771E-5
Lilliefors Test Statistic	0.182
Lilliefors Critical (0.95) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.985
A-D Test Statistic	0.628
A-D Critical (0.95) Value	0.754
K-S Test Statistic	0.156
K-S Critical(0.95) Value	0.142

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.99
Shapiro Wilk Test Statistic	0.973
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.563
Lilliefors Test Statistic	0.135
Lilliefors Critical (0.95) Value	0.142

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Titanium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	10

Raw Statistics		Log-Transformed Statistics	
Minimum	56	Minimum	4.025
Maximum	300	Maximum	5.704
Second Largest	280	Second Largest	5.635
First Quartile	160	First Quartile	5.075
Median	180	Median	5.193
Third Quartile	245	Third Quartile	5.501
Mean	188.4	Mean	5.147
SD	73.21	SD	0.487
Coefficient of Variation	0.389		
Skewness	-0.228		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.948	Shapiro Wilk Test Statistic	0.867
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	388.7	95% UTL with 95% Coverage	651.8
95% UPL (t)	325.3	95% UPL (t)	427.4
90% Percentile (z)	282.2	90% Percentile (z)	321
95% Percentile (z)	308.8	95% Percentile (z)	383.1
99% Percentile (z)	358.7	99% Percentile (z)	533.9

Gamma Distribution Test		Data Distribution Test	
k star	4.279	Data appear Normal at 5% Significance Level	
Theta Star	44.03		
MLE of Mean	188.4		
MLE of Standard Deviation	91.08		
nu star	102.7		
A-D Test Statistic	0.521	Nonparametric Statistics	
5% A-D Critical Value	0.732	90% Percentile	278
K-S Test Statistic	0.241	95% Percentile	289
5% K-S Critical Value	0.246	99% Percentile	297.8
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	300
90% Percentile	310.5	95% Percentile Bootstrap UTL with 95% Coverage	300
95% Percentile	358.8	95% BCA Bootstrap UTL with 95% Coverage	300
99% Percentile	461.8	95% UPL	300
		95% Chebyshev UPL	520.5
95% WH Approx. Gamma UPL	372.3	Upper Threshold Limit Based upon IQR	372.5
95% HW Approx. Gamma UPL	382.8		
95% WH Approx. Gamma UTL with 95% Coverage	497		
95% HW Approx. Gamma UTL with 95% Coverage	523.8		

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	29

Raw Statistics		Log-Transformed Statistics	
Minimum	21	Minimum	3.045
Maximum	210	Maximum	5.347
Second Largest	150	Second Largest	5.011
First Quartile	39	First Quartile	3.663
Median	56	Median	4.025
Third Quartile	85.5	Third Quartile	4.448
Mean	67.18	Mean	4.054
SD	40.52	SD	0.552
Coefficient of Variation	0.603		
Skewness	1.535		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.862	Shapiro Wilk Test Statistic	0.973
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	153.3	95% UTL with 95% Coverage	186.1
95% UPL (t)	136.4	95% UPL (t)	147.8
90% Percentile (z)	119.1	90% Percentile (z)	116.9
95% Percentile (z)	133.8	95% Percentile (z)	142.8
99% Percentile (z)	161.4	99% Percentile (z)	208
Gamma Distribution Test		Data Distribution Test	
k star	3.175	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	21.16		
MLE of Mean	67.18		
MLE of Standard Deviation	37.7		
nu star	247.6		
A-D Test Statistic	0.628	Nonparametric Statistics	
5% A-D Critical Value	0.754	90% Percentile	112
K-S Test Statistic	0.156	95% Percentile	141
5% K-S Critical Value	0.142	99% Percentile	187.2

Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	210
90% Percentile	117.7	95% Percentile Bootstrap UTL with 95% Coverage	210
95% Percentile	138.7	95% BCA Bootstrap UTL with 95% Coverage	210
99% Percentile	184.1	95% UPL	150
		95% Chebyshev UPL	246
95% WH Approx. Gamma UPL	140.2	Upper Threshold Limit Based upon IQR	155.3
95% HW Approx. Gamma UPL	141.6		
95% WH Approx. Gamma UTL with 95% Coverage	166.8		
95% HW Approx. Gamma UTL with 95% Coverage	170.4		

Outlier Tests for Selected Variables

User Selected Options	
From File	Titanium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12
10% critical value: 0.49
5% critical value: 0.546
1% critical value: 0.642

1. Data Value 300 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.186

For 10% significance level, 300 is not an outlier.
For 5% significance level, 300 is not an outlier.
For 1% significance level, 300 is not an outlier.

2. Data Value 56 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.464

For 10% significance level, 56 is not an outlier.
For 5% significance level, 56 is not an outlier.
For 1% significance level, 56 is not an outlier.

Rosner's Outlier Test for MC

Mean	67.18
Standard Deviation	40.52
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	67.18	39.99	210	7	3.571	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 210 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 210 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Titanium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Observations	39	12
Number of Distinct Observations	29	10
Minimum	21	56
Maximum	210	300
Mean	67.18	188.4
Median	56	180
SD	40.52	73.21
SE of Mean	6.488	21.13

Wilcoxon-Mann-Whitney (WMW) Test

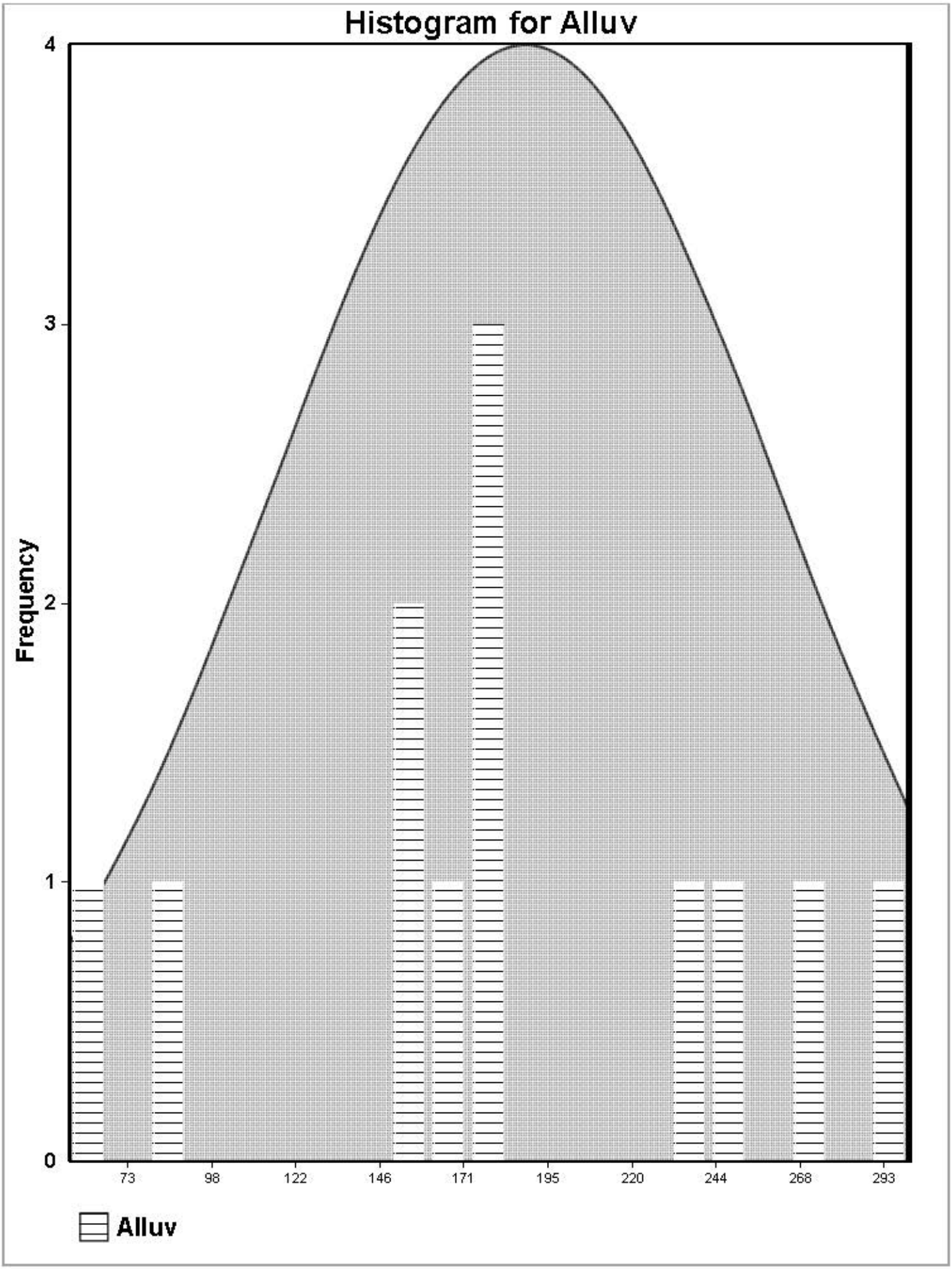
H0: Mean/Median of Site or AOC = Mean/Median of Background

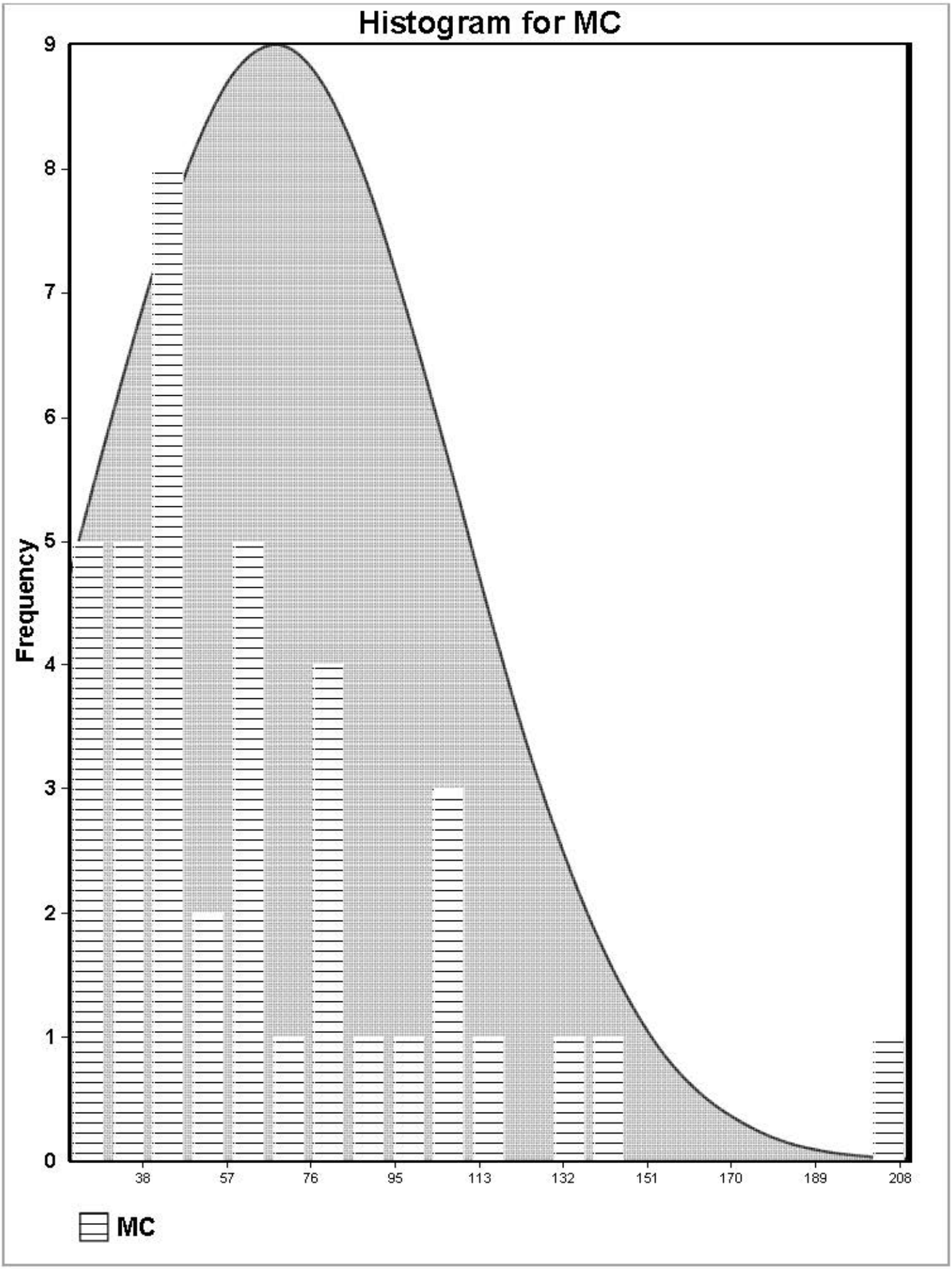
Site Rank Sum W-Stat	816.5
WMW Test U-Stat	4.375
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	1.0989E-5

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
73
98
122
146
171
195
220
244
268
293
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
7
8
9
38
57
76
95
113
132
151
170
189
208
MC

Location	Alluv
BG-1-2	260
BG-1-10	300
BG-1-29	280
BG-1-40	160
BG-2-2	180
BG-2-10	170
BG-2-19	190
BG-2-21	160
BG-3-2	56
BG-3-10	85
BG-6-2	240
BG-6-9	180

Location	MC
BG-1-43	21
BG-1-46	34
BG-1-55	36
BG-1-78	59
BG-1-92	26
BG-2-30	150
BG-2-32	210
BG-2-75	35
BG-2-81	84
BG-3-17	44
BG-3-22	30
BG-3-29	42
BG-3-63	34
BG-3-65	75
BG-3-69	63
BG-3-95	44
BG-3-105	85
BG-3-131	23
BG-3-136	120
BG-4-1	62
BG-4-10	84
BG-4-19	56
BG-4-40	88
BG-4-65	40
BG-4-79	110
BG-4-82	140
BG-4-95	43
BG-4-117	30
BG-4-120	43
BG-4-161	59
BG-4-163	110
BG-6-28	56
BG-6-53	100
BG-6-58	45
BG-6-75	61
BG-6-87	38
BG-6-98	86
BG-6-114	110
BG-1-127	44
Average	67.17949

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Vanadium.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	33
Minimum	5.1
Maximum	54
Mean of Raw Data	18.39
Standard Deviation of Raw Data	10.9
Kstar	2.992
Mean of Log Transformed Data	2.745
Standard Deviation of Log Transformed Data	0.588

Normal Distribution Test Results	
Correlation Coefficient R	0.95
Approximate Shapiro Wilk Test Statistic	0.899
Approximate Shapiro Wilk P Value	1.9657E-4
Lilliefors Test Statistic	0.127
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.995
A-D Test Statistic	0.475
A-D Critical (0.95) Value	0.756
K-S Test Statistic	0.0982
K-S Critical(0.95) Value	0.125

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.99
Approximate Shapiro Wilk Test Statistic	0.965
Approximate Shapiro Wilk P Value	0.236
Lilliefors Test Statistic	0.0887
Lilliefors Critical (0.95) Value	0.124

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Vanadium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Total Number of Observations	51	Number of Distinct Observations	33

Raw Statistics		Log-Transformed Statistics	
Minimum	5.1	Minimum	1.629
Maximum	54	Maximum	3.989
Second Largest	46	Second Largest	3.829
First Quartile	9.5	First Quartile	2.251
Median	17	Median	2.833
Third Quartile	25	Third Quartile	3.219
Mean	18.39	Mean	2.745
SD	10.9	SD	0.588
Coefficient of Variation	0.593		
Skewness	1.165		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.127	Lilliefors Test Statistic	0.0887
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	40.76	95% UTL with 95% Coverage	52.13
95% UPL (t)	36.83	95% UPL (t)	42.14
90% Percentile (z)	32.35	90% Percentile (z)	33.1
95% Percentile (z)	36.31	95% Percentile (z)	40.98
99% Percentile (z)	43.74	99% Percentile (z)	61.2

Gamma Distribution Test		Data Distribution Test
k star	2.992	Data appear Gamma Distributed at 5% Significance Level
Theta Star	6.145	
MLE of Mean	18.39	
MLE of Standard Deviation	10.63	
nu star	305.2	
A-D Test Statistic	0.475	Nonparametric Statistics
5% A-D Critical Value	0.756	90% Percentile 31
K-S Test Statistic	0.0982	95% Percentile 38
5% K-S Critical Value	0.125	99% Percentile 50
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	46
90% Percentile	32.64	95% Percentile Bootstrap UTL with 95% Coverage	50
95% Percentile	38.61	95% BCA Bootstrap UTL with 95% Coverage	47.5
99% Percentile	51.57	95% UPL	43
		95% Chebyshev UPL	66.35
95% WH Approx. Gamma UPL	38.96	Upper Threshold Limit Based upon IQR	48.25
95% HW Approx. Gamma UPL	39.55		
95% WH Approx. Gamma UTL with 95% Coverage	45.53		
95% HW Approx. Gamma UTL with 95% Coverage	46.74		

Outlier Tests for Selected Variables

User Selected Options	
From File	Vanadium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for All Data

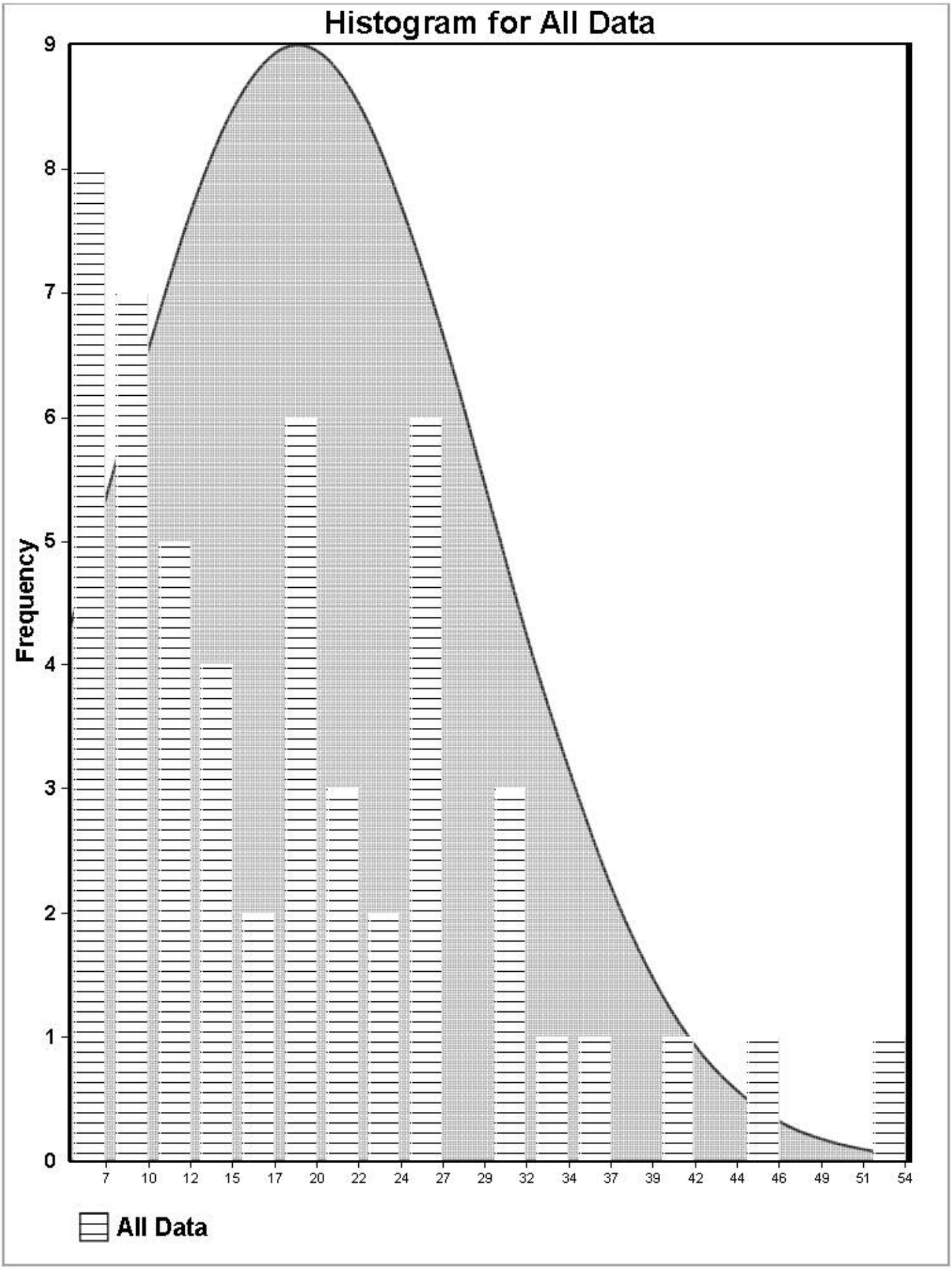
Mean	18.39
Standard Deviation	10.9
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	18.39	10.79	54	51	3.301	3.137	3.488

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 54 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
7
10
12
15
17
20
22
24
27
29
32
34
37
39
42
44
46
49
51
54
All Data

Location	All Data
BG-1-2	23
BG-3-17	9.9
BG-4-2	19
BG-4-19	46
BG-1-10	13
BG-2-2	12
BG-2-10	12
BG-2-19	14
BG-3-2	9.4
BG-3-10	19
BG-4-10	25
BG-6-2	18
BG-6-9	17
BG-1-29	18
BG-1-40	8.1
BG-1-46	8.5
BG-1-92	6.7
BG-2-21	12
BG-2-32	14
BG-2-75	7.4
BG-3-29	8.7
BG-3-63	8.4
BG-3-65	14
BG-3-95	6.6
BG-3-105	18
BG-3-131	5.1
BG-3-136	31
BG-4-65	9.6
BG-4-82	20
BG-4-95	7.3
BG-4-117	6
BG-4-120	25
BG-6-58	10
BG-6-75	12
BG-6-98	21
BG-6-114	22
BG-6-127	41
BG-1-43	27
BG-1-55	7.4
BG-1-78	27
BG-2-30	25
BG-2-81	27
BG-3-22	6.6
BG-3-69	18
BG-4-40	35
BG-4-79	32
BG-4-161	17
BG-4-163	30
BG-6-28	31
BG-6-53	23
BG-6-87	54

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Vanadium.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	11
Minimum	9.4
Maximum	46
Mean of Raw Data	18.25
Standard Deviation of Raw Data	9.63
Kstar	4.161
Mean of Log Transformed Data	2.808
Standard Deviation of Log Transformed Data	0.433

Normal Distribution Test Results	
Correlation Coefficient R	0.869
Shapiro Wilk Test Statistic	0.775
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.00214
Lilliefors Test Statistic	0.238
Lilliefors Critical (0.95) Value	0.246

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.934
A-D Test Statistic	0.465
A-D Critical (0.95) Value	0.736
K-S Test Statistic	0.175
K-S Critical(0.95) Value	0.237

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.964
Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.355
Lilliefors Test Statistic	0.145
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

>20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	28
Minimum	5.1
Maximum	54
Mean of Raw Data	18.43
Standard Deviation of Raw Data	11.42
Kstar	2.584
Mean of Log Transformed Data	2.724
Standard Deviation of Log Transformed Data	0.637

Normal Distribution Test Results

Correlation Coefficient R	0.95
Shapiro Wilk Test Statistic	0.9
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.00233
Lilliefors Test Statistic	0.138
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.989
A-D Test Statistic	0.735
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.133
K-S Critical(0.95) Value	0.144

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.978
Shapiro Wilk Test Statistic	0.942
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.0642
Lilliefors Test Statistic	0.127
Lilliefors Critical (0.95) Value	0.144

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Vanadium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	11

Raw Statistics		Log-Transformed Statistics	
Minimum	9.4	Minimum	2.241
Maximum	46	Maximum	3.829
Second Largest	25	Second Largest	3.219
First Quartile	12	First Quartile	2.485
Median	17	Median	2.833
Third Quartile	19	Third Quartile	2.944
Mean	18.25	Mean	2.808
SD	9.63	SD	0.433
Coefficient of Variation	0.528		
Skewness	2.182		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.775	Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	43.97	95% UTL with 95% Coverage	52.64
95% UPL (t)	36.06	95% UPL (t)	36.9
90% Percentile (z)	30.59	90% Percentile (z)	28.86
95% Percentile (z)	34.09	95% Percentile (z)	33.77
99% Percentile (z)	40.66	99% Percentile (z)	45.35

Gamma Distribution Test		Data Distribution Test
k star	4.161	Data appear Gamma Distributed at 5% Significance Level
Theta Star	4.387	
MLE of Mean	18.25	
MLE of Standard Deviation	8.948	
nu star	108.2	
A-D Test Statistic	0.465	Nonparametric Statistics
5% A-D Critical Value	0.736	90% Percentile 24.6
K-S Test Statistic	0.175	95% Percentile 33.4
5% K-S Critical Value	0.237	99% Percentile 43.48
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	46
90% Percentile	30.25	95% Percentile Bootstrap UTL with 95% Coverage	46
95% Percentile	35.02	95% BCA Bootstrap UTL with 95% Coverage	46
99% Percentile	45.19	95% UPL	46
		95% Chebyshev UPL	61.81
95% WH Approx. Gamma UPL	36.1	Upper Threshold Limit Based upon IQR	29.5
95% HW Approx. Gamma UPL	36.24		
95% WH Approx. Gamma UTL with 95% Coverage	47.8		
95% HW Approx. Gamma UTL with 95% Coverage	48.73		

>20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	28
Raw Statistics		Log-Transformed Statistics	
Minimum	5.1	Minimum	1.629
Maximum	54	Maximum	3.989
Second Largest	41	Second Largest	3.714
First Quartile	8.425	First Quartile	2.131
Median	17.5	Median	2.862
Third Quartile	26.5	Third Quartile	3.277
Mean	18.43	Mean	2.724
SD	11.42	SD	0.637
Coefficient of Variation	0.619		
Skewness	1.004		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.9	Shapiro Wilk Test Statistic	0.942
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	42.78	95% UTL with 95% Coverage	59.22
95% UPL (t)	37.95	95% UPL (t)	45.24
90% Percentile (z)	33.06	90% Percentile (z)	34.46
95% Percentile (z)	37.21	95% Percentile (z)	43.43
99% Percentile (z)	44.99	99% Percentile (z)	67.02
Gamma Distribution Test		Data Distribution Test	
k star	2.584	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	7.133		
MLE of Mean	18.43		
MLE of Standard Deviation	11.47		
nu star	196.4		
A-D Test Statistic	0.735	Nonparametric Statistics	
5% A-D Critical Value	0.755	90% Percentile	31.3
K-S Test Statistic	0.133	95% Percentile	35.9
5% K-S Critical Value	0.144	99% Percentile	49.19

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	54
90% Percentile	33.8	95% Percentile Bootstrap UTL with 95% Coverage	54
95% Percentile	40.41	95% BCA Bootstrap UTL with 95% Coverage	54
99% Percentile	54.86	95% UPL	41.65
		95% Chebyshev UPL	68.85
95% WH Approx. Gamma UPL	41.02	Upper Threshold Limit Based upon IQR	53.61
95% HW Approx. Gamma UPL	41.81		
95% WH Approx. Gamma UTL with 95% Coverage	49.64		
95% HW Approx. Gamma UTL with 95% Coverage	51.37		

Outlier Tests for Selected Variables

User Selected Options	
From File	Vanadium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 46 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.637

For 10% significance level, 46 is an outlier.
For 5% significance level, 46 is an outlier.
For 1% significance level, 46 is an outlier.

2. Data Value 9.4 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.167

For 10% significance level, 9.4 is not an outlier.
For 5% significance level, 9.4 is not an outlier.
For 1% significance level, 9.4 is not an outlier.

Rosner's Outlier Test for >20

Mean	18.43
Standard Deviation	11.42
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	18.43	11.27	54	38	3.157	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 54 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Vanadium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Observations	38	13
Number of Distinct Observations	28	11
Minimum	5.1	9.4
Maximum	54	46
Mean	18.43	18.25
Median	17.5	17
SD	11.42	9.63
SE of Mean	1.852	2.671

Wilcoxon-Mann-Whitney (WMW) Test

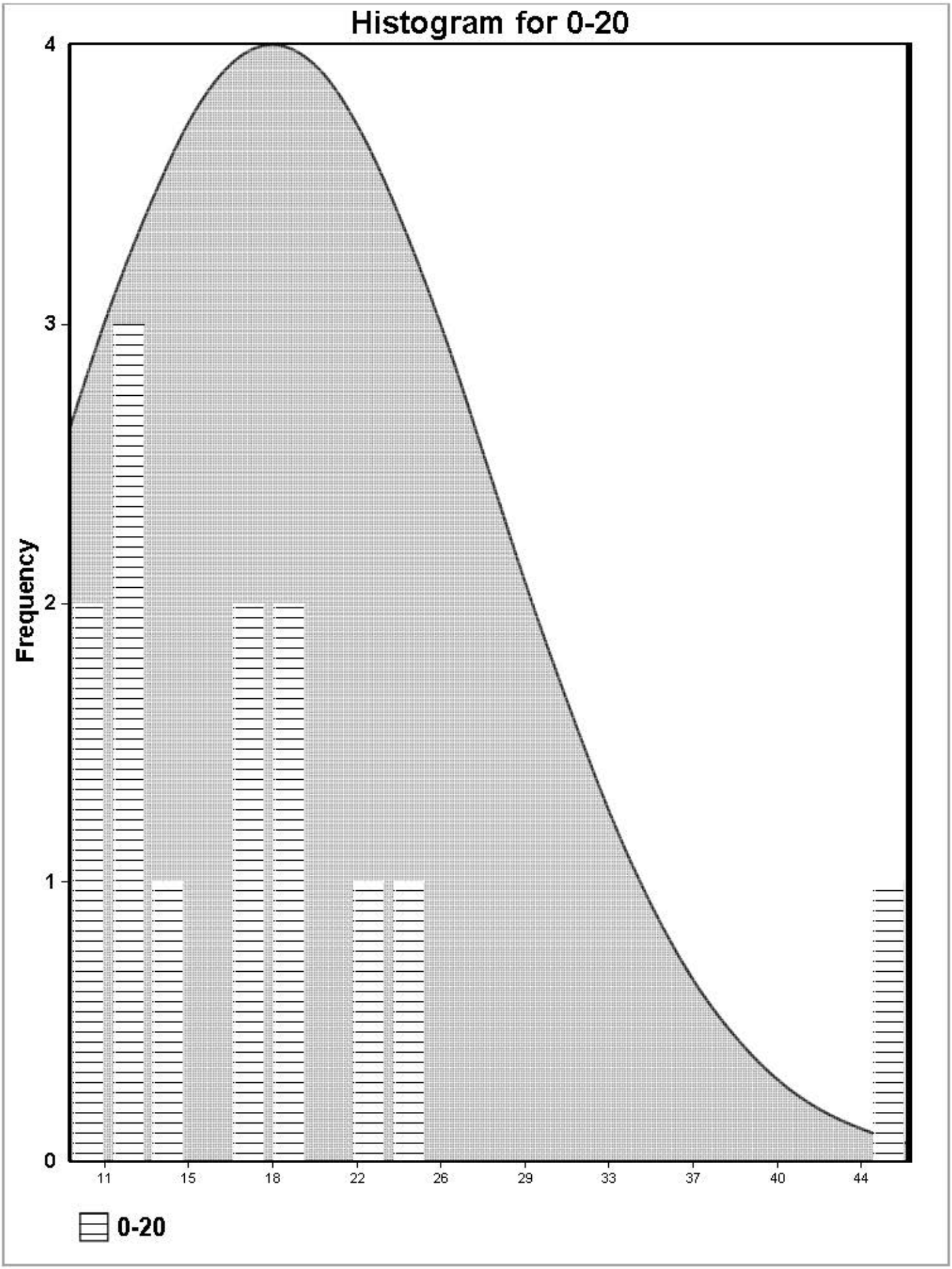
H0: Mean/Median of Site or AOC = Mean/Median of Background

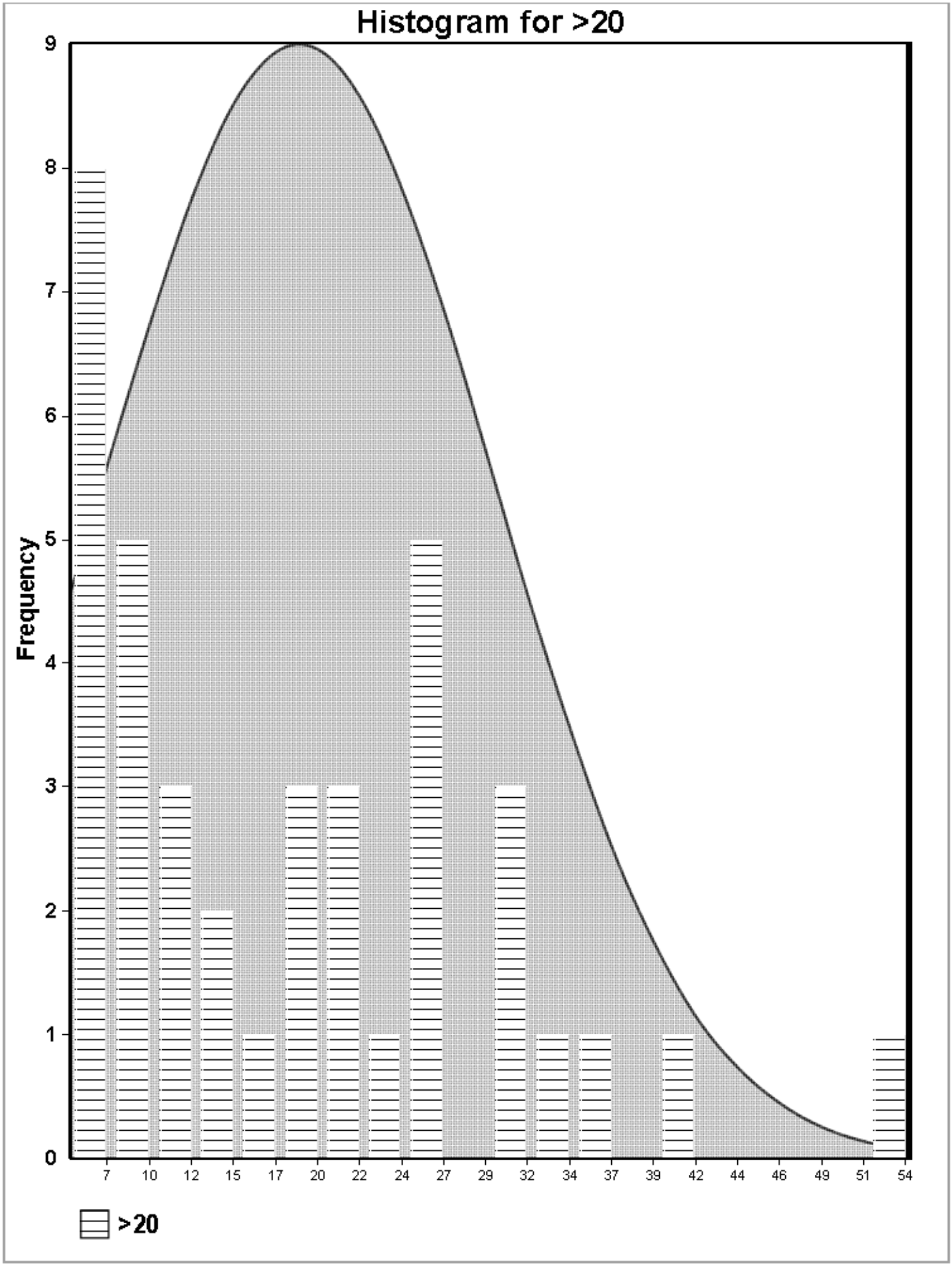
Site Rank Sum W-Stat	974.5
WMW Test U-Stat	0.281
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.762

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for 0-20
Frequency
0
1
2
3
4
11
15
18
22
26
29
33
37
40
44
0-20


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
8
9
7
10
12
15
17
20
22
24
27
29
32
34
37
39
42
44
46
49
51
54
>20

Location	0-20
BG-1-2	23
BG-3-17	9.9
BG-4-2	19
BG-4-19	46
BG-1-10	13
BG-2-2	12
BG-2-10	12
BG-2-19	14
BG-3-2	9.4
BG-3-10	19
BG-4-10	25
BG-6-2	18
BG-6-9	17

Location	>20
BG-1-29	18
BG-1-40	8.1
BG-1-46	8.5
BG-1-92	6.7
BG-2-21	12
BG-2-32	14
BG-2-75	7.4
BG-3-29	8.7
BG-3-63	8.4
BG-3-65	14
BG-3-95	6.6
BG-3-105	18
BG-3-131	5.1
BG-3-136	31
BG-4-65	9.6
BG-4-82	20
BG-4-95	7.3
BG-4-117	6
BG-4-120	25
BG-6-58	10
BG-6-75	12
BG-6-98	21
BG-6-114	22
BG-6-127	41
BG-1-43	27
BG-1-55	7.4
BG-1-78	27
BG-2-30	25
BG-2-81	27
BG-3-22	6.6
BG-3-69	18
BG-4-40	35
BG-4-79	32
BG-4-161	17
BG-4-163	30
BG-6-28	31
BG-6-53	23
BG-6-87	54

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Vanadium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	15
Minimum	6.6
Maximum	54
Mean of Raw Data	25.44
Standard Deviation of Raw Data	12.21
Kstar	3.357
Mean of Log Transformed Data	3.106
Standard Deviation of Log Transformed Data	0.567

Normal Distribution Test Results	
Correlation Coefficient R	0.974
Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.442
Lilliefors Test Statistic	0.129
Lilliefors Critical (0.95) Value	0.209

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.981
A-D Test Statistic	0.442
A-D Critical (0.95) Value	0.743
K-S Test Statistic	0.155
K-S Critical(0.95) Value	0.205

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.956
Shapiro Wilk Test Statistic	0.914
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.104
Lilliefors Test Statistic	0.188
Lilliefors Critical (0.95) Value	0.209

Data appear Lognormal at (0.05) Significance Level

Non-Clay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	25
Minimum	5.1
Maximum	41
Mean of Raw Data	14.54
Standard Deviation of Raw Data	7.943
Kstar	3.718
Mean of Log Transformed Data	2.549
Standard Deviation of Log Transformed Data	0.507

Normal Distribution Test Results

Correlation Coefficient R	0.935
Shapiro Wilk Test Statistic	0.88
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.00145
Lilliefors Test Statistic	0.163
Lilliefors Critical (0.95) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.987
A-D Test Statistic	0.384
A-D Critical (0.95) Value	0.751
K-S Test Statistic	0.1
K-S Critical(0.95) Value	0.154

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.992
Shapiro Wilk Test Statistic	0.978
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.774
Lilliefors Test Statistic	0.0829
Lilliefors Critical (0.95) Value	0.154

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Vanadium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	15

Raw Statistics		Log-Transformed Statistics	
Minimum	6.6	Minimum	1.887
Maximum	54	Maximum	3.989
Second Largest	46	Second Largest	3.829
First Quartile	18.25	First Quartile	2.904
Median	26	Median	3.257
Third Quartile	30.75	Third Quartile	3.426
Mean	25.44	Mean	3.106
SD	12.21	SD	0.567
Coefficient of Variation	0.48		
Skewness	0.575		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.952	Shapiro Wilk Test Statistic	0.914
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	55.39	95% UTL with 95% Coverage	89.69
95% UPL (t)	47.26	95% UPL (t)	61.49
90% Percentile (z)	41.08	90% Percentile (z)	46.16
95% Percentile (z)	45.52	95% Percentile (z)	56.72
99% Percentile (z)	53.84	99% Percentile (z)	83.48

Gamma Distribution Test		Data Distribution Test	
k star	3.357	Data appear Normal at 5% Significance Level	
Theta Star	7.577		
MLE of Mean	25.44		
MLE of Standard Deviation	13.88		
nu star	120.9		
A-D Test Statistic	0.442	Nonparametric Statistics	
5% A-D Critical Value	0.743	90% Percentile	38.3
K-S Test Statistic	0.155	95% Percentile	47.2
5% K-S Critical Value	0.205	99% Percentile	52.64
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	54
90% Percentile	44.06	95% Percentile Bootstrap UTL with 95% Coverage	54
95% Percentile	51.71	95% BCA Bootstrap UTL with 95% Coverage	54
99% Percentile	68.22	95% UPL	54
		95% Chebyshev UPL	80.11
95% WH Approx. Gamma UPL	53.27	Upper Threshold Limit Based upon IQR	49.5
95% HW Approx. Gamma UPL	54.77		
95% WH Approx. Gamma UTL with 95% Coverage	68.84		
95% HW Approx. Gamma UTL with 95% Coverage	72.38		

Non-Clay

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	25
Raw Statistics		**Log-Transformed Statistics**	
Minimum	5.1	Minimum	1.629
Maximum	41	Maximum	3.714
Second Largest	31	Second Largest	3.434
First Quartile	8.5	First Quartile	2.14
Median	12	Median	2.485
Third Quartile	18	Third Quartile	2.89
Mean	14.54	Mean	2.549
SD	7.943	SD	0.507
Coefficient of Variation	0.546		
Skewness	1.449		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.88	Shapiro Wilk Test Statistic	0.978
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	31.82	95% UTL with 95% Coverage	38.58
95% UPL (t)	28.2	95% UPL (t)	30.6
90% Percentile (z)	24.72	90% Percentile (z)	24.51
95% Percentile (z)	27.61	95% Percentile (z)	29.47
99% Percentile (z)	33.02	99% Percentile (z)	41.64
Gamma Distribution Test		**Data Distribution Test**	
k star	3.718	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3.91		
MLE of Mean	14.54		
MLE of Standard Deviation	7.54		
nu star	245.4		
A-D Test Statistic	0.384	**Nonparametric Statistics**	
5% A-D Critical Value	0.751	90% Percentile	24.4
K-S Test Statistic	0.1	95% Percentile	27.4
5% K-S Critical Value	0.154	99% Percentile	37.8

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	41
90% Percentile	24.65	95% Percentile Bootstrap UTL with 95% Coverage	41
95% Percentile	28.74	95% BCA Bootstrap UTL with 95% Coverage	35
99% Percentile	37.51	95% UPL	34
		95% Chebyshev UPL	49.68
95% WH Approx. Gamma UPL	29.11	Upper Threshold Limit Based upon IQR	32.25
95% HW Approx. Gamma UPL	29.39		
95% WH Approx. Gamma UTL with 95% Coverage	34.75		
95% HW Approx. Gamma UTL with 95% Coverage	35.47		

Outlier Tests for Selected Variables

User Selected Options	
From File	Vanadium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18
10% critical value: 0.424
5% critical value: 0.475
1% critical value: 0.561

1. Data Value 54 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.431

For 10% significance level, 54 is an outlier.
For 5% significance level, 54 is not an outlier.
For 1% significance level, 54 is not an outlier.

2. Data Value 6.6 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.116

For 10% significance level, 6.6 is not an outlier.
For 5% significance level, 6.6 is not an outlier.
For 1% significance level, 6.6 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	14.54
Standard Deviation	7.943
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	14.54	7.822	41	33	3.383	2.95	3.29

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 41 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier
Therefore, Observation 41 is a Potential Statistical Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Vanadium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Observations	33	18
Number of Distinct Observations	25	15
Minimum	5.1	6.6
Maximum	41	54
Mean	14.54	25.44
Median	12	26
SD	7.943	12.21
SE of Mean	1.383	2.878

Wilcoxon-Mann-Whitney (WMW) Test

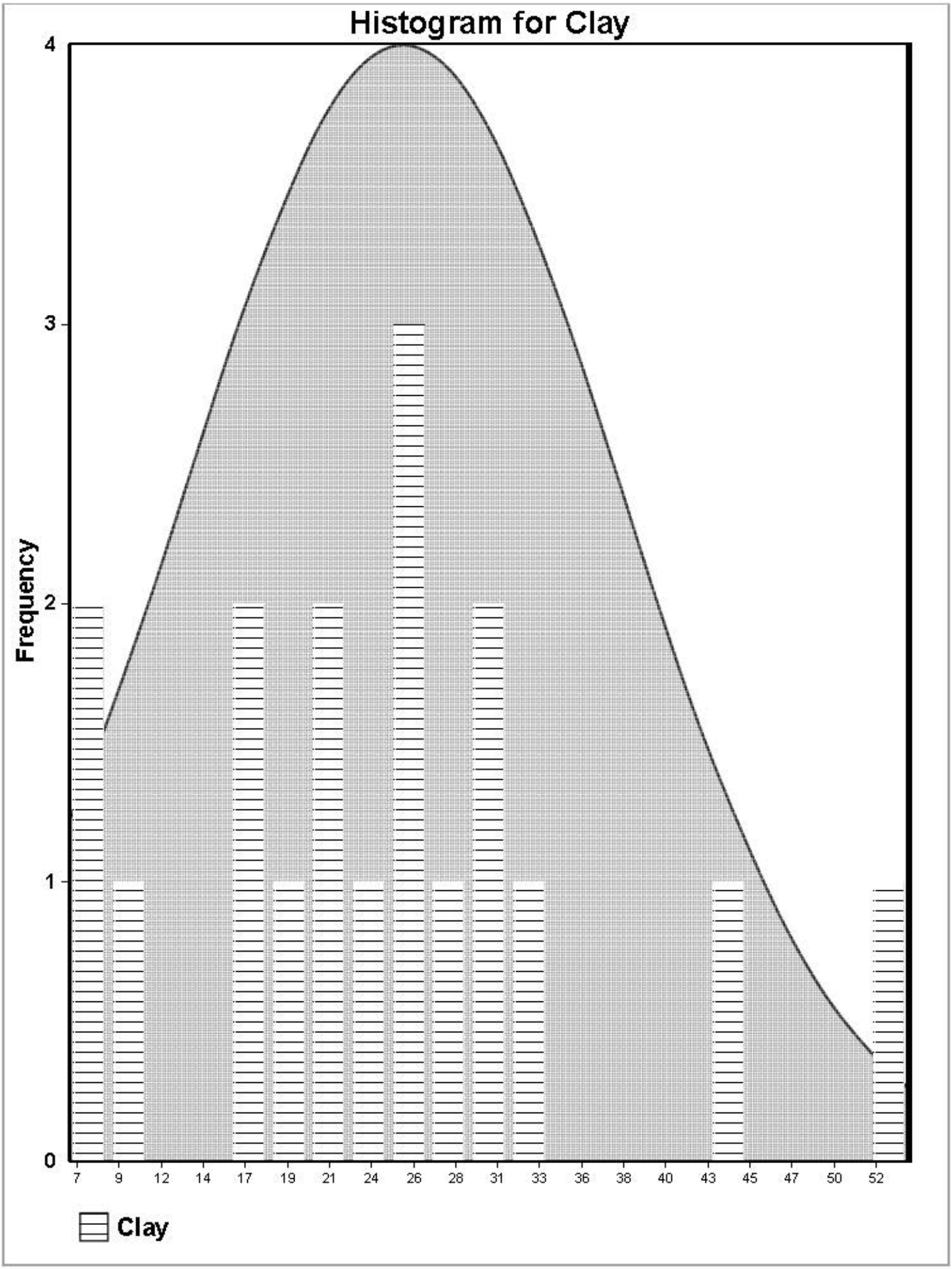
H0: Mean/Median of Site or AOC = Mean/Median of Background

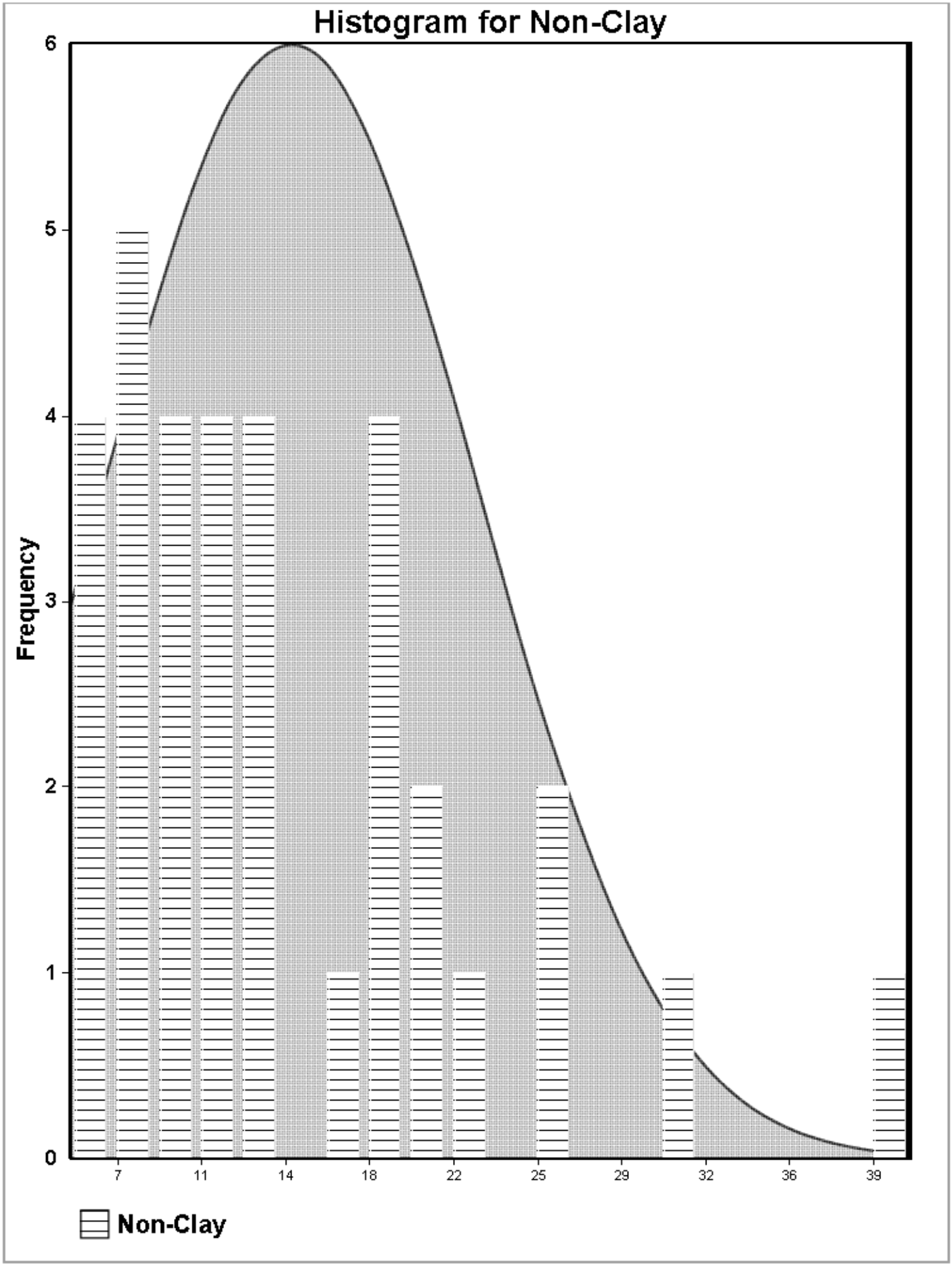
Site Rank Sum W-Stat	691
WMW Test U-Stat	3.282
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	9.6171E-4

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
7
9
12
14
17
19
21
24
26
28
31
33
36
38
40
43
45
47
50
52
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
11
14
18
22
25
29
32
36
39
Non-Clay

Location	Clay
BG-1-2	23
BG-1-43	27
BG-1-55	7.4
BG-1-78	27
BG-2-30	25
BG-2-81	27
BG-3-17	9.9
BG-3-22	6.6
BG-3-69	18
BG-4-2	19
BG-4-19	46
BG-4-40	35
BG-4-79	32
BG-4-161	17
BG-4-163	30
BG-6-28	31
BG-6-53	23
BG-6-87	54

Location	Non-Clay
BG-1-10	13
BG-1-29	18
BG-1-40	8.1
BG-1-46	8.5
BG-1-92	6.7
BG-2-2	12
BG-2-10	12
BG-2-19	14
BG-2-21	12
BG-2-32	14
BG-2-75	7.4
BG-3-2	9.4
BG-3-10	19
BG-3-29	8.7
BG-3-63	8.4
BG-3-65	14
BG-3-95	6.6
BG-3-105	18
BG-3-131	5.1
BG-3-136	31
BG-4-10	25
BG-4-65	9.6
BG-4-82	20
BG-4-95	7.3
BG-4-117	6
BG-4-120	25
BG-6-2	18
BG-6-9	17
BG-6-58	10
BG-6-75	12
BG-6-98	21
BG-6-114	22
BG-6-127	41
Average	14.53939394

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Vanadium.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	9
Minimum	8.1
Maximum	23
Mean of Raw Data	14.63
Standard Deviation of Raw Data	4.383
Kstar	9.044
Mean of Log Transformed Data	2.64
Standard Deviation of Log Transformed Data	0.307

Normal Distribution Test Results	
Correlation Coefficient R	0.978
Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.688
Lilliefors Test Statistic	0.145
Lilliefors Critical (0.95) Value	0.256

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.983
A-D Test Statistic	0.298
A-D Critical (0.95) Value	0.731
K-S Test Statistic	0.152
K-S Critical(0.95) Value	0.245

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.982
Shapiro Wilk Test Statistic	0.961
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.786
Lilliefors Test Statistic	0.151
Lilliefors Critical (0.95) Value	0.256

Data appear Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	30
Minimum	5.1
Maximum	54
Mean of Raw Data	19.54
Standard Deviation of Raw Data	12.03
Kstar	2.528
Mean of Log Transformed Data	2.778
Standard Deviation of Log Transformed Data	0.651

Normal Distribution Test Results

Correlation Coefficient R	0.957
Shapiro Wilk Test Statistic	0.909
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.00392
Lilliefors Test Statistic	0.145
Lilliefors Critical (0.95) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.99
A-D Test Statistic	0.701
A-D Critical (0.95) Value	0.756
K-S Test Statistic	0.142
K-S Critical(0.95) Value	0.143

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.978
Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.0491
Lilliefors Test Statistic	0.126
Lilliefors Critical (0.95) Value	0.142

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Vanadium.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-Transformed Statistics	
Minimum	8.1	Minimum	2.092
Maximum	23	Maximum	3.135
Second Largest	19	Second Largest	2.944
First Quartile	12	First Quartile	2.485
Median	13.5	Median	2.602
Third Quartile	18	Third Quartile	2.89
Mean	14.63	Mean	2.64
SD	4.383	SD	0.307
Coefficient of Variation	0.3		
Skewness	0.366		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.954	Shapiro Wilk Test Statistic	0.961
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	26.62	95% UTL with 95% Coverage	32.5
95% UPL (t)	22.82	95% UPL (t)	24.9
90% Percentile (z)	20.24	90% Percentile (z)	20.78
95% Percentile (z)	21.83	95% Percentile (z)	23.24
99% Percentile (z)	24.82	99% Percentile (z)	28.65

Gamma Distribution Test		Data Distribution Test	
k star	9.044	Data appear Normal at 5% Significance Level	
Theta Star	1.617		
MLE of Mean	14.63		
MLE of Standard Deviation	4.863		
nu star	217.1		
A-D Test Statistic	0.298	Nonparametric Statistics	
5% A-D Critical Value	0.731	90% Percentile	18.9
K-S Test Statistic	0.152	95% Percentile	20.8
5% K-S Critical Value	0.245	99% Percentile	22.56
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	23
90% Percentile	21.1	95% Percentile Bootstrap UTL with 95% Coverage	23
95% Percentile	23.43	95% BCA Bootstrap UTL with 95% Coverage	23
99% Percentile	28.24	95% UPL	23
		95% Chebyshev UPL	34.51
95% WH Approx. Gamma UPL	23.96	Upper Threshold Limit Based upon IQR	27
95% HW Approx. Gamma UPL	24.16		
95% WH Approx. Gamma UTL with 95% Coverage	29.68		
95% HW Approx. Gamma UTL with 95% Coverage	30.26		

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	30

Raw Statistics		Log-Transformed Statistics	
Minimum	5.1	Minimum	1.629
Maximum	54	Maximum	3.989
Second Largest	46	Second Largest	3.829
First Quartile	8.6	First Quartile	2.152
Median	18	Median	2.89
Third Quartile	27	Third Quartile	3.296
Mean	19.54	Mean	2.778
SD	12.03	SD	0.651
Coefficient of Variation	0.616		
Skewness	0.89		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.909	Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	45.11	95% UTL with 95% Coverage	64.1
95% UPL (t)	40.09	95% UPL (t)	48.86
90% Percentile (z)	34.97	90% Percentile (z)	37.03
95% Percentile (z)	39.34	95% Percentile (z)	46.91
99% Percentile (z)	47.54	99% Percentile (z)	73.1
Gamma Distribution Test		Data Distribution Test	
k star	2.528	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	7.731		
MLE of Mean	19.54		
MLE of Standard Deviation	12.29		
nu star	197.2		
A-D Test Statistic	0.701	Nonparametric Statistics	
5% A-D Critical Value	0.756	90% Percentile	32.6
K-S Test Statistic	0.142	95% Percentile	41.5

5% K-S Critical Value	0.143	99% Percentile	50.96
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	54
90% Percentile	36.01	95% Percentile Bootstrap UTL with 95% Coverage	54
95% Percentile	43.13	95% BCA Bootstrap UTL with 95% Coverage	54
99% Percentile	58.7	95% UPL	46
		95% Chebyshev UPL	72.67
95% WH Approx. Gamma UPL	43.79	Upper Threshold Limit Based upon IQR	54.6
95% HW Approx. Gamma UPL	44.74		
95% WH Approx. Gamma UTL with 95% Coverage	52.95		
95% HW Approx. Gamma UTL with 95% Coverage	54.93		

Outlier Tests for Selected Variables

User Selected Options	
From File	Vanadium.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12

10% critical value: 0.49

5% critical value: 0.546

1% critical value: 0.642

1. Data Value 23 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.368

For 10% significance level, 23 is not an outlier.

For 5% significance level, 23 is not an outlier.

For 1% significance level, 23 is not an outlier.

2. Data Value 8.1 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.358

For 10% significance level, 8.1 is not an outlier.

For 5% significance level, 8.1 is not an outlier.

For 1% significance level, 8.1 is not an outlier.

Rosner's Outlier Test for MC

Mean	19.54
Standard Deviation	12.03
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	19.54	11.88	54	36	2.901	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Vanadium.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Observations	39	12
Number of Distinct Observations	30	9
Minimum	5.1	8.1
Maximum	54	23
Mean	19.54	14.63
Median	18	13.5
SD	12.03	4.383
SE of Mean	1.927	1.265

Wilcoxon-Mann-Whitney (WMW) Test

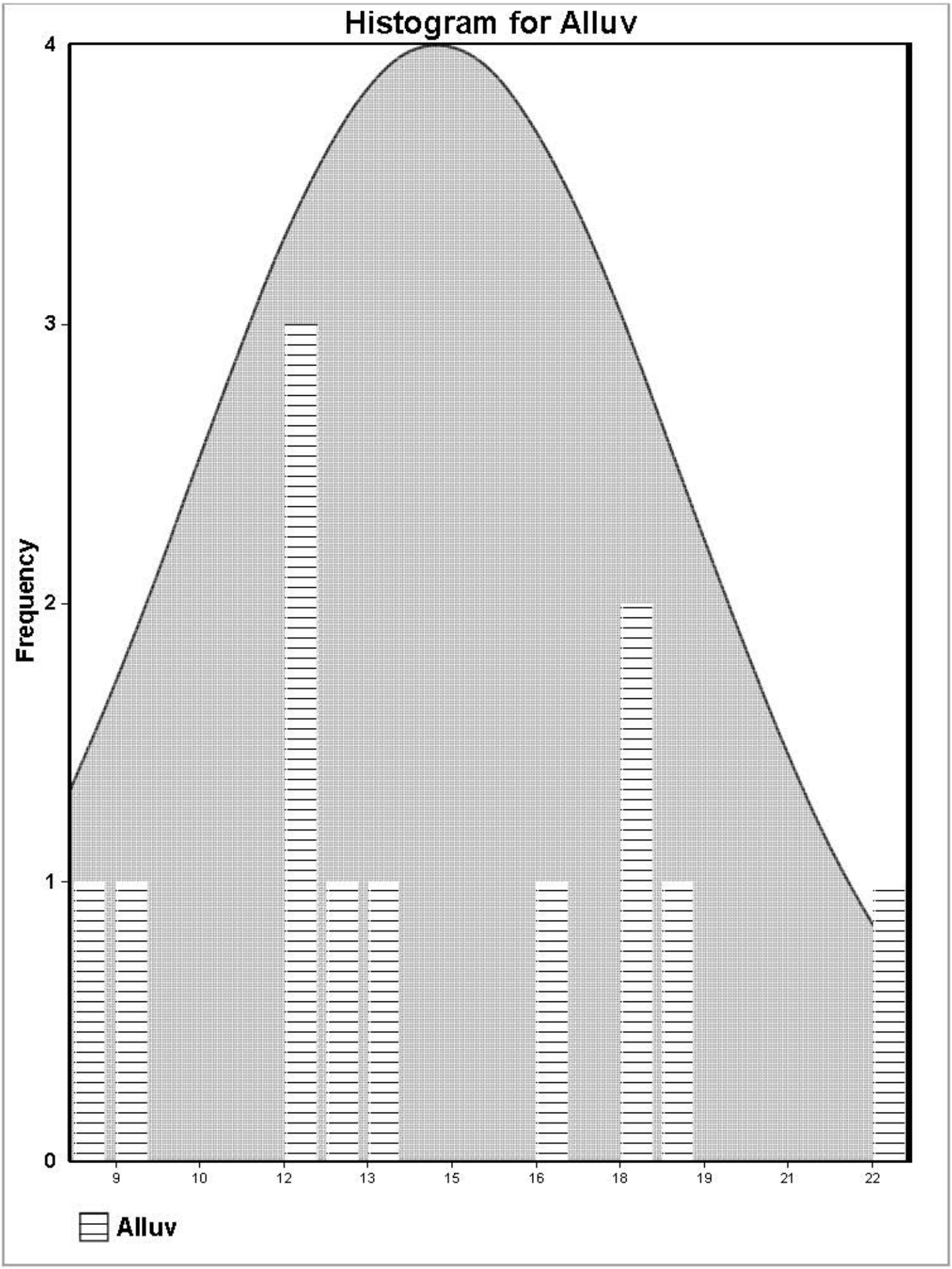
H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1054
WMW Test U-Stat	0.877
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.38

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
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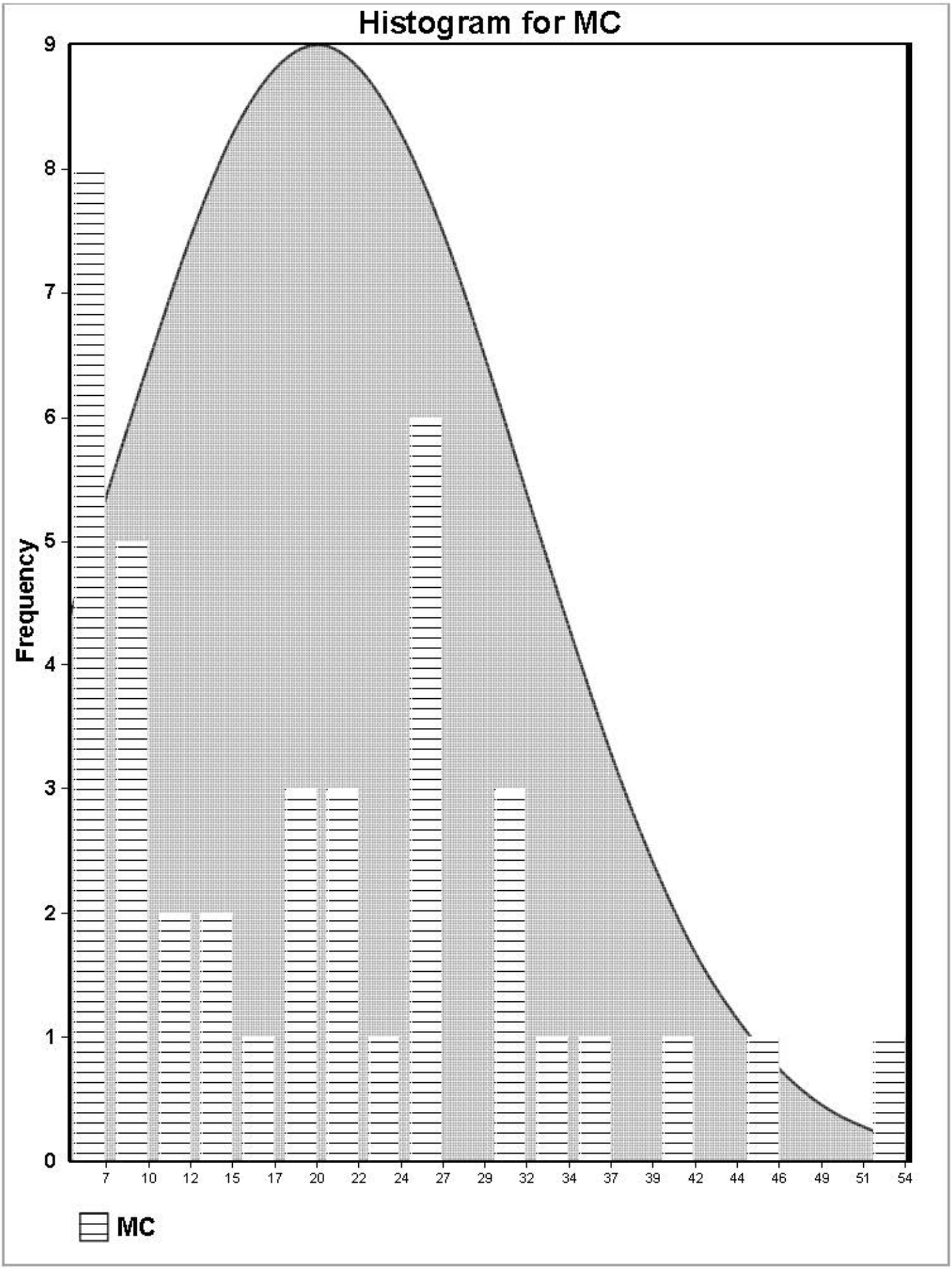
1
2
3
4
9
10
12
13
15
16
18
19
21
22
Alluv


Histogram for MC
Frequency
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1
2
3
4
5
6
7
8
9
7
10
12
15
17
20
22
24
27
29
32
34
37
39
42
44
46
49
51
54
MC

Location	Alluv
BG-1-2	23
BG-1-10	13
BG-1-29	18
BG-1-40	8.1
BG-2-2	12
BG-2-10	12
BG-2-19	14
BG-2-21	12
BG-3-2	9.4
BG-3-10	19
BG-6-2	18
BG-6-9	17

Location	MC
BG-1-43	27
BG-1-46	8.5
BG-1-55	7.4
BG-1-78	27
BG-1-92	6.7
BG-2-30	25
BG-2-32	14
BG-2-75	7.4
BG-2-81	27
BG-3-17	9.9
BG-3-22	6.6
BG-3-29	8.7
BG-3-63	8.4
BG-3-65	14
BG-3-69	18
BG-3-95	6.6
BG-3-105	18
BG-3-131	5.1
BG-3-136	31
BG-4-1	19
BG-4-10	25
BG-4-19	46
BG-4-40	35
BG-4-65	9.6
BG-4-79	32
BG-4-82	20
BG-4-95	7.3
BG-4-117	6
BG-4-120	25
BG-4-161	17
BG-4-163	30
BG-6-28	31
BG-6-53	23
BG-6-58	10
BG-6-75	12
BG-6-87	54
BG-6-98	21
BG-6-114	22
BG-1-127	41

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Zinc.wst
Full Precision	OFF
Confidence Coefficient	0.95

All Data

Raw Statistics	
Number of Valid Observations	51
Number of Distinct Observations	33
Minimum	7.3
Maximum	81
Mean of Raw Data	32.75
Standard Deviation of Raw Data	20.96
Kstar	2.313
Mean of Log Transformed Data	3.271
Standard Deviation of Log Transformed Data	0.688

Normal Distribution Test Results	
Correlation Coefficient R	0.956
Approximate Shapiro Wilk Test Statistic	0.893
Approximate Shapiro Wilk P Value	9.9978E-5
Lilliefors Test Statistic	0.16
Lilliefors Critical (0.95) Value	0.124

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.977
A-D Test Statistic	0.999
A-D Critical (0.95) Value	0.76
K-S Test Statistic	0.154
K-S Critical(0.95) Value	0.126

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.977
Approximate Shapiro Wilk Test Statistic	0.932
Approximate Shapiro Wilk P Value	0.00786
Lilliefors Test Statistic	0.138
Lilliefors Critical (0.95) Value	0.124

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Zinc.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

All Data

General Statistics

Total Number of Observations	51	Number of Distinct Observations	33

Raw Statistics		Log-Transformed Statistics	
Minimum	7.3	Minimum	1.988
Maximum	81	Maximum	4.394
Second Largest	78	Second Largest	4.357
First Quartile	13.5	First Quartile	2.602
Median	30	Median	3.401
Third Quartile	48.5	Third Quartile	3.882
Mean	32.75	Mean	3.271
SD	20.96	SD	0.688
Coefficient of Variation	0.64		
Skewness	0.687		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.16	Lilliefors Test Statistic	0.138
Lilliefors Critical Value	0.124	Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	75.81	95% UTL with 95% Coverage	108.2
95% UPL (t)	68.23	95% UPL (t)	84.39
90% Percentile (z)	59.62	90% Percentile (z)	63.61
95% Percentile (z)	67.24	95% Percentile (z)	81.68
99% Percentile (z)	81.52	99% Percentile (z)	130.6
Gamma Distribution Test		Data Distribution Test	
k star	2.313	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.16		
MLE of Mean	32.75		
MLE of Standard Deviation	21.54		
nu star	235.9		
A-D Test Statistic	0.999	Nonparametric Statistics	
5% A-D Critical Value	0.76	90% Percentile	64
K-S Test Statistic	0.154	95% Percentile	71
5% K-S Critical Value	0.126	99% Percentile	79.5
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	78
90% Percentile	61.58	95% Percentile Bootstrap UTL with 95% Coverage	79.5
95% Percentile	74.25	95% BCA Bootstrap UTL with 95% Coverage	78
99% Percentile	102.1	95% UPL	75
		95% Chebyshev UPL	125
95% WH Approx. Gamma UPL	75.13	Upper Threshold Limit Based upon IQR	101
95% HW Approx. Gamma UPL	76.84		
95% WH Approx. Gamma UTL with 95% Coverage	89.26		
95% HW Approx. Gamma UTL with 95% Coverage	92.62		

Outlier Tests for Selected Variables

User Selected Options	
From File	Zinc.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

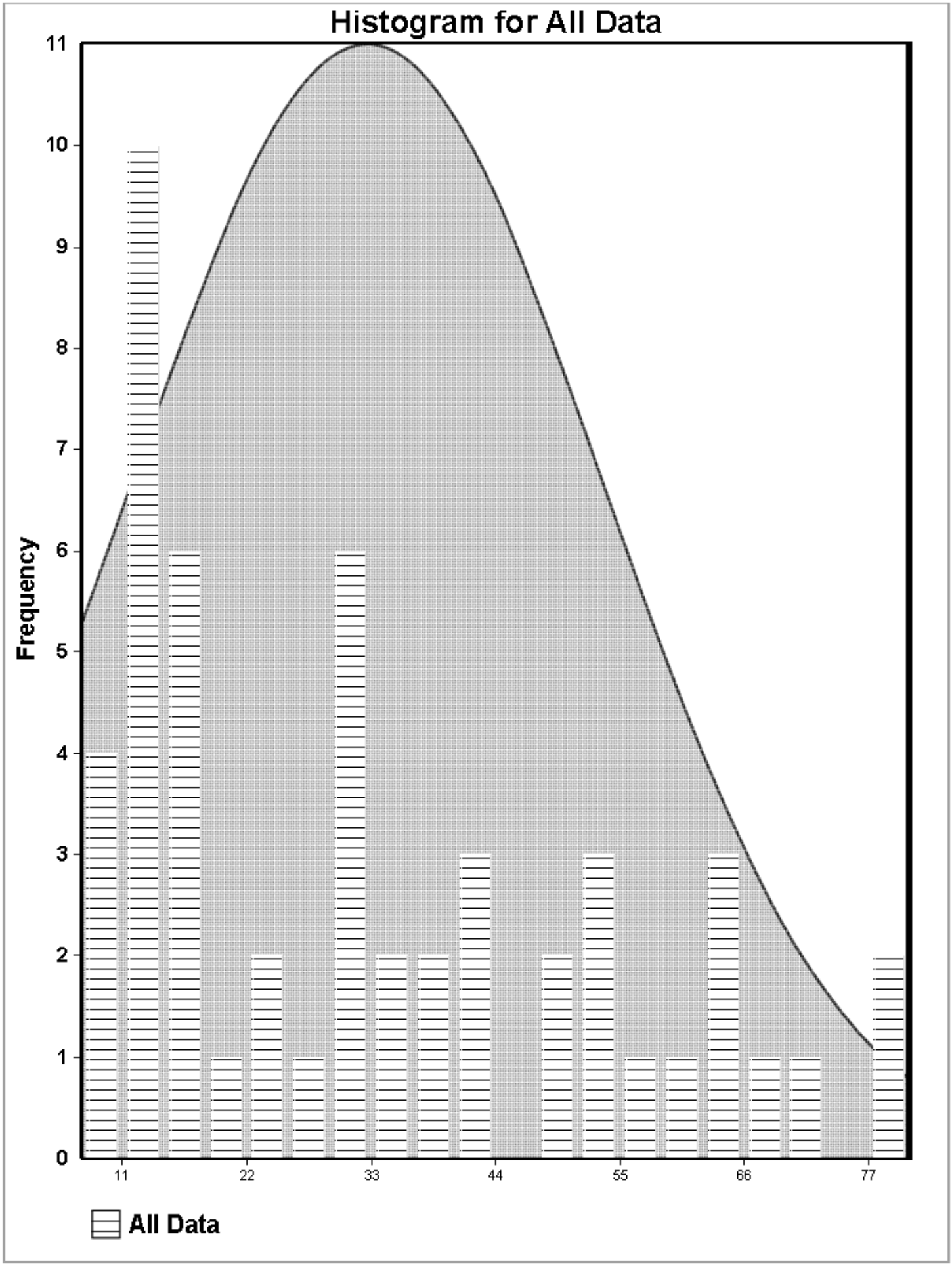
Rosner's Outlier Test for All Data

Mean	32.75
Standard Deviation	20.96
Number of data	51
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	32.75	20.76	81	51	2.324	3.137	3.488

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier


Histogram for All Data
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
11
22
33
44
55
66
77
All Data

Location	All Data
BG-1-2	78
BG-3-17	15
BG-4-2	30
BG-4-19	73
BG-1-10	52
BG-2-2	13
BG-2-10	11
BG-2-19	16
BG-3-2	12
BG-3-10	31
BG-4-10	39
BG-6-2	18
BG-6-9	14
BG-1-29	41
BG-1-40	63
BG-1-46	31
BG-1-92	19
BG-2-21	13
BG-2-32	16
BG-2-75	13
BG-3-29	13
BG-3-63	16
BG-3-65	30
BG-3-95	9.6
BG-3-105	30
BG-3-131	7.7
BG-3-136	57
BG-4-65	13
BG-4-82	29
BG-4-95	11
BG-4-117	7.3
BG-4-120	43
BG-6-58	13
BG-6-75	16
BG-6-98	30
BG-6-114	34
BG-6-127	64
BG-1-43	64
BG-1-55	23
BG-1-78	69
BG-2-30	49
BG-2-81	61
BG-3-22	9.8
BG-3-69	39
BG-4-40	52
BG-4-79	52
BG-4-161	24
BG-4-163	41
BG-6-28	48
BG-6-53	36
BG-6-87	81

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Zinc.wst
Full Precision	OFF
Confidence Coefficient	0.95

0-20

Raw Statistics	
Number of Valid Observations	13
Number of Distinct Observations	13
Minimum	11
Maximum	78
Mean of Raw Data	30.92
Standard Deviation of Raw Data	23.28
Kstar	1.806
Mean of Log Transformed Data	3.197
Standard Deviation of Log Transformed Data	0.695

Normal Distribution Test Results	
Correlation Coefficient R	0.904
Shapiro Wilk Test Statistic	0.806
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.00857
Lilliefors Test Statistic	0.249
Lilliefors Critical (0.95) Value	0.246

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.968
A-D Test Statistic	0.717
A-D Critical (0.95) Value	0.742
K-S Test Statistic	0.237
K-S Critical(0.95) Value	0.239

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.955
Shapiro Wilk Test Statistic	0.892
Shapiro Wilk Critical (0.95) Value	0.866
Approximate Shapiro Wilk P Value	0.145
Lilliefors Test Statistic	0.209
Lilliefors Critical (0.95) Value	0.246

Data appear Lognormal at (0.05) Significance Level

>20

Raw Statistics	
Number of Valid Observations	38

Number of Distinct Observations	27
Minimum	7.3
Maximum	81
Mean of Raw Data	33.38
Standard Deviation of Raw Data	20.41
Kstar	2.332
Mean of Log Transformed Data	3.296
Standard Deviation of Log Transformed Data	0.694

Normal Distribution Test Results

Correlation Coefficient R	0.968
Shapiro Wilk Test Statistic	0.921
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.0121
Lilliefors Test Statistic	0.145
Lilliefors Critical (0.95) Value	0.144

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.976
A-D Test Statistic	0.65
A-D Critical (0.95) Value	0.757
K-S Test Statistic	0.135
K-S Critical(0.95) Value	0.145

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.977
Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical (0.95) Value	0.938
Approximate Shapiro Wilk P Value	0.0355
Lilliefors Test Statistic	0.12
Lilliefors Critical (0.95) Value	0.144

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Zinc.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

0-20

General Statistics

Total Number of Observations	13	Number of Distinct Observations	13

Raw Statistics		Log-Transformed Statistics	
Minimum	11	Minimum	2.398
Maximum	78	Maximum	4.357
Second Largest	73	Second Largest	4.29
First Quartile	14	First Quartile	2.639
Median	18	Median	2.89
Third Quartile	39	Third Quartile	3.664
Mean	30.92	Mean	3.197
SD	23.28	SD	0.695
Coefficient of Variation	0.753		
Skewness	1.202		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.806	Shapiro Wilk Test Statistic	0.892
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	93.1	95% UTL with 95% Coverage	156.4
95% UPL (t)	73.98	95% UPL (t)	88.39
90% Percentile (z)	60.76	90% Percentile (z)	59.57
95% Percentile (z)	69.21	95% Percentile (z)	76.67
99% Percentile (z)	85.08	99% Percentile (z)	123.1

Gamma Distribution Test		Data Distribution Test
k star	1.806	Data appear Gamma Distributed at 5% Significance Level
Theta Star	17.13	
MLE of Mean	30.92	
MLE of Standard Deviation	23.01	
nu star	46.95	

		Nonparametric Statistics	
A-D Test Statistic	0.717		
5% A-D Critical Value	0.742	90% Percentile	68.8
K-S Test Statistic	0.237	95% Percentile	75
5% K-S Critical Value	0.239	99% Percentile	77.4
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	78
90% Percentile	61.62	95% Percentile Bootstrap UTL with 95% Coverage	78
95% Percentile	75.78	95% BCA Bootstrap UTL with 95% Coverage	78
99% Percentile	107.4	95% UPL	78
		95% Chebyshev UPL	136.2
95% WH Approx. Gamma UPL	80.25	Upper Threshold Limit Based upon IQR	76.5
95% HW Approx. Gamma UPL	81.78		
95% WH Approx. Gamma UTL with 95% Coverage	118.1		
95% HW Approx. Gamma UTL with 95% Coverage	124.6		

>20

General Statistics			
Total Number of Observations	38	Number of Distinct Observations	27

Raw Statistics		Log-Transformed Statistics	
Minimum	7.3	Minimum	1.988
Maximum	81	Maximum	4.394
Second Largest	69	Second Largest	4.234
First Quartile	13.75	First Quartile	2.617
Median	30	Median	3.401
Third Quartile	48.75	Third Quartile	3.887
Mean	33.38	Mean	3.296
SD	20.41	SD	0.694
Coefficient of Variation	0.612		
Skewness	0.527		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.921	Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical Value	0.938	Shapiro Wilk Critical Value	0.938
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	76.9	95% UTL with 95% Coverage	118.5
95% UPL (t)	68.26	95% UPL (t)	88.36
90% Percentile (z)	59.54	90% Percentile (z)	65.68
95% Percentile (z)	66.95	95% Percentile (z)	84.51
99% Percentile (z)	80.86	99% Percentile (z)	135.6
Gamma Distribution Test		Data Distribution Test	
k star	2.332	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	14.31		
MLE of Mean	33.38		
MLE of Standard Deviation	21.86		
nu star	177.3		
A-D Test Statistic	0.65	Nonparametric Statistics	
5% A-D Critical Value	0.757	90% Percentile	63.3
K-S Test Statistic	0.135	95% Percentile	64.75
5% K-S Critical Value	0.145	99% Percentile	76.56

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	81
90% Percentile	62.64	95% Percentile Bootstrap UTL with 95% Coverage	81
95% Percentile	75.48	95% BCA Bootstrap UTL with 95% Coverage	70.8
99% Percentile	103.7	95% UPL	69.6
		95% Chebyshev UPL	123.5
95% WH Approx. Gamma UPL	76.83	Upper Threshold Limit Based upon IQR	101.3
95% HW Approx. Gamma UPL	78.94		
95% WH Approx. Gamma UTL with 95% Coverage	93.68		
95% HW Approx. Gamma UTL with 95% Coverage	97.96		

Outlier Tests for Selected Variables

User Selected Options	
From File	Zinc.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for 0-20

Number of data = 13
10% critical value: 0.467
5% critical value: 0.521
1% critical value: 0.615

1. Data Value 78 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.394

For 10% significance level, 78 is not an outlier.
For 5% significance level, 78 is not an outlier.
For 1% significance level, 78 is not an outlier.

2. Data Value 11 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.032

For 10% significance level, 11 is not an outlier.
For 5% significance level, 11 is not an outlier.
For 1% significance level, 11 is not an outlier.

Rosner's Outlier Test for >20

Mean	33.38
Standard Deviation	20.41
Number of data	38
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	33.38	20.14	81	38	2.364	3.01	3.36

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Zinc.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: >20

Background Data: 0-20

Raw Statistics

	Site	Background
Number of Valid Observations	38	13
Number of Distinct Observations	27	13
Minimum	7.3	11
Maximum	81	78
Mean	33.38	30.92
Median	30	18
SD	20.41	23.28
SE of Mean	3.311	6.456

Wilcoxon-Mann-Whitney (WMW) Test

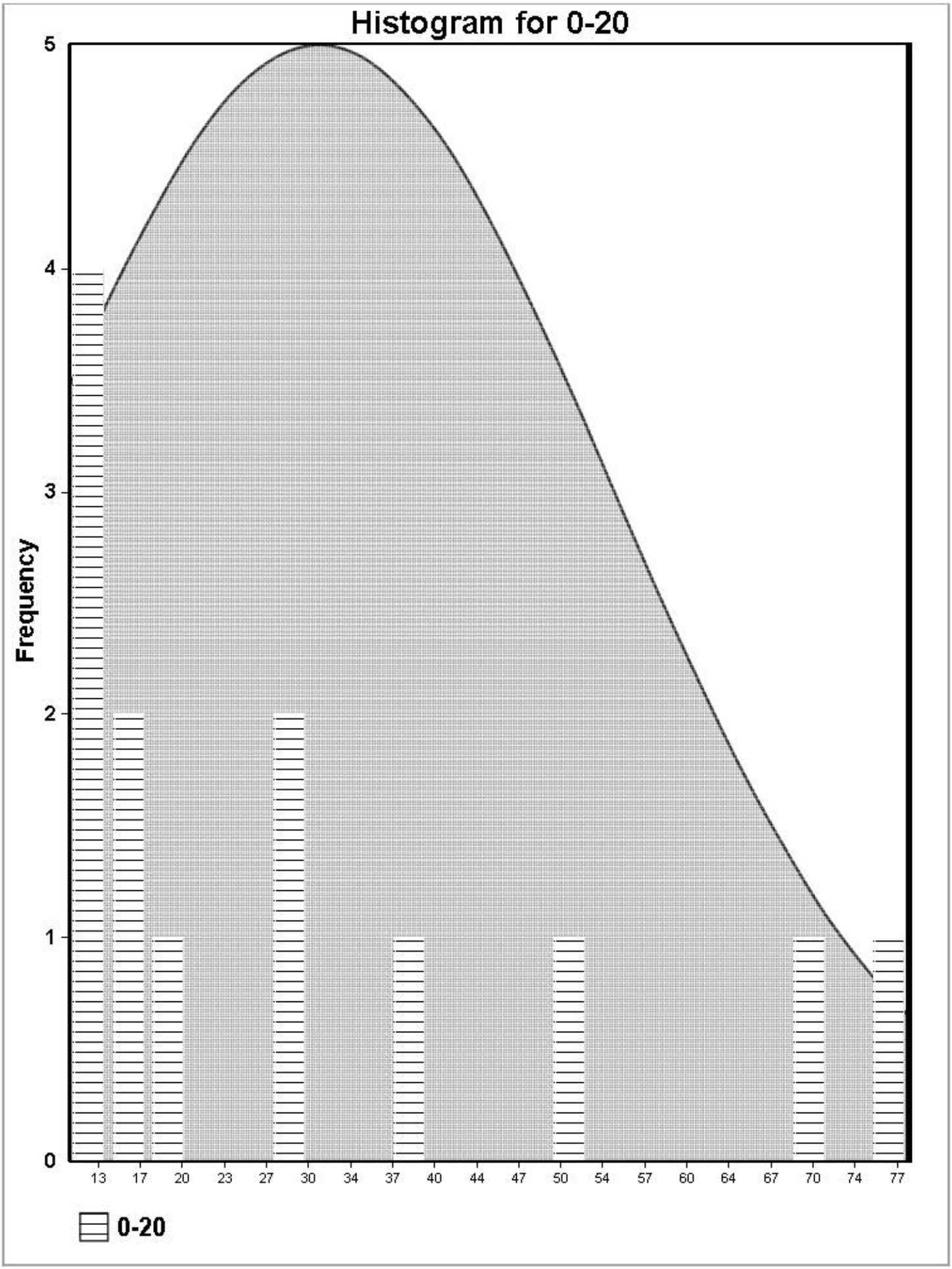
H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1007
WMW Test U-Stat	0.4
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.689

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for 0-20
Frequency
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1
2
3
4
5
13
17
20
23
27
30
34
37
40
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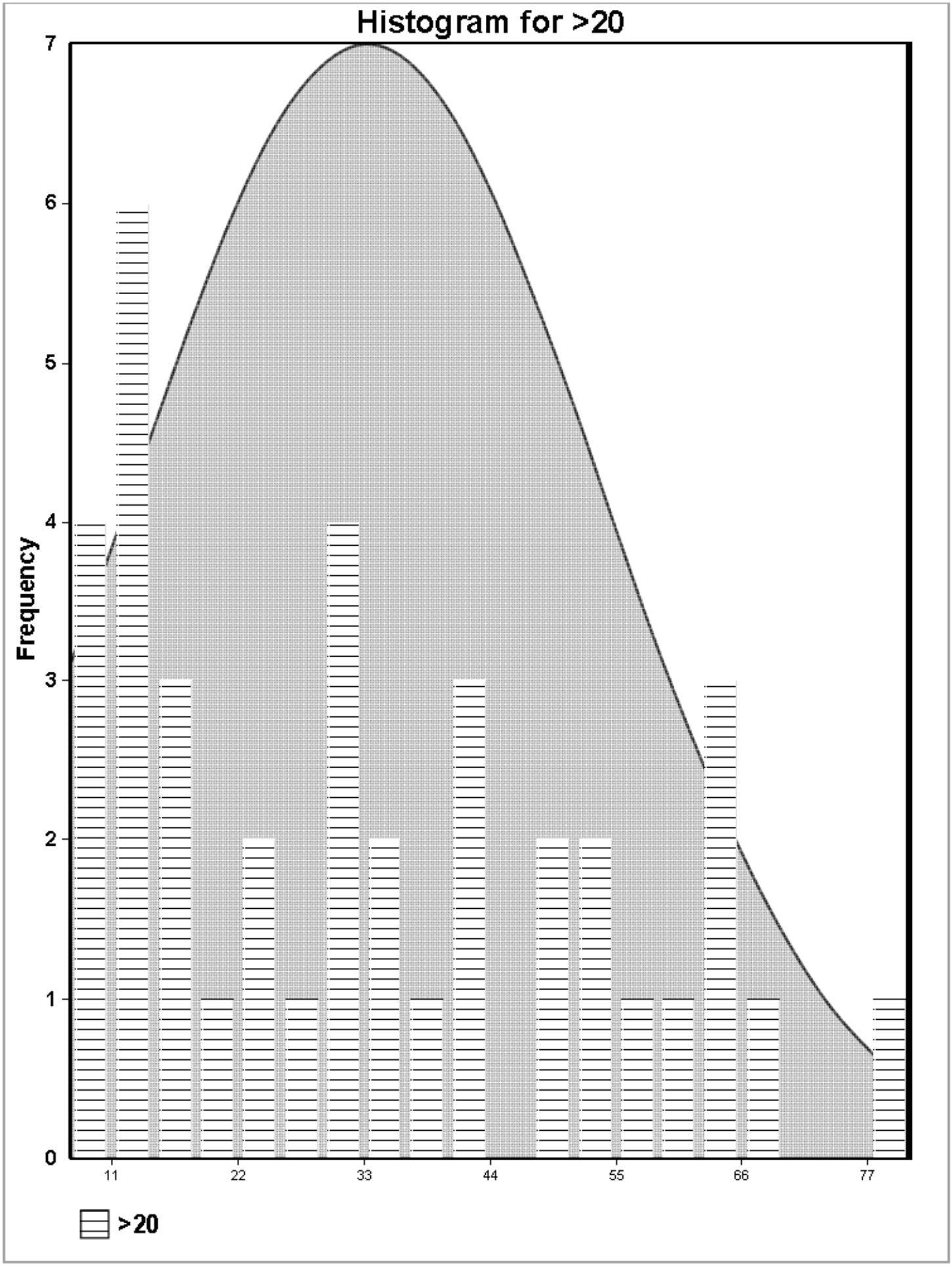
64
67
70
74
77
0-20


Histogram for >20
Frequency
0
1
2
3
4
5
6
7
11
22
33
44
55
66
77
>20

Location	0-20
BG-1-2	78
BG-3-17	15
BG-4-2	30
BG-4-19	73
BG-1-10	52
BG-2-2	13
BG-2-10	11
BG-2-19	16
BG-3-2	12
BG-3-10	31
BG-4-10	39
BG-6-2	18
BG-6-9	14

Location	>20
BG-1-29	41
BG-1-40	63
BG-1-46	31
BG-1-92	19
BG-2-21	13
BG-2-32	16
BG-2-75	13
BG-3-29	13
BG-3-63	16
BG-3-65	30
BG-3-95	9.6
BG-3-105	30
BG-3-131	7.7
BG-3-136	57
BG-4-65	13
BG-4-82	29
BG-4-95	11
BG-4-117	7.3
BG-4-120	43
BG-6-58	13
BG-6-75	16
BG-6-98	30
BG-6-114	34
BG-6-127	64
BG-1-43	64
BG-1-55	23
BG-1-78	69
BG-2-30	49
BG-2-81	61
BG-3-22	9.8
BG-3-69	39
BG-4-40	52
BG-4-79	52
BG-4-161	24
BG-4-163	41
BG-6-28	48
BG-6-53	36
BG-6-87	81

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Zinc.wst
Full Precision	OFF
Confidence Coefficient	0.95

Clay

Raw Statistics	
Number of Valid Observations	18
Number of Distinct Observations	17
Minimum	9.8
Maximum	81
Mean of Raw Data	46.93
Standard Deviation of Raw Data	21.47
Kstar	3.294
Mean of Log Transformed Data	3.715
Standard Deviation of Log Transformed Data	0.584

Normal Distribution Test Results	
Correlation Coefficient R	0.992
Shapiro Wilk Test Statistic	0.97
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.845
Lilliefors Test Statistic	0.0794
Lilliefors Critical (0.95) Value	0.209

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.961
A-D Test Statistic	0.349
A-D Critical (0.95) Value	0.743
K-S Test Statistic	0.14
K-S Critical(0.95) Value	0.205

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.955
Shapiro Wilk Test Statistic	0.909
Shapiro Wilk Critical (0.95) Value	0.897
Approximate Shapiro Wilk P Value	0.0866
Lilliefors Test Statistic	0.161
Lilliefors Critical (0.95) Value	0.209

Data appear Lognormal at (0.05) Significance Level

Non-Clay

Raw Statistics	
Number of Valid Observations	33

Number of Distinct Observations	21
Minimum	7.3
Maximum	64
Mean of Raw Data	25.02
Standard Deviation of Raw Data	16.34
Kstar	2.534
Mean of Log Transformed Data	3.028
Standard Deviation of Log Transformed Data	0.622

Normal Distribution Test Results

Correlation Coefficient R	0.925
Shapiro Wilk Test Statistic	0.844
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	1.4349E-4
Lilliefors Test Statistic	0.225
Lilliefors Critical (0.95) Value	0.154

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.975
A-D Test Statistic	1.141
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.201
K-S Critical(0.95) Value	0.154

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.973
Shapiro Wilk Test Statistic	0.93
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.0435
Lilliefors Test Statistic	0.174
Lilliefors Critical (0.95) Value	0.154

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Zinc.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Clay

General Statistics

Total Number of Observations	18	Number of Distinct Observations	17

Raw Statistics		Log-Transformed Statistics	
Minimum	9.8	Minimum	2.282
Maximum	81	Maximum	4.394
Second Largest	78	Second Largest	4.357
First Quartile	31.5	First Quartile	3.447
Median	48.5	Median	3.882
Third Quartile	63.25	Third Quartile	4.147
Mean	46.93	Mean	3.715
SD	21.47	SD	0.584
Coefficient of Variation	0.458		
Skewness	-0.0695		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.97	Shapiro Wilk Test Statistic	0.909
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	99.61	95% UTL with 95% Coverage	172.2
95% UPL (t)	85.31	95% UPL (t)	116.7
90% Percentile (z)	74.45	90% Percentile (z)	86.85
95% Percentile (z)	82.26	95% Percentile (z)	107.4
99% Percentile (z)	96.89	99% Percentile (z)	159.9

Gamma Distribution Test		Data Distribution Test	
k star	3.294	Data appear Normal at 5% Significance Level	
Theta Star	14.25		
MLE of Mean	46.93		
MLE of Standard Deviation	25.86		
nu star	118.6		
A-D Test Statistic	0.349	Nonparametric Statistics	
5% A-D Critical Value	0.743	90% Percentile	74.5
K-S Test Statistic	0.14	95% Percentile	78.45
5% K-S Critical Value	0.205	99% Percentile	80.49
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	81
90% Percentile	81.61	95% Percentile Bootstrap UTL with 95% Coverage	81
95% Percentile	95.92	95% BCA Bootstrap UTL with 95% Coverage	81
99% Percentile	126.8	95% UPL	81
		95% Chebyshev UPL	143.1
95% WH Approx. Gamma UPL	98.93	Upper Threshold Limit Based upon IQR	110.9
95% HW Approx. Gamma UPL	102.2		
95% WH Approx. Gamma UTL with 95% Coverage	128.1		
95% HW Approx. Gamma UTL with 95% Coverage	135.4		

Non-Clay

General Statistics			
Total Number of Observations	33	Number of Distinct Observations	21

Raw Statistics		Log-Transformed Statistics	
Minimum	7.3	Minimum	1.988
Maximum	64	Maximum	4.159
Second Largest	63	Second Largest	4.143
First Quartile	13	First Quartile	2.565
Median	16	Median	2.773
Third Quartile	31	Third Quartile	3.434
Mean	25.02	Mean	3.028
SD	16.34	SD	0.622
Coefficient of Variation	0.653		
Skewness	1.092		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.844	Shapiro Wilk Test Statistic	0.93
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	60.57	95% UTL with 95% Coverage	79.98
95% UPL (t)	53.11	95% UPL (t)	60.2
90% Percentile (z)	45.96	90% Percentile (z)	45.85
95% Percentile (z)	51.89	95% Percentile (z)	57.47
99% Percentile (z)	63.03	99% Percentile (z)	87.82
Gamma Distribution Test		Data Distribution Test	
k star	2.534	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.872		
MLE of Mean	25.02		
MLE of Standard Deviation	15.72		
nu star	167.3		
A-D Test Statistic	1.141	Nonparametric Statistics	
5% A-D Critical Value	0.755	90% Percentile	50.2
K-S Test Statistic	0.201	95% Percentile	59.4
5% K-S Critical Value	0.154	99% Percentile	63.68

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 95% Coverage	64
90% Percentile	46.07	95% Percentile Bootstrap UTL with 95% Coverage	64
95% Percentile	55.17	95% BCA Bootstrap UTL with 95% Coverage	64
99% Percentile	75.06	95% UPL	63.3
		95% Chebyshev UPL	97.31
95% WH Approx. Gamma UPL	56.07	Upper Threshold Limit Based upon IQR	58
95% HW Approx. Gamma UPL	56.84		
95% WH Approx. Gamma UTL with 95% Coverage	68.9		
95% HW Approx. Gamma UTL with 95% Coverage	70.93		

Outlier Tests for Selected Variables

User Selected Options	
From File	Zinc.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Clay

Number of data = 18

10% critical value: 0.424

5% critical value: 0.475

1% critical value: 0.561

1. Data Value 81 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.138

For 10% significance level, 81 is not an outlier.

For 5% significance level, 81 is not an outlier.

For 1% significance level, 81 is not an outlier.

2. Data Value 9.8 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.209

For 10% significance level, 9.8 is not an outlier.

For 5% significance level, 9.8 is not an outlier.

For 1% significance level, 9.8 is not an outlier.

Rosner's Outlier Test for Non-Clay

Mean	25.02
Standard Deviation	16.34
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	25.02	16.09	64	33	2.423	2.95	3.29

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Zinc.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Non-Clay

Background Data: Clay

Raw Statistics

	Site	Background
Number of Valid Observations	33	18
Number of Distinct Observations	21	17
Minimum	7.3	9.8
Maximum	64	81
Mean	25.02	46.93
Median	16	48.5
SD	16.34	21.47
SE of Mean	2.844	5.062

Wilcoxon-Mann-Whitney (WMW) Test

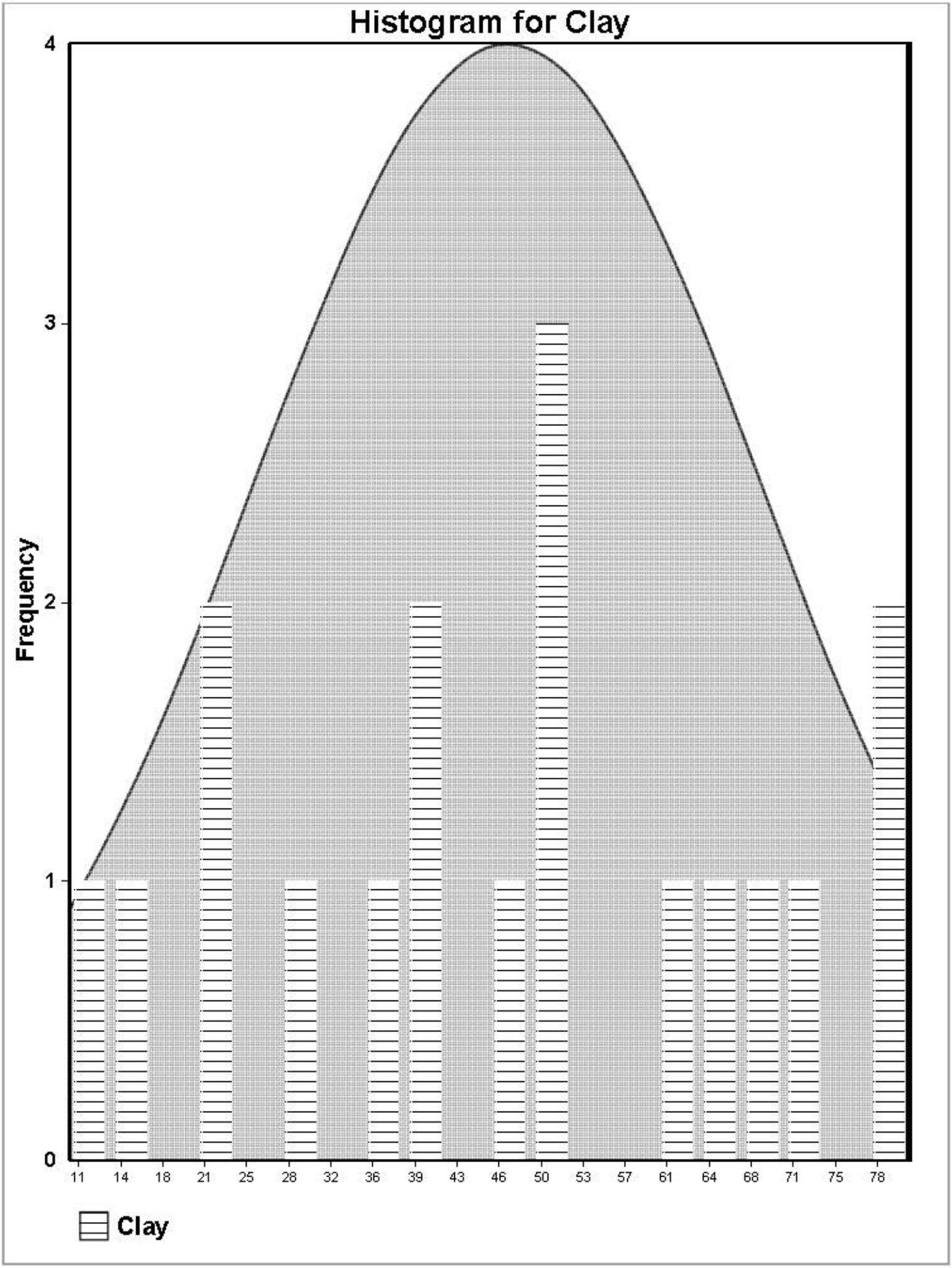
H0: Mean/Median of Site or AOC = Mean/Median of Background

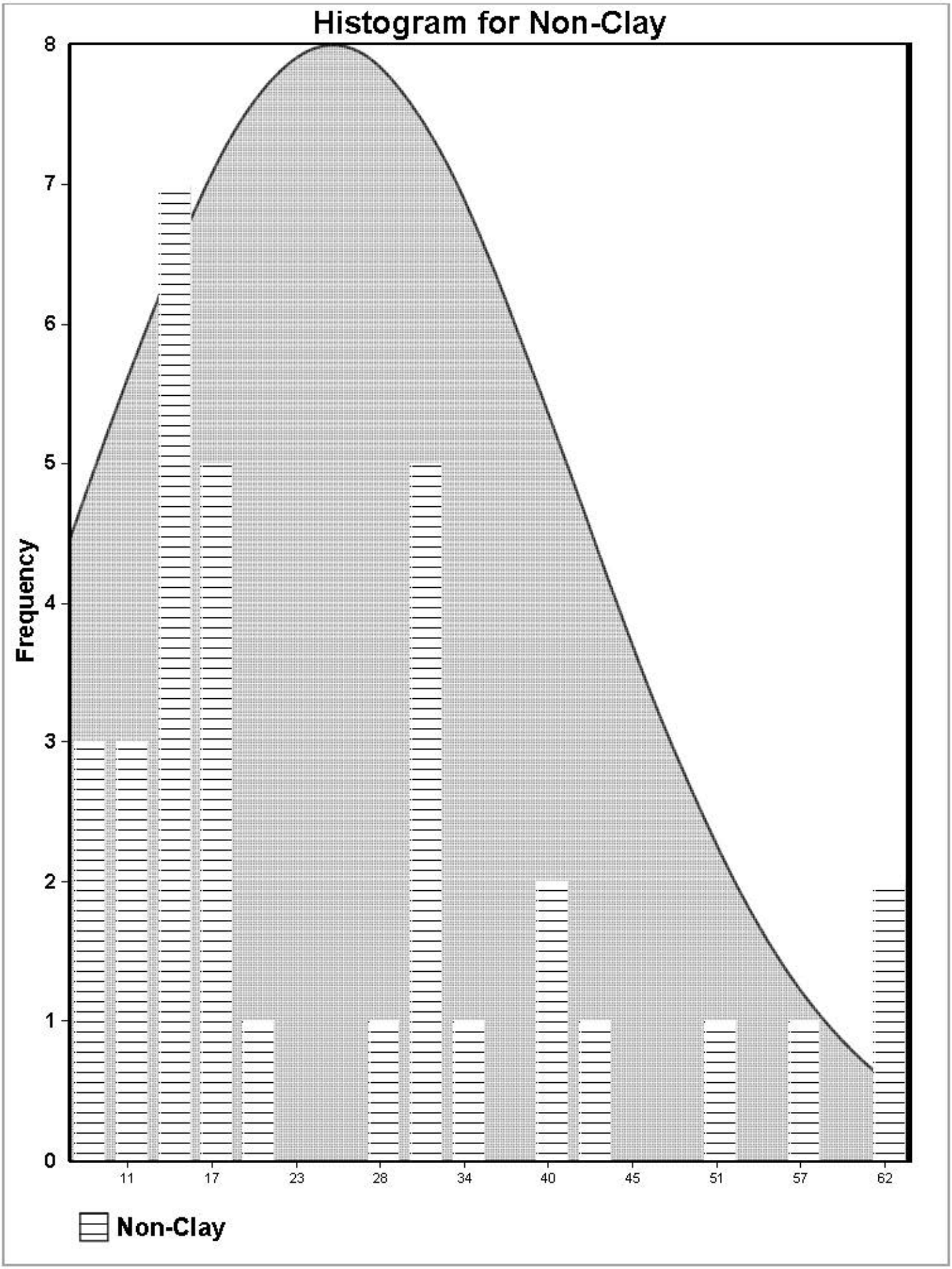
Site Rank Sum W-Stat	687
WMW Test U-Stat	3.361
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	7.2397E-4

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Clay
Frequency
0
1
2
3
4
11
14
18
21
25
28
32
36
39
43
46
50
53
57
61
64
68
71
75
78
Clay


Histogram for Non-Clay
Frequency
0
1
2
3
4
5
6
7
8
11
17
23
28
34
40
45
51
57
62
Non-Clay

Location	Clay
BG-1-2	78
BG-1-43	64
BG-1-55	23
BG-1-78	69
BG-2-30	49
BG-2-81	61
BG-3-17	15
BG-3-22	9.8
BG-3-69	39
BG-4-2	30
BG-4-19	73
BG-4-40	52
BG-4-79	52
BG-4-161	24
BG-4-163	41
BG-6-28	48
BG-6-53	36
BG-6-87	81

Location	Non-Clay
BG-1-10	52
BG-1-29	41
BG-1-40	63
BG-1-46	31
BG-1-92	19
BG-2-2	13
BG-2-10	11
BG-2-19	16
BG-2-21	13
BG-2-32	16
BG-2-75	13
BG-3-2	12
BG-3-10	31
BG-3-29	13
BG-3-63	16
BG-3-65	30
BG-3-95	9.6
BG-3-105	30
BG-3-131	7.7
BG-3-136	57
BG-4-10	39
BG-4-65	13
BG-4-82	29
BG-4-95	11
BG-4-117	7.3
BG-4-120	43
BG-6-2	18
BG-6-9	14
BG-6-58	13
BG-6-75	16
BG-6-98	30
BG-6-114	34
BG-6-127	64
Average	25.01818

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Zinc.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv

Raw Statistics	
Number of Valid Observations	12
Number of Distinct Observations	11
Minimum	11
Maximum	78
Mean of Raw Data	30.17
Standard Deviation of Raw Data	23.08
Kstar	1.686
Mean of Log Transformed Data	3.159
Standard Deviation of Log Transformed Data	0.716

Normal Distribution Test Results	
Correlation Coefficient R	0.906
Shapiro Wilk Test Statistic	0.81
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.0127
Lilliefors Test Statistic	0.284
Lilliefors Critical (0.95) Value	0.256

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.973
A-D Test Statistic	0.835
A-D Critical (0.95) Value	0.741
K-S Test Statistic	0.262
K-S Critical(0.95) Value	0.248

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.941
Shapiro Wilk Test Statistic	0.864
Shapiro Wilk Critical (0.95) Value	0.859
Approximate Shapiro Wilk P Value	0.0771
Lilliefors Test Statistic	0.23
Lilliefors Critical (0.95) Value	0.256

Data appear Lognormal at (0.05) Significance Level

MC

Raw Statistics	
Number of Valid Observations	39

Number of Distinct Observations	28
Minimum	7.3
Maximum	81
Mean of Raw Data	33.57
Standard Deviation of Raw Data	20.56
Kstar	2.373
Mean of Log Transformed Data	3.305
Standard Deviation of Log Transformed Data	0.686

Normal Distribution Test Results

Correlation Coefficient R	0.968
Shapiro Wilk Test Statistic	0.921
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.0104
Lilliefors Test Statistic	0.137
Lilliefors Critical (0.95) Value	0.142

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.981
A-D Test Statistic	0.522
A-D Critical (0.95) Value	0.757
K-S Test Statistic	0.131
K-S Critical(0.95) Value	0.143

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.981
Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical (0.95) Value	0.939
Approximate Shapiro Wilk P Value	0.0638
Lilliefors Test Statistic	0.126
Lilliefors Critical (0.95) Value	0.142

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Zinc.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv

General Statistics

Total Number of Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-Transformed Statistics	
Minimum	11	Minimum	2.398
Maximum	78	Maximum	4.357
Second Largest	63	Second Largest	4.143
First Quartile	13	First Quartile	2.565
Median	17	Median	2.831
Third Quartile	43.75	Third Quartile	3.773
Mean	30.17	Mean	3.159
SD	23.08	SD	0.716
Coefficient of Variation	0.765		
Skewness	1.105		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.81	Shapiro Wilk Test Statistic	0.864
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	93.3	95% UTL with 95% Coverage	167.2
95% UPL (t)	73.3	95% UPL (t)	89.88
90% Percentile (z)	59.74	90% Percentile (z)	59
95% Percentile (z)	68.12	95% Percentile (z)	76.54
99% Percentile (z)	83.85	99% Percentile (z)	124.7

Gamma Distribution Test		Data Distribution Test	
k star	1.686	Data appear Lognormal at 5% Significance Level	
Theta Star	17.89		
MLE of Mean	30.17		
MLE of Standard Deviation	23.23		
nu star	40.46		
A-D Test Statistic	0.835	Nonparametric Statistics	
5% A-D Critical Value	0.741	90% Percentile	61.9
K-S Test Statistic	0.262	95% Percentile	69.75
5% K-S Critical Value	0.248	99% Percentile	76.35
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	78
90% Percentile	61.11	95% Percentile Bootstrap UTL with 95% Coverage	78
95% Percentile	75.6	95% BCA Bootstrap UTL with 95% Coverage	78
99% Percentile	108.1	95% UPL	78
		95% Chebyshev UPL	134.9
95% WH Approx. Gamma UPL	80.74	Upper Threshold Limit Based upon IQR	89.88
95% HW Approx. Gamma UPL	82.48		
95% WH Approx. Gamma UTL with 95% Coverage	122.1		
95% HW Approx. Gamma UTL with 95% Coverage	129.6		

MC

General Statistics			
Total Number of Observations	39	Number of Distinct Observations	28

Raw Statistics		Log-Transformed Statistics	
Minimum	7.3	Minimum	1.988
Maximum	81	Maximum	4.394
Second Largest	73	Second Largest	4.29
First Quartile	15.5	First Quartile	2.74
Median	30	Median	3.401
Third Quartile	48.5	Third Quartile	3.882
Mean	33.57	Mean	3.305
SD	20.56	SD	0.686
Coefficient of Variation	0.612		
Skewness	0.6		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.921	Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	77.26	95% UTL with 95% Coverage	117
95% UPL (t)	68.69	95% UPL (t)	87.92
90% Percentile (z)	59.93	90% Percentile (z)	65.65
95% Percentile (z)	67.4	95% Percentile (z)	84.22
99% Percentile (z)	81.41	99% Percentile (z)	134.4
Gamma Distribution Test		Data Distribution Test	
k star	2.373	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	14.15		
MLE of Mean	33.57		
MLE of Standard Deviation	21.79		
nu star	185.1		
A-D Test Statistic	0.522	Nonparametric Statistics	
5% A-D Critical Value	0.757	90% Percentile	64
K-S Test Statistic	0.131	95% Percentile	69.4
5% K-S Critical Value	0.143	99% Percentile	77.96

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	81
90% Percentile	62.76	95% Percentile Bootstrap UTL with 95% Coverage	81
95% Percentile	75.52	95% BCA Bootstrap UTL with 95% Coverage	81
99% Percentile	103.5	95% UPL	73
		95% Chebyshev UPL	124.4
95% WH Approx. Gamma UPL	76.79	Upper Threshold Limit Based upon IQR	98
95% HW Approx. Gamma UPL	78.82		
95% WH Approx. Gamma UTL with 95% Coverage	93.27		
95% HW Approx. Gamma UTL with 95% Coverage	97.38		

Outlier Tests for Selected Variables

User Selected Options	
From File	Zinc.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Dixon's Outlier Test for Alluv

Number of data = 12

10% critical value: 0.49

5% critical value: 0.546

1% critical value: 0.642

1. Data Value 78 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.394

For 10% significance level, 78 is not an outlier.

For 5% significance level, 78 is not an outlier.

For 1% significance level, 78 is not an outlier.

2. Data Value 11 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.038

For 10% significance level, 11 is not an outlier.

For 5% significance level, 11 is not an outlier.

For 1% significance level, 11 is not an outlier.

Rosner's Outlier Test for MC

Mean	33.57
Standard Deviation	20.56
Number of data	39
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	33.57	20.3	81	36	2.336	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Zinc.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: MC

Background Data: Alluv

Raw Statistics

	Site	Background
Number of Valid Observations	39	12
Number of Distinct Observations	28	11
Minimum	7.3	11
Maximum	81	78
Mean	33.57	30.17
Median	30	17
SD	20.56	23.08
SE of Mean	3.293	6.662

Wilcoxon-Mann-Whitney (WMW) Test

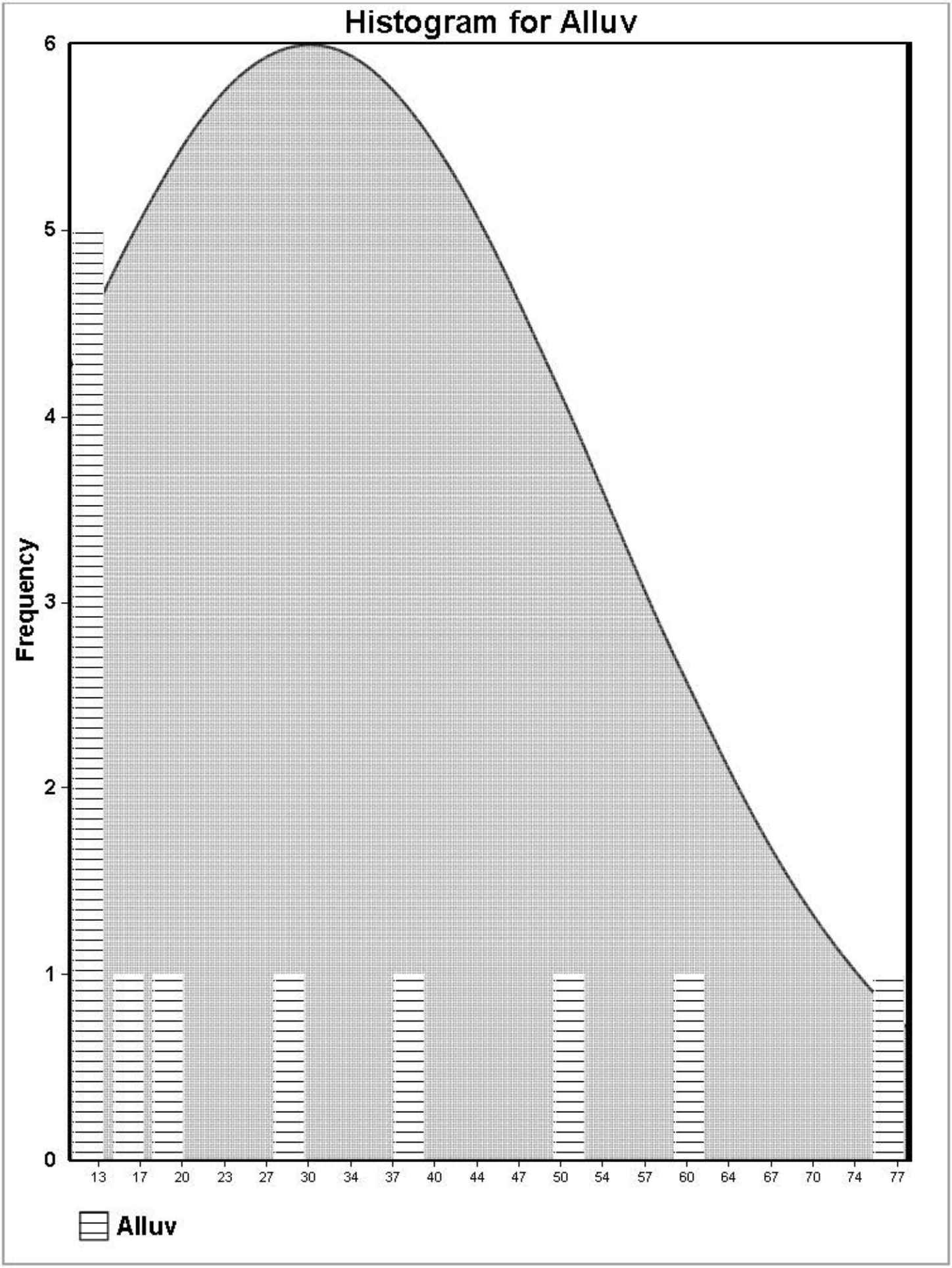
H0: Mean/Median of Site or AOC = Mean/Median of Background

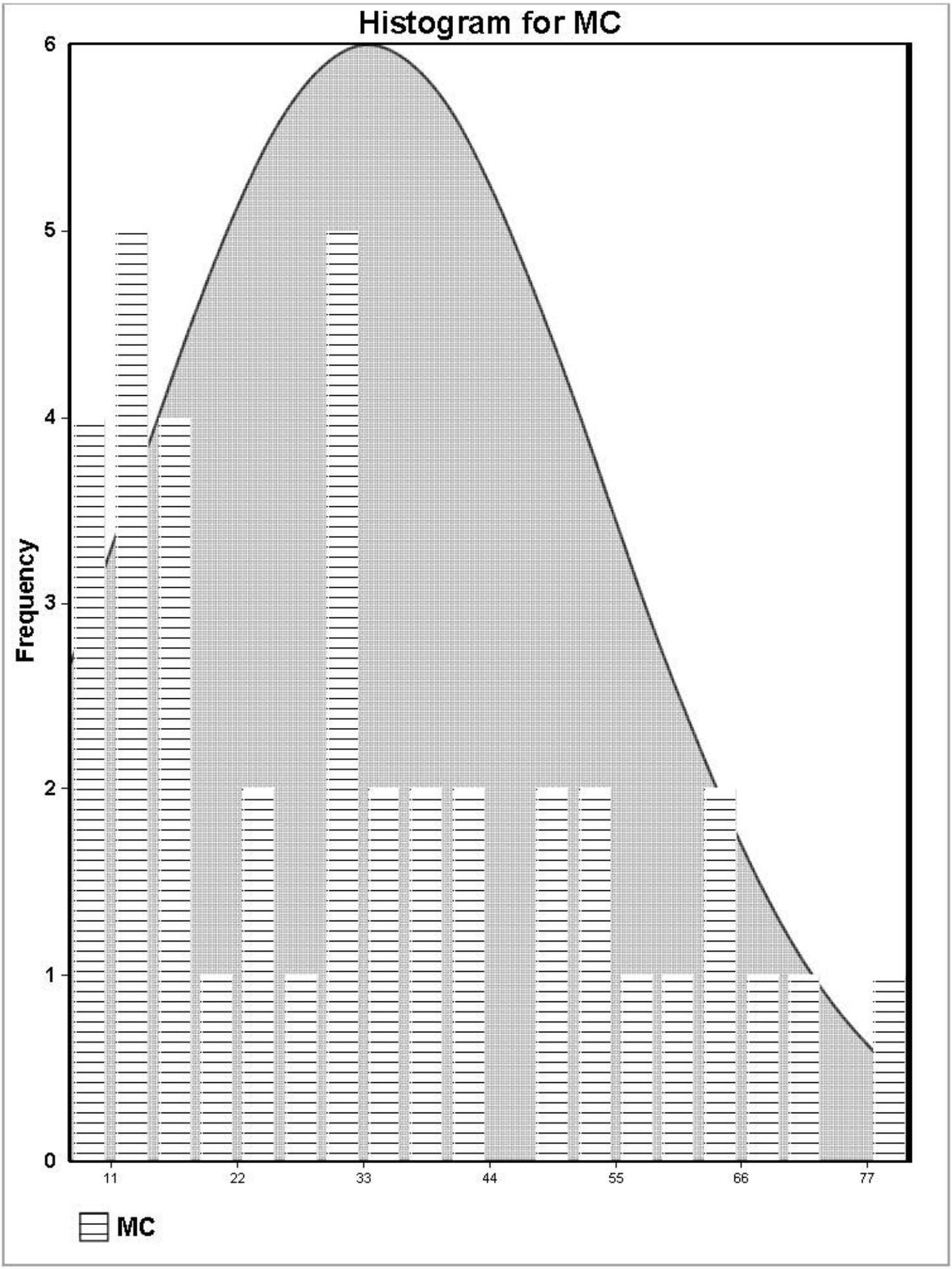
Site Rank Sum W-Stat	1040
WMW Test U-Stat	0.566
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.571

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv
Frequency
0
1
2
3
4
5
6
13
17
20
23
27
30
34
37
40
44
47
50
54
57
60
64
67
70
74
77
Alluv


Histogram for MC
Frequency
0
1
2
3
4
5
6
11
22
33
44
55
66
77
MC

Location	Alluv
BG-1-2	78
BG-1-10	52
BG-1-29	41
BG-1-40	63
BG-2-2	13
BG-2-10	11
BG-2-19	16
BG-2-21	13
BG-3-2	12
BG-3-10	31
BG-6-2	18
BG-6-9	14

Location	MC
BG-1-43	64
BG-1-46	31
BG-1-55	23
BG-1-78	69
BG-1-92	19
BG-2-30	49
BG-2-32	16
BG-2-75	13
BG-2-81	62
BG-3-17	15
BG-3-22	9.8
BG-3-29	13
BG-3-63	16
BG-3-65	30
BG-3-69	39
BG-3-95	9.6
BG-3-105	30
BG-3-131	7.7
BG-3-136	57
BG-4-1	30
BG-4-10	39
BG-4-19	73
BG-4-40	52
BG-4-65	13
BG-4-79	52
BG-4-82	29
BG-4-95	11
BG-4-117	7.3
BG-4-120	43
BG-4-161	24
BG-4-163	41
BG-6-28	48
BG-6-53	36
BG-6-58	13
BG-6-75	16
BG-6-87	81
BG-6-98	30
BG-6-114	34
BG-1-127	64

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	1,1-Biphenyl.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv 1,1-Biphenyl

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	0	26	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv 1,1-Biphenyl was not processed!

Muddy Creek 1,1-Biphenyl

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	1	45	97.83%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Muddy Creek 1,1-Biphenyl was not processed!

Mesa 1,1-Biphenyl

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	0	28	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mesa 1,1-Biphenyl was not processed!

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	1,1-Biphenyl.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv 1,1-Biphenyl

General Statistics

Number of Valid Data	26	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	26

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv 1,1-Biphenyl was not processed!

Muddy Creek 1,1-Biphenyl

General Statistics

Number of Valid Data	46	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	45

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Muddy Creek 1,1-Biphenyl was not processed!

Mesa 1,1-Biphenyl

General Statistics

Number of Valid Data	28	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	28

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mesa 1,1-Biphenyl was not processed!

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	1,1-Biphenyl.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa 1,1-Biphenyl

Background Data: Alluv 1,1-Biphenyl

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	28	26
Number of Detect Data	0	0
Minimum Non-Detect	10	10
Maximum Non-Detect	10	10
Percent Non detects	100.00%	100.00%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	1,1-Biphenyl.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek 1,1-Biphenyl

Background Data: Alluv 1,1-Biphenyl

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	45	26
Number of Detect Data	1	0
Minimum Non-Detect	1	10
Maximum Non-Detect	10	10
Percent Non detects	97.83%	100.00%
Minimum Detected	0.22	N/A
Maximum Detected	0.22	N/A
Mean of Detected Data	0.22	N/A
Median of Detected Data	0.22	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	1,1-Biphenyl.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa 1,1-Biphenyl

Background Data: Muddy Creek 1,1-Biphenyl

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	28	45
Number of Detect Data	0	1
Minimum Non-Detect	10	1
Maximum Non-Detect	10	10
Percent Non detects	100.00%	97.83%
Minimum Detected	N/A	0.22
Maximum Detected	N/A	0.22
Mean of Detected Data	N/A	0.22
Median of Detected Data	N/A	0.22
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

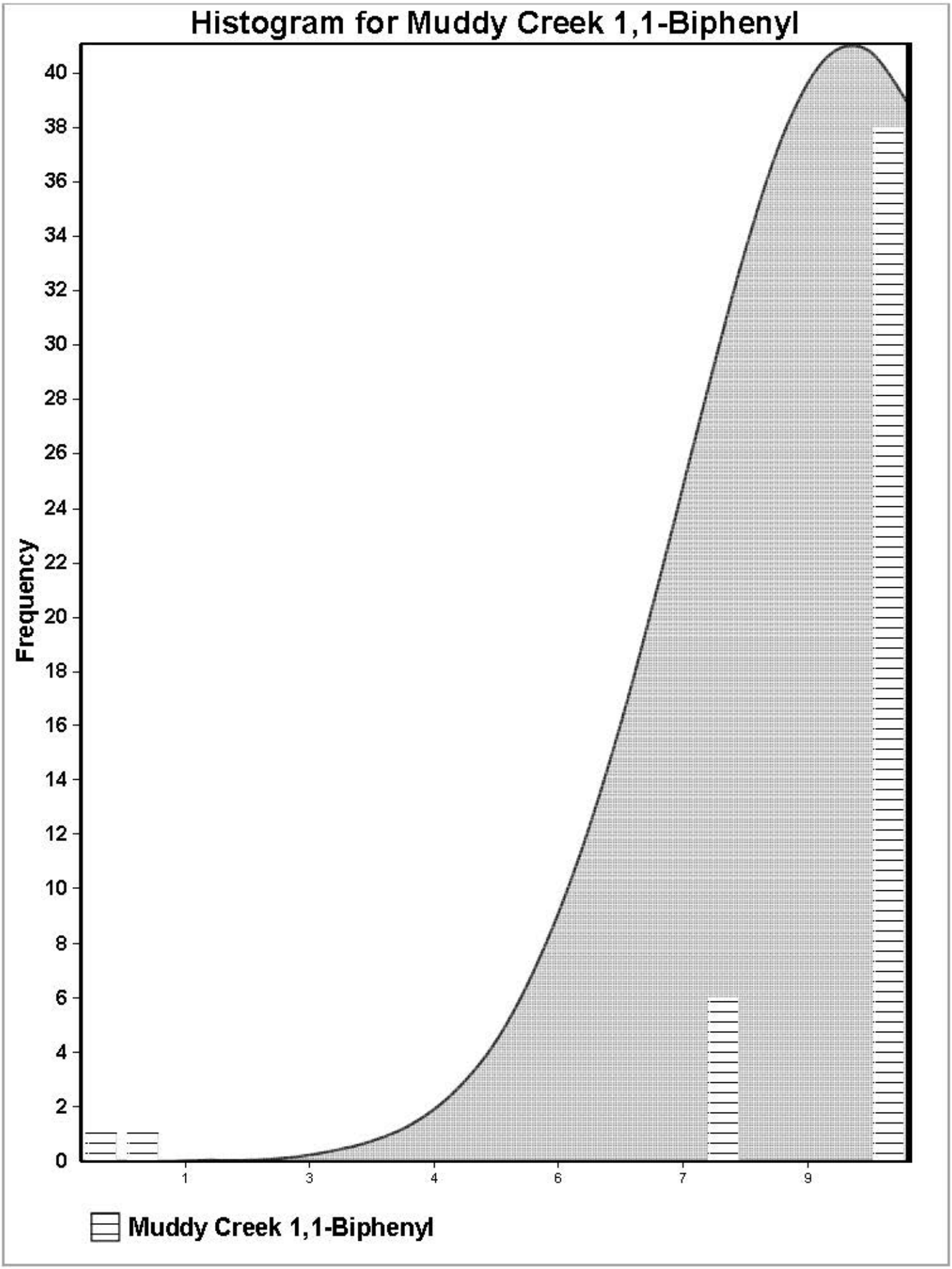
H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Muddy Creek 1,1-Biphenyl
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
1
3
4
6
7
9
Muddy Creek 1,1-Biphenyl

Outlier Tests for Selected Variables

User Selected Options	
From File	1,1-Biphenyl.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv 1,1-Biphenyl

Mean	5
Standard Deviation	0

Rosner's Outlier Test for Muddy Creek 1,1-Biphenyl

Mean	4.668
Standard Deviation	0.989
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4.668	0.978	0.22	44	4.547	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.22 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.22 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa 1,1-Biphenyl

Mean	5
Standard Deviation	0

Location Name	Sample Date	Alluv 1,1-Biphenyl	D_Alluv 1,1-Biphenyl
BG-1S	11/26/2012	10	0
BG-1S	8/23/2012	10	0
BG-1S	5/24/2012	10	0
BG-1S	3/20/2012	10	0
IMW-2.5D	11/26/2012	10	0
IMW-2.5D	8/24/2012	10	0
IMW-2.5D	5/21/2012	10	0
IMW-2.5D	3/21/2012	10	0
IMW-2.5S	11/26/2012	10	0
IMW-2.5S	8/24/2012	10	0
IMW-2.5S	5/21/2012	10	0
IMW-2.5S	3/21/2012	10	0
IMW-3S	5/21/2012	10	0
IMW-3S	3/20/2012	10	0
KMW-2D	11/26/2012	10	0
KMW-2D	8/24/2012	10	0
KMW-2D	5/21/2012	10	0
KMW-2D	3/23/2012	10	0
KMW-2M	11/26/2012	10	0
KMW-2M	8/24/2012	10	0
KMW-2M	5/21/2012	10	0
KMW-2M	3/23/2012	10	0
KMW-2S	11/26/2012	10	0
KMW-2S	8/24/2012	10	0
KMW-2S	5/21/2012	10	0
KMW-2S	3/23/2012	10	0

Location Name	Sample Date	Muddy Creel	D_Muddy Cr
BG-3S	11/27/2012	10	0
BG-3S	8/22/2012	10	0
BG-3S	5/23/2012	10	0
BG-3S	3/21/2012	10	0
BG-4S	11/27/2012	10	0
BG-4S	8/30/2012	10	0
BG-4S	5/30/2012	10	0
BG-4S	3/20/2012	10	0
BG-6S	11/27/2012	10	0
BG-6S	8/23/2012	8	0
BG-6S	5/25/2012	10	0
BG-6S	3/21/2012	10	0
BG-1M	11/26/2012	10	0
BG-1M	8/23/2012	8	0
BG-1M	5/24/2012	10	0
BG-1M	3/20/2012	10	0
BG-3M	11/27/2012	10	0
BG-3M	8/22/2012	8	0
BG-3M	5/24/2012	10	0
BG-3M	3/21/2012	10	0
BG-4M	11/27/2012	10	0
BG-4M	8/30/2012	10	0
BG-4M	5/30/2012	10	0
BG-4M	3/20/2012	1	0
BG-6M	11/27/2012	10	0
BG-6M	8/22/2012	8	0
BG-6M	5/25/2012	10	0
BG-6M	3/21/2012	10	0
BG-1D	11/26/2012	10	0
BG-1D	8/23/2012	8	0
BG-1D	5/24/2012	10	0
BG-1D	3/20/2012	10	0
BG-3D	11/27/2012	10	0
BG-3D	8/21/2012	10	0
BG-3D	5/23/2012	10	0
BG-3D	3/21/2012	10	0
BG-4D	11/27/2012	10	0
BG-4D	8/30/2012	10	0
BG-4D	5/30/2012	10	0
BG-4D	3/20/2012	10	0
BG-6D	11/27/2012	10	0
BG-6D	8/22/2012	8	0
BG-6D	5/25/2012	10	0
BG-6D	3/21/2012	0.22	1
IMW-3D	5/21/2012	10	0
IMW-3D	3/22/2012	10	0

Location Name	Sample Date	Mesa 1,1-Biphe	D_Mesa 1,1-Biphenyl
LMW-10	11/28/2012	10	0
LMW-10	8/27/2012	10	0
LMW-10	5/30/2012	10	0
LMW-10	3/22/2012	10	0
LMW-11R	11/26/2012	10	0
LMW-11R	8/21/2012	10	0
LMW-11R	5/29/2012	10	0
LMW-11R	3/23/2012	10	0
LMW-7	11/28/2012	10	0
LMW-7	8/27/2012	10	0
LMW-7	5/31/2012	10	0
LMW-7	3/23/2012	10	0
BG-2S	11/26/2012	10	0
BG-2S	8/23/2012	10	0
BG-2S	5/24/2012	10	0
BG-2S	3/21/2012	10	0
LMW-9	11/28/2012	10	0
LMW-9	8/27/2012	10	0
LMW-9	5/31/2012	10	0
LMW-9	3/23/2012	10	0
BG-2M	11/26/2012	10	0
BG-2M	8/23/2012	10	0
BG-2M	5/24/2012	10	0
BG-2M	3/21/2012	10	0
BG-2D	11/26/2012	10	0
BG-2D	8/23/2012	10	0
BG-2D	5/24/2012	10	0
BG-2D	3/21/2012	10	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Acenaphthene.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Acenaphthene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	1	25	96.15%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Alluv Acenaphthene was not processed!

Muddy Creek Acenaphthene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	6	40	86.96%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	40	0.05	0.05	0.05	0.05	2.108E-17
Statistics (Detects Only)	6	0.0086	0.02	0.0128	0.011	0.00469
Statistics (All: NDs treated as DL value)	46	0.0086	0.05	0.0451	0.05	0.0128
Statistics (All: NDs treated as DL/2 value)	46	0.0086	0.025	0.0234	0.025	0.00445
Statistics (Normal ROS Estimated Data)	46	0.00151	0.024	0.0128	0.0124	0.0052
Statistics (Gamma ROS Estimated Data)	46	1.000E-12	0.02	0.0124	0.0131	0.00479
Statistics (Lognormal ROS Estimated Data)	46	0.00516	0.0285	0.0131	0.012	0.00524

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	9.669	9.053	0.00132	-4.414	0.349	-0.0791
Statistics (NDs = DL)	6.204	5.814	0.00728	-3.181	0.497	-0.156
Statistics (NDs = DL/2)	17.67	16.53	0.00132	-3.783	0.273	-0.0721
Statistics (Gamma ROS Estimates)	1.012	0.961	0.0123	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.414	0.394	-0.0892

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.938	0.639	0.629	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.864	0.788	Data Appear Normal
Lilliefors (Detects Only)	0.232	0.362	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.411	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.518	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.404	0.945	Data Not Normal
Lilliefors (NDs = DL/2)	0.51	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.988	0.945	Data Appear Normal

Lilliefors (Normal ROS Estimates)	0.0473	0.131	Data Appear Normal			

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS		
Correlation Coefficient R	0.967	0.532	0.565	0.811		

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Anderson-Darling (Detects Only)	0.425	0.698				
Kolmogorov-Smirnov (Detects Only)	0.232	0.333	Data Appear Gamma Distributed			
Anderson-Darling (NDs = DL)	13.72	0.752				
Kolmogorov-Smirnov (NDs = DL)	0.522	0.131	Data Not Gamma Distributed			
Anderson-Darling (NDs = DL/2)	13.46	0.748				
Kolmogorov-Smirnov (NDs = DL/2)	0.51	0.13	Data Not Gamma Distributed			
Anderson-Darling (Gamma ROS Estimates)	8.023	0.777				
Kolmogorov-Smirnov (Gamma ROS Est.)	0.319	0.134	Data Not Gamma Distributed			

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS		
Correlation Coefficient R	0.956	0.64	0.619	0.999		

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Shapiro-Wilks (Detects Only)	0.893	0.788	Data Appear Lognormal			
Lilliefors (Detects Only)	0.209	0.362	Data Appear Lognormal			
Shapiro-Wilks (NDs = DL)	0.415	0.945	Data Not Lognormal			
Lilliefors (NDs = DL)	0.515	0.131	Data Not Lognormal			
Shapiro-Wilks (NDs = DL/2)	0.395	0.945	Data Not Lognormal			
Lilliefors (NDs = DL/2)	0.505	0.131	Data Not Lognormal			
Shapiro-Wilks (Lognormal ROS Estimates)	0.989	0.945	Data Appear Lognormal			
Lilliefors (Lognormal ROS Estimates)	0.0431	0.131	Data Appear Lognormal			

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Acenaphthene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	8	20	71.43%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	20	0.05	0.05	0.05	0.05	7.119E-18
Statistics (Detects Only)	8	0.01	0.18	0.0393	0.019	0.0573
Statistics (All: NDs treated as DL value)	28	0.01	0.18	0.0469	0.05	0.0296
Statistics (All: NDs treated as DL/2 value)	28	0.01	0.18	0.0291	0.025	0.0299
Statistics (Normal ROS Estimated Data)	28	-0.0458	0.18	0.0303	0.0205	0.0434
Statistics (Gamma ROS Estimated Data)	28	1.000E-12	0.18	0.0363	0.029	0.0344
Statistics (Lognormal ROS Estimated Data)	28	0.00515	0.18	0.028	0.019	0.0327

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.144	1.045	0.0343	-3.735	0.895	-0.24
Statistics (NDs = DL)	3.543	3.187	0.0132	-3.207	0.569	-0.177
Statistics (NDs = DL/2)	3.206	2.887	0.00907	-3.702	0.456	-0.123
Statistics (Gamma ROS Estimates)	0.542	0.508	0.067	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.896	0.737	-0.189

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.706	0.701	0.511	0.941

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.528	0.818	Data Not Normal
Lilliefors (Detects Only)	0.411	0.313	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.53	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.423	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.297	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.483	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.906	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.131	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.889	0.746	0.625	0.934

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.25	0.733	
Kolmogorov-Smirnov (Detects Only)	0.36	0.301	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.17	0.752	
Kolmogorov-Smirnov (NDs = DL)	0.367	0.166	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	6.103	0.753	
Kolmogorov-Smirnov (NDs = DL/2)	0.458	0.166	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.987	0.806	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.274	0.174	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.871	0.832	0.714	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.783	0.818	Data Not Lognormal
Lilliefors (Detects Only)	0.307	0.313	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.716	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.395	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.557	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.417	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.967	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0921	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

All Acenaphthene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	109	0	109	16	93	85.32%

	Number	Minimum	Maximum	Mean	Median	SD

Statistics (Non-Detects Only)	93	0.05	0.05	0.05	0.05	9.767E-17
Statistics (Detects Only)	16	0.0086	0.18	0.0264	0.018	0.0415
Statistics (All: NDs treated as DL value)	109	0.0086	0.18	0.0465	0.05	0.0176
Statistics (All: NDs treated as DL/2 value)	109	0.0086	0.18	0.0252	0.025	0.0155
Statistics (Normal ROS Estimated Data)	109	-0.0435	0.18	0.0223	0.019	0.0292
Statistics (Gamma ROS Estimated Data)	109	0.00477	0.18	0.0252	0.0218	0.0192
Statistics (Lognormal ROS Estimated Data)	109	0.0037	0.18	0.0199	0.0162	0.0189

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.369	1.338	0.0193	-4.042	0.726	-0.18
Statistics (NDs = DL)	6.278	6.111	0.00741	-3.149	0.46	-0.146
Statistics (NDs = DL/2)	8.493	8.265	0.00297	-3.741	0.298	-0.0797
Statistics (Gamma ROS Estimates)	2.749	2.679	0.00918	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.133	0.615	-0.149

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.608	0.617	0.4	0.954

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.401	0.887	Data Not Normal
Lilliefors (Detects Only)	0.427	0.222	Data Not Normal
Lilliefors (NDs = DL)	0.44	0.0849	Data Not Normal
Lilliefors (NDs = DL/2)	0.487	0.0849	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0663	0.0849	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.79	0.6	0.446	0.838

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.296	0.757	
Kolmogorov-Smirnov (Detects Only)	0.361	0.219	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	28.28	0.754	
Kolmogorov-Smirnov (NDs = DL)	0.486	0.0872	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	9.174E+28	0.753	
Kolmogorov-Smirnov (NDs = DL/2)	0.446	0.0871	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.668	0.76	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0743	0.0879	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.853	0.685	0.629	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.75	0.887	Data Not Lognormal
Lilliefors (Detects Only)	0.278	0.222	Data Not Lognormal
Lilliefors (NDs = DL)	0.493	0.0849	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.44	0.0849	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0372	0.0849	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.											

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Acenaphthene.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Acenaphthene

General Statistics

Number of Valid Data	26	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	25

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Alluv Acenaphthene was not processed!

Muddy Creek Acenaphthene

General Statistics

Number of Valid Data	46	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	40
		Percent Non-Detects	86.96%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0086	Minimum Detected	-4.756
Maximum Detected	0.02	Maximum Detected	-3.912
Mean of Detected	0.0128	Mean of Detected	-4.414
SD of Detected	0.00469	SD of Detected	0.349
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Warning: There are only 6 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.864	Shapiro Wilk Test Statistic	0.893
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution	Assuming Lognormal Distribution

DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0234	Mean (Log Scale)	-3.783
SD	0.00445	SD (Log Scale)	0.273
95% UTL 95% Coverage	0.0327	95% UTL 95% Coverage	0.0401
95% UPL (t)	0.031	95% UPL (t)	0.0361
90% Percentile (z)	0.0291	90% Percentile (z)	0.0323
95% Percentile (z)	0.0307	95% Percentile (z)	0.0356
99% Percentile (z)	0.0338	99% Percentile (z)	0.0429
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0131
		SD in Original Scale	0.00524
		Mean in Log Scale	-4.414
		SD in Log Scale	0.394
		95% UTL 95% Coverage	0.0275
		95% UPL (t)	0.0236
		90% Percentile (z)	0.0201
		95% Percentile (z)	0.0231
		99% Percentile (z)	0.0303
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	4.946	Data appear Normal at 5% Significance Level	
Theta Star	0.00258		
nu star	59.35		
A-D Test Statistic	0.425	Nonparametric Statistics	
5% A-D Critical Value	0.698	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.232	Mean	0.0128
5% K-S Critical Value	0.333	SD	0.00428
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00192
		95% KM UTL with 95% Coverage	0.0217
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0316
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.02
Mean	0.0124	90% Percentile (z)	0.0183
Median	0.0131	95% Percentile (z)	0.0198
SD	0.00479	99% Percentile (z)	0.0227
k star	0.961		
Theta star	0.0129	Gamma ROS Limits with Extrapolated Data	
Nu star	88.37	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0279
95% Percentile of Chisquare (2k)	5.838	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0328
		95% WH Approx. Gamma UTL with 95% Coverage	0.0331
90% Percentile	0.0289	95% HW Approx. Gamma UTL with 95% Coverage	0.0405
95% Percentile	0.0378		
99% Percentile	0.0584		

Note: DL/2 is not a recommended method.

Mesa Acenaphthene

General Statistics			
Number of Valid Data	28	Number of Detected Data	8
Number of Distinct Detected Data	6	Number of Non-Detect Data	20

		Percent Non-Detects	71.43%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.01	Minimum Detected	-4.605
Maximum Detected	0.18	Maximum Detected	-1.715
Mean of Detected	0.0393	Mean of Detected	-3.735
SD of Detected	0.0573	SD of Detected	0.895
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Warning: There are only 8 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.528	Shapiro Wilk Test Statistic	0.783
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0291	Mean (Log Scale)	-3.702
SD	0.0299	SD (Log Scale)	0.456
95% UTL 95% Coverage	0.0963	95% UTL 95% Coverage	0.0688
95% UPL (t)	0.0809	95% UPL (t)	0.0544
90% Percentile (z)	0.0674	90% Percentile (z)	0.0443
95% Percentile (z)	0.0783	95% Percentile (z)	0.0523
99% Percentile (z)	0.0987	99% Percentile (z)	0.0713
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.028
		SD in Original Scale	0.0327
		Mean in Log Scale	-3.896
		SD in Log Scale	0.737
		95% UTL 95% Coverage	0.106
		95% UPL (t)	0.0729
		90% Percentile (z)	0.0523
		95% Percentile (z)	0.0683
		99% Percentile (z)	0.113

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.798	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0492		
nu star	12.78		
A-D Test Statistic	1.25	Nonparametric Statistics	
5% A-D Critical Value	0.733	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.36	Mean	0.0249

5% K-S Critical Value	0.301	SD	0.0307
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00664
		95% KM UTL with 95% Coverage	0.0938
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.161
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.078
Mean	0.0363	90% Percentile (z)	0.0642
Median	0.029	95% Percentile (z)	0.0753
SD	0.0344	99% Percentile (z)	0.0962
k star	0.508		
Theta star	0.0716	Gamma ROS Limits with Extrapolated Data	
Nu star	28.44	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.112
95% Percentile of Chisquare (2k)	3.88	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.131
		95% WH Approx. Gamma UTL with 95% Coverage	0.154
90% Percentile	0.098	95% HW Approx. Gamma UTL with 95% Coverage	0.192
95% Percentile	0.139		
99% Percentile	0.239		

Note: DL/2 is not a recommended method.

All Acenaphthene

General Statistics

Number of Valid Data	109	Number of Detected Data	16
Number of Distinct Detected Data	11	Number of Non-Detect Data	93
		Percent Non-Detects	85.32%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0086	Minimum Detected	-4.756
Maximum Detected	0.18	Maximum Detected	-1.715
Mean of Detected	0.0264	Mean of Detected	-4.042
SD of Detected	0.0415	SD of Detected	0.726
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.401	Shapiro Wilk Test Statistic	0.75
5% Shapiro Wilk Critical Value	0.887	5% Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0252	Mean (Log Scale)	-3.741
SD	0.0155	SD (Log Scale)	0.298
95% UTL 95% Coverage	0.0547	95% UTL 95% Coverage	0.042
95% UPL (t)	0.051	95% UPL (t)	0.039
90% Percentile (z)	0.045	90% Percentile (z)	0.0348
95% Percentile (z)	0.0506	95% Percentile (z)	0.0388
99% Percentile (z)	0.0612	99% Percentile (z)	0.0475
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	

Mean in Original Scale	0.0199
SD in Original Scale	0.0189
Mean in Log Scale	-4.133
SD in Log Scale	0.615
95% UTL 95% Coverage	0.052
95% UPL (t)	0.0447
90% Percentile (z)	0.0353
95% Percentile (z)	0.0441
99% Percentile (z)	0.0671

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.154
Theta Star	0.0229
nu star	36.94
A-D Test Statistic	2.296
5% A-D Critical Value	0.757
K-S Test Statistic	0.361
5% K-S Critical Value	0.219
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics with Extrapolated Data	
Mean	0.0252
Median	0.0218
SD	0.0192
k star	2.679
Theta star	0.00942
Nu star	584.1
95% Percentile of Chisquare (2k)	11.62
90% Percentile	0.0459
95% Percentile	0.0548
99% Percentile	0.074

Data Distribution Test with Detected Values Only	
Data do not follow a Discernable Distribution (0.05)	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.0177
SD	0.0169
SE of Mean	0.00229
95% KM UTL with 95% Coverage	0.0499
95% KM Chebyshev UPL	0.0916
95% KM UPL (t)	0.0458
90% Percentile (z)	0.0393
95% Percentile (z)	0.0454
99% Percentile (z)	0.0569
Gamma ROS Limits with Extrapolated Data	
95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0545
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0551
95% WH Approx. Gamma UTL with 95% Coverage	0.0609
95% HW Approx. Gamma UTL with 95% Coverage	0.0621

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Acenaphthene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Acenaphthene

Background Data: Alluv Acenaphthene

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	20	25
Number of Detect Data	8	1
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	71.43%	96.15%
Minimum Detected	0.01	0.013
Maximum Detected	0.18	0.013
Mean of Detected Data	0.0393	0.013
Median of Detected Data	0.019	0.013
SD of Detected Data	0.0573	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	1.045
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.296

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Acenaphthene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Acenaphthene

Background Data: Alluv Acenaphthene

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	40	25
Number of Detect Data	6	1
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	86.96%	96.15%
Minimum Detected	0.0086	0.013
Maximum Detected	0.02	0.013
Mean of Detected Data	0.0128	0.013
Median of Detected Data	0.011	0.013
SD of Detected Data	0.00469	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-0.391
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.696

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Acenaphthene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Acenaphthene

Background Data: Muddy Creek Acenaphthene

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	20	40
Number of Detect Data	8	6
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	71.43%	86.96%
Minimum Detected	0.01	0.0086
Maximum Detected	0.18	0.02
Mean of Detected Data	0.0393	0.0128
Median of Detected Data	0.019	0.011
SD of Detected Data	0.0573	0.00469

Site vs Background Gehan Test

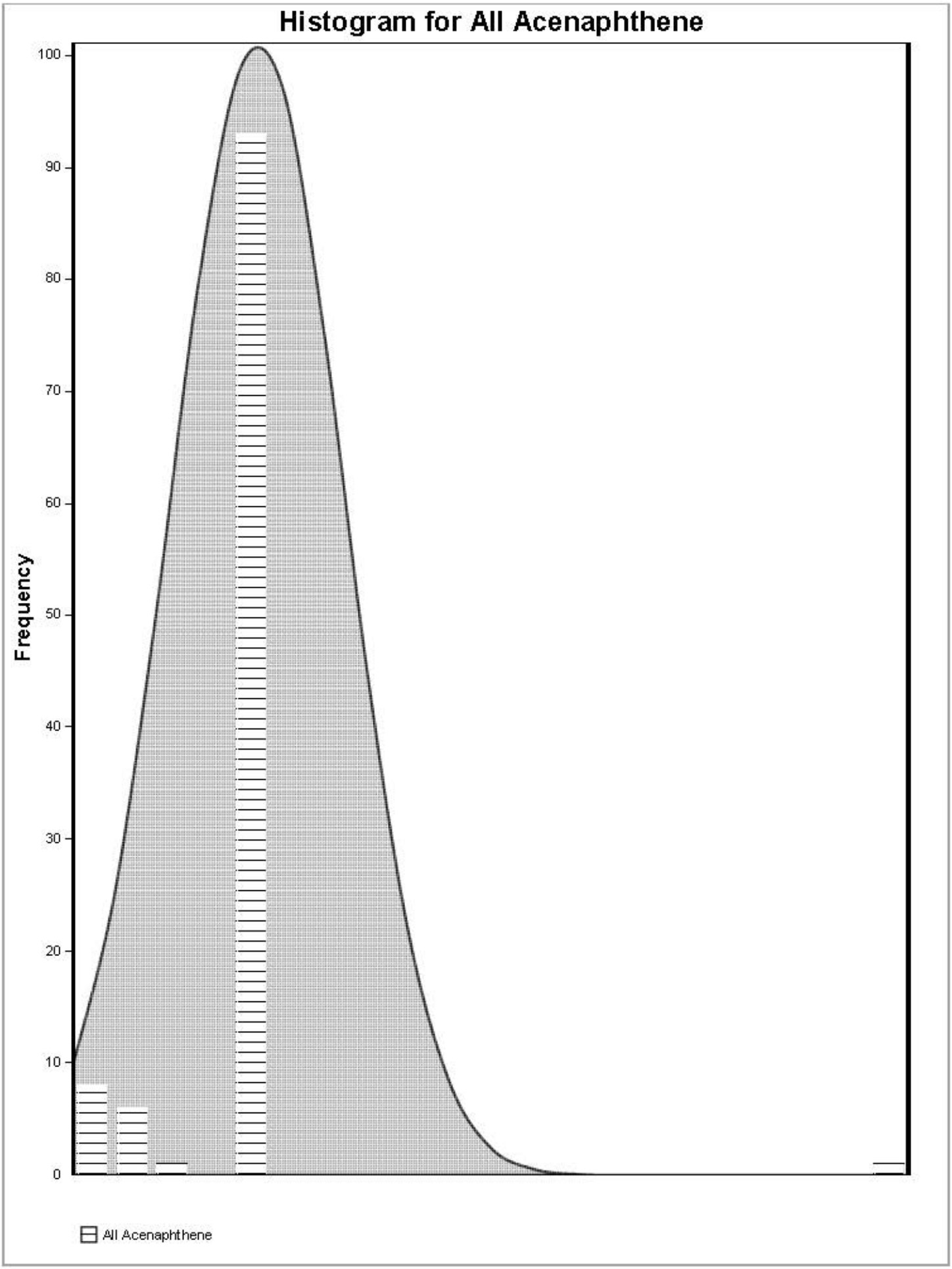
H0: Mu of Site or AOC = Mu of background

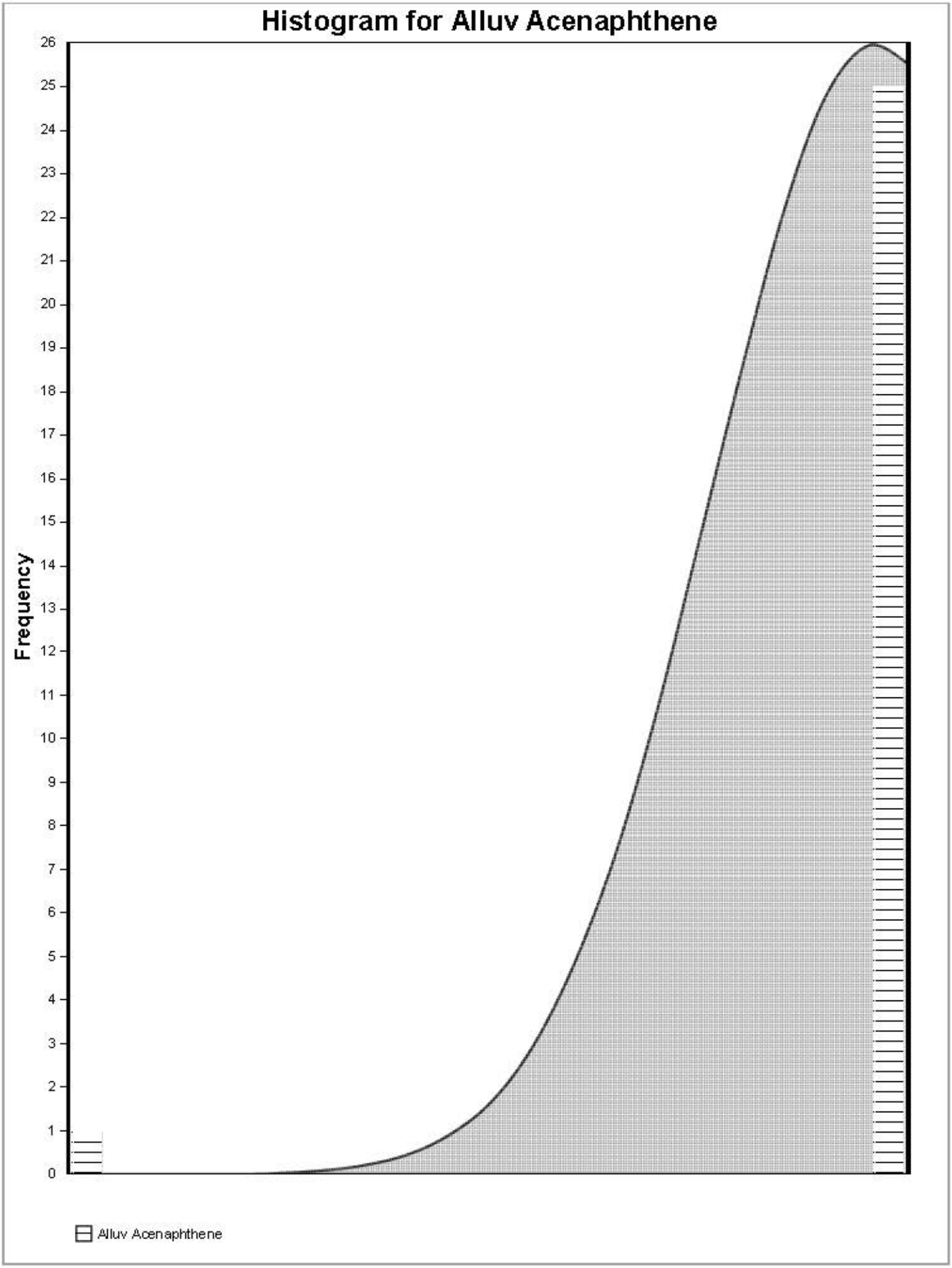
Gehan z Test Value	1.779
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0753

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for All Acenaphthene
Frequency
100
90
80
70
60
50
40
30
20
10
0
All Acenaphthene


Histogram for Alluv Acenaphthene
Frequency
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1
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3
4
5
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7
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9
10
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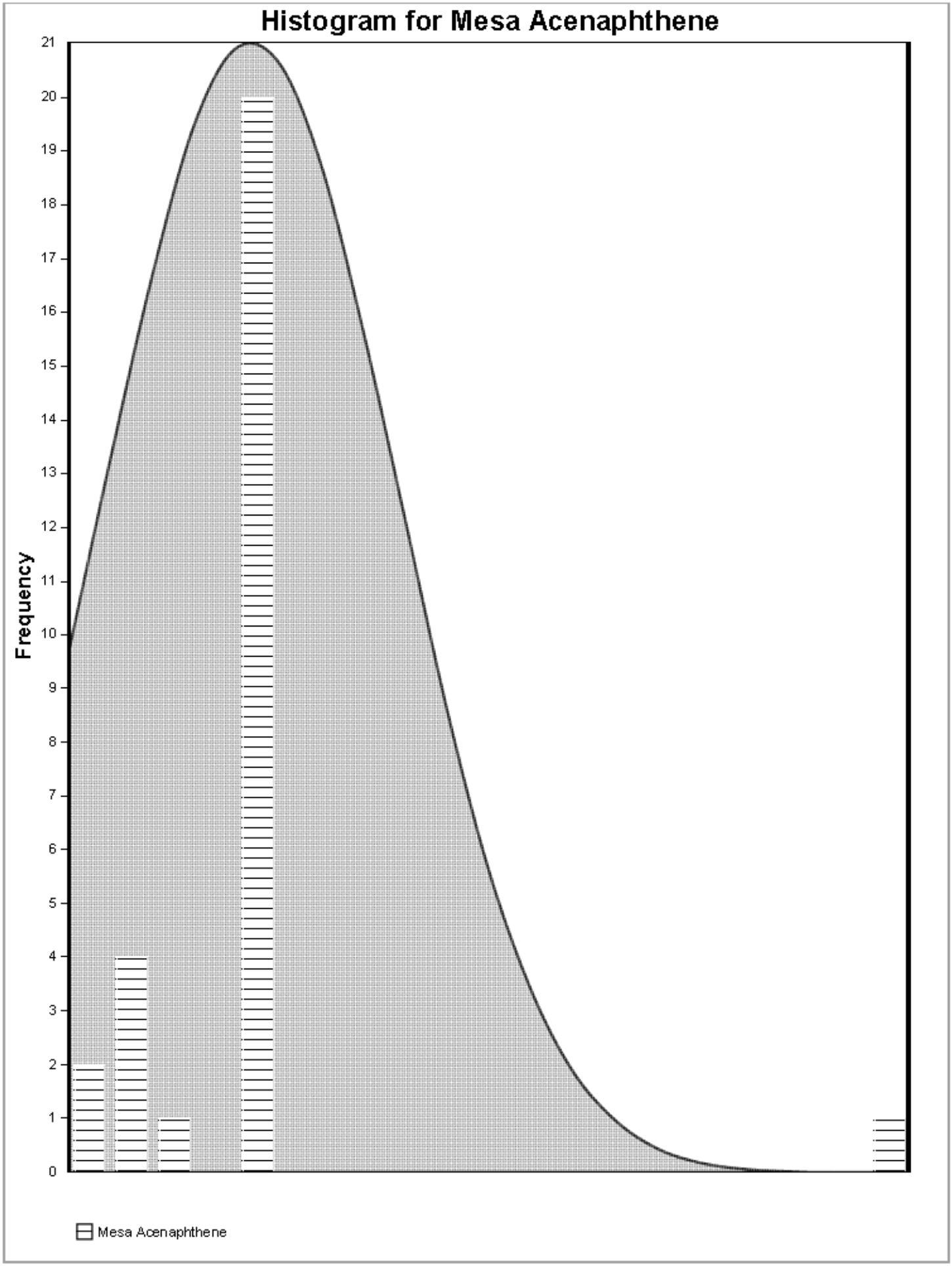
20
21
22
23
24
25
26
Alluv Acenaphthene


Histogram for Mesa Acenaphthene
Frequency
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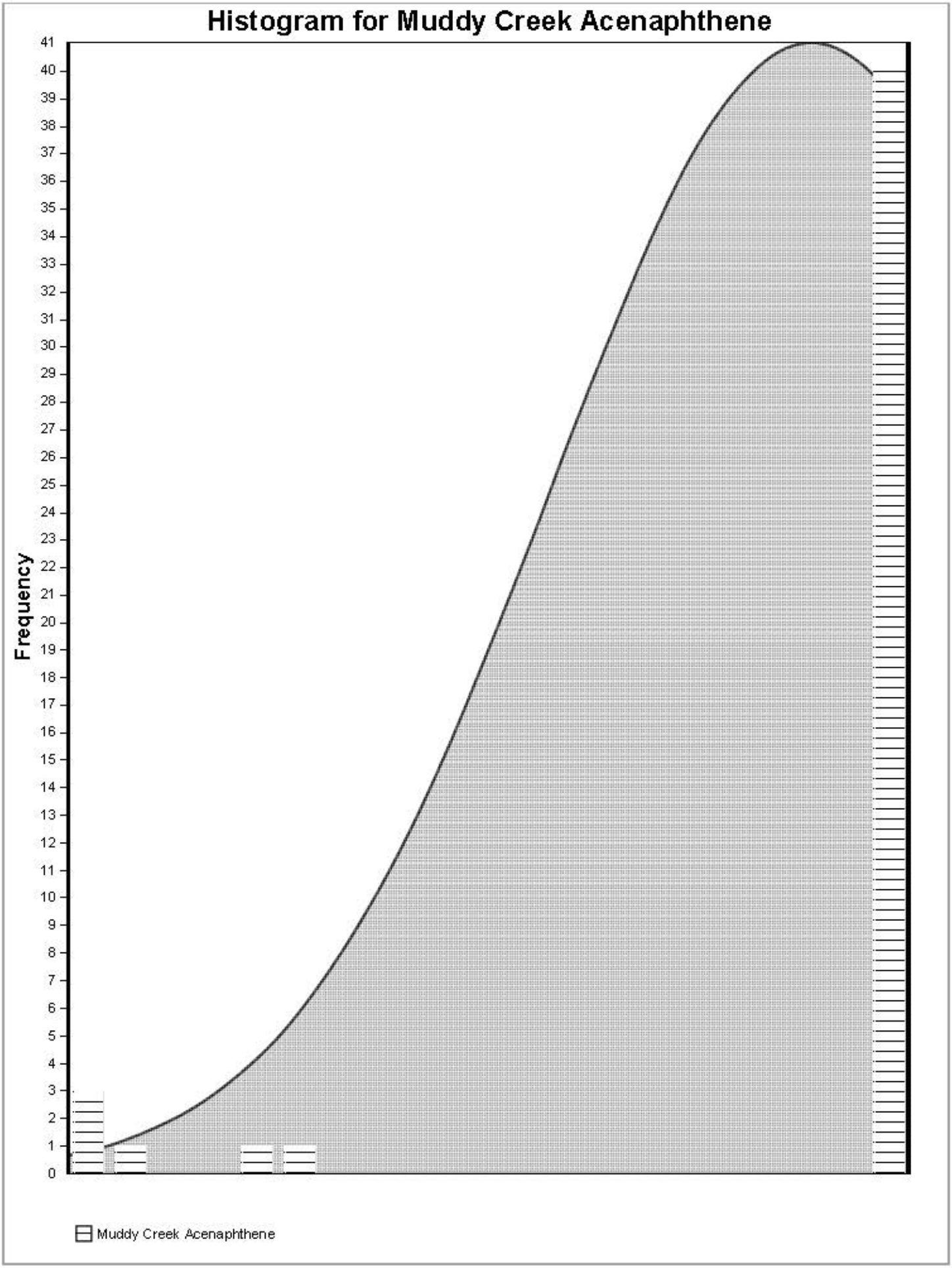
21
Mesa Acenaphthene


Histogram for Muddy Creek Acenaphthene
Frequency
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41
Muddy Creek Acenaphthene

Outlier Tests for Selected Variables

User Selected Options	
From File	Acenaphthene.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Acenaphthene

Mean	0.0245
Standard Deviation	0.00235
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0245	0.00231	0.013	20	5	2.84	3.16

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.013 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.013 is a Potential Statistical Outlier

Rosner's Outlier Test for Muddy Creek Acenaphthene

Mean	0.0234
Standard Deviation	0.00445
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0234	0.0044	0.0086	40	3.364	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.0086 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Acenaphthene

Mean	0.0291
Standard Deviation	0.0299
Number of data	28
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0291	0.0294	0.18	17	5.138	2.88	3.2

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.18 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.18 is a Potential Statistical Outlier

Rosner's Outlier Test for All Acenaphthene

Mean	0.0252
Standard Deviation	0.0155
Number of data	109
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0252	0.0154	0.18	98	10.06	3.405	3.775

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.18 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.18 is a Potential Statistical Outlier

Location Name	Sample Date	Alluv Acenaphthe	D_Alluv Acenaphthe
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.013	1
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0

Location Name	Sample Date	Muddy Creek	D_Muddy Creek
BG-3S	11/27/2012	0.05	0
BG-3S	8/22/2012	0.05	0
BG-3S	5/23/2012	0.05	0
BG-3S	3/21/2012	0.05	0
BG-4S	11/27/2012	0.05	0
BG-4S	8/30/2012	0.05	0
BG-4S	5/30/2012	0.05	0
BG-4S	3/20/2012	0.05	0
BG-6S	11/27/2012	0.05	0
BG-6S	8/23/2012	0.05	0
BG-6S	5/25/2012	0.05	0
BG-6S	3/21/2012	0.05	0
BG-1M	11/26/2012	0.05	0
BG-1M	8/23/2012	0.05	0
BG-1M	5/24/2012	0.05	0
BG-1M	3/20/2012	0.05	0
BG-3M	3/21/2012	0.01	1
BG-3M	11/27/2012	0.05	0
BG-3M	8/22/2012	0.017	1
BG-3M	5/23/2012	0.05	0
BG-4M	3/21/2012	0.05	0
BG-4M	11/27/2012	0.05	0
BG-4M	8/30/2012	0.05	0
BG-4M	5/30/2012	0.05	0
BG-6M	3/20/2012	0.05	0
BG-6M	11/27/2012	0.05	0
BG-6M	8/22/2012	0.009	1
BG-6M	5/25/2012	0.05	0
BG-1D	3/21/2012	0.05	0
BG-1D	11/26/2012	0.05	0
BG-1D	8/23/2012	0.05	0
BG-1D	5/24/2012	0.05	0
BG-3D	3/21/2012	0.012	1
BG-3D	11/27/2012	0.05	0
BG-3D	8/21/2012	0.05	0
BG-3D	5/23/2012	0.05	0
BG-4D	3/21/2012	0.05	0
BG-4D	11/27/2012	0.05	0
BG-4D	8/30/2012	0.05	0
BG-4D	5/30/2012	0.0086	1
BG-6D	3/20/2012	0.05	0
BG-6D	11/27/2012	0.05	0
BG-6D	8/22/2012	0.05	0
BG-6D	5/25/2012	0.05	0
IMW-3D	3/21/2012	0.02	1

Location Name	Sample Date	Mesa Acenaphthe	D_Mesa Acenaphthe
LMW-10	3/22/2012	0.05	0
LMW-10	11/28/2012	0.034	1
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-11R	3/23/2012	0.019	1
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-7	3/23/2012	0.019	1
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
BG-2S	11/26/2012	0.019	1
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
LMW-9	11/28/2012	0.18	1
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.021	1
BG-2M	3/20/2012	0.01	1
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2D	3/20/2012	0.012	1
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0

Location Name	Sample Date	All Acenaphthe	D_All Acenaphthe
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.013	1
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0
BG-3S	11/27/2012	0.05	0
BG-3S	8/22/2012	0.05	0
BG-3S	5/23/2012	0.05	0
BG-3S	3/21/2012	0.05	0
BG-4S	11/27/2012	0.05	0
BG-4S	8/30/2012	0.05	0
BG-4S	5/30/2012	0.05	0
BG-4S	3/20/2012	0.05	0
BG-6S	11/27/2012	0.05	0
BG-6S	8/23/2012	0.05	0
BG-6S	5/25/2012	0.05	0
BG-6S	3/21/2012	0.05	0
BG-1M	11/26/2012	0.05	0
BG-1M	8/23/2012	0.05	0
BG-1M	5/24/2012	0.05	0
BG-1M	3/20/2012	0.05	0
BG-3M	3/21/2012	0.01	1
BG-3M	11/27/2012	0.05	0
BG-3M	8/22/2012	0.017	1

IMW-3D	5/25/2012	0.05	0

BG-3M	5/24/2012	0.05	0
BG-4M	3/21/2012	0.05	0
BG-4M	11/27/2012	0.05	0
BG-4M	8/30/2012	0.05	0
BG-4M	5/30/2012	0.05	0
BG-6M	3/20/2012	0.05	0
BG-6M	11/27/2012	0.05	0
BG-6M	8/22/2012	0.009	1
BG-6M	5/25/2012	0.05	0
BG-1D	3/21/2012	0.05	0
BG-1D	11/26/2012	0.05	0
BG-1D	8/23/2012	0.05	0
BG-1D	5/24/2012	0.05	0
BG-3D	3/21/2012	0.012	1
BG-3D	11/27/2012	0.05	0
BG-3D	8/21/2012	0.05	0
BG-3D	5/23/2012	0.05	0
BG-4D	3/21/2012	0.05	0
BG-4D	11/27/2012	0.05	0
BG-4D	8/30/2012	0.05	0
BG-4D	5/30/2012	0.0086	1
BG-6D	3/20/2012	0.05	0
BG-6D	11/27/2012	0.05	0
BG-6D	8/22/2012	0.05	0
BG-6D	5/25/2012	0.05	0
IMW-3D	3/21/2012	0.02	1
IMW-3D	5/25/2012	0.05	0
BG-2M	3/20/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2D	3/20/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-10	11/28/2012	0.034	1
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-11R	3/23/2012	0.019	1
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-7	3/23/2012	0.019	1
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0

BG-2S	11/26/2012	0.019	1
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
LMW-9	3/23/2012	0.019	1
LMW-9	11/28/2012	0.18	1
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.021	1
BG-2M	3/20/2012	0.01	1
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2D	3/20/2012	0.012	1
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Alkalinity Bicarbonate.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Alkalinity Bicarbonate

Raw Statistics	
Number of Valid Observations	26
Number of Distinct Observations	16
Minimum	300
Maximum	1200
Mean of Raw Data	445.4
Standard Deviation of Raw Data	164.1
Kstar	11.41
Mean of Log Transformed Data	6.06
Standard Deviation of Log Transformed Data	0.257

Normal Distribution Test Results	
Correlation Coefficient R	0.69
Shapiro Wilk Test Statistic	0.512
Shapiro Wilk Critical (0.95) Value	0.92
Approximate Shapiro Wilk P Value	2.0624E-9
Lilliefors Test Statistic	0.34
Lilliefors Critical (0.95) Value	0.174

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.739
A-D Test Statistic	2.653
A-D Critical (0.95) Value	0.744
K-S Test Statistic	0.281
K-S Critical(0.95) Value	0.171

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.83
Shapiro Wilk Test Statistic	0.719
Shapiro Wilk Critical (0.95) Value	0.92
Approximate Shapiro Wilk P Value	3.0682E-6
Lilliefors Test Statistic	0.251
Lilliefors Critical (0.95) Value	0.174

Data not Lognormal at (0.05) Significance Level

Muddy Creek Alkalinity Bicarbonate

Raw Statistics	
Number of Valid Observations	46

Number of Distinct Observations	17
Minimum	89
Maximum	240
Mean of Raw Data	157.8
Standard Deviation of Raw Data	43.7
Kstar	12.59
Mean of Log Transformed Data	5.024
Standard Deviation of Log Transformed Data	0.279

Normal Distribution Test Results

Correlation Coefficient R	0.973
Shapiro Wilk Test Statistic	0.925
Shapiro Wilk Critical (0.95) Value	0.945
Approximate Shapiro Wilk P Value	0.00636
Lilliefors Test Statistic	0.18
Lilliefors Critical (0.95) Value	0.131

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.977
A-D Test Statistic	0.749
A-D Critical (0.95) Value	0.748
K-S Test Statistic	0.154
K-S Critical(0.95) Value	0.13

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.982
Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical (0.95) Value	0.945
Approximate Shapiro Wilk P Value	0.0392
Lilliefors Test Statistic	0.138
Lilliefors Critical (0.95) Value	0.131

Data not Lognormal at (0.05) Significance Level

Mesa Alkalinity Bicarbonate

Raw Statistics

Number of Valid Observations	28
Number of Distinct Observations	20
Minimum	66
Maximum	260
Mean of Raw Data	135.4
Standard Deviation of Raw Data	64.17
Kstar	4.576
Mean of Log Transformed Data	4.807
Standard Deviation of Log Transformed Data	0.451

Normal Distribution Test Results

Correlation Coefficient R	0.929
Shapiro Wilk Test Statistic	0.844
Shapiro Wilk Critical (0.95) Value	0.924
Approximate Shapiro Wilk P Value	5.2108E-4
Lilliefors Test Statistic	0.212
Lilliefors Critical (0.95) Value	0.167

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.955
A-D Test Statistic	1.252
A-D Critical (0.95) Value	0.748
K-S Test Statistic	0.162
K-S Critical(0.95) Value	0.166

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.958
Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical (0.95) Value	0.924
Approximate Shapiro Wilk P Value	0.0104
Lilliefors Test Statistic	0.149
Lilliefors Critical (0.95) Value	0.167

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Alkalinity Bicarbonate.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Alkalinity Bicarbonate

General Statistics

Total Number of Observations	26	Number of Distinct Observations	16

Raw Statistics		Log-Transformed Statistics	
Minimum	300	Minimum	5.704
Maximum	1200	Maximum	7.09
Second Largest	500	Second Largest	6.215
First Quartile	402.5	First Quartile	5.998
Median	440	Median	6.087
Third Quartile	457.5	Third Quartile	6.126
Mean	445.4	Mean	6.06
SD	164.1	SD	0.257
Coefficient of Variation	0.368		
Skewness	4.097		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.512	Shapiro Wilk Test Statistic	0.719
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	818.7	95% UTL with 95% Coverage	768.4
95% UPL (t)	731	95% UPL (t)	669.8
90% Percentile (z)	655.7	90% Percentile (z)	595.3
95% Percentile (z)	715.3	95% Percentile (z)	653.5
99% Percentile (z)	827.1	99% Percentile (z)	778.6

Gamma Distribution Test		Data Distribution Test	
k star	11.41	Data do not follow a Discernable Distribution (0.05)	
Theta Star	39.03		
MLE of Mean	445.4		
MLE of Standard Deviation	131.9		
nu star	593.3		
A-D Test Statistic	2.653	Nonparametric Statistics	
5% A-D Critical Value	0.744	90% Percentile	475
K-S Test Statistic	0.281	95% Percentile	495
5% K-S Critical Value	0.171	99% Percentile	1025
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	1200
90% Percentile	620.5	95% Percentile Bootstrap UTL with 95% Coverage	1200
95% Percentile	682.1	95% BCA Bootstrap UTL with 95% Coverage	1200
99% Percentile	807.9	95% UPL	955
		95% Chebyshev UPL	1174
95% WH Approx. Gamma UPL	685.8	Upper Threshold Limit Based upon IQR	540
95% HW Approx. Gamma UPL	681.3		
95% WH Approx. Gamma UTL with 95% Coverage	779.4		
95% HW Approx. Gamma UTL with 95% Coverage	776		

Muddy Creek Alkalinity Bicarbonate

General Statistics			
Total Number of Observations	46	Number of Distinct Observations	17
Raw Statistics		**Log-Transformed Statistics**	
Minimum	89	Minimum	4.489
Maximum	240	Maximum	5.481
Second Largest	240	Second Largest	5.481
First Quartile	130	First Quartile	4.868
Median	140	Median	4.942
Third Quartile	190	Third Quartile	5.247
Mean	157.8	Mean	5.024
SD	43.7	SD	0.279
Coefficient of Variation	0.277		
Skewness	0.4		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.925	Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical Value	0.945	Shapiro Wilk Critical Value	0.945
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	248.7	95% UTL with 95% Coverage	271.3
95% UPL (t)	232	95% UPL (t)	243.9
90% Percentile (z)	213.8	90% Percentile (z)	217.2
95% Percentile (z)	229.7	95% Percentile (z)	240.3
99% Percentile (z)	259.5	99% Percentile (z)	290.6
Gamma Distribution Test		**Data Distribution Test**	
k star	12.59	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12.54		
MLE of Mean	157.8		
MLE of Standard Deviation	44.48		
nu star	1158		
A-D Test Statistic	0.749	**Nonparametric Statistics**	
5% A-D Critical Value	0.748	90% Percentile	225
K-S Test Statistic	0.154	95% Percentile	230
5% K-S Critical Value	0.13	99% Percentile	240

Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	240
90% Percentile	216.8	95% Percentile Bootstrap UTL with 95% Coverage	240
95% Percentile	237.4	95% BCA Bootstrap UTL with 95% Coverage	230
99% Percentile	279.3	95% UPL	236.5
		95% Chebyshev UPL	350.4
95% WH Approx. Gamma UPL	238.6	Upper Threshold Limit Based upon IQR	280
95% HW Approx. Gamma UPL	239.8		
95% WH Approx. Gamma UTL with 95% Coverage	261.2		
95% HW Approx. Gamma UTL with 95% Coverage	263.4		

Mesa Alkalinity Bicarbonate

General Statistics			
Total Number of Observations	28	Number of Distinct Observations	20
Raw Statistics		Log-Transformed Statistics	
Minimum	66	Minimum	4.19
Maximum	260	Maximum	5.561
Second Largest	250	Second Largest	5.521
First Quartile	87.75	First Quartile	4.474
Median	110	Median	4.7
Third Quartile	195	Third Quartile	5.272
Mean	135.4	Mean	4.807
SD	64.17	SD	0.451
Coefficient of Variation	0.474		
Skewness	0.779		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.844	Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical Value	0.924	Shapiro Wilk Critical Value	0.924
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	279.5	95% UTL with 95% Coverage	336.6
95% UPL (t)	246.6	95% UPL (t)	267.2
90% Percentile (z)	217.6	90% Percentile (z)	218
95% Percentile (z)	240.9	95% Percentile (z)	256.8
99% Percentile (z)	284.7	99% Percentile (z)	349.1
Gamma Distribution Test		Data Distribution Test	
k star	4.576	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	29.59		
MLE of Mean	135.4		
MLE of Standard Deviation	63.29		
nu star	256.2		
A-D Test Statistic	1.252	Nonparametric Statistics	
5% A-D Critical Value	0.748	90% Percentile	236

K-S Test Statistic	0.162	95% Percentile	250
5% K-S Critical Value	0.166	99% Percentile	257.3
Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	260
90% Percentile	220.2	95% Percentile Bootstrap UTL with 95% Coverage	260
95% Percentile	253.4	95% BCA Bootstrap UTL with 95% Coverage	256.5
99% Percentile	324	95% UPL	255.5
		95% Chebyshev UPL	420.1
95% WH Approx. Gamma UPL	257.3	Upper Threshold Limit Based upon IQR	355.9
95% HW Approx. Gamma UPL	259.4		
95% WH Approx. Gamma UTL with 95% Coverage	308.5		
95% HW Approx. Gamma UTL with 95% Coverage	314.2		

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Alkalinity Bicarbonate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Alkalinity Bicarbonate

Background Data: Alluv Alkalinity Bicarbonate

Raw Statistics

	Site	Background
Number of Valid Observations	28	26
Number of Distinct Observations	20	16
Minimum	66	300
Maximum	260	1200
Mean	135.4	445.4
Median	110	440
SD	64.17	164.1
SE of Mean	12.13	32.18

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	406
WMW Test U-Stat	6.293
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	2.787E-10

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Alkalinity Bicarbonate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Alkalinity Bicarbonate

Background Data: Alluv Alkalinity Bicarbonate

Raw Statistics

	Site	Background
Number of Valid Observations	46	26
Number of Distinct Observations	17	16
Minimum	89	300
Maximum	240	1200
Mean	157.8	445.4
Median	140	440
SD	43.7	164.1
SE of Mean	6.443	32.18

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1081
WMW Test U-Stat	7.005
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	2.273E-12

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Alkalinity Bicarbonate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Alkalinity Bicarbonate

Background Data: Muddy Creek Alkalinity Bicarbonate

Raw Statistics

	Site	Background
Number of Valid Observations	28	46
Number of Distinct Observations	20	17
Minimum	66	89
Maximum	260	240
Mean	135.4	157.8
Median	110	140
SD	64.17	43.7
SE of Mean	12.13	6.443

Wilcoxon-Mann-Whitney (WMW) Test

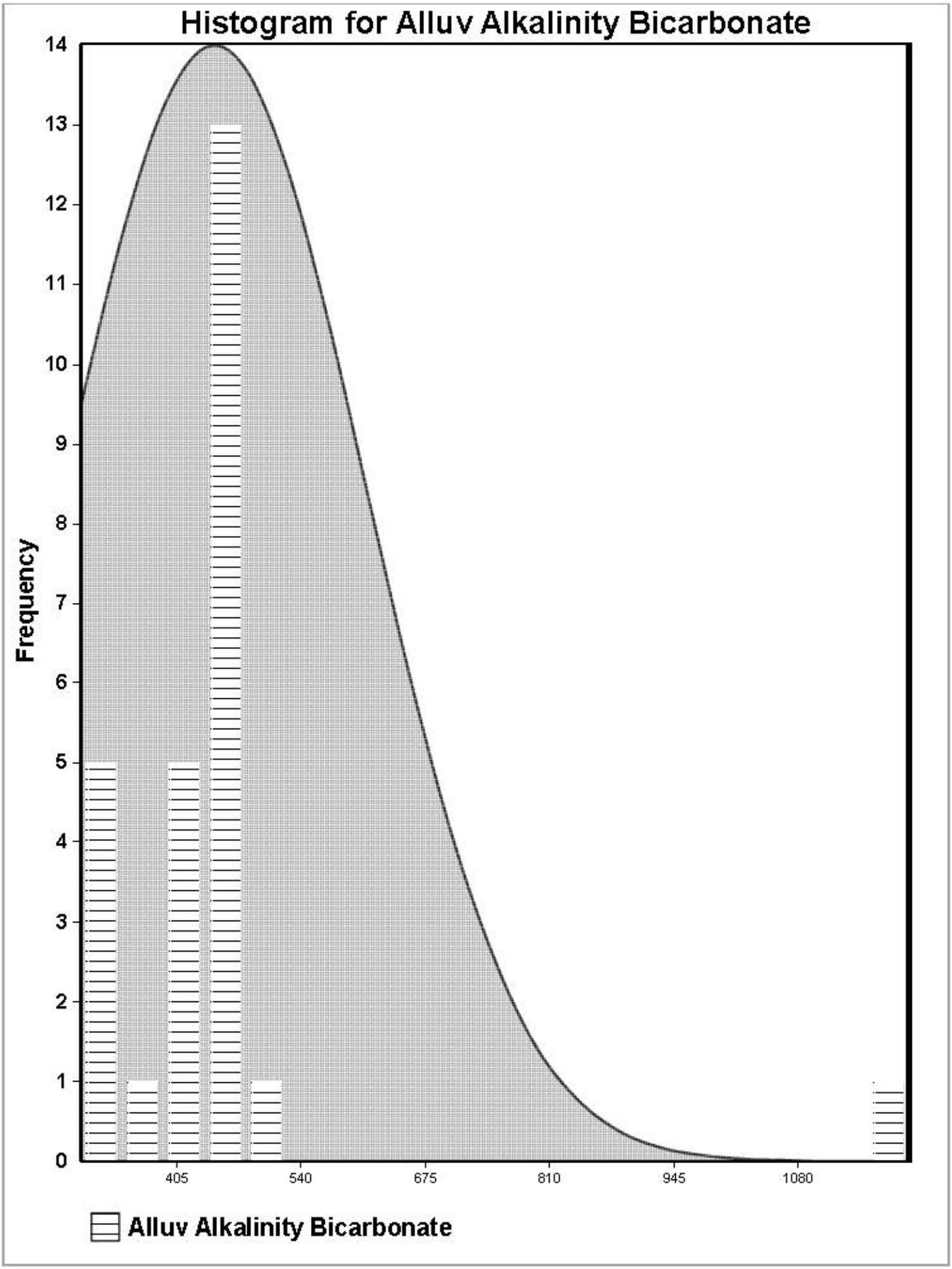
H0: Mean/Median of Site or AOC = Mean/Median of Background

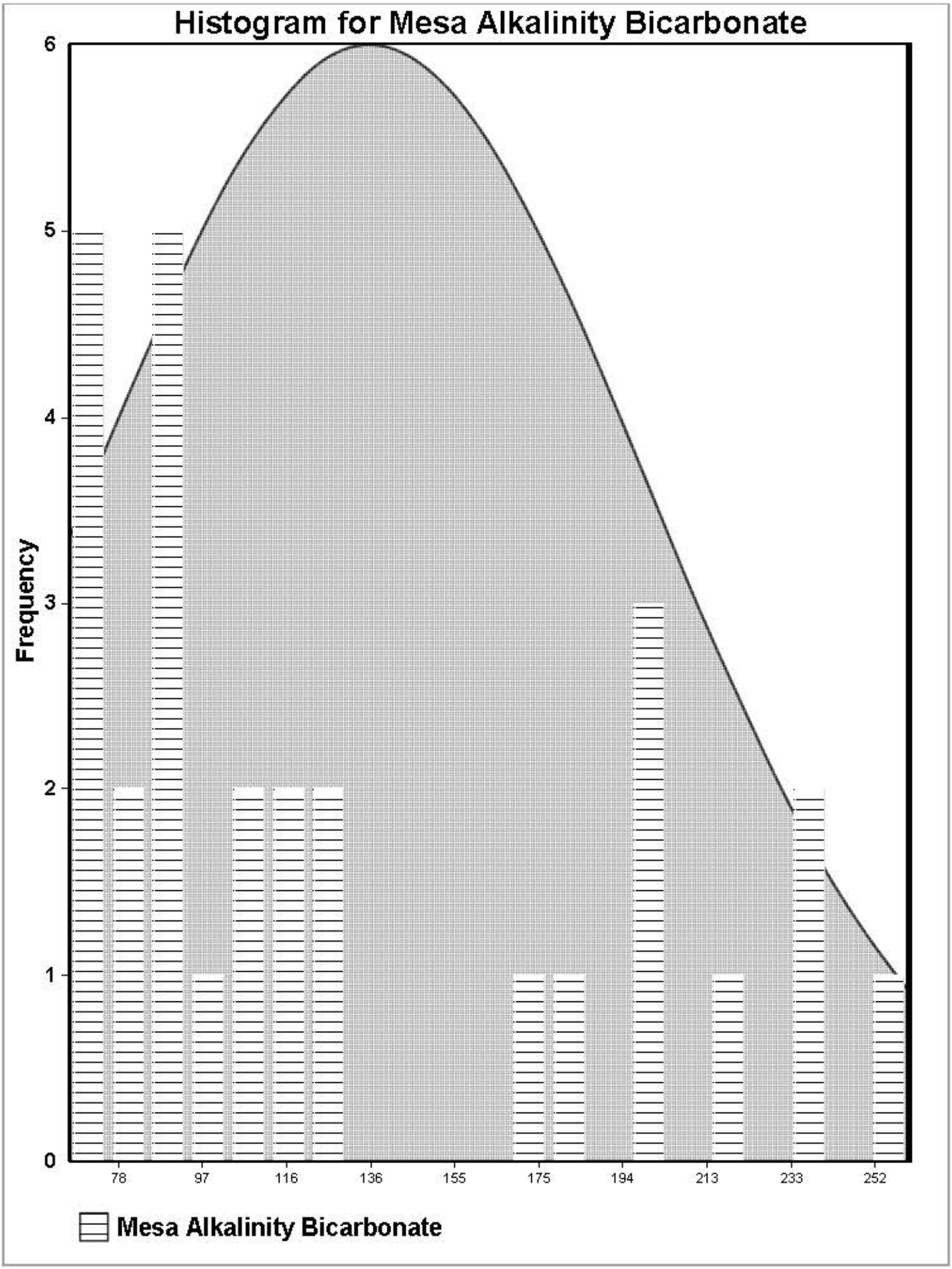
Site Rank Sum W-Stat	833.5
WMW Test U-Stat	2.407
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.0156

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Alkalinity Bicarbonate
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
405
540
675
810
945
1080
Alluv Alkalinity Bicarbonate


Histogram for Mesa Alkalinity Bicarbonate
Frequency
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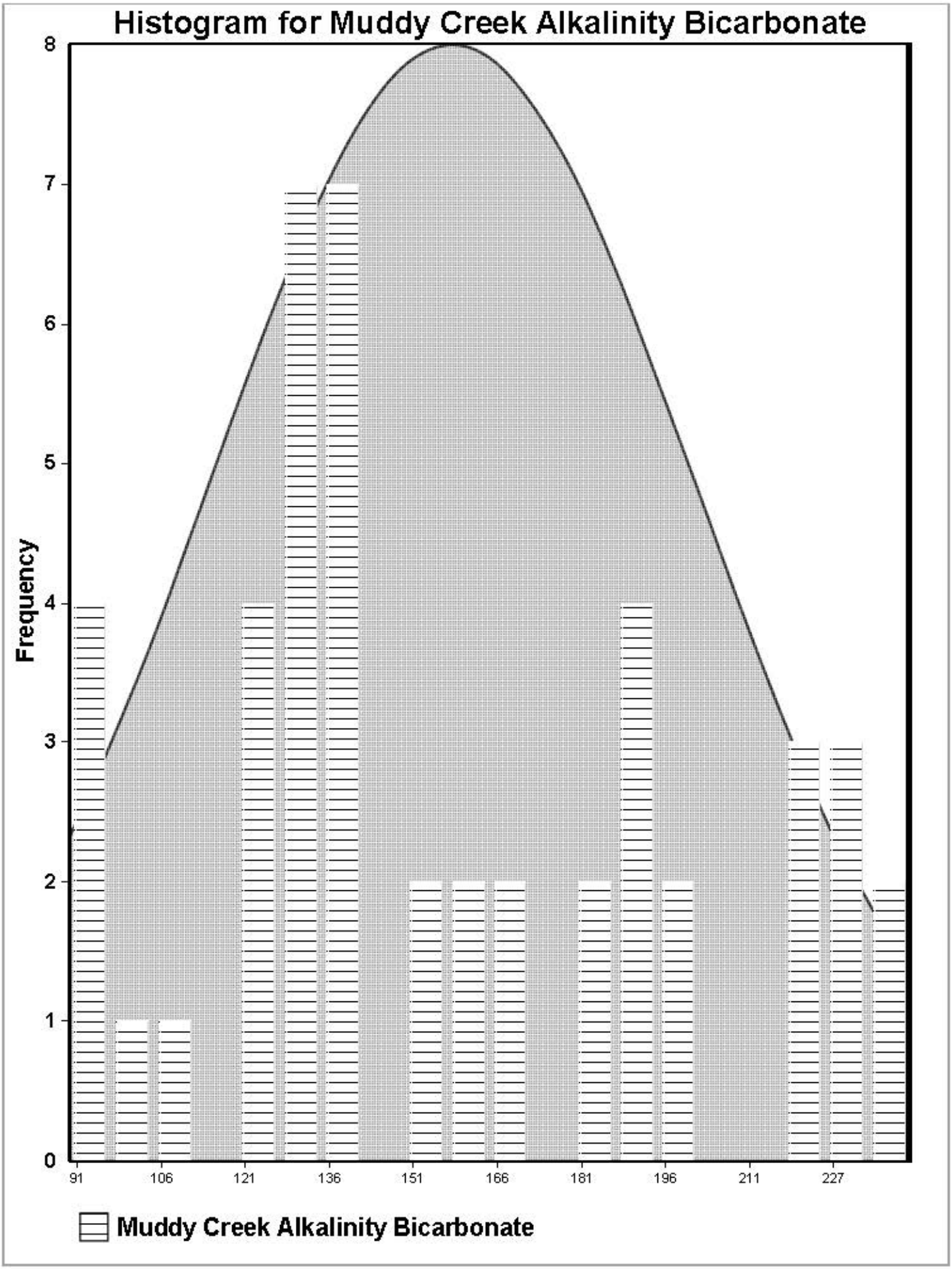
1
2
3
4
5
6
78
97
116
136
155
175
194
213
233
252
Mesa Alkalinity Bicarbonate


Histogram for Muddy Creek Alkalinity Bicarbonate
Frequency
0
1
2
3
4
5
6
7
8
91
106
121
136
151
166
181
196
211
227
Muddy Creek Alkalinity Bicarbonate

Outlier Tests for Selected Variables

User Selected Options	
From File	Alkalinity Bicarbonate.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for Alluv Alkalinity Bicarbonate

Mean	445.4
Standard Deviation	164.1
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	445.4	160.9	1200	26	4.689	2.84	3.16

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1200 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1200 is a Potential Statistical Outlier

Rosner's Outlier Test for Muddy Creek Alkalinity Bicarbonate

Mean	157.8
Standard Deviation	43.7
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	157.8	43.22	240	45	1.901	3.09	3.45

For 5% Significance Level, there is no Potential Outlier

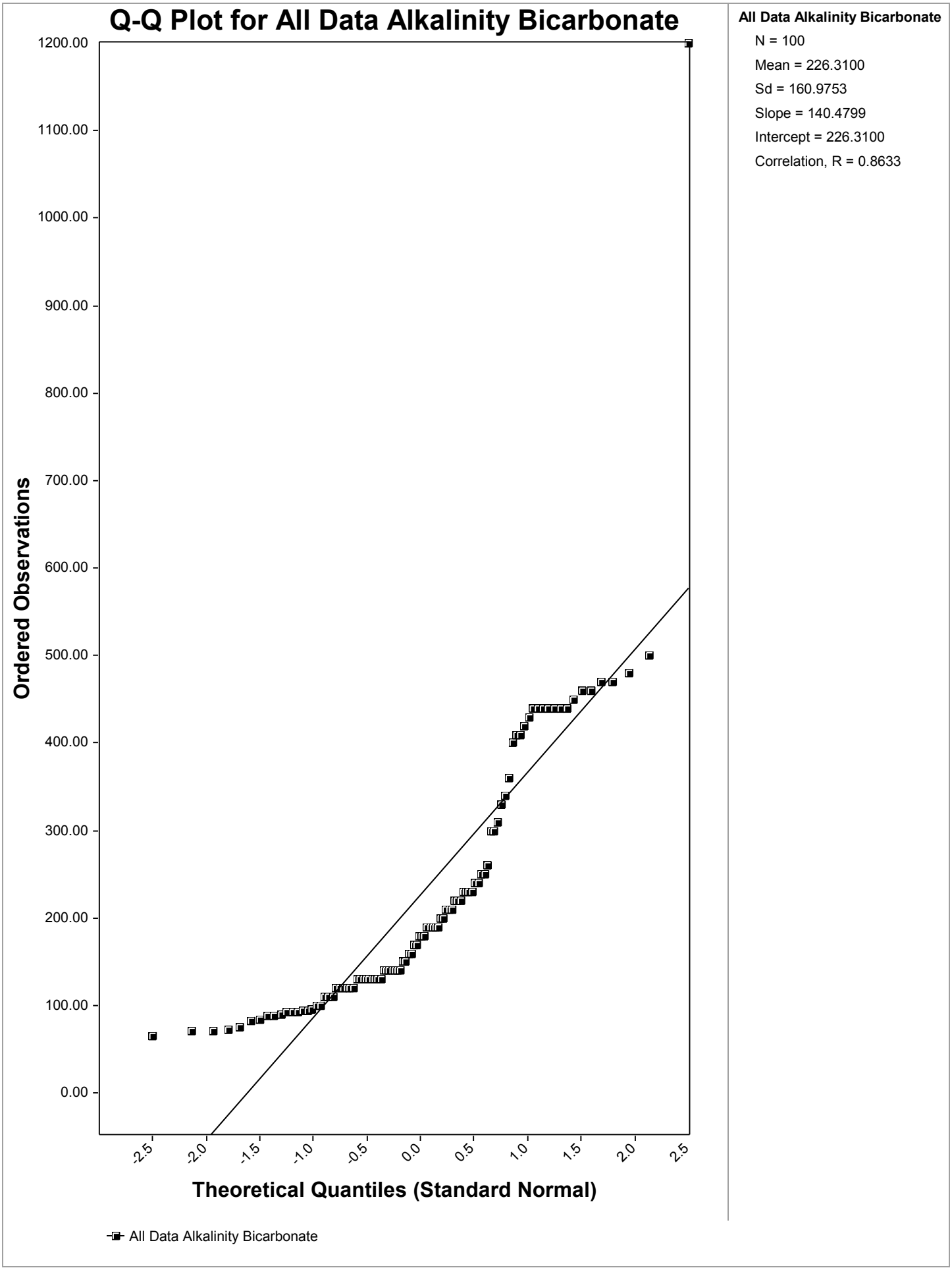
For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Alkalinity Bicarbonate

Mean	135.4
Standard Deviation	64.17
Number of data	28
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical

#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	135.4	63.02	260	13	1.977	2.88	3.2				
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											


Q-Q Plot for All Data Alkalinity Bicarbonate
Ordered Observations
Theoretical Quantiles (Standard Normal)
1200.00
1100.00
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
-2.5
-2.0
-1.5
-1.0
-0.5
0.0
0.5
1.0
1.5
2.0
2.5
All Data Alkalinity Bicarbonate
All Data Alkalinity Bicarbonate
N = 100
Mean = 226.3100
Sd = 160.9753
Slope = 140.4799
Intercept = 226.3100
Correlation, R = 0.8633

Location Name	Sample Date	Alluv Alkalinity Bicarbonate
BG-1S	3/20/2012	300
BG-1S	5/24/2012	310
BG-1S	8/23/2012	340
BG-1S	11/26/2012	300
IMW-2.5D	3/21/2012	450
IMW-2.5D	5/21/2012	460
IMW-2.5D	8/24/2012	480
IMW-2.5D	11/26/2012	440
IMW-2.5S	3/21/2012	440
IMW-2.5S	5/21/2012	500
IMW-2.5S	8/24/2012	470
IMW-2.5S	11/26/2012	440
IMW-3S	3/20/2012	330
IMW-3S	5/21/2012	360
KMW-2D	3/23/2012	440
KMW-2D	5/21/2012	460
KMW-2D	8/24/2012	470
KMW-2D	11/26/2012	440
KMW-2M	3/23/2012	410
KMW-2M	5/21/2012	430
KMW-2M	8/24/2012	440
KMW-2M	11/26/2012	410
KMW-2S	3/23/2012	400
KMW-2S	5/21/2012	420
KMW-2S	8/24/2012	440
KMW-2S	11/26/2012	1200

Location Name	Sample Date	Muddy Creek Alkalinity Bicarbonate
BG-3S	3/21/2012	130
BG-3S	5/23/2012	160
BG-3S	8/22/2012	150
BG-3S	11/27/2012	140
BG-4S	3/20/2012	140
BG-4S	5/30/2012	140
BG-4S	8/30/2012	140
BG-4S	11/27/2012	140
BG-6S	3/21/2012	130
BG-6S	5/25/2012	160
BG-6S	8/23/2012	140
BG-6S	11/27/2012	130
BG-1M	3/20/2012	230
BG-1M	5/24/2012	230
BG-1M	8/23/2012	200
BG-1M	11/26/2012	230
BG-3M	3/21/2012	190
BG-3M	5/24/2012	200
BG-3M	8/22/2012	220
BG-3M	11/27/2012	190
BG-4M	3/20/2012	120
BG-4M	5/30/2012	100
BG-4M	8/30/2012	110
BG-4M	11/27/2012	120
BG-6M	3/21/2012	120
BG-6M	5/25/2012	130
BG-6M	8/22/2012	140
BG-6M	11/27/2012	120
BG-1D	3/20/2012	180
BG-1D	5/24/2012	170
BG-1D	8/23/2012	180
BG-1D	11/26/2012	170
BG-3D	3/21/2012	190
BG-3D	5/23/2012	220
BG-3D	8/21/2012	220
BG-3D	11/27/2012	190
BG-4D	3/20/2012	95
BG-4D	5/30/2012	89
BG-4D	8/30/2012	93
BG-4D	11/27/2012	93
BG-6D	3/21/2012	130
BG-6D	5/25/2012	130
BG-6D	8/22/2012	150
BG-6D	11/27/2012	130
IMW-3D	3/22/2012	240

Location Name	Sample Date	Mesa Alkalinity Bicarbonate
LMW-10	3/22/2012	93
LMW-10	5/30/2012	89
LMW-10	8/27/2012	94
LMW-10	11/28/2012	110
LMW-11R	3/23/2012	84
LMW-11R	5/29/2012	71
LMW-11R	8/21/2012	90
LMW-11R	11/26/2012	82
LMW-7	3/23/2012	100
LMW-7	5/31/2012	110
LMW-7	8/27/2012	94
LMW-7	11/28/2012	180
BG-2S	3/21/2012	260
BG-2S	5/24/2012	250
BG-2S	8/23/2012	250
BG-2S	11/26/2012	230
LMW-9	3/23/2012	75
LMW-9	5/31/2012	71
LMW-9	8/27/2012	66
LMW-9	11/28/2012	72
BG-2M	3/21/2012	210
BG-2M	5/24/2012	210
BG-2M	8/23/2012	190
BG-2M	11/26/2012	210
BG-2D	3/21/2012	130
BG-2D	5/24/2012	120
BG-2D	8/23/2012	130
BG-2D	11/26/2012	120

Location Name	Sample Date	All Data Alkalinity Bicarbonate
BG-1S	3/20/2012	300
BG-1S	5/24/2012	310
BG-1S	8/23/2012	340
BG-1S	11/26/2012	300
IMW-2.5D	3/21/2012	450
IMW-2.5D	5/21/2012	460
IMW-2.5D	8/24/2012	480
IMW-2.5D	11/26/2012	440
IMW-2.5S	3/21/2012	440
IMW-2.5S	5/21/2012	500
IMW-2.5S	8/24/2012	470
IMW-2.5S	11/26/2012	440
IMW-3S	3/20/2012	330
IMW-3S	5/21/2012	360
KMW-2D	3/23/2012	440
KMW-2D	5/21/2012	460
KMW-2D	8/24/2012	470
KMW-2D	11/26/2012	440
KMW-2M	3/23/2012	410
KMW-2M	5/21/2012	430
KMW-2M	8/24/2012	440
KMW-2M	11/26/2012	410
KMW-2S	3/23/2012	400
KMW-2S	5/21/2012	420
KMW-2S	8/24/2012	440
KMW-2S	11/26/2012	1200
BG-3S	3/21/2012	130
BG-3S	5/23/2012	160
BG-3S	8/22/2012	150
BG-3S	11/27/2012	140
BG-4S	3/20/2012	140
BG-4S	5/30/2012	140
BG-4S	8/30/2012	140
BG-4S	11/27/2012	140
BG-6S	3/21/2012	130
BG-6S	5/25/2012	160
BG-6S	8/23/2012	140
BG-6S	11/27/2012	130
BG-1M	3/20/2012	230
BG-1M	5/24/2012	230
BG-1M	8/23/2012	200
BG-1M	11/26/2012	230
BG-3M	3/21/2012	190
BG-3M	5/24/2012	200
BG-3M	8/22/2012	220

IMW-3D	5/25/2012	240

BG-3M	11/27/2012	190
BG-4M	3/20/2012	120
BG-4M	5/30/2012	100
BG-4M	8/30/2012	110
BG-4M	11/27/2012	120
BG-6M	3/21/2012	120
BG-6M	5/25/2012	130
BG-6M	8/22/2012	140
BG-6M	11/27/2012	120
BG-1D	3/20/2012	180
BG-1D	5/24/2012	170
BG-1D	8/23/2012	180
BG-1D	11/26/2012	170
BG-3D	3/21/2012	190
BG-3D	5/23/2012	220
BG-3D	8/21/2012	220
BG-3D	11/27/2012	190
BG-4D	3/20/2012	95
BG-4D	5/30/2012	89
BG-4D	8/30/2012	93
BG-4D	11/27/2012	93
BG-6D	3/21/2012	130
BG-6D	5/25/2012	130
BG-6D	8/22/2012	150
BG-6D	11/27/2012	130
IMW-3D	3/22/2012	240
IMW-3D	5/25/2012	240
LMW-10	3/22/2012	93
LMW-10	5/30/2012	89
LMW-10	8/27/2012	94
LMW-10	11/28/2012	110
LMW-11R	3/23/2012	84
LMW-11R	5/29/2012	71
LMW-11R	8/21/2012	90
LMW-11R	11/26/2012	82
LMW-7	3/23/2012	100
LMW-7	5/31/2012	110
LMW-7	8/27/2012	94
LMW-7	11/28/2012	180
BG-2S	3/21/2012	260
BG-2S	5/24/2012	250
BG-2S	8/23/2012	250
BG-2S	11/26/2012	230
LMW-9	3/23/2012	75
LMW-9	5/31/2012	71
LMW-9	8/27/2012	66
LMW-9	11/28/2012	72

BG-2M	3/21/2012	210
BG-2M	5/24/2012	210
BG-2M	8/23/2012	190
BG-2M	11/26/2012	210
BG-2D	3/21/2012	130
BG-2D	5/24/2012	120
BG-2D	8/23/2012	130
BG-2D	11/26/2012	120

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Aluminum_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Aluminum, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	15	11	42.31%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	11	0.1	0.1	0.1	0.1	1.456E-17
Statistics (Detects Only)	15	0.031	0.093	0.0613	0.058	0.0204
Statistics (All: NDs treated as DL value)	26	0.031	0.1	0.0777	0.086	0.0247
Statistics (All: NDs treated as DL/2 value)	26	0.031	0.093	0.0565	0.05	0.0163
Statistics (Normal ROS Estimated Data)	26	0.0295	0.0932	0.0613	0.058	0.0195
Statistics (Gamma ROS Estimated Data)	26	0.0249	0.093	0.0615	0.0592	0.0193
Statistics (Lognormal ROS Estimated Data)	26	0.031	0.101	0.0612	0.058	0.0199

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	9.209	8.172	0.00666	-2.847	0.352	-0.124
Statistics (NDs = DL)	8.293	7.361	0.00937	-2.617	0.38	-0.145
Statistics (NDs = DL/2)	13.71	12.15	0.00413	-2.91	0.274	-0.094
Statistics (Gamma ROS Estimates)	9.269	8.225	0.00663	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.847	0.337	-0.119

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.979	0.916	0.921	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.94	0.881	Data Appear Normal
Lilliefors (Detects Only)	0.165	0.229	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.819	0.92	Data Not Normal
Lilliefors (NDs = DL)	0.24	0.174	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.847	0.92	Data Not Normal
Lilliefors (NDs = DL/2)	0.272	0.174	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.953	0.92	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.106	0.174	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.97	0.862	0.943	0.967

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.343	0.738	
Kolmogorov-Smirnov (Detects Only)	0.157	0.222	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.949	0.745	
Kolmogorov-Smirnov (NDs = DL)	0.232	0.171	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	1.667	0.744	
Kolmogorov-Smirnov (NDs = DL/2)	0.254	0.171	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.452	0.744	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.139	0.171	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.979	0.906	0.945	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.942	0.881	Data Appear Lognormal
Lilliefors (Detects Only)	0.155	0.229	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.807	0.92	Data Not Lognormal
Lilliefors (NDs = DL)	0.219	0.174	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.893	0.92	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.239	0.174	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.963	0.92	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.11	0.174	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Aluminum, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	10	36	78.26%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	36	0.1	0.1	0.1	0.1	4.222E-17
Statistics (Detects Only)	10	0.036	0.12	0.062	0.0505	0.0283
Statistics (All: NDs treated as DL value)	46	0.036	0.12	0.0917	0.1	0.0203
Statistics (All: NDs treated as DL/2 value)	46	0.036	0.12	0.0526	0.05	0.0136
Statistics (Normal ROS Estimated Data)	46	0.00635	0.12	0.0537	0.0517	0.0227
Statistics (Gamma ROS Estimated Data)	46	0.036	0.12	0.0587	0.0548	0.0156
Statistics (Lognormal ROS Estimated Data)	46	0.0248	0.12	0.0535	0.0495	0.0192

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	6.303	5.907	0.00984	-2.862	0.412	-0.144
Statistics (NDs = DL)	14.29	13.37	0.00642	-2.424	0.297	-0.123
Statistics (NDs = DL/2)	23.11	21.62	0.00228	-2.967	0.192	-0.0649
Statistics (Gamma ROS Estimates)	17.17	16.07	0.00342	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.986	0.337	-0.113

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.922	0.73	0.637	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.846	0.842	Data Appear Normal
Lilliefors (Detects Only)	0.238	0.28	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.542	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.484	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.443	0.945	Data Not Normal

Lilliefors (NDs = DL/2)	0.467	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.988	0.945	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0568	0.131	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.969	0.672	0.684	0.882

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.493	0.728	
Kolmogorov-Smirnov (Detects Only)	0.216	0.267	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	11.19	0.748	
Kolmogorov-Smirnov (NDs = DL)	0.488	0.13	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	10.63	0.748	
Kolmogorov-Smirnov (NDs = DL/2)	0.46	0.13	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.74	0.748	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0947	0.13	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.962	0.715	0.7	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.911	0.842	Data Appear Lognormal
Lilliefors (Detects Only)	0.191	0.28	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.52	0.945	Data Not Lognormal
Lilliefors (NDs = DL)	0.485	0.131	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.529	0.945	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.451	0.131	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.991	0.945	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0447	0.131	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Aluminum, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	17	11	39.29%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	11	0.1	0.1	0.1	0.1	1.456E-17
Statistics (Detects Only)	17	0.033	0.072	0.0495	0.048	0.0115
Statistics (All: NDs treated as DL value)	28	0.033	0.1	0.0693	0.06	0.0266
Statistics (All: NDs treated as DL/2 value)	28	0.033	0.072	0.0497	0.05	0.00886
Statistics (Normal ROS Estimated Data)	28	0.0316	0.072	0.0495	0.048	0.0111
Statistics (Gamma ROS Estimated Data)	28	0.0293	0.072	0.0496	0.0486	0.0108
Statistics (Lognormal ROS Estimated Data)	28	0.033	0.072	0.0494	0.048	0.0111

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	19.57	17.5	0.00253	-3.032	0.235	-0.0776
Statistics (NDs = DL)	6.696	6.002	0.0104	-2.746	0.406	-0.148
Statistics (NDs = DL/2)	32.11	28.69	0.00155	-3.018	0.182	-0.0603

Statistics (Gamma ROS Estimates)	20.66	18.47	0.0024	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.032	0.226	-0.0746

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.987	0.913	0.955	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.963	0.892	Data Appear Normal
Lilliefors (Detects Only)	0.139	0.215	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.808	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.268	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.917	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.236	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.971	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0886	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.99	0.89	0.959	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.229	0.738	
Kolmogorov-Smirnov (Detects Only)	0.111	0.209	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.774	0.747	
Kolmogorov-Smirnov (NDs = DL)	0.265	0.166	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.248	0.744	
Kolmogorov-Smirnov (NDs = DL/2)	0.212	0.165	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.3	0.745	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.108	0.165	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.988	0.934	0.953	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.964	0.892	Data Appear Lognormal
Lilliefors (Detects Only)	0.104	0.215	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.849	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.256	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.911	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.209	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.964	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0847	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

All Aluminum, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	42	58	58.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	58	0.1	0.1	0.1	0.1	8.399E-17
Statistics (Detects Only)	42	0.031	0.12	0.0567	0.0525	0.0201
Statistics (All: NDs treated as DL value)	100	0.031	0.12	0.0818	0.1	0.0251
Statistics (All: NDs treated as DL/2 value)	100	0.031	0.12	0.0528	0.05	0.0134
Statistics (Normal ROS Estimated Data)	100	0.0144	0.12	0.0554	0.0538	0.0186
Statistics (Gamma ROS Estimated Data)	100	0.031	0.12	0.0571	0.0576	0.0135
Statistics (Lognormal ROS Estimated Data)	100	0.0263	0.12	0.0551	0.0522	0.0176

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	9.211	8.941	0.00615	-2.925	0.33	-0.113
Statistics (NDs = DL)	8.385	8.14	0.00976	-2.564	0.375	-0.146
Statistics (NDs = DL/2)	20.05	19.46	0.00263	-2.966	0.215	-0.0726
Statistics (Gamma ROS Estimates)	19.62	19.04	0.00291	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.947	0.308	-0.105

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.954	0.862	0.821	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.87	0.942	Data Not Normal
Lilliefors (Detects Only)	0.145	0.137	Data Not Normal
Lilliefors (NDs = DL)	0.366	0.0886	Data Not Normal
Lilliefors (NDs = DL/2)	0.363	0.0886	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0577	0.0886	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.986	0.803	0.858	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.512	0.749	
Kolmogorov-Smirnov (Detects Only)	0.102	0.136	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	12.52	0.753	
Kolmogorov-Smirnov (NDs = DL)	0.363	0.0895	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	11.45	0.75	
Kolmogorov-Smirnov (NDs = DL/2)	0.347	0.0892	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.209	0.75	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.167	0.0892	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.989	0.859	0.88	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.923	0.942	Data Not Lognormal
Lilliefors (Detects Only)	0.0842	0.137	Data Appear Lognormal
Lilliefors (NDs = DL)	0.357	0.0886	Data Not Lognormal

			Lilliefors (NDs = DL/2)	0.335	0.0886	Data Not Lognormal					
			Lilliefors (Lognormal ROS Estimates)	0.0399	0.0886	Data Appear Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.											

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Aluminum_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Aluminum, Dissolved

General Statistics

Number of Valid Data	26	Number of Detected Data	15
Number of Distinct Detected Data	14	Number of Non-Detect Data	11
		Percent Non-Detects	42.31%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.031	Minimum Detected	-3.474
Maximum Detected	0.093	Maximum Detected	-2.375
Mean of Detected	0.0613	Mean of Detected	-2.847
SD of Detected	0.0204	SD of Detected	0.352
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.94	Shapiro Wilk Test Statistic	0.942
5% Shapiro Wilk Critical Value	0.881	5% Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0565	Mean (Log Scale)	-2.91
SD	0.0163	SD (Log Scale)	0.274
95% UTL 95% Coverage	0.0935	95% UTL 95% Coverage	0.102
95% UPL (t)	0.0849	95% UPL (t)	0.0877
90% Percentile (z)	0.0774	90% Percentile (z)	0.0774
95% Percentile (z)	0.0833	95% Percentile (z)	0.0855
99% Percentile (z)	0.0944	99% Percentile (z)	0.103
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0612
		SD in Original Scale	0.0199
		Mean in Log Scale	-2.847
		SD in Log Scale	0.337
		95% UTL 95% Coverage	0.125
		95% UPL (t)	0.104
		90% Percentile (z)	0.0894
		95% Percentile (z)	0.101
		99% Percentile (z)	0.127

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	7.411	Data appear Normal at 5% Significance Level	
Theta Star	0.00828		
nu star	222.3		
A-D Test Statistic	0.343	Nonparametric Statistics	
5% A-D Critical Value	0.738	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.157	Mean	0.0613
5% K-S Critical Value	0.222	SD	0.0197
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00526
		95% KM UTL with 95% Coverage	0.106
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.149
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0956
Mean	0.0615	90% Percentile (z)	0.0865
Median	0.0592	95% Percentile (z)	0.0937
SD	0.0193	99% Percentile (z)	0.107
k star	8.225		
Theta star	0.00747	Gamma ROS Limits with Extrapolated Data	
Nu star	427.7	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.102
95% Percentile of Chisquare (2k)	26.88	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.103
		95% WH Approx. Gamma UTL with 95% Coverage	0.118
90% Percentile	0.09	95% HW Approx. Gamma UTL with 95% Coverage	0.12
95% Percentile	0.1		
99% Percentile	0.122		

Note: DL/2 is not a recommended method.

Muddy Creek Aluminum, Dissolved

General Statistics			
Number of Valid Data	46	Number of Detected Data	10
Number of Distinct Detected Data	9	Number of Non-Detect Data	36
		Percent Non-Detects	78.26%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.036	Minimum Detected	-3.324
Maximum Detected	0.12	Maximum Detected	-2.12
Mean of Detected	0.062	Mean of Detected	-2.862
SD of Detected	0.0283	SD of Detected	0.412
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.846	Shapiro Wilk Test Statistic	0.911
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0526	Mean (Log Scale)	-2.967

SD	0.0136	SD (Log Scale)	0.192
95% UTL 95% Coverage	0.0809	95% UTL 95% Coverage	0.0768
95% UPL (t)	0.0757	95% UPL (t)	0.0714
90% Percentile (z)	0.07	90% Percentile (z)	0.0659
95% Percentile (z)	0.075	95% Percentile (z)	0.0706
99% Percentile (z)	0.0842	99% Percentile (z)	0.0805
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0535
		SD in Original Scale	0.0192
		Mean in Log Scale	-2.986
		SD in Log Scale	0.337
		95% UTL 95% Coverage	0.102
		95% UPL (t)	0.0895
		90% Percentile (z)	0.0778
		95% Percentile (z)	0.0879
		99% Percentile (z)	0.111
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	4.479	Data appear Normal at 5% Significance Level	
Theta Star	0.0138		
nu star	89.58		
A-D Test Statistic	0.493	Nonparametric Statistics	
5% A-D Critical Value	0.728	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.216	Mean	0.0526
5% K-S Critical Value	0.267	SD	0.0173
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00481
		95% KM UTL with 95% Coverage	0.0886
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.129
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.082
Mean	0.0587	90% Percentile (z)	0.0748
Median	0.0548	95% Percentile (z)	0.0811
SD	0.0156	99% Percentile (z)	0.0929
k star	16.07		
Theta star	0.00365	Gamma ROS Limits with Extrapolated Data	
Nu star	1478	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.085
95% Percentile of Chisquare (2k)	46.35	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0851
		95% WH Approx. Gamma UTL with 95% Coverage	0.0922
90% Percentile	0.0781	95% HW Approx. Gamma UTL with 95% Coverage	0.0924
95% Percentile	0.0847		
99% Percentile	0.098		

Note: DL/2 is not a recommended method.

Mesa Aluminum, Dissolved

General Statistics

Number of Valid Data	28	Number of Detected Data	17
Number of Distinct Detected Data	14	Number of Non-Detect Data	11
		Percent Non-Detects	39.29%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.033	Minimum Detected	-3.411
Maximum Detected	0.072	Maximum Detected	-2.631
Mean of Detected	0.0495	Mean of Detected	-3.032
SD of Detected	0.0115	SD of Detected	0.235
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.963	Shapiro Wilk Test Statistic	0.964
5% Shapiro Wilk Critical Value	0.892	5% Shapiro Wilk Critical Value	0.892
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0497	Mean (Log Scale)	-3.018
SD	0.00886	SD (Log Scale)	0.182
95% UTL 95% Coverage	0.0696	95% UTL 95% Coverage	0.0736
95% UPL (t)	0.065	95% UPL (t)	0.067
90% Percentile (z)	0.061	90% Percentile (z)	0.0618
95% Percentile (z)	0.0643	95% Percentile (z)	0.066
99% Percentile (z)	0.0703	99% Percentile (z)	0.0747
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0494
		SD in Original Scale	0.0111
		Mean in Log Scale	-3.032
		SD in Log Scale	0.226
		95% UTL 95% Coverage	0.0801
		95% UPL (t)	0.0714
		90% Percentile (z)	0.0644
		95% Percentile (z)	0.0699
		99% Percentile (z)	0.0816

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	16.16	Data appear Normal at 5% Significance Level	
Theta Star	0.00306		
nu star	549.4		
A-D Test Statistic	0.229	Nonparametric Statistics	
5% A-D Critical Value	0.738	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.111	Mean	0.0495
5% K-S Critical Value	0.209	SD	0.0112
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00279
		95% KM UTL with 95% Coverage	0.0745
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.099
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0688
Mean	0.0496	90% Percentile (z)	0.0638
Median	0.0486	95% Percentile (z)	0.0678
SD	0.0108	99% Percentile (z)	0.0754
k star	18.47		

Theta star	0.00268	Gamma ROS Limits with Extrapolated Data	
Nu star	1034	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0704
95% Percentile of Chisquare (2k)	52.12	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0708
		95% WH Approx. Gamma UTL with 95% Coverage	0.0779
90% Percentile	0.0648	95% HW Approx. Gamma UTL with 95% Coverage	0.0785
95% Percentile	0.0699		
99% Percentile	0.0803		

Note: DL/2 is not a recommended method.

All Aluminum, Dissolved

General Statistics

Number of Valid Data	100	Number of Detected Data	42
Number of Distinct Detected Data	33	Number of Non-Detect Data	58
		Percent Non-Detects	58.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.031	Minimum Detected	-3.474
Maximum Detected	0.12	Maximum Detected	-2.12
Mean of Detected	0.0567	Mean of Detected	-2.925
SD of Detected	0.0201	SD of Detected	0.33
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.87	Shapiro Wilk Test Statistic	0.923
5% Shapiro Wilk Critical Value	0.942	5% Shapiro Wilk Critical Value	0.942
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0528	Mean (Log Scale)	-2.966
SD	0.0134	SD (Log Scale)	0.215
95% UTL 95% Coverage	0.0785	95% UTL 95% Coverage	0.0779
95% UPL (t)	0.0751	95% UPL (t)	0.0738
90% Percentile (z)	0.0699	90% Percentile (z)	0.0679
95% Percentile (z)	0.0748	95% Percentile (z)	0.0734
99% Percentile (z)	0.0839	99% Percentile (z)	0.085
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0551
		SD in Original Scale	0.0176
		Mean in Log Scale	-2.947
		SD in Log Scale	0.308
		95% UTL 95% Coverage	0.095
		95% UPL (t)	0.0878
		90% Percentile (z)	0.0779
		95% Percentile (z)	0.0872
		99% Percentile (z)	0.108

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	8.569	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.00662		
nu star	719.8		
A-D Test Statistic	0.512	Nonparametric Statistics	
5% A-D Critical Value	0.749	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.102	Mean	0.0551
5% K-S Critical Value	0.136	SD	0.0179
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00266
		95% KM UTL with 95% Coverage	0.0895
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.133
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0849
Mean	0.0571	90% Percentile (z)	0.078
Median	0.0576	95% Percentile (z)	0.0845
SD	0.0135	99% Percentile (z)	0.0967
k star	19.04		
Theta star	0.003	Gamma ROS Limits with Extrapolated Data	
Nu star	3808	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0802
95% Percentile of Chisquare (2k)	53.47	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0804
		95% WH Approx. Gamma UTL with 95% Coverage	0.0844
90% Percentile	0.0743	95% HW Approx. Gamma UTL with 95% Coverage	0.0848
95% Percentile	0.0801		
99% Percentile	0.0918		

Note: DL/2 is not a recommended method.

From File: Aluminum_Dissolved.wst

Summary Statistics for Raw Data Sets with NDs using Detected Data Only

				Raw Statistics using Detected Observations							
Variable	Num Ds	NumNDs	% NDs	Minimum	Maximum	Mean	Median	SD	MAD/0.675	Skewness	CV
v Aluminum, Dissolved	15	11	42.31%	0.031	0.093	0.0613	0.058	0.0204	0.0297	0.117	0.332
k Aluminum, Dissolved	10	36	78.26%	0.036	0.12	0.062	0.0505	0.0283	0.0193	1.242	0.456
a Aluminum, Dissolved	17	11	39.29%	0.033	0.072	0.0495	0.048	0.0115	0.0148	0.303	0.233

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Aluminum_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Aluminum, Dissolved

Background Data: Alluv Aluminum, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	11	11
Number of Detect Data	17	15
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	0.1	0.1
Percent Non detects	39.29%	42.31%
Minimum Detected	0.033	0.031
Maximum Detected	0.072	0.093
Mean of Detected Data	0.0495	0.0613
Median of Detected Data	0.048	0.058
SD of Detected Data	0.0115	0.0204

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-1.727
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0841

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Aluminum_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Aluminum, Dissolved

Background Data: Alluv Aluminum, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	36	11
Number of Detect Data	10	15
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	0.1	0.1
Percent Non detects	78.26%	42.31%
Minimum Detected	0.036	0.031
Maximum Detected	0.12	0.093
Mean of Detected Data	0.062	0.0613
Median of Detected Data	0.0505	0.058
SD of Detected Data	0.0283	0.0204

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0.209
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.835

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Aluminum_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Aluminum, Dissolved

Background Data: Muddy Creek Aluminum, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	11	36
Number of Detect Data	17	10
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	0.1	0.1
Percent Non detects	39.29%	78.26%
Minimum Detected	0.033	0.036
Maximum Detected	0.072	0.12
Mean of Detected Data	0.0495	0.062
Median of Detected Data	0.048	0.0505
SD of Detected Data	0.0115	0.0283

Site vs Background Gehan Test

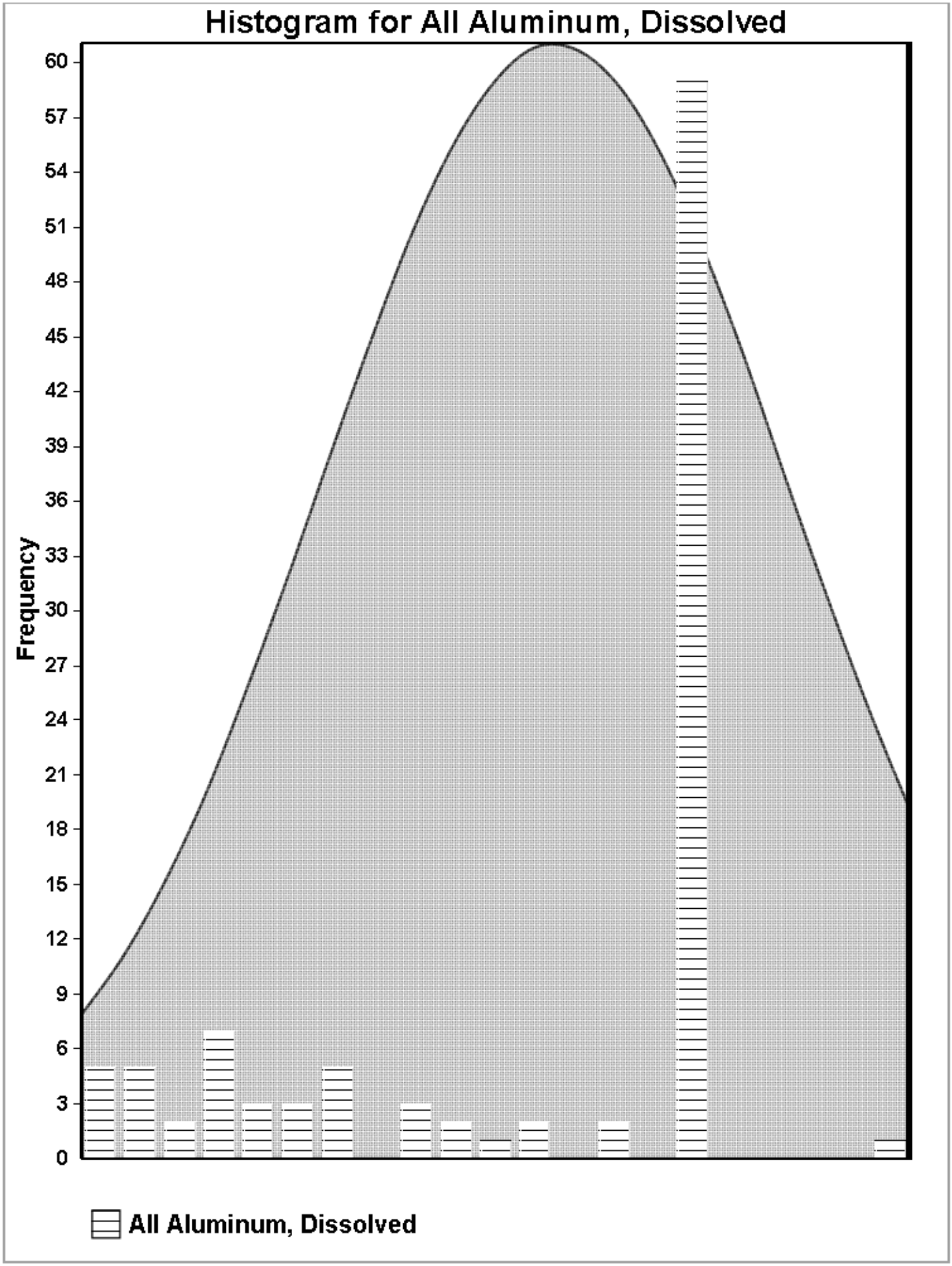
H0: Mu of Site or AOC = Mu of background

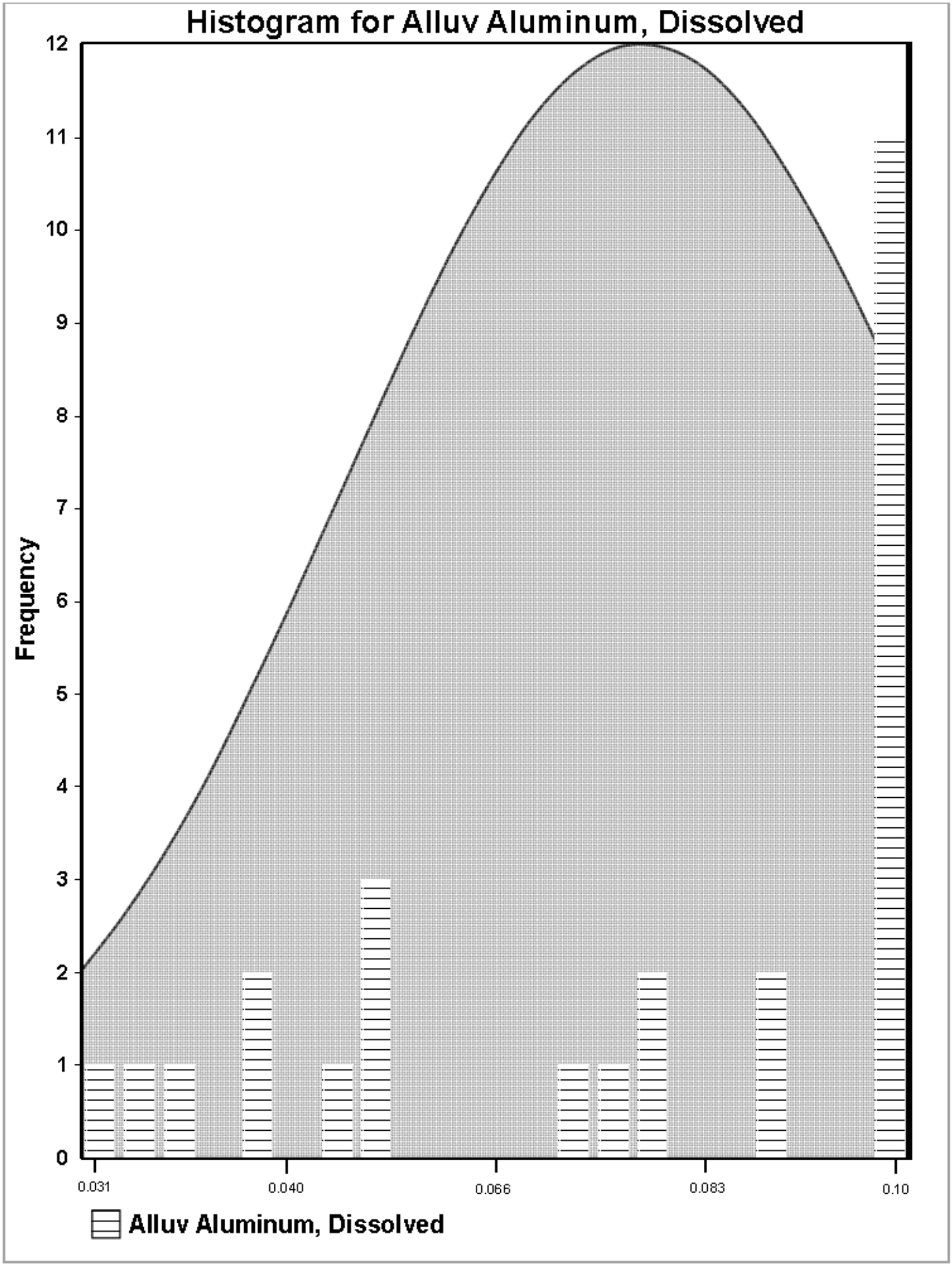
Gehan z Test Value	-0.943
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.346

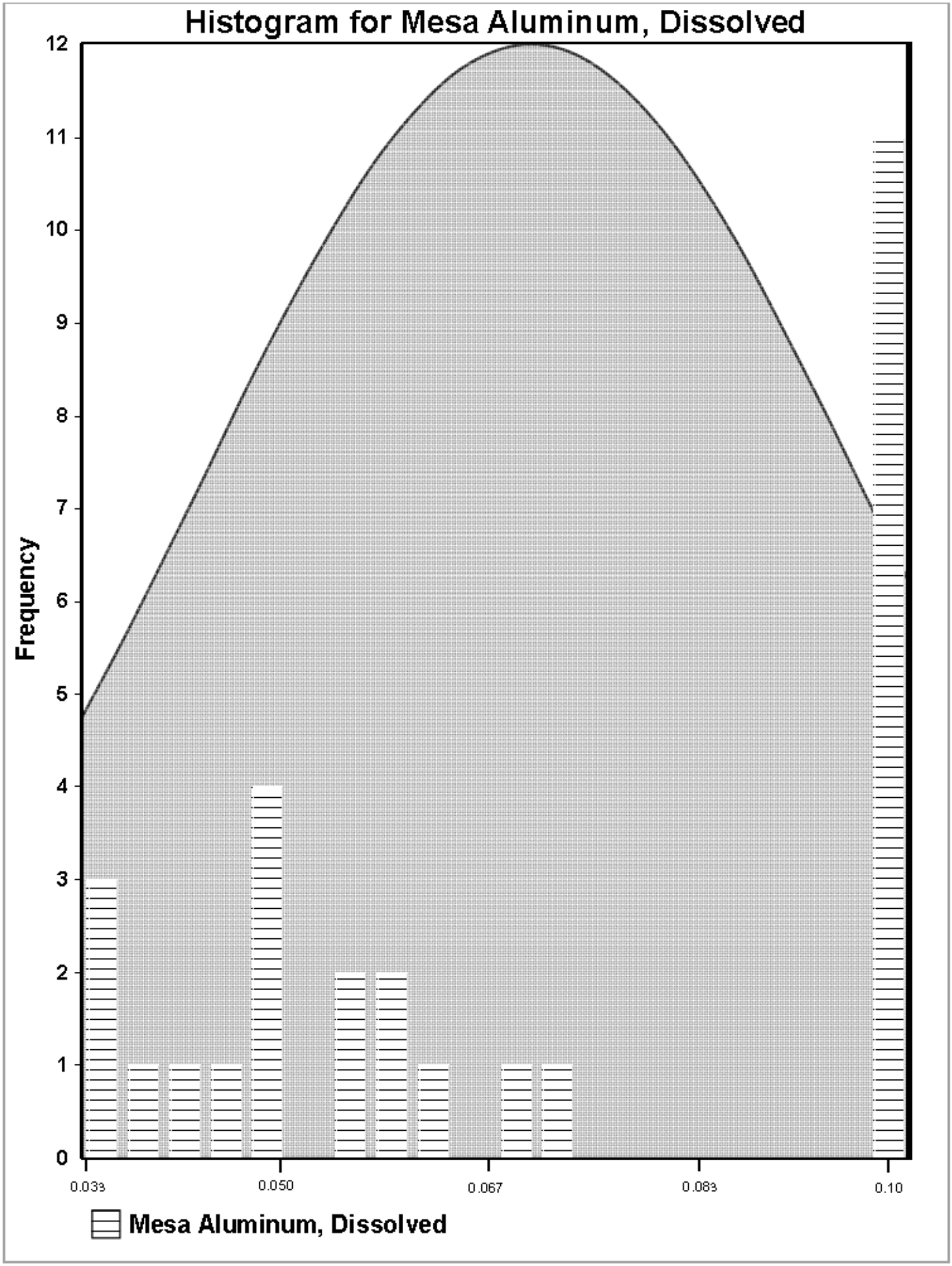
Conclusion with Alpha = 0.05

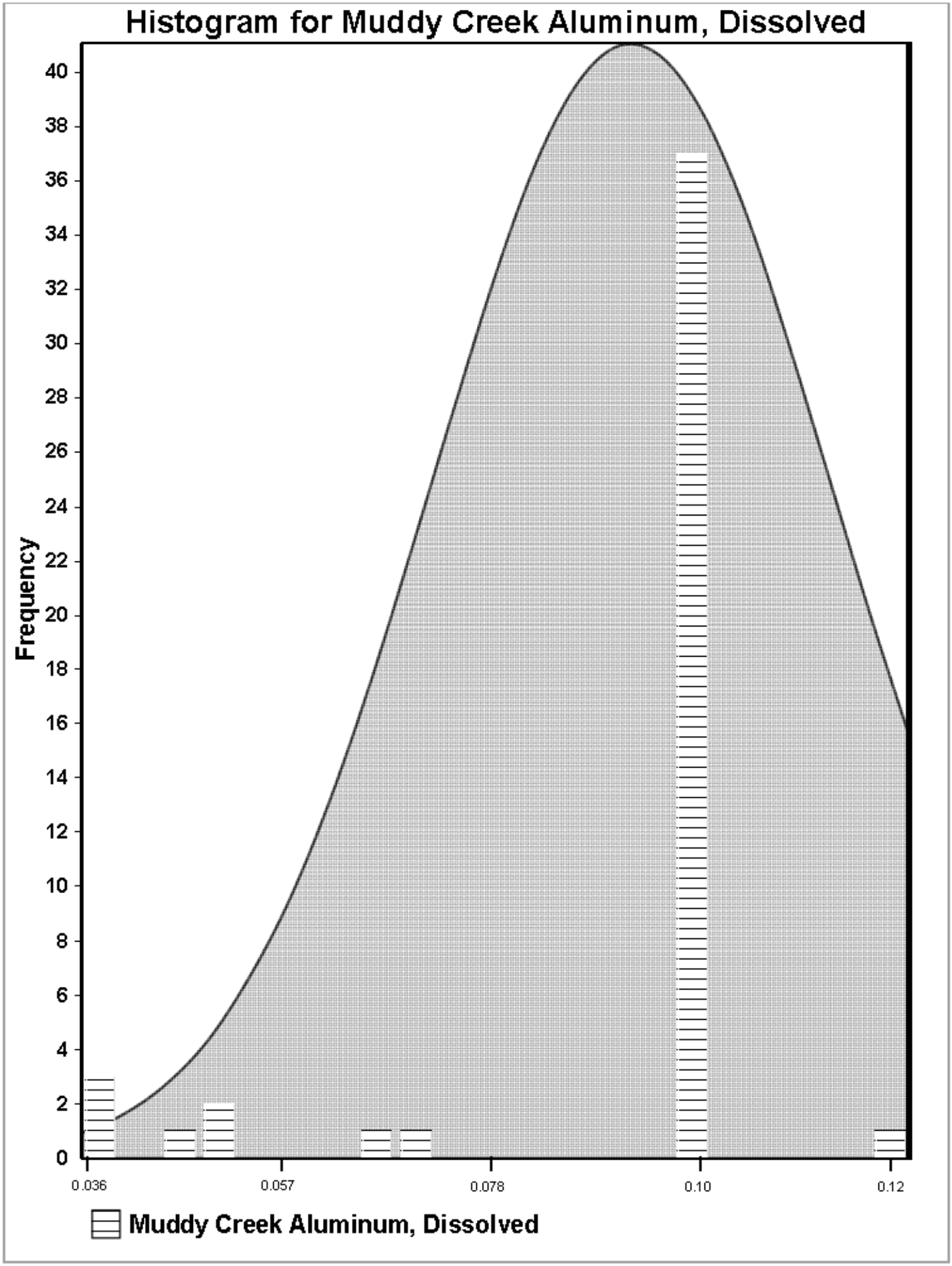
Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for All Aluminum, Dissolved
Frequency
60
57
54
51
48
45
42
39
36
33
30
27
24
21
18
15
12
9
6
3
0
All Aluminum, Dissolved


Histogram for Alluv Aluminum, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
0.031
0.040
0.066
0.083
0.10
Alluv Aluminum, Dissolved


Histogram for Mesa Aluminum, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
0.033
0.050
0.067
0.083
0.10
Mesa Aluminum, Dissolved


Histogram for Muddy Creek Aluminum, Dissolved
Frequency
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
0.036
0.057
0.078
0.10
0.12
Muddy Creek Aluminum, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Aluminum_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Aluminum, Dissolved

Mean	0.0565
Standard Deviation	0.0163
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0565	0.0159	0.093	15	2.286	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Aluminum, Dissolved

Mean	0.0526
Standard Deviation	0.0136
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0526	0.0134	0.12	7	5.014	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.12 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.12 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Aluminum, Dissolved

Mean	0.0497
Standard Deviation	0.00886
Number of data	28
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical

#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.0497	0.0087	0.072	2	2.565	2.88	3.2

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for All Aluminum, Dissolved

Mean	0.0528
Standard Deviation	0.0134
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0528	0.0133	0.12	33	5.053	3.38	3.75

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.12 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.12 is a Potential Statistical Outlier

Aluminum, Dissolved

Location Name	Sample Date	Alluv Aluminum, Dissolved	Location Name	Sample Date	Muddy Creek Aluminum, Dissolved	Location Name	Sample Date	Mesa Aluminum, Dissolved
BG-1S	11/26/2012	0.082	BG-3S	11/27/2012	0.1*	LMW-10	11/28/2012	0.1*
BG-1S	8/23/2012	0.1*	BG-3S	8/22/2012	0.1*	LMW-10	8/27/2012	0.072
BG-1S	5/24/2012	0.031	BG-3S	5/23/2012	0.1*	LMW-10	5/30/2012	0.1*
BG-1S	3/20/2012	0.1*	BG-3S	3/21/2012	0.1*	LMW-10	3/22/2012	0.1*
IMW-2.5D	11/26/2012	0.078	BG-4S	11/27/2012	0.1*	LMW-11R	11/26/2012	0.054
IMW-2.5D	8/24/2012	0.045	BG-4S	8/30/2012	0.1*	LMW-11R	8/21/2012	0.044
IMW-2.5D	5/21/2012	0.1*	BG-4S	5/30/2012	0.12	LMW-11R	5/29/2012	0.047
IMW-2.5D	3/21/2012	0.058	BG-4S	3/20/2012	0.1*	LMW-11R	3/23/2012	0.048
IMW-2.5S	11/26/2012	0.09	BG-6S	11/27/2012	0.1*	LMW-7	11/28/2012	0.1*
IMW-2.5S	8/24/2012	0.048	BG-6S	8/23/2012	0.1*	LMW-7	8/27/2012	0.041
IMW-2.5S	5/21/2012	0.1*	BG-6S	5/25/2012	0.039	LMW-7	5/31/2012	0.033
IMW-2.5S	3/21/2012	0.056	BG-6S	3/21/2012	0.1	LMW-7	3/23/2012	0.034
IMW-3S	5/21/2012	0.1*	BG-1M	11/26/2012	0.071	BG-2S	11/26/2012	0.058
IMW-3S	3/20/2012	0.1*	BG-1M	8/23/2012	0.1*	BG-2S	8/23/2012	0.1*
KMW-2D	11/26/2012	0.093	BG-1M	5/24/2012	0.1*	BG-2S	5/24/2012	0.035
KMW-2D	8/24/2012	0.058	BG-1M	3/20/2012	0.1*	BG-2S	3/21/2012	0.1*
KMW-2D	5/21/2012	0.1*	BG-3M	11/27/2012	0.1*	BG-2M	11/26/2012	0.061
KMW-2D	3/23/2012	0.1*	BG-3M	8/22/2012	0.1*	BG-2M	8/23/2012	0.1*
KMW-2M	11/26/2012	0.081	BG-3M	5/24/2012	0.1*	BG-2M	5/24/2012	0.1*
KMW-2M	8/24/2012	0.053	BG-3M	3/21/2012	0.036	BG-2M	3/21/2012	0.048
KMW-2M	5/21/2012	0.1*	BG-4M	11/27/2012	0.1*	BG-2D	11/26/2012	0.054
KMW-2M	3/23/2012	0.1*	BG-4M	8/30/2012	0.1*	BG-2D	8/23/2012	0.1*
KMW-2S	11/26/2012	0.074	BG-4M	5/30/2012	0.1*	BG-2D	5/24/2012	0.1*
KMW-2S	8/24/2012	0.035	BG-4M	3/20/2012	0.1*	BG-2D	3/21/2012	0.038
KMW-2S	5/21/2012	0.1*	BG-6M	11/27/2012	0.046	LMW-9	11/28/2012	0.1*
KMW-2S	3/23/2012	0.038	BG-6M	8/22/2012	0.1*	LMW-9	8/27/2012	0.048
			BG-6M	5/25/2012	0.1*	LMW-9	5/31/2012	0.067
			BG-6M	3/21/2012	0.052	LMW-9	3/23/2012	0.059
			BG-1D	11/26/2012	0.068			
			BG-1D	8/23/2012	0.1*			
			BG-1D	5/24/2012	0.1*			
			BG-1D	3/20/2012	0.039			
			BG-3D	11/27/2012	0.1*			
			BG-3D	8/21/2012	0.1*			
			BG-3D	5/23/2012	0.1*			
			BG-3D	3/21/2012	0.1*			
			BG-4D	11/27/2012	0.1*			
			BG-4D	8/30/2012	0.1*			
			BG-4D	5/30/2012	0.049			
			BG-4D	3/20/2012	0.1*			
			BG-6D	11/27/2012	0.1*			
			BG-6D	8/22/2012	0.1*			
			BG-6D	5/25/2012	0.1*			
			BG-6D	3/21/2012	0.1*			
			IMW-3D	5/25/2012	0.1*			
			IMW-3D	3/22/2012	0.1*			* non-detect

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Anthracene.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Anthracene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	0	26	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv Anthracene was not processed!

Muddy Creek Anthracene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	3	43	93.48%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	43	0.05	0.05	0.05	0.05	7.021E-18
Statistics (Detects Only)	3	0.013	0.017	0.015	0.015	0.002
Statistics (All: NDs treated as DL value)	46	0.013	0.05	0.0477	0.05	0.00875
Statistics (All: NDs treated as DL/2 value)	46	0.013	0.025	0.0243	0.025	0.00253
Statistics (Normal ROS Estimated Data)	46	0.00907	0.0209	0.015	0.015	0.00271
Statistics (Gamma ROS Estimated Data)	46	1.000E-12	0.017	9.7826E-4	1.000E-12	0.00377
Statistics (Lognormal ROS Estimated Data)	46	0.01	0.0222	0.0152	0.015	0.00277

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	83.79	78.34	1.7902E-4	-4.206	0.134	-0.0319
Statistics (NDs = DL)	15.7	14.69	0.00304	-3.075	0.303	-0.0987
Statistics (NDs = DL/2)	68.93	64.45	3.5323E-4	-3.723	0.132	-0.0355
Statistics (Gamma ROS Estimates)	0.046	0.0575	0.0213	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.206	0.182	-0.0433

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	1	0.512	0.513	1

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	1	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.175	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.279	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.538	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.285	0.945	Data Not Normal
Lilliefors (NDs = DL/2)	0.536	0.131	Data Not Normal

Shapiro-Wilks (Normal ROS Estimates)	0.991	0.945	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0303	0.131	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.448	0.485	0.899

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	16.12	0.748	
Kolmogorov-Smirnov (NDs = DL)	0.541	0.13	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	15.82	0.747	
Kolmogorov-Smirnov (NDs = DL/2)	0.538	0.13	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	17.11	1.696	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.591	0.18	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.999	0.513	0.512	1

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.998	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.184	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.282	0.945	Data Not Lognormal
Lilliefors (NDs = DL)	0.537	0.131	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.286	0.945	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.535	0.131	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.991	0.945	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0303	0.131	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Anthracene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	2	26	92.86%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	26	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	28	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	28	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	28	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	

Lilliefors (Detects Only)	N/A	N/A				
Shapiro-Wilks (NDs = DL)	N/A	N/A				
Lilliefors (NDs = DL)	N/A	N/A				
Shapiro-Wilks (NDs = DL/2)	N/A	N/A				
Lilliefors (NDs = DL/2)	N/A	N/A				
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A				
Lilliefors (Normal ROS Estimates)	N/A	N/A				

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A	
Anderson-Darling (NDs = DL/2)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A	
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A	
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A	

Note: Substitution methods such as DL or DL/2 are not recommended.

All Anthracene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	5	95	95.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	95	0.05	0.05	0.05	0.05	9.766E-17
Statistics (Detects Only)	5	0.008	0.017	0.0132	0.013	0.00335
Statistics (All: NDs treated as DL value)	100	0.008	0.05	0.0482	0.05	0.00809
Statistics (All: NDs treated as DL/2 value)	100	0.008	0.025	0.0244	0.025	0.00267
Statistics (Normal ROS Estimated Data)	100	0.00334	0.0231	0.0132	0.0131	0.00406
Statistics (Gamma ROS Estimated Data)	100	1.000E-12	0.0178	0.0128	0.0137	0.0041
Statistics (Lognormal ROS Estimated Data)	100	0.00567	0.0289	0.0135	0.013	0.00461

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	16.78	16.28	7.8672E-4	-4.358	0.286	-0.0656
Statistics (NDs = DL)	16.5	16.02	0.00292	-3.064	0.304	-0.0992
Statistics (NDs = DL/2)	52.5	50.93	4.6499E-4	-3.722	0.157	-0.0423
Statistics (Gamma ROS Estimates)	1.859	1.81	0.00686	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.358	0.336	-0.0772

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.958	0.473	0.47	1

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.933	0.762	Data Appear Normal
Lilliefors (Detects Only)	0.276	0.396	Data Appear Normal

Lilliefors (NDs = DL)	0.54	0.0886	Data Not Normal
Lilliefors (NDs = DL/2)	0.537	0.0886	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0181	0.0886	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.937	0.41	0.435	0.815

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.401	0.679	
Kolmogorov-Smirnov (Detects Only)	0.308	0.357	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	35.81	0.75	
Kolmogorov-Smirnov (NDs = DL)	0.543	0.0893	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	35.03	0.75	
Kolmogorov-Smirnov (NDs = DL/2)	0.537	0.0892	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	13.94	0.766	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.247	0.0908	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.928	0.472	0.46	1

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.877	0.762	Data Appear Lognormal
Lilliefors (Detects Only)	0.321	0.396	Data Appear Lognormal
Lilliefors (NDs = DL)	0.539	0.0886	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.534	0.0886	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0209	0.0886	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Anthracene.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Anthracene

General Statistics

Number of Valid Data	26	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	26

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv Anthracene was not processed!

Muddy Creek Anthracene

General Statistics

Number of Valid Data	46	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	43
		Percent Non-Detects	93.48%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.013	Minimum Detected	-4.343
Maximum Detected	0.017	Maximum Detected	-4.075
Mean of Detected	0.015	Mean of Detected	-4.206
SD of Detected	0.002	SD of Detected	0.134
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	1	Shapiro Wilk Test Statistic	0.998
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767

Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0243	Mean (Log Scale)	-3.723
SD	0.00253	SD (Log Scale)	0.132
95% UTL 95% Coverage	0.0296	95% UTL 95% Coverage	0.0318
95% UPL (t)	0.0286	95% UPL (t)	0.0302
90% Percentile (z)	0.0276	90% Percentile (z)	0.0286
95% Percentile (z)	0.0285	95% Percentile (z)	0.03
99% Percentile (z)	0.0302	99% Percentile (z)	0.0329
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0152
		SD in Original Scale	0.00277
		Mean in Log Scale	-4.206
		SD in Log Scale	0.182
		95% UTL 95% Coverage	0.0218
		95% UPL (t)	0.0203
		90% Percentile (z)	0.0188
		95% Percentile (z)	0.0201
		99% Percentile (z)	0.0228
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.015
5% K-S Critical Value	N/A	SD	0.00163
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00115
		95% KM UTL with 95% Coverage	0.0184
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0222
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0178
Mean	N/A	90% Percentile (z)	0.0171
Median	N/A	95% Percentile (z)	0.0177
SD	N/A	99% Percentile (z)	0.0188
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

Mesa Anthracene

General Statistics

Number of Valid Data	28	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	26
		Percent Non-Detects	92.86%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.008	Minimum Detected	-4.828
Maximum Detected	0.013	Maximum Detected	-4.343
Mean of Detected	0.0105	Mean of Detected	-4.586
SD of Detected	0.00354	SD of Detected	0.343
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.024	Mean (Log Scale)	-3.753
SD	0.00386	SD (Log Scale)	0.244
95% UTL 95% Coverage	0.0326	95% UTL 95% Coverage	0.0406
95% UPL (t)	0.0307	95% UPL (t)	0.0358
90% Percentile (z)	0.0289	90% Percentile (z)	0.0321
95% Percentile (z)	0.0303	95% Percentile (z)	0.035
99% Percentile (z)	0.033	99% Percentile (z)	0.0414
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		95% UTL 95% Coverage	N/A
		95% UPL (t)	N/A
		90% Percentile (z)	N/A
		95% Percentile (z)	N/A

		99% Percentile (z)	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.0105
5% K-S Critical Value	N/A	SD	0.0025
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0025
		95% KM UTL with 95% Coverage	0.0161
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0216
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0148
Mean	N/A	90% Percentile (z)	0.0137
Median	N/A	95% Percentile (z)	0.0146
SD	N/A	99% Percentile (z)	0.0163
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

All Anthracene

General Statistics			
Number of Valid Data	100	Number of Detected Data	5
Number of Distinct Detected Data	4	Number of Non-Detect Data	95
		Percent Non-Detects	95.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.008	Minimum Detected	-4.828
Maximum Detected	0.017	Maximum Detected	-4.075
Mean of Detected	0.0132	Mean of Detected	-4.358
SD of Detected	0.00335	SD of Detected	0.286
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.933	Shapiro Wilk Test Statistic	0.877
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0244	Mean (Log Scale)	-3.722
SD	0.00267	SD (Log Scale)	0.157
95% UTL 95% Coverage	0.0295	95% UTL 95% Coverage	0.0327
95% UPL (t)	0.0289	95% UPL (t)	0.0314
90% Percentile (z)	0.0278	90% Percentile (z)	0.0296
95% Percentile (z)	0.0288	95% Percentile (z)	0.0313
99% Percentile (z)	0.0306	99% Percentile (z)	0.0349
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0135
		SD in Original Scale	0.00461
		Mean in Log Scale	-4.358
		SD in Log Scale	0.336
		95% UTL 95% Coverage	0.0245
		95% UPL (t)	0.0224
		90% Percentile (z)	0.0197
		95% Percentile (z)	0.0223
		99% Percentile (z)	0.028
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	6.845	Data appear Normal at 5% Significance Level	
Theta Star	0.00193		
nu star	68.45		
A-D Test Statistic	0.401	**Nonparametric Statistics**	
5% A-D Critical Value	0.679	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.308	Mean	0.0132
5% K-S Critical Value	0.357	SD	0.00299
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0015
		95% KM UTL with 95% Coverage	0.019
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0263
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0182
Mean	0.0128	90% Percentile (z)	0.017
Median	0.0137	95% Percentile (z)	0.0181
SD	0.0041	99% Percentile (z)	0.0202
k star	1.81		
Theta star	0.00705	**Gamma ROS Limits with Extrapolated Data**	
Nu star	361.9	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0245
95% Percentile of Chisquare (2k)	8.863	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0273
		95% WH Approx. Gamma UTL with 95% Coverage	0.0269
90% Percentile	0.0254	95% HW Approx. Gamma UTL with 95% Coverage	0.0306
95% Percentile	0.0312		
99% Percentile	0.0442		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Anthracene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Anthracene

Background Data: Alluv Anthracene

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	26	26
Number of Detect Data	2	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	92.86%	100.00%
Minimum Detected	0.008	N/A
Maximum Detected	0.013	N/A
Mean of Detected Data	0.0105	N/A
Median of Detected Data	0.0105	N/A
SD of Detected Data	0.00354	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	1

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Anthracene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Anthracene

Background Data: Alluv Anthracene

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	43	26
Number of Detect Data	3	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	93.48%	100.00%
Minimum Detected	0.013	N/A
Maximum Detected	0.017	N/A
Mean of Detected Data	0.015	N/A
Median of Detected Data	0.015	N/A
SD of Detected Data	0.002	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	1

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Anthracene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Anthracene

Background Data: Muddy Creek Anthracene

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	26	43
Number of Detect Data	2	3
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	92.86%	93.48%
Minimum Detected	0.008	0.013
Maximum Detected	0.013	0.017
Mean of Detected Data	0.0105	0.015
Median of Detected Data	0.0105	0.015
SD of Detected Data	0.00354	0.002

Site vs Background Gehan Test

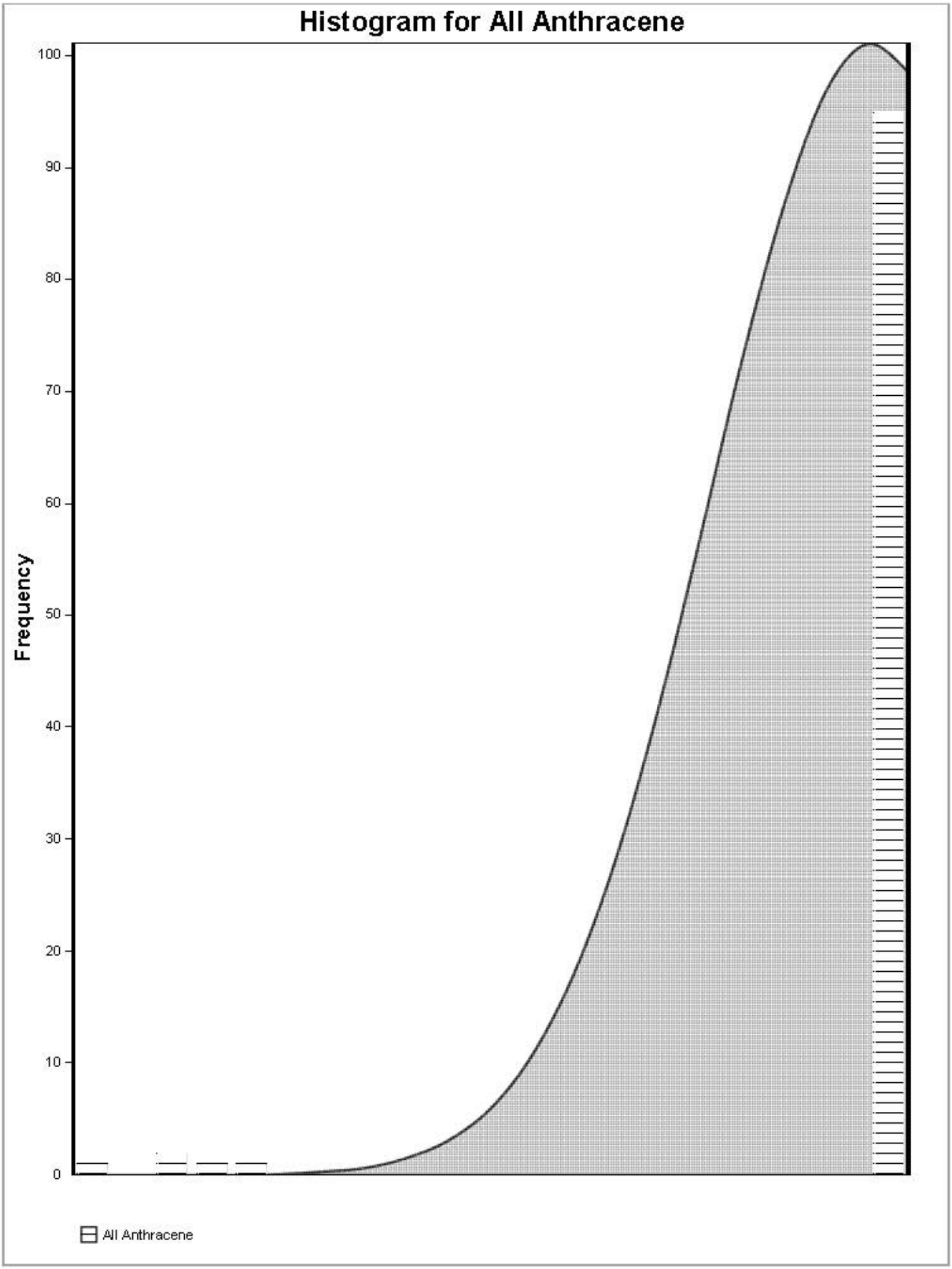
H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-1.943
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.052

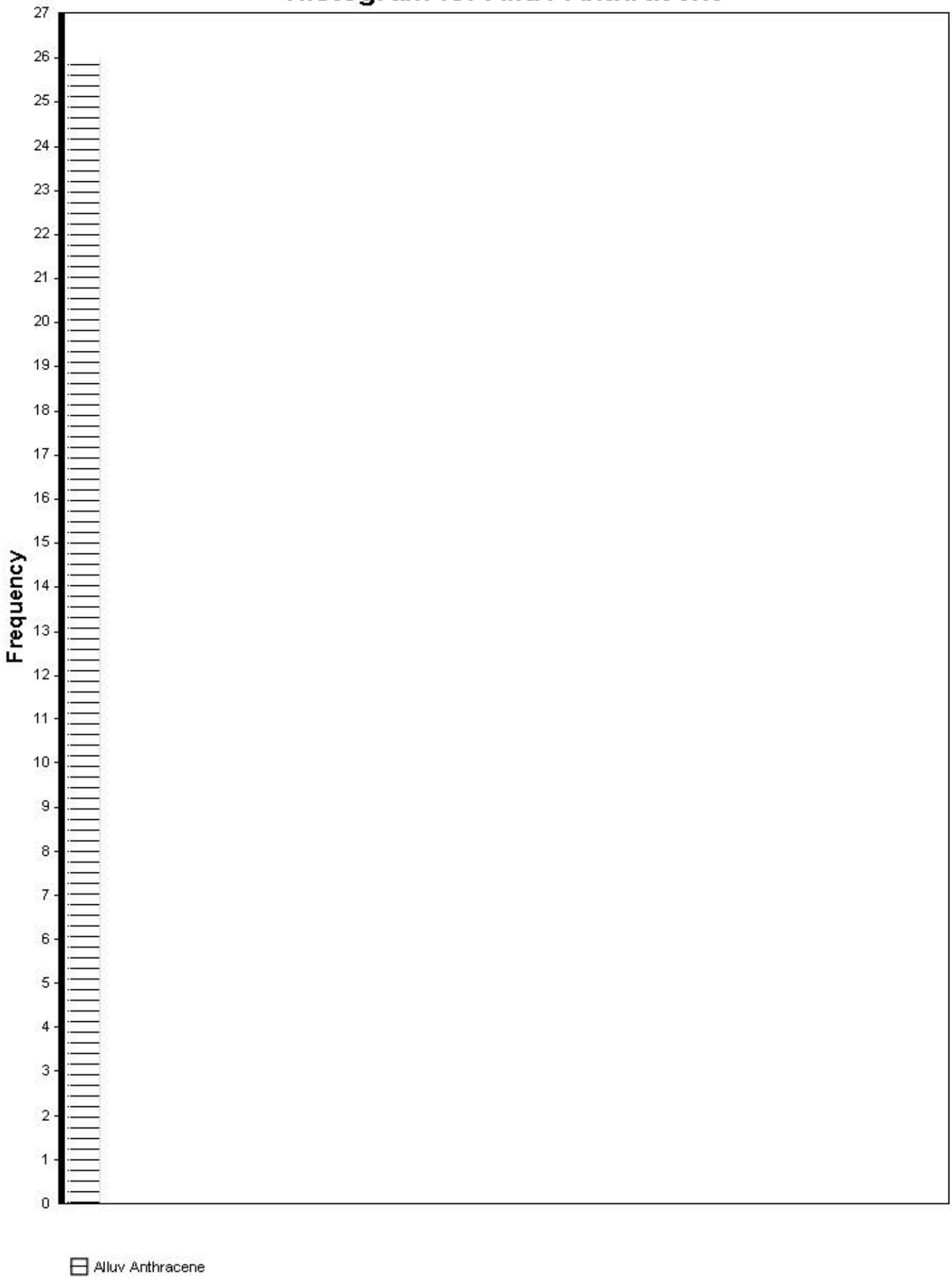
Conclusion with Alpha = 0.05

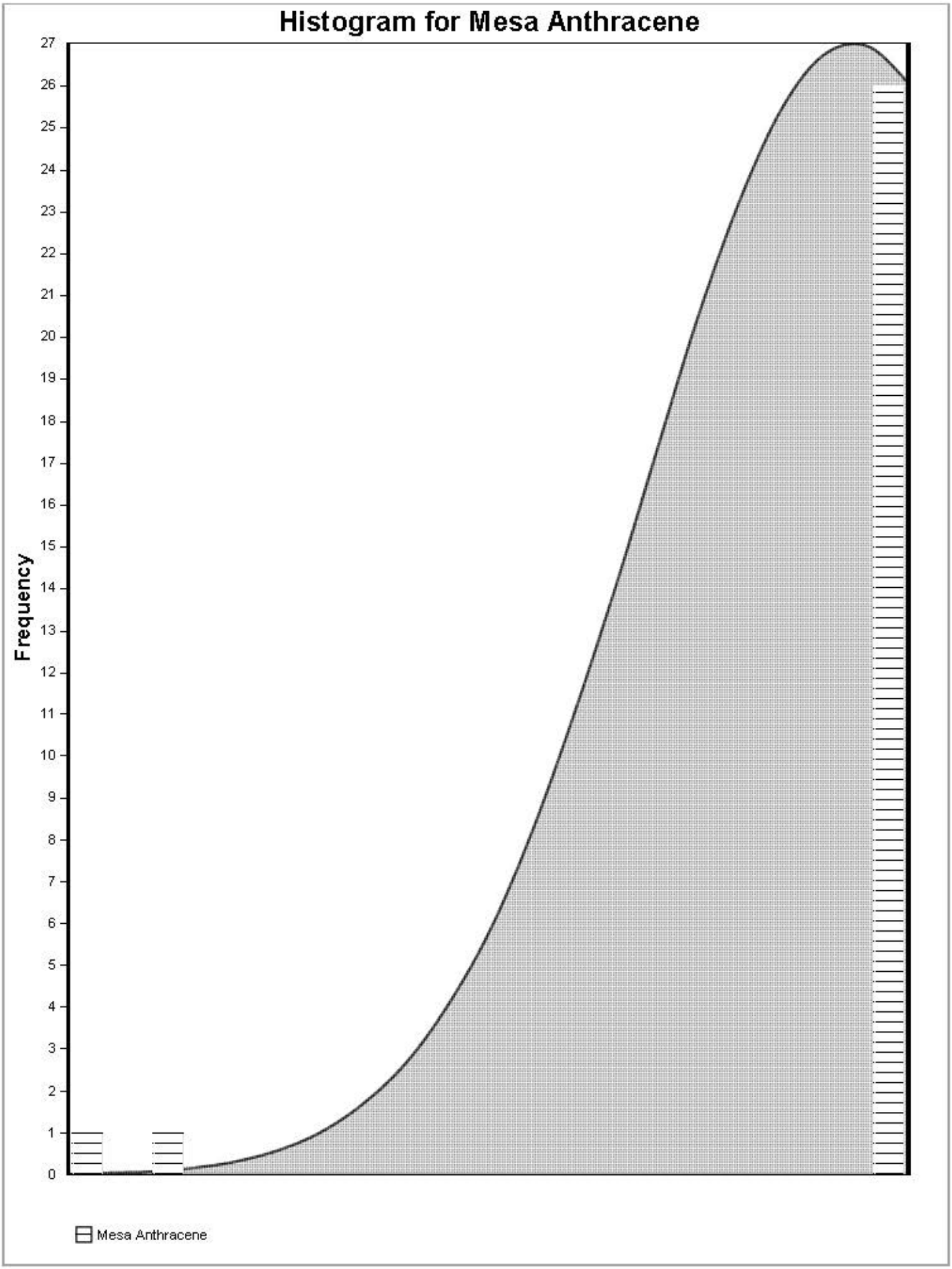
Do Not Reject H0, Conclude Site = Background

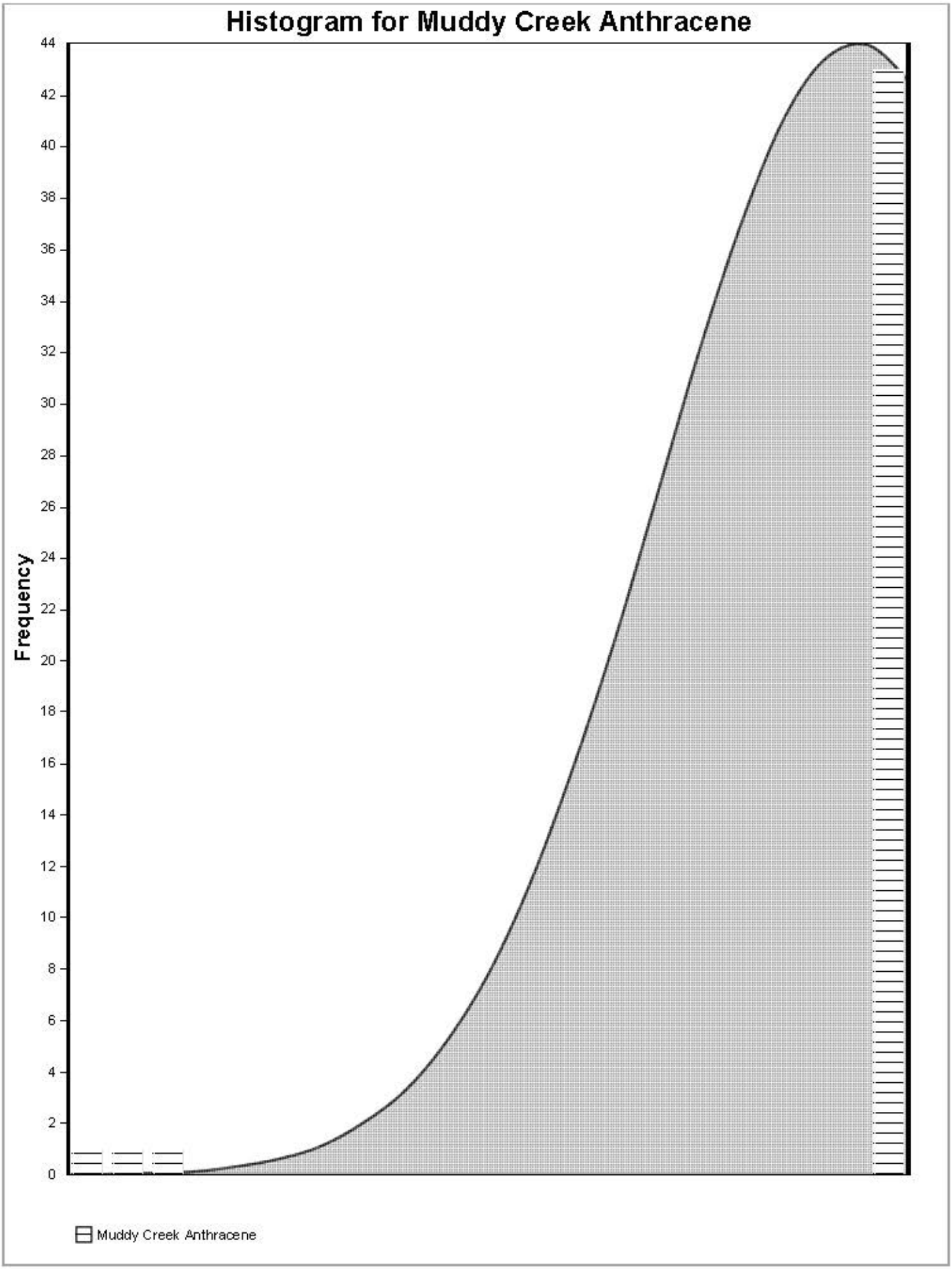
P-Value >= alpha (0.05)


Histogram for All Anthracene
Frequency
100
90
80
70
60
50
40
30
20
10
0
All Anthracene

Histogram for Alluv Anthracene




Histogram for Mesa Anthracene
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
Mesa Anthracene


Histogram for Muddy Creek Anthracene
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
Muddy Creek Anthracene

Outlier Tests for Selected Variables

User Selected Options	
From File	Anthracene.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Anthracene

Mean	0.025
Standard Deviation	7.076E-18

Rosner's Outlier Test for Muddy Creek Anthracene

Mean	0.0243
Standard Deviation	0.00253
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0243	0.0025	0.013	46	4.532	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.013 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.013 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Anthracene

Mean	0.024
Standard Deviation	0.00386
Number of data	28
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.024	0.00379	0.008	25	4.208	2.88	3.2

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.008 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.008 is a Potential Statistical Outlier

Rosner's Outlier Test for All Anthracene

Mean	0.0244
Standard Deviation	0.00267
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0244	0.00266	0.008	97	6.175	3.38	3.75

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.008 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.008 is a Potential Statistical Outlier

Location Name	Sample Date	Alluv Anthracene	D_Alluv Anthracene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0

Location Name	Sample Date	Muddy Creek Anthracene	D_Muddy Creek Anthracene
BG-3S	11/27/2012	0.05	0
BG-3S	8/22/2012	0.05	0
BG-3S	5/23/2012	0.05	0
BG-3S	3/21/2012	0.05	0
BG-4S	11/27/2012	0.05	0
BG-4S	8/30/2012	0.05	0
BG-4S	5/30/2012	0.05	0
BG-4S	3/20/2012	0.05	0
BG-6S	11/27/2012	0.05	0
BG-6S	8/23/2012	0.05	0
BG-6S	5/25/2012	0.05	0
BG-6S	3/21/2012	0.05	0
BG-1M	11/26/2012	0.05	0
BG-1M	8/23/2012	0.05	0
BG-1M	5/24/2012	0.05	0
BG-1M	3/20/2012	0.05	0
BG-3M	11/27/2012	0.05	0
BG-3M	8/22/2012	0.05	0
BG-3M	5/24/2012	0.05	0
BG-3M	3/21/2012	0.015	1
BG-4M	11/27/2012	0.05	0
BG-4M	8/30/2012	0.05	0
BG-4M	5/30/2012	0.05	0
BG-4M	3/20/2012	0.05	0
BG-6M	11/27/2012	0.05	0
BG-6M	8/22/2012	0.05	0
BG-6M	5/25/2012	0.05	0
BG-6M	3/21/2012	0.05	0
BG-1D	11/26/2012	0.05	0
BG-1D	8/23/2012	0.05	0
BG-1D	5/24/2012	0.05	0
BG-1D	3/20/2012	0.05	0
BG-3D	11/27/2012	0.05	0
BG-3D	8/21/2012	0.05	0
BG-3D	5/23/2012	0.05	0
BG-3D	3/21/2012	0.05	0
BG-4D	11/27/2012	0.05	0
BG-4D	8/30/2012	0.05	0
BG-4D	5/30/2012	0.05	0
BG-4D	3/20/2012	0.05	0
BG-6D	11/27/2012	0.05	0
BG-6D	8/22/2012	0.05	0
BG-6D	5/25/2012	0.05	0
BG-6D	3/21/2012	0.017	1

Location Name	Sample Date	Mesa Anthracene	D_Mesa Anthracene
LMW-10	11/28/2012	0.013	1
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-9	11/28/2012	0.008	1
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Location Name	Sample Date	All Anthracene	D_All Anthracene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0
BG-3S	11/27/2012	0.05	0
BG-3S	8/22/2012	0.05	0
BG-3S	5/23/2012	0.05	0
BG-3S	3/21/2012	0.05	0
BG-4S	11/27/2012	0.05	0
BG-4S	8/30/2012	0.05	0
BG-4S	5/30/2012	0.05	0
BG-4S	3/20/2012	0.05	0
BG-6S	11/27/2012	0.05	0
BG-6S	8/23/2012	0.05	0
BG-6S	5/25/2012	0.05	0
BG-6S	3/21/2012	0.05	0
BG-1M	11/26/2012	0.05	0
BG-1M	8/23/2012	0.05	0
BG-1M	5/24/2012	0.05	0
BG-1M	3/20/2012	0.05	0
BG-3M	11/27/2012	0.05	0
BG-3M	8/22/2012	0.05	0

IMW-3D	5/25/2012	0.05	0
IMW-3D	3/22/2012	0.013	1

BG-3M	5/24/2012	0.05	0
BG-3M	3/21/2012	0.015	1
BG-4M	11/27/2012	0.05	0
BG-4M	8/30/2012	0.05	0
BG-4M	5/30/2012	0.05	0
BG-4M	3/20/2012	0.05	0
BG-6M	11/27/2012	0.05	0
BG-6M	8/22/2012	0.05	0
BG-6M	5/25/2012	0.05	0
BG-6M	3/21/2012	0.05	0
BG-1D	11/26/2012	0.05	0
BG-1D	8/23/2012	0.05	0
BG-1D	5/24/2012	0.05	0
BG-1D	3/20/2012	0.05	0
BG-3D	11/27/2012	0.05	0
BG-3D	8/21/2012	0.05	0
BG-3D	5/23/2012	0.05	0
BG-3D	3/21/2012	0.05	0
BG-4D	11/27/2012	0.05	0
BG-4D	8/30/2012	0.05	0
BG-4D	5/30/2012	0.05	0
BG-4D	3/20/2012	0.05	0
BG-6D	11/27/2012	0.05	0
BG-6D	8/22/2012	0.05	0
BG-6D	5/25/2012	0.05	0
BG-6D	3/21/2012	0.017	1
IMW-3D	5/25/2012	0.05	0
IMW-3D	3/22/2012	0.013	1
LMW-10	11/28/2012	0.013	1
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0

BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-9	11/28/2012	0.008	1
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Antimony_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Antimony, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	9	17	65.38%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	17	0.02	0.02	0.02	0.02	0
Statistics (Detects Only)	9	0.0079	0.028	0.0203	0.022	0.00662
Statistics (All: NDs treated as DL value)	26	0.0079	0.028	0.0201	0.02	0.00375
Statistics (All: NDs treated as DL/2 value)	26	0.0079	0.028	0.0136	0.01	0.00625
Statistics (Normal ROS Estimated Data)	26	0.00217	0.028	0.015	0.0147	0.00673
Statistics (Gamma ROS Estimated Data)	26	0.0079	0.028	0.0194	0.0191	0.0041
Statistics (Lognormal ROS Estimated Data)	26	0.00644	0.028	0.015	0.014	0.00608

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	8.23	7.306	0.00247	-3.958	0.403	-0.102
Statistics (NDs = DL)	23.44	20.76	8.5809E-4	-3.928	0.229	-0.0584
Statistics (NDs = DL/2)	6.298	5.597	0.00216	-4.381	0.388	-0.0886
Statistics (Gamma ROS Estimates)	20.14	17.85	9.6485E-4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.277	0.405	-0.0948

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.967	0.841	0.822	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.93	0.829	Data Appear Normal
Lilliefors (Detects Only)	0.207	0.295	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.738	0.92	Data Not Normal
Lilliefors (NDs = DL)	0.373	0.174	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.671	0.92	Data Not Normal
Lilliefors (NDs = DL/2)	0.408	0.174	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.983	0.92	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.056	0.174	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.927	0.836	0.886	0.806

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.475	0.722	
Kolmogorov-Smirnov (Detects Only)	0.25	0.28	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	3.671	0.744	
Kolmogorov-Smirnov (NDs = DL)	0.401	0.171	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	4.123	0.746	
Kolmogorov-Smirnov (NDs = DL/2)	0.416	0.171	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.684	0.744	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.153	0.171	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.921	0.778	0.839	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.855	0.829	Data Appear Lognormal
Lilliefors (Detects Only)	0.26	0.295	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.64	0.92	Data Not Lognormal
Lilliefors (NDs = DL)	0.412	0.174	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.698	0.92	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.41	0.174	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.977	0.92	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0771	0.174	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Antimony, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	23	23	50.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	23	0.02	0.02	0.02	0.02	7.095E-18
Statistics (Detects Only)	23	0.0066	0.041	0.0213	0.022	0.00975
Statistics (All: NDs treated as DL value)	46	0.0066	0.041	0.0206	0.02	0.00684
Statistics (All: NDs treated as DL/2 value)	46	0.0066	0.041	0.0156	0.01	0.00888
Statistics (Normal ROS Estimated Data)	46	-0.00437	0.041	0.0158	0.0155	0.00991
Statistics (Gamma ROS Estimated Data)	46	0.0066	0.041	0.0216	0.0223	0.007
Statistics (Lognormal ROS Estimated Data)	46	0.0042	0.041	0.0159	0.0139	0.00908

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.967	3.722	0.00536	-3.983	0.568	-0.143
Statistics (NDs = DL)	7.725	7.236	0.00267	-3.947	0.399	-0.101
Statistics (NDs = DL/2)	3.86	3.623	0.00405	-4.294	0.507	-0.118
Statistics (Gamma ROS Estimates)	7.478	7.005	0.00289	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.301	0.577	-0.134

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.975	0.909	0.891	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.942	0.914	Data Appear Normal
Lilliefors (Detects Only)	0.137	0.185	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.837	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.29	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.787	0.945	Data Not Normal

Lilliefors (NDs = DL/2)	0.346	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.98	0.945	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0741	0.131	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.961	0.915	0.952	0.846

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.989	0.749	
Kolmogorov-Smirnov (Detects Only)	0.172	0.182	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	4.473	0.751	
Kolmogorov-Smirnov (NDs = DL)	0.34	0.131	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.883	0.753	
Kolmogorov-Smirnov (NDs = DL/2)	0.348	0.131	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.141	0.751	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.202	0.131	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.935	0.866	0.922	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.863	0.914	Data Not Lognormal
Lilliefors (Detects Only)	0.202	0.185	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.758	0.945	Data Not Lognormal
Lilliefors (NDs = DL)	0.361	0.131	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.836	0.945	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.339	0.131	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.967	0.945	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0817	0.131	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Antimony, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	0	31	15	16	51.61%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	16	0.015	0.02	0.0191	0.02	0.00202
Statistics (Detects Only)	15	0.0097	0.061	0.0278	0.023	0.0138
Statistics (All: NDs treated as DL value)	31	0.0097	0.061	0.0233	0.02	0.0105
Statistics (All: NDs treated as DL/2 value)	31	0.0075	0.061	0.0184	0.01	0.0133
Statistics (Normal ROS Estimated Data)	31	-0.0117	0.061	0.0168	0.017	0.016
Statistics (Gamma ROS Estimated Data)	31	0.0097	0.061	0.0279	0.0278	0.00947
Statistics (Lognormal ROS Estimated Data)	31	0.00568	0.061	0.0196	0.017	0.0128

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.702	4.269	0.00591	-3.694	0.486	-0.132
Statistics (NDs = DL)	6.919	6.271	0.00336	-3.834	0.369	-0.0962
Statistics (NDs = DL/2)	2.727	2.485	0.00673	-4.192	0.598	-0.143

Statistics (Gamma ROS Estimates)	9.508	8.609	0.00293	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.103	0.587	-0.143

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.951	0.844	0.868	0.981

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.908	0.881	Data Appear Normal
Lilliefors (Detects Only)	0.208	0.229	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.732	0.929	Data Not Normal
Lilliefors (NDs = DL)	0.332	0.159	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.757	0.929	Data Not Normal
Lilliefors (NDs = DL/2)	0.284	0.159	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.966	0.929	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.134	0.159	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.988	0.909	0.961	0.852

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.334	0.739	
Kolmogorov-Smirnov (Detects Only)	0.161	0.222	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.674	0.747	
Kolmogorov-Smirnov (NDs = DL)	0.313	0.158	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.26	0.754	
Kolmogorov-Smirnov (NDs = DL/2)	0.306	0.159	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.167	0.746	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.206	0.158	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.985	0.919	0.929	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.972	0.881	Data Appear Lognormal
Lilliefors (Detects Only)	0.13	0.229	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.861	0.929	Data Not Lognormal
Lilliefors (NDs = DL)	0.293	0.159	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.852	0.929	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.304	0.159	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.978	0.929	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0832	0.159	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Antimony_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Antimony, Dissolved

General Statistics

Number of Valid Data	26	Number of Detected Data	9
Number of Distinct Detected Data	7	Number of Non-Detect Data	17
		Percent Non-Detects	65.38%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0079	Minimum Detected	-4.841
Maximum Detected	0.028	Maximum Detected	-3.576
Mean of Detected	0.0203	Mean of Detected	-3.958
SD of Detected	0.00662	SD of Detected	0.403
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.93	Shapiro Wilk Test Statistic	0.855
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0136	Mean (Log Scale)	-4.381
SD	0.00625	SD (Log Scale)	0.388
95% UTL 95% Coverage	0.0278	95% UTL 95% Coverage	0.0303
95% UPL (t)	0.0245	95% UPL (t)	0.0246
90% Percentile (z)	0.0216	90% Percentile (z)	0.0206
95% Percentile (z)	0.0239	95% Percentile (z)	0.0237
99% Percentile (z)	0.0281	99% Percentile (z)	0.0309
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0247	Mean in Original Scale	0.015
SD	0.00285	SD in Original Scale	0.00608
95% UTL with 95% Coverage	0.0312	95% UTL with 95% Coverage	0.0349

		95% BCA UTL with 95% Coverage	0.028
		95% Bootstrap (%) UTL with 95% Coverage	0.028
95% UPL (t)	0.0297	95% UPL (t)	0.0281
90% Percentile (z)	0.0283	90% Percentile (z)	0.0233
95% Percentile (z)	0.0294	95% Percentile (z)	0.027
99% Percentile (z)	0.0313	99% Percentile (z)	0.0356
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	5.561	Data appear Normal at 5% Significance Level	
Theta Star	0.00365		
nu star	100.1		
A-D Test Statistic	0.475	Nonparametric Statistics	
5% A-D Critical Value	0.722	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.25	Mean	0.0153
5% K-S Critical Value	0.28	SD	0.00588
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00193
		95% KM UTL with 95% Coverage	0.0287
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0414
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0255
Mean	0.0194	90% Percentile (z)	0.0228
Median	0.0191	95% Percentile (z)	0.025
SD	0.0041	99% Percentile (z)	0.029
k star	17.85		
Theta star	0.00109	Gamma ROS Limits with Extrapolated Data	
Nu star	928	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0278
95% Percentile of Chisquare (2k)	50.63	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.028
		95% WH Approx. Gamma UTL with 95% Coverage	0.0309
90% Percentile	0.0255	95% HW Approx. Gamma UTL with 95% Coverage	0.0313
95% Percentile	0.0276		
99% Percentile	0.0317		

Note: DL/2 is not a recommended method.

Muddy Creek Antimony, Dissolved

General Statistics			
Number of Valid Data	46	Number of Detected Data	23
Number of Distinct Detected Data	18	Number of Non-Detect Data	23
		Percent Non-Detects	50.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0066	Minimum Detected	-5.021
Maximum Detected	0.041	Maximum Detected	-3.194
Mean of Detected	0.0213	Mean of Detected	-3.983
SD of Detected	0.00975	SD of Detected	0.568
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912
Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	

Shapiro Wilk Test Statistic	0.942	Shapiro Wilk Test Statistic	0.863
5% Shapiro Wilk Critical Value	0.914	5% Shapiro Wilk Critical Value	0.914
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0156	Mean (Log Scale)	-4.294
SD	0.00888	SD (Log Scale)	0.507
95% UTL 95% Coverage	0.0341	95% UTL 95% Coverage	0.0392
95% UPL (t)	0.0307	95% UPL (t)	0.0323
90% Percentile (z)	0.027	90% Percentile (z)	0.0261
95% Percentile (z)	0.0302	95% Percentile (z)	0.0314
99% Percentile (z)	0.0363	99% Percentile (z)	0.0444
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.015	Mean in Original Scale	0.0159
SD	0.0109	SD in Original Scale	0.00908
95% UTL with 95% Coverage	0.0376	95% UTL with 95% Coverage	0.045
		95% BCA UTL with 95% Coverage	0.038
		95% Bootstrap (%) UTL with 95% Coverage	0.0403
95% UPL (t)	0.0335	95% UPL (t)	0.0361
90% Percentile (z)	0.029	90% Percentile (z)	0.0284
95% Percentile (z)	0.0329	95% Percentile (z)	0.035
99% Percentile (z)	0.0403	99% Percentile (z)	0.0519
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.478	Data appear Normal at 5% Significance Level	
Theta Star	0.00611		
nu star	160		
A-D Test Statistic	0.989	Nonparametric Statistics	
5% A-D Critical Value	0.749	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.172	Mean	0.0159
5% K-S Critical Value	0.182	SD	0.00916
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	0.00167
		95% KM UTL with 95% Coverage	0.035
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0563
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0315
Mean	0.0216	90% Percentile (z)	0.0277
Median	0.0223	95% Percentile (z)	0.031
SD	0.007	99% Percentile (z)	0.0372
k star	7.005		
Theta star	0.00309	Gamma ROS Limits with Extrapolated Data	
Nu star	644.4	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0368
95% Percentile of Chisquare (2k)	23.7	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0376
		95% WH Approx. Gamma UTL with 95% Coverage	0.0413
90% Percentile	0.0325	95% HW Approx. Gamma UTL with 95% Coverage	0.0425
95% Percentile	0.0366		
99% Percentile	0.045		

Note: DL/2 is not a recommended method.

Mesa Antimony, Dissolved

General Statistics			
Number of Valid Data	31	Number of Detected Data	15
Number of Distinct Detected Data	14	Number of Non-Detect Data	16
		Percent Non-Detects	51.61%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0097	Minimum Detected	-4.636
Maximum Detected	0.061	Maximum Detected	-2.797
Mean of Detected	0.0278	Mean of Detected	-3.694
SD of Detected	0.0138	SD of Detected	0.486
Minimum Non-Detect	0.015	Minimum Non-Detect	-4.2
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	21
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	10
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	67.74%

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.908	Shapiro Wilk Test Statistic	0.972
5% Shapiro Wilk Critical Value	0.881	5% Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0184	Mean (Log Scale)	-4.192
SD	0.0133	SD (Log Scale)	0.598
95% UTL 95% Coverage	0.0475	95% UTL 95% Coverage	0.0562
95% UPL (t)	0.0412	95% UPL (t)	0.0424
90% Percentile (z)	0.0354	90% Percentile (z)	0.0325
95% Percentile (z)	0.0402	95% Percentile (z)	0.0404
99% Percentile (z)	0.0492	99% Percentile (z)	0.0608
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00956	Mean in Original Scale	0.0196
SD	0.0221	SD in Original Scale	0.0128
95% UTL with 95% Coverage	0.0582	95% UTL with 95% Coverage	0.0599
		95% BCA UTL with 95% Coverage	0.053
		95% Bootstrap (%) UTL with 95% Coverage	0.061
95% UPL (t)	0.0477	95% UPL (t)	0.0454
90% Percentile (z)	0.0379	90% Percentile (z)	0.035
95% Percentile (z)	0.046	95% Percentile (z)	0.0434
99% Percentile (z)	0.061	99% Percentile (z)	0.0647
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.806	Data appear Normal at 5% Significance Level	
Theta Star	0.0073		
nu star	114.2		
A-D Test Statistic	0.334	Nonparametric Statistics	

5% A-D Critical Value	0.739	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.161	Mean	0.02
5% K-S Critical Value	0.222	SD	0.0123
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00239
		95% KM UTL with 95% Coverage	0.0469
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0743
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0411
Mean	0.0279	90% Percentile (z)	0.0357
Median	0.0278	95% Percentile (z)	0.0401
SD	0.00947	99% Percentile (z)	0.0485
k star	8.609		
Theta star	0.00324	Gamma ROS Limits with Extrapolated Data	
Nu star	533.8	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0455
95% Percentile of Chisquare (2k)	27.87	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0458
		95% WH Approx. Gamma UTL with 95% Coverage	0.0518
90% Percentile	0.0405	95% HW Approx. Gamma UTL with 95% Coverage	0.0525
95% Percentile	0.0451		
99% Percentile	0.0546		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Antimony_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Antimony, Dissolved

Background Data: Alluv Antimony, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	23	17
Number of Detect Data	23	9
Minimum Non-Detect	0.02	0.02
Maximum Non-Detect	0.02	0.02
Percent Non detects	50.00%	65.38%
Minimum Detected	0.0066	0.0079
Maximum Detected	0.041	0.028
Mean of Detected Data	0.0213	0.0203
Median of Detected Data	0.022	0.022
SD of Detected Data	0.00975	0.00662

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0.845
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.398

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Antimony_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Antimony, Dissolved

Background Data: Alluv Antimony, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	31	26
Number of Non-Detect Data	16	17
Number of Detect Data	15	9
Minimum Non-Detect	0.015	0.02
Maximum Non-Detect	0.02	0.02
Percent Non detects	51.61%	65.38%
Minimum Detected	0.0097	0.0079
Maximum Detected	0.061	0.028
Mean of Detected Data	0.0278	0.0203
Median of Detected Data	0.023	0.022
SD of Detected Data	0.0138	0.00662

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	1.046
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.295

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Antimony_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Antimony, Dissolved

Background Data: Muddy Creek Antimony, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	31	46
Number of Non-Detect Data	16	23
Number of Detect Data	15	23
Minimum Non-Detect	0.015	0.02
Maximum Non-Detect	0.02	0.02
Percent Non detects	51.61%	50.00%
Minimum Detected	0.0097	0.0066
Maximum Detected	0.061	0.041
Mean of Detected Data	0.0278	0.0213
Median of Detected Data	0.023	0.022
SD of Detected Data	0.0138	0.00975

Site vs Background Gehan Test

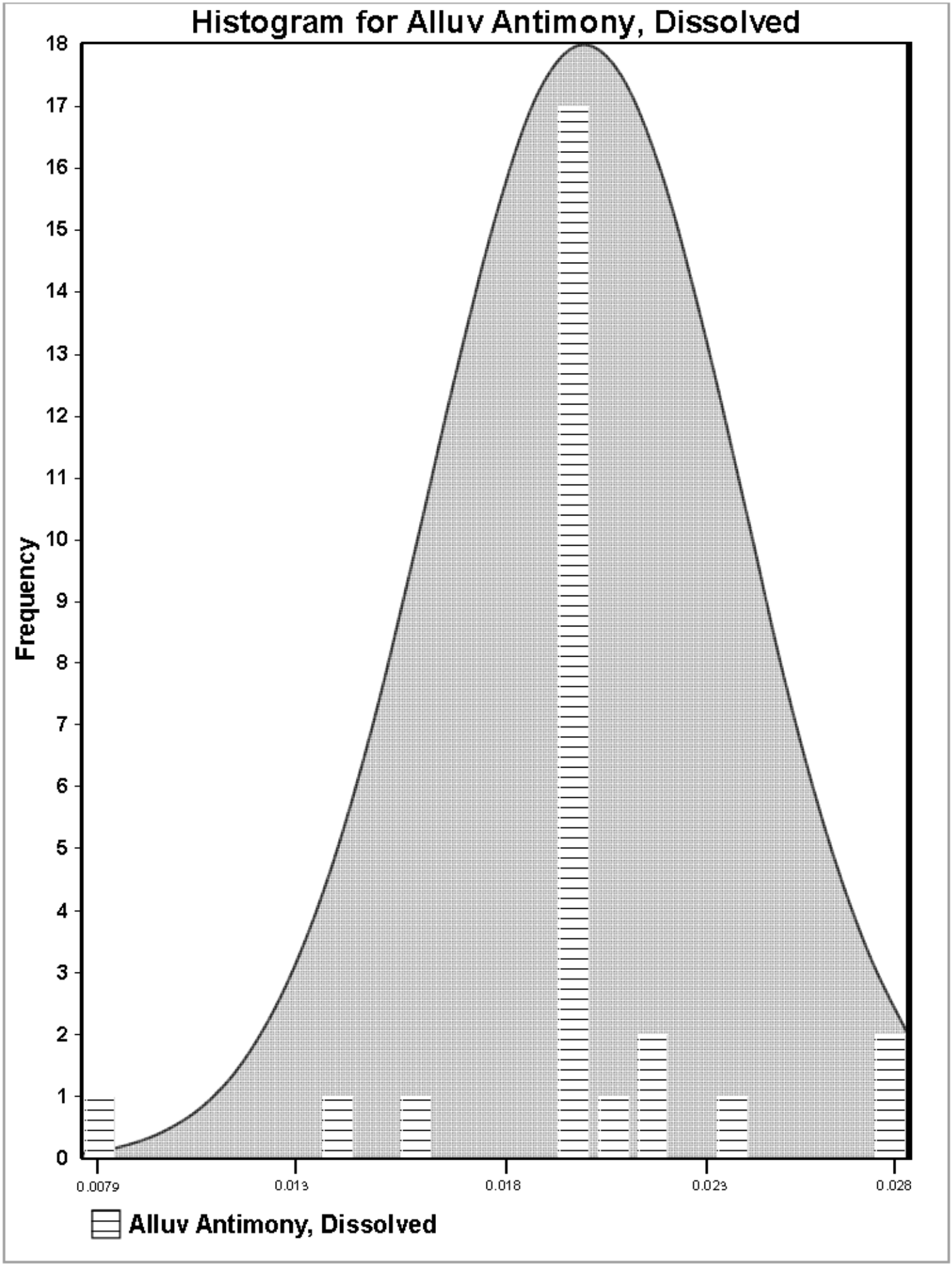
H0: Mu of Site or AOC = Mu of background

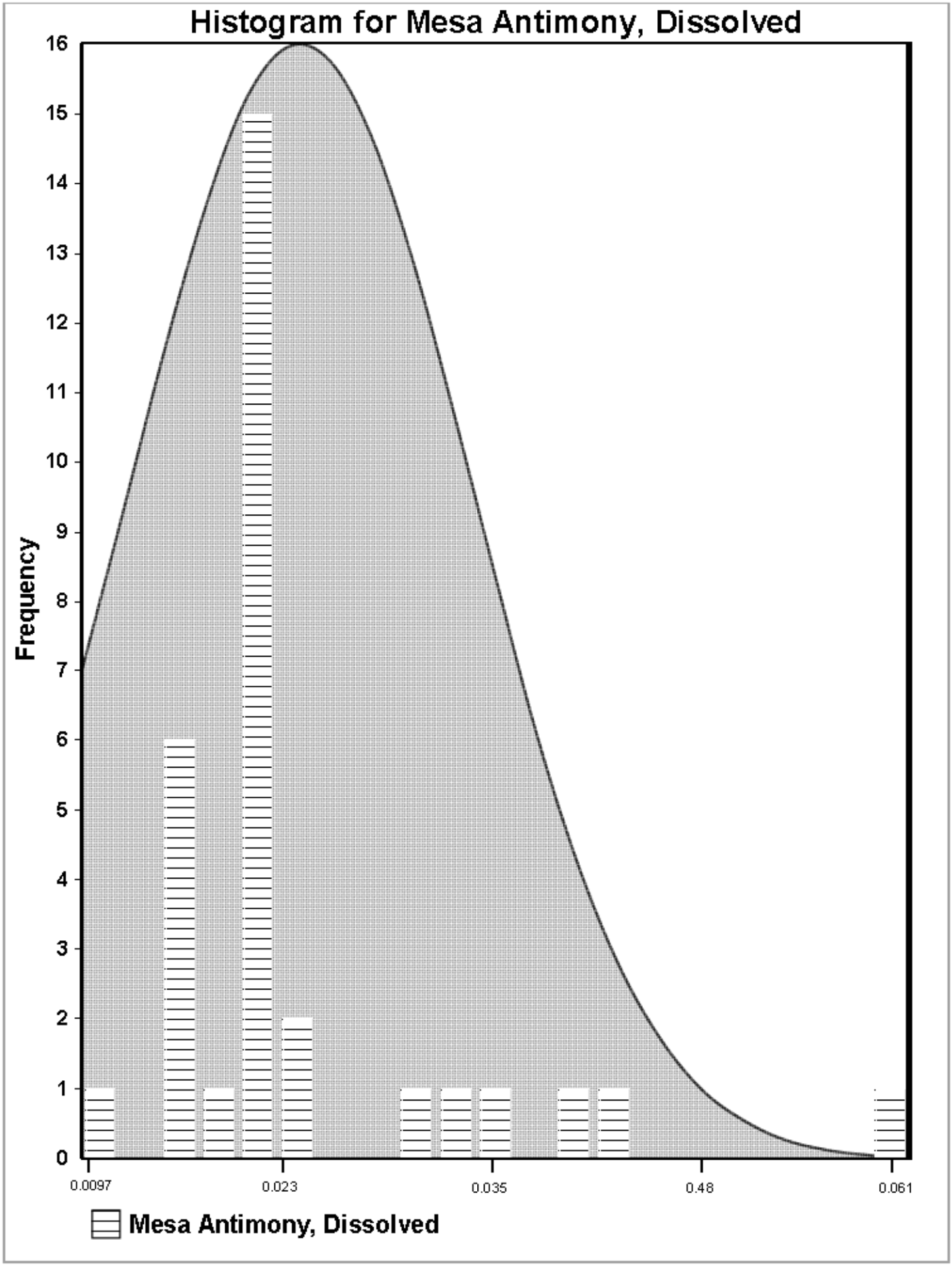
Gehan z Test Value	0.261
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.794

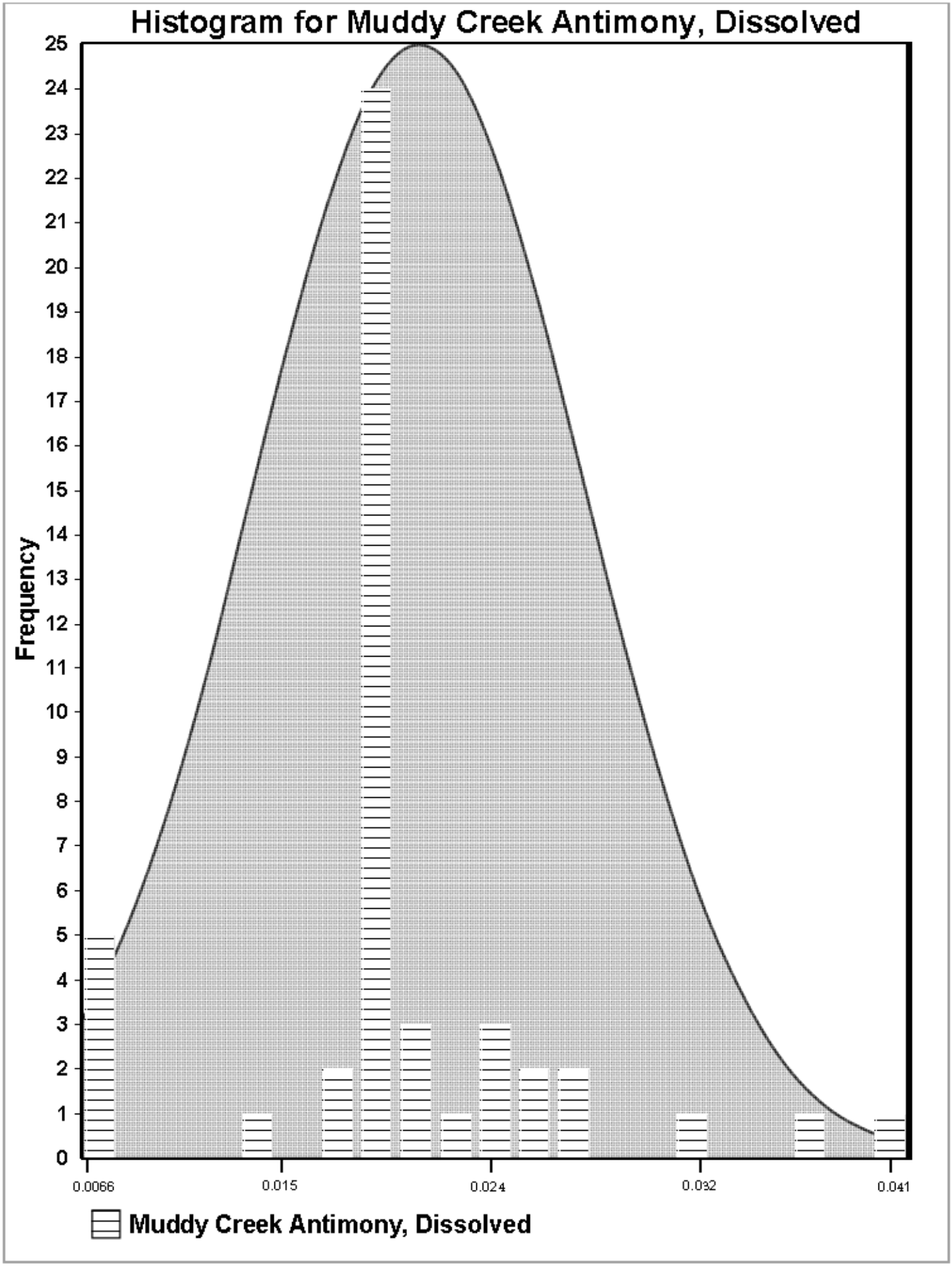
Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv Antimony, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
0.0079
0.013
0.018
0.023
0.028
Alluv Antimony, Dissolved


Histogram for Mesa Antimony, Dissolved
Frequency
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
0.0097
0.023
0.035
0.48
0.061
Mesa Antimony, Dissolved


Histogram for Muddy Creek Antimony, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
0.0066
0.015
0.024
0.032
0.041
Muddy Creek Antimony, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Antimony_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Antimony, Dissolved

Mean	0.0136
Standard Deviation	0.00625
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0136	0.00613	0.028	1	2.353	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Antimony, Dissolved

Mean	0.0156
Standard Deviation	0.00888
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0156	0.00878	0.041	26	2.89	3.09	3.45

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Antimony, Dissolved

Mean	0.0184
Standard Deviation	0.0133
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0184	0.013	0.061	18	3.269	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.061 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.061 is a Potential Statistical Outlier

Antimony, Dissolved

Location Name	Sample Date	Alluv Antimony, Dissolved	Location Name	Sample Date	Muddy Creek Antimony, Dissolved	Location Name	Sample Date	Mesa Antimony, Dissolved
BG-1S	11/26/2012	0.028	BG-3S	11/27/2012	0.017	LMW-10	11/28/2012	0.017
BG-1S	8/23/2012	0.028	BG-3S	8/22/2012	0.02*	LMW-10	8/27/2012	0.02*
BG-1S	5/24/2012	0.02	BG-3S	5/23/2012	0.02*	LMW-10	5/30/2012	0.034
BG-1S	3/20/2012	0.02	BG-3S	3/21/2012	0.02*	LMW-10	2/22/2012	0.015*
IMW-2.5D	11/26/2012	0.016	BG-4S	11/27/2012	0.0076	LMW-10	3/22/2012	0.037
IMW-2.5D	8/24/2012	0.02	BG-4S	8/30/2012	0.02*	LMW-10	12/6/2011	0.015*
IMW-2.5D	5/21/2012	0.02	BG-4S	5/30/2012	0.026	LMW-11R	11/26/2012	0.023
IMW-2.5D	3/21/2012	0.02	BG-4S	3/20/2012	0.02*	LMW-11R	8/21/2012	0.018
IMW-2.5S	11/26/2012	0.021	BG-6S	11/27/2012	0.025	LMW-11R	5/29/2012	0.016
IMW-2.5S	8/24/2012	0.014	BG-6S	8/23/2012	0.038	LMW-11R	3/23/2012	0.02*
IMW-2.5S	5/21/2012	0.02	BG-6S	5/25/2012	0.02*	LMW-7	11/28/2012	0.021
IMW-2.5S	3/21/2012	0.02	BG-6S	3/21/2012	0.02*	LMW-7	8/27/2012	0.02*
IMW-3S	5/21/2012	0.02	BG-1M	11/26/2012	0.02*	LMW-7	5/31/2012	0.02*
IMW-3S	3/20/2012	0.0079	BG-1M	8/23/2012	0.027	LMW-7	3/23/2012	0.02*
KMW-2D	11/26/2012	0.022	BG-1M	5/24/2012	0.02*	LMW-7	12/5/2011	0.015*
KMW-2D	8/24/2012	0.02	BG-1M	3/20/2012	0.02*	BG-2S	11/26/2012	0.017
KMW-2D	5/21/2012	0.02	BG-3M	11/27/2012	0.02*	BG-2S	8/23/2012	0.042
KMW-2D	3/23/2012	0.02	BG-3M	8/22/2012	0.024	BG-2S	5/24/2012	0.02*
KMW-2M	11/26/2012	0.022	BG-3M	5/24/2012	0.02*	BG-2S	3/21/2012	0.061
KMW-2M	8/24/2012	0.02	BG-3M	3/21/2012	0.02*	BG-2M	11/26/2012	0.02
KMW-2M	5/21/2012	0.02	BG-4M	11/27/2012	0.017	BG-2M	8/23/2012	0.032
KMW-2M	3/23/2012	0.02*	BG-4M	8/30/2012	0.02*	BG-2M	5/24/2012	0.02*
KMW-2S	11/26/2012	0.024	BG-4M	5/30/2012	0.022	BG-2M	3/21/2012	0.02*
KMW-2S	8/24/2012	0.02*	BG-4M	3/20/2012	0.0066	BG-2D	11/26/2012	0.02*
KMW-2S	5/21/2012	0.02*	BG-6M	11/27/2012	0.025	BG-2D	8/23/2012	0.045
KMW-2S	3/23/2012	0.02*	BG-6M	8/22/2012	0.041	BG-2D	5/24/2012	0.02*
			BG-6M	5/25/2012	0.02*	BG-2D	3/21/2012	0.02*
			BG-6M	3/21/2012	0.02*	LMW-9	8/27/2012	0.0097
			BG-1D	11/26/2012	0.02	LMW-9	5/31/2012	0.02*
			BG-1D	8/23/2012	0.028	LMW-9	3/23/2012	0.02*
			BG-1D	5/24/2012	0.02*	LMW-9	12/5/2011	0.015*
			BG-1D	3/20/2012	0.0068			
			BG-3D	11/27/2012	0.015			
			BG-3D	8/21/2012	0.02*			
			BG-3D	5/23/2012	0.02*			
			BG-3D	3/21/2012	0.02*			
			BG-4D	11/27/2012	0.028			
			BG-4D	8/30/2012	0.02*			
			BG-4D	5/30/2012	0.021			
			BG-4D	3/20/2012	0.0076			
			BG-6D	11/27/2012	0.022			
			BG-6D	8/22/2012	0.034			
			BG-6D	5/25/2012	0.0072			
			BG-6D	3/21/2012	0.02*			
			IMW-3D	5/25/2012	0.02*			
			IMW-3D	3/22/2012	0.023			
* non-detect								

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Arsenic_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Arsenic, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	88	0	88	87	1	1.14%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	87	0.014	0.29	0.124	0.11	0.0688
Statistics (All: NDs treated as DL value)	88	0.014	0.29	0.123	0.105	0.0693
Statistics (All: NDs treated as DL/2 value)	88	0.01	0.29	0.122	0.105	0.0695
Statistics (Normal ROS Estimated Data)	88	-0.0288	0.29	0.122	0.105	0.0704
Statistics (Gamma ROS Estimated Data)	88	1.000E-12	0.29	0.122	0.105	0.0697
Statistics (Lognormal ROS Estimated Data)	88	0.014	0.29	0.123	0.105	0.0693

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.737	2.652	0.0452	-2.283	0.679	-0.297
Statistics (NDs = DL)	2.623	2.541	0.0467	-2.302	0.697	-0.303
Statistics (NDs = DL/2)	2.541	2.462	0.0482	-2.31	0.719	-0.311
Statistics (Gamma ROS Estimates)	1.203	1.169	0.102	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.3	0.693	-0.301

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.976	0.976	0.978	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.129	0.095	Data Not Normal
Lilliefors (NDs = DL)	0.127	0.0944	Data Not Normal
Lilliefors (NDs = DL/2)	0.126	0.0944	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.123	0.0944	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.966	0.965	0.964	0.932

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.361	0.761	
Kolmogorov-Smirnov (Detects Only)	0.131	0.0967	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	1.345	0.761	
Kolmogorov-Smirnov (NDs = DL)	0.131	0.0962	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.302	0.762	
Kolmogorov-Smirnov (NDs = DL/2)	0.131	0.0963	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.693	0.778	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.168	0.0977	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.97	0.97	0.965	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.151	0.095	Data Not Lognormal
Lilliefors (NDs = DL)	0.151	0.0944	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.15	0.0944	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.151	0.0944	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Arsenic, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	54	0	54	29	25	46.30%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	25	0.01	0.02	0.0184	0.02	0.00374
Statistics (Detects Only)	29	0.0046	0.22	0.0403	0.02	0.0531
Statistics (All: NDs treated as DL value)	54	0.0046	0.22	0.0302	0.02	0.0402
Statistics (All: NDs treated as DL/2 value)	54	0.0046	0.22	0.0259	0.01	0.0417
Statistics (Normal ROS Estimated Data)	54	-0.0594	0.22	0.0197	0.016	0.0485
Statistics (Gamma ROS Estimated Data)	54	0.0046	0.22	0.0405	0.0372	0.0387
Statistics (Lognormal ROS Estimated Data)	54	0.00246	0.22	0.0267	0.016	0.0416

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.208	1.154	0.0334	-3.678	0.906	-0.246
Statistics (NDs = DL)	1.629	1.551	0.0185	-3.838	0.703	-0.183
Statistics (NDs = DL/2)	1.126	1.075	0.023	-4.159	0.858	-0.206
Statistics (Gamma ROS Estimates)	2.129	2.023	0.019	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.16	0.951	-0.229

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.748	0.652	0.666	0.854

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.571	0.926	Data Not Normal
Lilliefors (Detects Only)	0.291	0.165	Data Not Normal
Lilliefors (NDs = DL)	0.341	0.121	Data Not Normal
Lilliefors (NDs = DL/2)	0.304	0.121	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.217	0.121	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.905	0.816	0.862	0.942

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.451	0.769	
Kolmogorov-Smirnov (Detects Only)	0.185	0.167	Data Not Gamma Distributed

Anderson-Darling (NDs = DL)	5.244	0.767	
Kolmogorov-Smirnov (NDs = DL)	0.328	0.123	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	4.768	0.777	
Kolmogorov-Smirnov (NDs = DL/2)	0.26	0.124	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.884	0.762	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.235	0.123	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.975	0.92	0.929	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.951	0.926	Data Appear Lognormal
Lilliefors (Detects Only)	0.119	0.165	Data Appear Lognormal
Lilliefors (NDs = DL)	0.283	0.121	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.254	0.121	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0822	0.121	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Arsenic, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	48	52	52.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	52	0.005	0.02	0.0148	0.015	0.00533
Statistics (Detects Only)	48	0.0049	0.13	0.0403	0.032	0.034
Statistics (All: NDs treated as DL value)	100	0.0049	0.13	0.027	0.02	0.0269
Statistics (All: NDs treated as DL/2 value)	100	0.0025	0.13	0.0232	0.01	0.0287
Statistics (Normal ROS Estimated Data)	100	-0.0919	0.13	0.00586	0.00988	0.0455
Statistics (Gamma ROS Estimated Data)	100	0.0049	0.13	0.0399	0.0373	0.0237
Statistics (Lognormal ROS Estimated Data)	100	7.8995E-4	0.13	0.0225	0.0103	0.0292

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.589	1.548	0.0253	-3.559	0.868	-0.244
Statistics (NDs = DL)	1.683	1.639	0.0161	-3.937	0.757	-0.192
Statistics (NDs = DL/2)	1.075	1.05	0.0216	-4.297	0.974	-0.227
Statistics (Gamma ROS Estimates)	3.097	3.01	0.0129	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.492	1.214	-0.27

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.919	0.821	0.814	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.831	0.947	Data Not Normal
Lilliefors (Detects Only)	0.205	0.128	Data Not Normal
Lilliefors (NDs = DL)	0.303	0.0886	Data Not Normal
Lilliefors (NDs = DL/2)	0.288	0.0886	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0866	0.0886	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.981	0.949	0.965	0.834

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.625	0.766	
Kolmogorov-Smirnov (Detects Only)	0.102	0.13	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	5.253	0.768	
Kolmogorov-Smirnov (NDs = DL)	0.243	0.0909	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	6.299	0.781	
Kolmogorov-Smirnov (NDs = DL/2)	0.246	0.092	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.562	0.758	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.167	0.09	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.989	0.96	0.951	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.96	0.947	Data Appear Lognormal
Lilliefors (Detects Only)	0.0832	0.128	Data Appear Lognormal
Lilliefors (NDs = DL)	0.187	0.0886	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.2	0.0886	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0598	0.0886	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Arsenic_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Arsenic, Dissolved

General Statistics

Number of Valid Data	88	Number of Detected Data	87
Number of Distinct Detected Data	61	Number of Non-Detect Data	1
		Percent Non-Detects	1.14%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.014	Minimum Detected	-4.269
Maximum Detected	0.29	Maximum Detected	-1.238
Mean of Detected	0.124	Mean of Detected	-2.283
SD of Detected	0.0688	SD of Detected	0.679
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.129	Lilliefors Test Statistic	0.151
5% Lilliefors Critical Value	0.095	5% Lilliefors Critical Value	0.095
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.122	Mean (Log Scale)	-2.31
SD	0.0695	SD (Log Scale)	0.719
95% UTL 95% Coverage	0.258	95% UTL 95% Coverage	0.402
95% UPL (t)	0.239	95% UPL (t)	0.33
90% Percentile (z)	0.212	90% Percentile (z)	0.249
95% Percentile (z)	0.237	95% Percentile (z)	0.324
99% Percentile (z)	0.284	99% Percentile (z)	0.529
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.122	Mean in Original Scale	0.123
SD	0.0708	SD in Original Scale	0.0693
95% UTL with 95% Coverage	0.259	95% UTL with 95% Coverage	0.386
		95% BCA UTL with 95% Coverage	0.259
		95% Bootstrap (%) UTL with 95% Coverage	0.259
95% UPL (t)	0.24	95% UPL (t)	0.319
90% Percentile (z)	0.212	90% Percentile (z)	0.244
95% Percentile (z)	0.238	95% Percentile (z)	0.314
99% Percentile (z)	0.286	99% Percentile (z)	0.503

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.651	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0467		
nu star	461.2		
A-D Test Statistic	1.361	Nonparametric Statistics	
5% A-D Critical Value	0.761	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.131	Mean	0.122
5% K-S Critical Value	0.0967	SD	0.069
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0074
		95% KM UTL with 95% Coverage	0.257
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.425
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.238
Mean	0.122	90% Percentile (z)	0.211
Median	0.105	95% Percentile (z)	0.236
SD	0.0697	99% Percentile (z)	0.283
k star	1.169		
Theta star	0.105	Gamma ROS Limits with Extrapolated Data	
Nu star	205.8	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.289
95% Percentile of Chisquare (2k)	6.631	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.317
		95% WH Approx. Gamma UTL with 95% Coverage	0.331
90% Percentile	0.271	95% HW Approx. Gamma UTL with 95% Coverage	0.371
95% Percentile	0.347		
99% Percentile	0.521		

Note: DL/2 is not a recommended method.

Muddy Creek Arsenic, Dissolved

General Statistics			
Number of Valid Data	54	Number of Detected Data	29
Number of Distinct Detected Data	20	Number of Non-Detect Data	25
		Percent Non-Detects	46.30%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0046	Minimum Detected	-5.382
Maximum Detected	0.22	Maximum Detected	-1.514
Mean of Detected	0.0403	Mean of Detected	-3.678
SD of Detected	0.0531	SD of Detected	0.906
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	39
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	15
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	72.22%

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.571	Shapiro Wilk Test Statistic	0.951
5% Shapiro Wilk Critical Value	0.926	5% Shapiro Wilk Critical Value	0.926
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0259	Mean (Log Scale)	-4.159
SD	0.0417	SD (Log Scale)	0.858
95% UTL 95% Coverage	0.111	95% UTL 95% Coverage	0.09
95% UPL (t)	0.0963	95% UPL (t)	0.0666
90% Percentile (z)	0.0793	90% Percentile (z)	0.0469
95% Percentile (z)	0.0944	95% Percentile (z)	0.0641
99% Percentile (z)	0.123	99% Percentile (z)	0.115
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.0407	Mean in Original Scale	0.0267
SD	0.0935	SD in Original Scale	0.0416
95% UTL with 95% Coverage	0.15	95% UTL with 95% Coverage	0.109
		95% BCA UTL with 95% Coverage	0.22
		95% Bootstrap (%) UTL with 95% Coverage	0.22
95% UPL (t)	0.117	95% UPL (t)	0.0778
90% Percentile (z)	0.0791	90% Percentile (z)	0.0528
95% Percentile (z)	0.113	95% Percentile (z)	0.0746
99% Percentile (z)	0.177	99% Percentile (z)	0.143
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.106	Data appear Lognormal at 5% Significance Level	
Theta Star	0.0365		
nu star	64.17		
A-D Test Statistic	1.451	Nonparametric Statistics	
5% A-D Critical Value	0.769	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.185	Mean	0.0268
5% K-S Critical Value	0.167	SD	0.0411
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00573
		95% KM UTL with 95% Coverage	0.111
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.207
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0962
Mean	0.0405	90% Percentile (z)	0.0794
Median	0.0372	95% Percentile (z)	0.0944
SD	0.0387	99% Percentile (z)	0.122
k star	2.023		
Theta star	0.02	Gamma ROS Limits with Extrapolated Data	
Nu star	218.5	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.095
95% Percentile of Chisquare (2k)	9.562	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0957
		95% WH Approx. Gamma UTL with 95% Coverage	0.113
90% Percentile	0.0786	95% HW Approx. Gamma UTL with 95% Coverage	0.115
95% Percentile	0.0958		
99% Percentile	0.134		

Note: DL/2 is not a recommended method.

Mesa Arsenic, Dissolved

General Statistics

Number of Valid Data	100	Number of Detected Data	48
Number of Distinct Detected Data	37	Number of Non-Detect Data	52
		Percent Non-Detects	52.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0049	Minimum Detected	-5.319
Maximum Detected	0.13	Maximum Detected	-2.04
Mean of Detected	0.0403	Mean of Detected	-3.559
SD of Detected	0.034	SD of Detected	0.868
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	69
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	31
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	69.00%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.831	Shapiro Wilk Test Statistic	0.96
5% Shapiro Wilk Critical Value	0.947	5% Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0232	Mean (Log Scale)	-4.297
SD	0.0287	SD (Log Scale)	0.974
95% UTL 95% Coverage	0.0784	95% UTL 95% Coverage	0.0886
95% UPL (t)	0.0711	95% UPL (t)	0.0691
90% Percentile (z)	0.06	90% Percentile (z)	0.0474
95% Percentile (z)	0.0704	95% Percentile (z)	0.0675
99% Percentile (z)	0.09	99% Percentile (z)	0.131
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.00964	Mean in Original Scale	0.0225
SD	0.0584	SD in Original Scale	0.0292
95% UTL with 95% Coverage	0.103	95% UTL with 95% Coverage	0.116
		95% BCA UTL with 95% Coverage	0.12
		95% Bootstrap (%) UTL with 95% Coverage	0.121
95% UPL (t)	0.0878	95% UPL (t)	0.0849
90% Percentile (z)	0.0652	90% Percentile (z)	0.0531
95% Percentile (z)	0.0864	95% Percentile (z)	0.0825
99% Percentile (z)	0.126	99% Percentile (z)	0.189

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.504	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0268		
nu star	144.4		
A-D Test Statistic	0.625	Nonparametric Statistics	
5% A-D Critical Value	0.766	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.102	Mean	0.0228
5% K-S Critical Value	0.13	SD	0.0288

Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00293
		95% KM UTL with 95% Coverage	0.0782
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.149
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0708
Mean	0.0399	90% Percentile (z)	0.0597
Median	0.0373	95% Percentile (z)	0.0702
SD	0.0237	99% Percentile (z)	0.0898
k star	3.01		
Theta star	0.0133	Gamma ROS Limits with Extrapolated Data	
Nu star	602.1	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0837
95% Percentile of Chisquare (2k)	12.62	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0856
		95% WH Approx. Gamma UTL with 95% Coverage	0.0935
90% Percentile	0.0707	95% HW Approx. Gamma UTL with 95% Coverage	0.0965
95% Percentile	0.0837		
99% Percentile	0.112		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Arsenic_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Arsenic, Dissolved

Background Data: Alluv Arsenic, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	54	88
Number of Non-Detect Data	25	1
Number of Detect Data	29	87
Minimum Non-Detect	0.01	0.02
Maximum Non-Detect	0.02	0.02
Percent Non detects	46.30%	1.14%
Minimum Detected	0.0046	0.014
Maximum Detected	0.22	0.29
Mean of Detected Data	0.0403	0.124
Median of Detected Data	0.02	0.11
SD of Detected Data	0.0531	0.0688

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-8.591
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	8.632E-18

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Arsenic_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Arsenic, Dissolved

Background Data: Alluv Arsenic, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	88
Number of Non-Detect Data	52	1
Number of Detect Data	48	87
Minimum Non-Detect	0.005	0.02
Maximum Non-Detect	0.02	0.02
Percent Non detects	52.00%	1.14%
Minimum Detected	0.0049	0.014
Maximum Detected	0.13	0.29
Mean of Detected Data	0.0403	0.124
Median of Detected Data	0.032	0.11
SD of Detected Data	0.034	0.0688

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-10.46
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	1.312E-25

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Arsenic_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Arsenic, Dissolved

Background Data: Muddy Creek Arsenic, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	54
Number of Non-Detect Data	52	25
Number of Detect Data	48	29
Minimum Non-Detect	0.005	0.01
Maximum Non-Detect	0.02	0.02
Percent Non detects	52.00%	46.30%
Minimum Detected	0.0049	0.0046
Maximum Detected	0.13	0.22
Mean of Detected Data	0.0403	0.0403
Median of Detected Data	0.032	0.02
SD of Detected Data	0.034	0.0531

Site vs Background Gehan Test

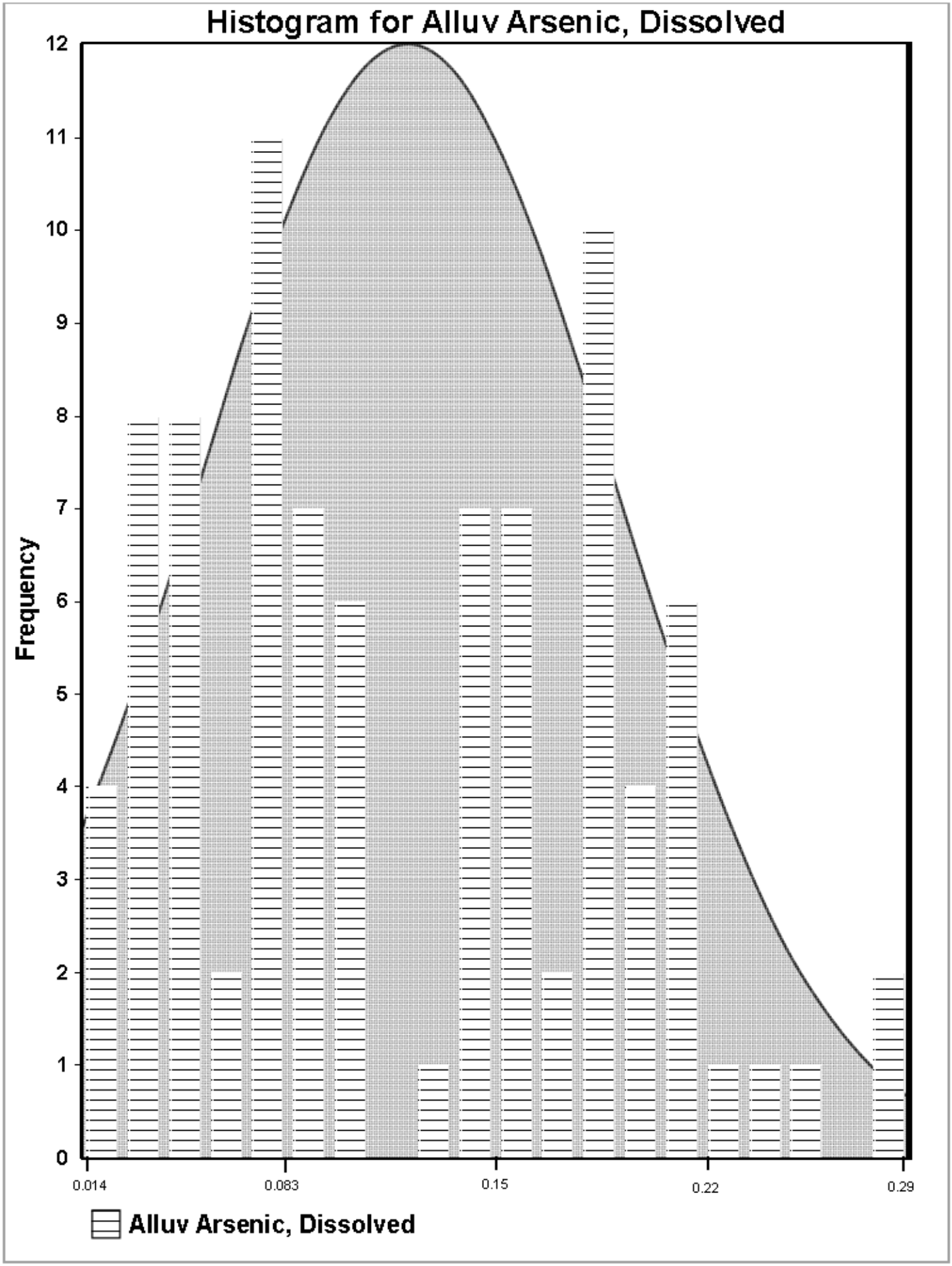
H0: Mu of Site or AOC = Mu of background

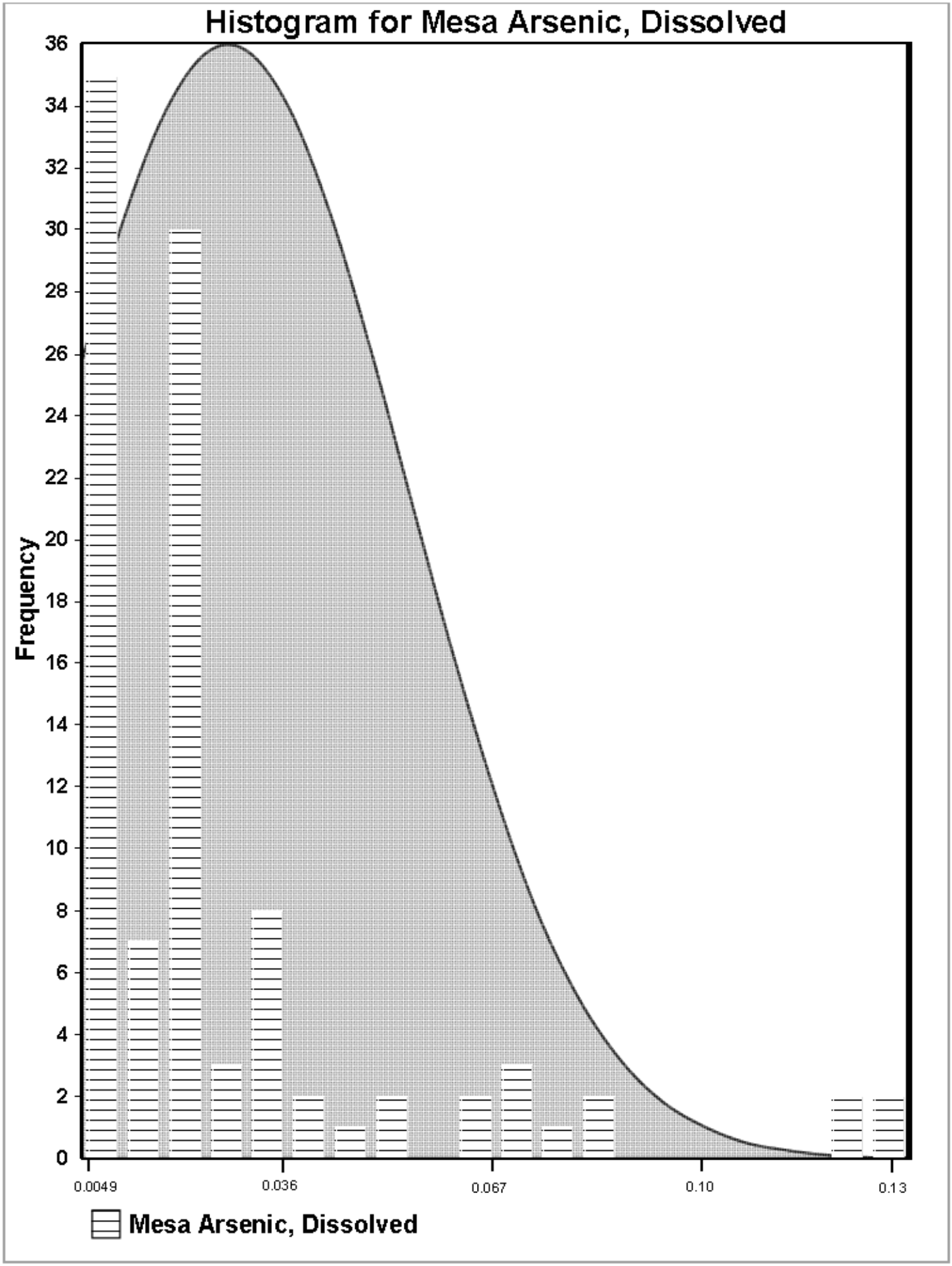
Gehan z Test Value	-0.237
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.813

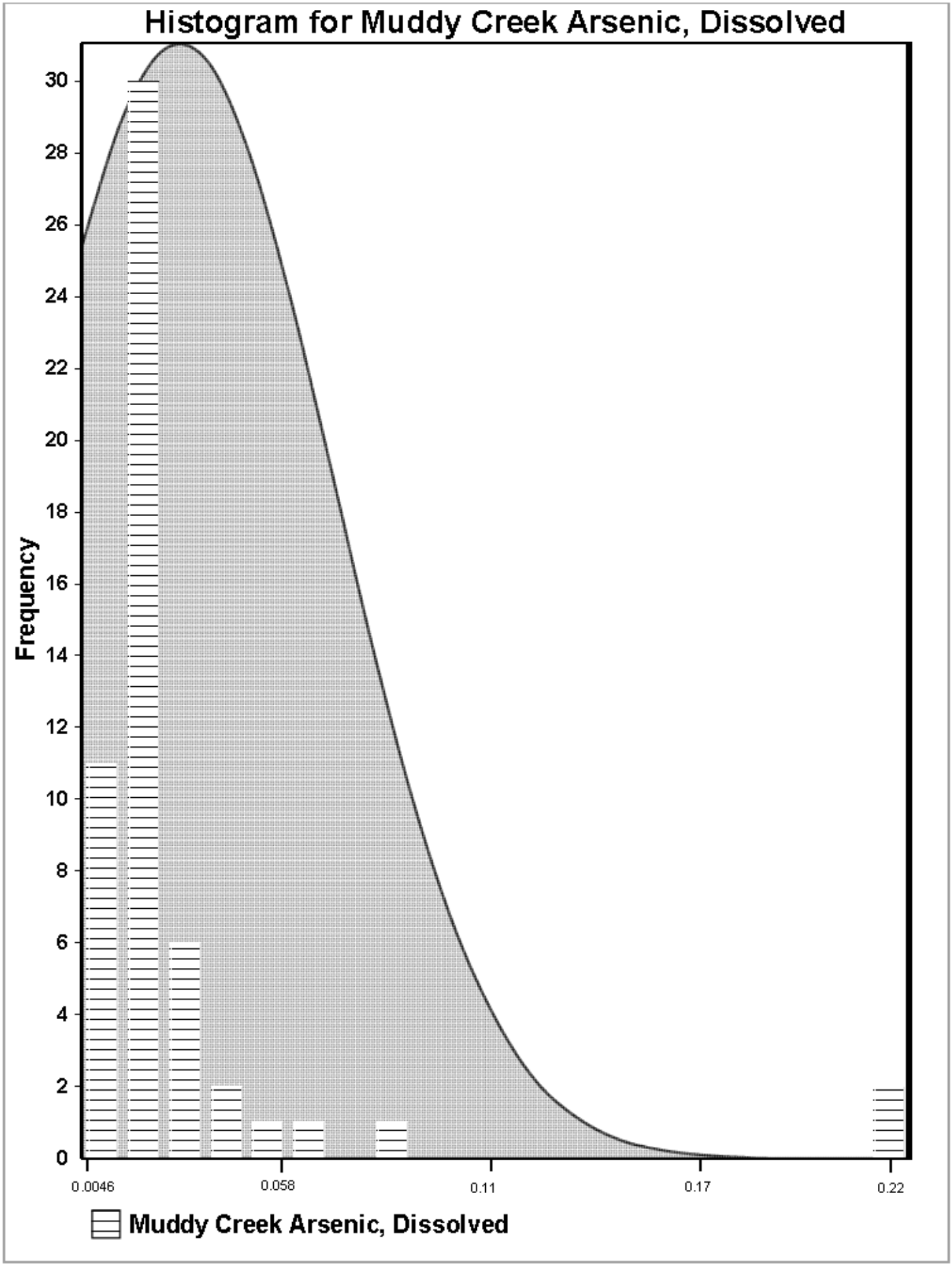
Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv Arsenic, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
0.014
0.083
0.15
0.22
0.29
Alluv Arsenic, Dissolved


Histogram for Mesa Arsenic, Dissolved
Frequency
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
0.0049
0.036
0.067
0.10
0.13
Mesa Arsenic, Dissolved


Histogram for Muddy Creek Arsenic, Dissolved
Frequency
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
0.0046
0.058
0.11
0.17
0.22
Muddy Creek Arsenic, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Arsenic_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Arsenic, Dissolved

Mean	0.122
Standard Deviation	0.0695
Number of data	88
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.122	0.0691	0.29	69	2.424	3.342	3.71

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Arsenic, Dissolved

Mean	0.0259
Standard Deviation	0.0417
Number of data	54
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0259	0.0413	0.22	33	4.702	3.158	3.512

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.22 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.22 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Arsenic, Dissolved

Mean	0.0232
Standard Deviation	0.0287
Number of data	100
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical

#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.0232	0.0286	0.13	78	3.74	3.38	3.75

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.13 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Arsenic

Location Name	Sample Date	Alluv Arsenic, Dissolved	Location Name	Sample Date	Alluv Arsenic, Dissolved	Location Name	Sample Date	Muddy Creek Arsenic, Dissolved	Location Name	Sample Date	Mesa Arsenic, Dissolved	Location Name	Sample Date	Mesa Arsenic, Dissolved
BG-1S	11/26/2012	0.03	KMW-2D	12/8/2009	0.074	BG-3S	11/27/2012	0.01	BG-2S	11/26/2012	0.036	LMW-9	6/8/2011	0.0101
BG-1S	8/23/2012	0.02 *	KMW-2D	12/10/2008	0.1	BG-3S	8/22/2012	0.043	BG-2S	8/23/2012	0.02 *	LMW-9	3/9/2011	0.0116
BG-1S	5/24/2012	0.014	KMW-2D	6/3/2008	0.07	BG-3S	5/23/2012	0.087	BG-2S	5/24/2012	0.02 *	LMW-9	12/10/2010	0.0123
BG-1S	3/20/2012	0.033	KMW-2M	11/26/2012	0.18	BG-3S	3/21/2012	0.029	BG-2S	3/21/2012	0.028	LMW-9	9/21/2010	0.01 *
IMW-2.5D	11/26/2012	0.19	KMW-2M	8/24/2012	0.077	BG-4S	11/27/2012	0.02 *	LMW-10	11/28/2012	0.02 *	LMW-9	6/9/2010	0.01 *
IMW-2.5D	8/24/2012	0.13	KMW-2M	5/21/2012	0.1	BG-4S	8/30/2012	0.02 *	LMW-10	8/27/2012	0.046	LMW-9	3/11/2010	0.011
IMW-2.5D	5/21/2012	0.14	KMW-2M	3/23/2012	0.094	BG-4S	5/30/2012	0.035	LMW-10	5/30/2012	0.02 *	LMW-9	12/11/2009	0.01 *
IMW-2.5D	3/21/2012	0.16	KMW-2M	12/8/2011	0.11	BG-4S	3/20/2012	0.019	LMW-10	3/22/2012	0.017	LMW-9	9/18/2009	0.01 *
IMW-2.5D	12/8/2011	0.18	KMW-2M	6/6/2011	0.0799	BG-6S	11/27/2012	0.02 *	LMW-10	12/6/2011	0.02 *	LMW-9	6/10/2009	0.01 *
IMW-2.5D	6/6/2011	0.162	KMW-2M	12/13/2010	0.0742	BG-6S	8/23/2012	0.02 *	LMW-10	9/8/2011	0.034	LMW-9	3/5/2009	0.073
IMW-2.5D	12/15/2010	0.0922	KMW-2M	6/8/2010	0.073	BG-6S	5/25/2012	0.016	LMW-10	6/8/2011	0.01 *	LMW-9	12/12/2008	0.035
IMW-2.5D	6/9/2010	0.069	KMW-2M	12/8/2009	0.07	BG-6S	3/21/2012	0.015	LMW-10	3/2/2011	0.01 *	LMW-9	9/10/2008	0.011
IMW-2.5D	12/12/2009	0.083	KMW-2M	12/10/2008	0.1	BG-1M	11/26/2012	0.016	LMW-10	12/9/2010	0.02 *	LMW-9	6/4/2008	0.01
IMW-2.5S	11/26/2012	0.24	KMW-2M	6/3/2008	0.072	BG-1M	8/23/2012	0.02 *	LMW-10	9/21/2010	0.01 *	LMW-9	3/5/2008	0.011
IMW-2.5S	8/24/2012	0.14	KMW-2S	11/26/2012	0.29	BG-1M	5/24/2012	0.01	LMW-10	6/9/2010	0.01 *	BG-2M	11/26/2012	0.036
IMW-2.5S	5/21/2012	0.16	KMW-2S	8/24/2012	0.16	BG-1M	3/20/2012	0.015	LMW-10	3/11/2010	0.01 *	BG-2M	8/23/2012	0.02 *
IMW-2.5S	3/21/2012	0.17	KMW-2S	5/21/2012	0.19	BG-3M	11/27/2012	0.05	LMW-10	12/11/2009	0.01 *	BG-2M	5/24/2012	0.02 *
IMW-2.5S	2/29/2012	0.18	KMW-2S	3/23/2012	0.21	BG-3M	8/22/2012	0.02 *	LMW-10	9/18/2009	0.01 *	BG-2M	3/21/2012	0.018
IMW-2.5S	12/8/2011	0.18	KMW-2S	12/8/2011	0.2	BG-3M	5/24/2012	0.068	LMW-10	6/10/2009	0.02	BG-2D	11/26/2012	0.012
IMW-2.5S	9/9/2011	0.17	KMW-2S	9/9/2011	0.2	BG-3M	3/21/2012	0.024	LMW-10	3/5/2009	0.066	BG-2D	8/23/2012	0.02 *
IMW-2.5S	6/6/2011	0.183	KMW-2S	6/6/2011	0.207	BG-4M	11/27/2012	0.02 *	LMW-10	12/12/2008	0.01 *	BG-2D	5/24/2012	0.02 *
IMW-2.5S	3/7/2011	0.165	KMW-2S	3/8/2011	0.259	BG-4M	8/30/2012	0.02 *	LMW-10	9/10/2008	0.01 *	BG-2D	3/21/2012	0.017
IMW-2.5S	12/15/2010	0.147	KMW-2S	12/13/2010	0.189	BG-4M	5/30/2012	0.033	LMW-10	6/4/2008	0.005 *	LMW-11	3/2/2011	0.0704
IMW-2.5S	9/20/2010	0.164	KMW-2S	9/15/2010	0.193	BG-4M	3/20/2012	0.019	LMW-10	3/5/2008	0.0049	LMW-11	9/8/2011	0.13
IMW-2.5S	6/9/2010	0.14	KMW-2S	6/8/2010	0.19	BG-6M	11/27/2012	0.02 *	LMW-11R	11/26/2012	0.02 *	LMW-11	12/6/2011	0.12
IMW-2.5S	3/9/2010	0.15	KMW-2S	3/9/2010	0.2	BG-6M	8/22/2012	0.02 *	LMW-11R	8/21/2012	0.053	LMW-11	2/22/2012	0.054
IMW-2.5S	12/12/2009	0.14	KMW-2S	12/8/2009	0.14	BG-6M	5/25/2012	0.02 *	LMW-11R	5/29/2012	0.03	LMW-12R	5/30/2012	0.13
IMW-2.5S	9/21/2009	0.22	KMW-2S	9/16/2009	0.084	BG-6M	3/21/2012	0.018	LMW-11R	3/23/2012	0.02 *	LMW-12R	8/21/2012	0.084
IMW-3S	5/21/2012	0.036	KMW-2S	6/10/2009	0.21	BG-1D	11/26/2012	0.02 *	LMW-7	11/28/2012	0.02 *	LMW-12R	10/22/2012	0.081
IMW-3S	3/20/2012	0.038	KMW-2S	3/3/2009	0.28	BG-1D	8/23/2012	0.02 *	LMW-7	8/27/2012	0.037	LMW-12R	11/30/2012	0.12
IMW-3S	12/9/2011	0.055	KMW-2S	12/10/2008	0.23	BG-1D	5/24/2012	0.007	LMW-7	5/31/2012	0.02 *	LMW-13R	5/29/2012	0.077
IMW-3S	9/9/2011	0.049	KMW-2S	9/8/2008	0.21	BG-1D	3/20/2012	0.019	LMW-7	3/23/2012	0.02 *	LMW-13R	8/20/2012	0.034
IMW-3S	6/7/2011	0.0409	KMW-2S	6/3/2008	0.22	BG-3D	11/27/2012	0.22	LMW-7	12/5/2011	0.02 *	LMW-13R	10/22/2012	0.028
IMW-3S	3/7/2011	0.0445	KMW-2S	3/4/2008	0.21	BG-3D	8/21/2012	0.22	LMW-7	9/6/2011	0.023	LMW-13R	11/28/2012	0.041
IMW-3S	12/10/2010	0.0435				BG-3D	5/23/2012	0.036	LMW-7	6/9/2011	0.01 *	LMW-14R	5/29/2012	0.025
IMW-3S	9/16/2010	0.0414				BG-3D	3/21/2012	0.046	LMW-7	3/9/2011	0.01 *	LMW-14R	8/20/2012	0.02 *
IMW-3S	6/8/2010	0.026				BG-4D	11/27/2012	0.02 *	LMW-7	12/10/2010	0.01 *	LMW-14R	10/22/2012	0.02 *
IMW-3S	3/9/2010	0.046				BG-4D	8/30/2012	0.02 *	LMW-7	9/21/2010	0.01 *	LMW-14R	11/30/2012	0.02 *
IMW-3S	12/10/2009	0.043				BG-4D	5/30/2012	0.032	LMW-7	6/9/2010	0.01 *	LMW-15	5/29/2012	0.034
IMW-3S	9/14/2009	0.017				BG-4D	3/20/2012	0.02	LMW-7	3/11/2010	0.01 *	LMW-15	8/20/2012	0.02 *
IMW-3S	6/9/2009	0.054				BG-6D	11/27/2012	0.02 *	LMW-7	12/11/2009	0.01 *	LMW-15	10/22/2012	0.02 *
IMW-3S	3/3/2009	0.092				BG-6D	8/22/2012	0.02 *	LMW-7	9/18/2009	0.01 *	LMW-15	11/28/2012	0.02 *
IMW-3S	12/9/2008	0.072				BG-6D	5/25/2012	0.02 *	LMW-7	6/10/2009	0.015	LMW-16	5/29/2012	0.02 *
IMW-3S	9/9/2008	0.044				BG-6D	3/21/2012	0.016	LMW-7	3/5/2009	0.07	LMW-16	8/20/2012	0.02 *
IMW-3S	6/3/2008	0.041				IMW-3D	5/25/2012	0.007	LMW-7	12/12/2008	0.01 *	LMW-16	10/22/2012	0.02 *
IMW-3S	3/4/2008	0.04				IMW-3D	3/22/2012	0.02 *	LMW-7	9/10/2008	0.01 *	LMW-16	11/28/2012	0.02 *
KMW-2D	11/26/2012	0.16				IMW-3D	2/29/2012	0.02 *	LMW-7	6/4/2008	0.005 *			
KMW-2D	8/24/2012	0.07				IMW-3D	12/9/2011	0.02 *	LMW-7	3/5/2008	0.005			
KMW-2D	5/21/2012	0.098				IMW-3D	6/7/2011	0.01 *	LMW-9	11/28/2012	0.01			
KMW-2D	3/23/2012	0.093				IMW-3D	12/10/2010	0.01 *	LMW-9	8/27/2012	0.063			
KMW-2D	12/8/2011	0.11				IMW-3D	6/8/2010	0.01 *	LMW-9	5/31/2012	0.014			
KMW-2D	6/6/2011	0.0795				IMW-3D	12/10/2009	0.01 *	LMW-9	3/23/2012	0.0075			
KMW-2D	12/13/2010	0.0682				IMW-3D	12/9/2008	0.035	LMW-9	12/5/2011	0.022			
KMW-2D	6/8/2010	0.083				IMW-3D	6/3/2008	0.0046	LMW-9	9/8/2011	0.035			

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Barium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Barium, Dissolved

Raw Statistics	
Number of Valid Observations	26
Number of Distinct Observations	11
Minimum	0.015
Maximum	0.029
Mean of Raw Data	0.0204
Standard Deviation of Raw Data	0.00404
Kstar	24.73
Mean of Log Transformed Data	-3.909
Standard Deviation of Log Transformed Data	0.192

Normal Distribution Test Results	
Correlation Coefficient R	0.96
Shapiro Wilk Test Statistic	0.91
Shapiro Wilk Critical (0.95) Value	0.92
Approximate Shapiro Wilk P Value	0.0281
Lilliefors Test Statistic	0.215
Lilliefors Critical (0.95) Value	0.174

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.972
A-D Test Statistic	0.792
A-D Critical (0.95) Value	0.744
K-S Test Statistic	0.2
K-S Critical(0.95) Value	0.171

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.973
Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical (0.95) Value	0.92
Approximate Shapiro Wilk P Value	0.0988
Lilliefors Test Statistic	0.188
Lilliefors Critical (0.95) Value	0.174

Data appear Lognormal at (0.05) Significance Level

Muddy Creek Barium, Dissolved

Raw Statistics	
Number of Valid Observations	46

Number of Distinct Observations	29
Minimum	0.013
Maximum	0.067
Mean of Raw Data	0.0297
Standard Deviation of Raw Data	0.0137
Kstar	5.242
Mean of Log Transformed Data	-3.61
Standard Deviation of Log Transformed Data	0.426

Normal Distribution Test Results

Correlation Coefficient R	0.939
Shapiro Wilk Test Statistic	0.872
Shapiro Wilk Critical (0.95) Value	0.945
Approximate Shapiro Wilk P Value	3.8917E-5
Lilliefors Test Statistic	0.129
Lilliefors Critical (0.95) Value	0.131

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.98
A-D Test Statistic	0.735
A-D Critical (0.95) Value	0.753
K-S Test Statistic	0.126
K-S Critical(0.95) Value	0.131

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.985
Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical (0.95) Value	0.945
Approximate Shapiro Wilk P Value	0.108
Lilliefors Test Statistic	0.116
Lilliefors Critical (0.95) Value	0.131

Data appear Lognormal at (0.05) Significance Level

Mesa Barium, Dissolved

Raw Statistics

Number of Valid Observations	34
Number of Distinct Observations	21
Minimum	0.0023
Maximum	0.046
Mean of Raw Data	0.0177
Standard Deviation of Raw Data	0.00962
Kstar	3.071
Mean of Log Transformed Data	-4.193
Standard Deviation of Log Transformed Data	0.611

Normal Distribution Test Results

Correlation Coefficient R	0.961
Shapiro Wilk Test Statistic	0.927
Shapiro Wilk Critical (0.95) Value	0.933
Approximate Shapiro Wilk P Value	0.0308
Lilliefors Test Statistic	0.157
Lilliefors Critical (0.95) Value	0.152

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.992
A-D Test Statistic	0.319
A-D Critical (0.95) Value	0.753
K-S Test Statistic	0.123
K-S Critical(0.95) Value	0.152

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.968
Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical (0.95) Value	0.933
Approximate Shapiro Wilk P Value	0.13
Lilliefors Test Statistic	0.155
Lilliefors Critical (0.95) Value	0.152

Data appear Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Barium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Barium, Dissolved

General Statistics

Total Number of Observations	26	Number of Distinct Observations	11

Raw Statistics		Log-Transformed Statistics	
Minimum	0.015	Minimum	-4.2
Maximum	0.029	Maximum	-3.54
Second Largest	0.028	Second Largest	-3.576
First Quartile	0.0173	First Quartile	-4.06
Median	0.019	Median	-3.963
Third Quartile	0.0243	Third Quartile	-3.721
Mean	0.0204	Mean	-3.909
SD	0.00404	SD	0.192
Coefficient of Variation	0.198		
Skewness	0.654		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.91	Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	0.0296	95% UTL with 95% Coverage	0.031
95% UPL (t)	0.0275	95% UPL (t)	0.028
90% Percentile (z)	0.0256	90% Percentile (z)	0.0256
95% Percentile (z)	0.0271	95% Percentile (z)	0.0275
99% Percentile (z)	0.0298	99% Percentile (z)	0.0313

Gamma Distribution Test		Data Distribution Test	
k star	24.73	Data appear Lognormal at 5% Significance Level	
Theta Star	8.2585E-4		
MLE of Mean	0.0204		
MLE of Standard Deviation	0.00411		
nu star	1286		
A-D Test Statistic	0.792	Nonparametric Statistics	
5% A-D Critical Value	0.744	90% Percentile	0.0255
K-S Test Statistic	0.2	95% Percentile	0.0275
5% K-S Critical Value	0.171	99% Percentile	0.0288
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	0.029
90% Percentile	0.0258	95% Percentile Bootstrap UTL with 95% Coverage	0.029
95% Percentile	0.0276	95% BCA Bootstrap UTL with 95% Coverage	0.029
99% Percentile	0.0312	95% UPL	0.0287
		95% Chebyshev UPL	0.0384
95% WH Approx. Gamma UPL	0.0278	Upper Threshold Limit Based upon IQR	0.0348
95% HW Approx. Gamma UPL	0.0278		
95% WH Approx. Gamma UTL with 95% Coverage	0.0304		
95% HW Approx. Gamma UTL with 95% Coverage	0.0306		

Muddy Creek Barium, Dissolved

General Statistics			
Total Number of Observations	46	Number of Distinct Observations	29
Raw Statistics		**Log-Transformed Statistics**	
Minimum	0.013	Minimum	-4.343
Maximum	0.067	Maximum	-2.703
Second Largest	0.066	Second Largest	-2.718
First Quartile	0.019	First Quartile	-3.963
Median	0.027	Median	-3.613
Third Quartile	0.0368	Third Quartile	-3.304
Mean	0.0297	Mean	-3.61
SD	0.0137	SD	0.426
Coefficient of Variation	0.46		
Skewness	1.227		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.872	Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical Value	0.945	Shapiro Wilk Critical Value	0.945
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	0.0581	95% UTL with 95% Coverage	0.0656
95% UPL (t)	0.0529	95% UPL (t)	0.0558
90% Percentile (z)	0.0472	90% Percentile (z)	0.0467
95% Percentile (z)	0.0521	95% Percentile (z)	0.0545
99% Percentile (z)	0.0615	99% Percentile (z)	0.0729
Gamma Distribution Test		**Data Distribution Test**	
k star	5.242	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.00566		
MLE of Mean	0.0297		
MLE of Standard Deviation	0.013		
nu star	482.3		
A-D Test Statistic	0.735	**Nonparametric Statistics**	
5% A-D Critical Value	0.753	90% Percentile	0.045
K-S Test Statistic	0.126	95% Percentile	0.0615
5% K-S Critical Value	0.131	99% Percentile	0.0666

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	0.066
90% Percentile	0.047	95% Percentile Bootstrap UTL with 95% Coverage	0.0663
95% Percentile	0.0537	95% BCA Bootstrap UTL with 95% Coverage	0.0663
99% Percentile	0.0678	95% UPL	0.0653
		95% Chebyshev UPL	0.0899
95% WH Approx. Gamma UPL	0.0541	Upper Threshold Limit Based upon IQR	0.0634
95% HW Approx. Gamma UPL	0.0544		
95% WH Approx. Gamma UTL with 95% Coverage	0.0616		
95% HW Approx. Gamma UTL with 95% Coverage	0.0624		

Mesa Barium, Dissolved

General Statistics			
Total Number of Observations	34	Number of Distinct Observations	21
Raw Statistics		Log-Transformed Statistics	
Minimum	0.0023	Minimum	-6.075
Maximum	0.046	Maximum	-3.079
Second Largest	0.038	Second Largest	-3.27
First Quartile	0.0113	First Quartile	-4.488
Median	0.015	Median	-4.2
Third Quartile	0.0235	Third Quartile	-3.751
Mean	0.0177	Mean	-4.193
SD	0.00962	SD	0.611
Coefficient of Variation	0.544		
Skewness	1.066		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.927	Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical Value	0.933	Shapiro Wilk Critical Value	0.933
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	0.0385	95% UTL with 95% Coverage	0.0567
95% UPL (t)	0.0342	95% UPL (t)	0.0431
90% Percentile (z)	0.03	90% Percentile (z)	0.033
95% Percentile (z)	0.0335	95% Percentile (z)	0.0413
99% Percentile (z)	0.04	99% Percentile (z)	0.0626
Gamma Distribution Test		Data Distribution Test	
k star	3.071	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.00575		
MLE of Mean	0.0177		
MLE of Standard Deviation	0.0101		
nu star	208.8		
A-D Test Statistic	0.319	Nonparametric Statistics	
5% A-D Critical Value	0.753	90% Percentile	0.0274

K-S Test Statistic	0.123	95% Percentile	0.0367
5% K-S Critical Value	0.152	99% Percentile	0.0434
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	0.046
90% Percentile	0.0312	95% Percentile Bootstrap UTL with 95% Coverage	0.046
95% Percentile	0.0368	95% BCA Bootstrap UTL with 95% Coverage	0.046
99% Percentile	0.049	95% UPL	0.04
		95% Chebyshev UPL	0.0602
95% WH Approx. Gamma UPL	0.0373	Upper Threshold Limit Based upon IQR	0.0419
95% HW Approx. Gamma UPL	0.0383		
95% WH Approx. Gamma UTL with 95% Coverage	0.045		
95% HW Approx. Gamma UTL with 95% Coverage	0.0469		

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Barium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Barium, Dissolved

Background Data: Alluv Barium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	34	26
Number of Distinct Observations	21	11
Minimum	0.0023	0.015
Maximum	0.046	0.029
Mean	0.0177	0.0204
Median	0.015	0.019
SD	0.00962	0.00404
SE of Mean	0.00165	7.9261E-4

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	879
WMW Test U-Stat	2.35
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.0181

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Barium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Barium, Dissolved

Background Data: Alluv Barium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	46	26
Number of Distinct Observations	29	11
Minimum	0.013	0.015
Maximum	0.067	0.029
Mean	0.0297	0.0204
Median	0.027	0.019
SD	0.0137	0.00404
SE of Mean	0.00201	7.9261E-4

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1938
WMW Test U-Stat	3.031
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.00244

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Barium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Barium, Dissolved

Background Data: Muddy Creek Barium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	34	46
Number of Distinct Observations	21	29
Minimum	0.0023	0.013
Maximum	0.046	0.067
Mean	0.0177	0.0297
Median	0.015	0.027
SD	0.00962	0.0137
SE of Mean	0.00165	0.00201

Wilcoxon-Mann-Whitney (WMW) Test

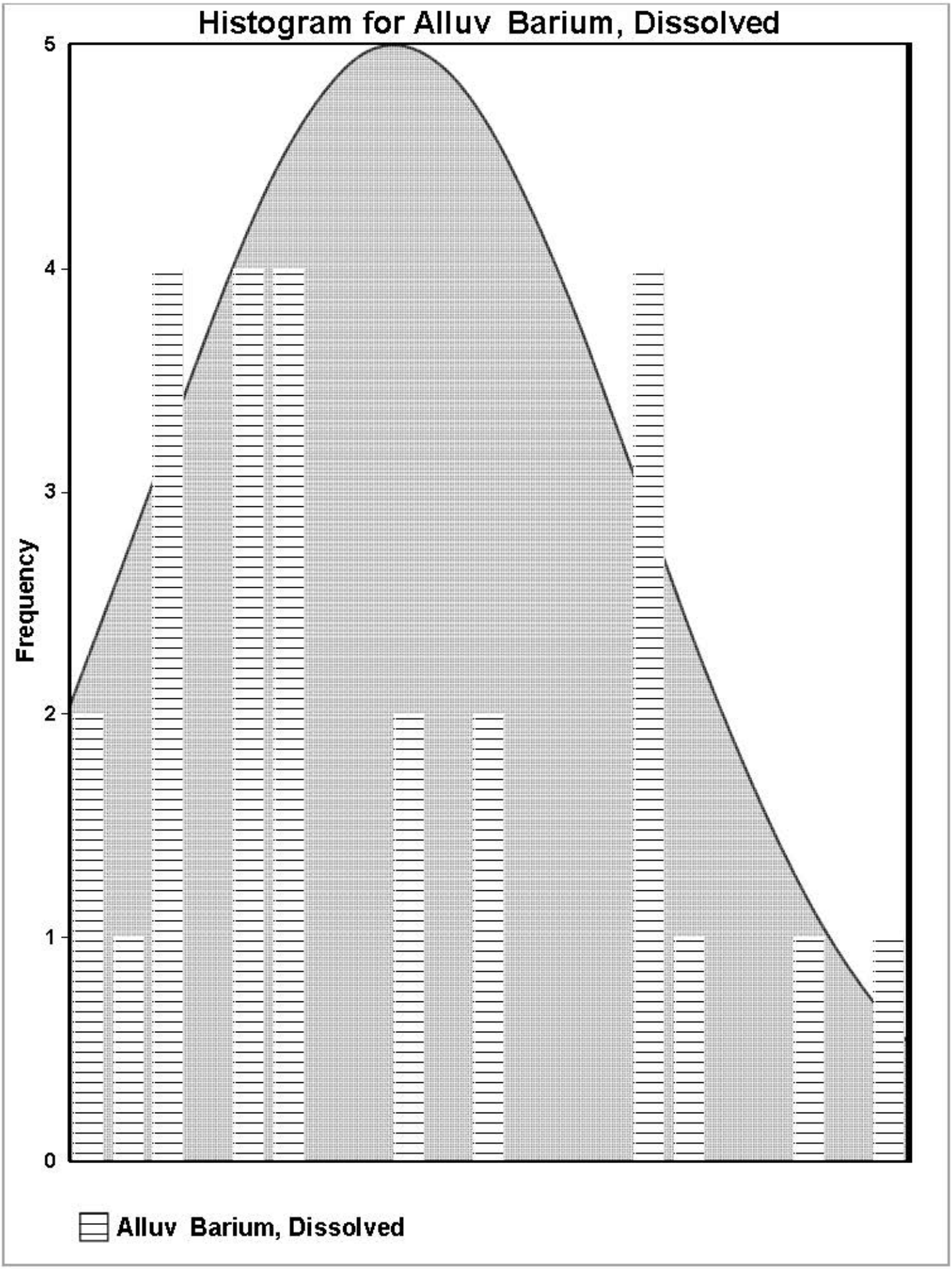
H0: Mean/Median of Site or AOC = Mean/Median of Background

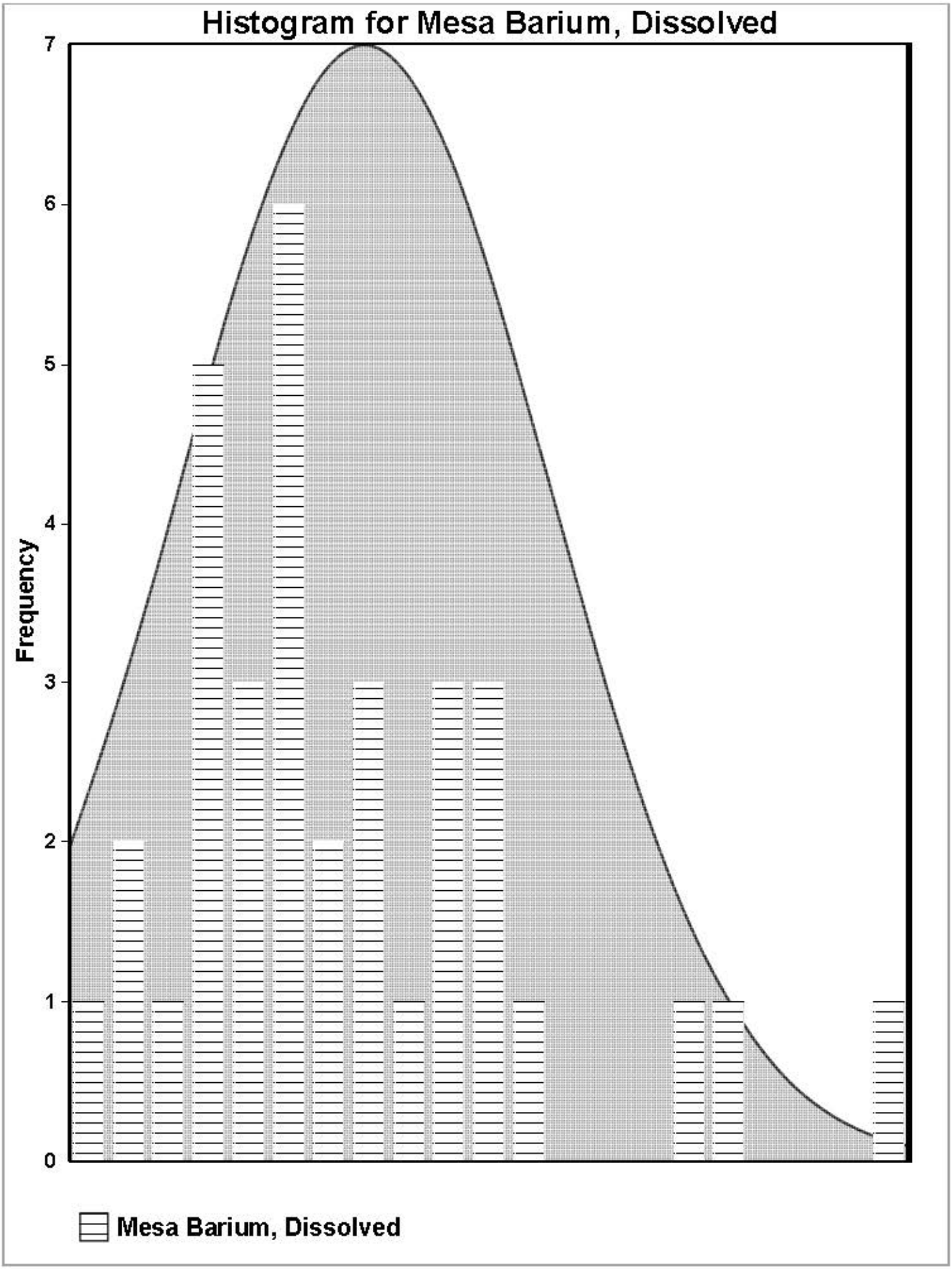
Site Rank Sum W-Stat	922.5
WMW Test U-Stat	4.419
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	9.4960E-6

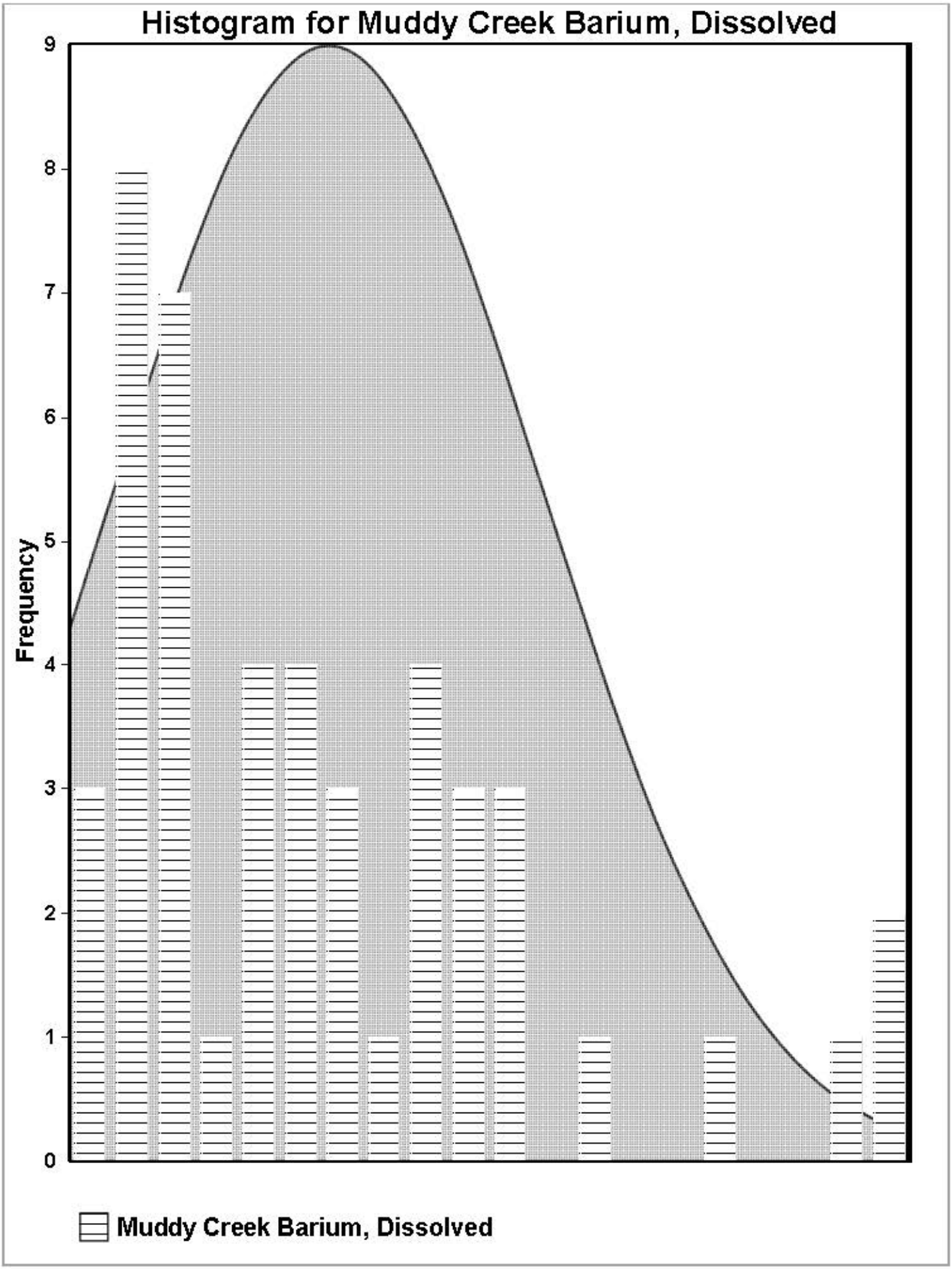
Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Barium, Dissolved
Frequency
0
1
2
3
4
5
Alluv Barium, Dissolved


Histogram for Mesa Barium, Dissolved
Frequency
0
1
2
3
4
5
6
7
Mesa Barium, Dissolved


Histogram for Muddy Creek Barium, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
Muddy Creek Barium, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Barium_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for Alluv Barium, Dissolved

Mean	0.0204
Standard Deviation	0.00404
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0204	0.00396	0.029	9	2.164	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Barium, Dissolved

Mean	0.0297
Standard Deviation	0.0137
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0297	0.0135	0.067	35	2.763	3.09	3.45

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Barium, Dissolved

Mean	0.0177
Standard Deviation	0.00962
Number of data	34
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0177	0.00947	0.046	17	2.991	2.97	3.3

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.046 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Location Name	Sample Date	Alluv Barium, Dissolved	Location Name	Sample Date	Muddy Creek Barium, Dissolved	Location Name	Sample Date	Mesa Barium, Dissolved
BG-1S	11/26/2012	0.026	BG-3S	11/27/2012	0.036	LMW-10	11/28/2012	0.011
BG-1S	8/23/2012	0.021	BG-3S	8/22/2012	0.035	LMW-10	8/27/2012	0.015
BG-1S	5/24/2012	0.022	BG-3S	5/23/2012	0.041	LMW-10	5/30/2012	0.0023
BG-1S	3/20/2012	0.025	BG-3S	3/21/2012	0.064	LMW-10	3/22/2012	0.012
IMW-2.5D	11/26/2012	0.018	BG-4S	11/27/2012	0.018	LMW-10	2/22/2012	0.0077
IMW-2.5D	8/24/2012	0.015	BG-4S	8/30/2012	0.024	LMW-10	12/6/2011	0.005
IMW-2.5D	5/21/2012	0.019	BG-4S	5/30/2012	0.029	LMW-11R	11/26/2012	0.012
IMW-2.5D	3/21/2012	0.015	BG-4S	3/20/2012	0.039	LMW-11R	8/21/2012	0.014
IMW-2.5S	11/26/2012	0.029	BG-6S	11/27/2012	0.041	LMW-11R	5/29/2012	0.011
IMW-2.5S	8/24/2012	0.025	BG-6S	8/23/2012	0.042	LMW-11R	3/23/2012	0.018
IMW-2.5S	5/21/2012	0.025	BG-6S	5/25/2012	0.054	LMW-7	11/28/2012	0.026
IMW-2.5S	3/21/2012	0.025	BG-6S	3/21/2012	0.048	LMW-7	8/27/2012	0.026
IMW-3S	5/21/2012	0.018	BG-1M	11/26/2012	0.029	LMW-7	5/31/2012	0.026
IMW-3S	3/20/2012	0.017	BG-1M	8/23/2012	0.03	LMW-7	2/22/2012	0.021
KMW-2D	11/26/2012	0.021	BG-1M	5/24/2012	0.028	LMW-7	3/23/2012	0.024
KMW-2D	8/24/2012	0.016	BG-1M	3/20/2012	0.029	LMW-7	12/5/2011	0.019
KMW-2D	5/21/2012	0.018	BG-3M	11/27/2012	0.016	BG-2S	11/26/2012	0.046
KMW-2D	3/23/2012	0.017	BG-3M	8/22/2012	0.036	BG-2S	8/23/2012	0.036
KMW-2M	11/26/2012	0.022	BG-3M	5/24/2012	0.02	BG-2S	5/24/2012	0.038
KMW-2M	8/24/2012	0.018	BG-3M	3/21/2012	0.038	BG-2S	3/21/2012	0.028
KMW-2M	5/21/2012	0.019	BG-4M	11/27/2012	0.031	BG-2M	11/26/2012	0.018
KMW-2M	3/23/2012	0.019	BG-4M	8/30/2012	0.019	BG-2M	8/23/2012	0.016
KMW-2S	11/26/2012	0.028	BG-4M	5/30/2012	0.018	BG-2M	5/24/2012	0.024
KMW-2S	8/24/2012	0.017	BG-4M	3/20/2012	0.025	BG-2M	3/21/2012	0.022
KMW-2S	5/21/2012	0.019	BG-6M	11/27/2012	0.018	BG-2D	11/26/2012	0.014
KMW-2S	3/23/2012	0.017	BG-6M	8/22/2012	0.024	BG-2D	8/23/2012	0.015
			BG-6M	5/25/2012	0.033	BG-2D	5/24/2012	0.015
			BG-6M	3/21/2012	0.031	BG-2D	3/21/2012	0.014
			BG-1D	11/26/2012	0.019	LMW-9	11/28/2012	0.011
			BG-1D	8/23/2012	0.02	LMW-9	8/27/2012	0.016
			BG-1D	5/24/2012	0.018	LMW-9	5/31/2012	0.013
			BG-1D	3/20/2012	0.021	LMW-9	2/23/2012	0.0047
			BG-3D	11/27/2012	0.023	LMW-9	3/23/2012	0.011
			BG-3D	8/21/2012	0.026	LMW-9	12/5/2011	0.0089
			BG-3D	5/23/2012	0.067			
			BG-3D	3/21/2012	0.066			
			BG-4D	11/27/2012	0.017			
			BG-4D	8/30/2012	0.02			
			BG-4D	5/30/2012	0.018			
			BG-4D	3/20/2012	0.021			
			BG-6D	11/27/2012	0.014			
			BG-6D	8/22/2012	0.014			
			BG-6D	5/25/2012	0.038			
			BG-6D	3/21/2012	0.037			
			IMW-3D	5/25/2012	0.017			
			IMW-3D	3/22/2012	0.013			

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(a)anthracene.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Benzo(a)anthracene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	1	25	96.15%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Alluv Benzo(a)anthracene was not processed!

Muddy Creek Benzo(a)anthracene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	0	46	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Muddy Creek Benzo(a)anthracene was not processed!

Mesa Benzo(a)anthracene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	0	28	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mesa Benzo(a)anthracene was not processed!

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(a)anthracene.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Benzo(a)anthracene

General Statistics

Number of Valid Data	26	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	25

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Alluv Benzo(a)anthracene was not processed!

Muddy Creek Benzo(a)anthracene

General Statistics

Number of Valid Data	46	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	46

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Muddy Creek Benzo(a)anthracene was not processed!

Mesa Benzo(a)anthracene

General Statistics

Number of Valid Data	28	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	28

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mesa Benzo(a)anthracene was not processed!

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(a)anthracene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Benzo(a)anthracene

Background Data: Alluv Benzo(a)anthracene

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	28	25
Number of Detect Data	0	1
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	96.15%
Minimum Detected	N/A	0.015
Maximum Detected	N/A	0.015
Mean of Detected Data	N/A	0.015
Median of Detected Data	N/A	0.015
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(a)anthracene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Benzo(a)anthracene

Background Data: Alluv Benzo(a)anthracene

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	46	25
Number of Detect Data	0	1
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	96.15%
Minimum Detected	N/A	0.015
Maximum Detected	N/A	0.015
Mean of Detected Data	N/A	0.015
Median of Detected Data	N/A	0.015
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(a)anthracene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Benzo(a)anthracene

Background Data: Muddy Creek Benzo(a)anthracene

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	28	46
Number of Detect Data	0	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	100.00%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

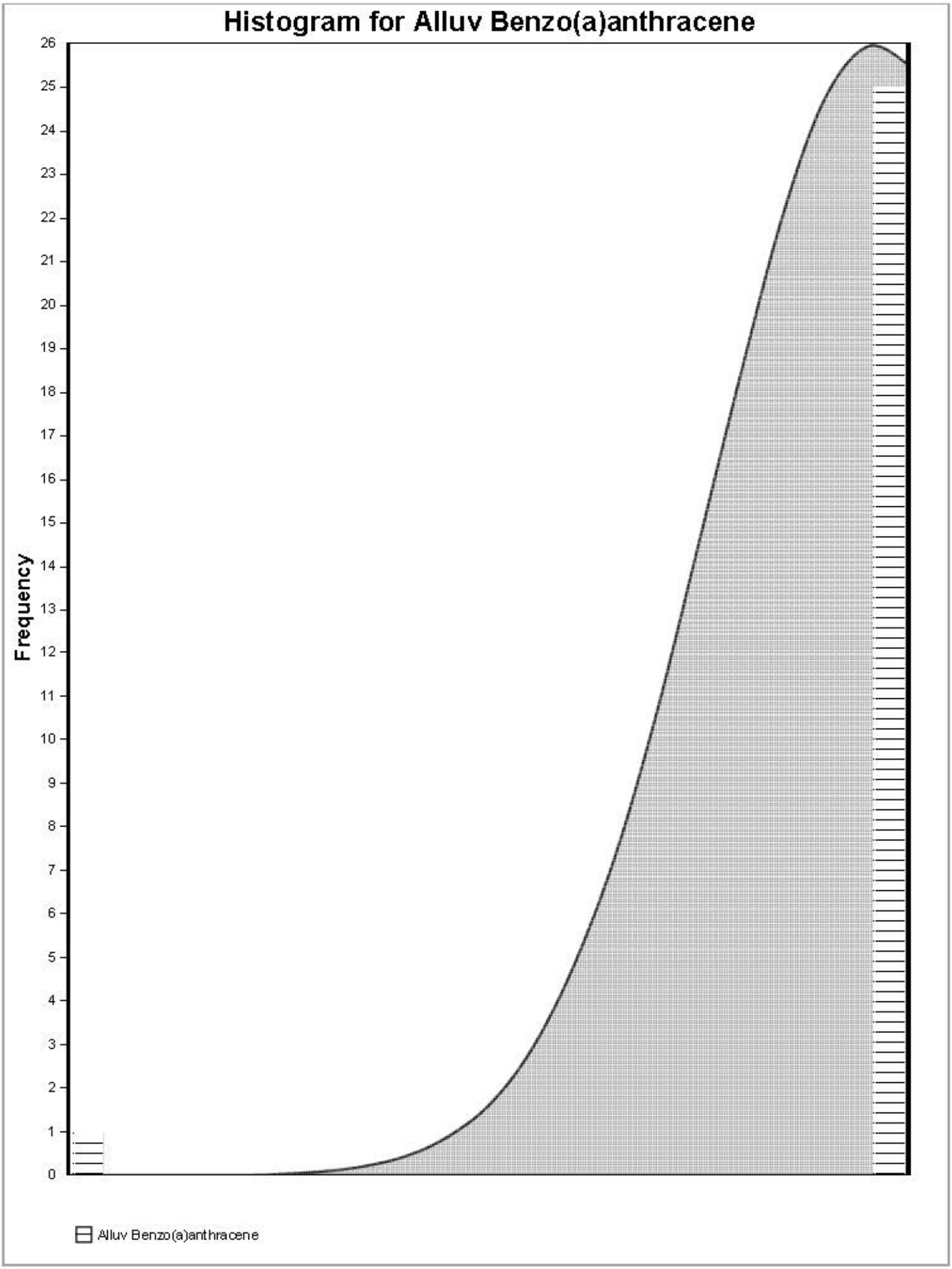
H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

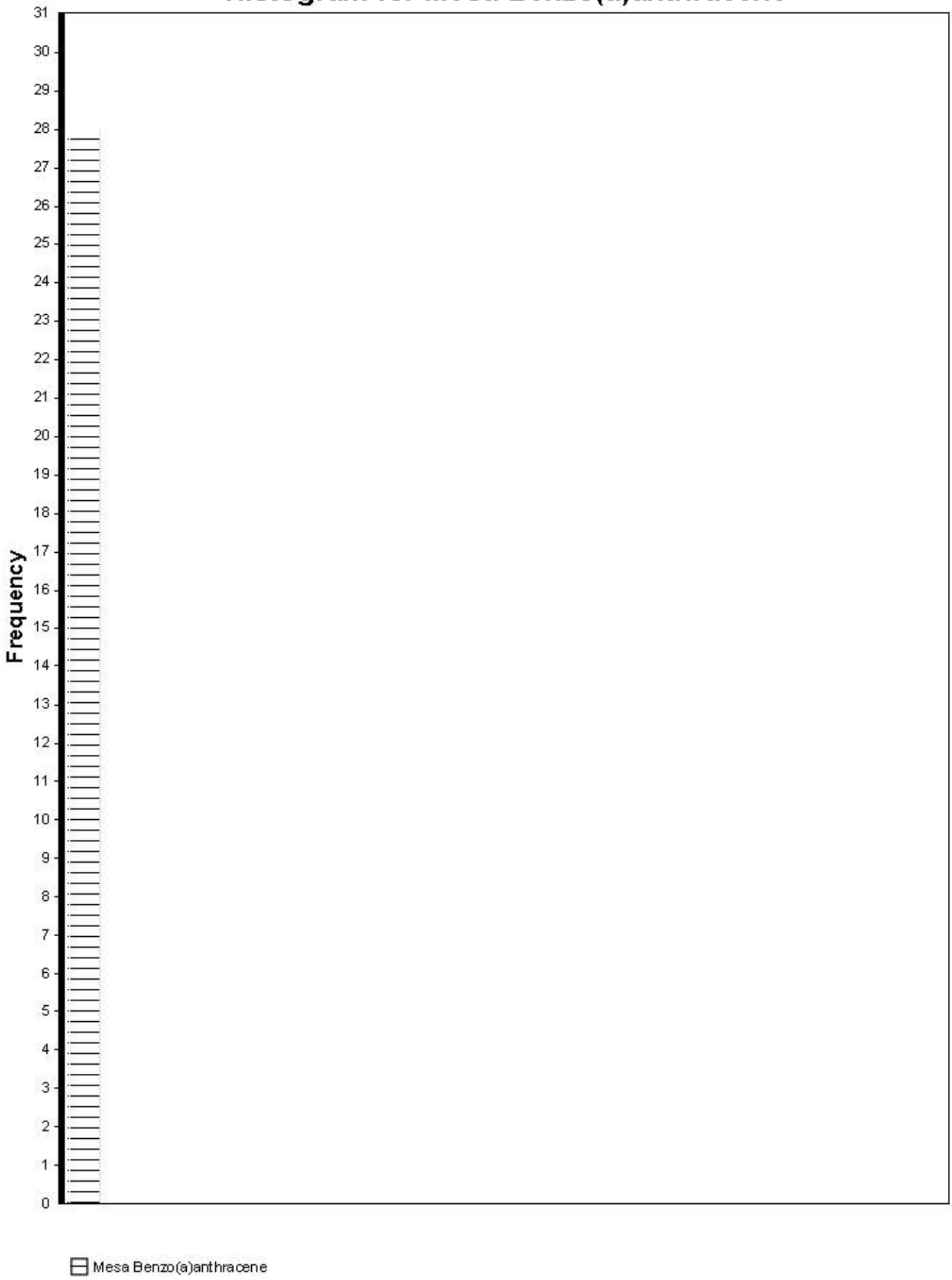
Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

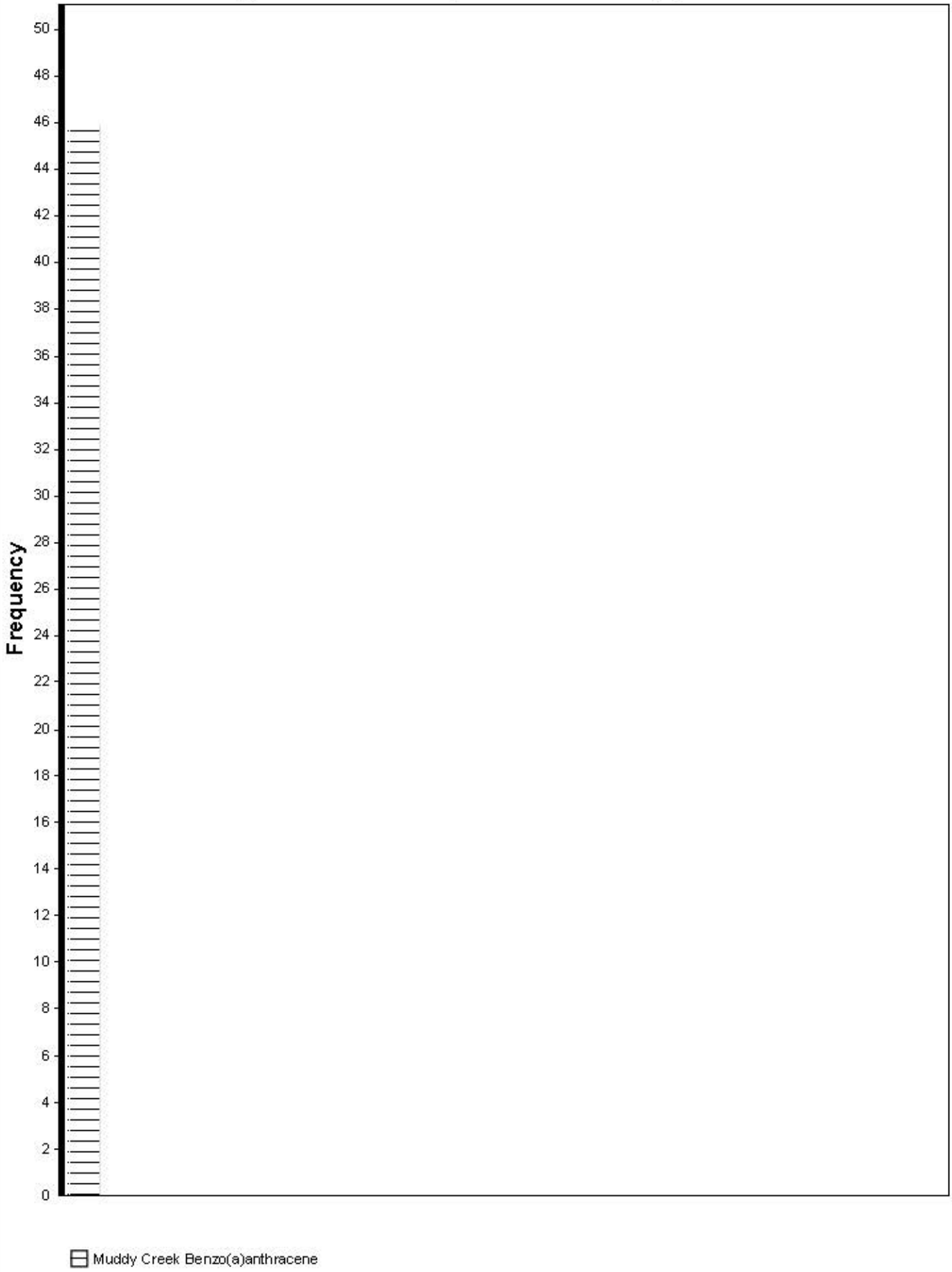
P-Value < alpha (0.05)


Histogram for Alluv Benzo(a)anthracene
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
Alluv Benzo(a)anthracene

Histogram for Mesa Benzo(a)anthracene



Histogram for Muddy Creek Benzo(a)anthracene



Outlier Tests for Selected Variables

User Selected Options	
From File	Benzo(a)anthracene.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Benzo(a)anthracene

Mean	0.0246
Standard Deviation	0.00196
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0246	0.00192	0.015	15	5	2.84	3.16

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.015 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.015 is a Potential Statistical Outlier

Rosner's Outlier Test for Muddy Creek Benzo(a)anthracene

Mean	0.025
Standard Deviation	3.508E-18

Rosner's Outlier Test for Mesa Benzo(a)anthracene

Mean	0.025
Standard Deviation	1.060E-17

Location Name	Sample Date	Alluv Benzo(a)anthracene	D_Alluv Benzo(a)anthracene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.015	1
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0

Location Name	Sample Date	Muddy Creek Benzo(a)anthracene	D_Muddy Creek Benzo(a)anthracene
BG-3S	11/27/2012	0.05	0
BG-3S	8/22/2012	0.05	0
BG-3S	5/23/2012	0.05	0
BG-3S	3/21/2012	0.05	0
BG-4S	11/27/2012	0.05	0
BG-4S	8/30/2012	0.05	0
BG-4S	5/30/2012	0.05	0
BG-4S	3/20/2012	0.05	0
BG-6S	11/27/2012	0.05	0
BG-6S	8/23/2012	0.05	0
BG-6S	5/25/2012	0.05	0
BG-6S	3/21/2012	0.05	0
BG-1M	11/26/2012	0.05	0
BG-1M	8/23/2012	0.05	0
BG-1M	5/24/2012	0.05	0
BG-1M	3/20/2012	0.05	0
BG-3M	11/27/2012	0.05	0
BG-3M	8/22/2012	0.05	0
BG-3M	5/24/2012	0.05	0
BG-3M	3/21/2012	0.05	0
BG-4M	11/27/2012	0.05	0
BG-4M	8/30/2012	0.05	0
BG-4M	5/30/2012	0.05	0
BG-4M	3/20/2012	0.05	0
BG-6M	11/27/2012	0.05	0
BG-6M	8/22/2012	0.05	0
BG-6M	5/25/2012	0.05	0
BG-6M	3/21/2012	0.05	0
BG-1D	11/26/2012	0.05	0
BG-1D	8/23/2012	0.05	0
BG-1D	5/24/2012	0.05	0
BG-1D	3/20/2012	0.05	0
BG-3D	11/27/2012	0.05	0
BG-3D	8/21/2012	0.05	0
BG-3D	5/23/2012	0.05	0
BG-3D	3/21/2012	0.05	0
BG-4D	11/27/2012	0.05	0
BG-4D	8/30/2012	0.05	0
BG-4D	5/30/2012	0.05	0
BG-4D	3/20/2012	0.05	0
BG-6D	11/27/2012	0.05	0
BG-6D	8/22/2012	0.05	0
BG-6D	5/25/2012	0.05	0
BG-6D	3/21/2012	0.05	0
IMW-3D	5/25/2012	0.05	0
IMW-3D	3/22/2012	0.05	0

Location Name	Sample Date	Mesa Benzo(a)anthracene	D_Mesa Benzo(a)anthracene
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Location Name	Sample Date	Alluv + Mesa Benzo(a)anthracene	D_Alluv + Mesa Benzo(a)anthracene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.015	1
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(a)pyrene.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Benzo(a)pyrene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	0	26	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv Benzo(a)pyrene was not processed!

Muddy Creek Benzo(a)pyrene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	0	46	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Muddy Creek Benzo(a)pyrene was not processed!

Mesa Benzo(a)pyrene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	0	28	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mesa Benzo(a)pyrene was not processed!

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(a)pyrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Benzo(a)pyrene

General Statistics

Number of Valid Data	26	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	26

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv Benzo(a)pyrene was not processed!

Muddy Creek Benzo(a)pyrene

General Statistics

Number of Valid Data	46	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	46

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Muddy Creek Benzo(a)pyrene was not processed!

Mesa Benzo(a)pyrene

General Statistics

Number of Valid Data	28	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	28

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mesa Benzo(a)pyrene was not processed!

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(a)pyrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Benzo(a)pyrene

Background Data: Alluv Benzo(a)pyrene

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	28	26
Number of Detect Data	0	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	100.00%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(a)pyrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Benzo(a)pyrene

Background Data: Alluv Benzo(a)pyrene

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	46	26
Number of Detect Data	0	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	100.00%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(a)pyrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Benzo(a)pyrene

Background Data: Muddy Creek Benzo(a)pyrene

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	28	46
Number of Detect Data	0	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	100.00%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

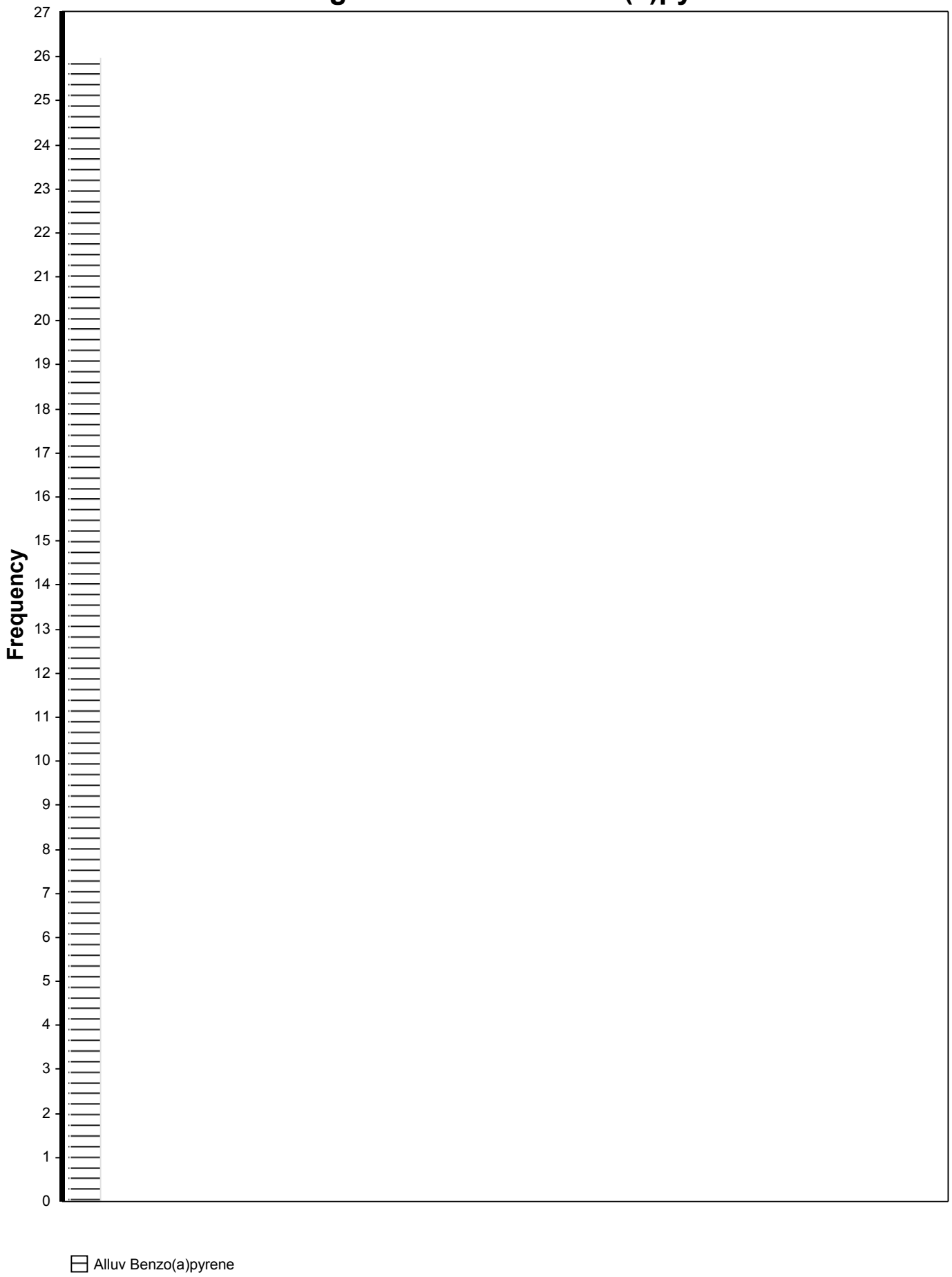
Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

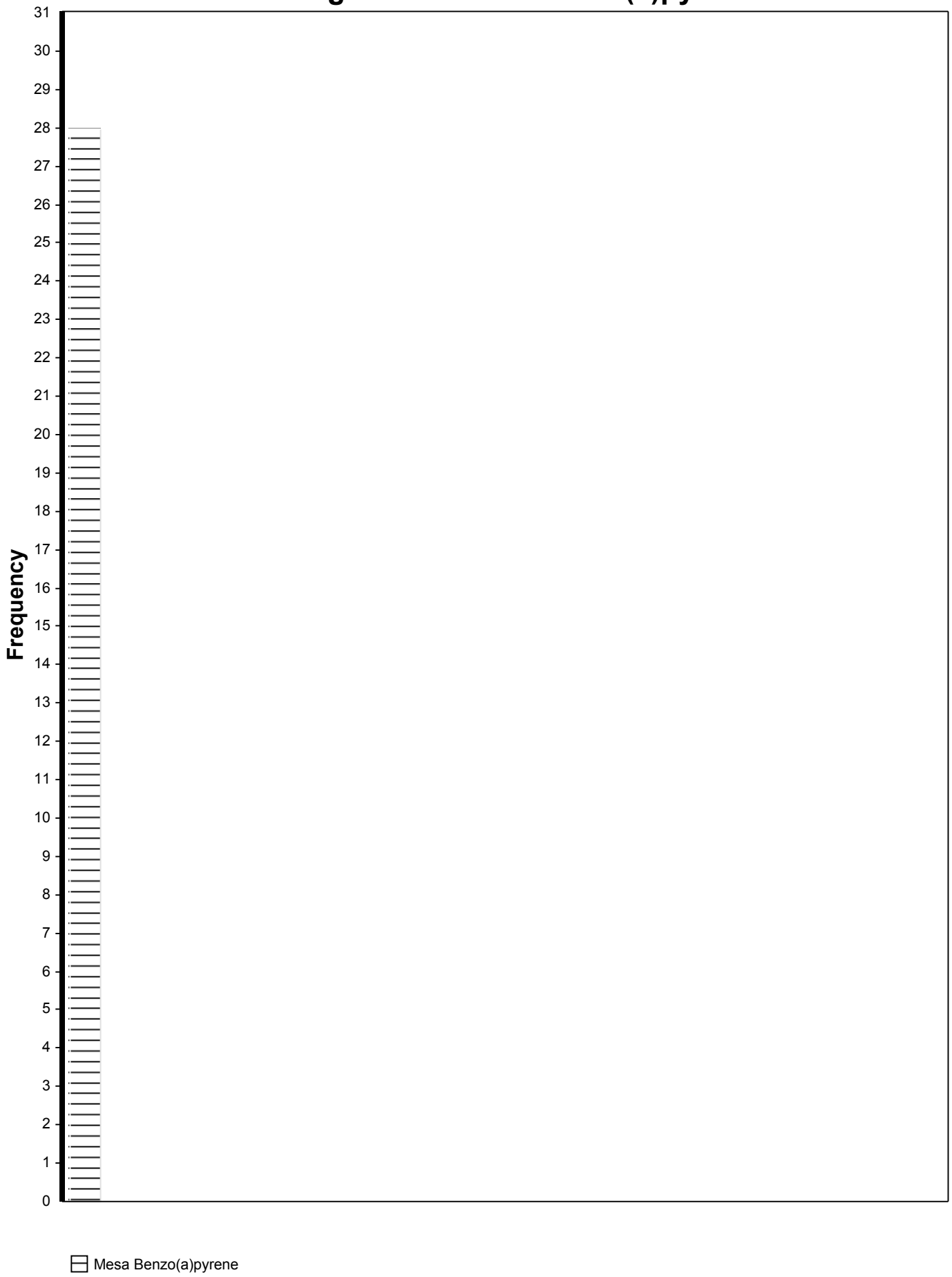
Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

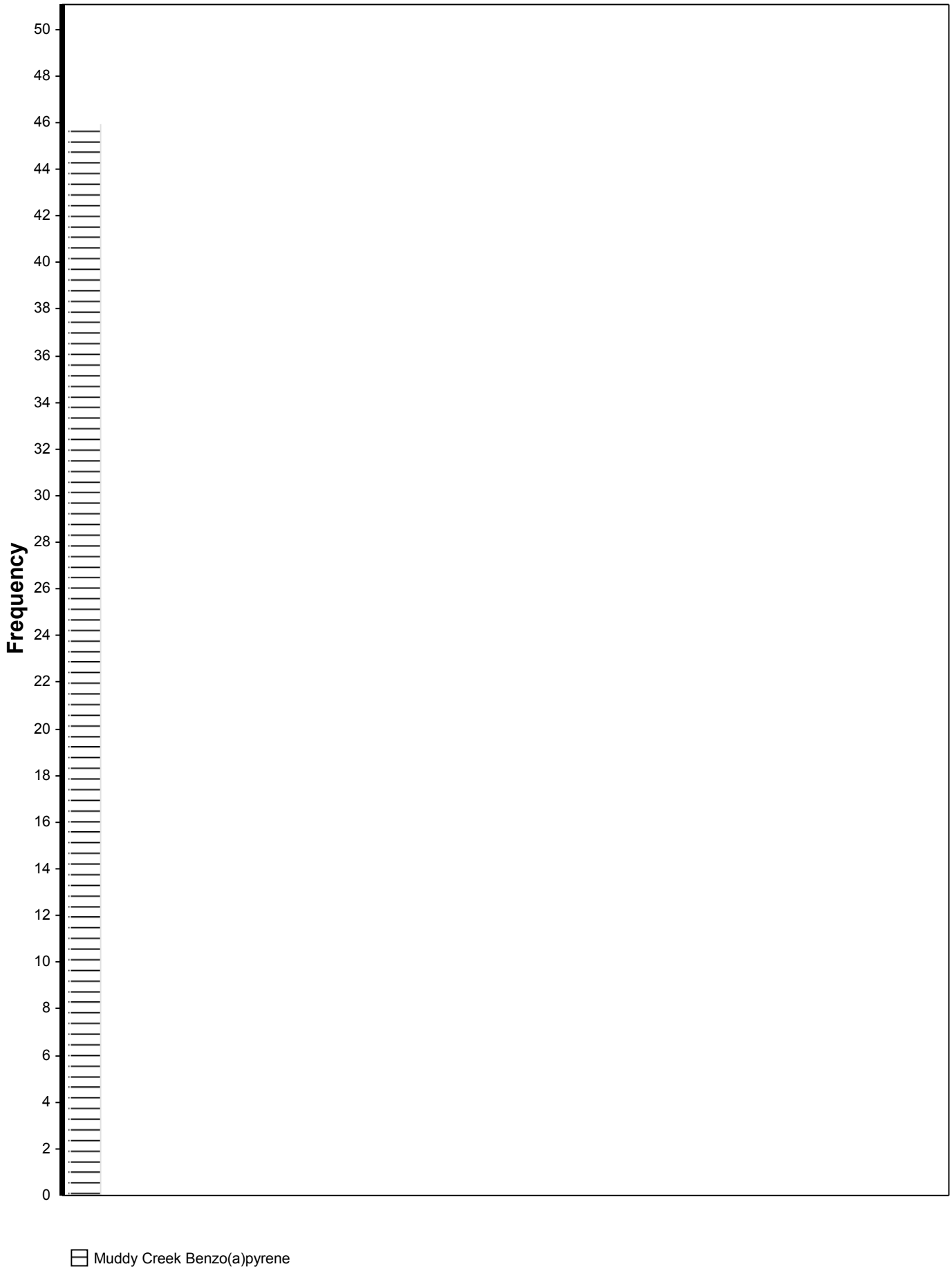
Histogram for Alluv Benzo(a)pyrene



Histogram for Mesa Benzo(a)pyrene



Histogram for Muddy Creek Benzo(a)pyrene



Outlier Tests for Selected Variables

User Selected Options	
From File	Benzo(a)pyrene.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Benzo(a)pyrene

Mean	0.025
Standard Deviation	7.076E-18

Rosner's Outlier Test for Muddy Creek Benzo(a)pyrene

Mean	0.025
Standard Deviation	3.508E-18

Rosner's Outlier Test for Mesa Benzo(a)pyrene

Mean	0.025
Standard Deviation	1.060E-17

Location Name	Sample Date	Alluv Benzo(a)pyrene	D_Alluv Benzo(a)pyrene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0

Location Name	Sample Date	Muddy Creek Benzo(a)pyrene	D_Muddy Creek Benzo(a)pyrene
BG-3S	11/27/2012	0.05	0
BG-3S	8/22/2012	0.05	0
BG-3S	5/23/2012	0.05	0
BG-3S	3/21/2012	0.05	0
BG-4S	11/27/2012	0.05	0
BG-4S	8/30/2012	0.05	0
BG-4S	5/30/2012	0.05	0
BG-4S	3/20/2012	0.05	0
BG-6S	11/27/2012	0.05	0
BG-6S	8/23/2012	0.05	0
BG-6S	5/25/2012	0.05	0
BG-6S	3/21/2012	0.05	0
BG-1M	11/26/2012	0.05	0
BG-1M	8/23/2012	0.05	0
BG-1M	5/24/2012	0.05	0
BG-1M	3/20/2012	0.05	0
BG-3M	11/27/2012	0.05	0
BG-3M	8/22/2012	0.05	0
BG-3M	5/24/2012	0.05	0
BG-3M	3/21/2012	0.05	0
BG-4M	11/27/2012	0.05	0
BG-4M	8/30/2012	0.05	0
BG-4M	5/30/2012	0.05	0
BG-4M	3/20/2012	0.05	0
BG-6M	11/27/2012	0.05	0
BG-6M	8/22/2012	0.05	0
BG-6M	5/25/2012	0.05	0
BG-6M	3/21/2012	0.05	0
BG-1D	11/26/2012	0.05	0
BG-1D	8/23/2012	0.05	0
BG-1D	5/24/2012	0.05	0
BG-1D	3/20/2012	0.05	0
BG-3D	11/27/2012	0.05	0
BG-3D	8/21/2012	0.05	0
BG-3D	5/23/2012	0.05	0
BG-3D	3/21/2012	0.05	0
BG-4D	11/27/2012	0.05	0
BG-4D	8/30/2012	0.05	0
BG-4D	5/30/2012	0.05	0
BG-4D	3/20/2012	0.05	0
BG-6D	11/27/2012	0.05	0
BG-6D	8/22/2012	0.05	0
BG-6D	5/25/2012	0.05	0
BG-6D	3/21/2012	0.05	0
IMW-3D	5/25/2012	0.05	0
IMW-3D	3/22/2012	0.05	0

Location Name	Sample Date	Mesa Benzo(a)pyrene	D_Mesa Benzo(a)pyrene
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Location Name	Sample Date	Alluv + Mesa Benzo(a)pyrene	D_Alluv + Mesa Benzo(a)pyrene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(b)fluoranthene.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Benzo(b)fluoranthene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	0	26	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv Benzo(b)fluoranthene was not processed!

Muddy Creek Benzo(b)fluoranthene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	1	45	97.83%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Muddy Creek Benzo(b)fluoranthene was not processed!

Mesa Benzo(b)fluoranthene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	0	28	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mesa Benzo(b)fluoranthene was not processed!

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(b)fluoranthene.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Benzo(b)fluoranthene

General Statistics

Number of Valid Data	26	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	26

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv Benzo(b)fluoranthene was not processed!

Muddy Creek Benzo(b)fluoranthene

General Statistics

Number of Valid Data	46	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	45

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Muddy Creek Benzo(b)fluoranthene was not processed!

Mesa Benzo(b)fluoranthene

General Statistics

Number of Valid Data	28	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	28

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mesa Benzo(b)fluoranthene was not processed!

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(b)fluoranthene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Benzo(b)fluoranthene

Background Data: Alluv Benzo(b)fluoranthene

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	28	26
Number of Detect Data	0	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	100.00%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(b)fluoranthene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Benzo(b)fluoranthene

Background Data: Alluv Benzo(b)fluoranthene

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	45	26
Number of Detect Data	1	0
Minimum Non-Detect	0.01	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	97.83%	100.00%
Minimum Detected	0.05	N/A
Maximum Detected	0.05	N/A
Mean of Detected Data	0.05	N/A
Median of Detected Data	0.05	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0.752
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.452

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(b)fluoranthene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Benzo(b)fluoranthene

Background Data: Muddy Creek Benzo(b)fluoranthene

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	28	45
Number of Detect Data	0	1
Minimum Non-Detect	0.05	0.01
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	97.83%
Minimum Detected	N/A	0.05
Maximum Detected	N/A	0.05
Mean of Detected Data	N/A	0.05
Median of Detected Data	N/A	0.05
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

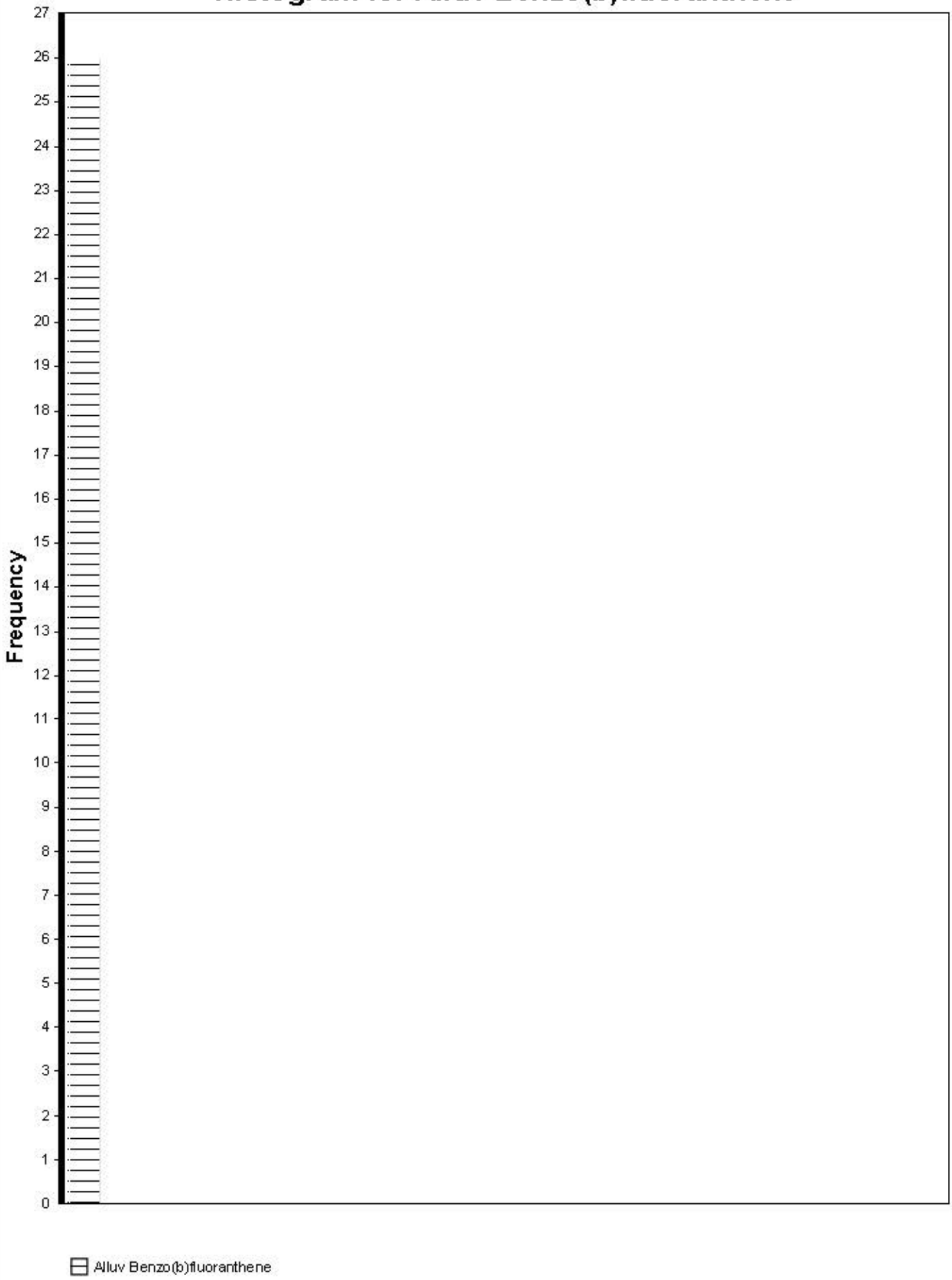
Gehan z Test Value	-0.78
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.435

Conclusion with Alpha = 0.05

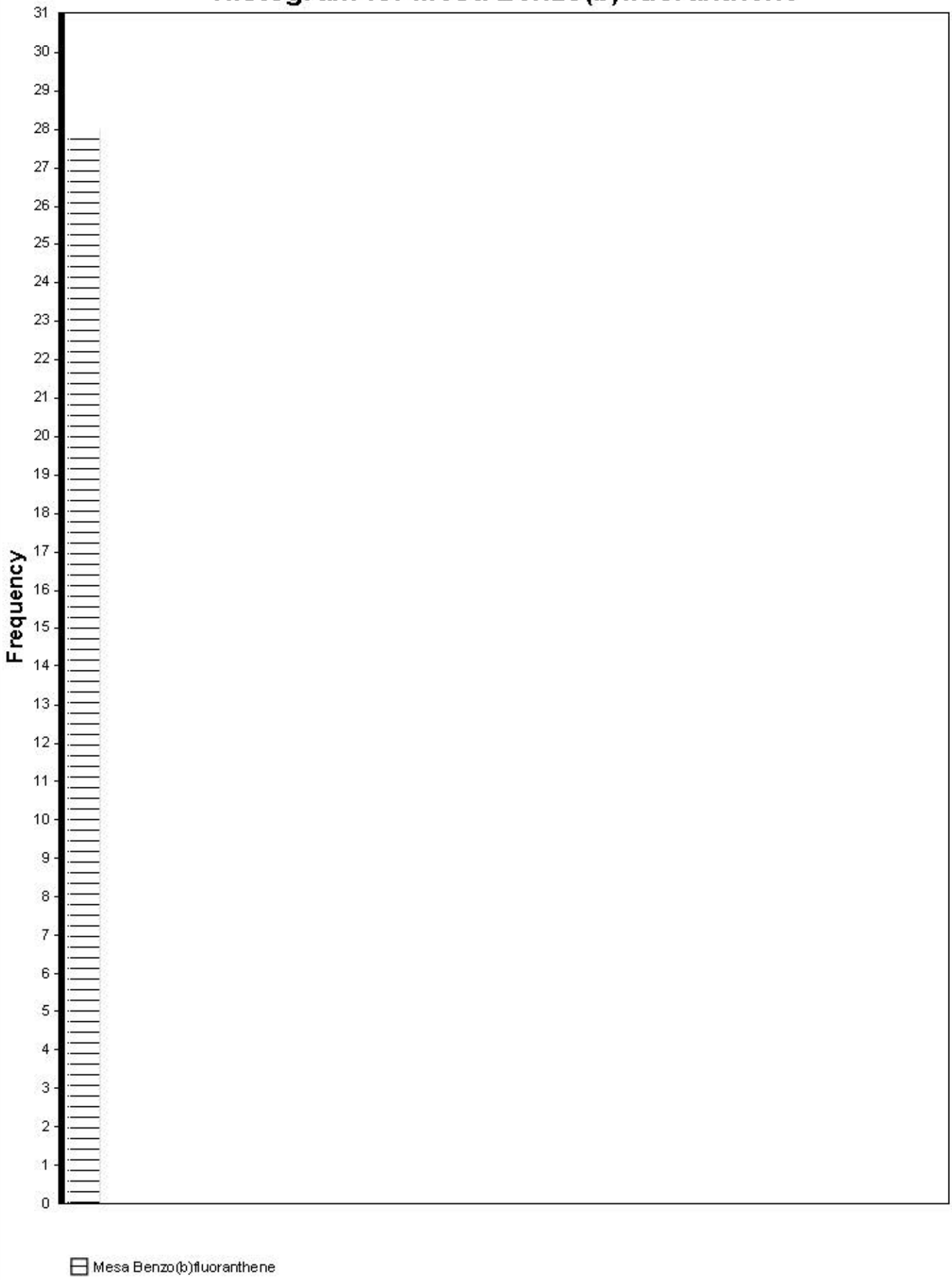
Do Not Reject H0, Conclude Site = Background

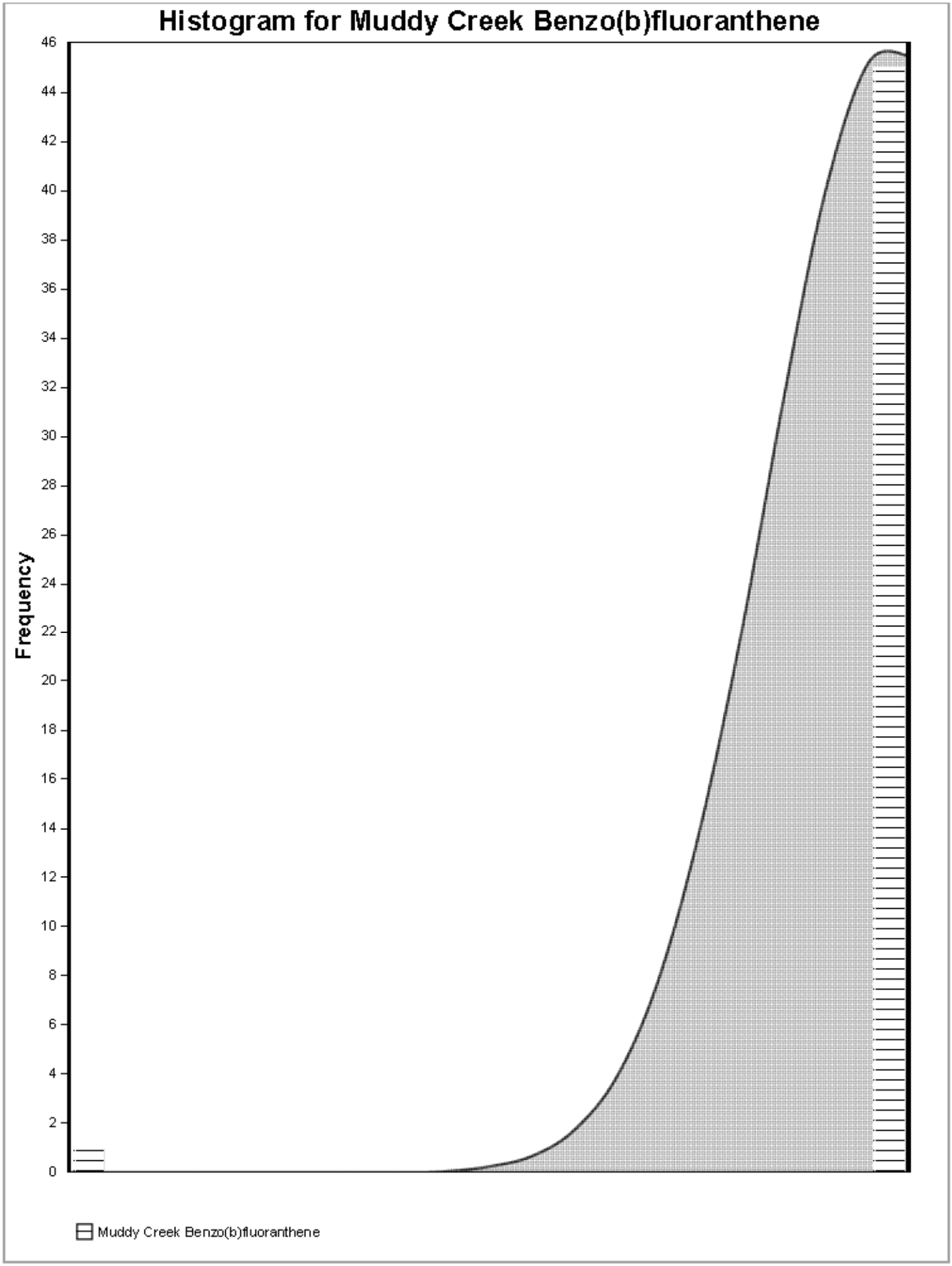
P-Value >= alpha (0.05)

Histogram for Alluv Benzo(b)fluoranthene



Histogram for Mesa Benzo(b)fluoranthene




Histogram for Muddy Creek Benzo(b)fluoranthene
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
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Muddy Creek Benzo(b)fluoranthene

Outlier Tests for Selected Variables

User Selected Options	
From File	Benzo(b)fluoranthene.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Benzo(b)fluoranthene

Mean	0.025
Standard Deviation	7.076E-18

Rosner's Outlier Test for Muddy Creek Benzo(b)fluoranthene

Mean	0.0251
Standard Deviation	0.00477
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0251	0.00472	0.05	31	5.274	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.05 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.05 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Benzo(b)fluoranthene

Mean	0.025
Standard Deviation	1.060E-17

Location Name	Sample Date	Alluv Benzo(b)fluoranthene	D_Alluv Benzo(b)fluoranthene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0

Location Name	Sample Date	Muddy Creek Benzo(b)fluoranthene	D_Muddy Creek Benzo(b)fluoranthene
BG-3S	11/27/2012	0.05	0
BG-3S	8/22/2012	0.05	0
BG-3S	5/23/2012	0.05	0
BG-3S	3/21/2012	0.05	0
BG-4S	11/27/2012	0.05	0
BG-4S	8/30/2012	0.05	0
BG-4S	5/30/2012	0.05	0
BG-4S	3/20/2012	0.05	0
BG-6S	11/27/2012	0.05	0
BG-6S	8/23/2012	0.05	0
BG-6S	5/25/2012	0.05	0
BG-6S	3/21/2012	0.05	0
BG-1M	11/26/2012	0.05	0
BG-1M	8/23/2012	0.05	0
BG-1M	5/24/2012	0.05	0
BG-1M	3/20/2012	0.05	0
BG-3M	11/27/2012	0.05	0
BG-3M	8/22/2012	0.05	0
BG-3M	5/24/2012	0.05	0
BG-3M	3/21/2012	0.05	0
BG-4M	11/27/2012	0.05	0
BG-4M	8/30/2012	0.05	0
BG-4M	5/30/2012	0.05	0
BG-4M	3/20/2012	0.05	0
BG-6M	11/27/2012	0.05	0
BG-6M	8/22/2012	0.05	0
BG-6M	5/25/2012	0.05	0
BG-6M	3/21/2012	0.05	0
BG-1D	11/26/2012	0.05	0
BG-1D	8/23/2012	0.05	0
BG-1D	5/24/2012	0.05	1
BG-1D	3/20/2012	0.01	0
BG-3D	11/27/2012	0.05	0
BG-3D	8/21/2012	0.05	0
BG-3D	5/23/2012	0.05	0
BG-3D	3/21/2012	0.05	0
BG-4D	11/27/2012	0.05	0
BG-4D	8/30/2012	0.05	0
BG-4D	5/30/2012	0.05	0
BG-4D	3/20/2012	0.05	0
BG-6D	11/27/2012	0.05	0
BG-6D	8/22/2012	0.05	0
BG-6D	5/25/2012	0.05	0
BG-6D	3/21/2012	0.05	0
IMW-3D	5/25/2012	0.05	0
IMW-3D	3/22/2012	0.05	0

Location Name	Sample Date	Mesa Benzo(b)fluoranthene	D_Mesa Benzo(b)fluoranthene
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Location Name	Sample Date	Alluv + Mesa Benzo(b)fluoranthene	D_Alluv + Mesa Benzo(b)fluoranthene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0

LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(g,h,i)perylene.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Benzo(g,h,i)perylene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	0	26	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv Benzo(g,h,i)perylene was not processed!

Muddy Creek Benzo(g,h,i)perylene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	1	45	97.83%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Muddy Creek Benzo(g,h,i)perylene was not processed!

Mesa Benzo(g,h,i)perylene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	0	28	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mesa Benzo(g,h,i)perylene was not processed!

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(g,h,i)perylene.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Benzo(g,h,i)perylene

General Statistics

Number of Valid Data	26	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	26

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv Benzo(g,h,i)perylene was not processed!

Muddy Creek Benzo(g,h,i)perylene

General Statistics

Number of Valid Data	46	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	45

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Muddy Creek Benzo(g,h,i)perylene was not processed!

Mesa Benzo(g,h,i)perylene

General Statistics

Number of Valid Data	28	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	28

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mesa Benzo(g,h,i)perylene was not processed!

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(g,h,i)perylene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Benzo(g,h,i)perylene

Background Data: Alluv Benzo(g,h,i)perylene

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	28	26
Number of Detect Data	0	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	100.00%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(g,h,i)perylene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Benzo(g,h,i)perylene

Background Data: Alluv Benzo(g,h,i)perylene

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	45	26
Number of Detect Data	1	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	97.83%	100.00%
Minimum Detected	0.011	N/A
Maximum Detected	0.011	N/A
Mean of Detected Data	0.011	N/A
Median of Detected Data	0.011	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(g,h,i)perylene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Benzo(g,h,i)perylene

Background Data: Muddy Creek Benzo(g,h,i)perylene

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	28	45
Number of Detect Data	0	1
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	97.83%
Minimum Detected	N/A	0.011
Maximum Detected	N/A	0.011
Mean of Detected Data	N/A	0.011
Median of Detected Data	N/A	0.011
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

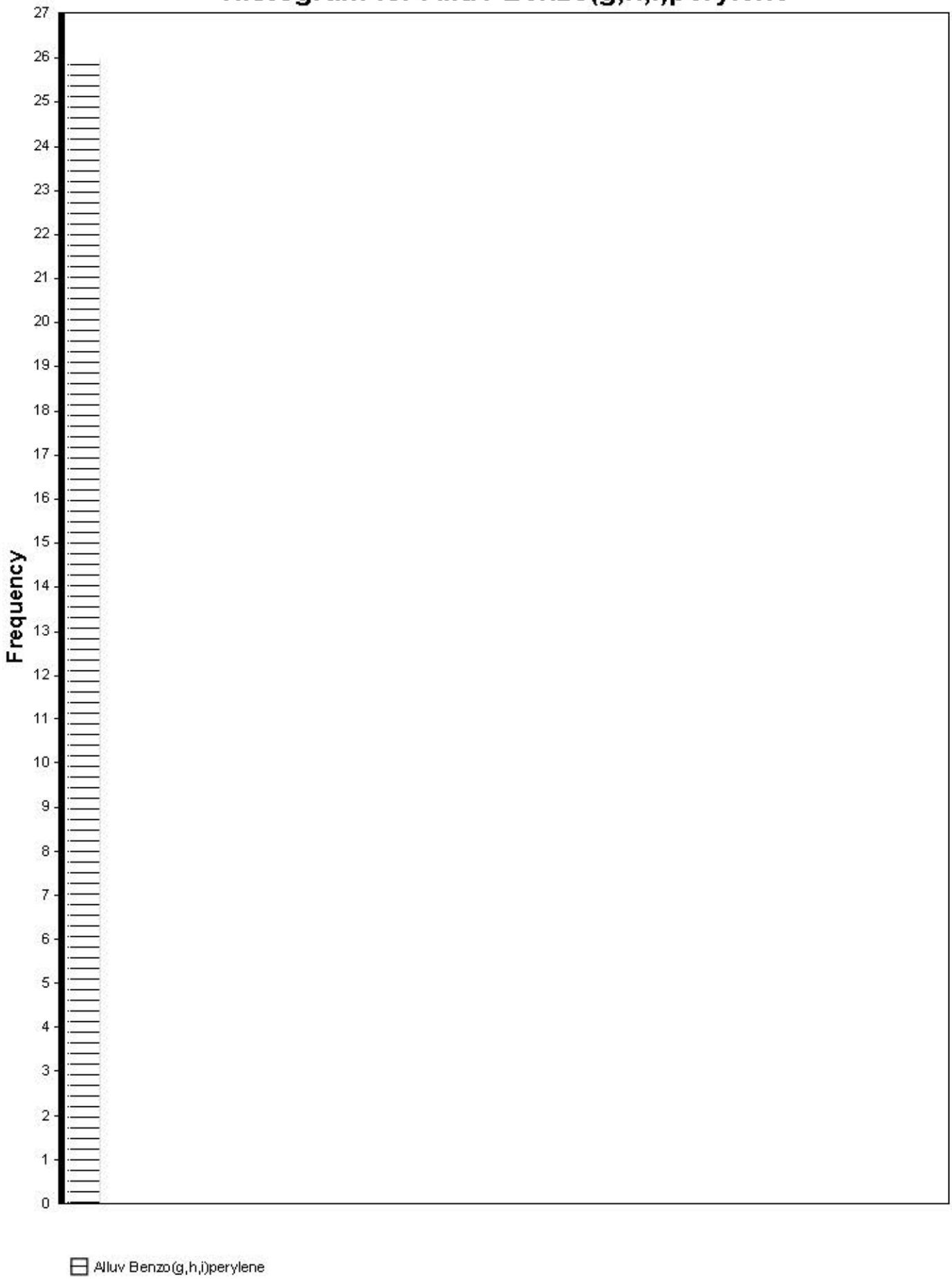
Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

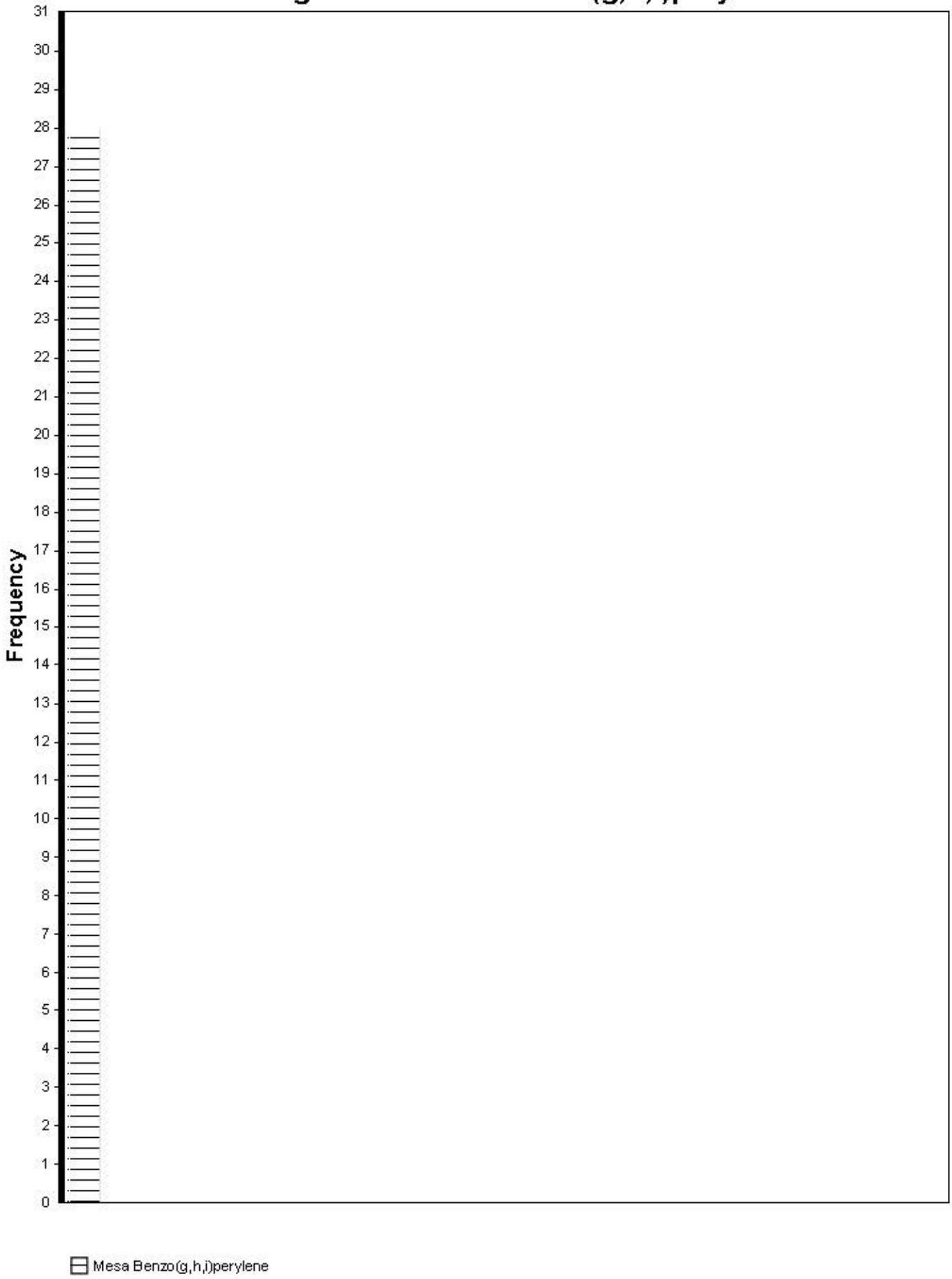
Reject H0, Conclude Site <> Background

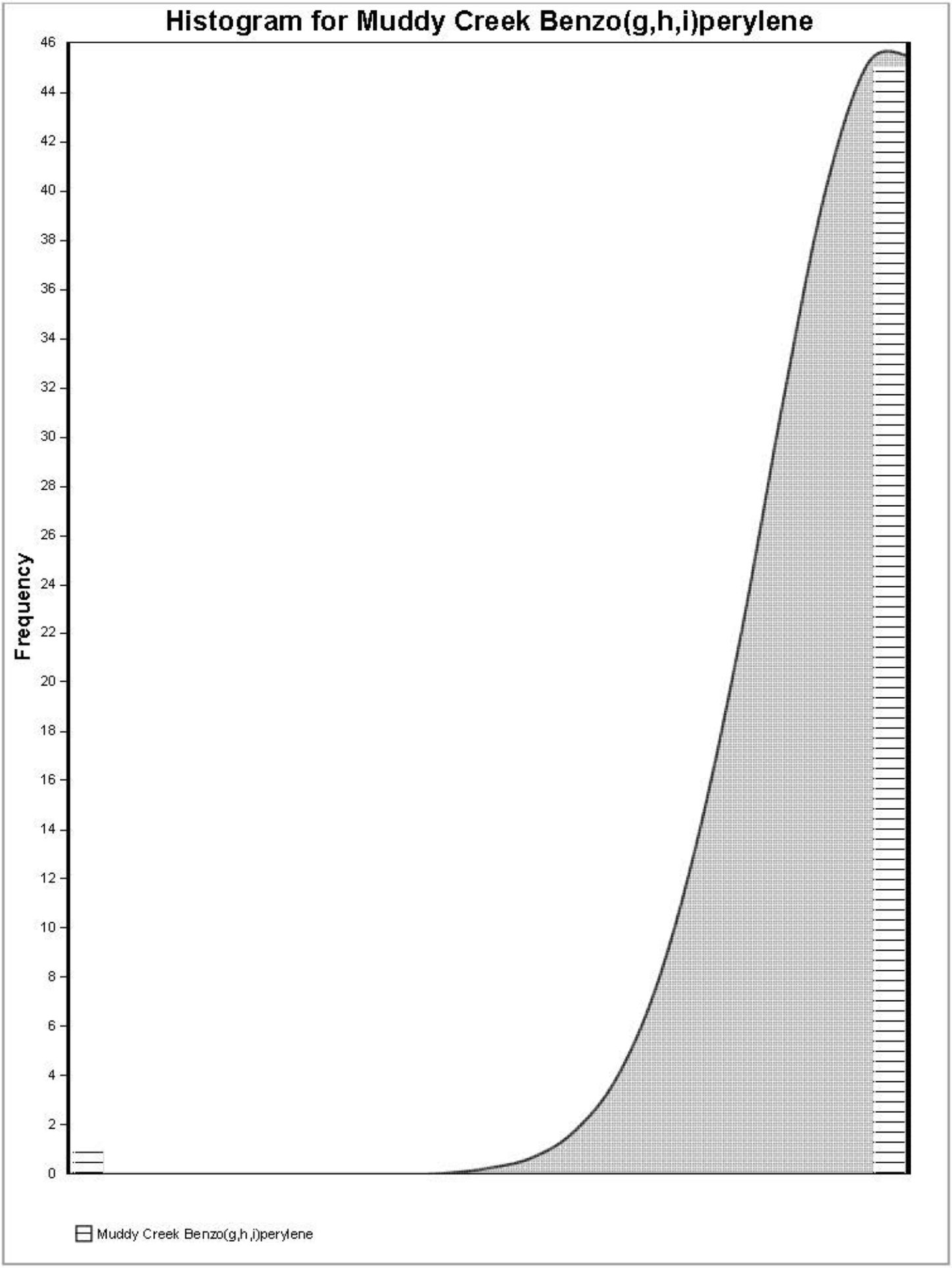
P-Value < alpha (0.05)

Histogram for Alluv Benzo(g,h,i)perylene



Histogram for Mesa Benzo(g,h,i)perylene




Histogram for Muddy Creek Benzo(g,h,i)perylene
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
Muddy Creek Benzo(g,h,i)perylene

Outlier Tests for Selected Variables

User Selected Options	
From File	Benzo(g,h,i)perylene.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Benzo(g,h,i)perylene

Mean	0.025
Standard Deviation	7.076E-18

Rosner's Outlier Test for Muddy Creek Benzo(g,h,i)perylene

Mean	0.0247
Standard Deviation	0.00206
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0247	0.00204	0.011	6	6.708	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.011 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.011 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Benzo(g,h,i)perylene

Mean	0.025
Standard Deviation	1.060E-17

Location Name	Sample Date	Alluv Benzo(g,h,i)perylene	D_Alluv Benzo(g,h,i)perylene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0

Location Name	Sample Date	Muddy Creek Benzo(g,h,i)perylene	D_Muddy Creek Benzo(g,h,i)perylene
BG-3S	11/27/2012	0.05	0
BG-3S	8/22/2012	0.05	0
BG-3S	5/23/2012	0.05	0
BG-3S	3/21/2012	0.05	0
BG-4S	11/27/2012	0.05	0
BG-4S	8/30/2012	0.011	1
BG-4S	5/30/2012	0.05	0
BG-4S	3/20/2012	0.05	0
BG-6S	11/27/2012	0.05	0
BG-6S	8/23/2012	0.05	0
BG-6S	5/25/2012	0.05	0
BG-6S	3/21/2012	0.05	0
BG-1M	11/26/2012	0.05	0
BG-1M	8/23/2012	0.05	0
BG-1M	5/24/2012	0.05	0
BG-1M	3/20/2012	0.05	0
BG-3M	11/27/2012	0.05	0
BG-3M	8/22/2012	0.05	0
BG-3M	5/24/2012	0.05	0
BG-3M	3/21/2012	0.05	0
BG-4M	11/27/2012	0.05	0
BG-4M	8/30/2012	0.05	0
BG-4M	5/30/2012	0.05	0
BG-4M	3/20/2012	0.05	0
BG-6M	11/27/2012	0.05	0
BG-6M	8/22/2012	0.05	0
BG-6M	5/25/2012	0.05	0
BG-6M	3/21/2012	0.05	0
BG-1D	11/26/2012	0.05	0
BG-1D	8/23/2012	0.05	0
BG-1D	5/24/2012	0.05	0
BG-1D	3/20/2012	0.05	0
BG-3D	11/27/2012	0.05	0
BG-3D	8/21/2012	0.05	0
BG-3D	5/23/2012	0.05	0
BG-3D	3/21/2012	0.05	0
BG-4D	11/27/2012	0.05	0
BG-4D	8/30/2012	0.05	0
BG-4D	5/30/2012	0.05	0
BG-4D	3/20/2012	0.05	0
BG-6D	11/27/2012	0.05	0
BG-6D	8/22/2012	0.05	0
BG-6D	5/25/2012	0.05	0
BG-6D	3/21/2012	0.05	0
IMW-3D	5/25/2012	0.05	0
IMW-3D	3/22/2012	0.05	0

Location Name	Sample Date	Mesa Benzo(g,h,i)perylene	D_Mesa Benzo(g,h,i)perylene
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Location Name	Sample Date	Alluv + Mesa Benzo(g,h,i)perylene	D_Alluv + Mesa Benzo(g,h,i)perylene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(k)fluoranthene.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv benzo(k)fluoranthene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	0	26	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv benzo(k)fluoranthene was not processed!

Muddy Creek benzo(k)fluoranthene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	0	46	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Muddy Creek benzo(k)fluoranthene was not processed!

Mesa benzo(k)fluoranthene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	0	28	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mesa benzo(k)fluoranthene was not processed!

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(k)fluoranthene.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv benzo(k)fluoranthene

General Statistics

Number of Valid Data	26	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	26

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv benzo(k)fluoranthene was not processed!

Muddy Creek benzo(k)fluoranthene

General Statistics

Number of Valid Data	46	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	46

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Muddy Creek benzo(k)fluoranthene was not processed!

Mesa benzo(k)fluoranthene

General Statistics

Number of Valid Data	28	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	28

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mesa benzo(k)fluoranthene was not processed!

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(k)fluoranthene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa benzo(k)fluoranthene

Background Data: Alluv benzo(k)fluoranthene

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	28	26
Number of Detect Data	0	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	100.00%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(k)fluoranthene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek benzo(k)fluoranthene

Background Data: Alluv benzo(k)fluoranthene

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	46	26
Number of Detect Data	0	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	100.00%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Benzo(k)fluoranthene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa benzo(k)fluoranthene

Background Data: Muddy Creek benzo(k)fluoranthene

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	28	46
Number of Detect Data	0	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	100.00%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

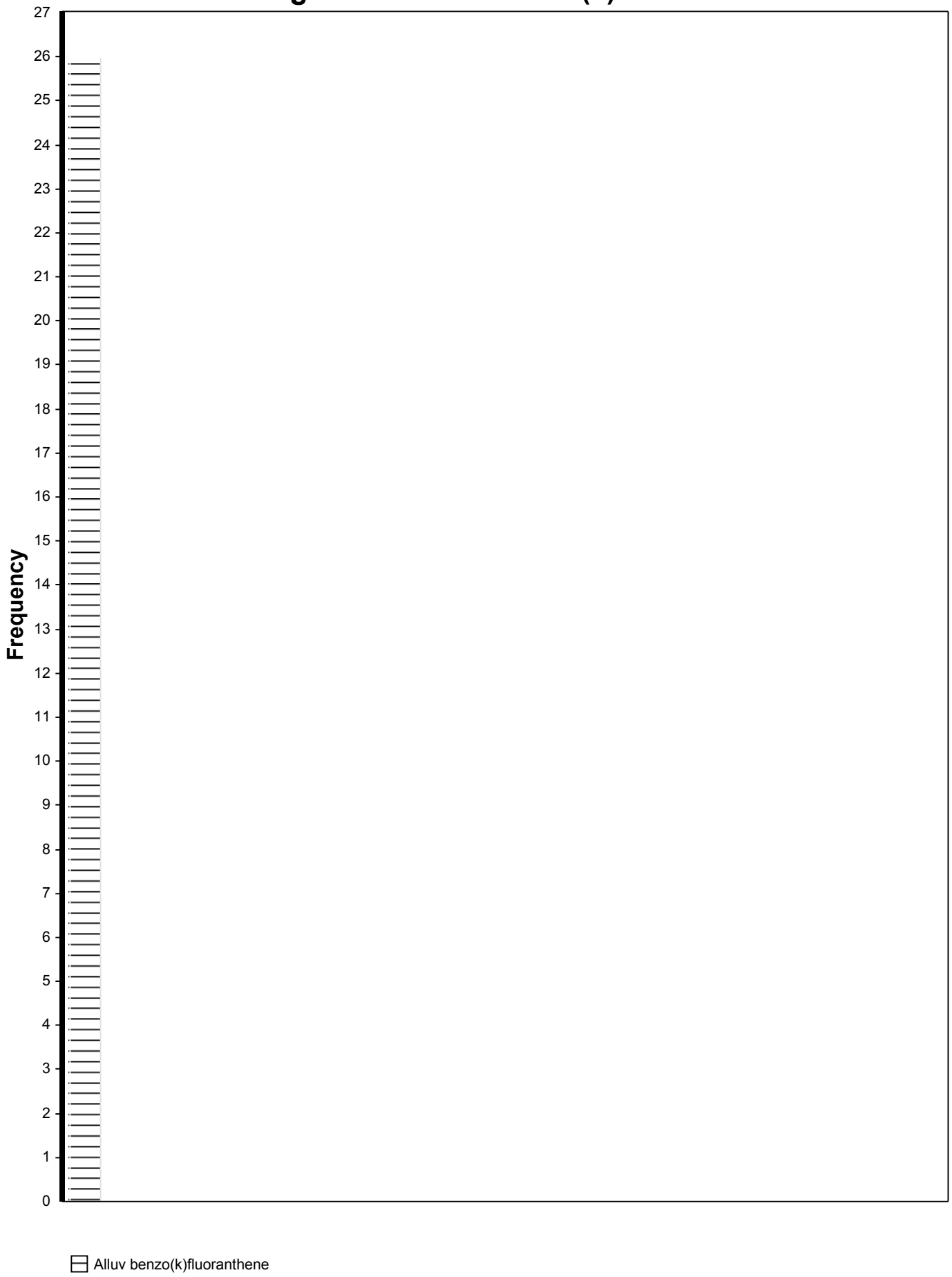
Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

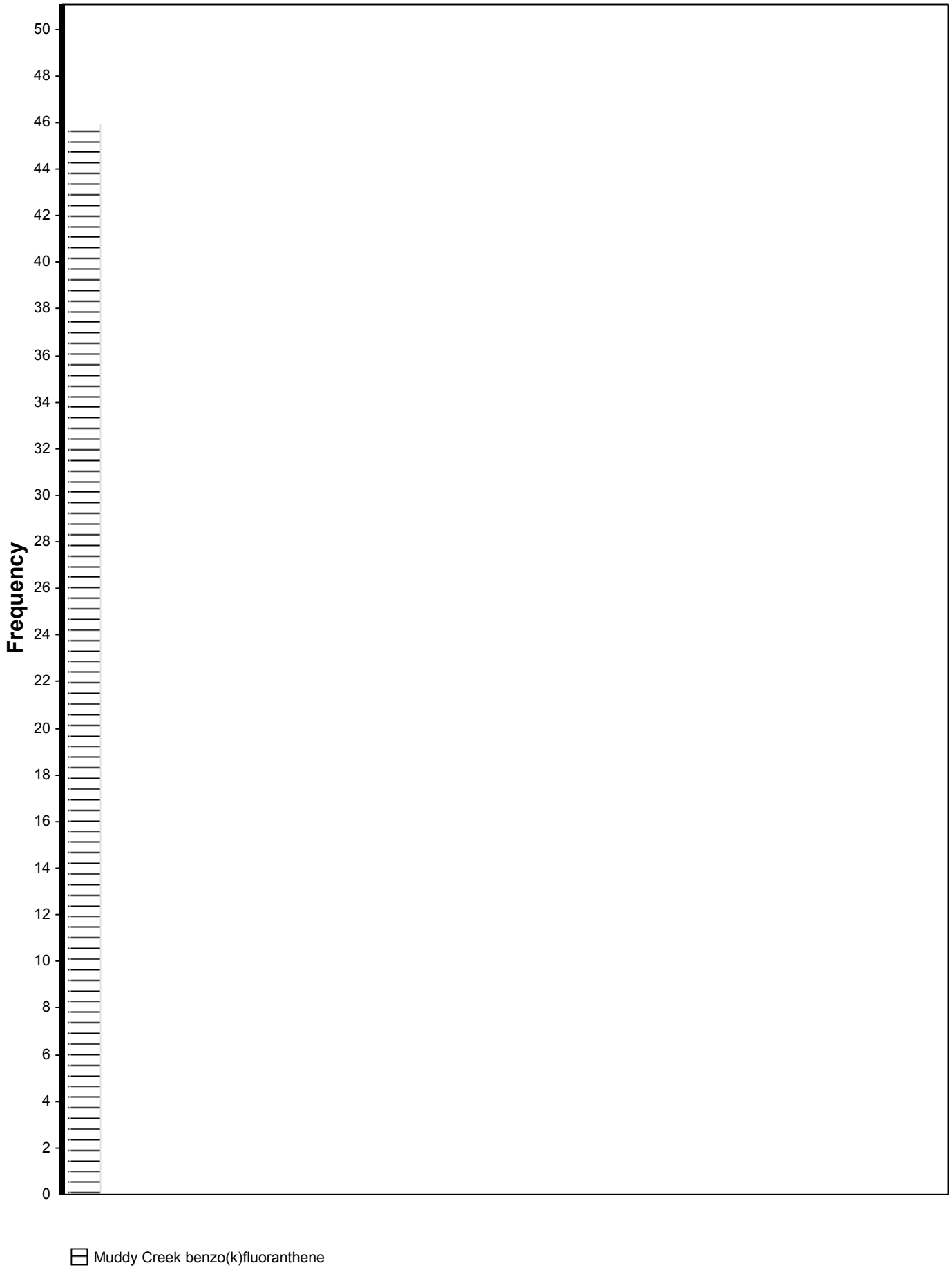
Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Histogram for Alluv benzo(k)fluoranthene



Histogram for Muddy Creek benzo(k)fluoranthene



Outlier Tests for Selected Variables

User Selected Options	
From File	Benzo(k)fluoranthene.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv benzo(k)fluoranthene

Mean	0.025
Standard Deviation	7.076E-18

Rosner's Outlier Test for Muddy Creek benzo(k)fluoranthene

Mean	0.025
Standard Deviation	3.508E-18

Rosner's Outlier Test for Mesa benzo(k)fluoranthene

Mean	0.025
Standard Deviation	1.060E-17

Location Name	Sample Date	Alluv benzo(k)fluoranthene	D_Alluv benzo(k)fluoranthene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0

Location Name	Sample Date	Muddy Creek benzo(k)fluoranthene	D_Muddy Creek benzo(k)fluoranthene
BG-3S	11/27/2012	0.05	0
BG-3S	8/22/2012	0.05	0
BG-3S	5/23/2012	0.05	0
BG-3S	3/21/2012	0.05	0
BG-4S	11/27/2012	0.05	0
BG-4S	8/30/2012	0.05	0
BG-4S	5/30/2012	0.05	0
BG-4S	3/20/2012	0.05	0
BG-6S	11/27/2012	0.05	0
BG-6S	8/23/2012	0.05	0
BG-6S	5/25/2012	0.05	0
BG-6S	3/21/2012	0.05	0
BG-1M	11/26/2012	0.05	0
BG-1M	8/23/2012	0.05	0
BG-1M	5/24/2012	0.05	0
BG-1M	3/20/2012	0.05	0
BG-3M	11/27/2012	0.05	0
BG-3M	8/22/2012	0.05	0
BG-3M	5/24/2012	0.05	0
BG-3M	3/21/2012	0.05	0
BG-4M	11/27/2012	0.05	0
BG-4M	8/30/2012	0.05	0
BG-4M	5/30/2012	0.05	0
BG-4M	3/20/2012	0.05	0
BG-6M	11/27/2012	0.05	0
BG-6M	8/22/2012	0.05	0
BG-6M	5/25/2012	0.05	0
BG-6M	3/21/2012	0.05	0
BG-1D	11/26/2012	0.05	0
BG-1D	8/23/2012	0.05	0
BG-1D	5/24/2012	0.05	0
BG-1D	3/20/2012	0.05	0
BG-3D	11/27/2012	0.05	0
BG-3D	8/21/2012	0.05	0
BG-3D	5/23/2012	0.05	0
BG-3D	3/21/2012	0.05	0
BG-4D	11/27/2012	0.05	0
BG-4D	8/30/2012	0.05	0
BG-4D	5/30/2012	0.05	0
BG-4D	3/20/2012	0.05	0
BG-6D	11/27/2012	0.05	0
BG-6D	8/22/2012	0.05	0
BG-6D	5/25/2012	0.05	0
BG-6D	3/21/2012	0.05	0
IMW-3D	5/25/2012	0.05	0
IMW-3D	3/22/2012	0.05	0

Location Name	Sample Date	Mesa benzo(k)fluoranthene	D_Mesa benzo(k)fluoranthene
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Location Name	Sample Date	Alluv + Mesa benzo(k)fluoranthene	D_Alluv + Mesa benzo(k)fluoranthene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Beryllium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Beryllium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	92	0	92	1	91	98.91%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Alluv Beryllium, Dissolved was not processed!

Muddy Creek Beryllium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	53	0	53	3	50	94.34%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	50	0.001	0.003	0.00206	0.002	3.7307E-4
Statistics (Detects Only)	3	7.1000E-4	0.0013	9.4333E-4	8.2000E-4	3.1374E-4
Statistics (All: NDs treated as DL value)	53	7.1000E-4	0.003	0.002	0.002	4.5034E-4
Statistics (All: NDs treated as DL/2 value)	53	5.0000E-4	0.0015	0.00103	0.001	1.9231E-4
Statistics (Normal ROS Estimated Data)	53	2.2533E-4	0.0015	8.6552E-4	8.6430E-4	2.8545E-4
Statistics (Gamma ROS Estimated Data)	53	1.000E-12	0.0013	5.3396E-5	1.000E-12	2.2851E-4
Statistics (Lognormal ROS Estimated Data)	53	4.3923E-4	0.00161	8.7753E-4	8.4097E-4	2.5840E-4

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	14.65	13.83	6.4402E-5	-7.001	0.316	-0.0451
Statistics (NDs = DL)	16.4	15.49	1.2173E-4	-6.247	0.27	-0.0432
Statistics (NDs = DL/2)	28.03	26.45	3.6575E-5	-6.901	0.196	-0.0285
Statistics (Gamma ROS Estimates)	0.0524	0.062	0.00102	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-7.08	0.29	-0.041

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.94	0.777	0.765	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.884	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.32	0.512	Data Appear Normal
Lilliefors (NDs = DL)	0.409	0.122	Data Not Normal
Lilliefors (NDs = DL/2)	0.439	0.122	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0368	0.122	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.771	0.776	0.954

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	11.02	0.749	
Kolmogorov-Smirnov (NDs = DL)	0.441	0.122	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	10.9	0.748	
Kolmogorov-Smirnov (NDs = DL/2)	0.414	0.122	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	20.23	1.588	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.597	0.165	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.957	0.747	0.754	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.916	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.298	0.512	Data Appear Lognormal
Lilliefors (NDs = DL)	0.453	0.122	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.411	0.122	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0369	0.122	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Beryllium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	2	98	98.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	98	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	100	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	100	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	100	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL/2)	N/A	N/A	
Lilliefors (Normal ROS Estimates)	N/A	N/A	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A	
Anderson-Darling (NDs = DL/2)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A	
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A	
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A	

Note: Substitution methods such as DL or DL/2 are not recommended.

All Beryllium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	252	0	252	6	246	97.62%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	246	0.001	0.003	0.00235	0.002	7.0053E-4
Statistics (Detects Only)	6	6.1000E-4	0.0013	8.1500E-4	7.6500E-4	2.5556E-4
Statistics (All: NDs treated as DL value)	252	6.1000E-4	0.003	0.00232	0.002	7.3182E-4
Statistics (All: NDs treated as DL/2 value)	252	5.0000E-4	0.0015	0.00117	0.001	3.5229E-4
Statistics (Normal ROS Estimated Data)	252	2.2017E-4	0.0013	7.4211E-4	7.4184E-4	2.0849E-4
Statistics (Gamma ROS Estimated Data)	252	6.1000E-4	0.0013	7.7463E-4	7.4265E-4	1.2369E-4
Statistics (Lognormal ROS Estimated Data)	252	4.0642E-4	0.0013	7.4542E-4	7.2556E-4	1.7466E-4

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	14.46	14.29	5.6356E-5	-7.147	0.279	-0.039
Statistics (NDs = DL)	7.751	7.661	2.9893E-4	-6.133	0.394	-0.0642
Statistics (NDs = DL/2)	8.825	8.722	1.3238E-4	-6.81	0.364	-0.0535
Statistics (Gamma ROS Estimates)	43.12	42.61	1.7964E-5	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-7.228	0.231	-0.032

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.89	0.885	0.882	1

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.804	0.788	Data Appear Normal
Lilliefors (Detects Only)	0.31	0.362	Data Appear Normal
Lilliefors (NDs = DL)	0.297	0.0558	Data Not Normal
Lilliefors (NDs = DL/2)	0.299	0.0558	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0122	0.0558	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.931	0.831	0.835	0.84

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Anderson-Darling (Detects Only)	0.491	0.698	
Kolmogorov-Smirnov (Detects Only)	0.271	0.332	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	24.53	0.755	
Kolmogorov-Smirnov (NDs = DL)	0.28	0.0577	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	24.46	0.754	
Kolmogorov-Smirnov (NDs = DL/2)	0.284	0.0576	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.81	0.751	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0926	0.0575	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.929	0.865	0.864	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.868	0.788	Data Appear Lognormal
Lilliefors (Detects Only)	0.258	0.362	Data Appear Lognormal
Lilliefors (NDs = DL)	0.267	0.0558	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.273	0.0558	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0129	0.0558	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Beryllium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Beryllium, Dissolved

General Statistics

Number of Valid Data	92	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	91

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Alluv Beryllium, Dissolved was not processed!

Muddy Creek Beryllium, Dissolved

General Statistics

Number of Valid Data	53	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	50
		Percent Non-Detects	94.34%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	7.1000E-4	Minimum Detected	-7.25
Maximum Detected	0.0013	Maximum Detected	-6.645
Mean of Detected	9.4333E-4	Mean of Detected	-7.001
SD of Detected	3.1374E-4	SD of Detected	0.316
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.003	Maximum Non-Detect	-5.809

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	53
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.884
5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level	

Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.916
5% Shapiro Wilk Critical Value	0.767
Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution	
DL/2 Substitution Method	
Mean	0.00103
SD	1.9231E-4
95% UTL 95% Coverage	0.00142
95% UPL (t)	0.00135
90% Percentile (z)	0.00127
95% Percentile (z)	0.00134
99% Percentile (z)	0.00147
Maximum Likelihood Estimate(MLE) Method	N/A

Assuming Lognormal Distribution	
DL/2 Substitution Method	
Mean (Log Scale)	-6.901
SD (Log Scale)	0.196
95% UTL 95% Coverage	0.0015
95% UPL (t)	0.0014
90% Percentile (z)	0.0013
95% Percentile (z)	0.00139
99% Percentile (z)	0.00159
Log ROS Method	
Mean in Original Scale	8.7753E-4
SD in Original Scale	2.5840E-4
Mean in Log Scale	-7.08
SD in Log Scale	0.29
95% UTL 95% Coverage	0.00152
95% UPL (t)	0.00137
90% Percentile (z)	0.00122
95% Percentile (z)	0.00136
99% Percentile (z)	0.00165

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	N/A
Theta Star	N/A
nu star	N/A
A-D Test Statistic	N/A
5% A-D Critical Value	N/A
K-S Test Statistic	N/A
5% K-S Critical Value	N/A
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics with Extrapolated Data	
Mean	N/A
Median	N/A
SD	N/A
k star	N/A
Theta star	N/A
Nu star	N/A
95% Percentile of Chisquare (2k)	N/A
90% Percentile	N/A
95% Percentile	N/A
99% Percentile	N/A

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	

Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	8.7200E-4
SD	2.1958E-4
SE of Mean	1.2325E-4
95% KM UTL with 95% Coverage	0.00132
95% KM Chebyshev UPL	0.00184
95% KM UPL (t)	0.00124
90% Percentile (z)	0.00115
95% Percentile (z)	0.00123
99% Percentile (z)	0.00138
Gamma ROS Limits with Extrapolated Data	
95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
95% WH Approx. Gamma UTL with 95% Coverage	N/A
95% HW Approx. Gamma UTL with 95% Coverage	N/A

Note: DL/2 is not a recommended method.

Mesa Beryllium, Dissolved

General Statistics

Number of Valid Data	100	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	98
		Percent Non-Detects	98.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	6.1000E-4	Minimum Detected	-7.402
Maximum Detected	8.3000E-4	Maximum Detected	-7.094
Mean of Detected	7.2000E-4	Mean of Detected	-7.248
SD of Detected	1.5556E-4	SD of Detected	0.218
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.003	Maximum Non-Detect	-5.809

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	100
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00123	Mean (Log Scale)	-6.759
SD	3.5772E-4	SD (Log Scale)	0.37
95% UTL 95% Coverage	0.00192	95% UTL 95% Coverage	0.00236
95% UPL (t)	0.00183	95% UPL (t)	0.00215
90% Percentile (z)	0.00169	90% Percentile (z)	0.00186
95% Percentile (z)	0.00182	95% Percentile (z)	0.00213
99% Percentile (z)	0.00206	99% Percentile (z)	0.00274
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	N/A

		SD in Original Scale	N/A
		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		95% UTL 95% Coverage	N/A
		95% UPL (t)	N/A
		90% Percentile (z)	N/A
		95% Percentile (z)	N/A
		99% Percentile (z)	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	7.2000E-4
5% K-S Critical Value	N/A	SD	1.1000E-4
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.1000E-4
		95% KM UTL with 95% Coverage	9.3158E-4
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0012
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	9.0355E-4
Mean	N/A	90% Percentile (z)	8.6097E-4
Median	N/A	95% Percentile (z)	9.0093E-4
SD	N/A	99% Percentile (z)	9.7590E-4
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

All Beryllium, Dissolved

General Statistics			
Number of Valid Data	252	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	246
		Percent Non-Detects	97.62%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	6.1000E-4	Minimum Detected	-7.402
Maximum Detected	0.0013	Maximum Detected	-6.645
Mean of Detected	8.1500E-4	Mean of Detected	-7.147
SD of Detected	2.5556E-4	SD of Detected	0.279
Minimum Non-Detect	0.001	Minimum Non-Detect	-6.908
Maximum Non-Detect	0.003	Maximum Non-Detect	-5.809
Data with Multiple Detection Limits		Single Detection Limit Scenario	

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	252
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 6 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.804	Shapiro Wilk Test Statistic	0.868
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00117	Mean (Log Scale)	-6.81
SD	3.5229E-4	SD (Log Scale)	0.364
95% UTL 95% Coverage	0.00181	95% UTL 95% Coverage	0.00213
95% UPL (t)	0.00175	95% UPL (t)	0.00201
90% Percentile (z)	0.00162	90% Percentile (z)	0.00176
95% Percentile (z)	0.00175	95% Percentile (z)	0.00201
99% Percentile (z)	0.00199	99% Percentile (z)	0.00257
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	7.4542E-4
		SD in Original Scale	1.7466E-4
		Mean in Log Scale	-7.228
		SD in Log Scale	0.231
		95% UTL 95% Coverage	0.0011
		95% UPL (t)	0.00106
		90% Percentile (z)	9.7644E-4
		95% Percentile (z)	0.00106
		99% Percentile (z)	0.00124
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	7.342	Data appear Normal at 5% Significance Level	
Theta Star	1.1101E-4		
nu star	88.1		
A-D Test Statistic	0.491	Nonparametric Statistics	
5% A-D Critical Value	0.698	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.271	Mean	7.3332E-4
5% K-S Critical Value	0.332	SD	1.3154E-4
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	4.7845E-5
		95% KM UTL with 95% Coverage	9.7187E-4
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.00131
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	9.5091E-4
Mean	7.7463E-4	90% Percentile (z)	9.0189E-4
Median	7.4265E-4	95% Percentile (z)	9.4968E-4

SD	1.2369E-4	99% Percentile (z)	0.00104
k star	42.61		
Theta star	1.8179E-5	**Gamma ROS Limits with Extrapolated Data**	
Nu star	21475	95% Wilson Hilferty (WH) Approx. Gamma UPL	9.7993E-4
95% Percentile of Chisquare (2k)	107.8	95% Hawkins Wixley (HW) Approx. Gamma UPL	9.8017E-4
		95% WH Approx. Gamma UTL with 95% Coverage	0.001
90% Percentile	9.3007E-4	95% HW Approx. Gamma UTL with 95% Coverage	0.001
95% Percentile	9.7960E-4		
99% Percentile	0.00108		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Beryllium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Beryllium, Dissolved

Background Data: Alluv Beryllium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	92
Number of Non-Detect Data	98	91
Number of Detect Data	2	1
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.003	0.003
Percent Non detects	98.00%	98.91%
Minimum Detected	6.1000E-4	6.2000E-4
Maximum Detected	8.3000E-4	6.2000E-4
Mean of Detected Data	7.2000E-4	6.2000E-4
Median of Detected Data	7.2000E-4	6.2000E-4
SD of Detected Data	1.5556E-4	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	1

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Beryllium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Beryllium, Dissolved

Background Data: Alluv Beryllium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	53	92
Number of Non-Detect Data	50	91
Number of Detect Data	3	1
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.003	0.003
Percent Non detects	94.34%	98.91%
Minimum Detected	7.1000E-4	6.2000E-4
Maximum Detected	0.0013	6.2000E-4
Mean of Detected Data	9.4333E-4	6.2000E-4
Median of Detected Data	8.2000E-4	6.2000E-4
SD of Detected Data	3.1374E-4	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	1.836
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0663

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Beryllium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Beryllium, Dissolved

Background Data: Muddy Creek Beryllium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	53
Number of Non-Detect Data	98	50
Number of Detect Data	2	3
Minimum Non-Detect	0.001	0.001
Maximum Non-Detect	0.003	0.003
Percent Non detects	98.00%	94.34%
Minimum Detected	6.1000E-4	7.1000E-4
Maximum Detected	8.3000E-4	0.0013
Mean of Detected Data	7.2000E-4	9.4333E-4
Median of Detected Data	7.2000E-4	8.2000E-4
SD of Detected Data	1.5556E-4	3.1374E-4

Site vs Background Gehan Test

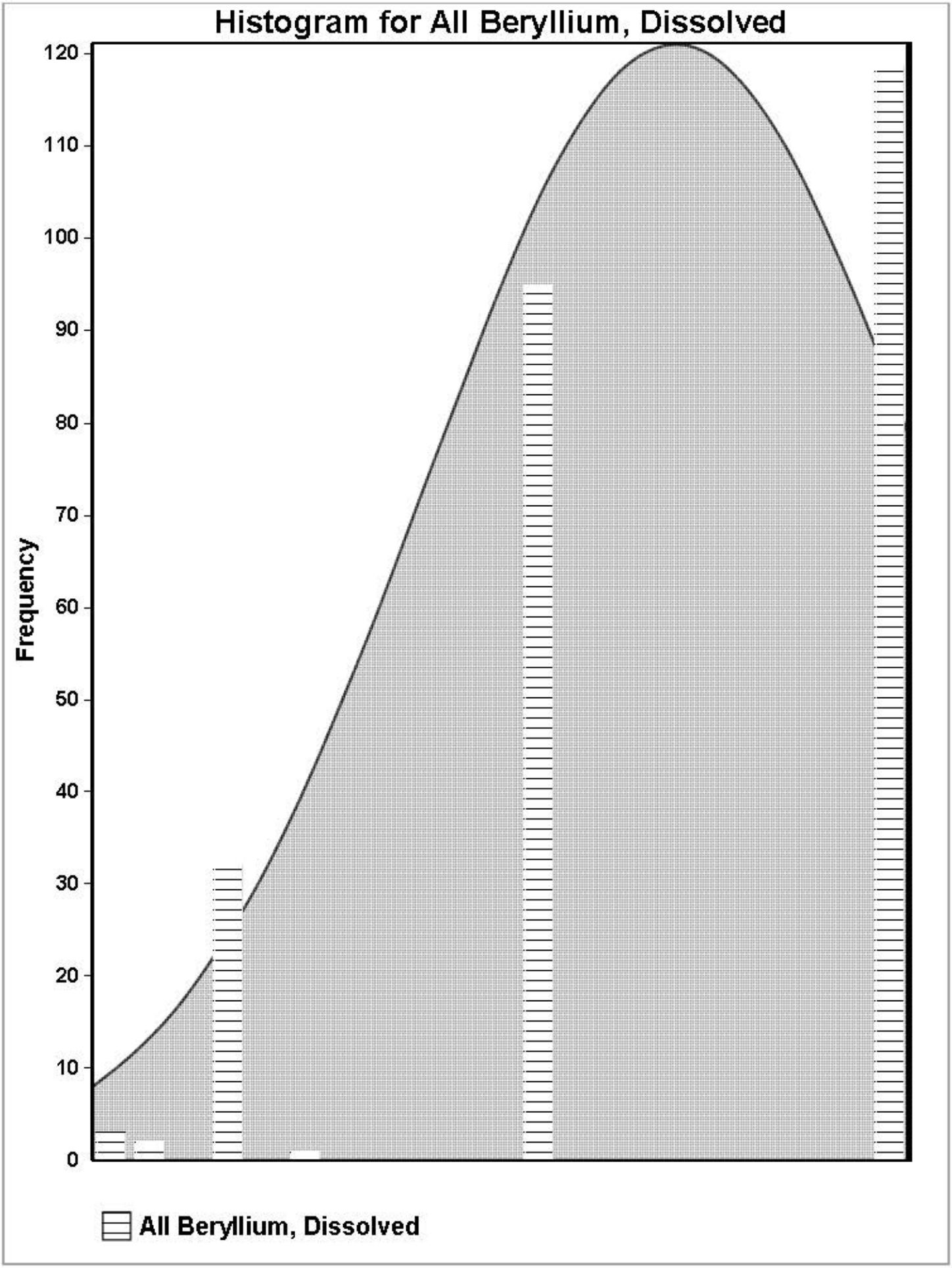
H0: Mu of Site or AOC = Mu of background

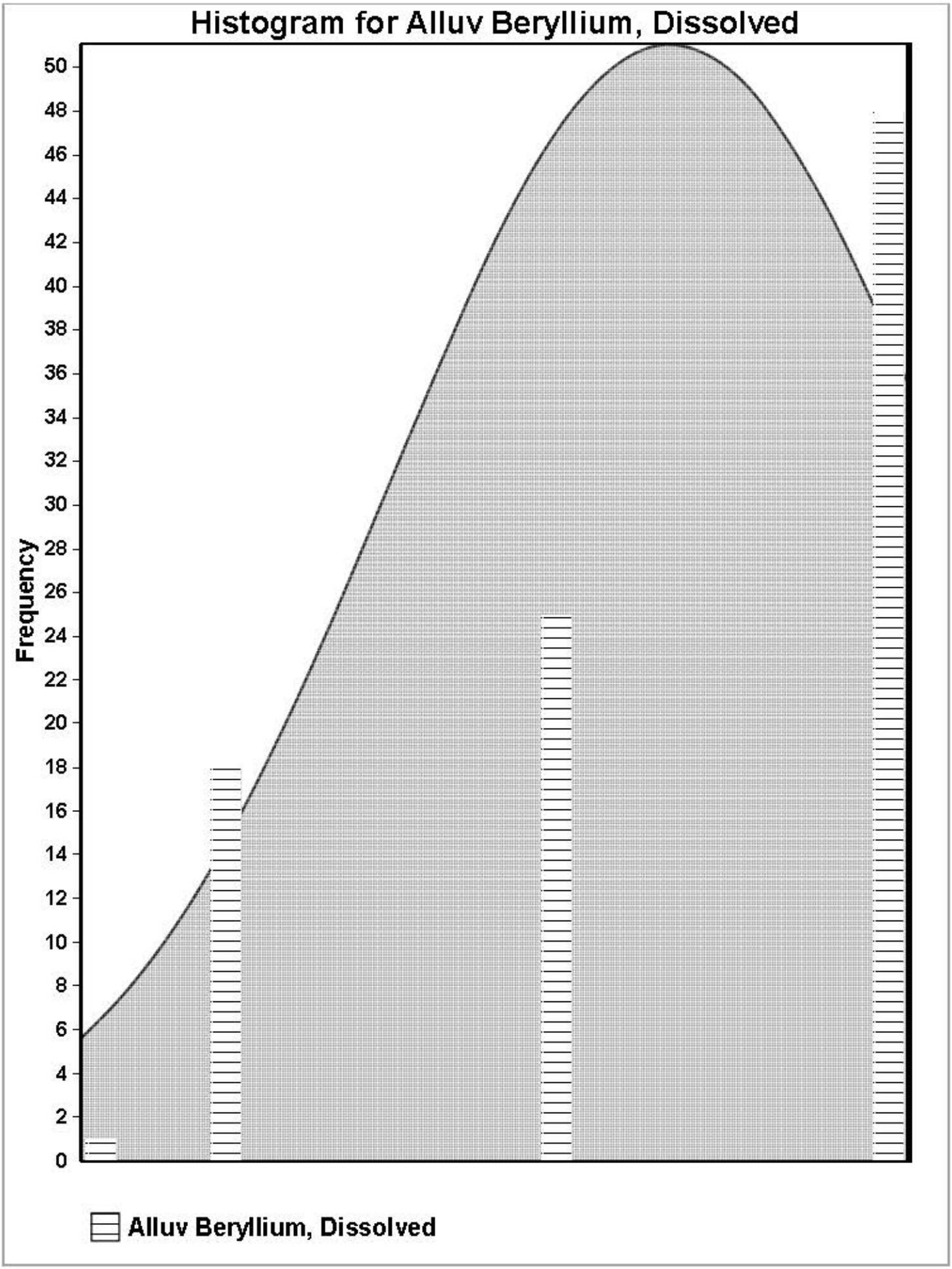
Gehan z Test Value	-1.541
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.123

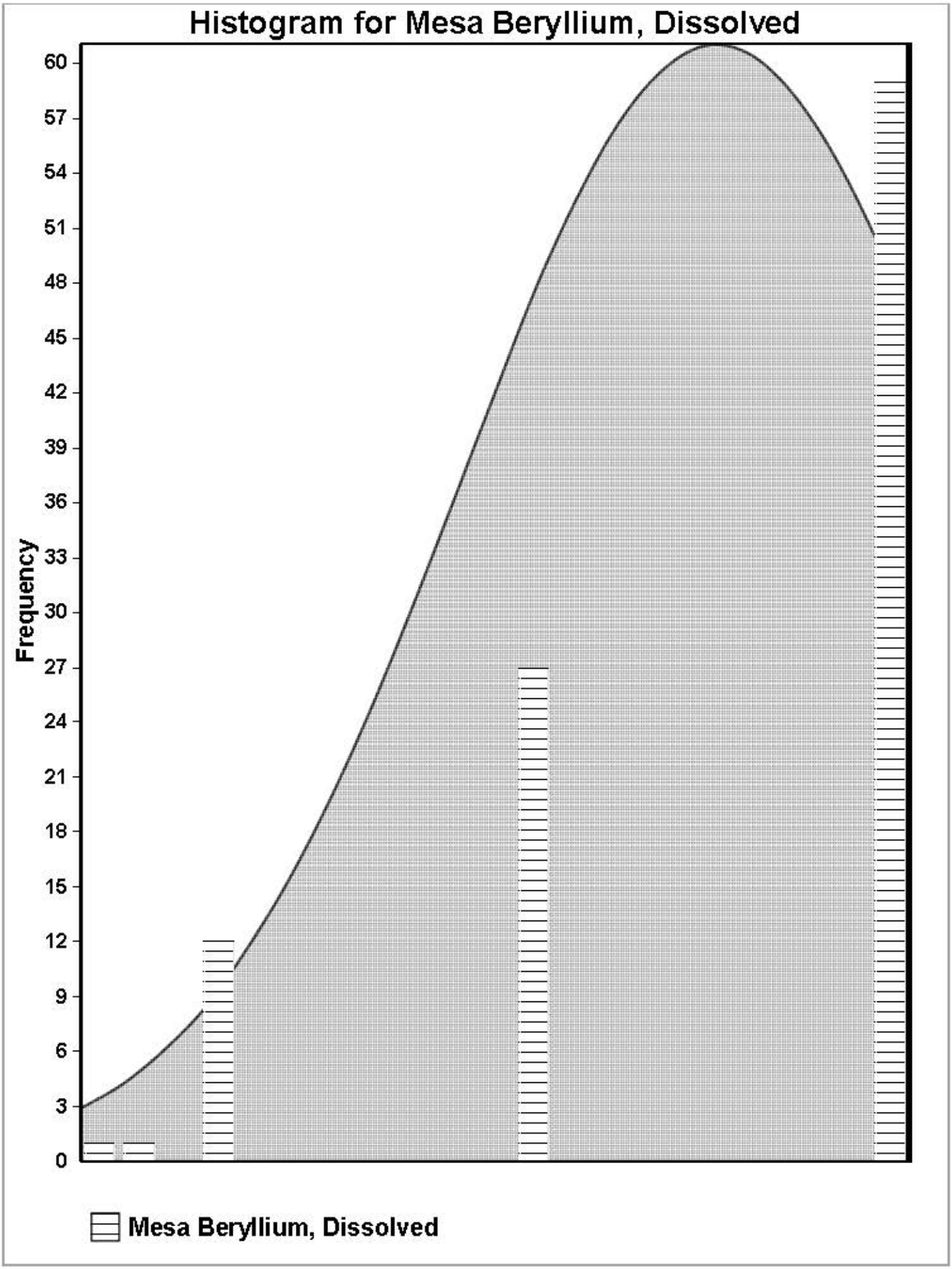
Conclusion with Alpha = 0.05

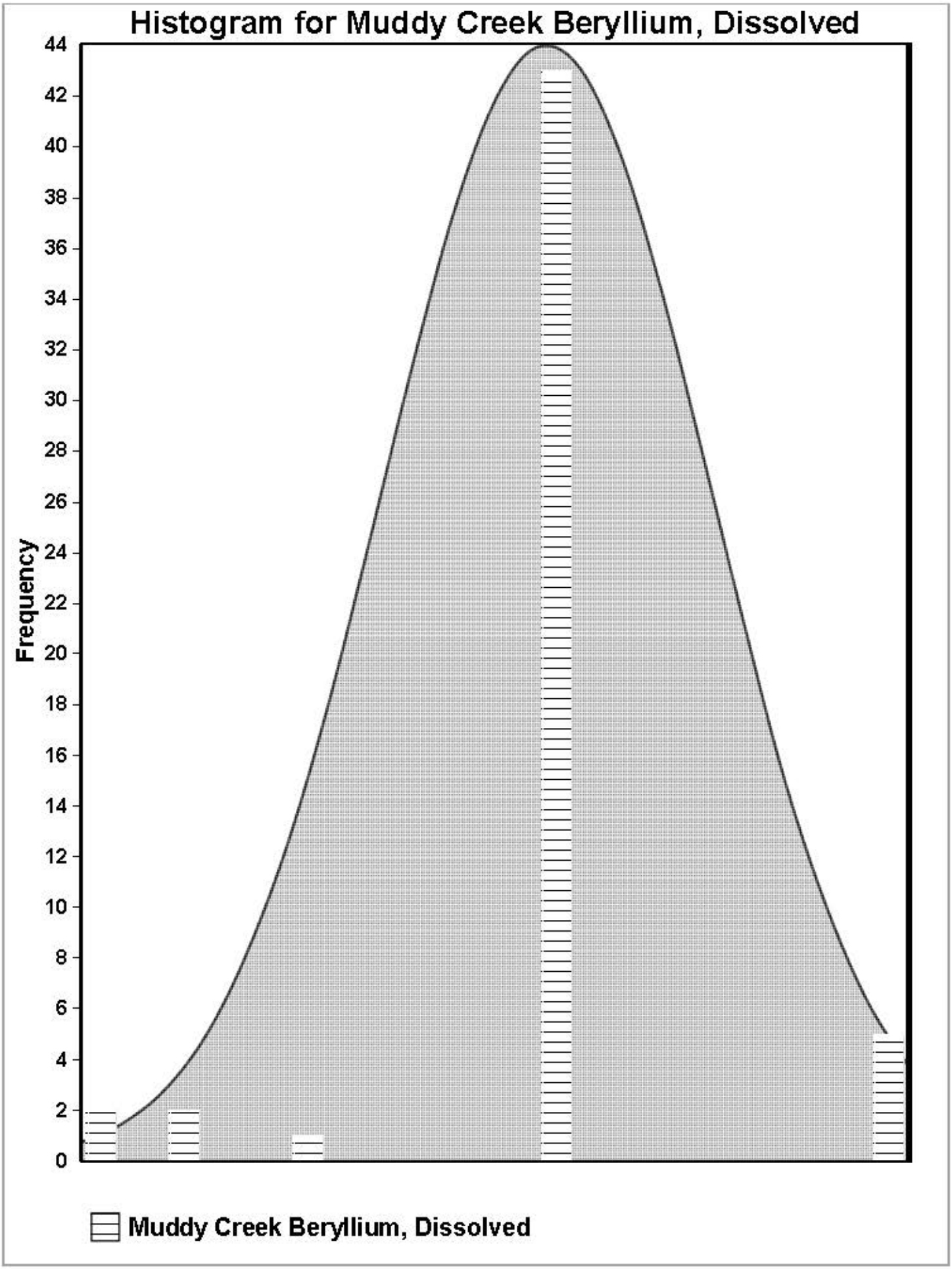
Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for All Beryllium, Dissolved
Frequency
120
110
100
90
80
70
60
50
40
30
20
10
0
All Beryllium, Dissolved


Histogram for Alluv Beryllium, Dissolved
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50
Alluv Beryllium, Dissolved


Histogram for Mesa Beryllium, Dissolved
Frequency
60
57
54
51
48
45
42
39
36
33
30
27
24
21
18
15
12
9
6
3
0
Mesa Beryllium, Dissolved


Histogram for Muddy Creek Beryllium, Dissolved
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
Muddy Creek Beryllium, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Beryllium_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Beryllium, Dissolved

Mean	0.00116
Standard Deviation	3.9670E-4
Number of data	92
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00116	3.9454E-4	5.0000E-4	12	1.67	3.356	3.726

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Beryllium, Dissolved

Mean	0.00103
Standard Deviation	1.9231E-4
Number of data	53
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00103	1.9049E-4	5.0000E-4	48	2.757	3.151	3.504

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Beryllium, Dissolved

Mean	0.00123
Standard Deviation	3.5772E-4
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00123	3.5593E-4	5.0000E-4	7	2.049	3.38	3.75

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for All Beryllium, Dissolved

Mean	0.00117
Standard Deviation	3.5229E-4
Number of data	252
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00117	3.5159E-4	5.0000E-4	12	1.901	3.672	4.042

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Location Name	Sample Date	Alluv Beryllium, Dissolved	D_Alluv Beryllium, Dissolved
BG-1S	#########	0.002	0
BG-1S	8/23/2012	0.002	0
BG-1S	5/24/2012	0.002	0
BG-1S	3/20/2012	0.002	0
IMW-2.5D	8/24/2012	0.002	0
IMW-2.5D	#########	0.002	0
IMW-2.5D	8/24/2012	0.003	0
IMW-2.5D	5/21/2012	0.002	0
IMW-2.5D	2/29/2012	0.003	0
IMW-2.5D	3/21/2012	0.002	0
IMW-2.5D	12/8/2011	0.003	0
IMW-2.5D	6/6/2011	0.001	0
IMW-2.5D	#########	0.001	0
IMW-2.5D	6/9/2010	0.003	0
IMW-2.5D	#########	0.003	0
IMW-2.5S	8/24/2012	0.002	0
IMW-2.5S	#########	0.002	0
IMW-2.5S	5/21/2012	0.002	0
IMW-2.5S	3/21/2012	0.002	0
IMW-2.5S	12/8/2011	0.003	0
IMW-2.5S	9/9/2011	0.003	0
IMW-2.5S	6/6/2011	0.001	0
IMW-2.5S	3/7/2011	0.001	0
IMW-2.5S	#########	0.001	0
IMW-2.5S	9/20/2010	0.001	0
IMW-2.5S	6/9/2010	0.003	0
IMW-2.5S	3/9/2010	0.003	0
IMW-2.5S	#########	0.003	0
IMW-2.5S	9/21/2009	0.003	0
IMW-3S	5/21/2012	0.00062	1
IMW-3S	3/20/2012	0.002	0
IMW-3S	12/9/2011	0.003	0
IMW-3S	9/9/2011	0.003	0
IMW-3S	6/7/2011	0.001	0
IMW-3S	3/7/2011	0.001	0
IMW-3S	#########	0.001	0
IMW-3S	9/16/2010	0.001	0
IMW-3S	6/8/2010	0.003	0
IMW-3S	3/9/2010	0.003	0
IMW-3S	#########	0.003	0
IMW-3S	9/14/2009	0.003	0
IMW-3S	6/9/2009	0.003	0
IMW-3S	3/3/2009	0.003	0
IMW-3S	12/9/2008	0.003	0
IMW-3S	9/9/2008	0.003	0
IMW-3S	6/3/2008	0.003	0
IMW-3S	3/4/2008	0.003	0
KMW-2D	8/24/2012	0.002	0
KMW-2D	#########	0.002	0
KMW-2D	5/21/2012	0.002	0

Location Name	Sample Date	Muddy Creek Beryllium, Dissolved	D_Muddy Creek Beryllium, Dissolved
BG-3S	11/27/2012	0.002	0
BG-3S	8/22/2012	0.002	0
BG-3S	5/23/2012	0.00071	1
BG-3S	3/21/2012	0.002	0
BG-4S	11/27/2012	0.002	0
BG-4S	8/30/2012	0.0013	1
BG-4S	5/30/2012	0.002	0
BG-4S	3/20/2012	0.002	0
BG-6S	11/27/2012	0.002	0
BG-6S	8/23/2012	0.002	0
BG-6S	5/25/2012	0.002	0
BG-6S	3/21/2012	0.002	0
BG-1M	11/26/2012	0.002	0
BG-1M	8/23/2012	0.002	0
BG-1M	5/24/2012	0.002	0
BG-1M	3/20/2012	0.002	0
BG-3M	11/27/2012	0.002	0
BG-3M	8/22/2012	0.002	0
BG-3M	5/24/2012	0.002	0
BG-3M	3/21/2012	0.002	0
BG-4M	11/27/2012	0.002	0
BG-4M	8/30/2012	0.002	0
BG-4M	5/30/2012	0.002	0
BG-4M	3/20/2012	0.002	0
BG-6M	11/27/2012	0.002	0
BG-6M	8/22/2012	0.002	0
BG-6M	5/25/2012	0.002	0
BG-6M	3/21/2012	0.002	0
BG-1D	11/26/2012	0.002	0
BG-1D	8/23/2012	0.002	0
BG-1D	5/24/2012	0.002	0
BG-1D	3/20/2012	0.002	0
BG-3D	11/27/2012	0.002	0
BG-3D	8/21/2012	0.002	0
BG-3D	5/23/2012	0.002	0
BG-3D	3/21/2012	0.002	0
BG-4D	11/27/2012	0.002	0
BG-4D	8/30/2012	0.002	0
BG-4D	5/30/2012	0.002	0
BG-4D	3/20/2012	0.002	0
BG-6D	11/27/2012	0.002	0
BG-6D	8/22/2012	0.002	0
BG-6D	5/25/2012	0.00082	1
BG-6D	3/21/2012	0.002	0
IMW-3D	5/25/2012	0.002	0
IMW-3D	3/22/2012	0.002	0
IMW-3D	12/9/2011	0.003	0
IMW-3D	6/7/2011	0.001	0
IMW-3D	12/10/2010	0.001	0
IMW-3D	6/8/2010	0.003	0

Location Name	Sample Date	Mesa Beryllium, Dissolved	D_Mesa Beryllium, Dissolved
LMW-10	11/28/2012	0.002	0
LMW-10	8/27/2012	0.002	0
LMW-10	5/30/2012	0.002	0
LMW-10	3/22/2012	0.002	0
LMW-10	12/6/2011	0.003	0
LMW-10	9/8/2011	0.003	0
LMW-10	6/8/2011	0.001	0
LMW-10	3/2/2011	0.001	0
LMW-10	12/9/2010	0.002	0
LMW-10	9/21/2010	0.001	0
LMW-10	6/9/2010	0.003	0
LMW-10	3/11/2010	0.003	0
LMW-10	12/11/2009	0.003	0
LMW-10	9/18/2009	0.003	0
LMW-10	6/10/2009	0.003	0
LMW-10	3/5/2009	0.003	0
LMW-10	12/12/2008	0.003	0
LMW-10	9/10/2008	0.003	0
LMW-10	6/4/2008	0.003	0
LMW-10	3/5/2008	0.003	0
LMW-11R	8/21/2012	0.002	0
LMW-11R	11/26/2012	0.002	0
LMW-11R	5/29/2012	0.002	0
LMW-11R	3/23/2012	0.002	0
LMW-7	8/27/2012	0.002	0
LMW-7	11/28/2012	0.002	0
LMW-7	5/31/2012	0.002	0
LMW-7	3/23/2012	0.002	0
LMW-7	12/5/2011	0.003	0
LMW-7	9/6/2011	0.003	0
LMW-7	6/9/2011	0.001	0
LMW-7	3/9/2011	0.001	0
LMW-7	12/10/2010	0.001	0
LMW-7	9/21/2010	0.001	0
LMW-7	6/9/2010	0.003	0
LMW-7	3/11/2010	0.003	0
LMW-7	12/11/2009	0.003	0
LMW-7	9/18/2009	0.003	0
LMW-7	6/10/2009	0.003	0
LMW-7	3/5/2009	0.003	0
LMW-7	12/12/2008	0.003	0
LMW-7	9/10/2008	0.003	0
LMW-7	6/4/2008	0.003	0
LMW-7	3/5/2008	0.003	0
BG-2S	11/26/2012	0.002	0
BG-2S	8/23/2012	0.002	0
BG-2S	5/24/2012	0.002	0
BG-2S	3/21/2012	0.002	0
BG-2M	11/26/2012	0.002	0
BG-2M	8/23/2012	0.002	0

Location Name	Sample Date	All Beryllium, Dissolved	D_All Beryllium, Dissolved
BG-1S	11/26/2012	0.002	0
BG-1S	8/23/2012	0.002	0
BG-1S	5/24/2012	0.002	0
BG-1S	3/20/2012	0.002	0
IMW-2.5D	8/24/2012	0.002	0
IMW-2.5D	11/26/2012	0.002	0
IMW-2.5D	8/24/2012	0.003	0
IMW-2.5D	5/21/2012	0.002	0
IMW-2.5D	2/29/2012	0.003	0
IMW-2.5D	3/21/2012	0.002	0
IMW-2.5D	12/8/2011	0.003	0
IMW-2.5D	6/6/2011	0.001	0
IMW-2.5D	12/15/2010	0.001	0
IMW-2.5D	6/9/2010	0.003	0
IMW-2.5D	12/12/2009	0.003	0
IMW-2.5S	8/24/2012	0.002	0
IMW-2.5S	11/26/2012	0.002	0
IMW-2.5S	8/24/2012	0.003	0
IMW-2.5S	5/21/2012	0.002	0
IMW-2.5S	3/21/2012	0.002	0
IMW-2.5S	2/29/2012	0.003	0
IMW-2.5S	12/8/2011	0.003	0
IMW-2.5S	9/9/2011	0.003	0
IMW-2.5S	6/6/2011	0.001	0
IMW-2.5S	3/7/2011	0.001	0
IMW-2.5S	12/15/2010	0.001	0
IMW-2.5S	9/20/2010	0.001	0
IMW-2.5S	6/9/2010	0.003	0
IMW-2.5S	3/9/2010	0.003	0
IMW-2.5S	12/12/2009	0.003	0
IMW-2.5S	9/21/2009	0.003	0
IMW-3S	5/21/2012	0.00062	1
IMW-3S	2/29/2012	0.003	0
IMW-3S	3/20/2012	0.002	0
IMW-3S	12/9/2011	0.003	0
IMW-3S	9/9/2011	0.003	0
IMW-3S	6/7/2011	0.001	0
IMW-3S	3/7/2011	0.001	0
IMW-3S	12/10/2010	0.001	0
IMW-3S	9/16/2010	0.001	0
IMW-3S	6/8/2010	0.003	0
IMW-3S	3/9/2010	0.003	0
IMW-3S	12/10/2009	0.003	0
IMW-3S	9/14/2009	0.003	0
IMW-3S	6/9/2009	0.003	0
IMW-3S	3/3/2009	0.003	0
IMW-3S	12/9/2008	0.003	0
IMW-3S	9/9/2008	0.003	0
IMW-3S	6/3/2008	0.003	0
IMW-3S	3/4/2008	0.003	0

KMW-2D	3/23/2012	0.002	0
KMW-2D	2/28/2012	0.003	0
KMW-2D	12/8/2011	0.003	0
KMW-2D	6/6/2011	0.001	0
KMW-2D	#########	0.001	0
KMW-2D	6/8/2010	0.003	0
KMW-2D	12/8/2009	0.003	0
KMW-2D	#########	0.003	0
KMW-2D	6/3/2008	0.003	0
KMW-2M	8/24/2012	0.002	0
KMW-2M	#########	0.002	0
KMW-2M	5/21/2012	0.002	0
KMW-2M	3/23/2012	0.002	0
KMW-2M	2/28/2012	0.003	0
KMW-2M	12/8/2011	0.003	0
KMW-2M	6/6/2011	0.001	0
KMW-2M	#########	0.001	0
KMW-2M	6/8/2010	0.003	0
KMW-2M	12/8/2009	0.003	0
KMW-2M	#########	0.003	0
KMW-2M	6/3/2008	0.003	0
KMW-2S	8/24/2012	0.002	0
KMW-2S	#########	0.002	0
KMW-2S	5/21/2012	0.002	0
KMW-2S	2/28/2012	0.003	0
KMW-2S	3/23/2012	0.002	0
KMW-2S	12/8/2011	0.003	0
KMW-2S	9/9/2011	0.003	0
KMW-2S	6/6/2011	0.001	0
KMW-2S	3/8/2011	0.001	0
KMW-2S	#########	0.001	0
KMW-2S	9/15/2010	0.001	0
KMW-2S	6/8/2010	0.003	0
KMW-2S	3/9/2010	0.003	0
KMW-2S	12/8/2009	0.003	0
KMW-2S	9/16/2009	0.003	0
KMW-2S	6/10/2009	0.003	0
KMW-2S	3/3/2009	0.003	0
KMW-2S	#########	0.003	0
KMW-2S	9/8/2008	0.003	0
KMW-2S	6/3/2008	0.003	0
KMW-2S	3/4/2008	0.003	0

IMW-3D	12/10/2009	0.003	0
IMW-3D	12/9/2008	0.003	0
IMW-3D	6/3/2008	0.003	0

BG-2M	5/24/2012	0.00083	1
BG-2M	3/21/2012	0.002	0
BG-2D	11/26/2012	0.002	0
BG-2D	8/23/2012	0.00061	1
BG-2D	5/24/2012	0.002	0
BG-2D	3/21/2012	0.002	0
LMW-9	8/27/2012	0.002	0
LMW-9	11/28/2012	0.002	0
LMW-9	5/31/2012	0.002	0
LMW-9	3/23/2012	0.002	0
LMW-9	12/5/2011	0.003	0
LMW-9	9/8/2011	0.003	0
LMW-9	6/8/2011	0.001	0
LMW-9	3/9/2011	0.001	0
LMW-9	12/10/2010	0.001	0
LMW-9	9/21/2010	0.001	0
LMW-9	6/9/2010	0.003	0
LMW-9	3/11/2010	0.003	0
LMW-9	12/11/2009	0.003	0
LMW-9	9/18/2009	0.003	0
LMW-9	6/10/2009	0.003	0
LMW-9	3/5/2009	0.003	0
LMW-9	12/12/2008	0.003	0
LMW-9	9/10/2008	0.003	0
LMW-9	6/4/2008	0.003	0
LMW-9	3/5/2008	0.003	0
LMW-11	3/2/2011	0.001	0
LMW-11	9/8/2011	0.003	0
LMW-11	12/6/2011	0.003	0
LMW-11	2/22/2012	0.003	0
LMW-12R	5/30/2012	0.003	0
LMW-12R	8/21/2012	0.003	0
LMW-12R	10/22/2012	0.003	0
LMW-12R	11/30/2012	0.003	0
LMW-13R	5/29/2012	0.003	0
LMW-13R	8/20/2012	0.003	0
LMW-13R	10/22/2012	0.003	0
LMW-13R	11/28/2012	0.003	0
LMW-14R	5/29/2012	0.003	0
LMW-14R	8/20/2012	0.003	0
LMW-14R	10/22/2012	0.003	0
LMW-14R	11/30/2012	0.003	0
LMW-15	5/29/2012	0.003	0
LMW-15	8/20/2012	0.003	0
LMW-15	10/22/2012	0.003	0
LMW-15	11/28/2012	0.003	0
LMW-16	5/29/2012	0.003	0
LMW-16	8/20/2012	0.003	0
LMW-16	10/22/2012	0.003	0
LMW-16	11/28/2012	0.003	0

KMW-2D	8/24/2012	0.002	0
KMW-2D	11/26/2012	0.002	0
KMW-2D	8/24/2012	0.003	0
KMW-2D	5/21/2012	0.002	0
KMW-2D	3/23/2012	0.002	0
KMW-2D	2/28/2012	0.003	0
KMW-2D	12/8/2011	0.003	0
KMW-2D	6/6/2011	0.001	0
KMW-2D	12/13/2010	0.001	0
KMW-2D	6/8/2010	0.003	0
KMW-2D	12/8/2009	0.003	0
KMW-2D	12/10/2008	0.003	0
KMW-2D	6/3/2008	0.003	0
KMW-2M	8/24/2012	0.002	0
KMW-2M	11/26/2012	0.002	0
KMW-2M	8/24/2012	0.003	0
KMW-2M	5/21/2012	0.002	0
KMW-2M	3/23/2012	0.002	0
KMW-2M	2/28/2012	0.003	0
KMW-2M	12/8/2011	0.003	0
KMW-2M	6/6/2011	0.001	0
KMW-2M	12/13/2010	0.001	0
KMW-2M	6/8/2010	0.003	0
KMW-2M	12/8/2009	0.003	0
KMW-2M	12/10/2008	0.003	0
KMW-2M	6/3/2008	0.003	0
KMW-2S	8/24/2012	0.002	0
KMW-2S	11/26/2012	0.002	0
KMW-2S	8/24/2012	0.003	0
KMW-2S	5/21/2012	0.002	0
KMW-2S	2/28/2012	0.003	0
KMW-2S	3/23/2012	0.002	0
KMW-2S	12/8/2011	0.003	0
KMW-2S	9/9/2011	0.003	0
KMW-2S	6/6/2011	0.001	0
KMW-2S	3/8/2011	0.001	0
KMW-2S	12/13/2010	0.001	0
KMW-2S	9/15/2010	0.001	0
KMW-2S	6/8/2010	0.003	0
KMW-2S	3/9/2010	0.003	0
KMW-2S	12/8/2009	0.003	0
KMW-2S	9/16/2009	0.003	0
KMW-2S	6/10/2009	0.003	0
KMW-2S	3/3/2009	0.003	0
KMW-2S	12/10/2008	0.003	0
KMW-2S	9/8/2008	0.003	0
KMW-2S	6/3/2008	0.003	0
KMW-2S	3/4/2008	0.003	0
BG-3S	11/27/2012	0.002	0
BG-3S	8/22/2012	0.002	0
BG-3S	5/23/2012	0.00071	1
BG-3S	3/21/2012	0.002	0

BG-4S	11/27/2012	0.002	0
BG-4S	8/30/2012	0.0013	1
BG-4S	5/30/2012	0.002	0
BG-4S	3/20/2012	0.002	0
BG-6S	11/27/2012	0.002	0
BG-6S	8/23/2012	0.002	0
BG-6S	5/25/2012	0.002	0
BG-6S	3/21/2012	0.002	0
BG-1M	11/26/2012	0.002	0
BG-1M	8/23/2012	0.002	0
BG-1M	5/24/2012	0.002	0
BG-1M	3/20/2012	0.002	0
BG-3M	11/27/2012	0.002	0
BG-3M	8/22/2012	0.002	0
BG-3M	5/24/2012	0.002	0
BG-3M	3/21/2012	0.002	0
BG-4M	11/27/2012	0.002	0
BG-4M	8/30/2012	0.002	0
BG-4M	5/30/2012	0.002	0
BG-4M	3/20/2012	0.002	0
BG-6M	11/27/2012	0.002	0
BG-6M	8/22/2012	0.002	0
BG-6M	5/25/2012	0.002	0
BG-6M	3/21/2012	0.002	0
BG-1D	11/26/2012	0.002	0
BG-1D	8/23/2012	0.002	0
BG-1D	5/24/2012	0.002	0
BG-1D	3/20/2012	0.002	0
BG-3D	11/27/2012	0.002	0
BG-3D	8/21/2012	0.002	0
BG-3D	5/23/2012	0.002	0
BG-3D	3/21/2012	0.002	0
BG-4D	11/27/2012	0.002	0
BG-4D	8/30/2012	0.002	0
BG-4D	5/30/2012	0.002	0
BG-4D	3/20/2012	0.002	0
BG-6D	11/27/2012	0.002	0
BG-6D	8/22/2012	0.002	0
BG-6D	5/25/2012	0.00082	1
BG-6D	3/21/2012	0.002	0
IMW-3D	5/25/2012	0.002	0
IMW-3D	2/29/2012	0.003	0
IMW-3D	3/22/2012	0.002	0
IMW-3D	12/9/2011	0.003	0
IMW-3D	6/7/2011	0.001	0
IMW-3D	12/10/2010	0.001	0
IMW-3D	6/8/2010	0.003	0
IMW-3D	12/10/2009	0.003	0
IMW-3D	12/9/2008	0.003	0
IMW-3D	6/3/2008	0.003	0
LMW-10	11/28/2012	0.002	0
LMW-10	8/27/2012	0.002	0

LMW-10	5/30/2012	0.002	0			
LMW-10	3/22/2012	0.002	0			
LMW-10	12/6/2011	0.003	0			
LMW-10	9/8/2011	0.003	0			
LMW-10	6/8/2011	0.001	0			
LMW-10	3/2/2011	0.001	0			
LMW-10	12/9/2010	0.002	0			
LMW-10	9/21/2010	0.001	0			
LMW-10	6/9/2010	0.003	0			
LMW-10	3/11/2010	0.003	0			
LMW-10	12/11/2009	0.003	0			
LMW-10	9/18/2009	0.003	0			
LMW-10	6/10/2009	0.003	0			
LMW-10	3/5/2009	0.003	0			
LMW-10	12/12/2008	0.003	0			
LMW-10	9/10/2008	0.003	0			
LMW-10	6/4/2008	0.003	0			
LMW-10	3/5/2008	0.003	0			
LMW-11R	8/21/2012	0.002	0			
LMW-11R	11/26/2012	0.002	0			
LMW-11R	5/29/2012	0.002	0			
LMW-11R	3/23/2012	0.002	0			
LMW-7	8/27/2012	0.002	0			
LMW-7	11/28/2012	0.002	0			
LMW-7	5/31/2012	0.002	0			
LMW-7	3/23/2012	0.002	0			
LMW-7	12/5/2011	0.003	0			
LMW-7	9/6/2011	0.003	0			
LMW-7	6/9/2011	0.001	0			
LMW-7	3/9/2011	0.001	0			
LMW-7	12/10/2010	0.001	0			
LMW-7	9/21/2010	0.001	0			
LMW-7	6/9/2010	0.003	0			
LMW-7	3/11/2010	0.003	0			
LMW-7	12/11/2009	0.003	0			
LMW-7	9/18/2009	0.003	0			
LMW-7	6/10/2009	0.003	0			
LMW-7	3/5/2009	0.003	0			
LMW-7	12/12/2008	0.003	0			
LMW-7	9/10/2008	0.003	0			
LMW-7	6/4/2008	0.003	0			
LMW-7	3/5/2008	0.003	0			
BG-2S	11/26/2012	0.002	0			
BG-2S	8/23/2012	0.002	0			
BG-2S	5/24/2012	0.002	0			
BG-2S	3/21/2012	0.002	0			
BG-2M	11/26/2012	0.002	0			
BG-2M	8/23/2012	0.002	0			
BG-2M	5/24/2012	0.00083	1			
BG-2M	3/21/2012	0.002	0			
BG-2D	11/26/2012	0.002	0			
BG-2D	8/23/2012	0.00061	1			

BG-2D	5/24/2012	0.002		0
BG-2D	3/21/2012	0.002		0
LMW-9	8/27/2012	0.002		0
LMW-9	11/28/2012	0.002		0
LMW-9	5/31/2012	0.002		0
LMW-9	3/23/2012	0.002		0
LMW-9	12/5/2011	0.003		0
LMW-9	9/8/2011	0.003		0
LMW-9	6/8/2011	0.001		0
LMW-9	3/9/2011	0.001		0
LMW-9	12/10/2010	0.001		0
LMW-9	9/21/2010	0.001		0
LMW-9	6/9/2010	0.003		0
LMW-9	3/11/2010	0.003		0
LMW-9	12/11/2009	0.003		0
LMW-9	9/18/2009	0.003		0
LMW-9	6/10/2009	0.003		0
LMW-9	3/5/2009	0.003		0
LMW-9	12/12/2008	0.003		0
LMW-9	9/10/2008	0.003		0
LMW-9	6/4/2008	0.003		0
LMW-9	3/5/2008	0.003		0
LMW-11	3/2/2011	0.001		0
LMW-11	9/8/2011	0.003		0
LMW-11	12/6/2011	0.003		0
LMW-11	2/22/2012	0.003		0
LMW-12R	5/30/2012	0.003		0
LMW-12R	8/21/2012	0.003		0
LMW-12R	10/22/2012	0.003		0
LMW-12R	11/30/2012	0.003		0
LMW-13R	5/29/2012	0.003		0
LMW-13R	8/20/2012	0.003		0
LMW-13R	10/22/2012	0.003		0
LMW-13R	11/28/2012	0.003		0
LMW-14R	5/29/2012	0.003		0
LMW-14R	8/20/2012	0.003		0
LMW-14R	10/22/2012	0.003		0
LMW-14R	11/30/2012	0.003		0
LMW-15	5/29/2012	0.003		0
LMW-15	8/20/2012	0.003		0
LMW-15	10/22/2012	0.003		0
LMW-15	11/28/2012	0.003		0
LMW-16	5/29/2012	0.003		0
LMW-16	8/20/2012	0.003		0
LMW-16	10/22/2012	0.003		0
LMW-16	11/28/2012	0.003		0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Bis(2-ethylhexyl)phthalate.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Bis(2-ethylhexyl)phthalate

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	20	6	23.08%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	6	1	3	1.333	1	0.816
Statistics (Detects Only)	20	0.54	2.7	1.145	0.93	0.632
Statistics (All: NDs treated as DL value)	26	0.54	3	1.188	1	0.666
Statistics (All: NDs treated as DL/2 value)	26	0.5	2.7	1.035	0.77	0.615
Statistics (Normal ROS Estimated Data)	26	0.297	2.7	1.063	0.921	0.588
Statistics (Gamma ROS Estimated Data)	26	0.478	2.7	1.13	1.015	0.576
Statistics (Lognormal ROS Estimated Data)	26	0.497	2.7	1.059	0.877	0.58

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.165	3.71	0.275	0.0106	0.496	46.88
Statistics (NDs = DL)	4.249	3.784	0.28	0.0504	0.482	9.572
Statistics (NDs = DL/2)	3.64	3.246	0.284	-0.11	0.527	-4.806
Statistics (Gamma ROS Estimates)	4.656	4.145	0.243	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.0579	0.466	-8.036

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.916	0.897	0.908	0.919

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.833	0.905	Data Not Normal
Lilliefors (Detects Only)	0.228	0.198	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.803	0.92	Data Not Normal
Lilliefors (NDs = DL)	0.284	0.174	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.82	0.92	Data Not Normal
Lilliefors (NDs = DL/2)	0.193	0.174	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.847	0.92	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.24	0.174	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.969	0.959	0.972	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.861	0.745	
Kolmogorov-Smirnov (Detects Only)	0.167	0.195	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	1.179	0.747	
Kolmogorov-Smirnov (NDs = DL)	0.228	0.172	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	1.078	0.749	
Kolmogorov-Smirnov (NDs = DL/2)	0.173	0.172	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.495	0.747	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.115	0.172	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.964	0.963	0.958	0.962

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.915	0.905	Data Appear Lognormal
Lilliefors (Detects Only)	0.144	0.198	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.917	0.92	Data Not Lognormal
Lilliefors (NDs = DL)	0.194	0.174	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.901	0.92	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.152	0.174	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.917	0.92	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.14	0.174	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Bis(2-ethylhexyl)phthalate

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	29	17	36.96%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	17	1	3	1.353	1	0.786
Statistics (Detects Only)	29	0.51	3.3	0.947	0.83	0.563
Statistics (All: NDs treated as DL value)	46	0.51	3.3	1.097	1	0.675
Statistics (All: NDs treated as DL/2 value)	46	0.5	3.3	0.847	0.65	0.519
Statistics (Normal ROS Estimated Data)	46	0.169	3.3	0.885	0.824	0.486
Statistics (Gamma ROS Estimated Data)	46	0.51	3.3	0.954	0.917	0.446
Statistics (Lognormal ROS Estimated Data)	46	0.43	3.3	0.878	0.787	0.468

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.949	4.64	0.191	-0.159	0.421	-2.649
Statistics (NDs = DL)	4.288	4.022	0.256	-0.0286	0.454	-15.89
Statistics (NDs = DL/2)	4.374	4.103	0.194	-0.285	0.452	-1.587
Statistics (Gamma ROS Estimates)	7.652	7.167	0.125	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.214	0.375	-1.757

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.799	0.803	0.817	0.84

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.662	0.926	Data Not Normal
Lilliefors (Detects Only)	0.249	0.165	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.648	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.34	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.69	0.945	Data Not Normal

Lilliefors (NDs = DL/2)	0.252	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.743	0.945	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.178	0.131	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.888	0.883	0.913	0.904

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.374	0.748	
Kolmogorov-Smirnov (Detects Only)	0.187	0.163	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.615	0.753	
Kolmogorov-Smirnov (NDs = DL)	0.293	0.131	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.575	0.753	
Kolmogorov-Smirnov (NDs = DL/2)	0.198	0.131	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.892	0.751	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.197	0.131	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.939	0.921	0.923	0.948

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.888	0.926	Data Not Lognormal
Lilliefors (Detects Only)	0.148	0.165	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.843	0.945	Data Not Lognormal
Lilliefors (NDs = DL)	0.258	0.131	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.846	0.945	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.183	0.131	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.914	0.945	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.105	0.131	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Bis(2-ethylhexyl)phthalate

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	17	11	39.29%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	11	1	3	1.182	1	0.603
Statistics (Detects Only)	17	0.52	18	1.782	0.82	4.182
Statistics (All: NDs treated as DL value)	28	0.52	18	1.546	0.94	3.254
Statistics (All: NDs treated as DL/2 value)	28	0.5	18	1.314	0.625	3.278
Statistics (Normal ROS Estimated Data)	28	-1.672	18	1.58	0.835	3.384
Statistics (Gamma ROS Estimated Data)	28	0.237	18	1.734	0.88	3.26
Statistics (Lognormal ROS Estimated Data)	28	0.388	18	1.421	0.82	3.258

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.871	0.802	2.046	-0.0957	0.795	-8.307
Statistics (NDs = DL)	1.239	1.13	1.248	-0.0189	0.652	-34.52
Statistics (NDs = DL/2)	1.02	0.935	1.288	-0.291	0.69	-2.371

Statistics (Gamma ROS Estimates)	1.172	1.07	1.48	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.145	0.664	-4.564

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.513	0.483	0.461	0.642

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.293	0.892	Data Not Normal
Lilliefors (Detects Only)	0.515	0.215	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.265	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.495	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.244	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.467	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.451	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.323	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.744	0.682	0.678	0.921

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	4.558	0.771	
Kolmogorov-Smirnov (Detects Only)	0.488	0.216	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	6.326	0.768	
Kolmogorov-Smirnov (NDs = DL)	0.485	0.169	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	6.218	0.773	
Kolmogorov-Smirnov (NDs = DL/2)	0.398	0.17	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.809	0.77	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.267	0.17	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.683	0.727	0.724	0.764

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.5	0.892	Data Not Lognormal
Lilliefors (Detects Only)	0.393	0.215	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.562	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.417	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.553	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.28	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.621	0.924	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.27	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

All Bis(2-ethylhexyl)phthalate

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	66	34	34.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	34	1	3	1.294	1	0.719
Statistics (Detects Only)	66	0.51	18	1.222	0.825	2.162
Statistics (All: NDs treated as DL value)	100	0.51	18	1.247	1	1.801
Statistics (All: NDs treated as DL/2 value)	100	0.5	18	1.027	0.68	1.785
Statistics (Normal ROS Estimated Data)	100	-0.814	18	1.08	0.833	1.809
Statistics (Gamma ROS Estimated Data)	100	0.51	18	1.242	0.96	1.759
Statistics (Lognormal ROS Estimated Data)	100	0.348	18	1.075	0.815	1.77

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.862	1.813	0.656	-0.0913	0.556	-6.09
Statistics (NDs = DL)	2.368	2.304	0.526	-0.00533	0.519	-97.35
Statistics (NDs = DL/2)	2.022	1.968	0.508	-0.241	0.547	-2.269
Statistics (Gamma ROS Estimates)	2.652	2.579	0.468	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.159	0.499	-3.143

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.48	0.505	0.468	0.541

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.371	0.109	Data Not Normal
Lilliefors (NDs = DL)	0.362	0.0886	Data Not Normal
Lilliefors (NDs = DL/2)	0.384	0.0886	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.278	0.0886	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.641	0.645	0.62	0.708

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	7.532	0.765	
Kolmogorov-Smirnov (Detects Only)	0.275	0.111	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	10.52	0.763	
Kolmogorov-Smirnov (NDs = DL)	0.322	0.0904	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	9.288	0.765	
Kolmogorov-Smirnov (NDs = DL/2)	0.253	0.0906	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	5.761	0.761	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.163	0.0903	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.863	0.879	0.874	0.89

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.191	0.109	Data Not Lognormal
Lilliefors (NDs = DL)	0.276	0.0886	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.204	0.0886	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.145	0.0886	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.											

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Bis(2-ethylhexyl)phthalate.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Bis(2-ethylhexyl)phthalate

General Statistics

Number of Valid Data	26	Number of Detected Data	20
Number of Distinct Detected Data	16	Number of Non-Detect Data	6
		Percent Non-Detects	23.08%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.54	Minimum Detected	-0.616
Maximum Detected	2.7	Maximum Detected	0.993
Mean of Detected	1.145	Mean of Detected	0.0106
SD of Detected	0.632	SD of Detected	0.496
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	3	Maximum Non-Detect	1.099

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	26
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.833	Shapiro Wilk Test Statistic	0.915
5% Shapiro Wilk Critical Value	0.905	5% Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.035	Mean (Log Scale)	-0.11
SD	0.615	SD (Log Scale)	0.527
95% UTL 95% Coverage	2.435	95% UTL 95% Coverage	2.969
95% UPL (t)	2.106	95% UPL (t)	2.241
90% Percentile (z)	1.823	90% Percentile (z)	1.76
95% Percentile (z)	2.047	95% Percentile (z)	2.131
99% Percentile (z)	2.466	99% Percentile (z)	3.051
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	1.059
		SD in Original Scale	0.58
		Mean in Log Scale	-0.0579
		SD in Log Scale	0.466
		95% UTL 95% Coverage	2.722
		95% UPL (t)	2.122

		90% Percentile (z)	1.714
		95% Percentile (z)	2.03
		99% Percentile (z)	2.788
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.574	Data follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.32		
nu star	142.9		
A-D Test Statistic	0.861	Nonparametric Statistics	
5% A-D Critical Value	0.745	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.167	Mean	1.058
5% K-S Critical Value	0.195	SD	0.58
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	0.12
		95% KM UTL with 95% Coverage	2.378
Assuming Gamma Distribution		95% KM Chebyshev UPL	3.636
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	2.068
Mean	1.13	90% Percentile (z)	1.802
Median	1.015	95% Percentile (z)	2.013
SD	0.576	99% Percentile (z)	2.408
k star	4.145		
Theta star	0.273	Gamma ROS Limits with Extrapolated Data	
Nu star	215.5	95% Wilson Hilferty (WH) Approx. Gamma UPL	2.205
95% Percentile of Chisquare (2k)	15.92	95% Hawkins Wixley (HW) Approx. Gamma UPL	2.223
		95% WH Approx. Gamma UTL with 95% Coverage	2.682
90% Percentile	1.874	95% HW Approx. Gamma UTL with 95% Coverage	2.736
95% Percentile	2.17		
99% Percentile	2.801		

Note: DL/2 is not a recommended method.

Muddy Creek Bis(2-ethylhexyl)phthalate

General Statistics			
Number of Valid Data	46	Number of Detected Data	29
Number of Distinct Detected Data	23	Number of Non-Detect Data	17
		Percent Non-Detects	36.96%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.51	Minimum Detected	-0.673
Maximum Detected	3.3	Maximum Detected	1.194
Mean of Detected	0.947	Mean of Detected	-0.159
SD of Detected	0.563	SD of Detected	0.421
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	3	Maximum Non-Detect	1.099
Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	45
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	97.83%
Background Statistics			

Normal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.662
5% Shapiro Wilk Critical Value	0.926
Data not Normal at 5% Significance Level	
Assuming Normal Distribution	
DL/2 Substitution Method	
Mean	0.847
SD	0.519
95% UTL 95% Coverage	1.926
95% UPL (t)	1.728
90% Percentile (z)	1.512
95% Percentile (z)	1.7
99% Percentile (z)	2.054
Maximum Likelihood Estimate(MLE) Method	N/A

Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.888
5% Shapiro Wilk Critical Value	0.926
Data not Lognormal at 5% Significance Level	
Assuming Lognormal Distribution	
DL/2 Substitution Method	
Mean (Log Scale)	-0.285
SD (Log Scale)	0.452
95% UTL 95% Coverage	1.925
95% UPL (t)	1.62
90% Percentile (z)	1.342
95% Percentile (z)	1.582
99% Percentile (z)	2.152
Log ROS Method	
Mean in Original Scale	0.878
SD in Original Scale	0.468
Mean in Log Scale	-0.214
SD in Log Scale	0.375
95% UTL 95% Coverage	1.763
95% UPL (t)	1.527
90% Percentile (z)	1.307
95% Percentile (z)	1.498
99% Percentile (z)	1.934

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	4.46
Theta Star	0.212
nu star	258.7
A-D Test Statistic	1.374
5% A-D Critical Value	0.748
K-S Test Statistic	0.187
5% K-S Critical Value	0.163
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics with Extrapolated Data	
Mean	0.954
Median	0.917
SD	0.446
k star	7.167
Theta star	0.133
Nu star	659.4
95% Percentile of Chisquare (2k)	24.12
90% Percentile	1.429
95% Percentile	1.605
99% Percentile	1.971

Data Distribution Test with Detected Values Only	
Data do not follow a Discernable Distribution (0.05)	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.871
SD	0.464
SE of Mean	0.0725
95% KM UTL with 95% Coverage	1.835
95% KM Chebyshev UPL	2.914
95% KM UPL (t)	1.658
90% Percentile (z)	1.465
95% Percentile (z)	1.634
99% Percentile (z)	1.95
Gamma ROS Limits with Extrapolated Data	
95% Wilson Hilferty (WH) Approx. Gamma UPL	1.608
95% Hawkins Wixley (HW) Approx. Gamma UPL	1.601
95% WH Approx. Gamma UTL with 95% Coverage	1.803
95% HW Approx. Gamma UTL with 95% Coverage	1.801

Note: DL/2 is not a recommended method.

Mesa Bis(2-ethylhexyl)phthalate

General Statistics			
Number of Valid Data	28	Number of Detected Data	17
Number of Distinct Detected Data	16	Number of Non-Detect Data	11
		Percent Non-Detects	39.29%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.52	Minimum Detected	-0.654
Maximum Detected	18	Maximum Detected	2.89
Mean of Detected	1.782	Mean of Detected	-0.0957
SD of Detected	4.182	SD of Detected	0.795
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	3	Maximum Non-Detect	1.099

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	27
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	96.43%

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.293	Shapiro Wilk Test Statistic	0.5
5% Shapiro Wilk Critical Value	0.892	5% Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.314	Mean (Log Scale)	-0.291
SD	3.278	SD (Log Scale)	0.69
95% UTL 95% Coverage	8.677	95% UTL 95% Coverage	3.523
95% UPL (t)	6.997	95% UPL (t)	2.473
90% Percentile (z)	5.516	90% Percentile (z)	1.81
95% Percentile (z)	6.707	95% Percentile (z)	2.326
99% Percentile (z)	8.941	99% Percentile (z)	3.724
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	1.421
		SD in Original Scale	3.258
		Mean in Log Scale	-0.145
		SD in Log Scale	0.664
		95% UTL 95% Coverage	3.842
		95% UPL (t)	2.733
		90% Percentile (z)	2.025
		95% Percentile (z)	2.577
		99% Percentile (z)	4.052
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.757	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.355		
nu star	25.73		

A-D Test Statistic	4.558	Nonparametric Statistics	
5% A-D Critical Value	0.771	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.488	Mean	1.378
5% K-S Critical Value	0.216	SD	3.202
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.624
		95% KM UTL with 95% Coverage	8.57
Assuming Gamma Distribution		95% KM Chebyshev UPL	15.58
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	6.929
Mean	1.734	90% Percentile (z)	5.482
Median	0.88	95% Percentile (z)	6.645
SD	3.26	99% Percentile (z)	8.827
k star	1.07		
Theta star	1.62	Gamma ROS Limits with Extrapolated Data	
Nu star	59.95	95% Wilson Hilferty (WH) Approx. Gamma UPL	4.815
95% Percentile of Chisquare (2k)	6.262	95% Hawkins Wixley (HW) Approx. Gamma UPL	4.603
		95% WH Approx. Gamma UTL with 95% Coverage	6.577
90% Percentile	3.927	95% HW Approx. Gamma UTL with 95% Coverage	6.404
95% Percentile	5.073		
99% Percentile	7.72		

Note: DL/2 is not a recommended method.

All Bis(2-ethylhexyl)phthalate

General Statistics

Number of Valid Data	100	Number of Detected Data	66
Number of Distinct Detected Data	42	Number of Non-Detect Data	34
		Percent Non-Detects	34.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.51	Minimum Detected	-0.673
Maximum Detected	18	Maximum Detected	2.89
Mean of Detected	1.222	Mean of Detected	-0.0913
SD of Detected	2.162	SD of Detected	0.556
Minimum Non-Detect	1	Minimum Non-Detect	0
Maximum Non-Detect	3	Maximum Non-Detect	1.099

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	98
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	2
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	98.00%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.371	Lilliefors Test Statistic	0.191
5% Lilliefors Critical Value	0.109	5% Lilliefors Critical Value	0.109
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.027	Mean (Log Scale)	-0.241
SD	1.785	SD (Log Scale)	0.547

95% UTL 95% Coverage	4.461	95% UTL 95% Coverage	2.249
95% UPL (t)	4.006	95% UPL (t)	1.957
90% Percentile (z)	3.315	90% Percentile (z)	1.584
95% Percentile (z)	3.963	95% Percentile (z)	1.932
99% Percentile (z)	5.18	99% Percentile (z)	2.804
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	1.075
		SD in Original Scale	1.77
		Mean in Log Scale	-0.159
		SD in Log Scale	0.499
		95% UTL 95% Coverage	2.226
		95% UPL (t)	1.961
		90% Percentile (z)	1.617
		95% Percentile (z)	1.938
		99% Percentile (z)	2.722
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.788	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.684		
nu star	236		
A-D Test Statistic	7.532	Nonparametric Statistics	
5% A-D Critical Value	0.765	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.275	Mean	1.062
5% K-S Critical Value	0.111	SD	1.761
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.178
		95% KM UTL with 95% Coverage	4.45
Assuming Gamma Distribution		95% KM Chebyshev UPL	8.778
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	4.001
Mean	1.242	90% Percentile (z)	3.319
Median	0.96	95% Percentile (z)	3.959
SD	1.759	99% Percentile (z)	5.16
k star	2.579		
Theta star	0.482	Gamma ROS Limits with Extrapolated Data	
Nu star	515.8	95% Wilson Hilferty (WH) Approx. Gamma UPL	2.595
95% Percentile of Chisquare (2k)	11.31	95% Hawkins Wixley (HW) Approx. Gamma UPL	2.497
		95% WH Approx. Gamma UTL with 95% Coverage	2.913
90% Percentile	2.278	95% HW Approx. Gamma UTL with 95% Coverage	2.807
95% Percentile	2.724		
99% Percentile	3.699		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Bis(2-ethylhexyl)phthalate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Bis(2-ethylhexyl)phthalate

Background Data: Alluv Bis(2-ethylhexyl)phthalate

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	11	6
Number of Detect Data	17	20
Minimum Non-Detect	1	1
Maximum Non-Detect	3	3
Percent Non detects	39.29%	23.08%
Minimum Detected	0.52	0.54
Maximum Detected	18	2.7
Mean of Detected Data	1.782	1.145
Median of Detected Data	0.82	0.93
SD of Detected Data	4.182	0.632

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-1.845
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0651

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Bis(2-ethylhexyl)phthalate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Bis(2-ethylhexyl)phthalate

Background Data: Alluv Bis(2-ethylhexyl)phthalate

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	17	6
Number of Detect Data	29	20
Minimum Non-Detect	1	1
Maximum Non-Detect	3	3
Percent Non detects	36.96%	23.08%
Minimum Detected	0.51	0.54
Maximum Detected	3.3	2.7
Mean of Detected Data	0.947	1.145
Median of Detected Data	0.83	0.93
SD of Detected Data	0.563	0.632

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-1.713
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0866

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Bis(2-ethylhexyl)phthalate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Bis(2-ethylhexyl)phthalate

Background Data: Muddy Creek Bis(2-ethylhexyl)phthalate

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	11	17
Number of Detect Data	17	29
Minimum Non-Detect	1	1
Maximum Non-Detect	3	3
Percent Non detects	39.29%	36.96%
Minimum Detected	0.52	0.51
Maximum Detected	18	3.3
Mean of Detected Data	1.782	0.947
Median of Detected Data	0.82	0.83
SD of Detected Data	4.182	0.563

Site vs Background Gehan Test

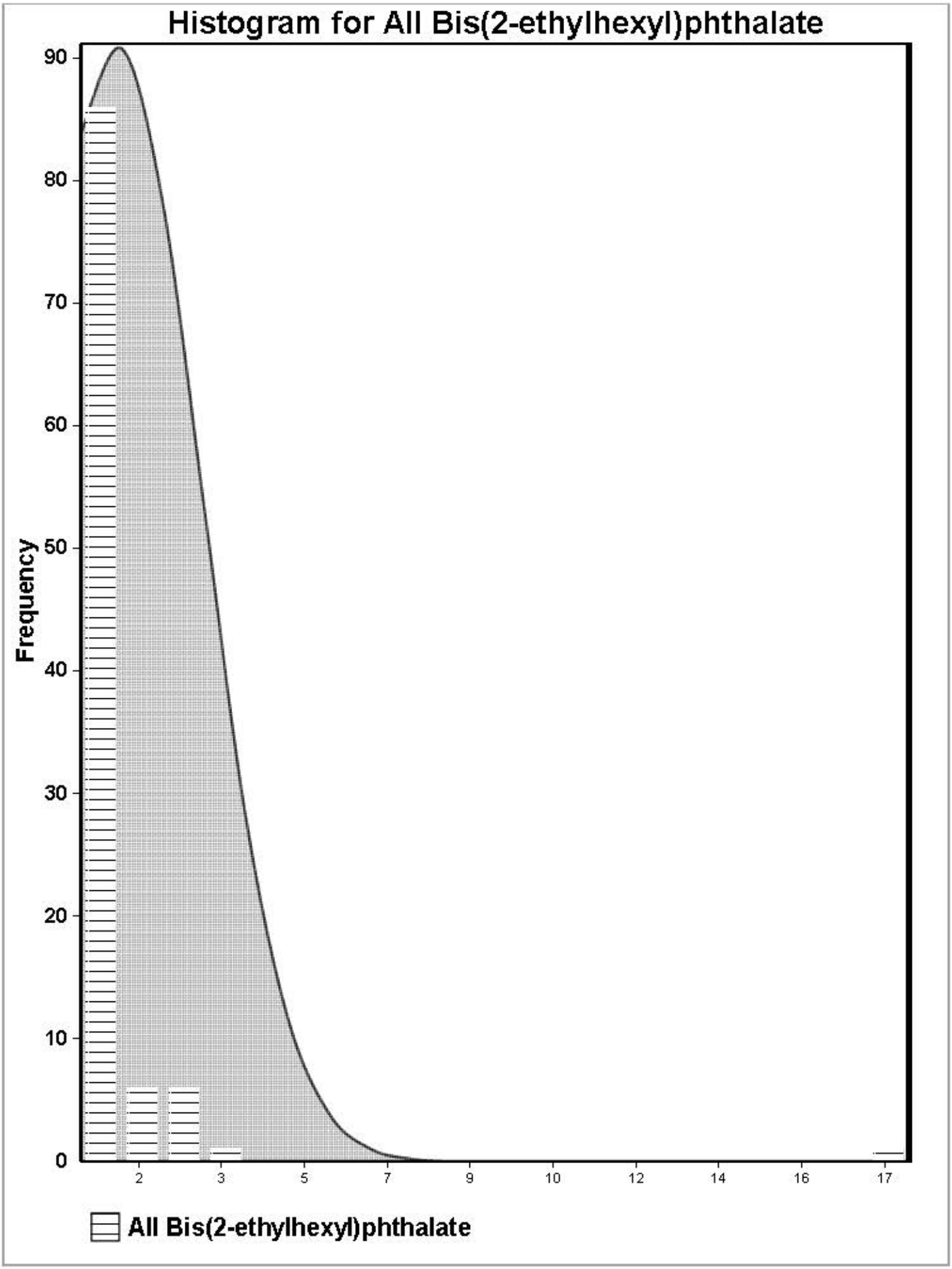
H0: Mu of Site or AOC = Mu of background

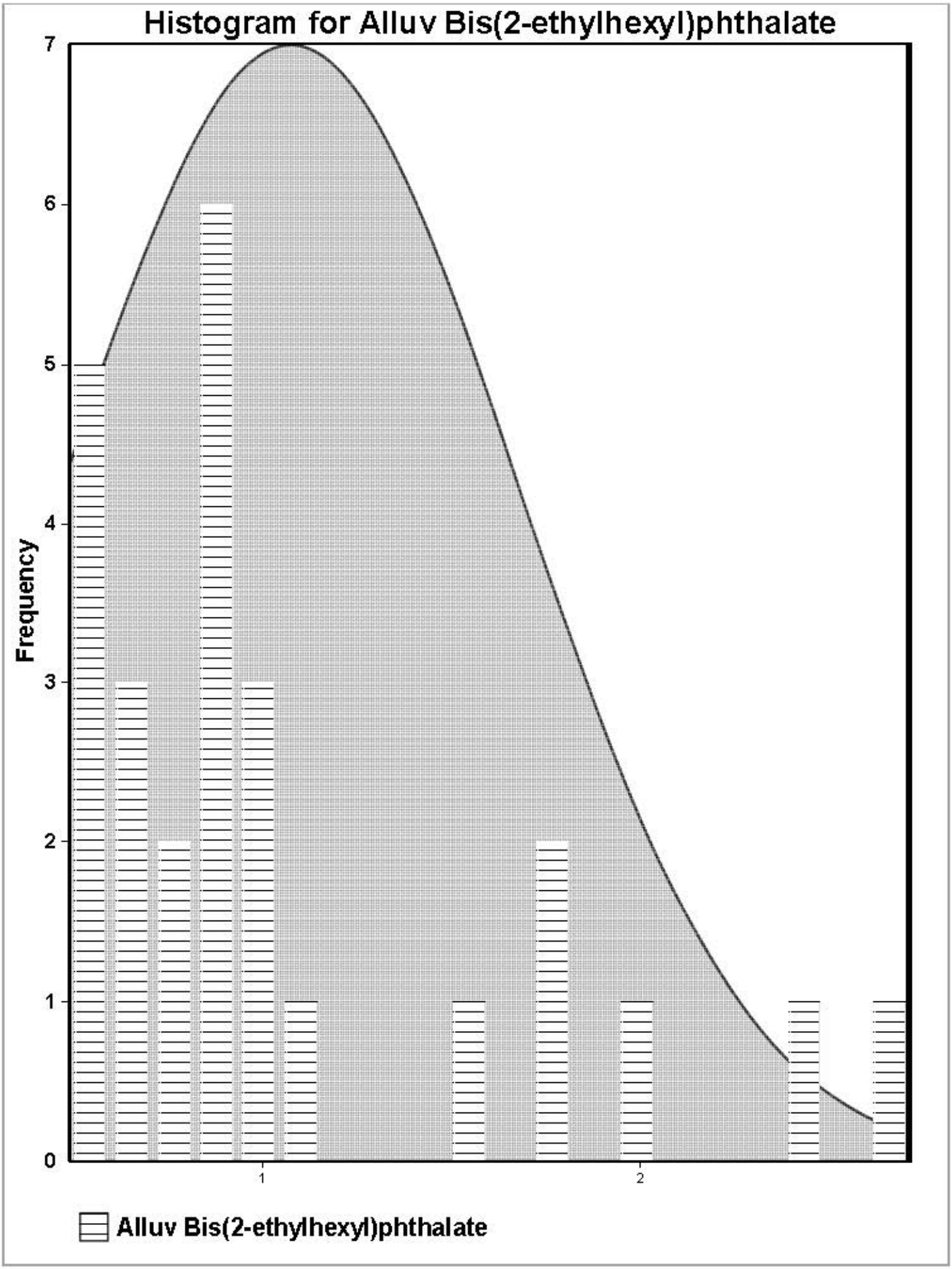
Gehan z Test Value	-0.662
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.508

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for All Bis(2-ethylhexyl)phthalate
Frequency
90
80
70
60
50
40
30
20
10
0
2
3
5
7
9
10
12
14
16
17
All Bis(2-ethylhexyl)phthalate


Histogram for Alluv Bis(2-ethylhexyl)phthalate
Frequency
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3
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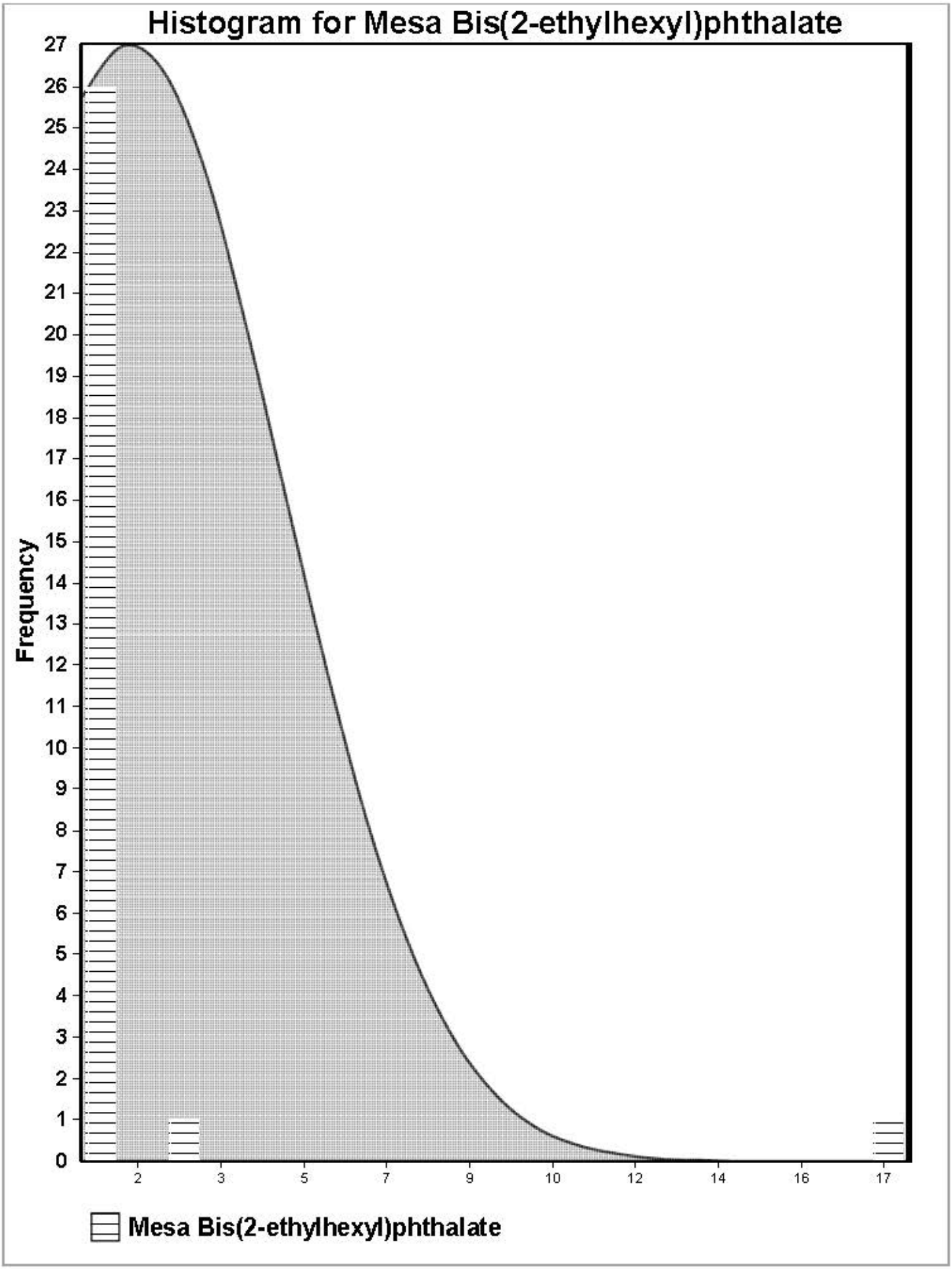
6
7
1
2
Alluv Bis(2-ethylhexyl)phthalate


Histogram for Mesa Bis(2-ethylhexyl)phthalate
Frequency
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5
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9
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14
15
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18
19
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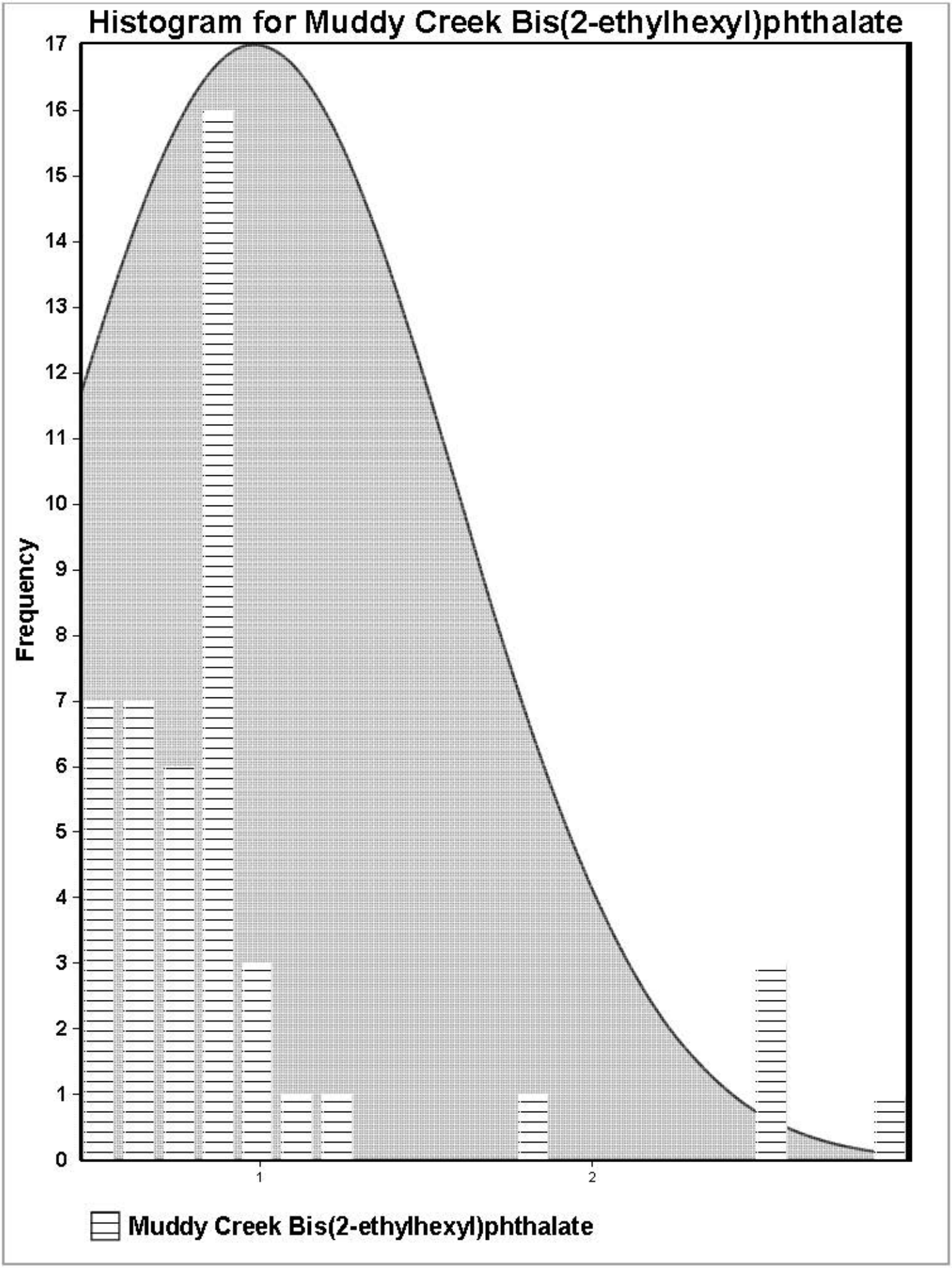
9
10
12
14
16
17
Mesa Bis(2-ethylhexyl)phthalate


Histogram for Muddy Creek Bis(2-ethylhexyl)phthalate
Frequency
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2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
1
2
Muddy Creek Bis(2-ethylhexyl)phthalate

Outlier Tests for Selected Variables

User Selected Options	
From File	Bis(2-ethylhexyl)phthalate.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Bis(2-ethylhexyl)phthalate

Mean	1.035
Standard Deviation	0.615
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.035	0.604	2.7	11	2.759	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Bis(2-ethylhexyl)phthalate

Mean	0.847
Standard Deviation	0.519
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.847	0.513	3.3	46	4.78	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 3.3 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 3.3 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Bis(2-ethylhexyl)phthalate

Mean	1.314
Standard Deviation	3.278
Number of data	28
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical

#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	1.314	3.219	18	27	5.183	2.88	3.2

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 18 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 18 is a Potential Statistical Outlier

Rosner's Outlier Test for All Bis(2-ethylhexyl)phthalate

Mean	1.027
Standard Deviation	1.785
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.027	1.776	18	99	9.555	3.38	3.75

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 18 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 18 is a Potential Statistical Outlier

Location Name	Sample Date	Alluv Bis(2-ethylhexyl)phthalate	D_Alluv Bis(2-ethylhexyl)phthalate
BG-1S	11/26/2012	3	0
BG-1S	8/23/2012	0.63	1
BG-1S	5/24/2012	0.54	1
BG-1S	3/20/2012	1.2	1
IMW-2.5D	11/26/2012	0.54	1
IMW-2.5D	8/24/2012	1.1	1
IMW-2.5D	5/21/2012	1.7	1
IMW-2.5D	3/21/2012	1	0
IMW-2.5S	11/26/2012	2.2	1
IMW-2.5S	8/24/2012	1.1	1
IMW-2.5S	5/21/2012	2.7	1
IMW-2.5S	3/21/2012	0.66	1
IMW-3S	5/21/2012	2	1
IMW-3S	3/20/2012	1	0
KMW-2D	11/26/2012	0.67	1
KMW-2D	8/24/2012	0.81	1
KMW-2D	5/21/2012	0.9	1
KMW-2D	3/23/2012	1	0
KMW-2M	11/26/2012	0.71	1
KMW-2M	8/24/2012	0.96	1
KMW-2M	5/21/2012	2	1
KMW-2M	3/23/2012	1	0
KMW-2S	11/26/2012	0.73	1
KMW-2S	8/24/2012	0.65	1
KMW-2S	5/21/2012	1.1	1
KMW-2S	3/23/2012	1	0

Location Name	Sample Date	Muddy Creek Bis(2-ethylhexyl)phthalate	D_Muddy Creek Bis(2-ethylhexyl)phthalate
BG-3S	11/27/2012	0.69	1
BG-3S	8/22/2012	0.83	1
BG-3S	5/23/2012	0.91	1
BG-3S	3/21/2012	0.84	1
BG-4S	11/27/2012	0.59	1
BG-4S	8/30/2012	0.52	1
BG-4S	5/30/2012	0.78	1
BG-4S	3/20/2012	1	0
BG-6S	11/27/2012	0.51	1
BG-6S	8/23/2012	0.9	1
BG-6S	5/25/2012	1	0
BG-6S	3/21/2012	0.69	1
BG-1M	11/26/2012	1.1	1
BG-1M	8/23/2012	0.95	1
BG-1M	5/24/2012	1	0
BG-1M	3/20/2012	1	0
BG-3M	11/27/2012	0.65	1
BG-3M	8/22/2012	1.3	1
BG-3M	5/24/2012	0.58	1
BG-3M	3/21/2012	1	0
BG-4M	11/27/2012	0.59	1
BG-4M	8/30/2012	0.52	1
BG-4M	5/30/2012	0.74	1
BG-4M	3/20/2012	1	0
BG-6M	11/27/2012	0.62	1
BG-6M	8/22/2012	1.2	1
BG-6M	5/25/2012	1	0
BG-6M	3/21/2012	1	0
BG-1D	11/26/2012	3	0
BG-1D	8/23/2012	1.1	1
BG-1D	5/24/2012	0.65	1
BG-1D	3/20/2012	1	0
BG-3D	11/27/2012	0.65	1
BG-3D	8/21/2012	1.4	1
BG-3D	5/23/2012	0.87	1
BG-3D	3/21/2012	1	0
BG-4D	11/27/2012	0.92	1
BG-4D	8/30/2012	3	0
BG-4D	5/30/2012	0.96	1
BG-4D	3/20/2012	1	0
BG-6D	11/27/2012	3	0
BG-6D	8/22/2012	2.1	1
BG-6D	5/25/2012	1	0
BG-6D	3/21/2012	1	0
IMW-3D	5/25/2012	1	0
IMW-3D	3/22/2012	3.3	1

Location Name	Sample Date	Mesa Bis(2-ethylhexyl)phthalate	D_Mesa Bis(2-ethylhexyl)phthalate
BG-2S	11/26/2012	3	0
BG-2S	8/23/2012	0.73	1
BG-2S	5/24/2012	1	0
BG-2S	3/21/2012	1	0
BG-2M	11/26/2012	0.86	1
BG-2M	8/23/2012	0.55	1
BG-2M	5/24/2012	1	0
BG-2M	3/21/2012	1	0
BG-2D	11/26/2012	1	1
BG-2D	8/23/2012	0.58	1
BG-2D	5/24/2012	0.9	1
BG-2D	3/21/2012	1	0
LMW-10	11/28/2012	0.92	1
LMW-10	8/27/2012	0.96	1
LMW-10	5/30/2012	0.66	1
LMW-10	3/22/2012	1	0
LMW-11R	11/26/2012	0.59	1
LMW-11R	8/21/2012	0.82	1
LMW-11R	5/29/2012	1	0
LMW-11R	3/23/2012	1	0
LMW-7	11/28/2012	0.82	1
LMW-7	8/27/2012	0.85	1
LMW-7	5/31/2012	0.52	1
LMW-7	3/23/2012	1	0
LMW-9	11/28/2012	0.75	1
LMW-9	8/27/2012	0.79	1
LMW-9	5/31/2012	18	1
LMW-9	3/23/2012	1	0

Location Name	Sample Date	All Bis(2-ethylhexyl)phthalate	D_All Bis(2-ethylhexyl)phthalate
BG-1S	11/26/2012	3	0
BG-1S	8/23/2012	0.63	1
BG-1S	5/24/2012	0.54	1
BG-1S	3/20/2012	1.2	1
IMW-2.5D	11/26/2012	0.54	1
IMW-2.5D	8/24/2012	1.1	1
IMW-2.5D	5/21/2012	1.7	1
IMW-2.5D	3/21/2012	1	0
IMW-2.5S	11/26/2012	2.2	1
IMW-2.5S	8/24/2012	1.1	1
IMW-2.5S	5/21/2012	2.7	1
IMW-2.5S	3/21/2012	0.66	1
IMW-3S	5/21/2012	2	1
IMW-3S	3/20/2012	1	0
KMW-2D	11/26/2012	0.67	1
KMW-2D	8/24/2012	0.81	1
KMW-2D	5/21/2012	0.9	1
KMW-2D	3/23/2012	1	0
KMW-2M	11/26/2012	0.71	1
KMW-2M	8/24/2012	0.96	1
KMW-2M	5/21/2012	2	1
KMW-2M	3/23/2012	1	0
KMW-2S	11/26/2012	0.73	1
KMW-2S	8/24/2012	0.65	1
KMW-2S	5/21/2012	1.1	1
KMW-2S	3/23/2012	1	0
BG-3S	11/27/2012	0.69	1
BG-3S	8/22/2012	0.83	1
BG-3S	5/23/2012	0.91	1
BG-3S	3/21/2012	0.84	1
BG-4S	11/27/2012	0.59	1
BG-4S	8/30/2012	0.52	1
BG-4S	5/30/2012	0.78	1
BG-4S	3/20/2012	1	0
BG-6S	11/27/2012	0.51	1
BG-6S	8/23/2012	0.9	1
BG-6S	5/25/2012	1	0
BG-6S	3/21/2012	0.69	1
BG-1M	11/26/2012	1.1	1
BG-1M	8/23/2012	0.95	1
BG-1M	5/24/2012	1	0
BG-1M	3/20/2012	1	0
BG-3M	11/27/2012	0.65	1
BG-3M	8/22/2012	1.3	1
BG-3M	5/24/2012	0.58	1
BG-3M	3/21/2012	1	0
BG-4M	11/27/2012	0.59	1
BG-4M	8/30/2012	0.52	1
BG-4M	5/30/2012	0.74	1
BG-4M	3/20/2012	1	0

BG-6M	11/27/2012	0.62	1
BG-6M	8/22/2012	1.2	1
BG-6M	5/25/2012	1	0
BG-6M	3/21/2012	1	0
BG-1D	11/26/2012	3	0
BG-1D	8/23/2012	1.1	1
BG-1D	5/24/2012	0.65	1
BG-1D	3/20/2012	1	0
BG-3D	11/27/2012	0.65	1
BG-3D	8/21/2012	1.4	1
BG-3D	5/23/2012	0.87	1
BG-3D	3/21/2012	1	0
BG-4D	11/27/2012	0.92	1
BG-4D	8/30/2012	3	0
BG-4D	5/30/2012	0.96	1
BG-4D	3/20/2012	1	0
BG-6D	11/27/2012	3	0
BG-6D	8/22/2012	2.1	1
BG-6D	5/25/2012	1	0
BG-6D	3/21/2012	1	0
IMW-3D	5/25/2012	1	0
IMW-3D	3/22/2012	3.3	1
BG-2S	11/26/2012	3	0
BG-2S	8/23/2012	0.73	1
BG-2S	5/24/2012	1	0
BG-2S	3/21/2012	1	0
BG-2M	11/26/2012	0.86	1
BG-2M	8/23/2012	0.55	1
BG-2M	5/24/2012	1	0
BG-2M	3/21/2012	1	0
BG-2D	11/26/2012	1	1
BG-2D	8/23/2012	0.58	1
BG-2D	5/24/2012	0.9	1
BG-2D	3/21/2012	1	0
LMW-10	11/28/2012	0.92	1
LMW-10	8/27/2012	0.96	1
LMW-10	5/30/2012	0.66	1
LMW-10	3/22/2012	1	0
LMW-11R	11/26/2012	0.59	1
LMW-11R	8/21/2012	0.82	1
LMW-11R	5/29/2012	1	0
LMW-11R	3/23/2012	1	0
LMW-7	11/28/2012	0.82	1
LMW-7	8/27/2012	0.85	1
LMW-7	5/31/2012	0.52	1
LMW-7	3/23/2012	1	0
LMW-9	11/28/2012	0.75	1
LMW-9	8/27/2012	0.79	1
LMW-9	5/31/2012	18	1
LMW-9	3/23/2012	1	0

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Boron_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Boron, Dissolved

Raw Statistics	
Number of Valid Observations	86
Number of Distinct Observations	32
Minimum	0.65
Maximum	4.2
Mean of Raw Data	1.291
Standard Deviation of Raw Data	0.393
Kstar	16.06
Mean of Log Transformed Data	0.225
Standard Deviation of Log Transformed Data	0.233

Normal Distribution Test Results	
Correlation Coefficient R	0.776
Approximate Shapiro Wilk Test Statistic	0.66
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.216
Lilliefors Critical (0.95) Value	0.0955

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.812
A-D Test Statistic	2.716
A-D Critical (0.95) Value	0.75
K-S Test Statistic	0.164
K-S Critical(0.95) Value	0.0962

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.928
Approximate Shapiro Wilk Test Statistic	0.903
Approximate Shapiro Wilk P Value	3.4025E-7
Lilliefors Test Statistic	0.141
Lilliefors Critical (0.95) Value	0.0955

Data not Lognormal at (0.05) Significance Level

Muddy Creek Boron, Dissolved

Raw Statistics	
Number of Valid Observations	53
Number of Distinct Observations	34
Minimum	0.4

Maximum	1
Mean of Raw Data	0.694
Standard Deviation of Raw Data	0.143
Kstar	21.29
Mean of Log Transformed Data	-0.388
Standard Deviation of Log Transformed Data	0.218

Normal Distribution Test Results

Correlation Coefficient R	0.991
Approximate Shapiro Wilk Test Statistic	0.97
Approximate Shapiro Wilk P Value	0.355
Lilliefors Test Statistic	0.121
Lilliefors Critical (0.95) Value	0.122

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.984
A-D Test Statistic	0.726
A-D Critical (0.95) Value	0.748
K-S Test Statistic	0.148
K-S Critical(0.95) Value	0.122

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.979
Approximate Shapiro Wilk Test Statistic	0.946
Approximate Shapiro Wilk P Value	0.032
Lilliefors Test Statistic	0.161
Lilliefors Critical (0.95) Value	0.122

Data not Lognormal at (0.05) Significance Level

Mesa Boron, Dissolved

Raw Statistics

Number of Valid Observations	100
Number of Distinct Observations	50
Minimum	0.83
Maximum	9.2
Mean of Raw Data	3.316
Standard Deviation of Raw Data	2.473
Kstar	2.193
Mean of Log Transformed Data	0.961
Standard Deviation of Log Transformed Data	0.678

Normal Distribution Test Results

Correlation Coefficient R	0.882
Approximate Shapiro Wilk Test Statistic	0.758
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.268

Lilliefors Critical (0.95) Value	0.0886
Data not Normal at (0.05) Significance Level	
Gamma Distribution Test Results	
Correlation Coefficient R	0.937
A-D Test Statistic	4.545
A-D Critical (0.95) Value	0.763
K-S Test Statistic	0.198
K-S Critical(0.95) Value	0.0905
Data not Gamma Distributed at (0.05) Significance Level	
Lognormal Distribution Test Results	
Correlation Coefficient R	0.964
Approximate Shapiro Wilk Test Statistic	0.903
Approximate Shapiro Wilk P Value	1.7261E-8
Lilliefors Test Statistic	0.151
Lilliefors Critical (0.95) Value	0.0886
Data not Lognormal at (0.05) Significance Level	

General Background Statistics for Full Data Sets

User Selected Options	
From File	Boron_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Boron, Dissolved

General Statistics

Total Number of Observations	86	Number of Distinct Observations	32

Raw Statistics		Log-Transformed Statistics	
Minimum	0.65	Minimum	-0.431
Maximum	4.2	Maximum	1.435
Second Largest	1.9	Second Largest	0.642
First Quartile	1.1	First Quartile	0.0953
Median	1.29	Median	0.255
Third Quartile	1.4	Third Quartile	0.336
Mean	1.291	Mean	0.225
SD	0.393	SD	0.233
Coefficient of Variation	0.305		
Skewness	4.831		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.216	Lilliefors Test Statistic	0.141
Lilliefors Critical Value	0.0955	Lilliefors Critical Value	0.0955
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	2.057	95% UTL with 95% Coverage	1.97
95% UPL (t)	1.948	95% UPL (t)	1.847
90% Percentile (z)	1.795	90% Percentile (z)	1.687
95% Percentile (z)	1.938	95% Percentile (z)	1.836
99% Percentile (z)	2.206	99% Percentile (z)	2.151

Gamma Distribution Test		Data Distribution Test	
k star	16.06	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0804		
MLE of Mean	1.291		
MLE of Standard Deviation	0.322		
nu star	2763		
A-D Test Statistic	2.716	Nonparametric Statistics	
5% A-D Critical Value	0.75	90% Percentile	1.56
K-S Test Statistic	0.164	95% Percentile	1.7
5% K-S Critical Value	0.0962	99% Percentile	2.245
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	1.8
90% Percentile	1.717	95% Percentile Bootstrap UTL with 95% Coverage	1.85
95% Percentile	1.862	95% BCA Bootstrap UTL with 95% Coverage	1.775
99% Percentile	2.155	95% UPL	1.765
		95% Chebyshev UPL	3.015
95% WH Approx. Gamma UPL	1.861	Upper Threshold Limit Based upon IQR	1.85
95% HW Approx. Gamma UPL	1.856		
95% WH Approx. Gamma UTL with 95% Coverage	1.975		
95% HW Approx. Gamma UTL with 95% Coverage	1.971		

Muddy Creek Boron, Dissolved

General Statistics			
Total Number of Observations	53	Number of Distinct Observations	34
Raw Statistics		**Log-Transformed Statistics**	
Minimum	0.4	Minimum	-0.916
Maximum	1	Maximum	0
Second Largest	0.98	Second Largest	-0.0202
First Quartile	0.58	First Quartile	-0.545
Median	0.71	Median	-0.342
Third Quartile	0.78	Third Quartile	-0.248
Mean	0.694	Mean	-0.388
SD	0.143	SD	0.218
Coefficient of Variation	0.205		
Skewness	-0.14		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.121	Lilliefors Test Statistic	0.161
Lilliefors Critical Value	0.122	Lilliefors Critical Value	0.122
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	0.985	95% UTL with 95% Coverage	1.06
95% UPL (t)	0.935	95% UPL (t)	0.981
90% Percentile (z)	0.877	90% Percentile (z)	0.897
95% Percentile (z)	0.928	95% Percentile (z)	0.972
99% Percentile (z)	1.025	99% Percentile (z)	1.127
Gamma Distribution Test		**Data Distribution Test**	
k star	21.29	Data appear Normal at 5% Significance Level	
Theta Star	0.0326		
MLE of Mean	0.694		
MLE of Standard Deviation	0.15		
nu star	2257		
A-D Test Statistic	0.726	**Nonparametric Statistics**	
5% A-D Critical Value	0.748	90% Percentile	0.85
K-S Test Statistic	0.148	95% Percentile	0.914
5% K-S Critical Value	0.122	99% Percentile	0.99

Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	0.98
90% Percentile	0.892	95% Percentile Bootstrap UTL with 95% Coverage	0.988
95% Percentile	0.958	95% BCA Bootstrap UTL with 95% Coverage	0.98
99% Percentile	1.091	95% UPL	0.938
		95% Chebyshev UPL	1.321
95% WH Approx. Gamma UPL	0.962	Upper Threshold Limit Based upon IQR	1.08
95% HW Approx. Gamma UPL	0.966		
95% WH Approx. Gamma UTL with 95% Coverage	1.028		
95% HW Approx. Gamma UTL with 95% Coverage	1.035		

Mesa Boron, Dissolved

General Statistics			
Total Number of Observations	100	Number of Distinct Observations	50
Raw Statistics		Log-Transformed Statistics	
Minimum	0.83	Minimum	-0.186
Maximum	9.2	Maximum	2.219
Second Largest	9	Second Largest	2.197
First Quartile	1.975	First Quartile	0.68
Median	2.3	Median	0.833
Third Quartile	3.625	Third Quartile	1.288
Mean	3.316	Mean	0.961
SD	2.473	SD	0.678
Coefficient of Variation	0.746		
Skewness	1.249		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.268	Lilliefors Test Statistic	0.151
Lilliefors Critical Value	0.0886	Lilliefors Critical Value	0.0886
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	8.071	95% UTL with 95% Coverage	9.631
95% UPL (t)	7.441	95% UPL (t)	8.103
90% Percentile (z)	6.484	90% Percentile (z)	6.232
95% Percentile (z)	7.383	95% Percentile (z)	7.973
99% Percentile (z)	9.068	99% Percentile (z)	12.66
Gamma Distribution Test		Data Distribution Test	
k star	2.193	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.512		
MLE of Mean	3.316		
MLE of Standard Deviation	2.239		
nu star	438.6		
A-D Test Statistic	4.545	Nonparametric Statistics	
5% A-D Critical Value	0.763	90% Percentile	7.937

K-S Test Statistic	0.198	95% Percentile	8.4
5% K-S Critical Value	0.0905	99% Percentile	9.002
Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	8.88
90% Percentile	6.311	95% Percentile Bootstrap UTL with 95% Coverage	8.88
95% Percentile	7.64	95% BCA Bootstrap UTL with 95% Coverage	8.424
99% Percentile	10.57	95% UPL	8.4
		95% Chebyshev UPL	14.15
95% WH Approx. Gamma UPL	7.629	Upper Threshold Limit Based upon IQR	6.1
95% HW Approx. Gamma UPL	7.707		
95% WH Approx. Gamma UTL with 95% Coverage	8.657		
95% HW Approx. Gamma UTL with 95% Coverage	8.826		

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Boron_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Boron, Dissolved

Background Data: Alluv Boron, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	100	86
Number of Distinct Observations	50	32
Minimum	0.83	0.65
Maximum	9.2	4.2
Mean	3.316	1.291
Median	2.3	1.29
SD	2.473	0.393
SE of Mean	0.247	0.0424

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	12241
WMW Test U-Stat	7.896
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	2.887E-15

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Boron_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Boron, Dissolved

Background Data: Alluv Boron, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	53	86
Number of Distinct Observations	34	32
Minimum	0.4	0.65
Maximum	1	4.2
Mean	0.694	1.291
Median	0.71	1.29
SD	0.143	0.393
SE of Mean	0.0196	0.0424

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1530
WMW Test U-Stat	9.454
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Boron_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Boron, Dissolved

Background Data: Muddy Creek Boron, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	100	53
Number of Distinct Observations	50	34
Minimum	0.83	0.4
Maximum	9.2	1
Mean	3.316	0.694
Median	2.3	0.71
SD	2.473	0.143
SE of Mean	0.247	0.0196

Wilcoxon-Mann-Whitney (WMW) Test

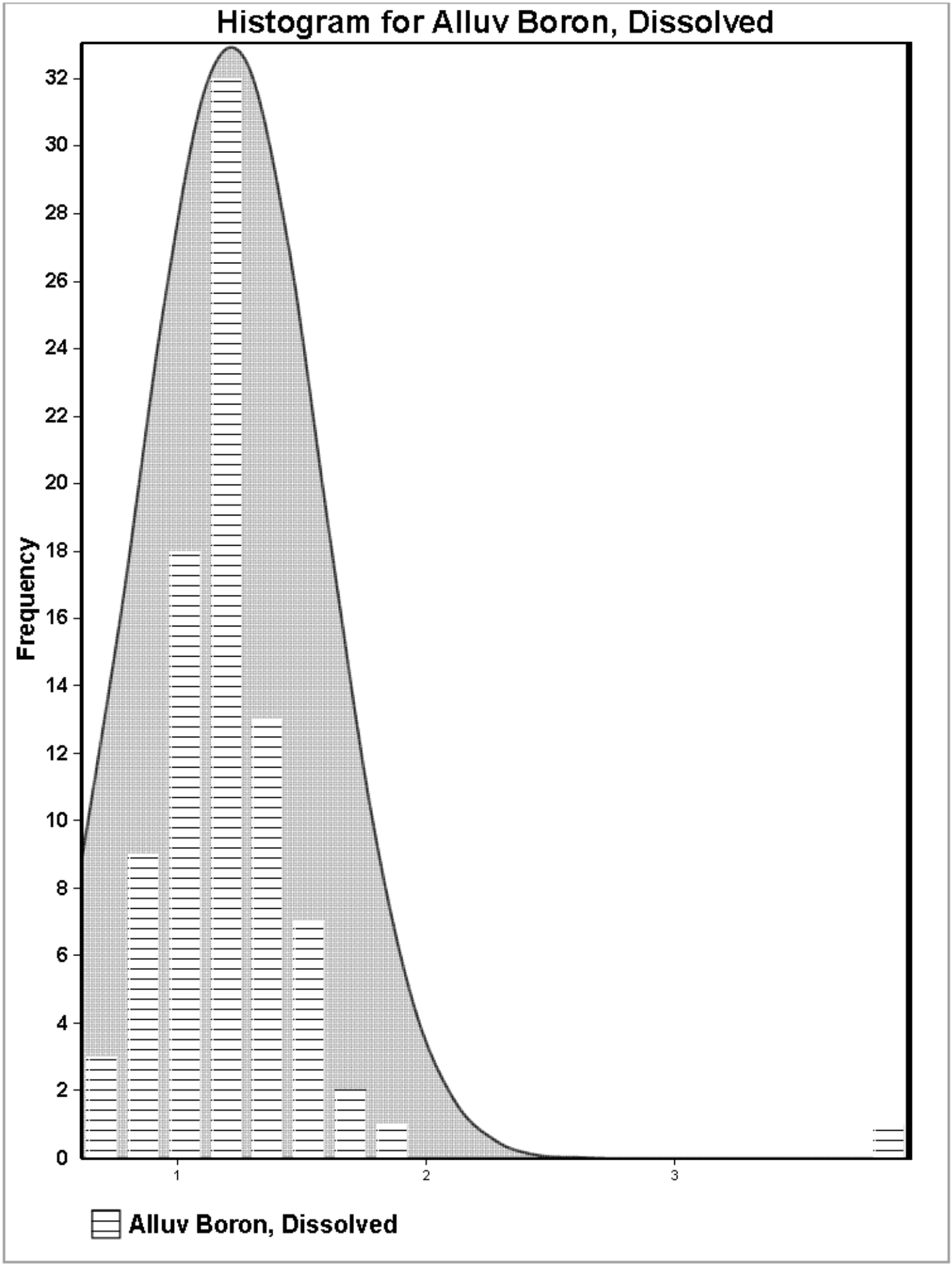
H0: Mean/Median of Site or AOC = Mean/Median of Background

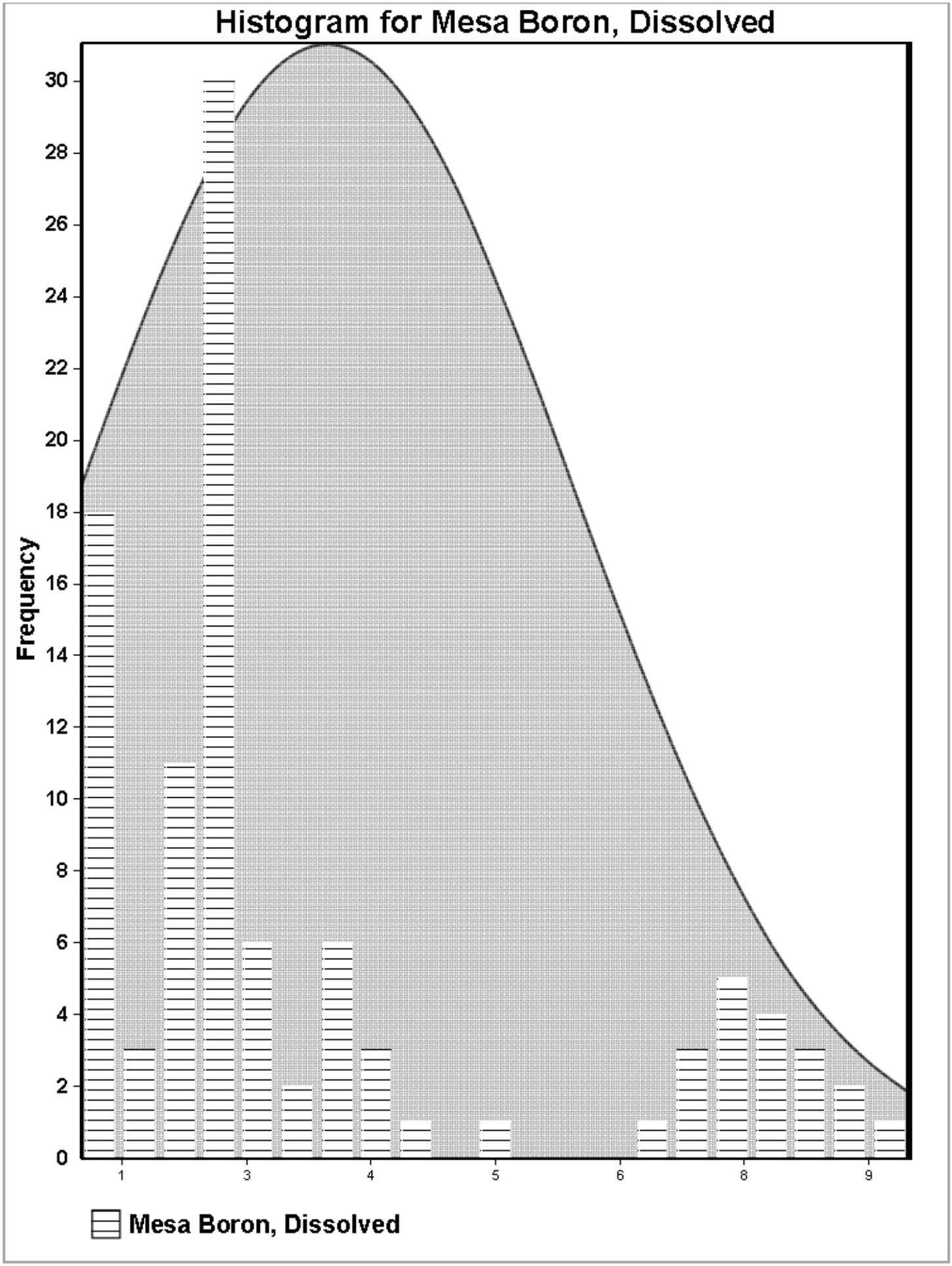
Site Rank Sum W-Stat	10315
WMW Test U-Stat	10.02
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0

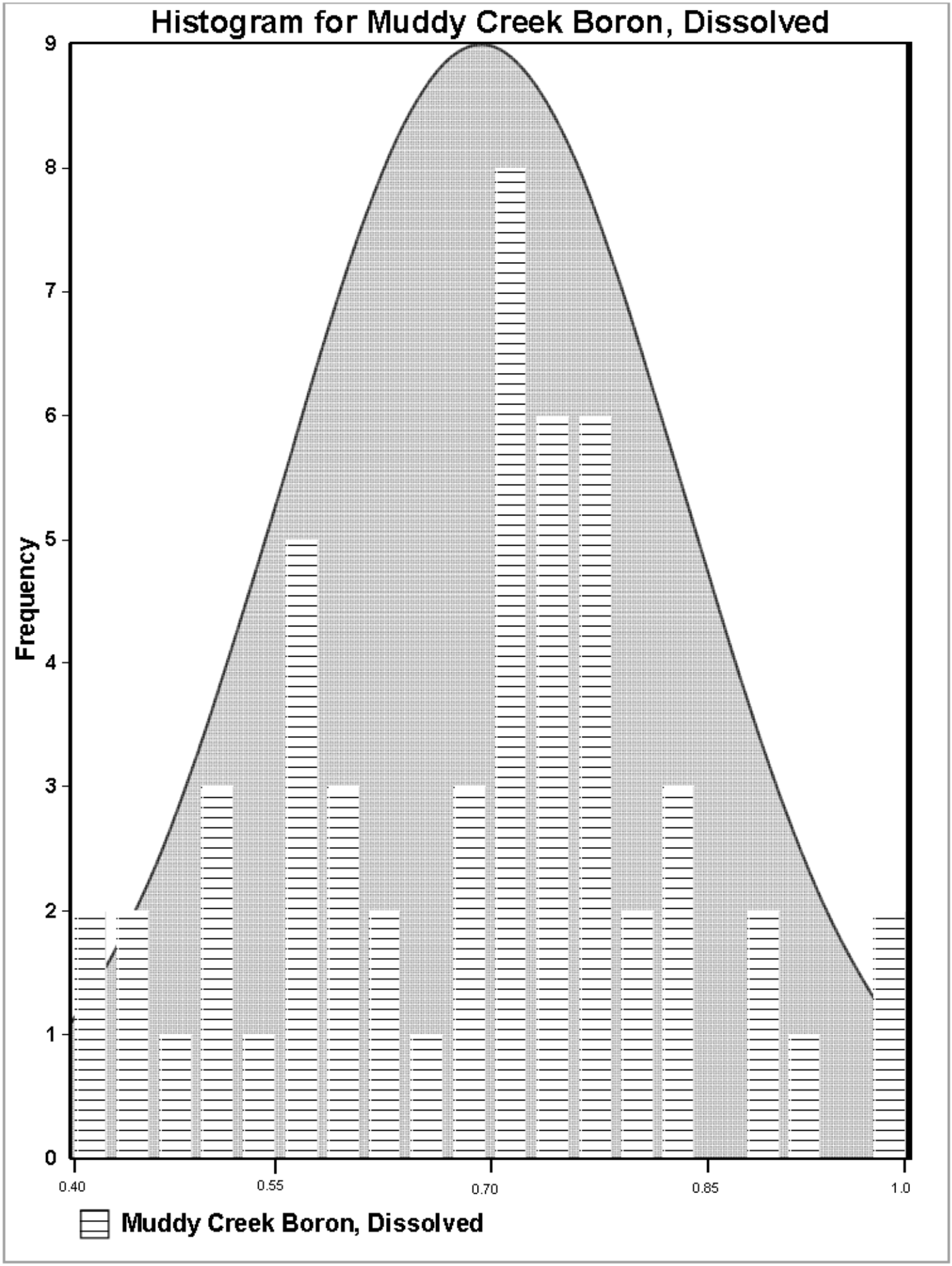
Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Boron, Dissolved
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
1
2
3
Alluv Boron, Dissolved


Histogram for Mesa Boron, Dissolved
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
1
3
4
5
6
8
9
Mesa Boron, Dissolved


Histogram for Muddy Creek Boron, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
0.40
0.55
0.70
0.85
1.0
Muddy Creek Boron, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Boron_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for Alluv Boron, Dissolved

Mean	1.291
Standard Deviation	0.393
Number of data	86
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.291	0.391	4.2	73	7.441	3.334	3.7

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 4.2 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 4.2 is a Potential Statistical Outlier

Rosner's Outlier Test for Muddy Creek Boron, Dissolved

Mean	0.694
Standard Deviation	0.143
Number of data	53
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.694	0.141	1	34	2.168	3.151	3.504

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Boron, Dissolved

Mean	3.316
Standard Deviation	2.473
Number of data	100
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical

#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	3.316	2.46	9.2	1	2.392	3.38	3.75				
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											

Boron, Dissolved

Location Name	Sample Date	Alluv Boron, Dissolved	Location Name	Sample Date	Alluv Boron, Dissolved	Location Name	Sample Date	Muddy Creek Boron, Dissolved	Location Name	Sample Date	Mesa Boron, Dissolved	Location Name	Sample Date	Mesa Boron, Dissolved
BG-1S	11/26/2012	1.1	KMW-2D	12/8/2009	1.3	BG-3S	11/27/2012	0.66	LMW-10	11/28/2012	9.2	BG-2D	8/23/2012	0.83
BG-1S	8/23/2012	0.96	KMW-2D	12/10/2008	1.3	BG-3S	8/22/2012	0.71	LMW-10	8/27/2012	9	BG-2D	5/24/2012	0.83
BG-1S	5/24/2012	0.94	KMW-2D	6/3/2008	1.4	BG-3S	5/23/2012	0.62	LMW-10	5/30/2012	5.4	BG-2D	3/21/2012	0.84
BG-1S	3/20/2012	0.89	KMW-2M	11/26/2012	1.5	BG-3S	3/21/2012	0.58	LMW-10	3/22/2012	8	LMW-9	11/28/2012	2.4
IMW-2.5D	11/26/2012	1.6	KMW-2M	8/24/2012	1.2	BG-4S	11/27/2012	0.7	LMW-10	12/6/2011	8.4	LMW-9	8/27/2012	2.4
IMW-2.5D	8/24/2012	1.3	KMW-2M	5/21/2012	1.2	BG-4S	8/30/2012	0.71	LMW-10	9/8/2011	7.1	LMW-9	5/31/2012	2.2
IMW-2.5D	5/21/2012	1.3	KMW-2M	3/23/2012	1.2	BG-4S	5/30/2012	0.68	LMW-10	6/8/2011	8	LMW-9	3/23/2012	2.2
IMW-2.5D	3/21/2012	1.4	KMW-2M	12/8/2011	1.3	BG-4S	3/20/2012	0.64	LMW-10	3/2/2011	8.3	LMW-9	12/5/2011	2
IMW-2.5D	12/8/2011	1.4	KMW-2M	6/6/2011	1.36	BG-6S	11/27/2012	0.92	LMW-10	12/9/2010	8.88	LMW-9	9/8/2011	2
IMW-2.5D	6/6/2011	1.39	KMW-2M	12/13/2010	1.31	BG-6S	8/23/2012	0.79	LMW-10	9/21/2010	7.93	LMW-9	6/8/2011	2.02
IMW-2.5D	12/15/2010	0.732	KMW-2M	6/8/2010	1.2	BG-6S	5/25/2012	0.72	LMW-10	6/9/2010	8	LMW-9	3/9/2011	2.3
IMW-2.5D	6/9/2010	0.71	KMW-2M	12/8/2009	1.3	BG-6S	3/21/2012	0.91	LMW-10	3/11/2010	7.7	LMW-9	12/10/2010	2.23
IMW-2.5D	12/12/2009	0.65	KMW-2M	12/10/2008	1.3	BG-1M	11/26/2012	0.71	LMW-10	12/11/2009	7.9	LMW-9	9/21/2010	2.23
IMW-2.5S	11/26/2012	1.7	KMW-2M	6/3/2008	1.4	BG-1M	8/23/2012	0.61	LMW-10	9/18/2009	7.5	LMW-9	6/9/2010	2.3
IMW-2.5S	8/24/2012	1.4	KMW-2S	11/26/2012	1.5	BG-1M	5/24/2012	0.58	LMW-10	6/10/2009	7.9	LMW-9	3/11/2010	2.3
IMW-2.5S	5/21/2012	1.4	KMW-2S	8/24/2012	1.1	BG-1M	3/20/2012	0.58	LMW-10	3/5/2009	8.4	LMW-9	12/11/2009	2.2
IMW-2.5S	3/21/2012	1.4	KMW-2S	5/21/2012	1.1	BG-3M	11/27/2012	0.91	LMW-10	12/12/2008	7.4	LMW-9	9/18/2009	2.3
IMW-2.5S	12/8/2011	1.5	KMW-2S	3/23/2012	1.1	BG-3M	8/22/2012	0.78	LMW-10	9/10/2008	7.5	LMW-9	6/10/2009	2.4
IMW-2.5S	9/9/2011	1.3	KMW-2S	12/8/2011	1.2	BG-3M	5/24/2012	0.85	LMW-10	6/4/2008	7.9	LMW-9	3/5/2009	2.4
IMW-2.5S	6/6/2011	1.56	KMW-2S	9/9/2011	4.2	BG-3M	3/21/2012	0.55	LMW-10	3/5/2008	8.4	LMW-9	12/12/2008	2.2
IMW-2.5S	3/7/2011	1.51	KMW-2S	6/6/2011	1.17	BG-4M	11/27/2012	0.75	LMW-11R	11/26/2012	4.5	LMW-9	9/10/2008	2.5
IMW-2.5S	12/15/2010	1.56	KMW-2S	3/8/2011	1.12	BG-4M	8/30/2012	0.76	LMW-11R	8/21/2012	3.8	LMW-9	6/4/2008	2.6
IMW-2.5S	9/20/2010	1.54	KMW-2S	12/13/2010	1.18	BG-4M	5/30/2012	0.73	LMW-11R	5/29/2012	3.7	LMW-9	3/5/2008	2.7
IMW-2.5S	6/9/2010	1.7	KMW-2S	9/15/2010	1.12	BG-4M	3/20/2012	0.72	LMW-11R	3/23/2012	3.6	LMW-11	3/2/2011	3.45
IMW-2.5S	3/9/2010	1.8	KMW-2S	6/8/2010	0.99	BG-6M	11/27/2012	0.58	LMW-7	11/28/2012	2.5	LMW-11	9/8/2011	2.9
IMW-2.5S	12/12/2009	1.9	KMW-2S	3/9/2010	0.98	BG-6M	8/22/2012	0.6	LMW-7	8/27/2012	2.6	LMW-11	12/6/2011	4
IMW-2.5S	9/21/2009	1.8	KMW-2S	12/8/2009	1.1	BG-6M	5/25/2012	0.41	LMW-7	5/31/2012	2.2	LMW-11	2/22/2012	3.6
IMW-3S	5/21/2012	1	KMW-2S	9/16/2009	1.1	BG-6M	3/21/2012	0.56	LMW-7	3/23/2012	2.1	LMW-12R	5/30/2012	2.5
IMW-3S	3/20/2012	0.98	KMW-2S	6/10/2009	1.2	BG-1D	11/26/2012	0.6	LMW-7	12/5/2011	2	LMW-12R	8/21/2012	2.5
IMW-3S	12/9/2011	1.1	KMW-2S	3/3/2009	1.1	BG-1D	8/23/2012	0.52	LMW-7	9/6/2011	2	LMW-12R	10/22/2012	2.7
IMW-3S	9/9/2011	1	KMW-2S	12/10/2008	1.1	BG-1D	5/24/2012	0.47	LMW-7	6/9/2011	2.21	LMW-12R	11/30/2012	2.7
IMW-3S	6/7/2011	1.04	KMW-2S	9/8/2008	1.3	BG-1D	3/20/2012	0.45	LMW-7	3/9/2011	2.03	LMW-13R	5/29/2012	1.2
IMW-3S	3/7/2011	1.11	KMW-2S	3/4/2008	1	BG-3D	11/27/2012	0.98	LMW-7	12/10/2010	2.13	LMW-13R	8/20/2012	1
IMW-3S	12/10/2010	1.15				BG-3D	8/21/2012	1	LMW-7	9/21/2010	2.18	LMW-13R	10/22/2012	1.2
IMW-3S	9/16/2010	1.28				BG-3D	5/23/2012	0.51	LMW-7	6/9/2010	2.1	LMW-13R	11/28/2012	1.1
IMW-3S	6/8/2010	1.2				BG-3D	3/21/2012	0.5	LMW-7	3/11/2010	1.9	LMW-14R	5/29/2012	1.1
IMW-3S	3/9/2010	1.2				BG-4D	11/27/2012	0.78	LMW-7	12/11/2009	2	LMW-14R	8/20/2012	1
IMW-3S	12/10/2009	1.1				BG-4D	8/30/2012	0.77	LMW-7	9/18/2009	4.1	LMW-14R	10/22/2012	1.1
IMW-3S	9/14/2009	1.1				BG-4D	5/30/2012	0.76	LMW-7	6/10/2009	2.2	LMW-14R	11/30/2012	1.1
IMW-3S	6/9/2009	1.2				BG-4D	3/20/2012	0.72	LMW-7	3/5/2009	2.1	LMW-15	5/29/2012	1.3
IMW-3S	3/3/2009	1.2				BG-6D	11/27/2012	0.7	LMW-7	12/12/2008	2.2	LMW-15	8/20/2012	1.2
IMW-3S	12/9/2008	1.2				BG-6D	8/22/2012	0.71	LMW-7	9/10/2008	2.4	LMW-15	10/22/2012	1.3
IMW-3S	9/9/2008	1.3				BG-6D	5/25/2012	0.44	LMW-7	6/4/2008	2.2	LMW-15	11/28/2012	1.2
IMW-3S	6/3/2008	1.4				BG-6D	3/21/2012	0.4	LMW-7	3/5/2008	2.4	LMW-16	5/29/2012	3.3
IMW-3S	3/4/2008	1.3				IMW-3D	5/25/2012	0.75	BG-2S	11/26/2012	1.8	LMW-16	8/20/2012	3.3
KMW-2D	11/26/2012	1.7				IMW-3D	3/22/2012	0.79	BG-2S	8/23/2012	1.7	LMW-16	10/22/2012	3.5
KMW-2D	8/24/2012	1.3				IMW-3D	12/9/2011	0.79	BG-2S	5/24/2012	1.7	LMW-16	11/28/2012	3.4
KMW-2D	5/21/2012	1.3				IMW-3D	6/7/2011	0.827	BG-2S	3/21/2012	1.6			
KMW-2D	3/23/2012	1.3				IMW-3D	12/10/2010	0.816	BG-2M	11/26/2012	1.1			
KMW-2D	12/8/2011	1.3				IMW-3D	6/8/2010	0.76	BG-2M	8/23/2012	0.87			
KMW-2D	6/6/2011	1.31				IMW-3D	12/10/2009	0.76	BG-2M	5/24/2012	0.87			
KMW-2D	12/13/2010	1.36				IMW-3D	12/9/2008	0.8	BG-2M	3/21/2012	0.92			
KMW-2D	6/8/2010	1.2				IMW-3D	6/3/2008	0.85	BG-2D	11/26/2012	1		* non-detect	

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Cadmium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Cadmium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	87	0	87	9	78	89.66%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	78	0.003	0.005	0.0039	0.003	0.001
Statistics (Detects Only)	9	8.0000E-4	0.0024	0.00179	0.002	4.7813E-4
Statistics (All: NDs treated as DL value)	87	8.0000E-4	0.005	0.00368	0.003	0.00116
Statistics (All: NDs treated as DL/2 value)	87	8.0000E-4	0.0025	0.00193	0.0015	4.9802E-4
Statistics (Normal ROS Estimated Data)	87	6.8161E-4	0.0029	0.00179	0.00179	5.0606E-4
Statistics (Gamma ROS Estimated Data)	87	2.7829E-4	0.0024	0.00176	0.00188	5.1919E-4
Statistics (Lognormal ROS Estimated Data)	87	8.0000E-4	0.00351	0.00181	0.00172	5.9017E-4

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	12.24	11.83	1.4612E-4	-6.368	0.329	-0.0516
Statistics (NDs = DL)	9.033	8.729	4.0734E-4	-5.661	0.356	-0.0629
Statistics (NDs = DL/2)	14.98	14.47	1.2896E-4	-6.283	0.263	-0.0419
Statistics (Gamma ROS Estimates)	7.86	7.597	2.2380E-4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-6.368	0.328	-0.0516

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.953	0.882	0.841	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.919	0.829	Data Appear Normal
Lilliefors (Detects Only)	0.226	0.295	Data Appear Normal
Lilliefors (NDs = DL)	0.319	0.095	Data Not Normal
Lilliefors (NDs = DL/2)	0.336	0.095	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0394	0.095	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.921	0.856	0.836	0.904

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.575	0.722	
Kolmogorov-Smirnov (Detects Only)	0.244	0.279	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	8.616	0.752	
Kolmogorov-Smirnov (NDs = DL)	0.282	0.0958	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	12.28	0.751	
Kolmogorov-Smirnov (NDs = DL/2)	0.332	0.0957	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.992	0.753	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.15	0.0959	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.898	0.877	0.843	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.824	0.829	Data Not Lognormal
Lilliefors (Detects Only)	0.235	0.295	Data Appear Lognormal
Lilliefors (NDs = DL)	0.259	0.095	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.326	0.095	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.04	0.095	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Cadmium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	53	0	53	7	46	86.79%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	46	0.003	0.005	0.00478	0.005	6.2939E-4
Statistics (Detects Only)	7	0.0016	0.0031	0.00257	0.003	6.4734E-4
Statistics (All: NDs treated as DL value)	53	0.0016	0.005	0.00449	0.005	9.8102E-4
Statistics (All: NDs treated as DL/2 value)	53	0.0015	0.0031	0.00242	0.0025	3.7127E-4
Statistics (Normal ROS Estimated Data)	53	9.1597E-4	0.00369	0.00231	0.00226	6.3925E-4
Statistics (Gamma ROS Estimated Data)	53	0.0016	0.0031	0.00256	0.00256	2.2087E-4
Statistics (Lognormal ROS Estimated Data)	53	0.00124	0.00401	0.00231	0.00219	6.3051E-4

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	16.57	15.65	1.5517E-4	-5.994	0.274	-0.0458
Statistics (NDs = DL)	15.51	14.64	2.8953E-4	-5.438	0.281	-0.0516
Statistics (NDs = DL/2)	36.03	34	6.7037E-5	-6.04	0.177	-0.0293
Statistics (Gamma ROS Estimates)	123.4	116.4	2.0765E-5	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-6.106	0.271	-0.0444

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.901	0.749	0.79	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.789	0.803	Data Not Normal
Lilliefors (Detects Only)	0.317	0.335	Data Appear Normal
Lilliefors (NDs = DL)	0.472	0.122	Data Not Normal
Lilliefors (NDs = DL/2)	0.44	0.122	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0618	0.122	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.866	0.687	0.773	0.901

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.794	0.707	
Kolmogorov-Smirnov (Detects Only)	0.337	0.312	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	11.57	0.749	
Kolmogorov-Smirnov (NDs = DL)	0.47	0.122	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	10.76	0.748	
Kolmogorov-Smirnov (NDs = DL/2)	0.453	0.122	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.06	0.748	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.404	0.122	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.902	0.744	0.766	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.797	0.803	Data Not Lognormal
Lilliefors (Detects Only)	0.321	0.335	Data Appear Lognormal
Lilliefors (NDs = DL)	0.465	0.122	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.457	0.122	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0618	0.122	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Cadmium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	3	97	97.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	97	0.003	0.01	0.00384	0.003	0.00116
Statistics (Detects Only)	3	7.0000E-4	0.0051	0.00257	0.0019	0.00227
Statistics (All: NDs treated as DL value)	100	7.0000E-4	0.01	0.0038	0.003	0.00121
Statistics (All: NDs treated as DL/2 value)	100	7.0000E-4	0.0051	0.00194	0.0015	6.6601E-4
Statistics (Normal ROS Estimated Data)	100	-0.0018	0.0051	0.00133	0.00132	0.00137
Statistics (Gamma ROS Estimated Data)	100	1.000E-12	0.0051	7.7000E-5	1.000E-12	5.4603E-4
Statistics (Lognormal ROS Estimated Data)	100	2.9849E-4	0.0051	0.00133	0.00111	8.2009E-4

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.791	1.744	0.00143	-6.27	0.993	-0.158
Statistics (NDs = DL)	10.5	10.19	3.6157E-4	-5.622	0.321	-0.0571
Statistics (NDs = DL/2)	10.66	10.34	1.8176E-4	-6.294	0.3	-0.0477
Statistics (Gamma ROS Estimates)	0.05	0.0551	0.00154	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-6.793	0.581	-0.0855

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.967	0.819	0.797	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.936	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.282	0.512	Data Appear Normal
Lilliefors (NDs = DL)	0.355	0.0886	Data Not Normal

Lilliefors (NDs = DL/2)	0.344	0.0886	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0158	0.0886	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.841	0.837	0.913

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	13.31	0.752	
Kolmogorov-Smirnov (NDs = DL)	0.346	0.0894	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	13.48	0.752	
Kolmogorov-Smirnov (NDs = DL/2)	0.357	0.0894	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	41.51	2.199	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.613	0.135	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	1	0.82	0.839	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	1	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.175	0.512	Data Appear Lognormal
Lilliefors (NDs = DL)	0.33	0.0886	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.356	0.0886	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0215	0.0886	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Alluv + Mesa Cadmium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	187	0	187	12	175	93.58%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	175	0.003	0.01	0.00386	0.003	0.00109
Statistics (Detects Only)	12	7.0000E-4	0.0051	0.00198	0.00195	0.00111
Statistics (All: NDs treated as DL value)	187	7.0000E-4	0.01	0.00374	0.003	0.00118
Statistics (All: NDs treated as DL/2 value)	187	7.0000E-4	0.0051	0.00193	0.0015	5.9226E-4
Statistics (Normal ROS Estimated Data)	187	-3.785E-4	0.0051	0.00178	0.00178	8.8426E-4
Statistics (Gamma ROS Estimated Data)	187	7.0000E-4	0.0051	0.00194	0.00188	3.7442E-4
Statistics (Lognormal ROS Estimated Data)	187	5.9240E-4	0.0051	0.00174	0.00161	7.2812E-4

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.323	4.257	4.5878E-4	-6.343	0.51	-0.0803
Statistics (NDs = DL)	9.739	9.587	3.8425E-4	-5.64	0.337	-0.0598
Statistics (NDs = DL/2)	12.31	12.11	1.5722E-4	-6.289	0.283	-0.045
Statistics (Gamma ROS Estimates)	30.92	30.43	6.2576E-5	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-6.437	0.407	-0.0633

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.857	0.856	0.816	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.764	0.859	Data Not Normal
Lilliefors (Detects Only)	0.27	0.256	Data Not Normal
Lilliefors (NDs = DL)	0.339	0.0648	Data Not Normal
Lilliefors (NDs = DL/2)	0.335	0.0648	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0176	0.0648	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.91	0.858	0.842	0.773

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.676	0.735	
Kolmogorov-Smirnov (Detects Only)	0.202	0.246	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	21.2	0.752	
Kolmogorov-Smirnov (NDs = DL)	0.315	0.0669	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	24.84	0.751	
Kolmogorov-Smirnov (NDs = DL/2)	0.343	0.0669	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.602	0.751	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.13	0.0668	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.939	0.858	0.846	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.901	0.859	Data Appear Lognormal
Lilliefors (Detects Only)	0.211	0.256	Data Appear Lognormal
Lilliefors (NDs = DL)	0.296	0.0648	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.341	0.0648	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0191	0.0648	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Cadmium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Cadmium, Dissolved

General Statistics

Number of Valid Data	87	Number of Detected Data	9
Number of Distinct Detected Data	6	Number of Non-Detect Data	78
		Percent Non-Detects	89.66%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	8.0000E-4	Minimum Detected	-7.131
Maximum Detected	0.0024	Maximum Detected	-6.032
Mean of Detected	0.00179	Mean of Detected	-6.368
SD of Detected	4.7813E-4	SD of Detected	0.329
Minimum Non-Detect	0.003	Minimum Non-Detect	-5.809
Maximum Non-Detect	0.005	Maximum Non-Detect	-5.298

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	87
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.919	Shapiro Wilk Test Statistic	0.824
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00193	Mean (Log Scale)	-6.283
SD	4.9802E-4	SD (Log Scale)	0.263
95% UTL 95% Coverage	0.0029	95% UTL 95% Coverage	0.00312
95% UPL (t)	0.00277	95% UPL (t)	0.0029
90% Percentile (z)	0.00257	90% Percentile (z)	0.00262
95% Percentile (z)	0.00275	95% Percentile (z)	0.00288
99% Percentile (z)	0.00309	99% Percentile (z)	0.00345

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00181
		SD in Original Scale	5.9017E-4
		Mean in Log Scale	-6.368
		SD in Log Scale	0.328
		95% UTL 95% Coverage	0.00325
		95% UPL (t)	0.00297
		90% Percentile (z)	0.00261
		95% Percentile (z)	0.00295
		99% Percentile (z)	0.00369
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	8.236	Data appear Normal at 5% Significance Level	
Theta Star	2.1721E-4		
nu star	148.2		
A-D Test Statistic	0.575	Nonparametric Statistics	
5% A-D Critical Value	0.722	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.244	Mean	0.00179
5% K-S Critical Value	0.279	SD	4.5079E-4
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.5938E-4
		95% KM UTL with 95% Coverage	0.00267
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.00377
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00254
Mean	0.00176	90% Percentile (z)	0.00237
Median	0.00188	95% Percentile (z)	0.00253
SD	5.1919E-4	99% Percentile (z)	0.00284
k star	7.597		
Theta star	2.3156E-4	Gamma ROS Limits with Extrapolated Data	
Nu star	1322	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00293
95% Percentile of Chisquare (2k)	25.25	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.003
		95% WH Approx. Gamma UTL with 95% Coverage	0.00318
90% Percentile	0.00261	95% HW Approx. Gamma UTL with 95% Coverage	0.00327
95% Percentile	0.00292		
99% Percentile	0.00357		

Note: DL/2 is not a recommended method.

Muddy Creek Cadmium, Dissolved

General Statistics			
Number of Valid Data	53	Number of Detected Data	7
Number of Distinct Detected Data	5	Number of Non-Detect Data	46
		Percent Non-Detects	86.79%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0016	Minimum Detected	-6.438
Maximum Detected	0.0031	Maximum Detected	-5.776
Mean of Detected	0.00257	Mean of Detected	-5.994
SD of Detected	6.4734E-4	SD of Detected	0.274
Minimum Non-Detect	0.003	Minimum Non-Detect	-5.809
Maximum Non-Detect	0.005	Maximum Non-Detect	-5.298

Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	53
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Warning: There are only 7 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.789	Shapiro Wilk Test Statistic	0.797
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00242	Mean (Log Scale)	-6.04
SD	3.7127E-4	SD (Log Scale)	0.177
95% UTL 95% Coverage	0.00317	95% UTL 95% Coverage	0.00342
95% UPL (t)	0.00304	95% UPL (t)	0.00321
90% Percentile (z)	0.00289	90% Percentile (z)	0.00299
95% Percentile (z)	0.00303	95% Percentile (z)	0.00319
99% Percentile (z)	0.00328	99% Percentile (z)	0.0036
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00231
		SD in Original Scale	6.3051E-4
		Mean in Log Scale	-6.106
		SD in Log Scale	0.271
		95% UTL 95% Coverage	0.00388
		95% UPL (t)	0.00353
		90% Percentile (z)	0.00316
		95% Percentile (z)	0.00348
		99% Percentile (z)	0.00419
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	9.565	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.6884E-4		
nu star	133.9		
A-D Test Statistic	0.794	Nonparametric Statistics	
5% A-D Critical Value	0.707	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.337	Mean	0.00229
5% K-S Critical Value	0.312	SD	5.8184E-4
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.9482E-4
		95% KM UTL with 95% Coverage	0.00348
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.00485
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00328

Mean	0.00256	90% Percentile (z)	0.00304
Median	0.00256	95% Percentile (z)	0.00325
SD	2.2087E-4	99% Percentile (z)	0.00365
k star	116.4		
Theta star	2.2009E-5	Gamma ROS Limits with Extrapolated Data	
Nu star	12342	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00297
95% Percentile of Chisquare (2k)	269.5	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00297
		95% WH Approx. Gamma UTL with 95% Coverage	0.00306
90% Percentile	0.00287	95% HW Approx. Gamma UTL with 95% Coverage	0.00307
95% Percentile	0.00297		
99% Percentile	0.00315		

Note: DL/2 is not a recommended method.

Mesa Cadmium, Dissolved

General Statistics

Number of Valid Data	100	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	97
		Percent Non-Detects	97.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	7.0000E-4	Minimum Detected	-7.264
Maximum Detected	0.0051	Maximum Detected	-5.279
Mean of Detected	0.00257	Mean of Detected	-6.27
SD of Detected	0.00227	SD of Detected	0.993
Minimum Non-Detect	0.003	Minimum Non-Detect	-5.809
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	100
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.936	Shapiro Wilk Test Statistic	1
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00194	Mean (Log Scale)	-6.294

SD	6.6601E-4	SD (Log Scale)	0.3
95% UTL 95% Coverage	0.00322	95% UTL 95% Coverage	0.00329
95% UPL (t)	0.00305	95% UPL (t)	0.00305
90% Percentile (z)	0.00279	90% Percentile (z)	0.00271
95% Percentile (z)	0.00303	95% Percentile (z)	0.00303
99% Percentile (z)	0.00349	99% Percentile (z)	0.00371
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00133
		SD in Original Scale	8.2009E-4
		Mean in Log Scale	-6.793
		SD in Log Scale	0.581
		95% UTL 95% Coverage	0.00343
		95% UPL (t)	0.00296
		90% Percentile (z)	0.00236
		95% Percentile (z)	0.00291
		99% Percentile (z)	0.00433
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.00134
5% K-S Critical Value	N/A	SD	7.0764E-4
Data not Gamma Distributed at 5% Significance Level		SE of Mean	5.1649E-4
		95% KM UTL with 95% Coverage	0.0027
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.00444
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00252
Mean	N/A	90% Percentile (z)	0.00225
Median	N/A	95% Percentile (z)	0.0025
SD	N/A	99% Percentile (z)	0.00298
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

Alluv + Mesa Cadmium, Dissolved

General Statistics

Number of Valid Data	187	Number of Detected Data	12
Number of Distinct Detected Data	9	Number of Non-Detect Data	175
		Percent Non-Detects	93.58%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	7.0000E-4	Minimum Detected	-7.264
Maximum Detected	0.0051	Maximum Detected	-5.279
Mean of Detected	0.00198	Mean of Detected	-6.343
SD of Detected	0.00111	SD of Detected	0.51
Minimum Non-Detect	0.003	Minimum Non-Detect	-5.809
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605
Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	187
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.764	Shapiro Wilk Test Statistic	0.901
5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00193	Mean (Log Scale)	-6.289
SD	5.9226E-4	SD (Log Scale)	0.283
95% UTL 95% Coverage	0.00303	95% UTL 95% Coverage	0.00313
95% UPL (t)	0.00292	95% UPL (t)	0.00297
90% Percentile (z)	0.00269	90% Percentile (z)	0.00267
95% Percentile (z)	0.00291	95% Percentile (z)	0.00296
99% Percentile (z)	0.00331	99% Percentile (z)	0.00359
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00174
		SD in Original Scale	7.2812E-4
		Mean in Log Scale	-6.437
		SD in Log Scale	0.407
		95% UTL 95% Coverage	0.00339
		95% UPL (t)	0.00315
		90% Percentile (z)	0.0027
		95% Percentile (z)	0.00313
		99% Percentile (z)	0.00413
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.298	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	6.0141E-4		
nu star	79.15		
A-D Test Statistic	0.676	Nonparametric Statistics	
5% A-D Critical Value	0.735	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.202	Mean	0.00172
5% K-S Critical Value	0.246	SD	5.7241E-4
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.6305E-4
		95% KM UTL with 95% Coverage	0.00277
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.00422
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00267

Mean	0.00194	90% Percentile (z)	0.00245
Median	0.00188	95% Percentile (z)	0.00266
SD	3.7442E-4	99% Percentile (z)	0.00305
k star	30.43		
Theta star	6.3588E-5	Gamma ROS Limits with Extrapolated Data	
Nu star	11381	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00255
95% Percentile of Chisquare (2k)	80.07	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00255
		95% WH Approx. Gamma UTL with 95% Coverage	0.00262
90% Percentile	0.0024	95% HW Approx. Gamma UTL with 95% Coverage	0.00263
95% Percentile	0.00255		
99% Percentile	0.00284		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Cadmium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Cadmium, Dissolved

Background Data: Alluv Cadmium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	87
Number of Non-Detect Data	97	78
Number of Detect Data	3	9
Minimum Non-Detect	0.003	0.003
Maximum Non-Detect	0.01	0.005
Percent Non detects	97.00%	89.66%
Minimum Detected	7.0000E-4	8.0000E-4
Maximum Detected	0.0051	0.0024
Mean of Detected Data	0.00257	0.00179
Median of Detected Data	0.0019	0.002
SD of Detected Data	0.00227	4.7813E-4

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0.825
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.41

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Cadmium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Cadmium, Dissolved

Background Data: Alluv Cadmium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	53	87
Number of Non-Detect Data	46	78
Number of Detect Data	7	9
Minimum Non-Detect	0.003	0.003
Maximum Non-Detect	0.005	0.005
Percent Non detects	86.79%	89.66%
Minimum Detected	0.0016	8.0000E-4
Maximum Detected	0.0031	0.0024
Mean of Detected Data	0.00257	0.00179
Median of Detected Data	0.003	0.002
SD of Detected Data	6.4734E-4	4.7813E-4

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	3.399
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	6.7514E-4

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Cadmium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Cadmium, Dissolved

Background Data: Muddy Creek Cadmium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	53
Number of Non-Detect Data	97	46
Number of Detect Data	3	7
Minimum Non-Detect	0.003	0.003
Maximum Non-Detect	0.01	0.005
Percent Non detects	97.00%	86.79%
Minimum Detected	7.0000E-4	0.0016
Maximum Detected	0.0051	0.0031
Mean of Detected Data	0.00257	0.00257
Median of Detected Data	0.0019	0.003
SD of Detected Data	0.00227	6.4734E-4

Site vs Background Gehan Test

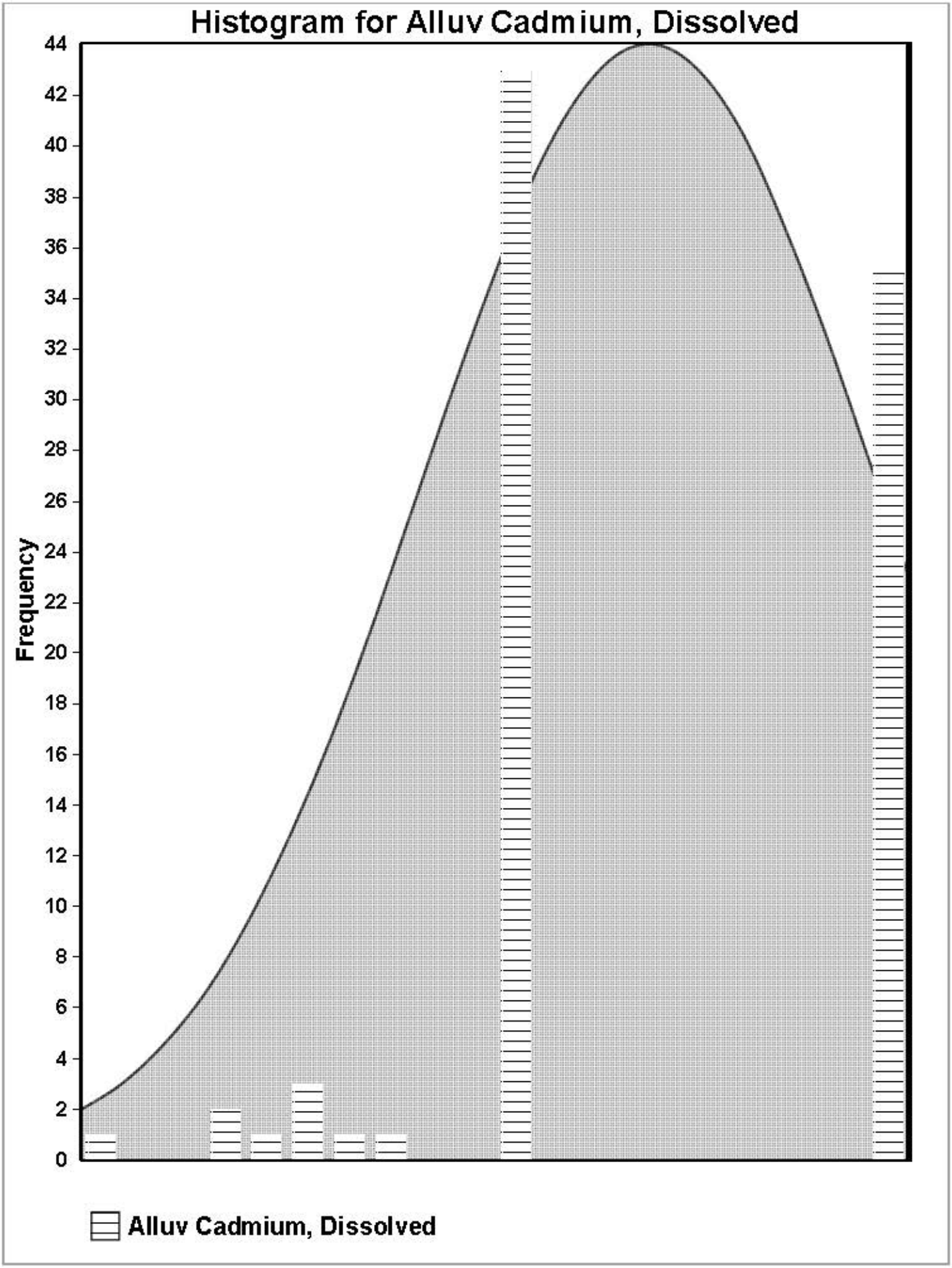
H0: Mu of Site or AOC = Mu of background

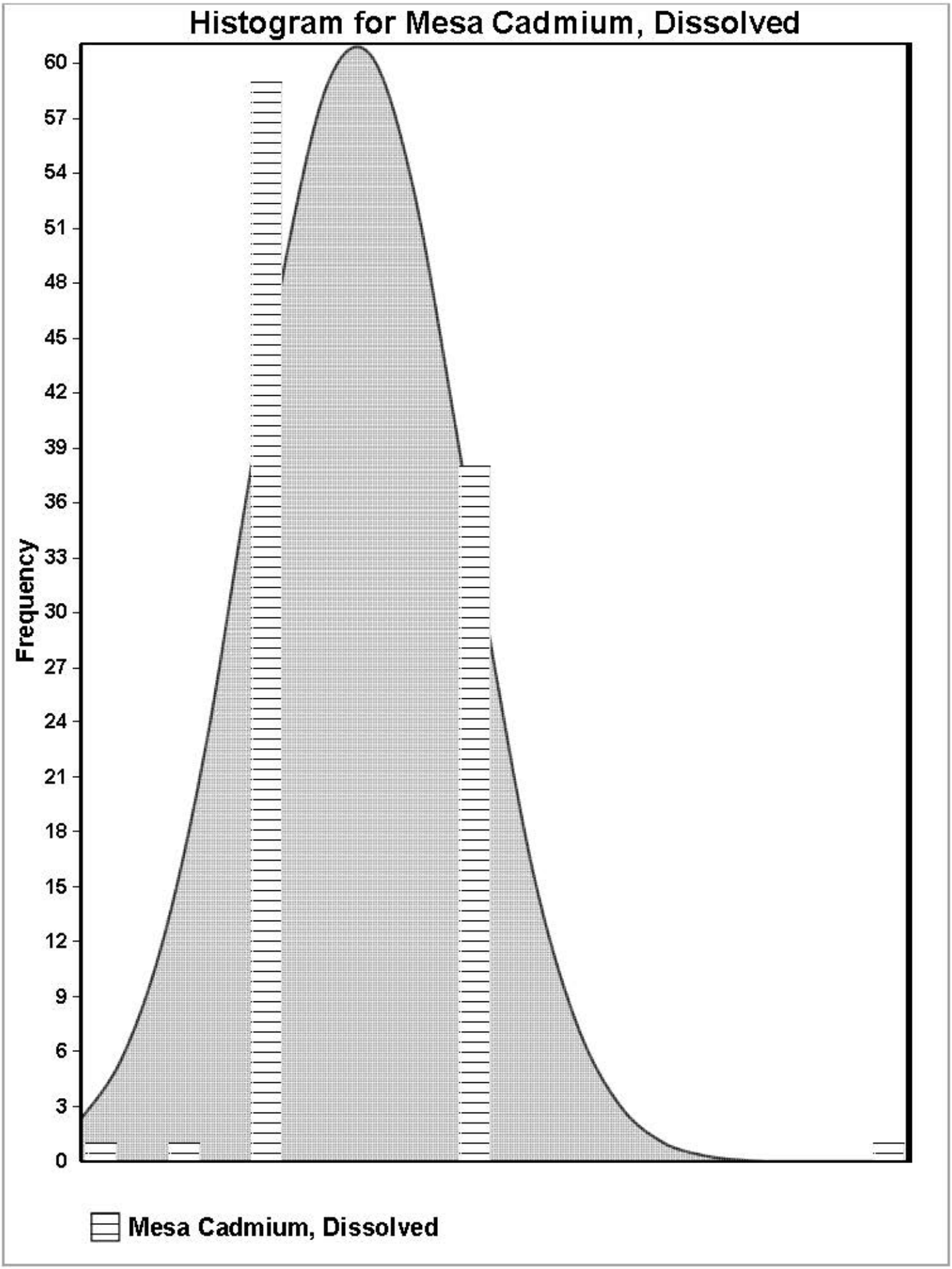
Gehan z Test Value	-1.966
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0493

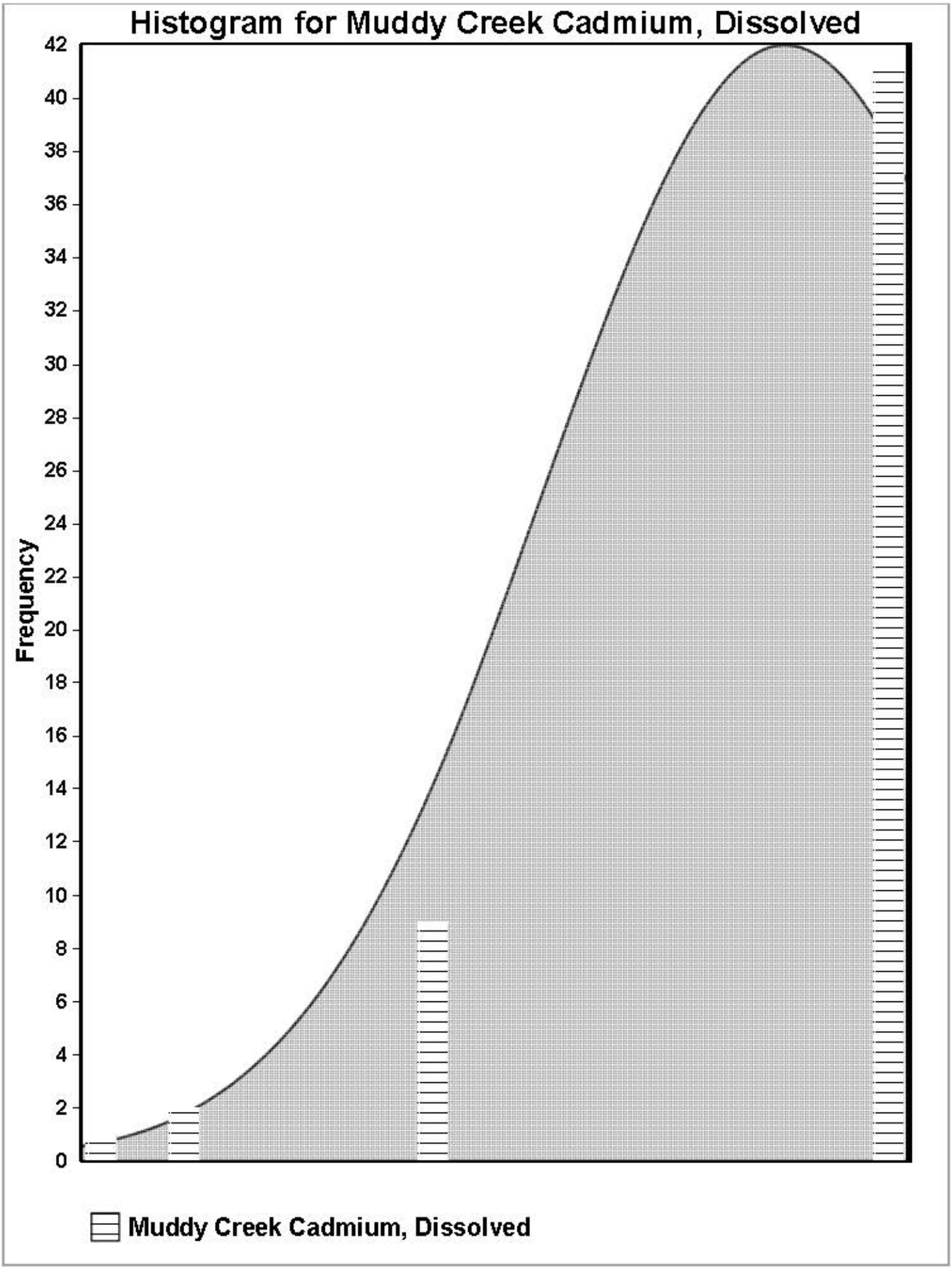
Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Cadmium, Dissolved
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
Alluv Cadmium, Dissolved


Histogram for Mesa Cadmium, Dissolved
Frequency
60
57
54
51
48
45
42
39
36
33
30
27
24
21
18
15
12
9
6
3
0
Mesa Cadmium, Dissolved


Histogram for Muddy Creek Cadmium, Dissolved
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
Muddy Creek Cadmium, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Cadmium_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Cadmium, Dissolved

Mean	0.00193
Standard Deviation	4.9802E-4
Number of data	87
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00193	4.9515E-4	8.0000E-4	68	2.287	3.338	3.705

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Cadmium, Dissolved

Mean	0.00242
Standard Deviation	3.7127E-4
Number of data	53
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00242	3.6776E-4	0.0015	47	2.488	3.151	3.504

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Cadmium, Dissolved

Mean	0.00194
Standard Deviation	6.6601E-4
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00194	6.6267E-4	0.0051	23	4.773	3.38	3.75

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.0051 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.0051 is a Potential Statistical Outlier

Rosner's Outlier Test for Alluv + Mesa Cadmium, Dissolved

Mean	0.00193
Standard Deviation	5.9226E-4
Number of data	187
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00193	5.9068E-4	0.0051	110	5.359	3.587	3.957

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.0051 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.0051 is a Potential Statistical Outlier

Location Name	Sample Date	Alluv Cadmium, Dissolved	D_Alluv Cadmium, Dissolved
BG-1S	11/26/2012	0.005	0
BG-1S	8/23/2012	0.005	0
BG-1S	5/24/2012	0.005	0
BG-1S	3/20/2012	0.0022	1
IMW-2.5D	11/26/2012	0.005	0
IMW-2.5D	8/24/2012	0.005	0
IMW-2.5D	5/21/2012	0.0017	1
IMW-2.5D	3/21/2012	0.005	0
IMW-2.5D	12/8/2011	0.003	0
IMW-2.5D	6/6/2011	0.005	0
IMW-2.5D	12/15/2010	0.005	0
IMW-2.5D	6/9/2010	0.003	0
IMW-2.5D	12/12/2009	0.003	0
IMW-2.5S	11/26/2012	0.005	0
IMW-2.5S	8/24/2012	0.0015	1
IMW-2.5S	5/21/2012	0.002	1
IMW-2.5S	3/21/2012	0.005	0
IMW-2.5S	12/8/2011	0.003	0
IMW-2.5S	9/9/2011	0.003	0
IMW-2.5S	6/6/2011	0.005	0
IMW-2.5S	3/7/2011	0.005	0
IMW-2.5S	12/15/2010	0.005	0
IMW-2.5S	9/20/2010	0.005	0
IMW-2.5S	6/9/2010	0.003	0
IMW-2.5S	3/9/2010	0.003	0
IMW-2.5S	12/12/2009	0.003	0
IMW-2.5S	9/21/2009	0.003	0
IMW-3S	5/21/2012	0.002	1
IMW-3S	3/20/2012	0.005	0
IMW-3S	12/9/2011	0.003	0
IMW-3S	9/9/2011	0.003	0
IMW-3S	6/7/2011	0.005	0
IMW-3S	3/7/2011	0.005	0
IMW-3S	12/10/2010	0.005	0
IMW-3S	9/16/2010	0.005	0
IMW-3S	6/8/2010	0.003	0
IMW-3S	3/9/2010	0.003	0
IMW-3S	12/10/2009	0.003	0
IMW-3S	9/14/2009	0.003	0
IMW-3S	6/9/2009	0.003	0
IMW-3S	3/3/2009	0.003	0
IMW-3S	12/9/2008	0.003	0
IMW-3S	9/9/2008	0.003	0
IMW-3S	6/3/2008	0.003	0
IMW-3S	3/4/2008	0.003	0
KMW-2D	11/26/2012	0.005	0
KMW-2D	8/24/2012	0.005	0
KMW-2D	5/21/2012	0.0015	1
KMW-2D	3/23/2012	0.005	0
KMW-2D	12/8/2011	0.003	0

Location Name	Sample Date	Muddy Creek Cadmium, Dissolved	D_Muddy Creek Cadmium, Dissolved
BG-3S	11/27/2012	0.005	0
BG-3S	8/22/2012	0.005	0
BG-3S	5/23/2012	0.0016	1
BG-3S	3/21/2012	0.005	0
BG-4S	11/27/2012	0.005	0
BG-4S	8/30/2012	0.005	0
BG-4S	5/30/2012	0.0031	1
BG-4S	3/20/2012	0.003	1
BG-6S	11/27/2012	0.005	0
BG-6S	8/23/2012	0.005	0
BG-6S	5/25/2012	0.005	0
BG-6S	3/21/2012	0.005	0
BG-1M	11/26/2012	0.005	0
BG-1M	8/23/2012	0.005	0
BG-1M	5/24/2012	0.005	0
BG-1M	3/20/2012	0.002	1
BG-3M	11/27/2012	0.005	0
BG-3M	8/22/2012	0.005	0
BG-3M	5/24/2012	0.005	0
BG-3M	3/21/2012	0.005	0
BG-4M	11/27/2012	0.005	0
BG-4M	8/30/2012	0.005	0
BG-4M	5/30/2012	0.0031	1
BG-4M	3/20/2012	0.0021	1
BG-6M	11/27/2012	0.005	0
BG-6M	8/22/2012	0.005	0
BG-6M	5/25/2012	0.005	0
BG-6M	3/21/2012	0.005	0
BG-1D	11/26/2012	0.005	0
BG-1D	8/23/2012	0.005	0
BG-1D	5/24/2012	0.005	0
BG-1D	3/20/2012	0.005	0
BG-3D	11/27/2012	0.005	0
BG-3D	8/21/2012	0.005	0
BG-3D	5/23/2012	0.005	0
BG-3D	3/21/2012	0.005	0
BG-4D	11/27/2012	0.005	0
BG-4D	8/30/2012	0.005	0
BG-4D	5/30/2012	0.0031	1
BG-4D	3/20/2012	0.005	0
BG-6D	11/27/2012	0.005	0
BG-6D	8/22/2012	0.005	0
BG-6D	5/25/2012	0.005	0
BG-6D	3/21/2012	0.005	0
IMW-3D	5/25/2012	0.005	0
IMW-3D	3/22/2012	0.005	0
IMW-3D	12/9/2011	0.003	0
IMW-3D	6/7/2011	0.005	0
IMW-3D	12/10/2010	0.005	0
IMW-3D	6/8/2010	0.003	0

Location Name	Sample Date	Mesa Cadmium, Dissolved	D_Mesa Cadmium, Dissolved
LMW-10	11/28/2012	0.005	0
LMW-10	8/27/2012	0.005	0
LMW-10	5/30/2012	0.005	0
LMW-10	3/22/2012	0.005	0
LMW-10	12/6/2011	0.003	0
LMW-10	9/8/2011	0.003	0
LMW-10	6/8/2011	0.005	0
LMW-10	3/2/2011	0.005	0
LMW-10	12/9/2010	0.01	0
LMW-10	9/21/2010	0.005	0
LMW-10	6/9/2010	0.003	0
LMW-10	3/11/2010	0.003	0
LMW-10	12/11/2009	0.003	0
LMW-10	9/18/2009	0.003	0
LMW-10	6/10/2009	0.003	0
LMW-10	3/5/2009	0.003	0
LMW-10	12/12/2008	0.003	0
LMW-10	9/10/2008	0.003	0
LMW-10	6/4/2008	0.003	0
LMW-10	3/5/2008	0.003	0
LMW-11R	11/26/2012	0.005	0
LMW-11R	8/21/2012	0.005	0
LMW-11R	5/29/2012	0.0051	1
LMW-11R	3/23/2012	0.005	0
LMW-7	11/28/2012	0.005	0
LMW-7	8/27/2012	0.005	0
LMW-7	5/31/2012	0.005	0
LMW-7	3/23/2012	0.005	0
LMW-7	12/5/2011	0.003	0
LMW-7	9/6/2011	0.003	0
LMW-7	6/9/2011	0.005	0
LMW-7	3/9/2011	0.005	0
LMW-7	12/10/2010	0.005	0
LMW-7	9/21/2010	0.005	0
LMW-7	6/9/2010	0.003	0
LMW-7	3/11/2010	0.003	0
LMW-7	12/11/2009	0.003	0
LMW-7	9/18/2009	0.003	0
LMW-7	6/10/2009	0.003	0
LMW-7	3/5/2009	0.003	0
LMW-7	12/12/2008	0.003	0
LMW-7	9/10/2008	0.003	0
LMW-7	6/4/2008	0.003	0
LMW-7	3/5/2008	0.003	0
BG-2S	11/26/2012	0.005	0
BG-2S	8/23/2012	0.005	0
BG-2S	5/24/2012	0.005	0
BG-2S	3/21/2012	0.0019	1
BG-2M	11/26/2012	0.005	0
BG-2M	8/23/2012	0.005	0

Location Name	Sample Date	Alluv + Mesa Cadmium, Dissolved	D_Alluv + Mesa Cadmium, Dissolved
BG-1S	11/26/2012	0.005	0
BG-1S	8/23/2012	0.005	0
BG-1S	5/24/2012	0.005	0
BG-1S	3/20/2012	0.0022	1
IMW-2.5D	11/26/2012	0.005	0
IMW-2.5D	8/24/2012	0.005	0
IMW-2.5D	5/21/2012	0.0017	1
IMW-2.5D	3/21/2012	0.005	0
IMW-2.5D	12/8/2011	0.003	0
IMW-2.5D	6/6/2011	0.005	0
IMW-2.5D	12/15/2010	0.005	0
IMW-2.5D	6/9/2010	0.003	0
IMW-2.5D	12/12/2009	0.003	0
IMW-2.5S	11/26/2012	0.005	0
IMW-2.5S	8/24/2012	0.0015	1
IMW-2.5S	5/21/2012	0.002	1
IMW-2.5S	3/21/2012	0.005	0
IMW-2.5S	12/8/2011	0.003	0
IMW-2.5S	9/9/2011	0.003	0
IMW-2.5S	6/6/2011	0.005	0
IMW-2.5S	3/7/2011	0.005	0
IMW-2.5S	12/15/2010	0.005	0
IMW-2.5S	9/20/2010	0.005	0
IMW-2.5S	6/9/2010	0.003	0
IMW-2.5S	3/9/2010	0.003	0
IMW-2.5S	12/12/2009	0.003	0
IMW-2.5S	9/21/2009	0.003	0
IMW-3S	5/21/2012	0.002	1
IMW-3S	3/20/2012	0.005	0
IMW-3S	12/9/2011	0.003	0
IMW-3S	9/9/2011	0.003	0
IMW-3S	6/7/2011	0.005	0
IMW-3S	3/7/2011	0.005	0
IMW-3S	12/10/2010	0.005	0
IMW-3S	9/16/2010	0.005	0
IMW-3S	6/8/2010	0.003	0
IMW-3S	3/9/2010	0.003	0
IMW-3S	12/10/2009	0.003	0
IMW-3S	9/14/2009	0.003	0
IMW-3S	6/9/2009	0.003	0
IMW-3S	3/3/2009	0.003	0
IMW-3S	12/9/2008	0.003	0
IMW-3S	9/9/2008	0.003	0
IMW-3S	6/3/2008	0.003	0
IMW-3S	3/4/2008	0.003	0
KMW-2D	11/26/2012	0.005	0
KMW-2D	8/24/2012	0.005	0
KMW-2D	5/21/2012	0.0015	1
KMW-2D	3/23/2012	0.005	0
KMW-2D	12/8/2011	0.003	0

KMW-2D	6/6/2011	0.005	0	IMW-3D	12/10/2009	0.003	0	BG-2M	5/24/2012	0.005	0	KMW-2D	6/6/2011	0.005	0
KMW-2D	12/13/2010	0.005	0	IMW-3D	12/9/2008	0.003	0	BG-2M	3/21/2012	0.005	0	KMW-2D	12/13/2010	0.005	0
KMW-2D	6/8/2010	0.003	0	IMW-3D	6/3/2008	0.003	0	BG-2D	11/26/2012	0.0007	1	KMW-2D	6/8/2010	0.003	0
KMW-2D	12/8/2009	0.003	0					BG-2D	8/23/2012	0.005	0	KMW-2D	12/8/2009	0.003	0
KMW-2D	12/10/2008	0.003	0					BG-2D	5/24/2012	0.005	0	KMW-2D	12/10/2008	0.003	0
KMW-2D	6/3/2008	0.003	0					BG-2D	3/21/2012	0.005	0	KMW-2D	6/3/2008	0.003	0
KMW-2M	11/26/2012	0.005	0					LMW-9	11/28/2012	0.005	0	KMW-2M	11/26/2012	0.005	0
KMW-2M	8/24/2012	0.005	0					LMW-9	8/27/2012	0.005	0	KMW-2M	8/24/2012	0.005	0
KMW-2M	5/21/2012	0.002	1					LMW-9	5/31/2012	0.005	0	KMW-2M	5/21/2012	0.002	1
KMW-2M	3/23/2012	0.005	0					LMW-9	3/23/2012	0.005	0	KMW-2M	3/23/2012	0.005	0
KMW-2M	12/8/2011	0.003	0					LMW-9	12/5/2011	0.003	0	KMW-2M	12/8/2011	0.003	0
KMW-2M	6/6/2011	0.005	0					LMW-9	9/8/2011	0.003	0	KMW-2M	6/6/2011	0.005	0
KMW-2M	12/13/2010	0.005	0					LMW-9	6/8/2011	0.005	0	KMW-2M	12/13/2010	0.005	0
KMW-2M	6/8/2010	0.003	0					LMW-9	3/9/2011	0.005	0	KMW-2M	6/8/2010	0.003	0
KMW-2M	12/8/2009	0.003	0					LMW-9	12/10/2010	0.005	0	KMW-2M	12/8/2009	0.003	0
KMW-2M	12/10/2008	0.003	0					LMW-9	9/21/2010	0.005	0	KMW-2M	12/10/2008	0.003	0
KMW-2M	6/3/2008	0.003	0					LMW-9	6/9/2010	0.003	0	KMW-2M	6/3/2008	0.003	0
KMW-2S	11/26/2012	0.0008	1					LMW-9	3/11/2010	0.003	0	KMW-2S	11/26/2012	0.0008	1
KMW-2S	8/24/2012	0.005	0					LMW-9	12/11/2009	0.003	0	KMW-2S	8/24/2012	0.005	0
KMW-2S	5/21/2012	0.0024	1					LMW-9	9/18/2009	0.003	0	KMW-2S	5/21/2012	0.0024	1
KMW-2S	3/23/2012	0.005	0					LMW-9	6/10/2009	0.003	0	KMW-2S	3/23/2012	0.005	0
KMW-2S	12/8/2011	0.003	0					LMW-9	3/5/2009	0.003	0	KMW-2S	12/8/2011	0.003	0
KMW-2S	9/9/2011	0.003	0					LMW-9	12/12/2008	0.003	0	KMW-2S	9/9/2011	0.003	0
KMW-2S	6/6/2011	0.005	0					LMW-9	9/10/2008	0.003	0	KMW-2S	6/6/2011	0.005	0
KMW-2S	3/8/2011	0.005	0					LMW-9	6/4/2008	0.003	0	KMW-2S	3/8/2011	0.005	0
KMW-2S	12/13/2010	0.005	0					LMW-9	3/5/2008	0.003	0	KMW-2S	12/13/2010	0.005	0
KMW-2S	9/15/2010	0.005	0					LMW-11	3/2/2011	0.005	0	KMW-2S	9/15/2010	0.005	0
KMW-2S	6/8/2010	0.003	0					LMW-11	9/8/2011	0.003	0	KMW-2S	6/8/2010	0.003	0
KMW-2S	3/9/2010	0.003	0					LMW-11	12/6/2011	0.003	0	KMW-2S	3/9/2010	0.003	0
KMW-2S	12/8/2009	0.003	0					LMW-11	2/22/2012	0.003	0	KMW-2S	12/8/2009	0.003	0
KMW-2S	9/16/2009	0.003	0					LMW-12R	5/30/2012	0.003	0	KMW-2S	9/16/2009	0.003	0
KMW-2S	6/10/2009	0.003	0					LMW-12R	8/21/2012	0.003	0	KMW-2S	6/10/2009	0.003	0
KMW-2S	3/3/2009	0.003	0					LMW-12R	10/22/2012	0.003	0	KMW-2S	3/3/2009	0.003	0
KMW-2S	12/10/2008	0.003	0					LMW-12R	11/30/2012	0.003	0	KMW-2S	12/10/2008	0.003	0
KMW-2S	9/8/2008	0.003	0					LMW-13R	5/29/2012	0.003	0	KMW-2S	9/8/2008	0.003	0
KMW-2S	6/3/2008	0.003	0					LMW-13R	8/20/2012	0.003	0	KMW-2S	6/3/2008	0.003	0
KMW-2S	3/4/2008	0.003	0					LMW-13R	10/22/2012	0.003	0	KMW-2S	3/4/2008	0.003	0
								LMW-13R	11/28/2012	0.003	0	LMW-10	11/28/2012	0.005	0
								LMW-14R	5/29/2012	0.003	0	LMW-10	8/27/2012	0.005	0
								LMW-14R	8/20/2012	0.003	0	LMW-10	5/30/2012	0.005	0
								LMW-14R	10/22/2012	0.003	0	LMW-10	3/22/2012	0.005	0
								LMW-14R	11/30/2012	0.003	0	LMW-10	12/6/2011	0.003	0
								LMW-15	5/29/2012	0.003	0	LMW-10	9/8/2011	0.003	0
								LMW-15	8/20/2012	0.003	0	LMW-10	6/8/2011	0.005	0
								LMW-15	10/22/2012	0.003	0	LMW-10	3/2/2011	0.005	0
								LMW-15	11/28/2012	0.003	0	LMW-10	12/9/2010	0.01	0
								LMW-16	5/29/2012	0.003	0	LMW-10	9/21/2010	0.005	0
								LMW-16	8/20/2012	0.003	0	LMW-10	6/9/2010	0.003	0
								LMW-16	10/22/2012	0.003	0	LMW-10	3/11/2010	0.003	0
								LMW-16	11/28/2012	0.003	0	LMW-10	12/11/2009	0.003	0
												LMW-10	9/18/2009	0.003	0
												LMW-10	6/10/2009	0.003	0

LMW-10	3/5/2009	0.003	0
LMW-10	12/12/2008	0.003	0
LMW-10	9/10/2008	0.003	0
LMW-10	6/4/2008	0.003	0
LMW-10	3/5/2008	0.003	0
LMW-11R	11/26/2012	0.005	0
LMW-11R	8/21/2012	0.005	0
LMW-11R	5/29/2012	0.0051	1
LMW-11R	3/23/2012	0.005	0
LMW-7	11/28/2012	0.005	0
LMW-7	8/27/2012	0.005	0
LMW-7	5/31/2012	0.005	0
LMW-7	3/23/2012	0.005	0
LMW-7	12/5/2011	0.003	0
LMW-7	9/6/2011	0.003	0
LMW-7	6/9/2011	0.005	0
LMW-7	3/9/2011	0.005	0
LMW-7	12/10/2010	0.005	0
LMW-7	9/21/2010	0.005	0
LMW-7	6/9/2010	0.003	0
LMW-7	3/11/2010	0.003	0
LMW-7	12/11/2009	0.003	0
LMW-7	9/18/2009	0.003	0
LMW-7	6/10/2009	0.003	0
LMW-7	3/5/2009	0.003	0
LMW-7	12/12/2008	0.003	0
LMW-7	9/10/2008	0.003	0
LMW-7	6/4/2008	0.003	0
LMW-7	3/5/2008	0.003	0
BG-2S	11/26/2012	0.005	0
BG-2S	8/23/2012	0.005	0
BG-2S	5/24/2012	0.005	0
BG-2S	3/21/2012	0.0019	1
BG-2M	11/26/2012	0.005	0
BG-2M	8/23/2012	0.005	0
BG-2M	5/24/2012	0.005	0
BG-2M	3/21/2012	0.005	0
BG-2D	11/26/2012	0.0007	1
BG-2D	8/23/2012	0.005	0
BG-2D	5/24/2012	0.005	0
BG-2D	3/21/2012	0.005	0
LMW-9	11/28/2012	0.005	0
LMW-9	8/27/2012	0.005	0
LMW-9	5/31/2012	0.005	0
LMW-9	3/23/2012	0.005	0
LMW-9	12/5/2011	0.003	0
LMW-9	9/8/2011	0.003	0
LMW-9	6/8/2011	0.005	0
LMW-9	3/9/2011	0.005	0
LMW-9	12/10/2010	0.005	0
LMW-9	9/21/2010	0.005	0
LMW-9	6/9/2010	0.003	0

			LMW-9	3/11/2010	0.003	0
			LMW-9	12/11/2009	0.003	0
			LMW-9	9/18/2009	0.003	0
			LMW-9	6/10/2009	0.003	0
			LMW-9	3/5/2009	0.003	0
			LMW-9	12/12/2008	0.003	0
			LMW-9	9/10/2008	0.003	0
			LMW-9	6/4/2008	0.003	0
			LMW-9	3/5/2008	0.003	0
			LMW-11	3/2/2011	0.005	0
			LMW-11	9/8/2011	0.003	0
			LMW-11	12/6/2011	0.003	0
			LMW-11	2/22/2012	0.003	0
			LMW-12R	5/30/2012	0.003	0
			LMW-12R	8/21/2012	0.003	0
			LMW-12R	10/22/2012	0.003	0
			LMW-12R	11/30/2012	0.003	0
			LMW-13R	5/29/2012	0.003	0
			LMW-13R	8/20/2012	0.003	0
			LMW-13R	10/22/2012	0.003	0
			LMW-13R	11/28/2012	0.003	0
			LMW-14R	5/29/2012	0.003	0
			LMW-14R	8/20/2012	0.003	0
			LMW-14R	10/22/2012	0.003	0
			LMW-14R	11/30/2012	0.003	0
			LMW-15	5/29/2012	0.003	0
			LMW-15	8/20/2012	0.003	0
			LMW-15	10/22/2012	0.003	0
			LMW-15	11/28/2012	0.003	0
			LMW-16	5/29/2012	0.003	0
			LMW-16	8/20/2012	0.003	0
			LMW-16	10/22/2012	0.003	0
			LMW-16	11/28/2012	0.003	0

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Calcium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Calcium, Dissolved

Raw Statistics	
Number of Valid Observations	87
Number of Distinct Observations	33
Minimum	78
Maximum	200
Mean of Raw Data	127.2
Standard Deviation of Raw Data	26.81
Kstar	21.27
Mean of Log Transformed Data	4.823
Standard Deviation of Log Transformed Data	0.218

Normal Distribution Test Results	
Correlation Coefficient R	0.988
Approximate Shapiro Wilk Test Statistic	0.963
Approximate Shapiro Wilk P Value	0.0574
Lilliefors Test Statistic	0.108
Lilliefors Critical (0.95) Value	0.095

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.986
A-D Test Statistic	1.023
A-D Critical (0.95) Value	0.75
K-S Test Statistic	0.132
K-S Critical(0.95) Value	0.0956

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.983
Approximate Shapiro Wilk Test Statistic	0.95
Approximate Shapiro Wilk P Value	0.00614
Lilliefors Test Statistic	0.144
Lilliefors Critical (0.95) Value	0.095

Data not Lognormal at (0.05) Significance Level

Muddy Creek Calcium, Dissolved

Raw Statistics	
Number of Valid Observations	54
Number of Distinct Observations	19
Minimum	68

Maximum	190
Mean of Raw Data	130.5
Standard Deviation of Raw Data	35.71
Kstar	11.84
Mean of Log Transformed Data	4.831
Standard Deviation of Log Transformed Data	0.296

Normal Distribution Test Results

Correlation Coefficient R	0.977
Approximate Shapiro Wilk Test Statistic	0.929
Approximate Shapiro Wilk P Value	0.00412
Lilliefors Test Statistic	0.135
Lilliefors Critical (0.95) Value	0.121

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.966
A-D Test Statistic	1.096
A-D Critical (0.95) Value	0.75
K-S Test Statistic	0.144
K-S Critical(0.95) Value	0.121

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.964
Approximate Shapiro Wilk Test Statistic	0.906
Approximate Shapiro Wilk P Value	2.6323E-4
Lilliefors Test Statistic	0.164
Lilliefors Critical (0.95) Value	0.121

Data not Lognormal at (0.05) Significance Level

Mesa Calcium, Dissolved

Raw Statistics

Number of Valid Observations	100
Number of Distinct Observations	38
Minimum	190
Maximum	530
Mean of Raw Data	318.6
Standard Deviation of Raw Data	76.33
Kstar	17.15
Mean of Log Transformed Data	5.735
Standard Deviation of Log Transformed Data	0.242

Normal Distribution Test Results

Correlation Coefficient R	0.988
Approximate Shapiro Wilk Test Statistic	0.96
Approximate Shapiro Wilk P Value	0.0216
Lilliefors Test Statistic	0.0803

Lilliefors Critical (0.95) Value	0.0886

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.994
A-D Test Statistic	0.514
A-D Critical (0.95) Value	0.75
K-S Test Statistic	0.0852
K-S Critical(0.95) Value	0.0893

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.993
Approximate Shapiro Wilk Test Statistic	0.965
Approximate Shapiro Wilk P Value	0.0612
Lilliefors Test Statistic	0.0993
Lilliefors Critical (0.95) Value	0.0886

Data not Lognormal at (0.05) Significance Level

Alluv + Muddy Creek Calcium, Dissolved

Raw Statistics

Number of Valid Observations	151
Number of Distinct Observations	46
Minimum	68
Maximum	200
Mean of Raw Data	127.9
Standard Deviation of Raw Data	30.31
Kstar	16.75
Mean of Log Transformed Data	4.822
Standard Deviation of Log Transformed Data	0.249

Normal Distribution Test Results

Correlation Coefficient R	0.992
Approximate Shapiro Wilk Test Statistic	0.963
Approximate Shapiro Wilk P Value	0.00789
Lilliefors Test Statistic	0.0683
Lilliefors Critical (0.95) Value	0.0721

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.989
A-D Test Statistic	0.994
A-D Critical (0.95) Value	0.751
K-S Test Statistic	0.0888
K-S Critical(0.95) Value	0.0761

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.986
Approximate Shapiro Wilk Test Statistic	0.951
Approximate Shapiro Wilk P Value	8.9894E-5
Lilliefors Test Statistic	0.103
Lilliefors Critical (0.95) Value	0.0721

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Calcium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Calcium, Dissolved

General Statistics

Total Number of Observations	87	Number of Distinct Observations	33

Raw Statistics		Log-Transformed Statistics	
Minimum	78	Minimum	4.357
Maximum	200	Maximum	5.298
Second Largest	180	Second Largest	5.193
First Quartile	110	First Quartile	4.7
Median	130	Median	4.868
Third Quartile	141.5	Third Quartile	4.952
Mean	127.2	Mean	4.823
SD	26.81	SD	0.218
Coefficient of Variation	0.211		
Skewness	0.0943		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.108	Lilliefors Test Statistic	0.144
Lilliefors Critical Value	0.095	Lilliefors Critical Value	0.095
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	179.4	95% UTL with 95% Coverage	190.1
95% UPL (t)	172.1	95% UPL (t)	179.1
90% Percentile (z)	161.6	90% Percentile (z)	164.4
95% Percentile (z)	171.3	95% Percentile (z)	178
99% Percentile (z)	189.6	99% Percentile (z)	206.5

Gamma Distribution Test		Data Distribution Test	
k star	21.27	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.981		
MLE of Mean	127.2		
MLE of Standard Deviation	27.58		
nu star	3702		
A-D Test Statistic	1.023	Nonparametric Statistics	
5% A-D Critical Value	0.75	90% Percentile	160
K-S Test Statistic	0.132	95% Percentile	170
5% K-S Critical Value	0.0956	99% Percentile	182.8
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	170
90% Percentile	163.6	95% Percentile Bootstrap UTL with 95% Coverage	177
95% Percentile	175.7	95% BCA Bootstrap UTL with 95% Coverage	170
99% Percentile	200	95% UPL	170
		95% Chebyshev UPL	244.8
95% WH Approx. Gamma UPL	176.1	Upper Threshold Limit Based upon IQR	188.8
95% HW Approx. Gamma UPL	176.8		
95% WH Approx. Gamma UTL with 95% Coverage	185.5		
95% HW Approx. Gamma UTL with 95% Coverage	186.6		

Muddy Creek Calcium, Dissolved

General Statistics			
Total Number of Observations	54	Number of Distinct Observations	19
Raw Statistics		**Log-Transformed Statistics**	
Minimum	68	Minimum	4.22
Maximum	190	Maximum	5.247
Second Largest	190	Second Largest	5.247
First Quartile	112	First Quartile	4.718
Median	130	Median	4.868
Third Quartile	160	Third Quartile	5.075
Mean	130.5	Mean	4.831
SD	35.71	SD	0.296
Coefficient of Variation	0.274		
Skewness	-0.0237		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.135	Lilliefors Test Statistic	0.164
Lilliefors Critical Value	0.121	Lilliefors Critical Value	0.121
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	203.4	95% UTL with 95% Coverage	229.2
95% UPL (t)	190.8	95% UPL (t)	206.6
90% Percentile (z)	176.3	90% Percentile (z)	183.1
95% Percentile (z)	189.2	95% Percentile (z)	203.9
99% Percentile (z)	213.6	99% Percentile (z)	249.4
Gamma Distribution Test		**Data Distribution Test**	
k star	11.84	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.02		
MLE of Mean	130.5		
MLE of Standard Deviation	37.93		
nu star	1279		
A-D Test Statistic	1.096	**Nonparametric Statistics**	
5% A-D Critical Value	0.75	90% Percentile	180
K-S Test Statistic	0.144	95% Percentile	190
5% K-S Critical Value	0.121	99% Percentile	190

Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	190
90% Percentile	180.8	95% Percentile Bootstrap UTL with 95% Coverage	190
95% Percentile	198.5	95% BCA Bootstrap UTL with 95% Coverage	190
99% Percentile	234.5	95% UPL	190
		95% Chebyshev UPL	287.6
95% WH Approx. Gamma UPL	199.5	Upper Threshold Limit Based upon IQR	232
95% HW Approx. Gamma UPL	201		
95% WH Approx. Gamma UTL with 95% Coverage	217.3		
95% HW Approx. Gamma UTL with 95% Coverage	219.8		

Mesa Calcium, Dissolved

General Statistics			
Total Number of Observations	100	Number of Distinct Observations	38
Raw Statistics		Log-Transformed Statistics	
Minimum	190	Minimum	5.247
Maximum	530	Maximum	6.273
Second Largest	490	Second Largest	6.194
First Quartile	257.5	First Quartile	5.551
Median	324.5	Median	5.782
Third Quartile	360	Third Quartile	5.886
Mean	318.6	Mean	5.735
SD	76.33	SD	0.242
Coefficient of Variation	0.24		
Skewness	0.408		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.0803	Lilliefors Test Statistic	0.0993
Lilliefors Critical Value	0.0886	Lilliefors Critical Value	0.0886
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	465.4	95% UTL with 95% Coverage	492.7
95% UPL (t)	445.9	95% UPL (t)	463.3
90% Percentile (z)	416.4	90% Percentile (z)	421.9
95% Percentile (z)	444.1	95% Percentile (z)	460.6
99% Percentile (z)	496.1	99% Percentile (z)	543
Gamma Distribution Test		Data Distribution Test	
k star	17.15	Data appear Normal at 5% Significance Level	
Theta Star	18.58		
MLE of Mean	318.6		
MLE of Standard Deviation	76.93		
nu star	3429		
A-D Test Statistic	0.514	Nonparametric Statistics	
5% A-D Critical Value	0.75	90% Percentile	420

K-S Test Statistic	0.0852	95% Percentile	450.5
5% K-S Critical Value	0.0893	99% Percentile	490.4
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	490
90% Percentile	420.3	95% Percentile Bootstrap UTL with 95% Coverage	490
95% Percentile	454.8	95% BCA Bootstrap UTL with 95% Coverage	490
99% Percentile	524.3	95% UPL	459.5
		95% Chebyshev UPL	652.9
95% WH Approx. Gamma UPL	455.7	Upper Threshold Limit Based upon IQR	513.8
95% HW Approx. Gamma UPL	457.4		
95% WH Approx. Gamma UTL with 95% Coverage	480.8		
95% HW Approx. Gamma UTL with 95% Coverage	483.4		

Alluv + Muddy Creek Calcium, Dissolved

General Statistics

Total Number of Observations	151	Number of Distinct Observations	46

Raw Statistics		Log-Transformed Statistics	
Minimum	68	Minimum	4.22
Maximum	200	Maximum	5.298
Second Largest	190	Second Largest	5.247
First Quartile	110	First Quartile	4.7
Median	130	Median	4.868
Third Quartile	150	Third Quartile	5.011
Mean	127.9	Mean	4.822
SD	30.31	SD	0.249
Coefficient of Variation	0.237		
Skewness	0.0946		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.0683	Lilliefors Test Statistic	0.103
Lilliefors Critical Value	0.0721	Lilliefors Critical Value	0.0721
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	184.5	95% UTL with 95% Coverage	197.5
95% UPL (t)	178.2	95% UPL (t)	187.7
90% Percentile (z)	166.7	90% Percentile (z)	170.8
95% Percentile (z)	177.8	95% Percentile (z)	186.9
99% Percentile (z)	198.4	99% Percentile (z)	221.5
Gamma Distribution Test		Data Distribution Test	
k star	16.75	Data appear Normal at 5% Significance Level	
Theta Star	7.636		
MLE of Mean	127.9		
MLE of Standard Deviation	31.25		
nu star	5058		

A-D Test Statistic	0.994	Nonparametric Statistics	
5% A-D Critical Value	0.751	90% Percentile	170
K-S Test Statistic	0.0888	95% Percentile	180
5% K-S Critical Value	0.0761	99% Percentile	190
Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	190
90% Percentile	169.2	95% Percentile Bootstrap UTL with 95% Coverage	190
95% Percentile	183.3	95% BCA Bootstrap UTL with 95% Coverage	180
99% Percentile	211.6	95% UPL	180
		95% Chebyshev UPL	260.5
95% WH Approx. Gamma UPL	183.5	Upper Threshold Limit Based upon IQR	210
95% HW Approx. Gamma UPL	184.4		
95% WH Approx. Gamma UTL with 95% Coverage	191.8		
95% HW Approx. Gamma UTL with 95% Coverage	193.1		

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Calcium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Calcium, Dissolved

Background Data: Alluv Calcium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	100	87
Number of Distinct Observations	38	33
Minimum	190	78
Maximum	530	200
Mean	318.6	127.2
Median	324.5	130
SD	76.33	26.81
SE of Mean	7.633	2.874

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	13746
WMW Test U-Stat	11.77
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Calcium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Calcium, Dissolved

Background Data: Alluv Calcium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	54	87
Number of Distinct Observations	19	33
Minimum	68	78
Maximum	190	200
Mean	130.5	127.2
Median	130	130
SD	35.71	26.81
SE of Mean	4.86	2.874

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	3949
WMW Test U-Stat	0.483
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.629

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Calcium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Calcium, Dissolved

Background Data: Muddy Creek Calcium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	100	54
Number of Distinct Observations	38	19
Minimum	190	68
Maximum	530	190
Mean	318.6	130.5
Median	324.5	130
SD	76.33	35.71
SE of Mean	7.633	4.86

Wilcoxon-Mann-Whitney (WMW) Test

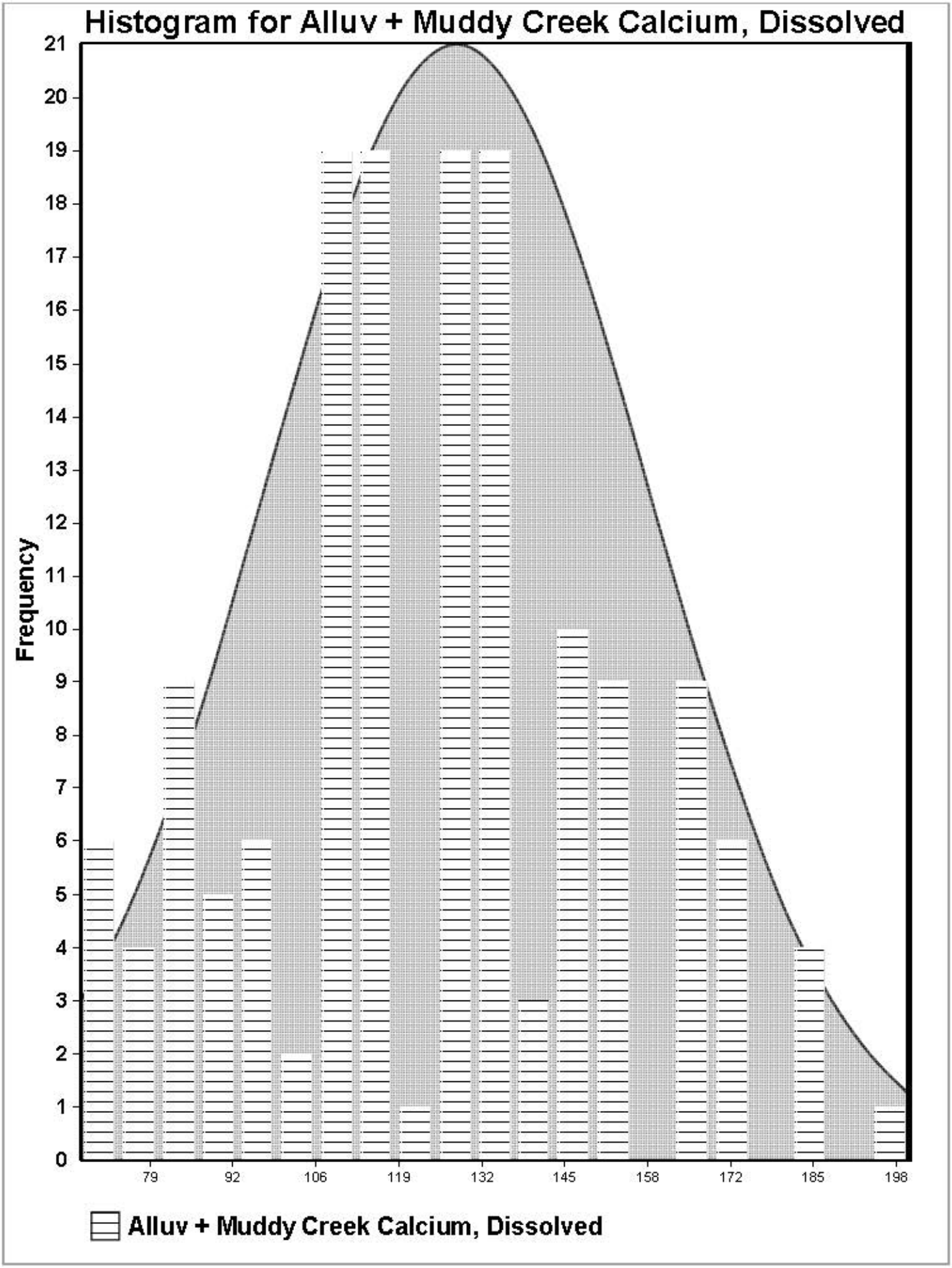
H0: Mean/Median of Site or AOC = Mean/Median of Background

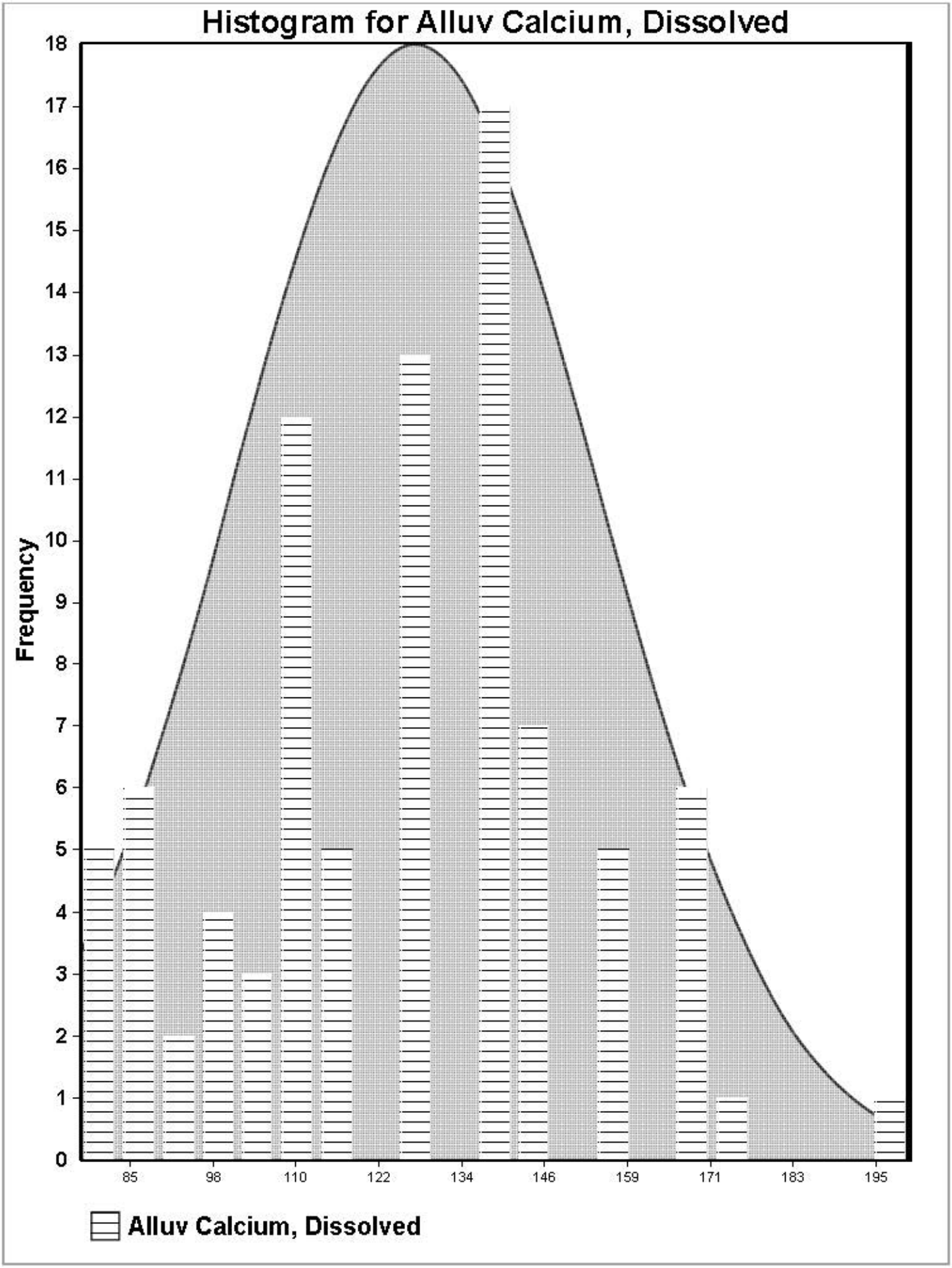
Site Rank Sum W-Stat	10446
WMW Test U-Stat	10.21
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0

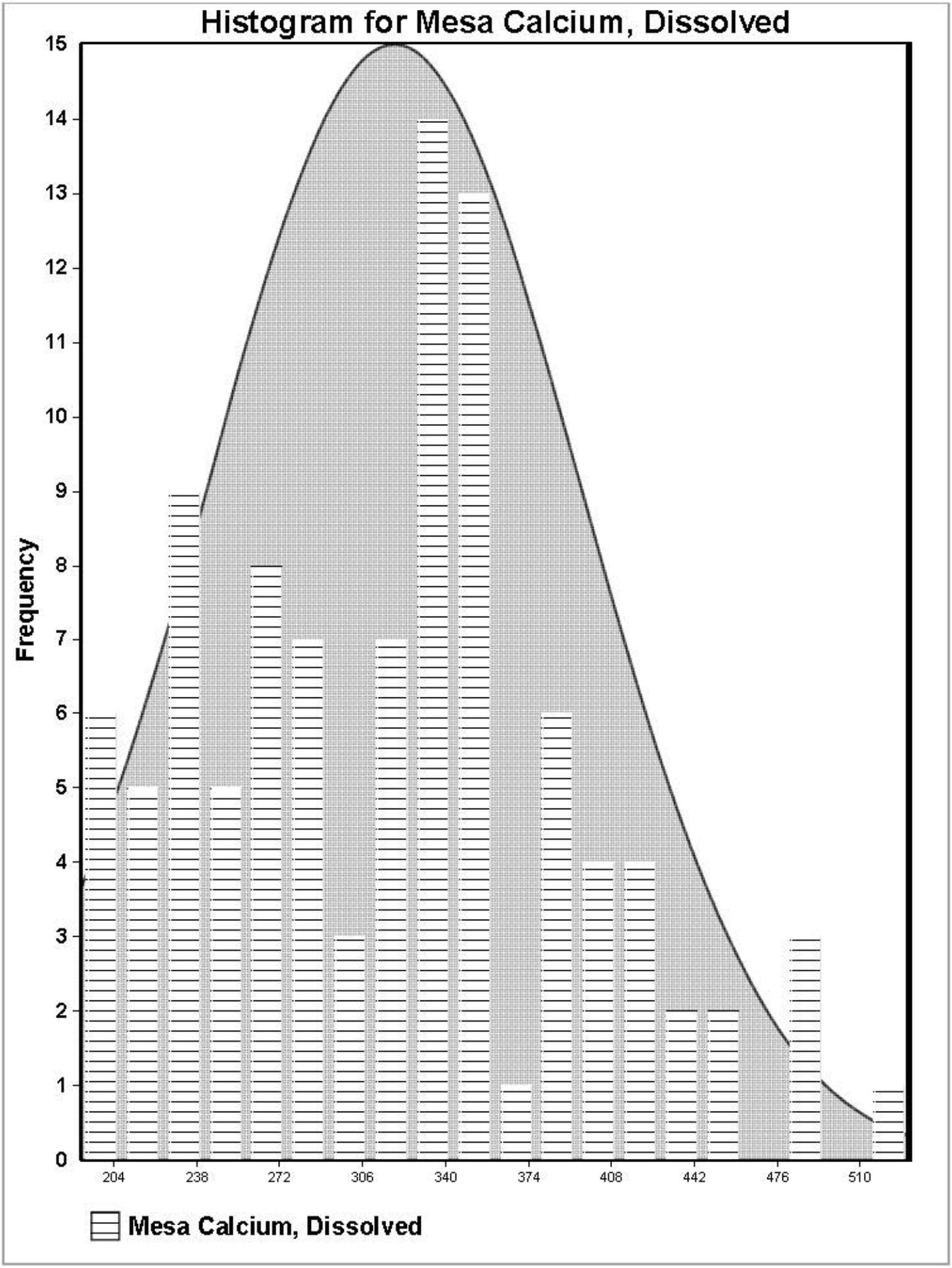
Conclusion with Alpha = 0.05

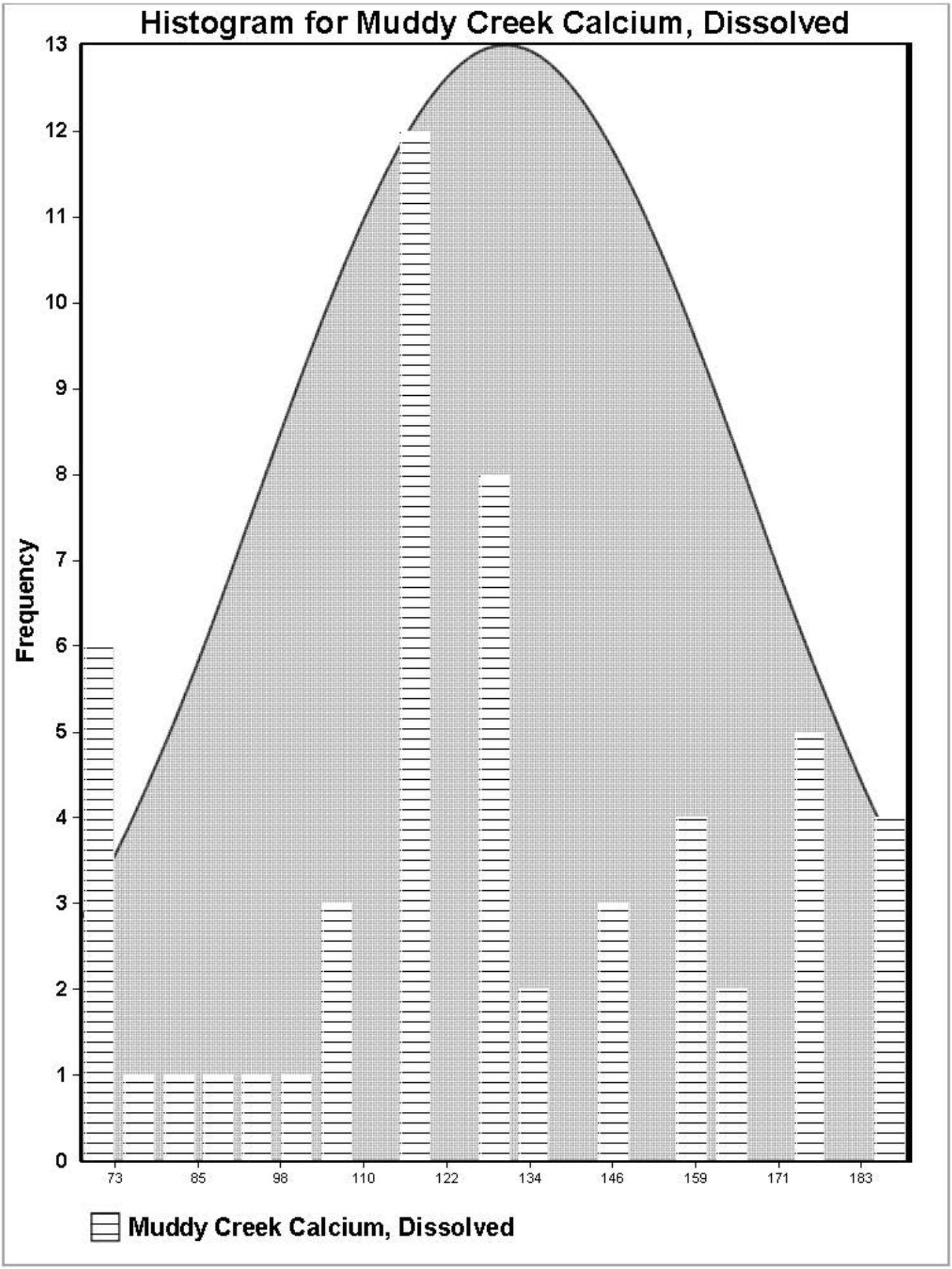
Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv + Muddy Creek Calcium, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
79
92
106
119
132
145
158
172
185
198
Alluv + Muddy Creek Calcium, Dissolved


Histogram for Alluv Calcium, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
85
98
110
122
134
146
159
171
183
195
Alluv Calcium, Dissolved


Histogram for Mesa Calcium, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
204
238
272
306
340
374
408
442
476
510
Mesa Calcium, Dissolved


Histogram for Muddy Creek Calcium, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
73
85
98
110
122
134
146
159
171
183
Muddy Creek Calcium, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Calcium_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for Alluv Calcium, Dissolved

Mean	127.2
Standard Deviation	26.81
Number of data	87
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	127.2	26.66	200	57	2.73	3.338	3.705

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Calcium, Dissolved

Mean	130.5
Standard Deviation	35.71
Number of data	54
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	130.5	35.38	68	33	1.767	3.158	3.512

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Calcium, Dissolved

Mean	318.6
Standard Deviation	76.33
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	318.6	75.94	530	21	2.784	3.38	3.75

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Alluv + Muddy Creek Calcium, Dissolved

Mean	127.9
Standard Deviation	30.31
Number of data	151
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	127.9	30.21	200	64	2.387	3.522	3.892

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Location Name	Sample Date	Alluv Calcium, Dissolved
BG-1S	11/26/2012	180
BG-1S	8/23/2012	140
BG-1S	5/24/2012	140
BG-1S	3/20/2012	150
IMW-2.5D	11/26/2012	130
IMW-2.5D	8/24/2012	110
IMW-2.5D	5/21/2012	110
IMW-2.5D	3/21/2012	110
IMW-2.5D	12/8/2011	100
IMW-2.5D	6/6/2011	98.1
IMW-2.5D	12/15/2010	84.3
IMW-2.5D	6/9/2010	98
IMW-2.5D	12/12/2009	96
IMW-2.5S	11/26/2012	110
IMW-2.5S	8/24/2012	93
IMW-2.5S	5/21/2012	90
IMW-2.5S	3/21/2012	87
IMW-2.5S	12/8/2011	78
IMW-2.5S	9/9/2011	85
IMW-2.5S	6/6/2011	83.3
IMW-2.5S	3/7/2011	82.4
IMW-2.5S	12/15/2010	80.2
IMW-2.5S	9/20/2010	87.4
IMW-2.5S	6/9/2010	110
IMW-2.5S	3/9/2010	110
IMW-2.5S	12/12/2009	130
IMW-2.5S	9/21/2009	110
IMW-3S	5/21/2012	110
IMW-3S	3/20/2012	110
IMW-3S	12/9/2011	100
IMW-3S	9/9/2011	110
IMW-3S	6/7/2011	88.1
IMW-3S	3/7/2011	108
IMW-3S	12/10/2010	104
IMW-3S	9/16/2010	108
IMW-3S	6/8/2010	130
IMW-3S	3/9/2010	130
IMW-3S	12/10/2009	120
IMW-3S	9/14/2009	120
IMW-3S	6/9/2009	130
IMW-3S	3/3/2009	120
IMW-3S	12/9/2008	120
IMW-3S	9/9/2008	110
IMW-3S	6/3/2008	140
IMW-3S	3/4/2008	130
KMW-2D	11/26/2012	170
KMW-2D	8/24/2012	130
KMW-2D	5/21/2012	130
KMW-2D	3/23/2012	140
KMW-2D	12/8/2011	130
KMW-2D	6/6/2011	119
KMW-2D	12/13/2010	127
KMW-2D	6/8/2010	140
KMW-2D	12/8/2009	130
KMW-2D	12/10/2008	110
KMW-2D	6/3/2008	130
KMW-2M	11/26/2012	200
KMW-2M	8/24/2012	160
KMW-2M	5/21/2012	170
KMW-2M	3/23/2012	160
KMW-2M	12/8/2011	140
KMW-2M	6/6/2011	139
KMW-2M	12/13/2010	139
KMW-2M	6/8/2010	160
KMW-2M	12/8/2009	170
KMW-2M	12/10/2008	140
KMW-2M	6/3/2008	150
KMW-2S	11/26/2012	170
KMW-2S	8/24/2012	140
KMW-2S	5/21/2012	140
KMW-2S	3/23/2012	140
KMW-2S	12/8/2011	140
KMW-2S	9/9/2011	81
KMW-2S	6/6/2011	144
KMW-2S	3/8/2011	140
KMW-2S	12/13/2010	146
KMW-2S	9/15/2010	143
KMW-2S	6/8/2010	170
KMW-2S	3/9/2010	150
KMW-2S	12/8/2009	160
KMW-2S	9/16/2009	170
KMW-2S	6/10/2009	160
KMW-2S	3/3/2009	140
KMW-2S	12/10/2008	150
KMW-2S	9/8/2008	150
KMW-2S	6/3/2008	150
KMW-2S	3/4/2008	130

Location Name	Sample Date	Muddy Creek Calcium, Dissolved
BG-3S	11/27/2012	110
BG-3S	8/22/2012	120
BG-3S	5/23/2012	110
BG-3S	3/21/2012	110
BG-4S	11/27/2012	160
BG-4S	8/30/2012	160
BG-4S	5/30/2012	170
BG-4S	3/20/2012	170
BG-6S	11/27/2012	190
BG-6S	8/23/2012	190
BG-6S	5/25/2012	180
BG-6S	3/21/2012	190
BG-1M	11/26/2012	150
BG-1M	8/23/2012	120
BG-1M	5/24/2012	120
BG-1M	3/20/2012	120
BG-3M	11/27/2012	83
BG-3M	8/22/2012	71
BG-3M	5/24/2012	79
BG-3M	3/21/2012	70
BG-4M	11/27/2012	150
BG-4M	8/30/2012	140
BG-4M	5/30/2012	150
BG-4M	3/20/2012	160
BG-6M	11/27/2012	180
BG-6M	8/22/2012	180
BG-6M	5/25/2012	120
BG-6M	3/21/2012	180
BG-1D	11/26/2012	160
BG-1D	8/23/2012	130
BG-1D	5/24/2012	120
BG-1D	3/20/2012	120
BG-3D	11/27/2012	68
BG-3D	8/21/2012	70
BG-3D	5/23/2012	69
BG-3D	3/21/2012	71
BG-4D	11/27/2012	130
BG-4D	8/30/2012	130
BG-4D	5/30/2012	140
BG-4D	3/20/2012	130
BG-6D	11/27/2012	190
BG-6D	8/22/2012	180
BG-6D	5/25/2012	94
BG-6D	3/21/2012	92
IMW-3D	5/25/2012	130
IMW-3D	2/29/2012	130
IMW-3D	3/22/2012	130
IMW-3D	12/9/2011	120
IMW-3D	6/7/2011	118
IMW-3D	12/10/2010	102
IMW-3D	6/8/2010	120
IMW-3D	12/10/2009	130
IMW-3D	12/9/2008	120
IMW-3D	6/3/2008	120

Location Name	Sample Date	Mesa Calcium, Dissolved
LMW-10	11/28/2012	340
LMW-10	8/27/2012	330
LMW-10	5/30/2012	190
LMW-10	3/22/2012	300
LMW-10	12/6/2011	310
LMW-10	9/8/2011	330
LMW-10	6/8/2011	291
LMW-10	3/2/2011	277
LMW-10	12/9/2010	312
LMW-10	9/21/2010	312
LMW-10	6/9/2010	350
LMW-10	3/11/2010	340
LMW-10	12/11/2009	330
LMW-10	9/18/2009	320
LMW-10	6/10/2009	310
LMW-10	3/5/2009	340
LMW-10	12/12/2008	300
LMW-10	9/10/2008	290
LMW-10	6/4/2008	310
LMW-10	3/5/2008	330
LMW-11R	11/26/2012	530
LMW-11R	8/21/2012	460
LMW-11R	5/29/2012	450
LMW-11R	3/23/2012	440
LMW-7	11/28/2012	280
LMW-7	8/27/2012	240
LMW-7	5/31/2012	250
LMW-7	3/23/2012	230
LMW-7	12/5/2011	250
LMW-7	9/6/2011	240
LMW-7	6/9/2011	209
LMW-7	3/9/2011	227
LMW-7	12/10/2010	220
LMW-7	9/21/2010	312
LMW-7	6/9/2010	270
LMW-7	3/11/2010	270
LMW-7	12/11/2009	250
LMW-7	9/18/2009	280
LMW-7	6/10/2009	250
LMW-7	3/5/2009	260
LMW-7	12/12/2008	240
LMW-7	9/10/2008	290
LMW-7	6/4/2008	260
LMW-7	3/5/2008	260
BG-2S	11/26/2012	440
BG-2S	8/23/2012	410
BG-2S	5/24/2012	420
BG-2S	3/21/2012	420
BG-2M	11/26/2012	240
BG-2M	8/23/2012	200
BG-2M	5/24/2012	190
BG-2M	3/21/2012	200
BG-2D	11/26/2012	240
BG-2D	8/23/2012	200
BG-2D	5/24/2012	200
BG-2D	3/21/2012	210
LMW-9	11/28/2012	350
LMW-9	8/27/2012	340
LMW-9	5/31/2012	330
LMW-9	3/23/2012	340
LMW-9	12/5/2011	350
LMW-9	9/8/2011	350
LMW-9	6/8/2011	284
LMW-9	3/9/2011	330
LMW-9	12/10/2010	298
LMW-9	9/21/2010	329
LMW-9	6/9/2010	390
LMW-9	3/11/2010	390
LMW-9	12/11/2009	360
LMW-9	9/18/2009	350
LMW-9	6/10/2009	350
LMW-9	3/5/2009	350
LMW-9	12/12/2008	340
LMW-9	9/10/2008	350
LMW-9	6/4/2008	360
LMW-9	3/5/2008	370
LMW-11	3/2/2011	397
LMW-11	9/8/2011	490
LMW-11	12/6/2011	490
LMW-11	2/22/2012	490
LMW-12R	5/30/2012	260
LMW-12R	8/21/2012	250
LMW-12R	10/22/2012	270
LMW-12R	11/30/2012	270
LMW-13R	5/29/2012	350
LMW-13R	8/20/2012	340
LMW-13R	10/22/2012	380
LMW-13R	11/28/2012	380
LMW-14R	5/29/2012	390
LMW-14R	8/20/2012	380
LMW-14R	10/22/2012	420
LMW-14R	11/30/2012	420
LMW-15	5/29/2012	360
LMW-15	8/20/2012	350
LMW-15	10/22/2012	400
LMW-15	11/28/2012	400
LMW-16	5/29/2012	220
LMW-16	8/20/2012	220
LMW-16	10/22/2012	230
LMW-16	11/28/2012	240

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Chloride

Raw Statistics	
Number of Valid Observations	87
Number of Distinct Observations	39
Minimum	120
Maximum	470
Mean of Raw Data	332.5
Standard Deviation of Raw Data	70.06
Kstar	17.76
Mean of Log Transformed Data	5.779
Standard Deviation of Log Transformed Data	0.252

Normal Distribution Test Results	
Correlation Coefficient R	0.966
Approximate Shapiro Wilk Test Statistic	0.928
Approximate Shapiro Wilk P Value	7.1683E-5
Lilliefors Test Statistic	0.139
Lilliefors Critical (0.95) Value	0.095

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.939
A-D Test Statistic	3.031
A-D Critical (0.95) Value	0.75
K-S Test Statistic	0.158
K-S Critical(0.95) Value	0.0956

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.916
Approximate Shapiro Wilk Test Statistic	0.844
Approximate Shapiro Wilk P Value	4.993E-13
Lilliefors Test Statistic	0.163
Lilliefors Critical (0.95) Value	0.095

Data not Lognormal at (0.05) Significance Level

Muddy Creek Chloride

Raw Statistics	
Number of Valid Observations	53
Number of Distinct Observations	21
Minimum	150

Maximum	370
Mean of Raw Data	245
Standard Deviation of Raw Data	56.31
Kstar	18.04
Mean of Log Transformed Data	5.475
Standard Deviation of Log Transformed Data	0.234

Normal Distribution Test Results

Correlation Coefficient R	0.984
Approximate Shapiro Wilk Test Statistic	0.951
Approximate Shapiro Wilk P Value	0.052
Lilliefors Test Statistic	0.115
Lilliefors Critical (0.95) Value	0.122

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.985
A-D Test Statistic	0.627
A-D Critical (0.95) Value	0.749
K-S Test Statistic	0.128
K-S Critical(0.95) Value	0.122

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.986
Approximate Shapiro Wilk Test Statistic	0.954
Approximate Shapiro Wilk P Value	0.0739
Lilliefors Test Statistic	0.135
Lilliefors Critical (0.95) Value	0.122

Data not Lognormal at (0.05) Significance Level

Mesa Chloride

Raw Statistics

Number of Valid Observations	100
Number of Distinct Observations	48
Minimum	34
Maximum	550
Mean of Raw Data	331.3
Standard Deviation of Raw Data	128.9
Kstar	3.201
Mean of Log Transformed Data	5.644
Standard Deviation of Log Transformed Data	0.708

Normal Distribution Test Results

Correlation Coefficient R	0.951
Approximate Shapiro Wilk Test Statistic	0.884
Approximate Shapiro Wilk P Value	9.069E-11
Lilliefors Test Statistic	0.144

Lilliefors Critical (0.95) Value	0.0886
Data not Normal at (0.05) Significance Level	
Gamma Distribution Test Results	
Correlation Coefficient R	0.874
A-D Test Statistic	9.423
A-D Critical (0.95) Value	0.758
K-S Test Statistic	0.262
K-S Critical(0.95) Value	0.09
Data not Gamma Distributed at (0.05) Significance Level	
Lognormal Distribution Test Results	
Correlation Coefficient R	0.817
Approximate Shapiro Wilk Test Statistic	0.659
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.312
Lilliefors Critical (0.95) Value	0.0886
Data not Lognormal at (0.05) Significance Level	

General Background Statistics for Full Data Sets

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Chloride

General Statistics

Total Number of Observations	87	Number of Distinct Observations	39

Raw Statistics		Log-Transformed Statistics	
Minimum	120	Minimum	4.787
Maximum	470	Maximum	6.153
Second Largest	460	Second Largest	6.131
First Quartile	280	First Quartile	5.635
Median	350	Median	5.858
Third Quartile	380.5	Third Quartile	5.941
Mean	332.5	Mean	5.779
SD	70.06	SD	0.252
Coefficient of Variation	0.211		
Skewness	-0.862		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.139	Lilliefors Test Statistic	0.163
Lilliefors Critical Value	0.095	Lilliefors Critical Value	0.095
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	468.8	95% UTL with 95% Coverage	527.9
95% UPL (t)	449.6	95% UPL (t)	492.8
90% Percentile (z)	422.3	90% Percentile (z)	446.6
95% Percentile (z)	447.7	95% Percentile (z)	489.4
99% Percentile (z)	495.5	99% Percentile (z)	581

Gamma Distribution Test		Data Distribution Test	
k star	17.76	Data do not follow a Discernable Distribution (0.05)	
Theta Star	18.72		
MLE of Mean	332.5		
MLE of Standard Deviation	78.9		
nu star	3090		
A-D Test Statistic	3.031	Nonparametric Statistics	
5% A-D Critical Value	0.75	90% Percentile	404
K-S Test Statistic	0.158	95% Percentile	410
5% K-S Critical Value	0.0956	99% Percentile	461.4
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	420
90% Percentile	436.7	95% Percentile Bootstrap UTL with 95% Coverage	420
95% Percentile	472	95% BCA Bootstrap UTL with 95% Coverage	410
99% Percentile	543	95% UPL	412.4
		95% Chebyshev UPL	639.6
95% WH Approx. Gamma UPL	473	Upper Threshold Limit Based upon IQR	531.3
95% HW Approx. Gamma UPL	477.3		
95% WH Approx. Gamma UTL with 95% Coverage	500.5		
95% HW Approx. Gamma UTL with 95% Coverage	506.3		

Muddy Creek Chloride

General Statistics			
Total Number of Observations	53	Number of Distinct Observations	21

Raw Statistics		Log-Transformed Statistics	
Minimum	150	Minimum	5.011
Maximum	370	Maximum	5.914
Second Largest	360	Second Largest	5.886
First Quartile	200	First Quartile	5.298
Median	230	Median	5.438
Third Quartile	290	Third Quartile	5.67
Mean	245	Mean	5.475
SD	56.31	SD	0.234
Coefficient of Variation	0.23		
Skewness	0.278		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.115	Lilliefors Test Statistic	0.135
Lilliefors Critical Value	0.122	Lilliefors Critical Value	0.122
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	360.1	95% UTL with 95% Coverage	385
95% UPL (t)	340.2	95% UPL (t)	354.4
90% Percentile (z)	317.2	90% Percentile (z)	322
95% Percentile (z)	337.6	95% Percentile (z)	350.6
99% Percentile (z)	376	99% Percentile (z)	411.2
Gamma Distribution Test		Data Distribution Test	
k star	18.04	Data appear Normal at 5% Significance Level	
Theta Star	13.58		
MLE of Mean	245		
MLE of Standard Deviation	57.69		
nu star	1912		
A-D Test Statistic	0.627	Nonparametric Statistics	
5% A-D Critical Value	0.749	90% Percentile	300
K-S Test Statistic	0.128	95% Percentile	354
5% K-S Critical Value	0.122	99% Percentile	364.8

Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	360
90% Percentile	321.3	95% Percentile Bootstrap UTL with 95% Coverage	364
95% Percentile	347	95% BCA Bootstrap UTL with 95% Coverage	364
99% Percentile	398.8	95% UPL	360
		95% Chebyshev UPL	492.8
95% WH Approx. Gamma UPL	348.3	Upper Threshold Limit Based upon IQR	425
95% HW Approx. Gamma UPL	349.6		
95% WH Approx. Gamma UTL with 95% Coverage	374.2		
95% HW Approx. Gamma UTL with 95% Coverage	376.6		

Mesa Chloride

General Statistics			
Total Number of Observations	100	Number of Distinct Observations	48
Raw Statistics		Log-Transformed Statistics	
Minimum	34	Minimum	3.526
Maximum	550	Maximum	6.31
Second Largest	520	Second Largest	6.254
First Quartile	290	First Quartile	5.67
Median	350	Median	5.858
Third Quartile	422.5	Third Quartile	6.046
Mean	331.3	Mean	5.644
SD	128.9	SD	0.708
Coefficient of Variation	0.389		
Skewness	-0.932		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.144	Lilliefors Test Statistic	0.312
Lilliefors Critical Value	0.0886	Lilliefors Critical Value	0.0886
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	579.2	95% UTL with 95% Coverage	1103
95% UPL (t)	546.4	95% UPL (t)	921.2
90% Percentile (z)	496.5	90% Percentile (z)	700.3
95% Percentile (z)	543.3	95% Percentile (z)	905.8
99% Percentile (z)	631.1	99% Percentile (z)	1468
Gamma Distribution Test		Data Distribution Test	
k star	3.201	Data do not follow a Discernable Distribution (0.05)	
Theta Star	103.5		
MLE of Mean	331.3		
MLE of Standard Deviation	185.2		
nu star	640.3		
A-D Test Statistic	9.423	Nonparametric Statistics	
5% A-D Critical Value	0.758	90% Percentile	471

K-S Test Statistic	0.262	95% Percentile	500.3
5% K-S Critical Value	0.09	99% Percentile	520.3
Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	510
90% Percentile	579.6	95% Percentile Bootstrap UTL with 95% Coverage	510.5
95% Percentile	682.6	95% BCA Bootstrap UTL with 95% Coverage	510
99% Percentile	905	95% UPL	504.8
		95% Chebyshev UPL	895.9
95% WH Approx. Gamma UPL	685.1	Upper Threshold Limit Based upon IQR	621.3
95% HW Approx. Gamma UPL	723.3		
95% WH Approx. Gamma UTL with 95% Coverage	762.5		
95% HW Approx. Gamma UTL with 95% Coverage	815.1		

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Chloride

Background Data: Alluv Chloride

Raw Statistics

	Site	Background
Number of Valid Observations	53	87
Number of Distinct Observations	21	39
Minimum	150	120
Maximum	370	470
Mean	245	332.5
Median	230	350
SD	56.31	70.06
SE of Mean	7.734	7.511

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	2193
WMW Test U-Stat	6.631
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	3.235E-11

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Chloride

Background Data: Alluv Chloride

Raw Statistics

	Site	Background
Number of Valid Observations	100	87
Number of Distinct Observations	48	39
Minimum	34	120
Maximum	550	470
Mean	331.3	332.5
Median	350	350
SD	128.9	70.06
SE of Mean	12.89	7.511

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	9668
WMW Test U-Stat	0.723
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.47

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Chloride

Background Data: Muddy Creek Chloride

Raw Statistics

	Site	Background
Number of Valid Observations	100	53
Number of Distinct Observations	48	21
Minimum	34	150
Maximum	550	370
Mean	331.3	245
Median	350	230
SD	128.9	56.31
SE of Mean	12.89	7.734

Wilcoxon-Mann-Whitney (WMW) Test

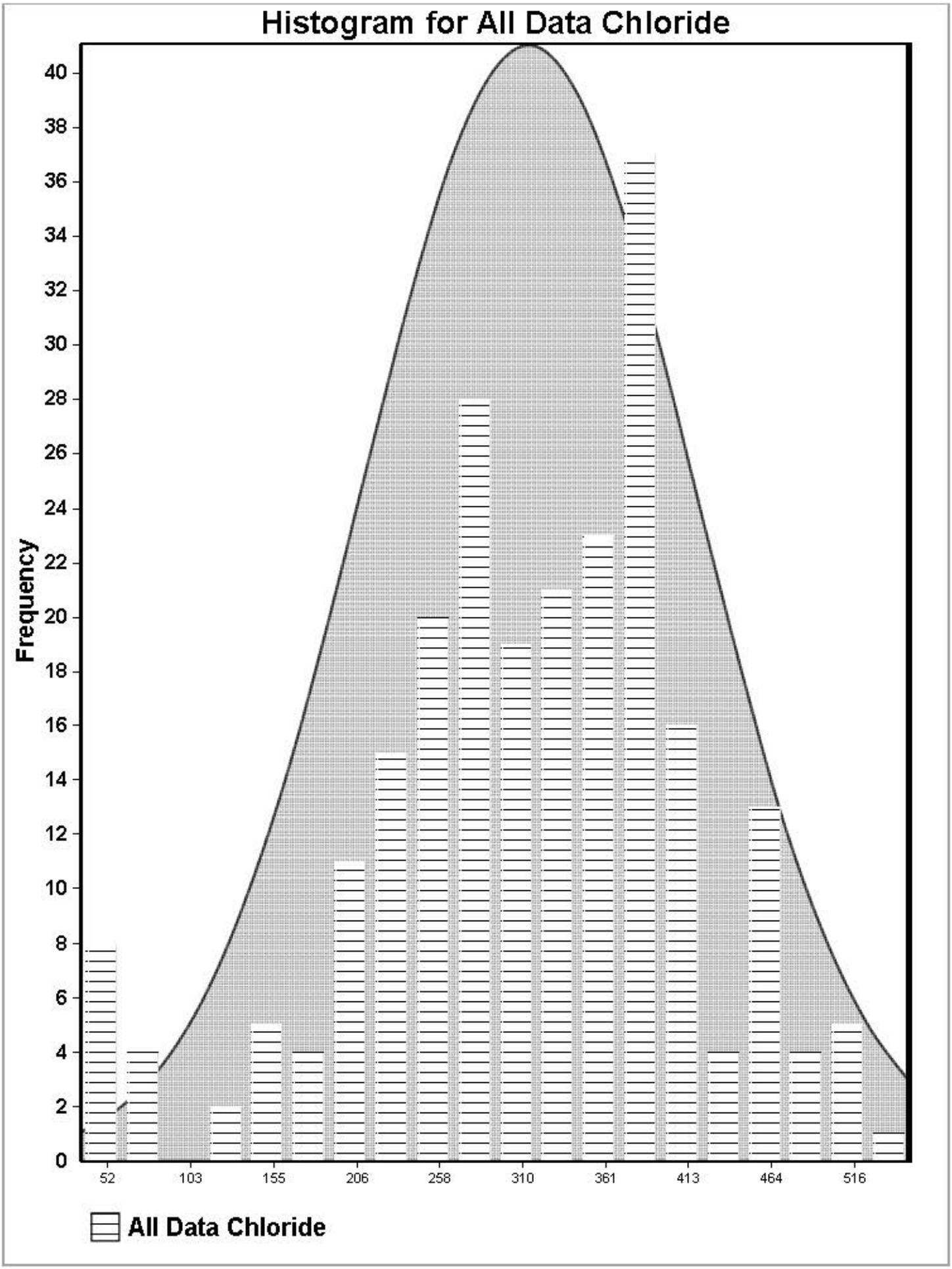
H0: Mean/Median of Site or AOC = Mean/Median of Background

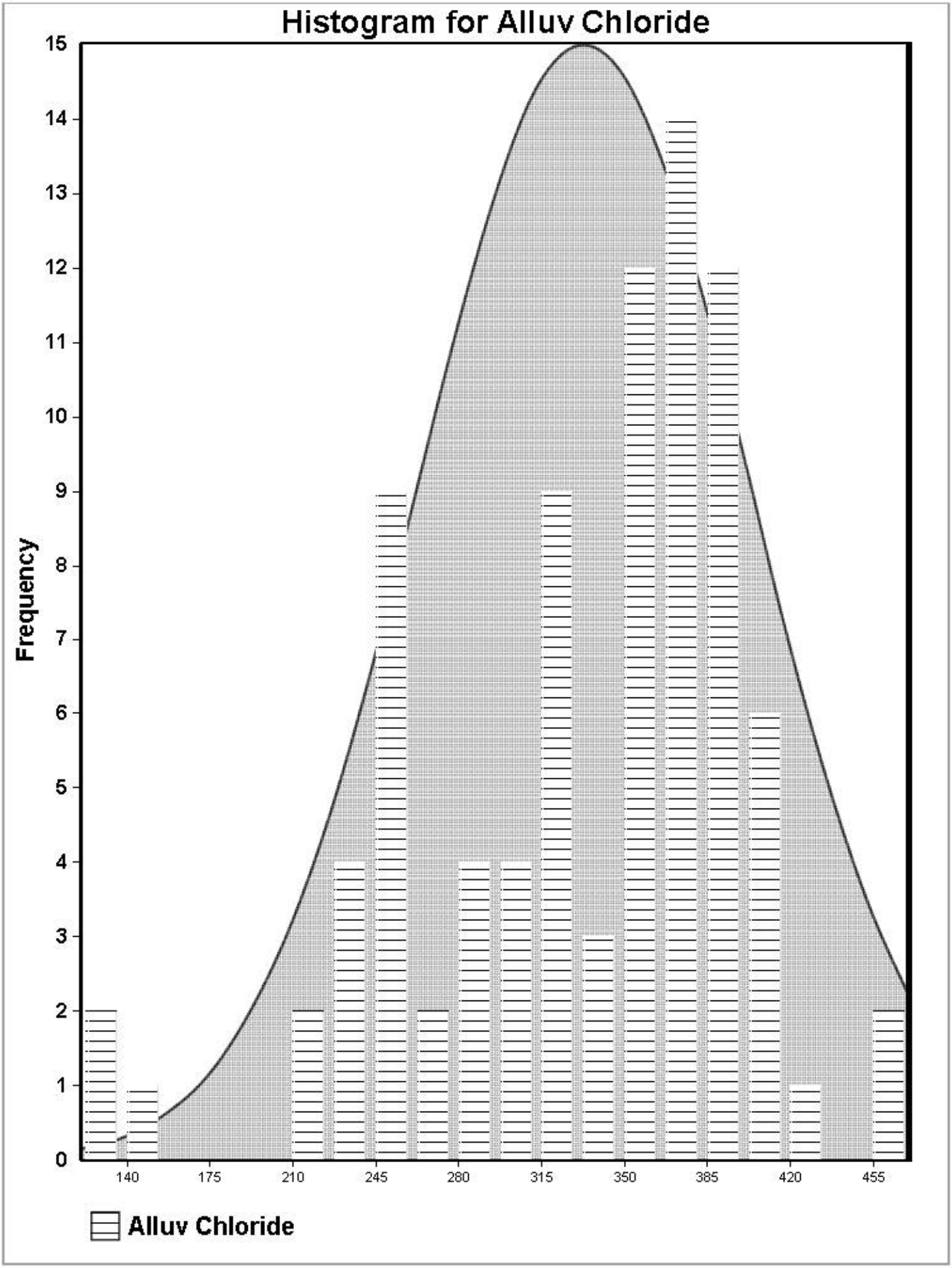
Site Rank Sum W-Stat	9262
WMW Test U-Stat	5.987
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	2.1329E-9

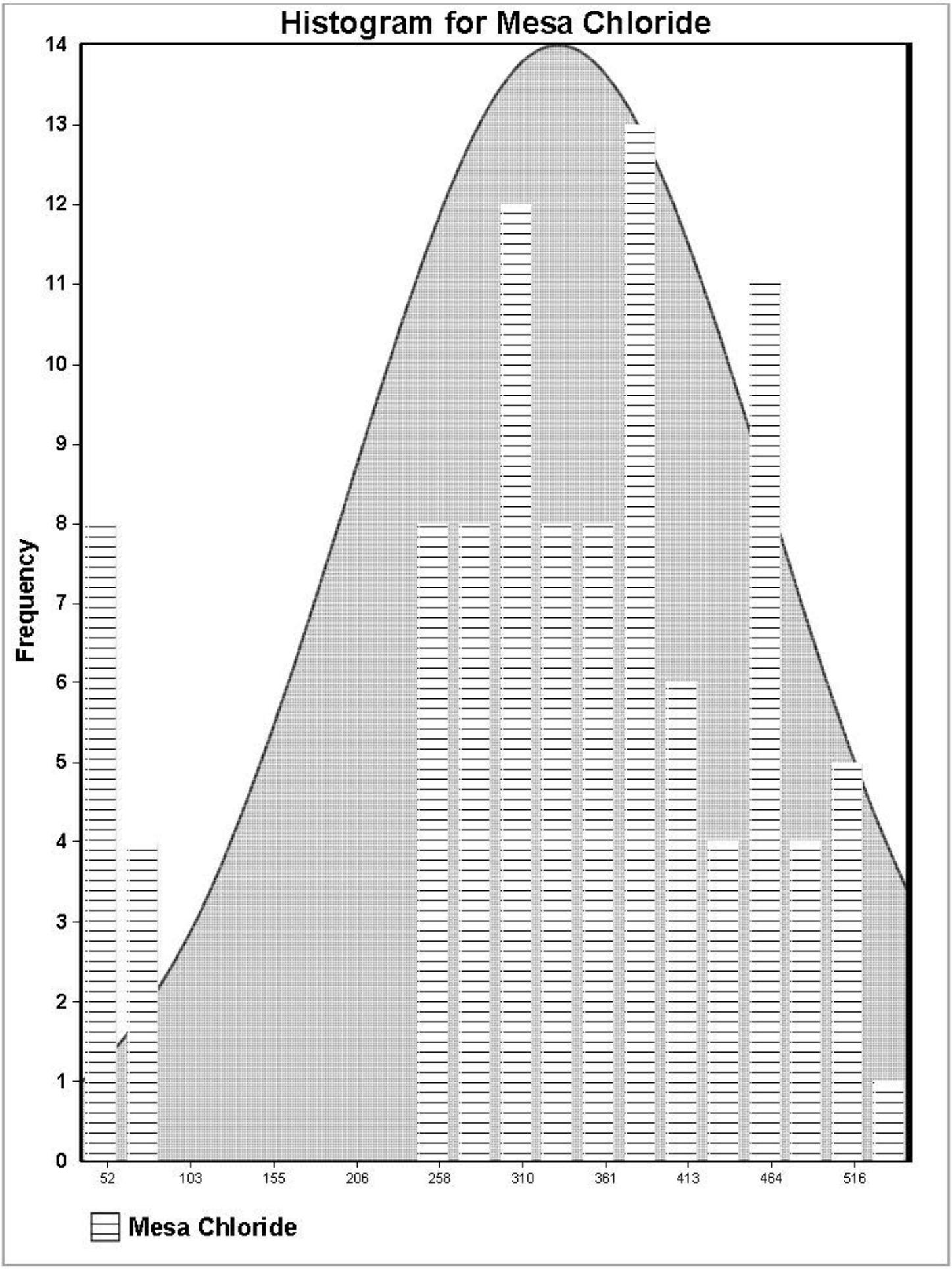
Conclusion with Alpha = 0.05

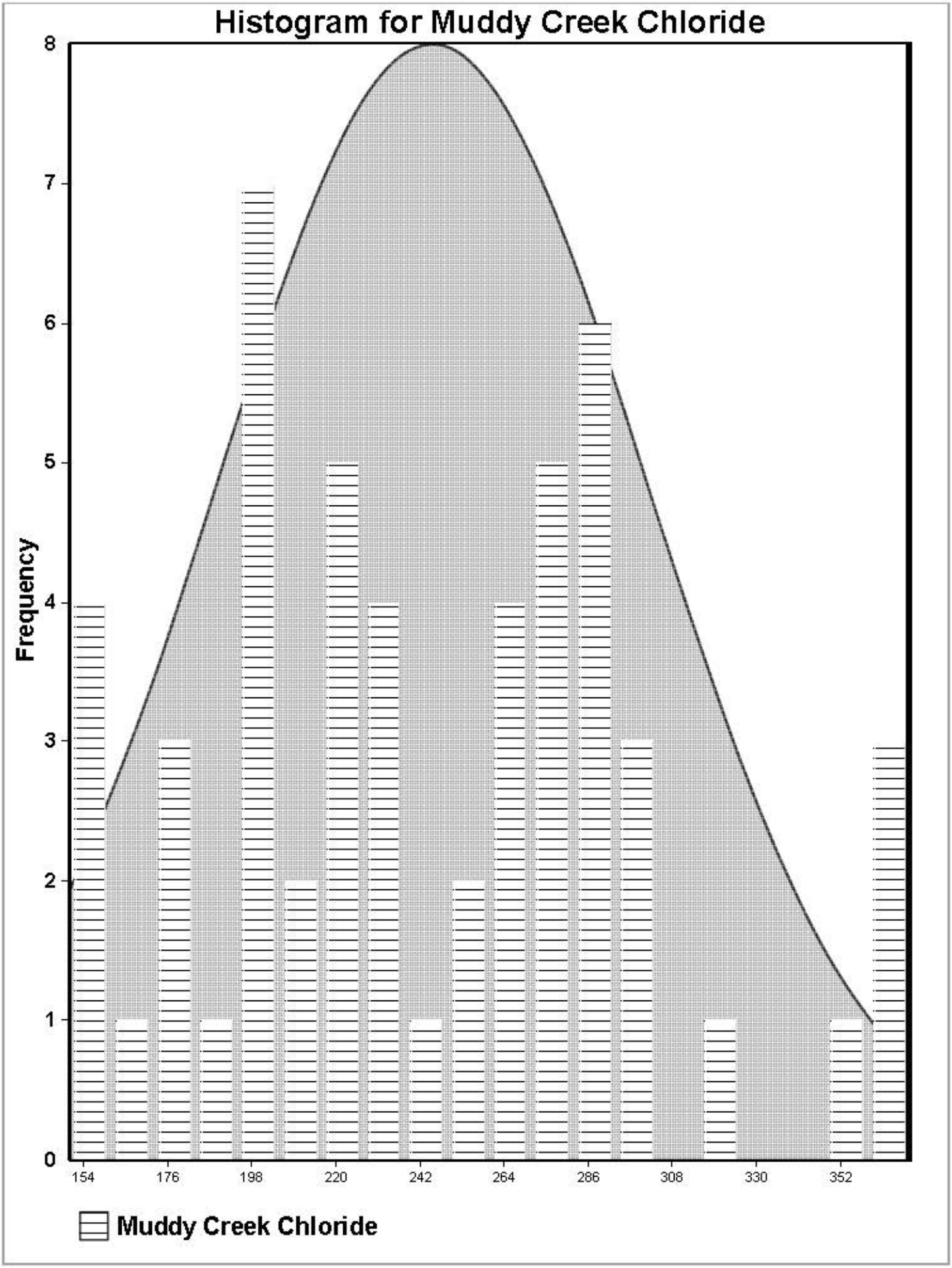
Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for All Data Chloride
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
52
103
155
206
258
310
361
413
464
516
All Data Chloride


Histogram for Alluv Chloride
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
140
175
210
245
280
315
350
385
420
455
Alluv Chloride


Histogram for Mesa Chloride
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
52
103
155
206
258
310
361
413
464
516
Mesa Chloride


Histogram for Muddy Creek Chloride
Frequency
0
1
2
3
4
5
6
7
8
154
176
198
220
242
264
286
308
330
352
Muddy Creek Chloride

Outlier Tests for Selected Variables

User Selected Options	
From File	Chloride.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for Alluv Chloride

Mean	332.5
Standard Deviation	70.06
Number of data	87
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	332.5	69.65	120	13	3.051	3.338	3.705

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Chloride

Mean	245
Standard Deviation	56.31
Number of data	53
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	245	55.77	370	9	2.241	3.151	3.504

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Chloride

Mean	331.3
Standard Deviation	128.9
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	331.3	128.2	34	52	2.319	3.38	3.75

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

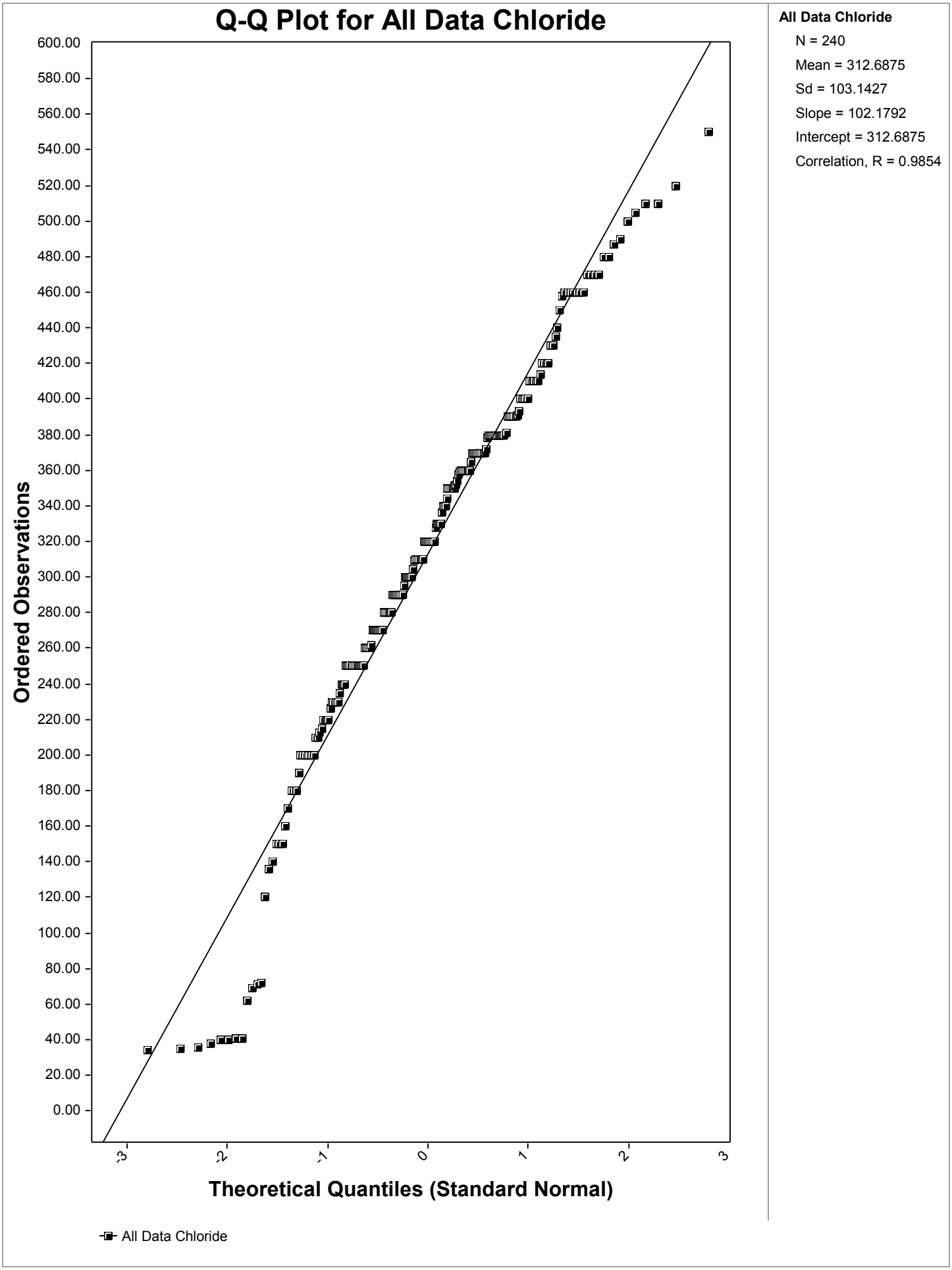
Rosner's Outlier Test for All Data Chloride

Mean	312.7
Standard Deviation	103.1
Number of data	240
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	312.7	102.9	34	192	2.708	3.658	4.028

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier


Q-Q Plot for All Data Chloride
Ordered Observations
Theoretical Quantiles (Standard Normal)
All Data Chloride
All Data Chloride
N = 240
Mean = 312.6875
Sd = 103.1427
Slope = 102.1792
Intercept = 312.6875
Correlation, R = 0.9854

Location Name	Sample Date	Alluv Chloride	Location Name	Sample Date	Muddy Creek Chloride	Location Name	Sample Date	Mesa Chloride	Location Name	Sample Date	All Data Chloride
BG-1S	11/26/2012	280	BG-3S	11/27/2012	200	LMW-10	11/28/2012	480	BG-1S	11/26/2012	280
BG-1S	8/23/2012	260	BG-3S	8/22/2012	200	LMW-10	8/27/2012	460	BG-1S	8/23/2012	260
BG-1S	5/24/2012	280	BG-3S	5/23/2012	200	LMW-10	5/30/2012	520	BG-1S	5/24/2012	280
BG-1S	3/20/2012	320	BG-3S	3/21/2012	190	LMW-10	3/22/2012	500	BG-1S	3/20/2012	320
IMW-2.5D	11/26/2012	320	BG-4S	11/27/2012	290	LMW-10	12/6/2011	550	IMW-2.5D	11/26/2012	320
IMW-2.5D	8/24/2012	310	BG-4S	8/30/2012	270	LMW-10	9/8/2011	490	IMW-2.5D	8/24/2012	310
IMW-2.5D	5/21/2012	330	BG-4S	5/30/2012	280	LMW-10	6/8/2011	487	IMW-2.5D	5/21/2012	330
IMW-2.5D	3/21/2012	310	BG-4S	3/20/2012	300	LMW-10	3/2/2011	510	IMW-2.5D	3/21/2012	310
IMW-2.5D	12/8/2011	380	BG-6S	11/27/2012	370	LMW-10	12/9/2010	505	IMW-2.5D	12/8/2011	380
IMW-2.5D	6/6/2011	310	BG-6S	8/23/2012	350	LMW-10	9/21/2010	458	IMW-2.5D	6/6/2011	310
IMW-2.5D	12/15/2010	136	BG-6S	5/25/2012	360	LMW-10	6/9/2010	470	IMW-2.5D	12/15/2010	136
IMW-2.5D	6/9/2010	140	BG-6S	3/21/2012	360	LMW-10	3/11/2010	430	IMW-2.5D	6/9/2010	140
IMW-2.5D	12/12/2009	120	BG-1M	11/26/2012	200	LMW-10	12/11/2009	510	IMW-2.5D	12/12/2009	120
IMW-2.5S	11/26/2012	360	BG-1M	8/23/2012	220	LMW-10	9/18/2009	440	IMW-2.5S	11/26/2012	360
IMW-2.5S	8/24/2012	340	BG-1M	5/24/2012	200	LMW-10	6/10/2009	480	IMW-2.5S	8/24/2012	340
IMW-2.5S	5/21/2012	370	BG-1M	3/20/2012	210	LMW-10	3/5/2009	460	IMW-2.5S	5/21/2012	370
IMW-2.5S	3/21/2012	350	BG-3M	11/27/2012	160	LMW-10	12/12/2008	470	IMW-2.5S	3/21/2012	350
IMW-2.5S	12/8/2011	410	BG-3M	8/22/2012	150	LMW-10	9/10/2008	460	IMW-2.5S	12/8/2011	410
IMW-2.5S	9/9/2011	360	BG-3M	5/24/2012	150	LMW-10	6/4/2008	420	IMW-2.5S	9/9/2011	360
IMW-2.5S	6/6/2011	328	BG-3M	3/21/2012	150	LMW-10	3/5/2008	420	IMW-2.5S	6/6/2011	328
IMW-2.5S	3/7/2011	393	BG-4M	11/27/2012	280	LMW-11R	11/26/2012	430	IMW-2.5S	3/7/2011	393
IMW-2.5S	12/15/2010	365	BG-4M	8/30/2012	260	LMW-11R	8/21/2012	420	IMW-2.5S	12/15/2010	365
IMW-2.5S	9/20/2010	351	BG-4M	5/30/2012	280	LMW-11R	5/29/2012	460	IMW-2.5S	9/20/2010	351
IMW-2.5S	6/9/2010	410	BG-4M	3/20/2012	290	LMW-11R	3/23/2012	470	IMW-2.5S	6/9/2010	410
IMW-2.5S	3/9/2010	410	BG-6M	11/27/2012	320	LMW-7	11/28/2012	290	IMW-2.5S	3/9/2010	410
IMW-2.5S	12/12/2009	460	BG-6M	8/22/2012	290	LMW-7	8/27/2012	290	IMW-2.5S	12/12/2009	460
IMW-2.5S	9/21/2009	470	BG-6M	5/25/2012	300	LMW-7	5/31/2012	290	IMW-2.5S	9/21/2009	470
IMW-3S	5/21/2012	230	BG-6M	3/21/2012	300	LMW-7	3/23/2012	300	IMW-3S	5/21/2012	230
IMW-3S	3/20/2012	250	BG-1D	11/26/2012	210	LMW-7	12/5/2011	320	IMW-3S	3/20/2012	250
IMW-3S	12/9/2011	290	BG-1D	8/23/2012	200	LMW-7	9/6/2011	310	IMW-3S	12/9/2011	290
IMW-3S	9/9/2011	240	BG-1D	5/24/2012	200	LMW-7	6/9/2011	309	IMW-3S	9/9/2011	240
IMW-3S	6/7/2011	213	BG-1D	3/20/2012	220	LMW-7	3/9/2011	358	IMW-3S	6/7/2011	213
IMW-3S	3/7/2011	262	BG-3D	11/27/2012	180	LMW-7	12/10/2010	352	IMW-3S	3/7/2011	262
IMW-3S	12/10/2010	235	BG-3D	8/21/2012	170	LMW-7	9/21/2010	295	IMW-3S	12/10/2010	235
IMW-3S	9/16/2010	215	BG-3D	5/23/2012	180	LMW-7	6/9/2010	310	IMW-3S	9/16/2010	215
IMW-3S	6/8/2010	250	BG-3D	3/21/2012	180	LMW-7	3/11/2010	290	IMW-3S	6/8/2010	250
IMW-3S	3/9/2010	250	BG-4D	11/27/2012	270	LMW-7	12/11/2009	320	IMW-3S	3/9/2010	250
IMW-3S	12/10/2009	250	BG-4D	8/30/2012	250	LMW-7	9/18/2009	320	IMW-3S	12/10/2009	250
IMW-3S	9/14/2009	260	BG-4D	5/30/2012	270	LMW-7	6/10/2009	310	IMW-3S	9/14/2009	260
IMW-3S	6/9/2009	250	BG-4D	3/20/2012	290	LMW-7	3/5/2009	300	IMW-3S	6/9/2009	250
IMW-3S	3/3/2009	250	BG-6D	11/27/2012	290	LMW-7	12/12/2008	310	IMW-3S	3/3/2009	250
IMW-3S	12/9/2008	250	BG-6D	8/22/2012	280	LMW-7	9/10/2008	320	IMW-3S	12/9/2008	250
IMW-3S	9/9/2008	270	BG-6D	5/25/2012	280	LMW-7	6/4/2008	320	IMW-3S	9/9/2008	270
IMW-3S	6/3/2008	280	BG-6D	3/21/2012	290	LMW-7	3/5/2008	300	IMW-3S	6/3/2008	280
IMW-3S	3/4/2008	240	IMW-3D	5/25/2012	230	BG-2S	11/26/2012	69	IMW-3S	3/4/2008	240
KMW-2D	11/26/2012	350	IMW-3D	3/22/2012	230	BG-2S	8/23/2012	71	KMW-2D	11/26/2012	350
KMW-2D	8/24/2012	340	IMW-3D	12/9/2011	270	BG-2S	5/24/2012	62	KMW-2D	8/24/2012	340
KMW-2D	5/21/2012	360	IMW-3D	6/7/2011	220	BG-2S	3/21/2012	72	KMW-2D	5/21/2012	360
KMW-2D	3/23/2012	370	IMW-3D	12/10/2010	226	BG-2M	11/26/2012	38	KMW-2D	3/23/2012	370
KMW-2D	12/8/2011	370	IMW-3D	6/8/2010	230	BG-2M	8/23/2012	36	KMW-2D	12/8/2011	370
KMW-2D	6/6/2011	304	IMW-3D	12/10/2009	240	BG-2M	5/24/2012	35	KMW-2D	6/6/2011	304
KMW-2D	12/13/2010	330	IMW-3D	12/9/2008	230	BG-2M	3/21/2012	34	KMW-2D	12/13/2010	330
KMW-2D	6/8/2010	330	IMW-3D	6/3/2008	220	BG-2D	11/26/2012	41	KMW-2D	6/8/2010	330
KMW-2D	12/8/2009	330				BG-2D	8/23/2012	40	KMW-2D	12/8/2009	330
KMW-2D	12/10/2008	320				BG-2D	5/24/2012	40	KMW-2D	12/10/2008	320
KMW-2D	6/3/2008	320				BG-2D	3/21/2012	41	KMW-2D	6/3/2008	320
KMW-2M	11/26/2012	380				LMW-9	11/28/2012	340	KMW-2M	11/26/2012	380
KMW-2M	8/24/2012	370				LMW-9	8/27/2012	310	KMW-2M	8/24/2012	370
KMW-2M	5/21/2012	370				LMW-9	5/31/2012	350	KMW-2M	5/21/2012	370
KMW-2M	3/23/2012	420				LMW-9	3/23/2012	360	KMW-2M	3/23/2012	420
KMW-2M	12/8/2011	400				LMW-9	12/5/2011	370	KMW-2M	12/8/2011	400
KMW-2M	6/6/2011	354				LMW-9	9/8/2011	380	KMW-2M	6/6/2011	354
KMW-2M	12/13/2010	391				LMW-9	6/8/2011	359	KMW-2M	12/13/2010	391
KMW-2M	6/8/2010	360				LMW-9	3/9/2011	400	KMW-2M	6/8/2010	360
KMW-2M	12/8/2009	370				LMW-9	12/10/2010	372	KMW-2M	12/8/2009	370
KMW-2M	12/10/2008	350				LMW-9	9/21/2010	344	KMW-2M	12/10/2008	350
KMW-2M	6/3/2008	350				LMW-9	6/9/2010	380	KMW-2M	6/3/2008	350
KMW-2S	11/26/2012	380				LMW-9	3/11/2010	370	KMW-2S	11/26/2012	380
KMW-2S	8/24/2012	360				LMW-9	12/11/2009	410	KMW-2S	8/24/2012	360
KMW-2S	5/21/2012	390				LMW-9	9/18/2009	380	KMW-2S	5/21/2012	390
KMW-2S	3/23/2012	390				LMW-9	6/10/2009	380	KMW-2S	3/23/2012	390
KMW-2S	12/8/2011	410				LMW-9	3/5/2009	370	KMW-2S	12/8/2011	410
KMW-2S	9/9/2011	390				LMW-9	12/12/2008	380	KMW-2S	9/9/2011	390
KMW-2S	6/6/2011	336				LMW-9	9/10/2008	380	KMW-2S	6/6/2011	336
KMW-2S	3/8/2011	414				LMW-9	6/4/2008	370	KMW-2S	3/8/2011	414
KMW-2S	12/13/2010	378				LMW-9	3/5/2008	360	KMW-2S	12/13/2010	378
KMW-2S	9/15/2010	381				LMW-11	3/2/2011	435	KMW-2S	9/15/2010	381
KMW-2S	6/8/2010	400				LMW-11	9/8/2011	460	KMW-2S	6/8/2010	400
KMW-2S	3/9/2010	380				LMW-11	12/6/2011	460	KMW-2S	3/9/2010	380
KMW-2S	12/8/2009	390				LMW-11	2/22/2012	450	KMW-2S	12/8/2009	390
KMW-2S	9/16/2009	400				LMW-12R	5/30/2012	380	KMW-2S	9/16/2009	400
KMW-2S	6/10/2009	390				LMW-12R	8/21/2012	380	KMW-2S	6/10/2009	390
KMW-2S	3/3/2009	380				LMW-12R	10/22/2012	350	KMW-2S	3/3/2009	380
KMW-2S	12/10/2008	390				LMW-12R	11/30/2012	400	KMW-2S	12/10/2008	390
KMW-2S	9/8/2008	410				LMW-13R	5/29/2012	250	KMW-2S	9/8/2008	410
KMW-2S	6/3/2008	390				LMW-13R	8/20/2012	250	KMW-2S	6/3/2008	390
KMW-2S	3/4/2008	370				LMW-13R	10/22/2012	250	KMW-2S	3/4/2008	370
						LMW-13R	11/28/2012	270	BG-3S	11/27/2012	200
						LMW-14R	5/29/2012	260	BG-3S	8/22/2012	200
						LMW-14R	8/20/2012	260	BG-3S	5/23/2012	200
						LMW-14R	10/22/2012	250	BG-3S	3/21/2012	190
						LMW-14R	11/30/2012	270	BG-4S	11/27/2012	290
						LMW-15	5/29/2012	270	BG-4S	8/30/2012	270
						LMW-15	8/20/2012	250	BG-4S	5/30/2012	280
						LMW-15	10/22/2012	250	BG-4S	3/20/2012	300
						LMW-15	11/28/2012	270	BG-6S	11/27/2012	370
						LMW-16	5/29/2012	320	BG-6S	8/23/2012	350
						LMW-16	8/20/2012	310	BG-6S	5/25/2012	360
						LMW-16	10/22/2012	300	BG-6S	3/21/2012	360
						LMW-16	11/28/2012	330	BG-1M	11/26/2012	200
									BG-1M	8/23/2012	220
									BG-1M	5/24/2012	200
									BG-1M	3/20/2012	210
									BG-3M	11/27/2012	160
									BG-3M	8/22/2012	150
									BG-3M	5/24/2012	150
									BG-3M	3/21/2012	150
									BG-4M	11/27/2012	280
									BG-4M	8/30/2012	260
									BG-4M	5/30/2012	280
									BG-4M	3/20/2012	290
									BG-6M	11/27/2012	320
									BG-6M	8/22/2012	290
									BG-6M	5/25/2012	300
									BG-6M	3/21/2012	300
									BG-1D	11/26/2012	210
									BG-1D	8/23/2012	200
									BG-1D	5/24/2012	200
									BG-1D	3/20/2012	220

									BG-3D	11/27/2012	180
									BG-3D	8/21/2012	170
									BG-3D	5/23/2012	180
									BG-3D	3/21/2012	180
									BG-4D	11/27/2012	270
									BG-4D	8/30/2012	250
									BG-4D	5/30/2012	270
									BG-4D	3/20/2012	290
									BG-6D	11/27/2012	290
									BG-6D	8/22/2012	280
									BG-6D	5/25/2012	280
									BG-6D	3/21/2012	290
									IMW-3D	5/25/2012	230
									IMW-3D	3/22/2012	230
									IMW-3D	12/9/2011	270
									IMW-3D	6/7/2011	220
									IMW-3D	12/10/2010	226
									IMW-3D	6/8/2010	230
									IMW-3D	12/10/2009	240
									IMW-3D	12/9/2008	230
									IMW-3D	6/3/2008	220
									LMW-10	11/28/2012	480
									LMW-10	8/27/2012	460
									LMW-10	5/30/2012	520
									LMW-10	3/22/2012	500
									LMW-10	12/6/2011	550
									LMW-10	9/8/2011	490
									LMW-10	6/8/2011	487
									LMW-10	3/2/2011	510
									LMW-10	12/9/2010	505
									LMW-10	9/21/2010	458
									LMW-10	6/9/2010	470
									LMW-10	3/11/2010	430
									LMW-10	12/11/2009	510
									LMW-10	9/18/2009	440
									LMW-10	6/10/2009	480
									LMW-10	3/5/2009	460
									LMW-10	12/12/2008	470
									LMW-10	9/10/2008	460
									LMW-10	6/4/2008	420
									LMW-10	3/5/2008	420
									LMW-11R	11/26/2012	430
									LMW-11R	8/21/2012	420
									LMW-11R	5/29/2012	460
									LMW-11R	3/23/2012	470
									LMW-7	11/28/2012	290
									LMW-7	8/27/2012	290
									LMW-7	5/31/2012	290
									LMW-7	3/23/2012	300
									LMW-7	12/5/2011	320
									LMW-7	9/6/2011	310
									LMW-7	6/9/2011	309
									LMW-7	3/9/2011	358
									LMW-7	12/10/2010	352
									LMW-7	9/21/2010	295
									LMW-7	6/9/2010	310
									LMW-7	3/11/2010	290
									LMW-7	12/11/2009	320
									LMW-7	9/18/2009	320
									LMW-7	6/10/2009	310
									LMW-7	3/5/2009	300
									LMW-7	12/12/2008	310
									LMW-7	9/10/2008	320
									LMW-7	6/4/2008	320
									LMW-7	3/5/2008	300
									BG-2S	11/26/2012	69
									BG-2S	8/23/2012	71
									BG-2S	5/24/2012	62
									BG-2S	3/21/2012	72
									BG-2M	11/26/2012	38
									BG-2M	8/23/2012	36
									BG-2M	5/24/2012	35
									BG-2M	3/21/2012	34
									BG-2D	11/26/2012	41
									BG-2D	8/23/2012	40
									BG-2D	5/24/2012	40
									BG-2D	3/21/2012	41
									LMW-9	11/28/2012	340
									LMW-9	8/27/2012	310
									LMW-9	5/31/2012	350
									LMW-9	3/23/2012	360
									LMW-9	12/5/2011	370
									LMW-9	9/8/2011	380
									LMW-9	6/8/2011	359
									LMW-9	3/9/2011	400
									LMW-9	12/10/2010	372
									LMW-9	9/21/2010	344
									LMW-9	6/9/2010	380
									LMW-9	3/11/2010	370
									LMW-9	12/11/2009	410
									LMW-9	9/18/2009	380
									LMW-9	6/10/2009	380
									LMW-9	3/5/2009	370
									LMW-9	12/12/2008	380
									LMW-9	9/10/2008	380
									LMW-9	6/4/2008	370
									LMW-9	3/5/2008	360
									LMW-11	3/2/2011	435
									LMW-11	9/8/2011	460
									LMW-11	12/6/2011	460
									LMW-11	2/22/2012	450
									LMW-12R	5/30/2012	380
									LMW-12R	8/21/2012	380
									LMW-12R	10/22/2012	350
									LMW-12R	11/30/2012	400
									LMW-13R	5/29/2012	250
									LMW-13R	8/20/2012	250
									LMW-13R	10/22/2012	250
									LMW-13R	11/28/2012	270
									LMW-14R	5/29/2012	260
									LMW-14R	8/20/2012	260
									LMW-14R	10/22/2012	250
									LMW-14R	11/30/2012	270
									LMW-15	5/29/2012	270
									LMW-15	8/20/2012	250
									LMW-15	10/22/2012	250
									LMW-15	11/28/2012	270
									LMW-16	5/29/2012	320
									LMW-16	8/20/2012	310
									LMW-16	10/22/2012	300
									LMW-16	11/28/2012	330

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Chromium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Chromium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	87	0	87	4	83	95.40%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	83	0.003	0.01	0.00565	0.005	0.00291
Statistics (Detects Only)	4	0.005	0.01	0.00625	0.005	0.0025
Statistics (All: NDs treated as DL value)	87	0.003	0.01	0.00568	0.005	0.00288
Statistics (All: NDs treated as DL/2 value)	87	0.0015	0.01	0.00298	0.0025	0.00166
Statistics (Normal ROS Estimated Data)	87	-0.0179	0.01	-0.00615	-0.00662	0.00566
Statistics (Gamma ROS Estimated Data)	87	0.00402	0.0206	0.014	0.0151	0.00454
Statistics (Lognormal ROS Estimated Data)	87	2.0801E-4	0.01	0.00147	9.9797E-4	0.00142

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	10.19	9.849	6.1319E-4	-5.125	0.347	-0.0676
Statistics (NDs = DL)	4.318	4.177	0.00132	-5.291	0.486	-0.0918
Statistics (NDs = DL/2)	3.789	3.666	7.8743E-4	-5.952	0.518	-0.087
Statistics (Gamma ROS Estimates)	7.357	7.111	0.00191	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-6.844	0.785	-0.115

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.785	0.866	0.866	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.63	0.748	Data Not Normal
Lilliefors (Detects Only)	0.441	0.443	Data Appear Normal
Lilliefors (NDs = DL)	0.306	0.095	Data Not Normal
Lilliefors (NDs = DL/2)	0.293	0.095	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0461	0.095	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.866	0.88	0.904	0.956

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.961	0.657	
Kolmogorov-Smirnov (Detects Only)	0.469	0.395	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	7.725	0.755	
Kolmogorov-Smirnov (NDs = DL)	0.251	0.0962	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.213	0.756	
Kolmogorov-Smirnov (NDs = DL/2)	0.242	0.0963	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.94	0.753	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.146	0.0959	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.785	0.896	0.903	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.63	0.748	Data Not Lognormal
Lilliefors (Detects Only)	0.441	0.443	Data Appear Lognormal
Lilliefors (NDs = DL)	0.219	0.095	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.219	0.095	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0461	0.095	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Chromium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	53	0	53	0	53	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Muddy Creek Chromium, Dissolved was not processed!

Mesa Chromium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	54	46	46.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	46	0.003	0.01	0.00702	0.005	0.00254
Statistics (Detects Only)	54	0.0041	0.12	0.0476	0.0178	0.0461
Statistics (All: NDs treated as DL value)	100	0.003	0.12	0.0289	0.01	0.0394
Statistics (All: NDs treated as DL/2 value)	100	0.0015	0.12	0.0273	0.00595	0.0403
Statistics (Normal ROS Estimated Data)	100	-0.13	0.12	0.00465	0.0065	0.0623
Statistics (Gamma ROS Estimated Data)	100	0.0041	0.12	0.0466	0.0399	0.0344
Statistics (Lognormal ROS Estimated Data)	100	2.2717E-4	0.12	0.0271	0.00685	0.0405

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.965	0.943	0.0494	-3.645	1.165	-0.32
Statistics (NDs = DL)	0.805	0.787	0.036	-4.279	1.124	-0.263
Statistics (NDs = DL/2)	0.617	0.605	0.0443	-4.598	1.365	-0.297
Statistics (Gamma ROS Estimates)	1.637	1.594	0.0285	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.79	1.636	-0.341

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.854	0.776	0.781	0.966

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.341	0.121	Data Not Normal
Lilliefors (NDs = DL)	0.37	0.0886	Data Not Normal
Lilliefors (NDs = DL/2)	0.353	0.0886	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.19	0.0886	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.827	0.874	0.873	0.631

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	4.614	0.781	
Kolmogorov-Smirnov (Detects Only)	0.253	0.125	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	11.42	0.792	
Kolmogorov-Smirnov (NDs = DL)	0.253	0.0928	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	9.495	0.808	
Kolmogorov-Smirnov (NDs = DL/2)	0.231	0.0938	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.284	0.768	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.106	0.091	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.926	0.903	0.922	0.976

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.24	0.121	Data Not Lognormal
Lilliefors (NDs = DL)	0.204	0.0886	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.181	0.0886	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.133	0.0886	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Chromium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Chromium, Dissolved

General Statistics

Number of Valid Data	87	Number of Detected Data	4
Number of Distinct Detected Data	2	Number of Non-Detect Data	83
		Percent Non-Detects	95.40%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.005	Minimum Detected	-5.298
Maximum Detected	0.01	Maximum Detected	-4.605
Mean of Detected	0.00625	Mean of Detected	-5.125
SD of Detected	0.0025	SD of Detected	0.347
Minimum Non-Detect	0.003	Minimum Non-Detect	-5.809
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	86
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	98.85%

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.63	Shapiro Wilk Test Statistic	0.63
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00298	Mean (Log Scale)	-5.952

SD	0.00166	SD (Log Scale)	0.518
95% UTL 95% Coverage	0.00621	95% UTL 95% Coverage	0.00712
95% UPL (t)	0.00576	95% UPL (t)	0.00618
90% Percentile (z)	0.00511	90% Percentile (z)	0.00505
95% Percentile (z)	0.00571	95% Percentile (z)	0.00609
99% Percentile (z)	0.00684	99% Percentile (z)	0.00867
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00147
		SD in Original Scale	0.00142
		Mean in Log Scale	-6.844
		SD in Log Scale	0.785
		95% UTL 95% Coverage	0.00491
		95% UPL (t)	0.00396
		90% Percentile (z)	0.00291
		95% Percentile (z)	0.00388
		99% Percentile (z)	0.00661
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.715	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0023		
nu star	21.72		
A-D Test Statistic	0.961	Nonparametric Statistics	
5% A-D Critical Value	0.657	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.469	Mean	0.00506
5% K-S Critical Value	0.395	SD	5.3297E-4
Data not Gamma Distributed at 5% Significance Level		SE of Mean	6.5980E-5
		95% KM UTL with 95% Coverage	0.00609
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.00739
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00595
Mean	0.014	90% Percentile (z)	0.00574
Median	0.0151	95% Percentile (z)	0.00593
SD	0.00454	99% Percentile (z)	0.0063
k star	7.111		
Theta star	0.00197	Gamma ROS Limits with Extrapolated Data	
Nu star	1237	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0237
95% Percentile of Chisquare (2k)	23.98	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0242
		95% WH Approx. Gamma UTL with 95% Coverage	0.0258
90% Percentile	0.021	95% HW Approx. Gamma UTL with 95% Coverage	0.0264
95% Percentile	0.0236		
99% Percentile	0.029		

Note: DL/2 is not a recommended method.

Muddy Creek Chromium, Dissolved

General Statistics

Number of Valid Data	53	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	53

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Muddy Creek Chromium, Dissolved was not processed!

Mesa Chromium, Dissolved

General Statistics

Number of Valid Data	100	Number of Detected Data	54
Number of Distinct Detected Data	33	Number of Non-Detect Data	46
		Percent Non-Detects	46.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0041	Minimum Detected	-5.497
Maximum Detected	0.12	Maximum Detected	-2.12
Mean of Detected	0.0476	Mean of Detected	-3.645
SD of Detected	0.0461	SD of Detected	1.165
Minimum Non-Detect	0.003	Minimum Non-Detect	-5.809
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	59
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	41
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	59.00%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.341	Lilliefors Test Statistic	0.24
5% Lilliefors Critical Value	0.121	5% Lilliefors Critical Value	0.121
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0273	Mean (Log Scale)	-4.598
SD	0.0403	SD (Log Scale)	1.365
95% UTL 95% Coverage	0.105	95% UTL 95% Coverage	0.139
95% UPL (t)	0.0946	95% UPL (t)	0.0982
90% Percentile (z)	0.079	90% Percentile (z)	0.0579
95% Percentile (z)	0.0937	95% Percentile (z)	0.0951
99% Percentile (z)	0.121	99% Percentile (z)	0.241
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.00856	Mean in Original Scale	0.0271
SD	0.0745	SD in Original Scale	0.0405
95% UTL with 95% Coverage	0.135	95% UTL with 95% Coverage	0.193
		95% BCA UTL with 95% Coverage	0.107
		95% Bootstrap (%) UTL with 95% Coverage	0.11
95% UPL (t)	0.116	95% UPL (t)	0.127
90% Percentile (z)	0.0869	90% Percentile (z)	0.0676
95% Percentile (z)	0.114	95% Percentile (z)	0.122
99% Percentile (z)	0.165	99% Percentile (z)	0.373

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.924	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0516		
nu star	99.74		
A-D Test Statistic	4.614	Nonparametric Statistics	
5% A-D Critical Value	0.781	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.253	Mean	0.0278
5% K-S Critical Value	0.125	SD	0.0399
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00402
		95% KM UTL with 95% Coverage	0.104
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.202
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0943
Mean	0.0466	90% Percentile (z)	0.0788
Median	0.0399	95% Percentile (z)	0.0933
SD	0.0344	99% Percentile (z)	0.121
k star	1.594		
Theta star	0.0292	Gamma ROS Limits with Extrapolated Data	
Nu star	318.9	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.119
95% Percentile of Chisquare (2k)	8.139	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.124
		95% WH Approx. Gamma UTL with 95% Coverage	0.138
90% Percentile	0.0957	95% HW Approx. Gamma UTL with 95% Coverage	0.145
95% Percentile	0.119		
99% Percentile	0.171		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Chromium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Chromium, Dissolved

Background Data: Alluv Chromium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	0	0
Number of Non-Detect Data	0	0
Number of Detect Data	0	0
Minimum Non-Detect	N/A	N/A
Maximum Non-Detect	N/A	N/A
Percent Non detects	NaN%	NaN%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Chromium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Chromium, Dissolved

Background Data: Alluv Chromium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	0
Number of Non-Detect Data	46	0
Number of Detect Data	54	0
Minimum Non-Detect	0.003	N/A
Maximum Non-Detect	0.01	N/A
Percent Non detects	46.00%	NaN%
Minimum Detected	0.0041	N/A
Maximum Detected	0.12	N/A
Mean of Detected Data	0.0476	N/A
Median of Detected Data	0.0178	N/A
SD of Detected Data	0.0461	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Chromium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Chromium, Dissolved

Background Data: Muddy Creek Chromium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	0
Number of Non-Detect Data	46	0
Number of Detect Data	54	0
Minimum Non-Detect	0.003	N/A
Maximum Non-Detect	0.01	N/A
Percent Non detects	46.00%	NaN%
Minimum Detected	0.0041	N/A
Maximum Detected	0.12	N/A
Mean of Detected Data	0.0476	N/A
Median of Detected Data	0.0178	N/A
SD of Detected Data	0.0461	N/A

Site vs Background Gehan Test

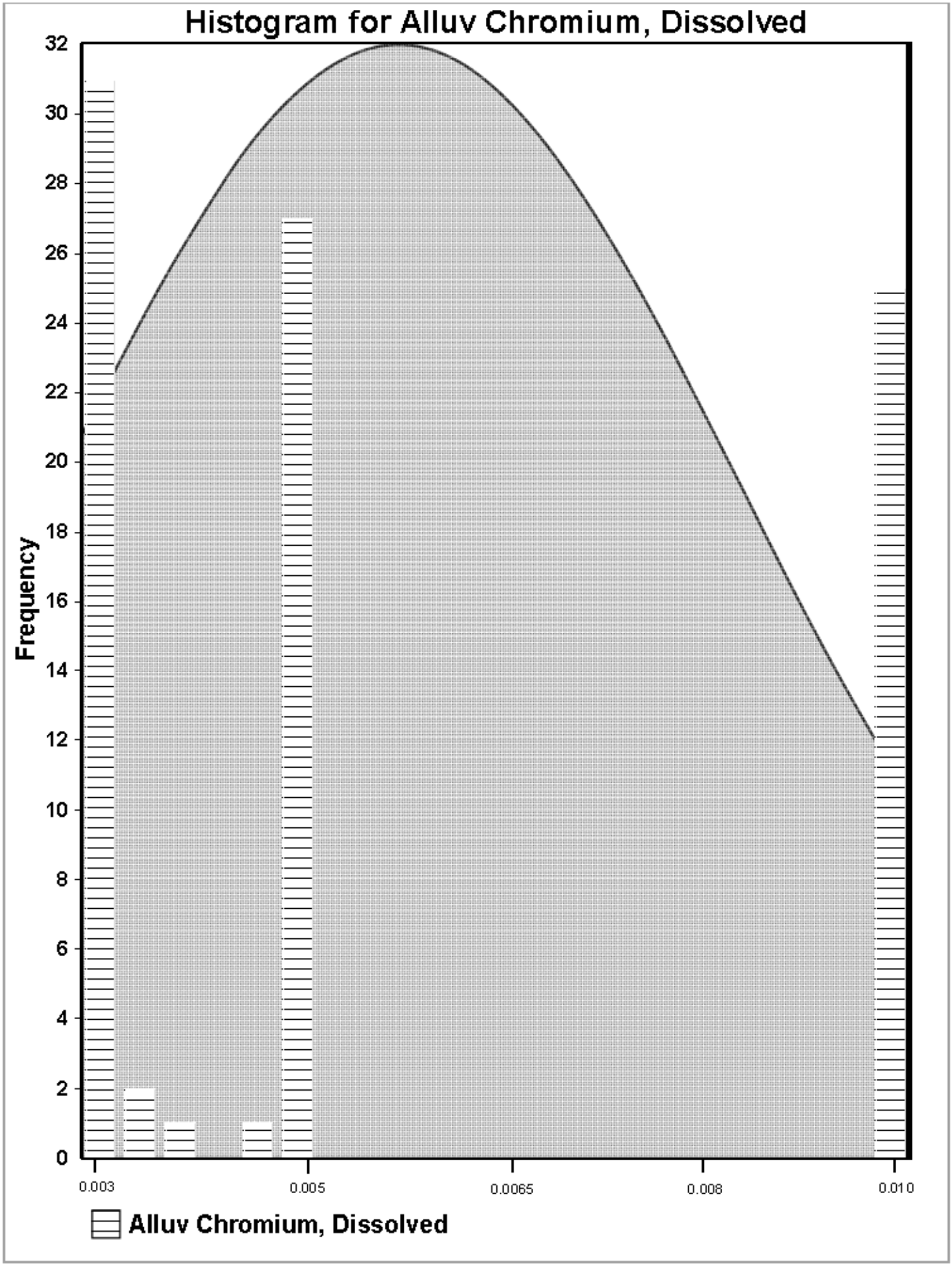
H0: Mu of Site or AOC = Mu of background

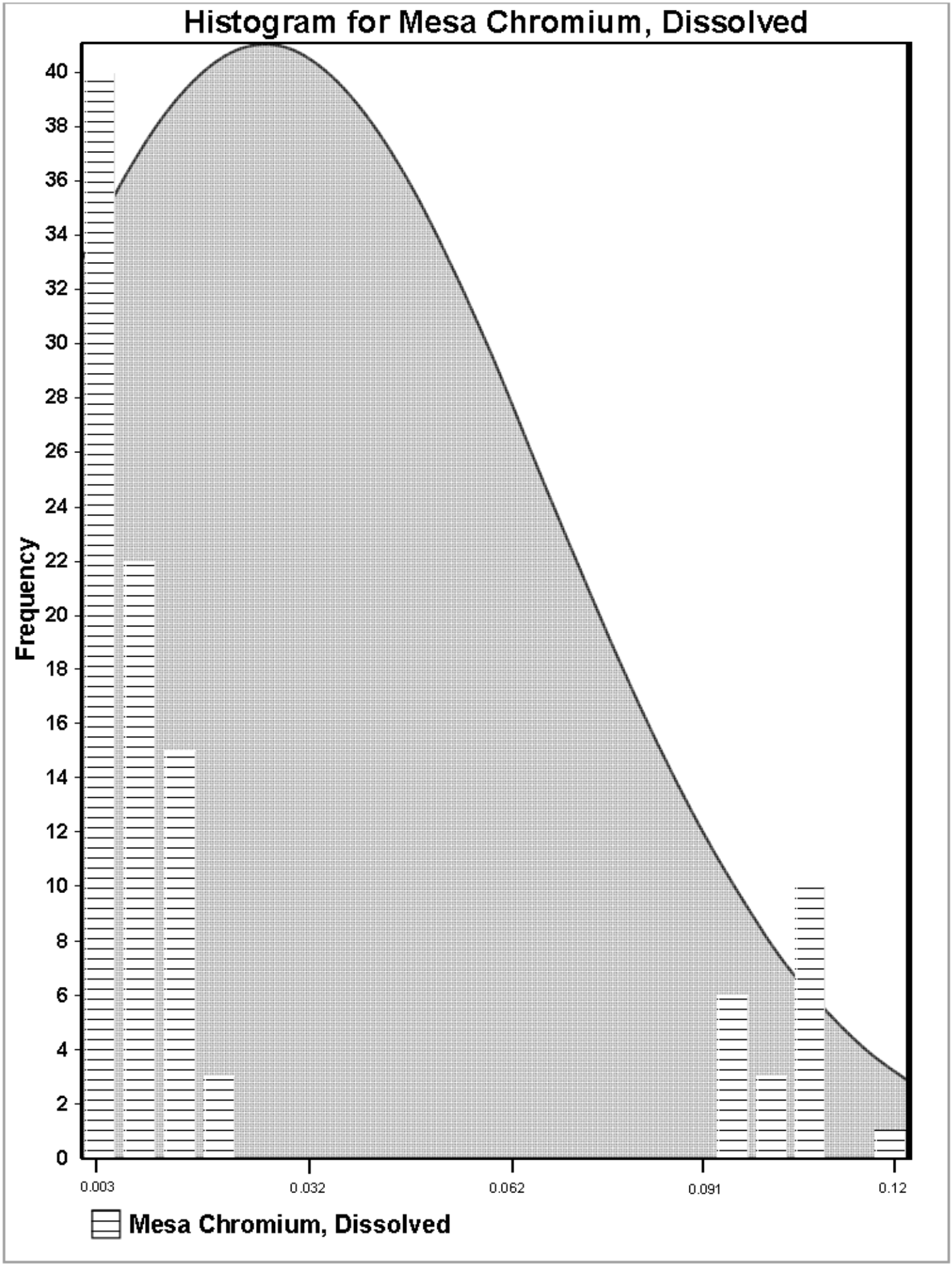
Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

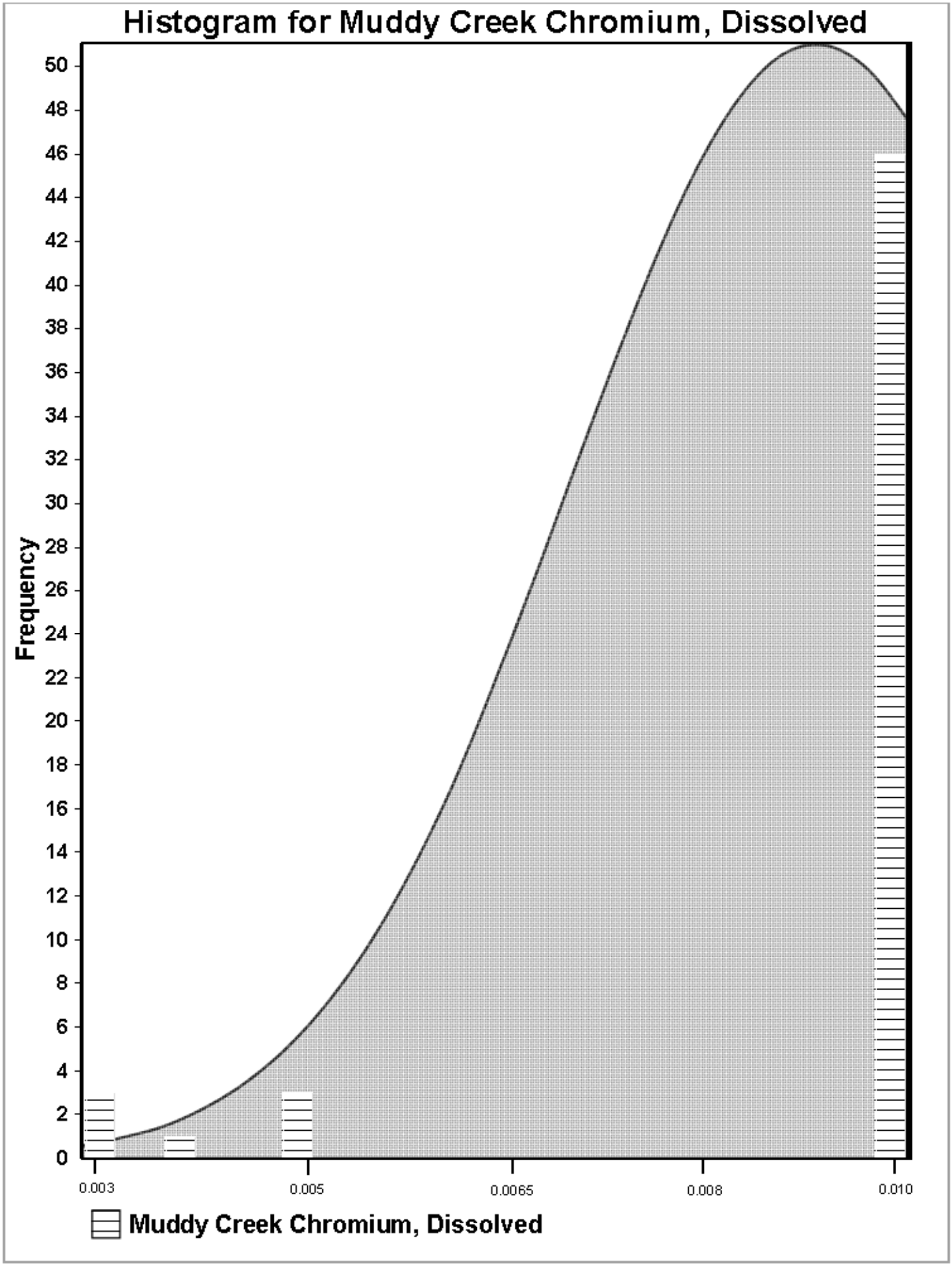
Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Chromium, Dissolved
Frequency
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
0.003
0.005
0.0065
0.008
0.010
Alluv Chromium, Dissolved


Histogram for Mesa Chromium, Dissolved
Frequency
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
0.003
0.032
0.062
0.091
0.12
Mesa Chromium, Dissolved


Histogram for Muddy Creek Chromium, Dissolved
Frequency
50
48
46
44
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
0.003
0.005
0.0065
0.008
0.010
Muddy Creek Chromium, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Chromium_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Chromium, Dissolved

Mean	0.00298
Standard Deviation	0.00166
Number of data	87
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00298	0.00165	0.01	49	4.254	3.338	3.705

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.01 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.01 is a Potential Statistical Outlier

Rosner's Outlier Test for Muddy Creek Chromium, Dissolved

Mean	0.0046
Standard Deviation	0.00104
Number of data	53
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0046	0.00103	0.0015	50	3.015	3.151	3.504

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Chromium, Dissolved

Mean	0.0273
Standard Deviation	0.0403
Number of data	100
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical

#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.0273	0.0401	0.12	57	2.31	3.38	3.75

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Location Name	Sample Date	Alluv Chromium, Dissolved	D_Alluv Chromium, Dissolved
BG-1S	11/26/2012	0.01	0
BG-1S	8/23/2012	0.01	0
BG-1S	5/24/2012	0.01	0
BG-1S	3/20/2012	0.01	0
IMW-2.5D	11/26/2012	0.01	0
IMW-2.5D	8/24/2012	0.01	0
IMW-2.5D	5/21/2012	0.01	0
IMW-2.5D	3/21/2012	0.0046	0
IMW-2.5D	12/8/2011	0.005	0
IMW-2.5D	6/6/2011	0.005	1
IMW-2.5D	12/15/2010	0.005	0
IMW-2.5D	6/9/2010	0.003	0
IMW-2.5D	12/12/2009	0.003	0
IMW-2.5S	11/26/2012	0.01	0
IMW-2.5S	8/24/2012	0.01	0
IMW-2.5S	5/21/2012	0.01	0
IMW-2.5S	3/21/2012	0.01	0
IMW-2.5S	12/8/2011	0.005	0
IMW-2.5S	9/9/2011	0.005	0
IMW-2.5S	6/6/2011	0.005	0
IMW-2.5S	3/7/2011	0.005	0
IMW-2.5S	12/15/2010	0.005	0
IMW-2.5S	9/20/2010	0.005	0
IMW-2.5S	6/9/2010	0.003	0
IMW-2.5S	3/9/2010	0.003	0
IMW-2.5S	12/12/2009	0.003	0
IMW-2.5S	9/21/2009	0.003	0
IMW-3S	5/21/2012	0.01	0
IMW-3S	3/20/2012	0.01	0
IMW-3S	12/9/2011	0.005	0
IMW-3S	9/9/2011	0.005	0
IMW-3S	6/7/2011	0.005	0
IMW-3S	3/7/2011	0.005	0
IMW-3S	12/10/2010	0.005	0
IMW-3S	9/16/2010	0.005	0
IMW-3S	6/8/2010	0.003	0
IMW-3S	3/9/2010	0.003	0
IMW-3S	12/10/2009	0.003	0
IMW-3S	9/14/2009	0.003	0
IMW-3S	6/9/2009	0.003	0
IMW-3S	3/3/2009	0.003	0
IMW-3S	12/9/2008	0.003	0
IMW-3S	9/9/2008	0.003	0
IMW-3S	6/3/2008	0.004	0
IMW-3S	3/4/2008	0.003	0
KMW-2D	11/26/2012	0.01	0
KMW-2D	8/24/2012	0.01	0
KMW-2D	5/21/2012	0.01	0
KMW-2D	3/23/2012	0.01	1
KMW-2D	12/8/2011	0.005	0
KMW-2D	6/6/2011	0.005	0
KMW-2D	12/13/2010	0.005	0
KMW-2D	6/8/2010	0.003	0
KMW-2D	12/8/2009	0.003	0
KMW-2D	12/10/2008	0.003	0
KMW-2D	6/3/2008	0.0037	0
KMW-2M	11/26/2012	0.01	0
KMW-2M	8/24/2012	0.01	0
KMW-2M	5/21/2012	0.01	0
KMW-2M	3/23/2012	0.01	0
KMW-2M	12/8/2011	0.005	0
KMW-2M	6/6/2011	0.005	0
KMW-2M	12/13/2010	0.005	1
KMW-2M	6/8/2010	0.003	0
KMW-2M	12/8/2009	0.003	0
KMW-2M	12/10/2008	0.003	0
KMW-2M	6/3/2008	0.0036	0
KMW-2S	11/26/2012	0.01	0
KMW-2S	8/24/2012	0.01	0
KMW-2S	5/21/2012	0.01	0
KMW-2S	3/23/2012	0.01	0
KMW-2S	12/8/2011	0.005	0
KMW-2S	9/9/2011	0.005	0
KMW-2S	6/6/2011	0.005	1
KMW-2S	3/8/2011	0.005	0
KMW-2S	12/13/2010	0.005	0
KMW-2S	9/15/2010	0.005	0
KMW-2S	6/8/2010	0.003	0
KMW-2S	3/9/2010	0.003	0
KMW-2S	12/8/2009	0.003	0
KMW-2S	9/16/2009	0.003	0
KMW-2S	6/10/2009	0.003	0
KMW-2S	3/3/2009	0.003	0
KMW-2S	12/10/2008	0.003	0
KMW-2S	9/8/2008	0.003	0
KMW-2S	6/3/2008	0.0032	1
KMW-2S	3/4/2008	0.003	0

Location Name	Sample Date	Muddy Creek Chromium, Dissolved	D_Muddy Creek Chromium, Dissolved
BG-3S	11/27/2012	0.01	0
BG-3S	8/22/2012	0.01	0
BG-3S	5/23/2012	0.01	0
BG-3S	3/21/2012	0.01	0
BG-4S	11/27/2012	0.01	0
BG-4S	8/30/2012	0.01	0
BG-4S	5/30/2012	0.01	0
BG-4S	3/20/2012	0.01	0
BG-6S	11/27/2012	0.01	0
BG-6S	8/23/2012	0.01	0
BG-6S	5/25/2012	0.01	0
BG-6S	3/21/2012	0.01	0
BG-1M	11/26/2012	0.01	0
BG-1M	8/23/2012	0.01	0
BG-1M	5/24/2012	0.01	0
BG-1M	3/20/2012	0.01	0
BG-3M	11/27/2012	0.01	0
BG-3M	8/22/2012	0.01	0
BG-3M	5/24/2012	0.01	0
BG-3M	3/21/2012	0.01	0
BG-4M	11/27/2012	0.01	0
BG-4M	8/30/2012	0.01	0
BG-4M	5/30/2012	0.01	0
BG-4M	3/20/2012	0.01	0
BG-6M	11/27/2012	0.01	0
BG-6M	8/22/2012	0.01	0
BG-6M	5/25/2012	0.01	0
BG-6M	3/21/2012	0.01	0
BG-1D	11/26/2012	0.01	0
BG-1D	8/23/2012	0.01	0
BG-1D	5/24/2012	0.01	0
BG-1D	3/20/2012	0.01	0
BG-3D	11/27/2012	0.01	0
BG-3D	8/21/2012	0.01	0
BG-3D	5/23/2012	0.01	0
BG-3D	3/21/2012	0.01	0
BG-4D	11/27/2012	0.01	0
BG-4D	8/30/2012	0.01	0
BG-4D	5/30/2012	0.01	0
BG-4D	3/20/2012	0.01	0
BG-6D	11/27/2012	0.01	0
BG-6D	8/22/2012	0.01	0
BG-6D	5/25/2012	0.01	0
BG-6D	3/21/2012	0.01	0
IMW-3D	5/25/2012	0.01	0
IMW-3D	3/22/2012	0.01	0
IMW-3D	12/9/2011	0.005	0
IMW-3D	6/7/2011	0.005	0
IMW-3D	12/10/2010	0.005	1
IMW-3D	6/8/2010	0.003	0
IMW-3D	12/10/2009	0.003	0
IMW-3D	12/9/2008	0.003	0
IMW-3D	6/3/2008	0.004	0

Location Name	Sample Date	Mesa Chromium, Dissolved	D_Mesa Chromium, Dissolved
LMW-10	11/28/2012	0.01	0
LMW-10	8/27/2012	0.0065	1
LMW-10	5/30/2012	0.01	0
LMW-10	3/22/2012	0.0051	1
LMW-10	12/6/2011	0.005	0
LMW-10	9/8/2011	0.005	0
LMW-10	6/8/2011	0.006	1
LMW-10	3/2/2011	0.00833	1
LMW-10	12/9/2010	0.01	0
LMW-10	9/21/2010	0.00707	1
LMW-10	6/9/2010	0.0059	1
LMW-10	3/11/2010	0.003	0
LMW-10	12/11/2009	0.0042	1
LMW-10	9/18/2009	0.0041	1
LMW-10	6/10/2009	0.007	1
LMW-10	3/5/2009	0.0067	1
LMW-10	12/12/2008	0.007	1
LMW-10	9/10/2008	0.0065	1
LMW-10	6/4/2008	0.0081	1
LMW-10	3/5/2008	0.011	1
LMW-11R	11/26/2012	0.01	0
LMW-11R	8/21/2012	0.01	0
LMW-11R	5/29/2012	0.01	0
LMW-11R	3/23/2012	0.01	0
LMW-7	11/28/2012	0.013	1
LMW-7	8/27/2012	0.015	1
LMW-7	5/31/2012	0.016	1
LMW-7	3/23/2012	0.017	1
LMW-7	12/5/2011	0.015	1
LMW-7	9/6/2011	0.015	1
LMW-7	6/9/2011	0.0164	1
LMW-7	3/9/2011	0.0175	1
LMW-7	12/10/2010	0.0176	1
LMW-7	9/21/2010	0.0176	1
LMW-7	6/9/2010	0.018	1
LMW-7	3/11/2010	0.015	1
LMW-7	12/11/2009	0.016	1
LMW-7	9/18/2009	0.012	1
LMW-7	6/10/2009	0.02	1
LMW-7	3/5/2009	0.02	1
LMW-7	12/12/2008	0.018	1
LMW-7	9/10/2008	0.022	1
LMW-7	6/4/2008	0.021	1
LMW-7	3/5/2008	0.022	1
BG-2S	11/26/2012	0.01	0
BG-2S	8/23/2012	0.01	0
BG-2S	5/24/2012	0.01	0
BG-2S	3/21/2012	0.01	0
BG-2M	11/26/2012	0.01	0
BG-2M	8/23/2012	0.01	0
BG-2M	5/24/2012	0.01	0
BG-2M	3/21/2012	0.01	0
BG-2D	11/26/2012	0.01	0
BG-2D	8/23/2012	0.01	1
BG-2D	5/24/2012	0.01	0
BG-2D	3/21/2012	0.01	0
LMW-9	11/28/2012	0.12	1
LMW-9	8/27/2012	0.11	1
LMW-9	5/31/2012	0.11	1
LMW-9	3/23/2012	0.11	1
LMW-9	12/5/2011	0.11	1
LMW-9	9/8/2011	0.099	1
LMW-9	6/8/2011	0.101	1
LMW-9	3/9/2011	0.104	1
LMW-9	12/10/2010	0.106	1
LMW-9	9/21/2010	0.107	1
LMW-9	6/9/2010	0.11	1
LMW-9	3/11/2010	0.1	1
LMW-9	12/11/2009	0.11	1
LMW-9	9/18/2009	0.097	1
LMW-9	6/10/2009	0.11	1
LMW-9	3/5/2009	0.1	1
LMW-9	12/12/2008	0.1	1
LMW-9	9/10/2008	0.11	1
LMW-9	6/4/2008	0.11	1
LMW-9	3/5/2008	0.11	1
LMW-11	3/2/2011	0.005	0
LMW-11	9/8/2011	0.005	0
LMW-11	12/6/2011	0.005	0
LMW-11	2/22/2012	0.005	0
LMW-12R	5/30/2012	0.005	0
LMW-12R	8/21/2012	0.005	0
LMW-12R	10/22/2012	0.005	0
LMW-12R	11/30/2012	0.005	0
LMW-13R	5/29/2012	0.005	0
LMW-13R	8/20/2012	0.005	0
LMW-13R	10/22/2012	0.005	0
LMW-13R	11/28/2012	0.005	0
LMW-14R	5/29/2012	0.005	0
LMW-14R	8/20/2012	0.005	0
LMW-14R	10/22/2012	0.005	0
LMW-14R	11/30/2012	0.005	0
LMW-15	5/29/2012	0.005	0
LMW-15	8/20/2012	0.005	0
LMW-15	10/22/2012	0.005	0
LMW-15	11/28/2012	0.005	0
LMW-16	5/29/2012	0.005	0
LMW-16	8/20/2012	0.005	0
LMW-16	10/22/2012	0.005	0
LMW-16	11/28/2012	0.005	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Chromium_Hexavalent.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Chromium, Hexavalent

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	9	17	65.38%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	17	0.01	0.01	0.01	0.01	0
Statistics (Detects Only)	9	0.003	0.007	0.00444	0.004	0.00133
Statistics (All: NDs treated as DL value)	26	0.003	0.01	0.00808	0.01	0.0028
Statistics (All: NDs treated as DL/2 value)	26	0.003	0.007	0.00481	0.005	8.0096E-4
Statistics (Normal ROS Estimated Data)	26	0.00202	0.007	0.00444	0.00412	0.00131
Statistics (Gamma ROS Estimated Data)	26	0.00168	0.007	0.00442	0.00435	0.00124
Statistics (Lognormal ROS Estimated Data)	26	0.00252	0.00727	0.00445	0.00404	0.00129

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	13.58	12.04	3.2723E-4	-5.453	0.285	-0.0523
Statistics (NDs = DL)	6.41	5.696	0.00126	-4.899	0.442	-0.0902
Statistics (NDs = DL/2)	34.77	30.78	1.3828E-4	-5.352	0.178	-0.0333
Statistics (Gamma ROS Estimates)	11.6	10.29	3.8074E-4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.453	0.284	-0.052

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.936	0.826	0.857	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.874	0.829	Data Appear Normal
Lilliefors (Detects Only)	0.297	0.295	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.666	0.92	Data Not Normal
Lilliefors (NDs = DL)	0.408	0.174	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.757	0.92	Data Not Normal
Lilliefors (NDs = DL/2)	0.364	0.174	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.973	0.92	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.129	0.174	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.961	0.749	0.852	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.518	0.721	
Kolmogorov-Smirnov (Detects Only)	0.281	0.279	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	4.146	0.746	
Kolmogorov-Smirnov (NDs = DL)	0.409	0.171	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	3.526	0.743	
Kolmogorov-Smirnov (NDs = DL/2)	0.383	0.171	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.365	0.744	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.136	0.171	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.955	0.83	0.847	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.905	0.829	Data Appear Lognormal
Lilliefors (Detects Only)	0.261	0.295	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.675	0.92	Data Not Lognormal
Lilliefors (NDs = DL)	0.401	0.174	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.738	0.92	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.388	0.174	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.975	0.92	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.103	0.174	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Chromium, Hexavalent

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	9	37	80.43%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	37	0.01	0.01	0.01	0.01	3.517E-18
Statistics (Detects Only)	9	0.004	0.006	0.00467	0.005	7.0711E-4
Statistics (All: NDs treated as DL value)	46	0.004	0.01	0.00896	0.01	0.00216
Statistics (All: NDs treated as DL/2 value)	46	0.004	0.006	0.00493	0.005	3.2675E-4
Statistics (Normal ROS Estimated Data)	46	0.00316	0.00617	0.00467	0.00469	7.1120E-4
Statistics (Gamma ROS Estimated Data)	46	0.00272	0.006	0.00463	0.00482	6.7540E-4
Statistics (Lognormal ROS Estimated Data)	46	0.00336	0.00635	0.00467	0.00465	7.0309E-4

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	50.55	47.27	9.2320E-5	-5.377	0.148	-0.0276
Statistics (NDs = DL)	12.4	11.61	7.2210E-4	-4.756	0.316	-0.0664
Statistics (NDs = DL/2)	216.5	202.4	2.2791E-5	-5.314	0.0702	-0.0132
Statistics (Gamma ROS Estimates)	43.38	40.56	1.0674E-4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.377	0.15	-0.0278

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.9	0.715	0.64	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.805	0.829	Data Not Normal
Lilliefors (Detects Only)	0.272	0.295	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.503	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.49	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.447	0.945	Data Not Normal

Lilliefors (NDs = DL/2)	0.492	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.981	0.945	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0713	0.131	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.911	0.647	0.638	0.958

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.941	0.721	
Kolmogorov-Smirnov (Detects Only)	0.291	0.279	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	11.62	0.749	
Kolmogorov-Smirnov (NDs = DL)	0.492	0.13	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	13.55	0.747	
Kolmogorov-Smirnov (NDs = DL/2)	0.499	0.13	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.22	0.748	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.136	0.13	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.902	0.717	0.636	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.803	0.829	Data Not Lognormal
Lilliefors (Detects Only)	0.279	0.295	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.508	0.945	Data Not Lognormal
Lilliefors (NDs = DL)	0.488	0.131	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.438	0.945	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.5	0.131	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.98	0.945	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0714	0.131	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Chromium, Hexavalent

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	17	11	39.29%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	11	0.01	0.01	0.01	0.01	1.819E-18
Statistics (Detects Only)	17	0.003	0.11	0.0327	0.009	0.0445
Statistics (All: NDs treated as DL value)	28	0.003	0.11	0.0238	0.01	0.0361
Statistics (All: NDs treated as DL/2 value)	28	0.003	0.11	0.0218	0.005	0.037
Statistics (Normal ROS Estimated Data)	28	-0.034	0.11	0.0222	0.0088	0.0391
Statistics (Gamma ROS Estimated Data)	28	0.003	0.11	0.0333	0.0264	0.0346
Statistics (Lognormal ROS Estimated Data)	28	0.00115	0.11	0.0224	0.00738	0.0368

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.679	0.63	0.0482	-4.314	1.357	-0.315
Statistics (NDs = DL)	0.853	0.786	0.0279	-4.428	1.055	-0.238
Statistics (NDs = DL/2)	0.691	0.641	0.0316	-4.701	1.154	-0.245

Statistics (Gamma ROS Estimates)	1.044	0.956	0.0319	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.699	1.253	-0.267

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.802	0.724	0.713	0.865

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.629	0.892	Data Not Normal
Lilliefors (Detects Only)	0.377	0.215	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.522	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.399	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.506	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.377	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.747	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.273	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.873	0.87	0.877	0.854

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.596	0.783	
Kolmogorov-Smirnov (Detects Only)	0.246	0.218	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.589	0.78	
Kolmogorov-Smirnov (NDs = DL)	0.339	0.171	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	4.469	0.791	
Kolmogorov-Smirnov (NDs = DL/2)	0.319	0.173	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.701	0.773	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.109	0.17	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.93	0.909	0.861	0.952

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.843	0.892	Data Not Lognormal
Lilliefors (Detects Only)	0.175	0.215	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.817	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.281	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.732	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.305	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.897	0.924	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.122	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Alluv + Muddy Creek Chromium, Hexavalent

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	72	0	72	18	54	75.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	54	0.01	0.01	0.01	0.01	5.253E-18
Statistics (Detects Only)	18	0.003	0.007	0.00456	0.004	0.00104
Statistics (All: NDs treated as DL value)	72	0.003	0.01	0.00864	0.01	0.00243
Statistics (All: NDs treated as DL/2 value)	72	0.003	0.007	0.00489	0.005	5.4529E-4
Statistics (Normal ROS Estimated Data)	72	0.00224	0.007	0.00456	0.00451	0.00104
Statistics (Gamma ROS Estimated Data)	72	0.00164	0.007	0.00453	0.00472	9.7356E-4
Statistics (Lognormal ROS Estimated Data)	72	0.00269	0.00736	0.00456	0.0044	0.00104

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	21.09	20.22	2.1598E-4	-5.415	0.224	-0.0414
Statistics (NDs = DL)	9.057	8.689	9.5385E-4	-4.808	0.37	-0.0769
Statistics (NDs = DL/2)	73.99	70.92	6.6074E-5	-5.328	0.121	-0.0227
Statistics (Gamma ROS Estimates)	18.52	17.75	2.4464E-4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.415	0.225	-0.0416

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.942	0.764	0.749	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.892	0.897	Data Not Normal
Lilliefors (Detects Only)	0.259	0.209	Data Not Normal
Lilliefors (NDs = DL)	0.462	0.104	Data Not Normal
Lilliefors (NDs = DL/2)	0.442	0.104	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0775	0.104	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.957	0.687	0.743	0.962

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.917	0.739	
Kolmogorov-Smirnov (Detects Only)	0.251	0.203	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	15.25	0.751	
Kolmogorov-Smirnov (NDs = DL)	0.463	0.105	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	15.58	0.749	
Kolmogorov-Smirnov (NDs = DL/2)	0.453	0.105	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.656	0.75	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.116	0.105	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.952	0.767	0.738	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.907	0.897	Data Appear Lognormal
Lilliefors (Detects Only)	0.238	0.209	Data Not Lognormal
Lilliefors (NDs = DL)	0.458	0.104	Data Not Lognormal

			Lilliefors (NDs = DL/2)	0.457	0.104	Data Not Lognormal					
			Lilliefors (Lognormal ROS Estimates)	0.0702	0.104	Data Appear Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.											

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Chromium_Hexavalent.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Chromium, Hexavalent

General Statistics

Number of Valid Data	26	Number of Detected Data	9
Number of Distinct Detected Data	5	Number of Non-Detect Data	17
		Percent Non-Detects	65.38%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.003	Minimum Detected	-5.809
Maximum Detected	0.007	Maximum Detected	-4.962
Mean of Detected	0.00444	Mean of Detected	-5.453
SD of Detected	0.00133	SD of Detected	0.285
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605

Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.874	Shapiro Wilk Test Statistic	0.905
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00481	Mean (Log Scale)	-5.352
SD	8.0096E-4	SD (Log Scale)	0.178
95% UTL 95% Coverage	0.00663	95% UTL 95% Coverage	0.00711
95% UPL (t)	0.0062	95% UPL (t)	0.00646
90% Percentile (z)	0.00583	90% Percentile (z)	0.00595
95% Percentile (z)	0.00613	95% Percentile (z)	0.00635
99% Percentile (z)	0.00667	99% Percentile (z)	0.00717
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00445
		SD in Original Scale	0.00129
		Mean in Log Scale	-5.453

		SD in Log Scale	0.284
		95% UTL 95% Coverage	0.00817
		95% UPL (t)	0.00702
		90% Percentile (z)	0.00616
		95% Percentile (z)	0.00683
		99% Percentile (z)	0.00829

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	9.129	Data appear Normal at 5% Significance Level	
Theta Star	4.8686E-4		
nu star	164.3		
A-D Test Statistic	0.518	Nonparametric Statistics	
5% A-D Critical Value	0.721	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.281	Mean	0.00444
5% K-S Critical Value	0.279	SD	0.00126
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	4.4444E-4
		95% KM UTL with 95% Coverage	0.0073
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.01
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00663
Mean	0.00442	90% Percentile (z)	0.00606
Median	0.00435	95% Percentile (z)	0.00651
SD	0.00124	99% Percentile (z)	0.00737
k star	10.29		
Theta star	4.2933E-4	Gamma ROS Limits with Extrapolated Data	
Nu star	535	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00697
95% Percentile of Chisquare (2k)	32.14	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00705
		95% WH Approx. Gamma UTL with 95% Coverage	0.00797
90% Percentile	0.00625	95% HW Approx. Gamma UTL with 95% Coverage	0.00812
95% Percentile	0.0069		
99% Percentile	0.00823		

Note: DL/2 is not a recommended method.

Muddy Creek Chromium, Hexavalent

General Statistics

Number of Valid Data	46	Number of Detected Data	9
Number of Distinct Detected Data	3	Number of Non-Detect Data	37
		Percent Non-Detects	80.43%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.004	Minimum Detected	-5.521
Maximum Detected	0.006	Maximum Detected	-5.116
Mean of Detected	0.00467	Mean of Detected	-5.377
SD of Detected	7.0711E-4	SD of Detected	0.148
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.805	Shapiro Wilk Test Statistic	0.803
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00493	Mean (Log Scale)	-5.314
SD	3.2675E-4	SD (Log Scale)	0.0702
95% UTL 95% Coverage	0.00561	95% UTL 95% Coverage	0.0057
95% UPL (t)	0.00549	95% UPL (t)	0.00555
90% Percentile (z)	0.00535	90% Percentile (z)	0.00539
95% Percentile (z)	0.00547	95% Percentile (z)	0.00553
99% Percentile (z)	0.00569	99% Percentile (z)	0.0058
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00467
		SD in Original Scale	7.0309E-4
		Mean in Log Scale	-5.377
		SD in Log Scale	0.15
		95% UTL 95% Coverage	0.00631
		95% UPL (t)	0.00596
		90% Percentile (z)	0.0056
		95% Percentile (z)	0.00591
		99% Percentile (z)	0.00655
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	33.77	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.3818E-4		
nu star	607.9		
A-D Test Statistic	0.941	Nonparametric Statistics	
5% A-D Critical Value	0.721	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.291	Mean	0.00467
5% K-S Critical Value	0.279	SD	6.6667E-4
Data not Gamma Distributed at 5% Significance Level		SE of Mean	2.3570E-4
		95% KM UTL with 95% Coverage	0.00605
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0076
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0058
Mean	0.00463	90% Percentile (z)	0.00552
Median	0.00482	95% Percentile (z)	0.00576
SD	6.7540E-4	99% Percentile (z)	0.00622
k star	40.56		
Theta star	1.1414E-4	Gamma ROS Limits with Extrapolated Data	
Nu star	3732	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0059

95% Percentile of Chisquare (2k)	103.2	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00592
		95% WH Approx. Gamma UTL with 95% Coverage	0.00623
90% Percentile	0.00558	95% HW Approx. Gamma UTL with 95% Coverage	0.00626
95% Percentile	0.00589		
99% Percentile	0.00649		

Note: DL/2 is not a recommended method.

Mesa Chromium, Hexavalent

General Statistics

Number of Valid Data	28	Number of Detected Data	17
Number of Distinct Detected Data	9	Number of Non-Detect Data	11
		Percent Non-Detects	39.29%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.003	Minimum Detected	-5.809
Maximum Detected	0.11	Maximum Detected	-2.207
Mean of Detected	0.0327	Mean of Detected	-4.314
SD of Detected	0.0445	SD of Detected	1.357
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.629	Shapiro Wilk Test Statistic	0.843
5% Shapiro Wilk Critical Value	0.892	5% Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0218	Mean (Log Scale)	-4.701
SD	0.037	SD (Log Scale)	1.154
95% UTL 95% Coverage	0.105	95% UTL 95% Coverage	0.121
95% UPL (t)	0.0859	95% UPL (t)	0.0672
90% Percentile (z)	0.0692	90% Percentile (z)	0.0399
95% Percentile (z)	0.0826	95% Percentile (z)	0.0606
99% Percentile (z)	0.108	99% Percentile (z)	0.133
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.0402	Mean in Original Scale	0.0224
SD	0.088	SD in Original Scale	0.0368
95% UTL with 95% Coverage	0.157	95% UTL with 95% Coverage	0.152
		95% BCA UTL with 95% Coverage	0.11
		95% Bootstrap (%) UTL with 95% Coverage	0.11
95% UPL (t)	0.112	95% UPL (t)	0.0799
90% Percentile (z)	0.0725	90% Percentile (z)	0.0454
95% Percentile (z)	0.104	95% Percentile (z)	0.0715
99% Percentile (z)	0.164	99% Percentile (z)	0.168

Gamma Distribution Test with Detected Values Only	Data Distribution Test with Detected Values Only

k star (bias corrected)	0.599	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0546		
nu star	20.35		
A-D Test Statistic	1.596	Nonparametric Statistics	
5% A-D Critical Value	0.783	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.246	Mean	0.0218
5% K-S Critical Value	0.218	SD	0.0363
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00708
		95% KM UTL with 95% Coverage	0.103
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.183
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0848
Mean	0.0333	90% Percentile (z)	0.0684
Median	0.0264	95% Percentile (z)	0.0816
SD	0.0346	99% Percentile (z)	0.106
k star	0.956		
Theta star	0.0349	Gamma ROS Limits with Extrapolated Data	
Nu star	53.55	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.104
95% Percentile of Chisquare (2k)	5.821	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.109
		95% WH Approx. Gamma UTL with 95% Coverage	0.144
90% Percentile	0.0776	95% HW Approx. Gamma UTL with 95% Coverage	0.157
95% Percentile	0.101		
99% Percentile	0.157		

Note: DL/2 is not a recommended method.

Alluv + Muddy Creek Chromium, Hexavalent

General Statistics

Number of Valid Data	72	Number of Detected Data	18
Number of Distinct Detected Data	5	Number of Non-Detect Data	54
		Percent Non-Detects	75.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.003	Minimum Detected	-5.809
Maximum Detected	0.007	Maximum Detected	-4.962
Mean of Detected	0.00456	Mean of Detected	-5.415
SD of Detected	0.00104	SD of Detected	0.224
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.892	Shapiro Wilk Test Statistic	0.907
5% Shapiro Wilk Critical Value	0.897	5% Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00489	Mean (Log Scale)	-5.328
SD	5.4529E-4	SD (Log Scale)	0.121

95% UTL 95% Coverage	0.00597	95% UTL 95% Coverage	0.00617
95% UPL (t)	0.0058	95% UPL (t)	0.00595
90% Percentile (z)	0.00559	90% Percentile (z)	0.00567
95% Percentile (z)	0.00579	95% Percentile (z)	0.00592
99% Percentile (z)	0.00616	99% Percentile (z)	0.00643
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00456
		SD in Original Scale	0.00104
		Mean in Log Scale	-5.415
		SD in Log Scale	0.225
		95% UTL 95% Coverage	0.00695
		95% UPL (t)	0.00649
		90% Percentile (z)	0.00594
		95% Percentile (z)	0.00644
		99% Percentile (z)	0.00751
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	17.61	Data appear Lognormal at 5% Significance Level	
Theta Star	2.5863E-4		
nu star	634.1		
A-D Test Statistic	0.917	Nonparametric Statistics	
5% A-D Critical Value	0.739	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.251	Mean	0.00456
5% K-S Critical Value	0.203	SD	0.00101
Data not Gamma Distributed at 5% Significance Level		SE of Mean	2.4551E-4
		95% KM UTL with 95% Coverage	0.00656
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.009
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00625
Mean	0.00453	90% Percentile (z)	0.00585
Median	0.00472	95% Percentile (z)	0.00622
SD	9.7356E-4	99% Percentile (z)	0.00691
k star	17.75		
Theta star	2.5514E-4	Gamma ROS Limits with Extrapolated Data	
Nu star	2556	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00645
95% Percentile of Chisquare (2k)	50.41	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0065
		95% WH Approx. Gamma UTL with 95% Coverage	0.00686
90% Percentile	0.00595	95% HW Approx. Gamma UTL with 95% Coverage	0.00693
95% Percentile	0.00643		
99% Percentile	0.0074		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Chromium_Hexavalent.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Chromium, Hexavalent

Background Data: Alluv Chromium, Hexavalent

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	11	17
Number of Detect Data	17	9
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.01	0.01
Percent Non detects	39.29%	65.38%
Minimum Detected	0.003	0.003
Maximum Detected	0.11	0.007
Mean of Detected Data	0.0327	0.00444
Median of Detected Data	0.009	0.004
SD of Detected Data	0.0445	0.00133

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	2.581
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.00984

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Chromium_Hexavalent.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Chromium, Hexavalent

Background Data: Alluv Chromium, Hexavalent

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	37	17
Number of Detect Data	9	9
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.01	0.01
Percent Non detects	80.43%	65.38%
Minimum Detected	0.004	0.003
Maximum Detected	0.006	0.007
Mean of Detected Data	0.00467	0.00444
Median of Detected Data	0.005	0.004
SD of Detected Data	7.0711E-4	0.00133

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-0.141
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.888

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Chromium_Hexavalent.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Chromium, Hexavalent

Background Data: Muddy Creek Chromium, Hexavalent

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	11	37
Number of Detect Data	17	9
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.01	0.01
Percent Non detects	39.29%	80.43%
Minimum Detected	0.003	0.004
Maximum Detected	0.11	0.006
Mean of Detected Data	0.0327	0.00467
Median of Detected Data	0.009	0.005
SD of Detected Data	0.0445	7.0711E-4

Site vs Background Gehan Test

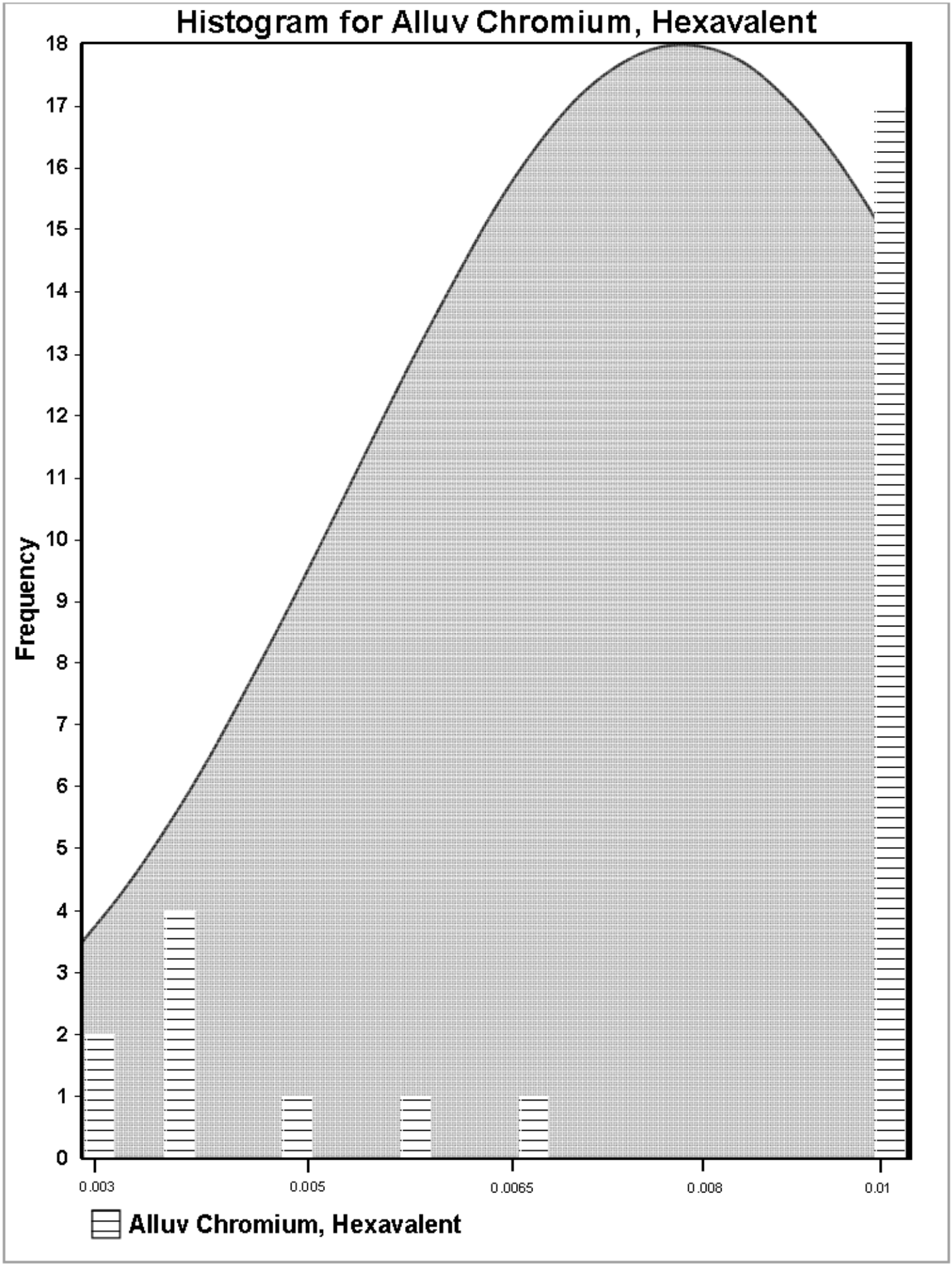
H0: Mu of Site or AOC = Mu of background

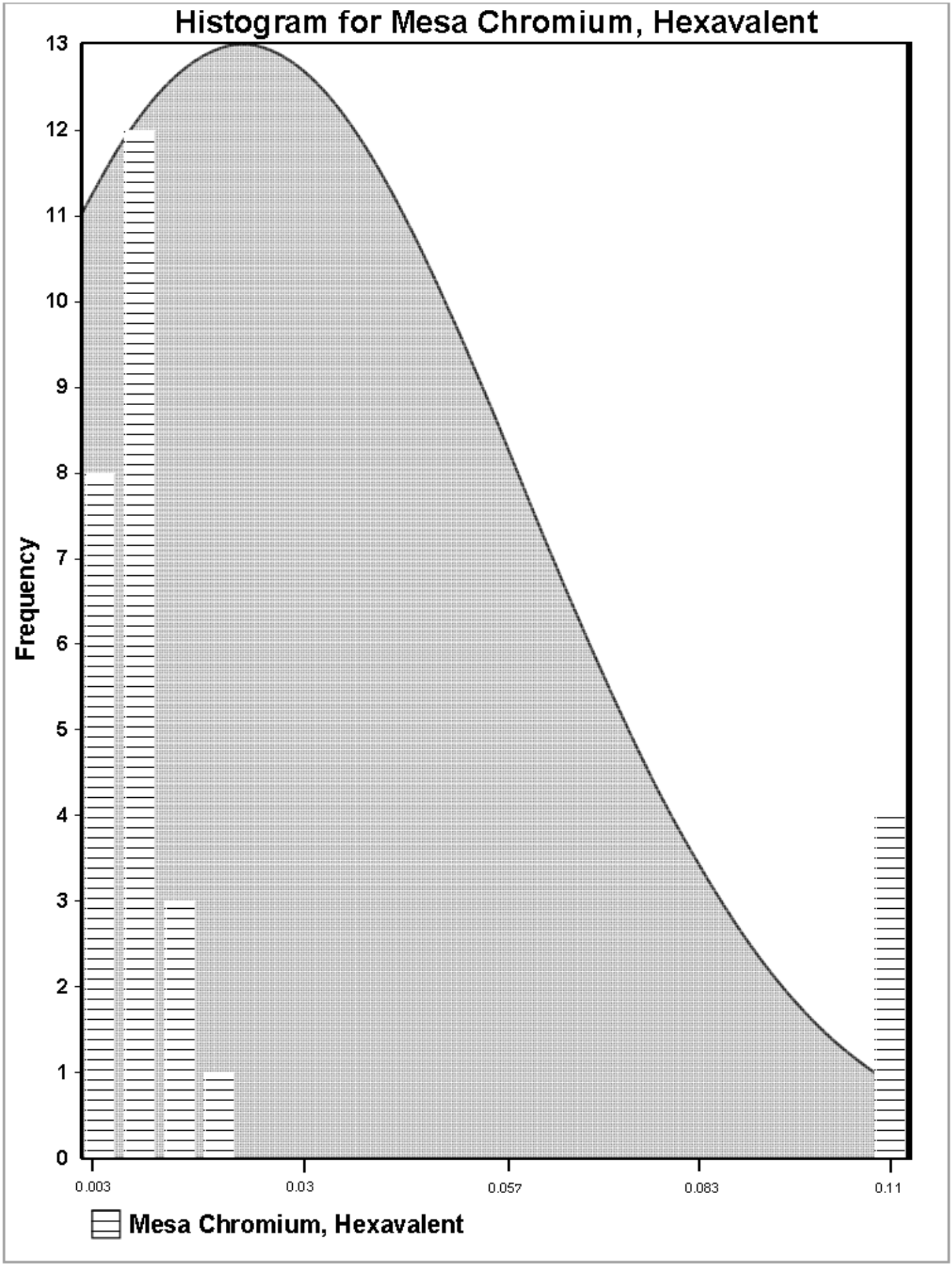
Gehan z Test Value	3.421
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	6.2331E-4

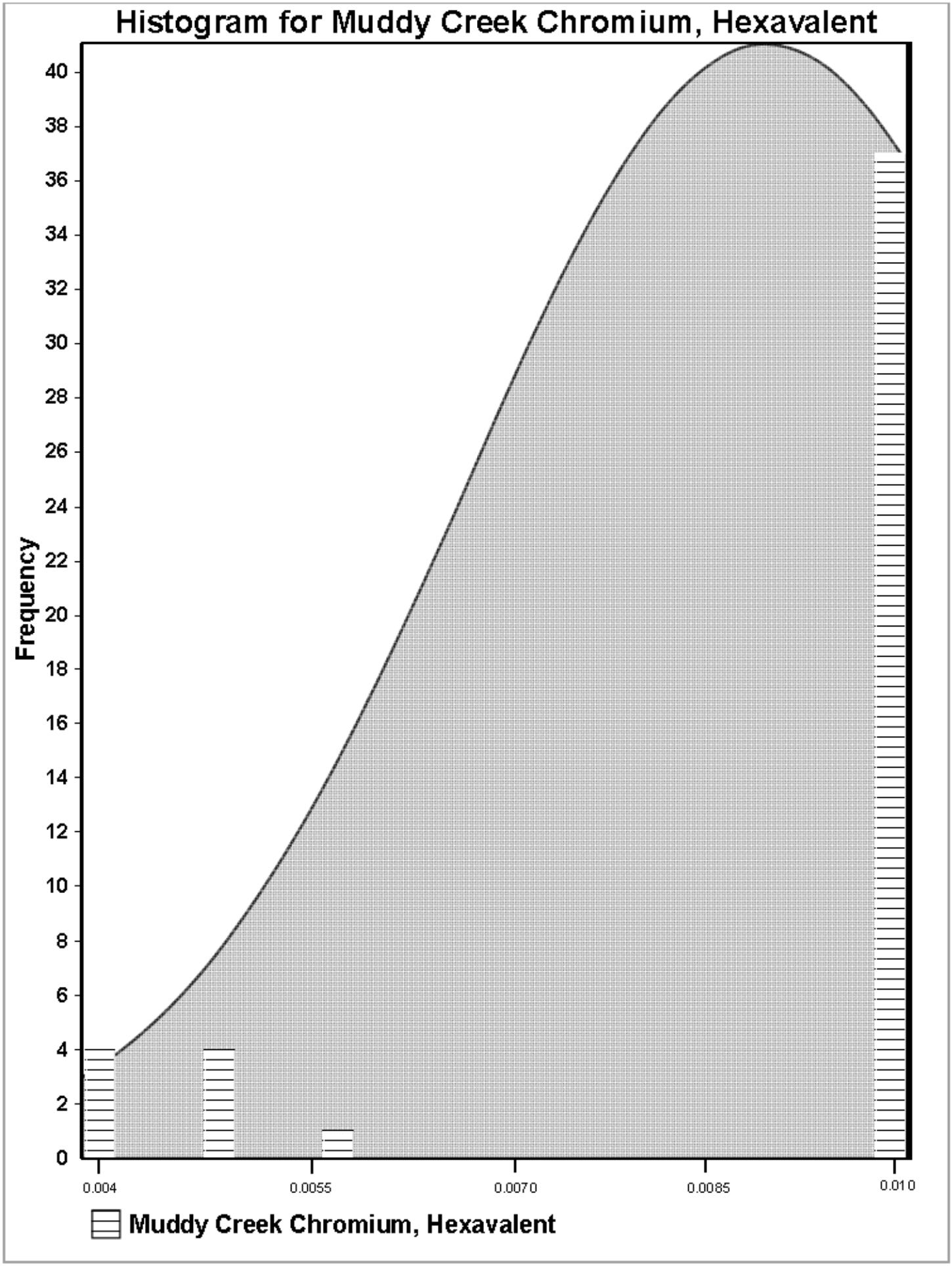
Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Chromium, Hexavalent
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
0.003
0.005
0.0065
0.008
0.01
Alluv Chromium, Hexavalent


Histogram for Mesa Chromium, Hexavalent
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
0.003
0.03
0.057
0.083
0.11
Mesa Chromium, Hexavalent


Histogram for Muddy Creek Chromium, Hexavalent
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
0.004
0.0055
0.0070
0.0085
0.010
Muddy Creek Chromium, Hexavalent

Outlier Tests for Selected Variables

User Selected Options	
From File	Chromium_Hexavalent.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Chromium, Hexavalent

Mean	0.00481
Standard Deviation	8.0096E-4
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00481	7.8541E-4	0.007	2	2.791	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Chromium, Hexavalent

Mean	0.00493
Standard Deviation	3.2675E-4
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00493	3.2318E-4	0.006	19	3.296	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.006 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Chromium, Hexavalent

Mean	0.0218
Standard Deviation	0.037
Number of data	28
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

1	0.0218	0.0363	0.11	25	2.43	2.88	3.2

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Alluv + Muddy Creek Chromium, Hexavalent

Mean	0.00489
Standard Deviation	5.4529E-4
Number of data	72
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00489	5.4149E-4	0.007	2	3.899	3.27	3.63

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.007 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.007 is a Potential Statistical Outlier

Chromium, Hexavalent

Location Name	Sample Date	Alluv Chromium, Hexavalent	Location Name	Sample Date	Muddy Creek Chromium, Hexavalent	Location Name	Sample Date	Mesa Chromium, Hexavalent
BG-1S	11/26/2012	0.01*	BG-3S	11/27/2012	0.01*	LMW-10	11/28/2012	0.004
BG-1S	8/23/2012	0.007	BG-3S	8/22/2012	0.005	LMW-10	8/27/2012	0.008
BG-1S	5/24/2012	0.01*	BG-3S	5/23/2012	0.01*	LMW-10	5/30/2012	0.004
BG-1S	3/20/2012	0.01*	BG-3S	3/21/2012	0.01*	LMW-10	3/22/2012	0.009
IMW-2.5D	11/26/2012	0.01*	BG-4S	11/27/2012	0.01*	LMW-11R	11/26/2012	0.01*
IMW-2.5D	8/24/2012	0.004	BG-4S	8/30/2012	0.01*	LMW-11R	8/21/2012	0.003
IMW-2.5D	5/21/2012	0.01*	BG-4S	5/30/2012	0.005	LMW-11R	5/29/2012	0.004
IMW-2.5D	3/21/2012	0.01*	BG-4S	3/20/2012	0.01*	LMW-11R	3/23/2012	0.01*
IMW-2.5S	11/26/2012	0.01*	BG-6S	11/27/2012	0.01*	LMW-7	11/28/2012	0.015
IMW-2.5S	8/24/2012	0.003	BG-6S	8/23/2012	0.005	LMW-7	8/27/2012	0.018
IMW-2.5S	5/21/2012	0.01*	BG-6S	5/25/2012	0.01*	LMW-7	5/31/2012	0.018
IMW-2.5S	3/21/2012	0.01*	BG-6S	3/21/2012	0.01*	LMW-7	3/23/2012	0.02
IMW-3S	5/21/2012	0.01*	BG-1M	11/26/2012	0.01*	BG-2S	11/26/2012	0.01*
IMW-3S	3/20/2012	0.01*	BG-1M	8/23/2012	0.004	BG-2S	8/23/2012	0.006
KMW-2D	11/26/2012	0.01*	BG-1M	5/24/2012	0.01*	BG-2S	5/24/2012	0.01*
KMW-2D	8/24/2012	0.004	BG-1M	3/20/2012	0.01*	BG-2S	3/21/2012	0.01*
KMW-2D	5/21/2012	0.01*	BG-3M	11/27/2012	0.01*	BG-2M	11/26/2012	0.01*
KMW-2D	3/23/2012	0.005	BG-3M	8/22/2012	0.01*	BG-2M	8/23/2012	0.004
KMW-2M	11/26/2012	0.01*	BG-3M	5/24/2012	0.006	BG-2M	5/24/2012	0.01*
KMW-2M	8/24/2012	0.006	BG-3M	3/21/2012	0.01*	BG-2M	3/21/2012	0.01*
KMW-2M	5/21/2012	0.01*	BG-4M	11/27/2012	0.01*	BG-2D	11/26/2012	0.01*
KMW-2M	3/23/2012	0.004	BG-4M	8/30/2012	0.01*	BG-2D	8/23/2012	0.003
KMW-2S	11/26/2012	0.01*	BG-4M	5/30/2012	0.01*	BG-2D	5/24/2012	0.01*
KMW-2S	8/24/2012	0.003	BG-4M	3/20/2012	0.01*	BG-2D	3/21/2012	0.01*
KMW-2S	5/21/2012	0.01*	BG-6M	11/27/2012	0.01*	LMW-9	11/28/2012	0.11
KMW-2S	3/23/2012	0.004	BG-6M	8/22/2012	0.01*	LMW-9	8/27/2012	0.11
			BG-6M	5/25/2012	0.01*	LMW-9	5/31/2012	0.11
			BG-6M	3/21/2012	0.01*	LMW-9	3/23/2012	0.11
			BG-1D	11/26/2012	0.01*			
			BG-1D	8/23/2012	0.005			
			BG-1D	5/24/2012	0.01*			
			BG-1D	3/20/2012	0.01*			
			BG-3D	11/27/2012	0.01*			
			BG-3D	8/21/2012	0.004			
			BG-3D	5/23/2012	0.004			
			BG-3D	3/21/2012	0.01*			
			BG-4D	11/27/2012	0.01*			
			BG-4D	8/30/2012	0.01*			
			BG-4D	5/30/2012	0.01*			
			BG-4D	3/20/2012	0.01*			
			BG-6D	11/27/2012	0.01*			
			BG-6D	8/22/2012	0.01*			
			BG-6D	5/25/2012	0.01*			
			BG-6D	3/21/2012	0.004			
			IMW-3D	5/25/2012	0.01*			
			IMW-3D	3/22/2012	0.01*			

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Chrysene.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv chrysene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	0	26	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv chrysene was not processed!

Muddy Creek chrysene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	0	46	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Muddy Creek chrysene was not processed!

Mesa chrysene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	0	28	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mesa chrysene was not processed!

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Chrysene.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv chrysene

General Statistics

Number of Valid Data	26	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	26

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv chrysene was not processed!

Muddy Creek chrysene

General Statistics

Number of Valid Data	46	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	46

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Muddy Creek chrysene was not processed!

Mesa chrysene

General Statistics

Number of Valid Data	28	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	28

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mesa chrysene was not processed!

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Chrysene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa chrysene

Background Data: Alluv chrysene

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	28	26
Number of Detect Data	0	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	100.00%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Chrysene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek chrysene

Background Data: Alluv chrysene

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	46	26
Number of Detect Data	0	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	100.00%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Chrysene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa chrysene

Background Data: Muddy Creek chrysene

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	28	46
Number of Detect Data	0	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	100.00%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

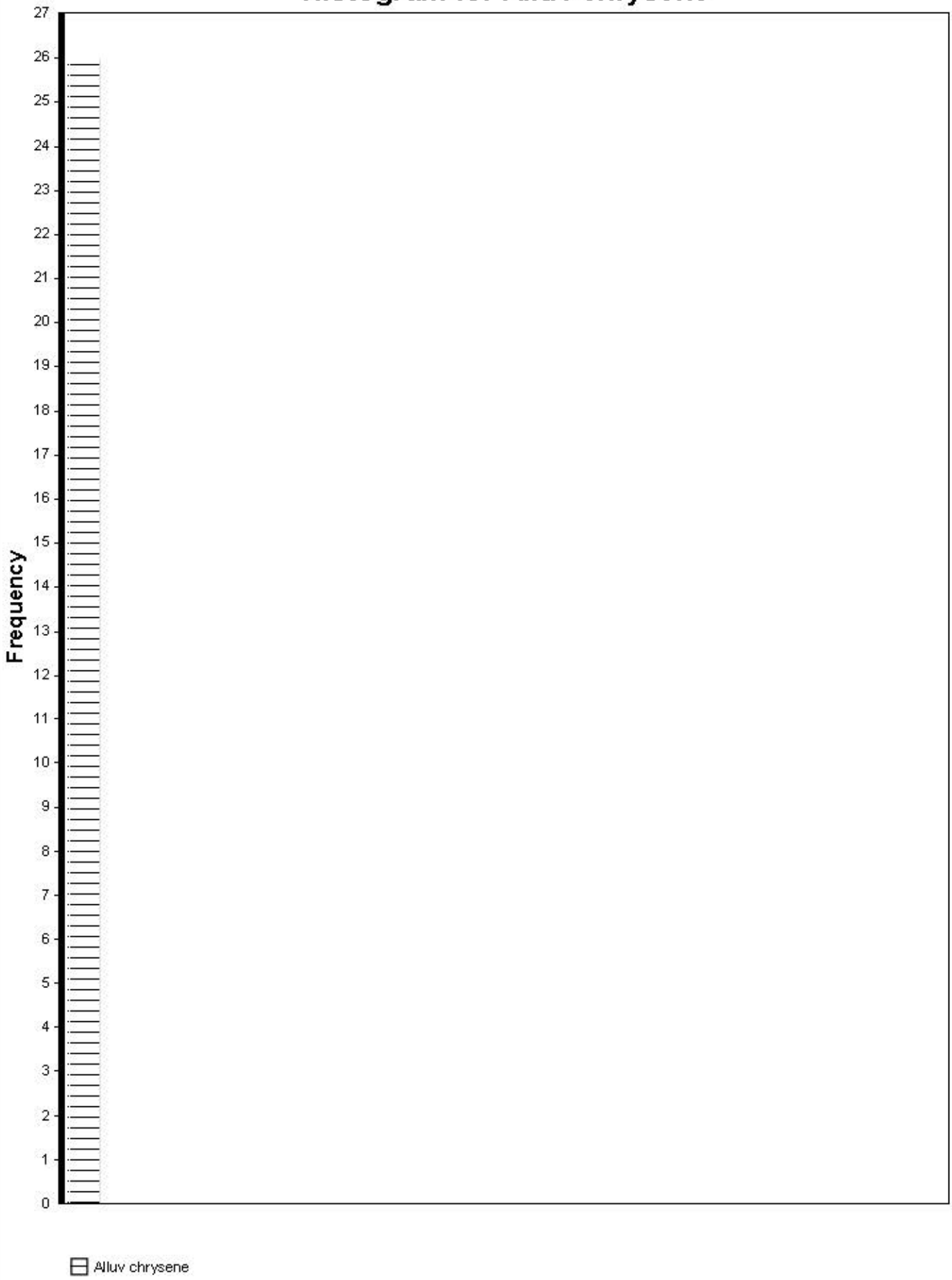
Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

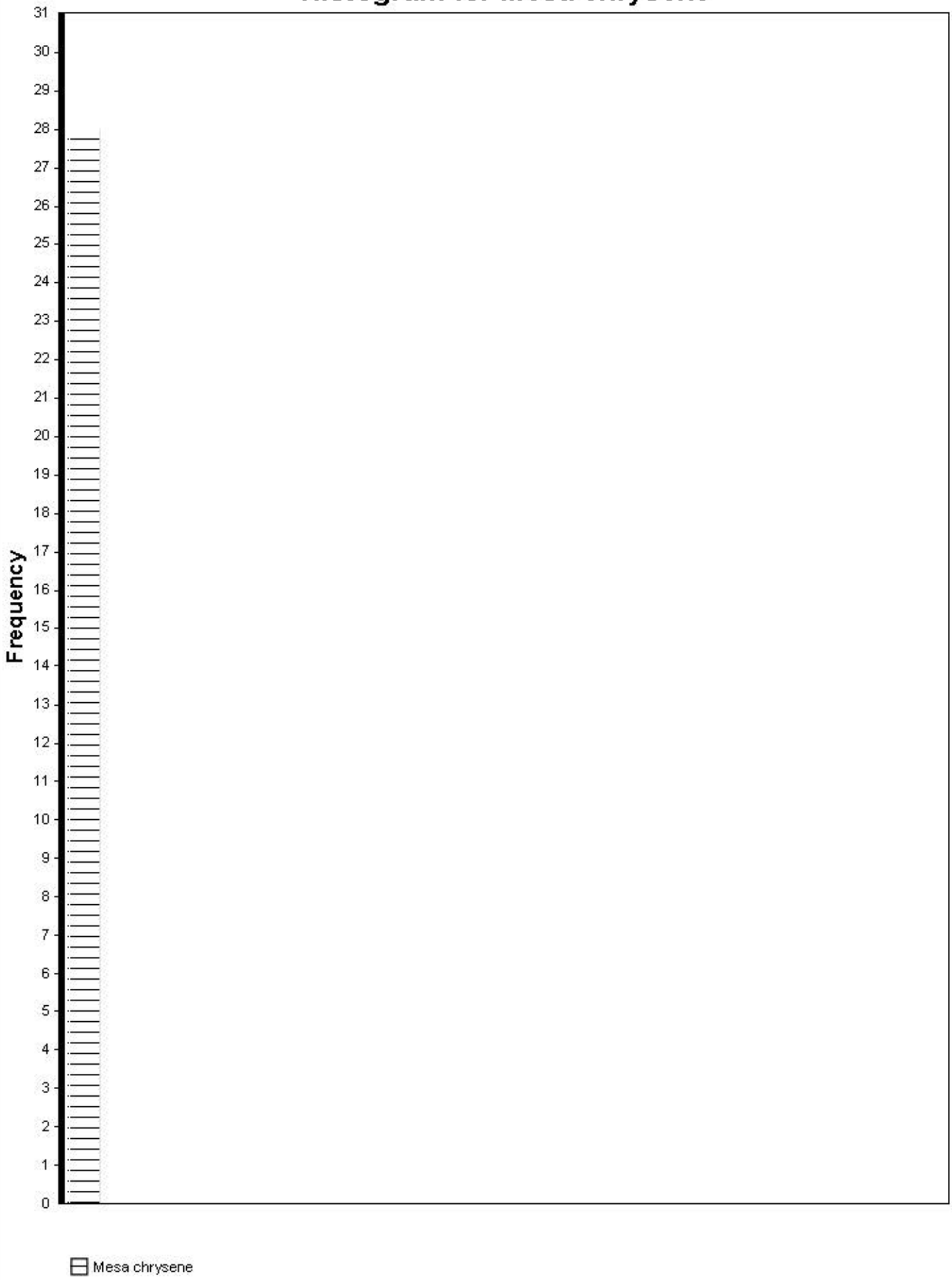
Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

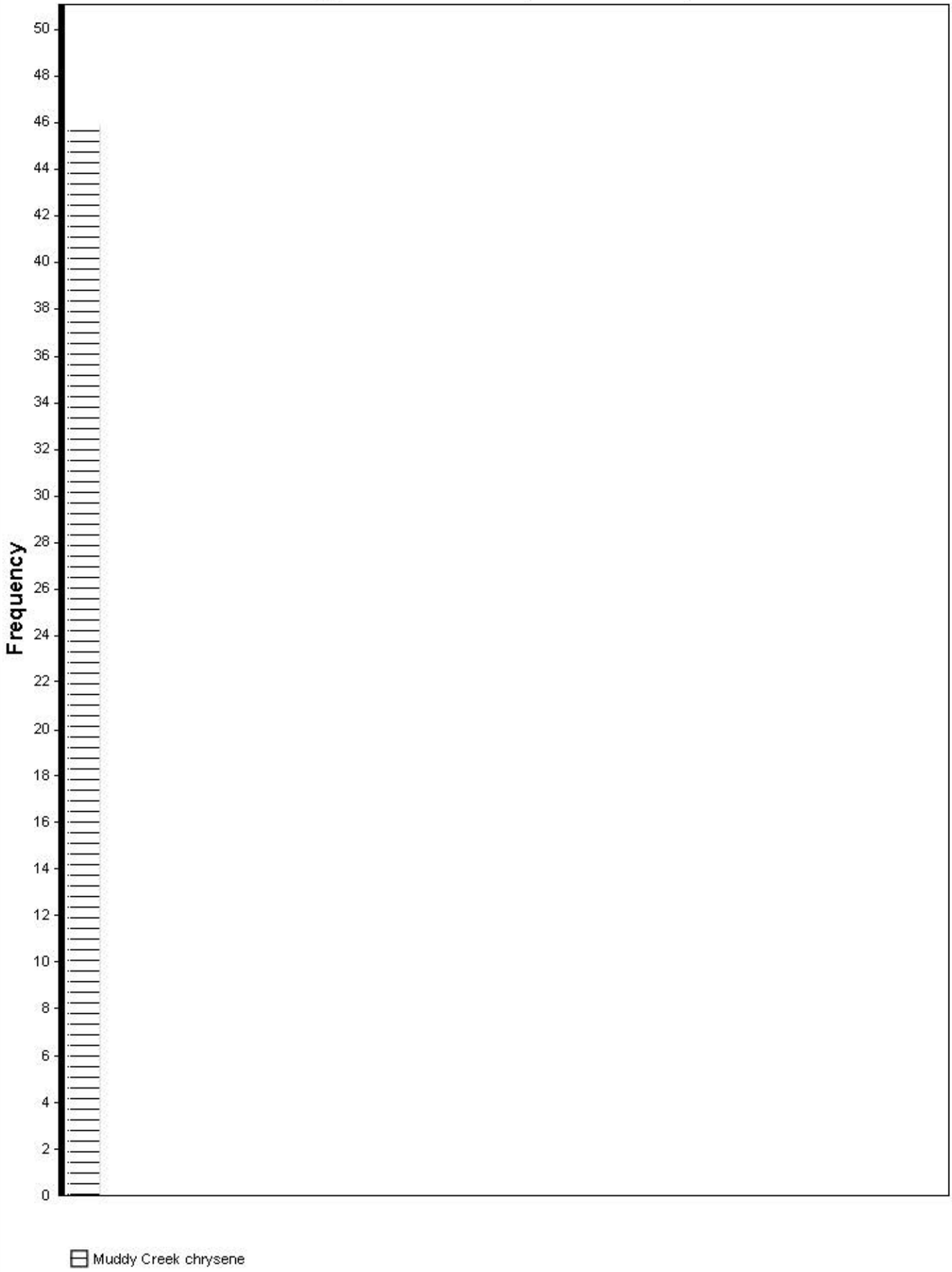
Histogram for Alluv chrysene



Histogram for Mesa chrysene



Histogram for Muddy Creek chrysene



Outlier Tests for Selected Variables

User Selected Options	
From File	Chrysene.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv chrysene

Mean	0.025
Standard Deviation	7.076E-18

Rosner's Outlier Test for Muddy Creek chrysene

Mean	0.025
Standard Deviation	3.508E-18

Rosner's Outlier Test for Mesa chrysene

Mean	0.025
Standard Deviation	1.060E-17

Location Name	Sample Date	Alluv chrysene	D_Alluv chrysene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0

Location Name	Sample Date	Muddy Creek chrysene	D_Muddy Creek chrysene
BG-3S	11/27/2012	0.05	0
BG-3S	8/22/2012	0.05	0
BG-3S	5/23/2012	0.05	0
BG-3S	3/21/2012	0.05	0
BG-4S	11/27/2012	0.05	0
BG-4S	8/30/2012	0.05	0
BG-4S	5/30/2012	0.05	0
BG-4S	3/20/2012	0.05	0
BG-6S	11/27/2012	0.05	0
BG-6S	8/23/2012	0.05	0
BG-6S	5/25/2012	0.05	0
BG-6S	3/21/2012	0.05	0
BG-1M	11/26/2012	0.05	0
BG-1M	8/23/2012	0.05	0
BG-1M	5/24/2012	0.05	0
BG-1M	3/20/2012	0.05	0
BG-3M	11/27/2012	0.05	0
BG-3M	8/22/2012	0.05	0
BG-3M	5/24/2012	0.05	0
BG-3M	3/21/2012	0.05	0
BG-4M	11/27/2012	0.05	0
BG-4M	8/30/2012	0.05	0
BG-4M	5/30/2012	0.05	0
BG-4M	3/20/2012	0.05	0
BG-6M	11/27/2012	0.05	0
BG-6M	8/22/2012	0.05	0
BG-6M	5/25/2012	0.05	0
BG-6M	3/21/2012	0.05	0
BG-1D	11/26/2012	0.05	0
BG-1D	8/23/2012	0.05	0
BG-1D	5/24/2012	0.05	0
BG-1D	3/20/2012	0.05	0
BG-3D	11/27/2012	0.05	0
BG-3D	8/21/2012	0.05	0
BG-3D	5/23/2012	0.05	0
BG-3D	3/21/2012	0.05	0
BG-4D	11/27/2012	0.05	0
BG-4D	8/30/2012	0.05	0
BG-4D	5/30/2012	0.05	0
BG-4D	3/20/2012	0.05	0
BG-6D	11/27/2012	0.05	0
BG-6D	8/22/2012	0.05	0
BG-6D	5/25/2012	0.05	0
BG-6D	3/21/2012	0.05	0
IMW-3D	5/25/2012	0.05	0
IMW-3D	3/22/2012	0.05	0

Location Name	Sample Date	Mesa chrysene	D_Mesa chrysene
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Location Name	Sample Date	Alluv + Mesa chrysene	D_Alluv + Mesa chrysene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Cobalt_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Cobalt, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	12	14	53.85%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	14	0.01	0.01	0.01	0.01	1.800E-18
Statistics (Detects Only)	12	0.0031	0.014	0.00788	0.00775	0.00439
Statistics (All: NDs treated as DL value)	26	0.0031	0.014	0.00902	0.01	0.0031
Statistics (All: NDs treated as DL/2 value)	26	0.0031	0.014	0.00633	0.005	0.00326
Statistics (Normal ROS Estimated Data)	26	-9.791E-4	0.014	0.006	0.00473	0.00396
Statistics (Gamma ROS Estimated Data)	26	0.0031	0.014	0.00737	0.00663	0.0033
Statistics (Lognormal ROS Estimated Data)	26	0.00187	0.014	0.00597	0.00445	0.00361

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.164	2.825	0.00249	-5.01	0.621	-0.124
Statistics (NDs = DL)	6.13	5.449	0.00147	-4.792	0.46	-0.0961
Statistics (NDs = DL/2)	5.041	4.485	0.00126	-5.165	0.437	-0.0846
Statistics (Gamma ROS Estimates)	5.134	4.567	0.00144	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.28	0.564	-0.107

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.905	0.879	0.838	0.973

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.793	0.859	Data Not Normal
Lilliefors (Detects Only)	0.279	0.256	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.769	0.92	Data Not Normal
Lilliefors (NDs = DL)	0.393	0.174	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.699	0.92	Data Not Normal
Lilliefors (NDs = DL/2)	0.427	0.174	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.94	0.92	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.148	0.174	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.887	0.83	0.891	0.827

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.25	0.738	
Kolmogorov-Smirnov (Detects Only)	0.292	0.247	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.768	0.746	
Kolmogorov-Smirnov (NDs = DL)	0.422	0.171	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	3.391	0.746	
Kolmogorov-Smirnov (NDs = DL/2)	0.409	0.172	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.574	0.746	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.131	0.172	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.907	0.84	0.885	0.972

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.796	0.859	Data Not Lognormal
Lilliefors (Detects Only)	0.29	0.256	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.701	0.92	Data Not Lognormal
Lilliefors (NDs = DL)	0.427	0.174	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.778	0.92	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.389	0.174	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.935	0.92	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.145	0.174	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Cobalt, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	47	0	47	7	40	85.11%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	40	0.01	0.01	0.01	0.01	5.270E-18
Statistics (Detects Only)	7	0.0025	0.012	0.00576	0.0037	0.0043
Statistics (All: NDs treated as DL value)	47	0.0025	0.012	0.00937	0.01	0.00218
Statistics (All: NDs treated as DL/2 value)	47	0.0025	0.012	0.00511	0.005	0.00158
Statistics (Normal ROS Estimated Data)	47	-0.00269	0.012	0.00399	0.0037	0.00317
Statistics (Gamma ROS Estimated Data)	47	6.3347E-4	0.012	0.00463	0.004	0.00285
Statistics (Lognormal ROS Estimated Data)	47	0.00119	0.012	0.004	0.0035	0.00231

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.545	2.397	0.00226	-5.366	0.668	-0.124
Statistics (NDs = DL)	10.56	9.897	8.8737E-4	-4.719	0.365	-0.0774
Statistics (NDs = DL/2)	15.57	14.59	3.2833E-4	-5.308	0.242	-0.0457
Statistics (Gamma ROS Estimates)	2.491	2.346	0.00186	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.653	0.507	-0.0898

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.85	0.665	0.615	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.704	0.803	Data Not Normal
Lilliefors (Detects Only)	0.373	0.335	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.456	0.946	Data Not Normal
Lilliefors (NDs = DL)	0.508	0.129	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.414	0.946	Data Not Normal

Lilliefors (NDs = DL/2)	0.486	0.129	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.98	0.946	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0634	0.129	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.901	0.601	0.65	0.803

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.884	0.713	
Kolmogorov-Smirnov (Detects Only)	0.344	0.314	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	13.52	0.749	
Kolmogorov-Smirnov (NDs = DL)	0.518	0.129	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	11.49	0.749	
Kolmogorov-Smirnov (NDs = DL/2)	0.459	0.129	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.107	0.759	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0391	0.13	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.904	0.64	0.691	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.797	0.803	Data Not Lognormal
Lilliefors (Detects Only)	0.306	0.335	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.424	0.946	Data Not Lognormal
Lilliefors (NDs = DL)	0.516	0.129	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.518	0.946	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.441	0.129	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.985	0.946	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0489	0.129	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Cobalt, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	10	18	64.29%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	18	0.01	0.01	0.01	0.01	1.785E-18
Statistics (Detects Only)	10	0.0025	0.014	0.00939	0.011	0.0046
Statistics (All: NDs treated as DL value)	28	0.0025	0.014	0.00978	0.01	0.00267
Statistics (All: NDs treated as DL/2 value)	28	0.0025	0.014	0.00657	0.005	0.00341
Statistics (Normal ROS Estimated Data)	28	-0.00342	0.014	0.00563	0.00497	0.00473
Statistics (Gamma ROS Estimated Data)	28	0.0025	0.014	0.00822	0.00811	0.00346
Statistics (Lognormal ROS Estimated Data)	28	0.00116	0.014	0.00572	0.00408	0.00407

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.059	2.755	0.00307	-4.84	0.692	-0.143
Statistics (NDs = DL)	8.231	7.373	0.00119	-4.689	0.416	-0.0886
Statistics (NDs = DL/2)	4.739	4.255	0.00139	-5.135	0.458	-0.0891

Statistics (Gamma ROS Estimates)	5.057	4.539	0.00163	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.404	0.709	-0.131

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.905	0.811	0.841	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.796	0.842	Data Not Normal
Lilliefors (Detects Only)	0.253	0.28	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.671	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.425	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.703	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.427	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.965	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0895	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.821	0.772	0.89	0.728

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.241	0.732	
Kolmogorov-Smirnov (Detects Only)	0.319	0.268	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	5.443	0.746	
Kolmogorov-Smirnov (NDs = DL)	0.464	0.165	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.841	0.749	
Kolmogorov-Smirnov (NDs = DL/2)	0.409	0.166	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.441	0.748	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.119	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.87	0.735	0.88	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.741	0.842	Data Not Lognormal
Lilliefors (Detects Only)	0.333	0.28	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.555	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.473	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.774	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.39	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.951	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.12	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Cobalt_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Cobalt, Dissolved

General Statistics

Number of Valid Data	26	Number of Detected Data	12
Number of Distinct Detected Data	9	Number of Non-Detect Data	14
		Percent Non-Detects	53.85%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0031	Minimum Detected	-5.776
Maximum Detected	0.014	Maximum Detected	-4.269
Mean of Detected	0.00788	Mean of Detected	-5.01
SD of Detected	0.00439	SD of Detected	0.621
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.793	Shapiro Wilk Test Statistic	0.796
5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00633	Mean (Log Scale)	-5.165
SD	0.00326	SD (Log Scale)	0.437
95% UTL 95% Coverage	0.0137	95% UTL 95% Coverage	0.0154
95% UPL (t)	0.012	95% UPL (t)	0.0122
90% Percentile (z)	0.0105	90% Percentile (z)	0.01
95% Percentile (z)	0.0117	95% Percentile (z)	0.0117
99% Percentile (z)	0.0139	99% Percentile (z)	0.0158
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00784	Mean in Original Scale	0.00597
SD	0.00305	SD in Original Scale	0.00361
95% UTL with 95% Coverage	0.0148	95% UTL with 95% Coverage	0.0184
		95% BCA UTL with 95% Coverage	0.012
		95% Bootstrap (%) UTL with 95% Coverage	0.014
95% UPL (t)	0.0132	95% UPL (t)	0.0136
90% Percentile (z)	0.0118	90% Percentile (z)	0.0105
95% Percentile (z)	0.0129	95% Percentile (z)	0.0129
99% Percentile (z)	0.0149	99% Percentile (z)	0.0189

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.429	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00324		
nu star	58.28		
A-D Test Statistic	1.25	Nonparametric Statistics	
5% A-D Critical Value	0.738	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.292	Mean	0.00565
5% K-S Critical Value	0.247	SD	0.00354
Data not Gamma Distributed at 5% Significance Level		SE of Mean	7.3645E-4
		95% KM UTL with 95% Coverage	0.0137
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0214
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0118
Mean	0.00737	90% Percentile (z)	0.0102
Median	0.00663	95% Percentile (z)	0.0115
SD	0.0033	99% Percentile (z)	0.0139
k star	4.567		
Theta star	0.00161	Gamma ROS Limits with Extrapolated Data	
Nu star	237.5	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.014
95% Percentile of Chisquare (2k)	17.11	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0142
		95% WH Approx. Gamma UTL with 95% Coverage	0.0169
90% Percentile	0.012	95% HW Approx. Gamma UTL with 95% Coverage	0.0174
95% Percentile	0.0138		
99% Percentile	0.0176		

Note: DL/2 is not a recommended method.

Muddy Creek Cobalt, Dissolved

General Statistics			
Number of Valid Data	47	Number of Detected Data	7
Number of Distinct Detected Data	6	Number of Non-Detect Data	40
		Percent Non-Detects	85.11%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0025	Minimum Detected	-5.991
Maximum Detected	0.012	Maximum Detected	-4.423
Mean of Detected	0.00576	Mean of Detected	-5.366
SD of Detected	0.0043	SD of Detected	0.668
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605

Warning: There are only 7 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only	Lognormal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.704	Shapiro Wilk Test Statistic	0.797
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00511	Mean (Log Scale)	-5.308
SD	0.00158	SD (Log Scale)	0.242
95% UTL 95% Coverage	0.00838	95% UTL 95% Coverage	0.00818
95% UPL (t)	0.00779	95% UPL (t)	0.00747
90% Percentile (z)	0.00713	90% Percentile (z)	0.00675
95% Percentile (z)	0.00771	95% Percentile (z)	0.00737
99% Percentile (z)	0.00878	99% Percentile (z)	0.0087
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.004
		SD in Original Scale	0.00231
		Mean in Log Scale	-5.653
		SD in Log Scale	0.507
		95% UTL 95% Coverage	0.01
		95% UPL (t)	0.00829
		90% Percentile (z)	0.00672
		95% Percentile (z)	0.00808
		99% Percentile (z)	0.0114
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.549	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00372		
nu star	21.69		
A-D Test Statistic	0.884	Nonparametric Statistics	
5% A-D Critical Value	0.713	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.344	Mean	0.00363
5% K-S Critical Value	0.314	SD	0.00186
Data not Gamma Distributed at 5% Significance Level		SE of Mean	3.9341E-4
		95% KM UTL with 95% Coverage	0.00749
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0118
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00679
Mean	0.00463	90% Percentile (z)	0.00602
Median	0.004	95% Percentile (z)	0.00669
SD	0.00285	99% Percentile (z)	0.00796
k star	2.346		
Theta star	0.00197	Gamma ROS Limits with Extrapolated Data	
Nu star	220.5	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0106
95% Percentile of Chisquare (2k)	10.59	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0109
		95% WH Approx. Gamma UTL with 95% Coverage	0.0126
90% Percentile	0.00867	95% HW Approx. Gamma UTL with 95% Coverage	0.0132
95% Percentile	0.0104		
99% Percentile	0.0143		

Note: DL/2 is not a recommended method.

Mesa Cobalt, Dissolved

General Statistics			
Number of Valid Data	28	Number of Detected Data	10
Number of Distinct Detected Data	7	Number of Non-Detect Data	18
		Percent Non-Detects	64.29%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0025	Minimum Detected	-5.991
Maximum Detected	0.014	Maximum Detected	-4.269
Mean of Detected	0.00939	Mean of Detected	-4.84
SD of Detected	0.0046	SD of Detected	0.692
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.796	Shapiro Wilk Test Statistic	0.741
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00657	Mean (Log Scale)	-5.135
SD	0.00341	SD (Log Scale)	0.458
95% UTL 95% Coverage	0.0142	95% UTL 95% Coverage	0.0165
95% UPL (t)	0.0125	95% UPL (t)	0.013
90% Percentile (z)	0.0109	90% Percentile (z)	0.0106
95% Percentile (z)	0.0122	95% Percentile (z)	0.0125
99% Percentile (z)	0.0145	99% Percentile (z)	0.0171
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00782	Mean in Original Scale	0.00572
SD	0.00333	SD in Original Scale	0.00407
95% UTL with 95% Coverage	0.0153	95% UTL with 95% Coverage	0.0221
		95% BCA UTL with 95% Coverage	0.013
		95% Bootstrap (%) UTL with 95% Coverage	0.014
95% UPL (t)	0.0136	95% UPL (t)	0.0154
90% Percentile (z)	0.0121	90% Percentile (z)	0.0112
95% Percentile (z)	0.0133	95% Percentile (z)	0.0144
99% Percentile (z)	0.0156	99% Percentile (z)	0.0234
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.208	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00425		
nu star	44.16		
A-D Test Statistic	1.241	Nonparametric Statistics	
5% A-D Critical Value	0.732	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.319	Mean	0.00526
5% K-S Critical Value	0.268	SD	0.00404
Data not Gamma Distributed at 5% Significance Level		SE of Mean	8.1780E-4

		95% KM UTL with 95% Coverage	0.0143
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0232
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0123
Mean	0.00822	90% Percentile (z)	0.0104
Median	0.00811	95% Percentile (z)	0.0119
SD	0.00346	99% Percentile (z)	0.0147
k star	4.539		
Theta star	0.00181	Gamma ROS Limits with Extrapolated Data	
Nu star	254.2	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0157
95% Percentile of Chisquare (2k)	17.03	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.016
		95% WH Approx. Gamma UTL with 95% Coverage	0.0188
90% Percentile	0.0134	95% HW Approx. Gamma UTL with 95% Coverage	0.0194
95% Percentile	0.0154		
99% Percentile	0.0197		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Cobalt_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Cobalt, Dissolved

Background Data: Alluv Cobalt, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	47	26
Number of Non-Detect Data	40	14
Number of Detect Data	7	12
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.01	0.01
Percent Non detects	85.11%	53.85%
Minimum Detected	0.0025	0.0031
Maximum Detected	0.012	0.014
Mean of Detected Data	0.00576	0.00788
Median of Detected Data	0.0037	0.00775
SD of Detected Data	0.0043	0.00439

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-2.619
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.00882

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Cobalt_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Cobalt, Dissolved

Background Data: Alluv Cobalt, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	18	14
Number of Detect Data	10	12
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.01	0.01
Percent Non detects	64.29%	53.85%
Minimum Detected	0.0025	0.0031
Maximum Detected	0.014	0.014
Mean of Detected Data	0.00939	0.00788
Median of Detected Data	0.011	0.00775
SD of Detected Data	0.0046	0.00439

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-0.046
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.963

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Cobalt_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Cobalt, Dissolved

Background Data: Muddy Creek Cobalt, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	28	47
Number of Non-Detect Data	18	40
Number of Detect Data	10	7
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.01	0.01
Percent Non detects	64.29%	85.11%
Minimum Detected	0.0025	0.0025
Maximum Detected	0.014	0.012
Mean of Detected Data	0.00939	0.00576
Median of Detected Data	0.011	0.0037
SD of Detected Data	0.0046	0.0043

Site vs Background Gehan Test

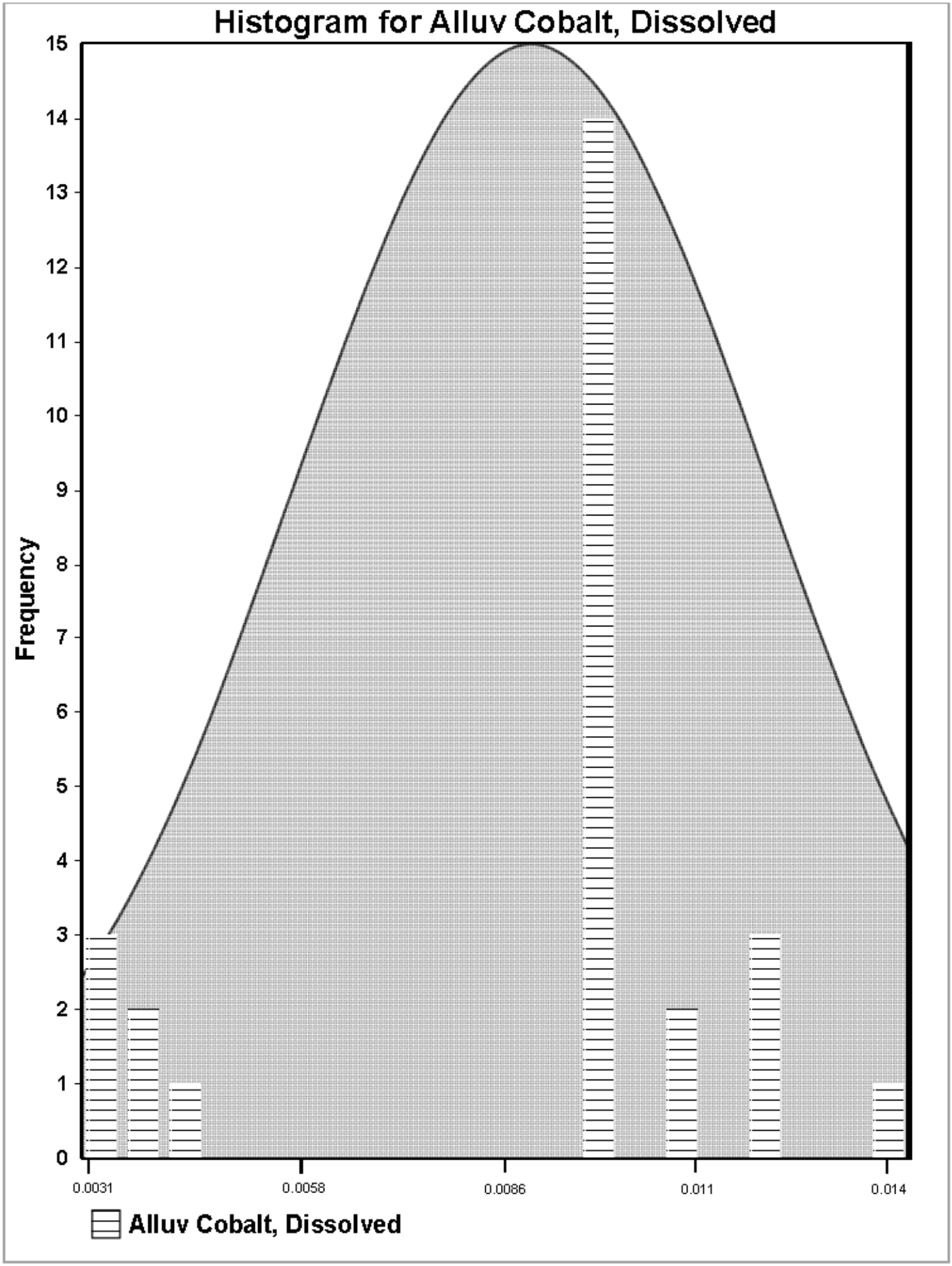
H0: Mu of Site or AOC = Mu of background

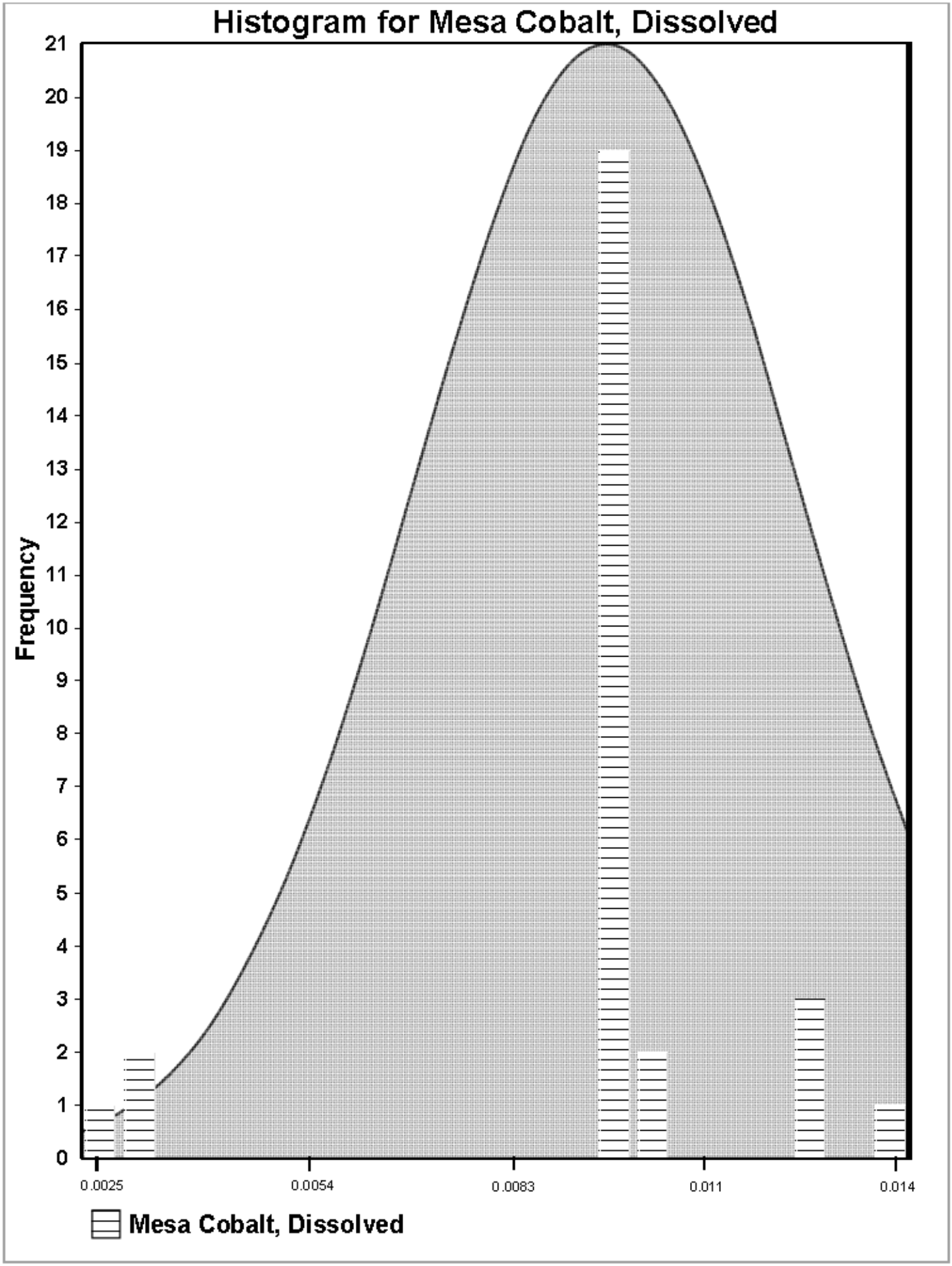
Gehan z Test Value	2.596
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.00944

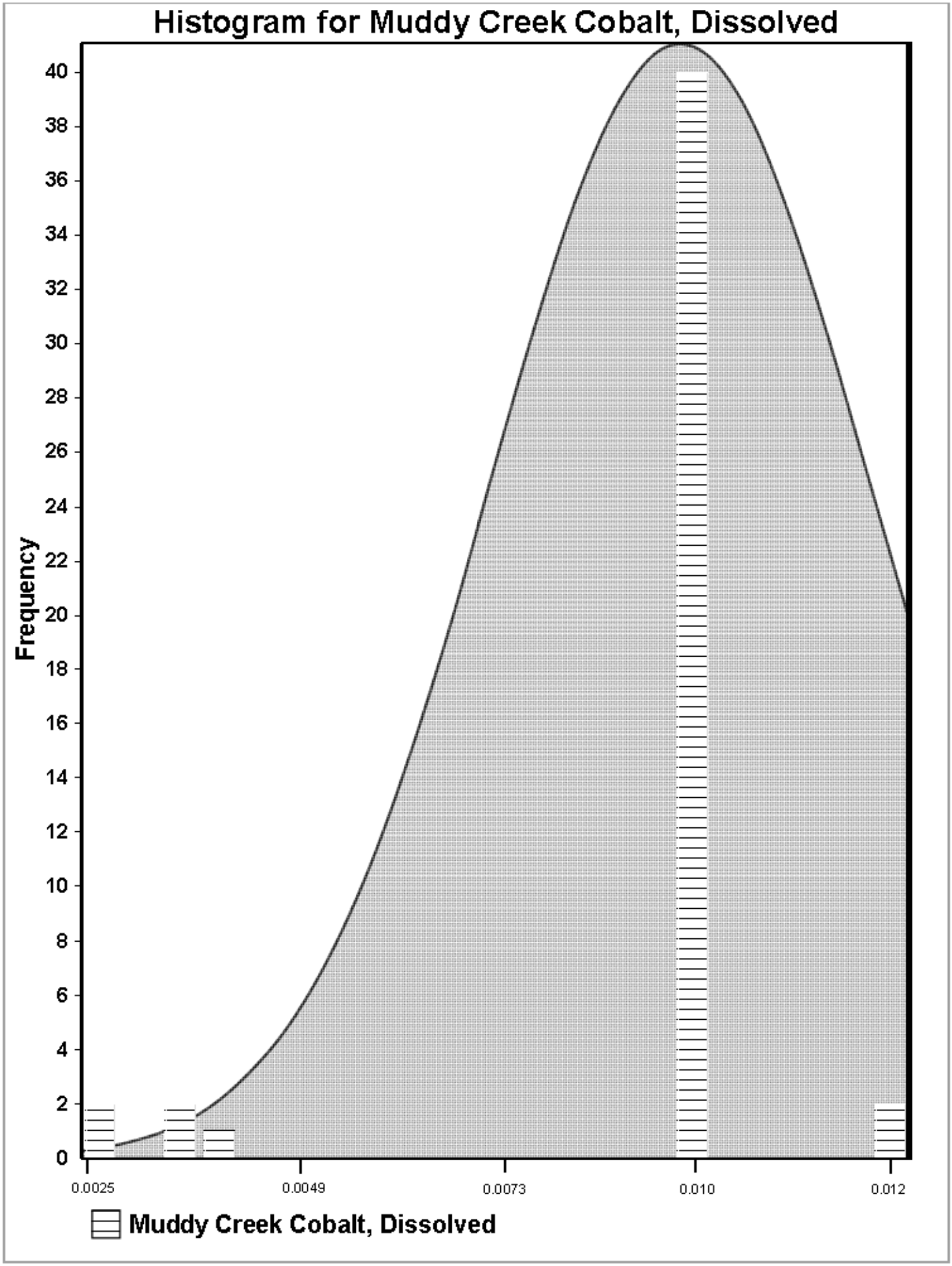
Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Cobalt, Dissolved
Frequency
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
0.0031
0.0058
0.0086
0.011
0.014
Alluv Cobalt, Dissolved


Histogram for Mesa Cobalt, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
0.0025
0.0054
0.0083
0.011
0.014
Mesa Cobalt, Dissolved


Histogram for Muddy Creek Cobalt, Dissolved
Frequency
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
0.0025
0.0049
0.0073
0.010
0.012
Muddy Creek Cobalt, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Cobalt_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Cobalt, Dissolved

Mean	0.00633
Standard Deviation	0.00326
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00633	0.00319	0.014	23	2.403	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Cobalt, Dissolved

Mean	0.00511
Standard Deviation	0.00158
Number of data	47
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00511	0.00156	0.012	13	4.415	3.1	3.46

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.012 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.012 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Cobalt, Dissolved

Mean	0.00657
Standard Deviation	0.00341
Number of data	28
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical

#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	0.00657	0.00335	0.014	13	2.22	2.88	3.2				
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											

Location Name	Sample Date	Alluv Cobalt, Dissolved	D_Alluv Cobalt, Dissolved
BG-1S	11/26/2012	0.011	1
BG-1S	8/23/2012	0.004	1
BG-1S	5/24/2012	0.01	0
BG-1S	3/20/2012	0.01	0
IMW-2.5D	11/26/2012	0.012	1
IMW-2.5D	8/24/2012	0.0041	1
IMW-2.5D	5/21/2012	0.01	0
IMW-2.5D	3/21/2012	0.01	0
IMW-2.5S	11/26/2012	0.012	1
IMW-2.5S	8/24/2012	0.0045	1
IMW-2.5S	5/21/2012	0.01	0
IMW-2.5S	3/21/2012	0.01	0
IMW-3S	5/21/2012	0.01	0
IMW-3S	3/20/2012	0.01	0
KMW-2D	11/26/2012	0.011	1
KMW-2D	8/24/2012	0.0031	1
KMW-2D	5/21/2012	0.01	0
KMW-2D	3/23/2012	0.01	0
KMW-2M	11/26/2012	0.012	1
KMW-2M	8/24/2012	0.0033	1
KMW-2M	5/21/2012	0.01	0
KMW-2M	3/23/2012	0.01	0
KMW-2S	11/26/2012	0.014	1
KMW-2S	8/24/2012	0.0035	1
KMW-2S	5/21/2012	0.01	0
KMW-2S	3/23/2012	0.01	0

Location Name	Sample Date	Muddy Creek Cobalt, Dissolved	D_Muddy Creek Cobalt, Dissolved
BG-3S	11/27/2012	0.01	0
BG-3S	8/22/2012	0.01	0
BG-3S	5/23/2012	0.01	0
BG-3S	3/21/2012	0.01	0
BG-4S	11/27/2012	0.01	0
BG-4S	8/30/2012	0.01	0
BG-4S	5/30/2012	0.01	0
BG-4S	3/20/2012	0.01	0
BG-6S	11/27/2012	0.01	0
BG-6S	8/23/2012	0.0035	1
BG-6S	5/25/2012	0.01	0
BG-6S	3/21/2012	0.01	0
BG-1M	11/26/2012	0.012	1
BG-1M	8/23/2012	0.0037	1
BG-1M	5/24/2012	0.01	0
BG-1M	3/20/2012	0.0025	1
BG-3M	11/27/2012	0.01	0
BG-3M	8/22/2012	0.01	0
BG-3M	5/24/2012	0.01	0
BG-3M	3/21/2012	0.01	0
BG-4M	11/27/2012	0.01	0
BG-4M	8/30/2012	0.01	0
BG-4M	5/30/2012	0.01	0
BG-4M	3/20/2012	0.01	0
BG-6M	11/27/2012	0.01	0
BG-6M	8/22/2012	0.0026	1
BG-6M	5/25/2012	0.01	0
BG-6M	3/21/2012	0.01	0
BG-1D	11/26/2012	0.012	1
BG-1D	8/23/2012	0.004	1
BG-1D	5/24/2012	0.01	0
BG-1D	3/20/2012	0.01	0
BG-3D	11/27/2012	0.01	0
BG-3D	11/27/2012	0.01	0
BG-3D	8/21/2012	0.01	0
BG-3D	5/23/2012	0.01	0
BG-3D	3/21/2012	0.01	0
BG-4D	11/27/2012	0.01	0
BG-4D	8/30/2012	0.01	0
BG-4D	5/30/2012	0.01	0
BG-4D	3/20/2012	0.01	0
BG-6D	11/27/2012	0.01	0
BG-6D	8/22/2012	0.01	0
BG-6D	5/25/2012	0.01	0
BG-6D	3/21/2012	0.01	0
IMW-3D	5/25/2012	0.01	0
IMW-3D	3/22/2012	0.01	0

Location Name	Sample Date	Mesa Cobalt, Dissolved	D_Mesa Cobalt, Dissolved
LMW-10	11/28/2012	0.01	1
LMW-10	8/27/2012	0.01	0
LMW-10	5/30/2012	0.01	0
LMW-10	3/22/2012	0.01	0
LMW-11R	11/26/2012	0.013	1
LMW-11R	8/21/2012	0.01	0
LMW-11R	5/29/2012	0.01	0
LMW-11R	3/23/2012	0.01	0
LMW-7	11/28/2012	0.011	1
LMW-7	8/27/2012	0.01	0
LMW-7	5/31/2012	0.01	0
LMW-7	3/23/2012	0.01	0
BG-2S	11/26/2012	0.014	1
BG-2S	8/23/2012	0.0025	1
BG-2S	5/24/2012	0.01	0
BG-2S	3/21/2012	0.01	0
BG-2M	11/26/2012	0.013	1
BG-2M	8/23/2012	0.0033	1
BG-2M	5/24/2012	0.01	0
BG-2M	3/21/2012	0.01	0
BG-2D	11/26/2012	0.011	1
BG-2D	8/23/2012	0.0031	1
BG-2D	5/24/2012	0.01	0
BG-2D	3/21/2012	0.01	0
LMW-9	11/28/2012	0.013	1
LMW-9	8/27/2012	0.01	0
LMW-9	5/31/2012	0.01	0
LMW-9	3/23/2012	0.01	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Copper_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Copper, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	7	19	73.08%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	19	0.02	0.02	0.02	0.02	3.565E-18
Statistics (Detects Only)	7	0.0022	0.0045	0.00323	0.0033	7.3420E-4
Statistics (All: NDs treated as DL value)	26	0.0022	0.02	0.0155	0.02	0.00759
Statistics (All: NDs treated as DL/2 value)	26	0.0022	0.01	0.00818	0.01	0.00308
Statistics (Normal ROS Estimated Data)	26	0.00175	0.00471	0.00323	0.00326	7.6736E-4
Statistics (Gamma ROS Estimated Data)	26	0.0014	0.0045	0.0032	0.0033	7.4732E-4
Statistics (Lognormal ROS Estimated Data)	26	0.00198	0.00503	0.00325	0.00321	7.8152E-4

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	22.59	20.01	1.4290E-4	-5.758	0.229	-0.0398
Statistics (NDs = DL)	2.226	1.995	0.00696	-4.409	0.843	-0.191
Statistics (NDs = DL/2)	4.743	4.221	0.00172	-4.916	0.533	-0.109
Statistics (Gamma ROS Estimates)	16.1	14.27	1.9850E-4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.758	0.241	-0.0418

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.975	0.764	0.775	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.963	0.803	Data Appear Normal
Lilliefors (Detects Only)	0.176	0.335	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.57	0.92	Data Not Normal
Lilliefors (NDs = DL)	0.455	0.174	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.589	0.92	Data Not Normal
Lilliefors (NDs = DL/2)	0.454	0.174	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.987	0.92	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0568	0.174	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.98	0.618	0.675	0.964

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.235	0.707	
Kolmogorov-Smirnov (Detects Only)	0.166	0.311	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	5.673	0.756	
Kolmogorov-Smirnov (NDs = DL)	0.463	0.173	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	5.383	0.747	
Kolmogorov-Smirnov (NDs = DL/2)	0.458	0.172	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.57	0.744	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.139	0.171	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.98	0.778	0.785	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.972	0.803	Data Appear Lognormal
Lilliefors (Detects Only)	0.182	0.335	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.595	0.92	Data Not Lognormal
Lilliefors (NDs = DL)	0.453	0.174	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.609	0.92	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.45	0.174	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.986	0.92	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0587	0.174	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Copper, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	12	34	73.91%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	34	0.02	0.02	0.02	0.02	7.043E-18
Statistics (Detects Only)	12	0.0016	0.0072	0.00412	0.0037	0.00203
Statistics (All: NDs treated as DL value)	46	0.0016	0.02	0.0159	0.02	0.00712
Statistics (All: NDs treated as DL/2 value)	46	0.0016	0.01	0.00847	0.01	0.0028
Statistics (Normal ROS Estimated Data)	46	-3.083E-4	0.00854	0.00412	0.00407	0.0021
Statistics (Gamma ROS Estimated Data)	46	1.000E-12	0.0072	0.00409	0.00427	0.00198
Statistics (Lognormal ROS Estimated Data)	46	0.0011	0.0119	0.00422	0.00362	0.00238

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.073	3.822	0.00101	-5.62	0.548	-0.0975
Statistics (NDs = DL)	2.496	2.347	0.00635	-4.358	0.805	-0.185
Statistics (NDs = DL/2)	5.25	4.922	0.00161	-4.87	0.526	-0.108
Statistics (Gamma ROS Estimates)	0.811	0.773	0.00504	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.62	0.566	-0.101

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.968	0.77	0.775	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.912	0.859	Data Appear Normal
Lilliefors (Detects Only)	0.169	0.256	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.577	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.459	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.59	0.945	Data Not Normal

Lilliefors (NDs = DL/2)	0.447	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.982	0.945	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0639	0.131	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.956	0.62	0.664	0.811

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.416	0.736	
Kolmogorov-Smirnov (Detects Only)	0.177	0.246	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	9.349	0.758	
Kolmogorov-Smirnov (NDs = DL)	0.462	0.132	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	9.124	0.753	
Kolmogorov-Smirnov (NDs = DL/2)	0.443	0.131	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	6.651	0.787	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.268	0.135	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.967	0.779	0.757	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.91	0.859	Data Appear Lognormal
Lilliefors (Detects Only)	0.163	0.256	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.599	0.945	Data Not Lognormal
Lilliefors (NDs = DL)	0.449	0.131	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.571	0.945	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.432	0.131	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.982	0.945	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0606	0.131	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Copper, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	0	31	10	21	67.74%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	21	0.005	0.02	0.0179	0.02	0.00538
Statistics (Detects Only)	10	0.0027	0.0067	0.00439	0.0043	0.00127
Statistics (All: NDs treated as DL value)	31	0.0027	0.02	0.0135	0.02	0.00779
Statistics (All: NDs treated as DL/2 value)	31	0.0025	0.01	0.00746	0.01	0.00316
Statistics (Normal ROS Estimated Data)	31	0.00201	0.0067	0.00423	0.0042	0.00117
Statistics (Gamma ROS Estimated Data)	31	0.00253	0.0067	0.00455	0.00463	0.00101
Statistics (Lognormal ROS Estimated Data)	31	0.00244	0.00675	0.00422	0.00414	0.00115

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	13.29	12.02	3.3038E-4	-5.467	0.293	-0.0535
Statistics (NDs = DL)	2.205	2.014	0.00613	-4.548	0.778	-0.171
Statistics (NDs = DL/2)	4.341	3.942	0.00172	-5.017	0.538	-0.107

Statistics (Gamma ROS Estimates)	19.14	17.31	2.3755E-4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.504	0.27	-0.049

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.988	0.832	0.859	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.969	0.842	Data Appear Normal
Lilliefors (Detects Only)	0.106	0.28	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.668	0.929	Data Not Normal
Lilliefors (NDs = DL)	0.378	0.159	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.714	0.929	Data Not Normal
Lilliefors (NDs = DL/2)	0.37	0.159	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.984	0.929	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0582	0.159	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.995	0.734	0.78	0.973

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.149	0.725	
Kolmogorov-Smirnov (Detects Only)	0.108	0.266	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	4.476	0.757	
Kolmogorov-Smirnov (NDs = DL)	0.381	0.16	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.768	0.749	
Kolmogorov-Smirnov (NDs = DL/2)	0.368	0.158	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.445	0.745	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0948	0.157	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.994	0.86	0.867	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.978	0.842	Data Appear Lognormal
Lilliefors (Detects Only)	0.101	0.28	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.718	0.929	Data Not Lognormal
Lilliefors (NDs = DL)	0.374	0.159	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.73	0.929	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.359	0.159	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.979	0.929	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0575	0.159	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

All Copper, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	103	0	103	29	74	71.84%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	74	0.005	0.02	0.0194	0.02	0.00298
Statistics (Detects Only)	29	0.0016	0.0072	0.004	0.0036	0.00157
Statistics (All: NDs treated as DL value)	103	0.0016	0.02	0.0151	0.02	0.00745
Statistics (All: NDs treated as DL/2 value)	103	0.0016	0.01	0.00809	0.01	0.00298
Statistics (Normal ROS Estimated Data)	103	3.2936E-4	0.00751	0.00392	0.0038	0.00154
Statistics (Gamma ROS Estimated Data)	103	1.000E-12	0.0072	0.00408	0.00425	0.00145
Statistics (Lognormal ROS Estimated Data)	103	0.00141	0.00932	0.00393	0.0036	0.0016

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	6.551	6.367	6.1008E-4	-5.601	0.412	-0.0735
Statistics (NDs = DL)	2.309	2.248	0.00652	-4.428	0.803	-0.181
Statistics (NDs = DL/2)	4.754	4.622	0.0017	-4.926	0.53	-0.108
Statistics (Gamma ROS Estimates)	1.926	1.876	0.00212	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.62	0.405	-0.0721

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.982	0.792	0.807	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.95	0.926	Data Appear Normal
Lilliefors (Detects Only)	0.127	0.165	Data Appear Normal
Lilliefors (NDs = DL)	0.436	0.0873	Data Not Normal
Lilliefors (NDs = DL/2)	0.428	0.0873	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0431	0.0873	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.987	0.654	0.704	0.9

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.233	0.747	
Kolmogorov-Smirnov (Detects Only)	0.0822	0.163	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	18.54	0.763	
Kolmogorov-Smirnov (NDs = DL)	0.437	0.0897	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	17.51	0.755	
Kolmogorov-Smirnov (NDs = DL/2)	0.425	0.0889	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.78	0.766	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.216	0.0899	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.989	0.814	0.809	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.965	0.926	Data Appear Lognormal
Lilliefors (Detects Only)	0.0813	0.165	Data Appear Lognormal
Lilliefors (NDs = DL)	0.429	0.0873	Data Not Lognormal

Lilliefors (NDs = DL/2)	0.417	0.0873	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.027	0.0873	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Copper_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Copper, Dissolved

General Statistics

Number of Valid Data	26	Number of Detected Data	7
Number of Distinct Detected Data	6	Number of Non-Detect Data	19
		Percent Non-Detects	73.08%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0022	Minimum Detected	-6.119
Maximum Detected	0.0045	Maximum Detected	-5.404
Mean of Detected	0.00323	Mean of Detected	-5.758
SD of Detected	7.3420E-4	SD of Detected	0.229
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Warning: There are only 7 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.963	Shapiro Wilk Test Statistic	0.972
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00818	Mean (Log Scale)	-4.916
SD	0.00308	SD (Log Scale)	0.533
95% UTL 95% Coverage	0.0152	95% UTL 95% Coverage	0.0247
95% UPL (t)	0.0135	95% UPL (t)	0.0186
90% Percentile (z)	0.0121	90% Percentile (z)	0.0145
95% Percentile (z)	0.0132	95% Percentile (z)	0.0176
99% Percentile (z)	0.0154	99% Percentile (z)	0.0254
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00325
		SD in Original Scale	7.8152E-4
		Mean in Log Scale	-5.758

		SD in Log Scale	0.241
		95% UTL 95% Coverage	0.00546
		95% UPL (t)	0.0048
		90% Percentile (z)	0.0043
		95% Percentile (z)	0.00469
		99% Percentile (z)	0.00553
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	13.01	Data appear Normal at 5% Significance Level	
Theta Star	2.4824E-4		
nu star	182.1		
A-D Test Statistic	0.235	Nonparametric Statistics	
5% A-D Critical Value	0.707	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.166	Mean	0.00323
5% K-S Critical Value	0.311	SD	6.7974E-4
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	2.7750E-4
		95% KM UTL with 95% Coverage	0.00477
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.00625
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00441
Mean	0.0032	90% Percentile (z)	0.0041
Median	0.0033	95% Percentile (z)	0.00435
SD	7.4732E-4	99% Percentile (z)	0.00481
k star	14.27		
Theta star	2.2399E-4	Gamma ROS Limits with Extrapolated Data	
Nu star	741.9	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00474
95% Percentile of Chisquare (2k)	41.99	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00479
		95% WH Approx. Gamma UTL with 95% Coverage	0.00533
90% Percentile	0.00432	95% HW Approx. Gamma UTL with 95% Coverage	0.00541
95% Percentile	0.0047		
99% Percentile	0.00549		

Note: DL/2 is not a recommended method.

Muddy Creek Copper, Dissolved

General Statistics

Number of Valid Data	46	Number of Detected Data	12
Number of Distinct Detected Data	9	Number of Non-Detect Data	34
		Percent Non-Detects	73.91%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0016	Minimum Detected	-6.438
Maximum Detected	0.0072	Maximum Detected	-4.934
Mean of Detected	0.00412	Mean of Detected	-5.62
SD of Detected	0.00203	SD of Detected	0.548
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Background Statistics

Normal Distribution Test with Detected Values Only	Lognormal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.912	Shapiro Wilk Test Statistic	0.91
5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00847	Mean (Log Scale)	-4.87
SD	0.0028	SD (Log Scale)	0.526
95% UTL 95% Coverage	0.0143	95% UTL 95% Coverage	0.0229
95% UPL (t)	0.0132	95% UPL (t)	0.0187
90% Percentile (z)	0.0121	90% Percentile (z)	0.0151
95% Percentile (z)	0.0131	95% Percentile (z)	0.0182
99% Percentile (z)	0.015	99% Percentile (z)	0.0261
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00422
		SD in Original Scale	0.00238
		Mean in Log Scale	-5.62
		SD in Log Scale	0.566
		95% UTL 95% Coverage	0.0117
		95% UPL (t)	0.00946
		90% Percentile (z)	0.00748
		95% Percentile (z)	0.00919
		99% Percentile (z)	0.0135
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.11	Data appear Normal at 5% Significance Level	
Theta Star	0.00132		
nu star	74.64		
A-D Test Statistic	0.416	Nonparametric Statistics	
5% A-D Critical Value	0.736	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.177	Mean	0.00412
5% K-S Critical Value	0.246	SD	0.00194
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	5.8580E-4
		95% KM UTL with 95% Coverage	0.00816
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0127
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00741
Mean	0.00409	90% Percentile (z)	0.00661
Median	0.00427	95% Percentile (z)	0.00731
SD	0.00198	99% Percentile (z)	0.00864
k star	0.773		
Theta star	0.00529	Gamma ROS Limits with Extrapolated Data	
Nu star	71.09	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0108
95% Percentile of Chisquare (2k)	5.076	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.013
		95% WH Approx. Gamma UTL with 95% Coverage	0.0132
90% Percentile	0.01	95% HW Approx. Gamma UTL with 95% Coverage	0.0167
95% Percentile	0.0134		
99% Percentile	0.0215		

Note: DL/2 is not a recommended method.

Mesa Copper, Dissolved

General Statistics			
Number of Valid Data	31	Number of Detected Data	10
Number of Distinct Detected Data	10	Number of Non-Detect Data	21
		Percent Non-Detects	67.74%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0027	Minimum Detected	-5.915
Maximum Detected	0.0067	Maximum Detected	-5.006
Mean of Detected	0.00439	Mean of Detected	-5.467
SD of Detected	0.00127	SD of Detected	0.293
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	31
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.969	Shapiro Wilk Test Statistic	0.978
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00746	Mean (Log Scale)	-5.017
SD	0.00316	SD (Log Scale)	0.538
95% UTL 95% Coverage	0.0144	95% UTL 95% Coverage	0.0216
95% UPL (t)	0.0129	95% UPL (t)	0.0168
90% Percentile (z)	0.0115	90% Percentile (z)	0.0132
95% Percentile (z)	0.0127	95% Percentile (z)	0.0161
99% Percentile (z)	0.0148	99% Percentile (z)	0.0232
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00422
		SD in Original Scale	0.00115
		Mean in Log Scale	-5.504
		SD in Log Scale	0.27
		95% UTL 95% Coverage	0.00736
		95% UPL (t)	0.00648
		90% Percentile (z)	0.00575
		95% Percentile (z)	0.00634
		99% Percentile (z)	0.00762
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	9.368	Data appear Normal at 5% Significance Level	
Theta Star	4.6862E-4		
nu star	187.4		
A-D Test Statistic	0.149	Nonparametric Statistics	

5% A-D Critical Value	0.725	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.108	Mean	0.00424
5% K-S Critical Value	0.266	SD	0.00114
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	3.5448E-4
		95% KM UTL with 95% Coverage	0.00675
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0093
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00621
Mean	0.00455	90% Percentile (z)	0.0057
Median	0.00463	95% Percentile (z)	0.00612
SD	0.00101	99% Percentile (z)	0.0069
k star	17.31		
Theta star	2.6267E-4	Gamma ROS Limits with Extrapolated Data	
Nu star	1073	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00652
95% Percentile of Chisquare (2k)	49.34	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00656
		95% WH Approx. Gamma UTL with 95% Coverage	0.00718
90% Percentile	0.00599	95% HW Approx. Gamma UTL with 95% Coverage	0.00725
95% Percentile	0.00648		
99% Percentile	0.00747		

Note: DL/2 is not a recommended method.

All Copper, Dissolved

General Statistics

Number of Valid Data	103	Number of Detected Data	29
Number of Distinct Detected Data	23	Number of Non-Detect Data	74
		Percent Non-Detects	71.84%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0016	Minimum Detected	-6.438
Maximum Detected	0.0072	Maximum Detected	-4.934
Mean of Detected	0.004	Mean of Detected	-5.601
SD of Detected	0.00157	SD of Detected	0.412
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	103
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.95	Shapiro Wilk Test Statistic	0.965
5% Shapiro Wilk Critical Value	0.926	5% Shapiro Wilk Critical Value	0.926
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00809	Mean (Log Scale)	-4.926
SD	0.00298	SD (Log Scale)	0.53
95% UTL 95% Coverage	0.0138	95% UTL 95% Coverage	0.0201

95% UPL (t)	0.0131	95% UPL (t)	0.0176
90% Percentile (z)	0.0119	90% Percentile (z)	0.0143
95% Percentile (z)	0.013	95% Percentile (z)	0.0174
99% Percentile (z)	0.015	99% Percentile (z)	0.0249
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00393
		SD in Original Scale	0.0016
		Mean in Log Scale	-5.62
		SD in Log Scale	0.405
		95% UTL 95% Coverage	0.00788
		95% UPL (t)	0.00712
		90% Percentile (z)	0.00609
		95% Percentile (z)	0.00706
		99% Percentile (z)	0.0093
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	5.896	Data appear Normal at 5% Significance Level	
Theta Star	6.7782E-4		
nu star	342		
A-D Test Statistic	0.233	Nonparametric Statistics	
5% A-D Critical Value	0.747	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.0822	Mean	0.00392
5% K-S Critical Value	0.163	SD	0.00151
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	2.7668E-4
		95% KM UTL with 95% Coverage	0.00682
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0105
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00644
Mean	0.00408	90% Percentile (z)	0.00586
Median	0.00425	95% Percentile (z)	0.00641
SD	0.00145	99% Percentile (z)	0.00744
k star	1.876		
Theta star	0.00218	Gamma ROS Limits with Extrapolated Data	
Nu star	386.5	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00792
95% Percentile of Chisquare (2k)	9.084	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00878
		95% WH Approx. Gamma UTL with 95% Coverage	0.00872
90% Percentile	0.00806	95% HW Approx. Gamma UTL with 95% Coverage	0.00983
95% Percentile	0.00988		
99% Percentile	0.0139		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Copper_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Copper, Dissolved

Background Data: Alluv Copper, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	31	26
Number of Non-Detect Data	21	19
Number of Detect Data	10	7
Minimum Non-Detect	0.005	0.02
Maximum Non-Detect	0.02	0.02
Percent Non detects	67.74%	73.08%
Minimum Detected	0.0027	0.0022
Maximum Detected	0.0067	0.0045
Mean of Detected Data	0.00439	0.00323
Median of Detected Data	0.0043	0.0033
SD of Detected Data	0.00127	7.3420E-4

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	1.808
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0706

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Copper_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Copper, Dissolved

Background Data: Alluv Copper, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	34	19
Number of Detect Data	12	7
Minimum Non-Detect	0.02	0.02
Maximum Non-Detect	0.02	0.02
Percent Non detects	73.91%	73.08%
Minimum Detected	0.0016	0.0022
Maximum Detected	0.0072	0.0045
Mean of Detected Data	0.00412	0.00323
Median of Detected Data	0.0037	0.0033
SD of Detected Data	0.00203	7.3420E-4

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0.52
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.603

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Copper_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Copper, Dissolved

Background Data: Muddy Creek Copper, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	31	46
Number of Non-Detect Data	21	34
Number of Detect Data	10	12
Minimum Non-Detect	0.005	0.02
Maximum Non-Detect	0.02	0.02
Percent Non detects	67.74%	73.91%
Minimum Detected	0.0027	0.0016
Maximum Detected	0.0067	0.0072
Mean of Detected Data	0.00439	0.00412
Median of Detected Data	0.0043	0.0037
SD of Detected Data	0.00127	0.00203

Site vs Background Gehan Test

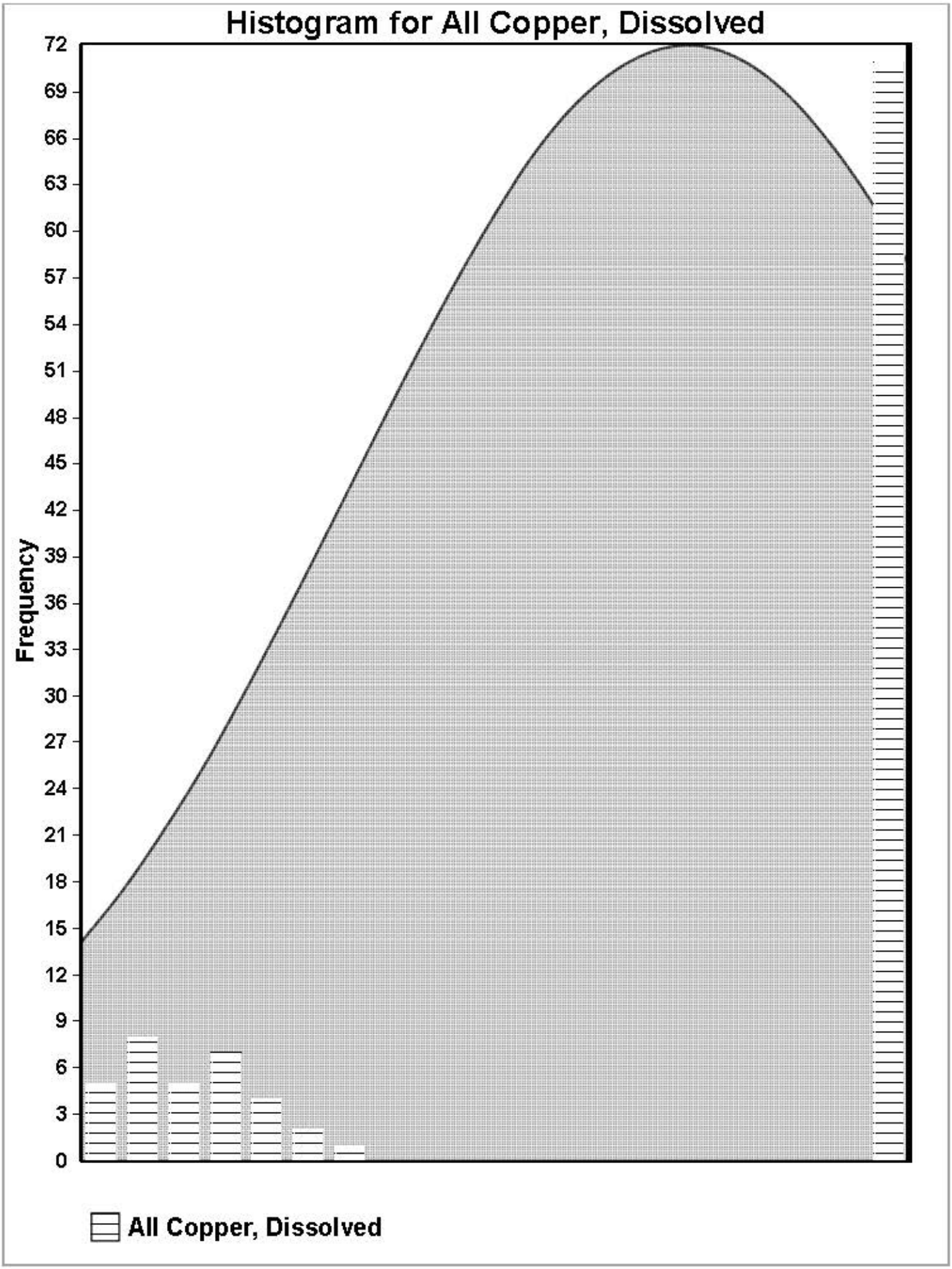
H0: Mu of Site or AOC = Mu of background

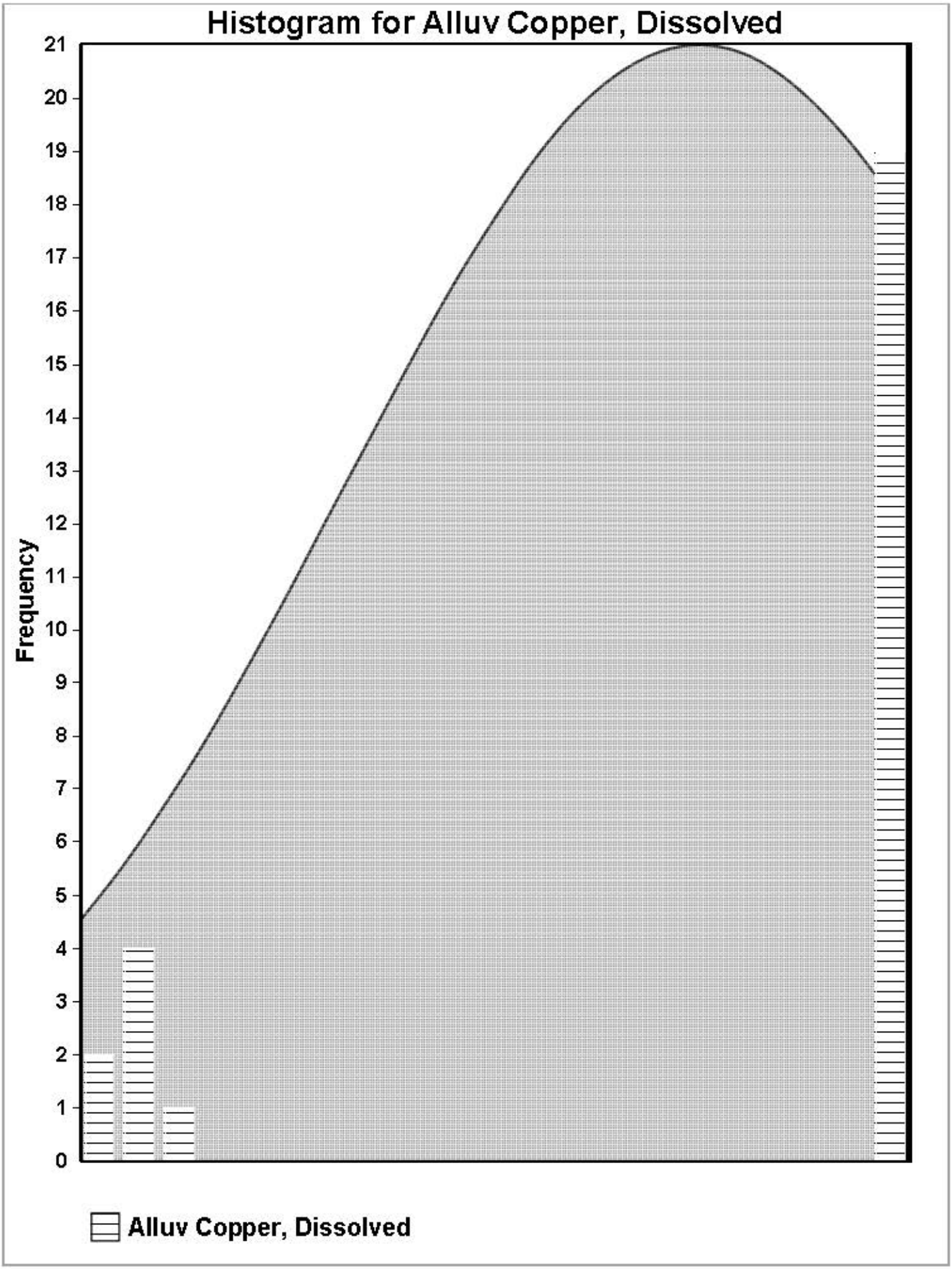
Gehan z Test Value	0.0303
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.976

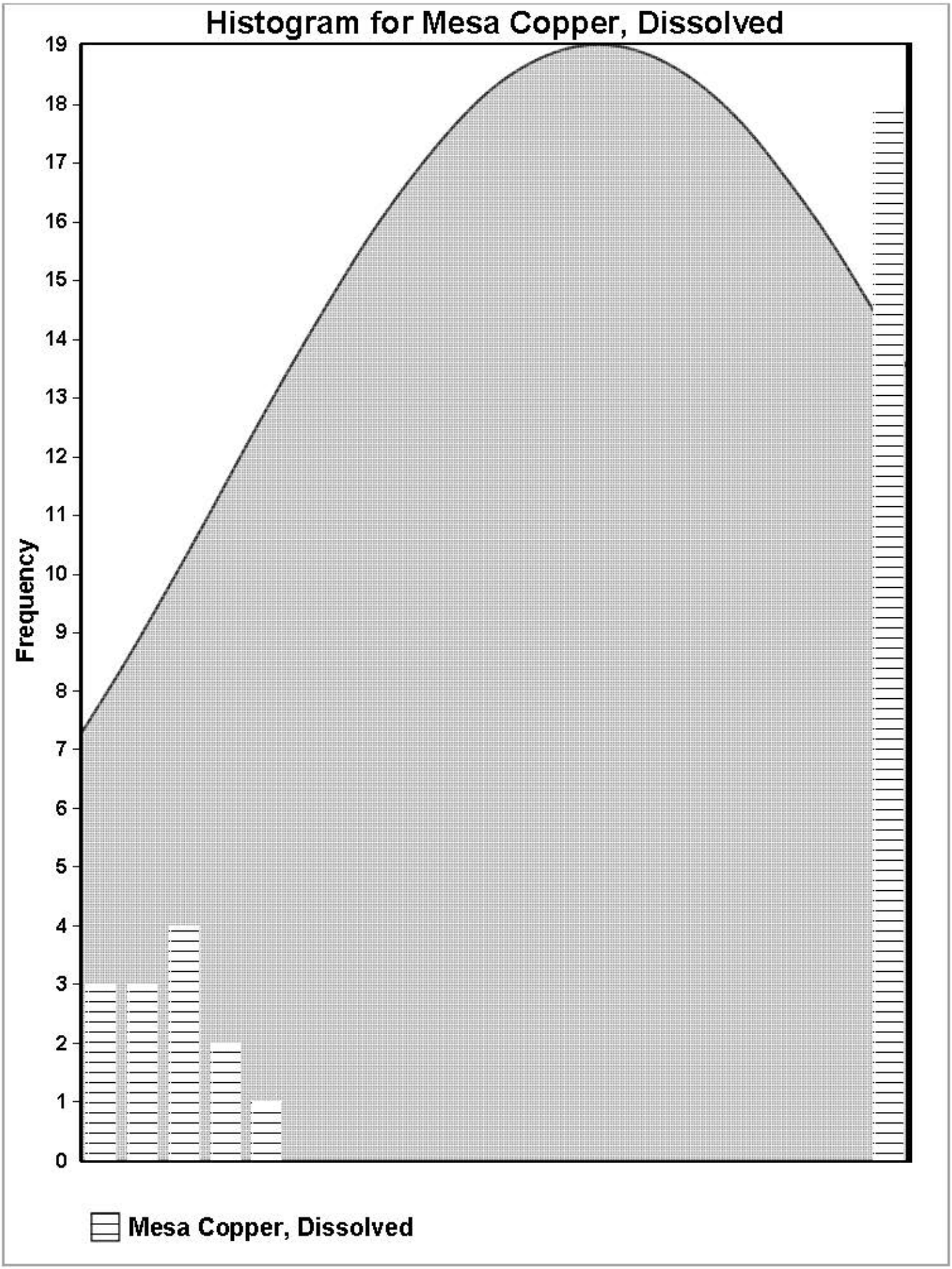
Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for All Copper, Dissolved
Frequency
72
69
66
63
60
57
54
51
48
45
42
39
36
33
30
27
24
21
18
15
12
9
6
3
0
All Copper, Dissolved


Histogram for Alluv Copper, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
Alluv Copper, Dissolved


Histogram for Mesa Copper, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
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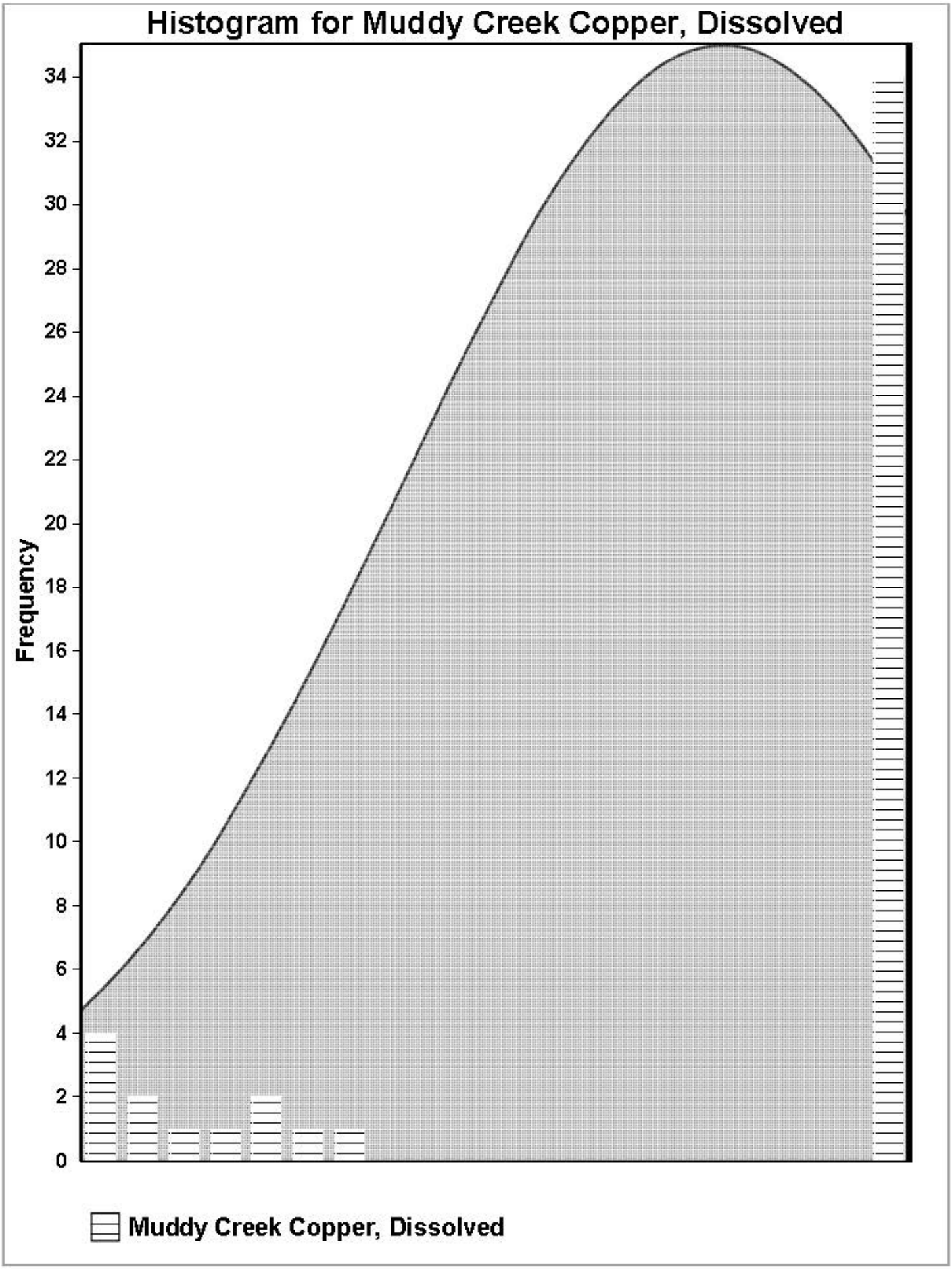
15
16
17
18
19
Mesa Copper, Dissolved


Histogram for Muddy Creek Copper, Dissolved
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
Muddy Creek Copper, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Copper_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Copper, Dissolved

Mean	0.00818
Standard Deviation	0.00308
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00818	0.00302	0.0022	8	1.976	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Copper, Dissolved

Mean	0.00847
Standard Deviation	0.0028
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00847	0.00277	0.0016	44	2.481	3.09	3.45

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Copper, Dissolved

Mean	0.00746
Standard Deviation	0.00316
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00746	0.0031	0.0025	5	1.599	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for All Copper, Dissolved

Mean	0.00809
Standard Deviation	0.00298
Number of data	103
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00809	0.00297	0.0016	70	2.187	3.388	3.758

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Location Name	Sample Date	Alluv Copper, Dissolved	D_Alluv Copper, Dissolved
BG-1S	11/26/2012	0.02	0
BG-1S	8/23/2012	0.0033	1
BG-1S	5/24/2012	0.02	0
BG-1S	3/20/2012	0.02	0
IMW-2.5D	11/26/2012	0.02	0
IMW-2.5D	8/24/2012	0.0031	1
IMW-2.5D	5/21/2012	0.02	0
IMW-2.5D	3/21/2012	0.0022	1
IMW-2.5S	11/26/2012	0.02	0
IMW-2.5S	8/24/2012	0.0045	1
IMW-2.5S	5/21/2012	0.02	0
IMW-2.5S	3/21/2012	0.02	0
IMW-3S	5/21/2012	0.02	0
IMW-3S	3/20/2012	0.02	0
KMW-2D	11/26/2012	0.02	0
KMW-2D	8/24/2012	0.0036	1
KMW-2D	5/21/2012	0.02	0
KMW-2D	3/23/2012	0.02	0
KMW-2M	11/26/2012	0.02	0
KMW-2M	8/24/2012	0.0033	1
KMW-2M	5/21/2012	0.02	0
KMW-2M	3/23/2012	0.02	0
KMW-2S	11/26/2012	0.02	0
KMW-2S	8/24/2012	0.0026	1
KMW-2S	5/21/2012	0.02	0
KMW-2S	3/23/2012	0.02	0

Location Name	Sample Date	Muddy Creek Copper, Dissolved	D_Muddy Creek Copper, Dissolved
BG-3S	11/27/2012	0.02	0
BG-3S	8/22/2012	0.02	0
BG-3S	5/23/2012	0.02	0
BG-3S	3/21/2012	0.0033	1
BG-4S	11/27/2012	0.02	0
BG-4S	8/30/2012	0.0066	1
BG-4S	5/30/2012	0.0061	1
BG-4S	3/20/2012	0.02	0
BG-6S	11/27/2012	0.02	0
BG-6S	8/23/2012	0.0041	1
BG-6S	5/25/2012	0.02	0
BG-6S	3/21/2012	0.02	0
BG-1M	11/26/2012	0.02	0
BG-1M	8/23/2012	0.0022	1
BG-1M	5/24/2012	0.02	0
BG-1M	3/20/2012	0.02	0
BG-3M	11/27/2012	0.02	0
BG-3M	8/22/2012	0.02	0
BG-3M	5/24/2012	0.02	0
BG-3M	3/21/2012	0.005	1
BG-4M	11/27/2012	0.02	0
BG-4M	8/30/2012	0.02	0
BG-4M	5/30/2012	0.02	0
BG-4M	3/20/2012	0.02	0
BG-6M	11/27/2012	0.02	0
BG-6M	8/22/2012	0.02	0
BG-6M	5/25/2012	0.02	0
BG-6M	3/21/2012	0.02	0
BG-1D	11/26/2012	0.02	0
BG-1D	8/23/2012	0.0033	1
BG-1D	5/24/2012	0.02	0
BG-1D	3/20/2012	0.02	0
BG-3D	11/27/2012	0.02	0
BG-3D	8/21/2012	0.02	0
BG-3D	5/23/2012	0.02	0
BG-3D	3/21/2012	0.02	0
BG-4D	11/27/2012	0.02	0
BG-4D	8/30/2012	0.0023	1
BG-4D	5/30/2012	0.0072	1
BG-4D	3/20/2012	0.02	0
BG-6D	11/27/2012	0.02	0
BG-6D	8/22/2012	0.02	0
BG-6D	5/25/2012	0.02	0
BG-6D	3/21/2012	0.0016	1
IMW-3D	5/25/2012	0.0061	1
IMW-3D	3/22/2012	0.0016	1

Location Name	Sample Date	Mesa Copper, Dissolved	D_Mesa Copper, Dissolved
LMW-10	11/28/2012	0.02	0
LMW-10	8/27/2012	0.0047	1
LMW-10	5/30/2012	0.0057	1
LMW-10	3/22/2012	0.0027	1
LMW-10	12/6/2011	0.005	0
LMW-11R	11/26/2012	0.0067	1
LMW-11R	8/21/2012	0.02	0
LMW-11R	5/29/2012	0.02	0
LMW-11R	3/23/2012	0.02	0
LMW-7	11/28/2012	0.02	0
LMW-7	8/27/2012	0.0029	1
LMW-7	5/31/2012	0.02	0
LMW-7	3/23/2012	0.02	0
LMW-7	12/5/2011	0.005	0
BG-2S	11/26/2012	0.02	0
BG-2S	8/23/2012	0.0054	1
BG-2S	5/24/2012	0.02	0
BG-2S	3/21/2012	0.0035	1
BG-2M	11/26/2012	0.02	0
BG-2M	8/23/2012	0.0037	1
BG-2M	5/24/2012	0.02	0
BG-2M	3/21/2012	0.02	0
BG-2D	11/26/2012	0.02	0
BG-2D	8/23/2012	0.0042	1
BG-2D	5/24/2012	0.02	0
BG-2D	3/21/2012	0.02	0
LMW-9	11/28/2012	0.02	0
LMW-9	8/27/2012	0.0044	1
LMW-9	5/31/2012	0.02	0
LMW-9	3/23/2012	0.02	0
LMW-9	12/5/2011	0.005	0

Location Name	Sample Date	All Copper, Dissolved	D_All Copper, Dissolved
BG-1S	11/26/2012	0.02	0
BG-1S	8/23/2012	0.0033	1
BG-1S	5/24/2012	0.02	0
BG-1S	3/20/2012	0.02	0
IMW-2.5D	11/26/2012	0.02	0
IMW-2.5D	8/24/2012	0.0031	1
IMW-2.5D	5/21/2012	0.02	0
IMW-2.5D	3/21/2012	0.0022	1
IMW-2.5S	11/26/2012	0.02	0
IMW-2.5S	8/24/2012	0.0045	1
IMW-2.5S	5/21/2012	0.02	0
IMW-2.5S	3/21/2012	0.02	0
IMW-3S	5/21/2012	0.02	0
IMW-3S	3/20/2012	0.02	0
KMW-2D	11/26/2012	0.02	0
KMW-2D	8/24/2012	0.0036	1
KMW-2D	5/21/2012	0.02	0
KMW-2D	3/23/2012	0.02	0
KMW-2M	11/26/2012	0.02	0
KMW-2M	8/24/2012	0.0033	1
KMW-2M	5/21/2012	0.02	0
KMW-2M	3/23/2012	0.02	0
KMW-2S	11/26/2012	0.02	0
KMW-2S	8/24/2012	0.0026	1
KMW-2S	5/21/2012	0.02	0
KMW-2S	3/23/2012	0.02	0
BG-3S	11/27/2012	0.02	0
BG-3S	8/22/2012	0.02	0
BG-3S	5/23/2012	0.02	0
BG-3S	3/21/2012	0.0033	1
BG-4S	11/27/2012	0.02	0
BG-4S	8/30/2012	0.0066	1
BG-4S	5/30/2012	0.0061	1
BG-4S	3/20/2012	0.02	0
BG-6S	11/27/2012	0.02	0
BG-6S	8/23/2012	0.0041	1
BG-6S	5/25/2012	0.02	0
BG-6S	3/21/2012	0.02	0
BG-1M	11/26/2012	0.02	0
BG-1M	8/23/2012	0.0022	1
BG-1M	5/24/2012	0.02	0
BG-1M	3/20/2012	0.02	0
BG-3M	11/27/2012	0.02	0
BG-3M	8/22/2012	0.02	0
BG-3M	5/24/2012	0.02	0
BG-3M	3/21/2012	0.005	1
BG-4M	11/27/2012	0.02	0
BG-4M	8/30/2012	0.02	0
BG-4M	5/30/2012	0.02	0
BG-4M	3/20/2012	0.02	0
BG-6M	11/27/2012	0.02	0
BG-6M	8/22/2012	0.02	0

BG-6M	5/25/2012	0.02	0
BG-6M	3/21/2012	0.02	0
BG-1D	8/23/2012	0.0033	1
BG-1D	11/26/2012	0.02	0
BG-1D	5/24/2012	0.02	0
BG-1D	3/20/2012	0.02	0
BG-3D	11/27/2012	0.02	0
BG-3D	8/21/2012	0.02	0
BG-3D	5/23/2012	0.02	0
BG-3D	3/21/2012	0.02	0
BG-4D	11/27/2012	0.02	0
BG-4D	8/30/2012	0.0023	1
BG-4D	5/30/2012	0.0072	1
BG-4D	3/20/2012	0.02	0
BG-6D	11/27/2012	0.02	0
BG-6D	8/22/2012	0.02	0
BG-6D	5/25/2012	0.02	0
BG-6D	3/21/2012	0.0016	1
IMW-3D	5/25/2012	0.0061	1
IMW-3D	3/22/2012	0.0016	1
LMW-10	11/28/2012	0.02	0
LMW-10	8/27/2012	0.0047	1
LMW-10	5/30/2012	0.0057	1
LMW-10	3/22/2012	0.0027	1
LMW-10	12/6/2011	0.005	0
LMW-11R	11/26/2012	0.0067	1
LMW-11R	8/21/2012	0.02	0
LMW-11R	5/29/2012	0.02	0
LMW-11R	3/23/2012	0.02	0
LMW-7	11/28/2012	0.02	0
LMW-7	8/27/2012	0.0029	1
LMW-7	5/31/2012	0.02	0
LMW-7	3/23/2012	0.02	0
LMW-7	12/5/2011	0.005	0
BG-2S	11/26/2012	0.02	0
BG-2S	8/23/2012	0.0054	1
BG-2S	5/24/2012	0.02	0
BG-2S	3/21/2012	0.0035	1
BG-2M	11/26/2012	0.02	0
BG-2M	8/23/2012	0.0037	1
BG-2M	5/24/2012	0.02	0
BG-2M	3/21/2012	0.02	0
BG-2D	11/26/2012	0.02	0
BG-2D	8/23/2012	0.0042	1
BG-2D	5/24/2012	0.02	0
BG-2D	3/21/2012	0.02	0
LMW-9	11/28/2012	0.02	0
LMW-9	8/27/2012	0.0044	1
LMW-9	5/31/2012	0.02	0
LMW-9	3/23/2012	0.02	0
LMW-9	12/5/2011	0.005	0

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Fluoranthene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Fluoranthene

Background Data: Alluv Fluoranthene

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	27	26
Number of Detect Data	1	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	96.43%	100.00%
Minimum Detected	50	N/A
Maximum Detected	50	N/A
Mean of Detected Data	50	N/A
Median of Detected Data	50	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0.964
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.335

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Fluoranthene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Fluoranthene

Background Data: Alluv Fluoranthene

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	45	26
Number of Detect Data	1	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	97.83%	100.00%
Minimum Detected	0.012	N/A
Maximum Detected	0.012	N/A
Mean of Detected Data	0.012	N/A
Median of Detected Data	0.012	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Fluoranthene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Fluoranthene

Background Data: Muddy Creek Fluoranthene

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	27	45
Number of Detect Data	1	1
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	96.43%	97.83%
Minimum Detected	50	0.012
Maximum Detected	50	0.012
Mean of Detected Data	50	0.012
Median of Detected Data	50	0.012
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

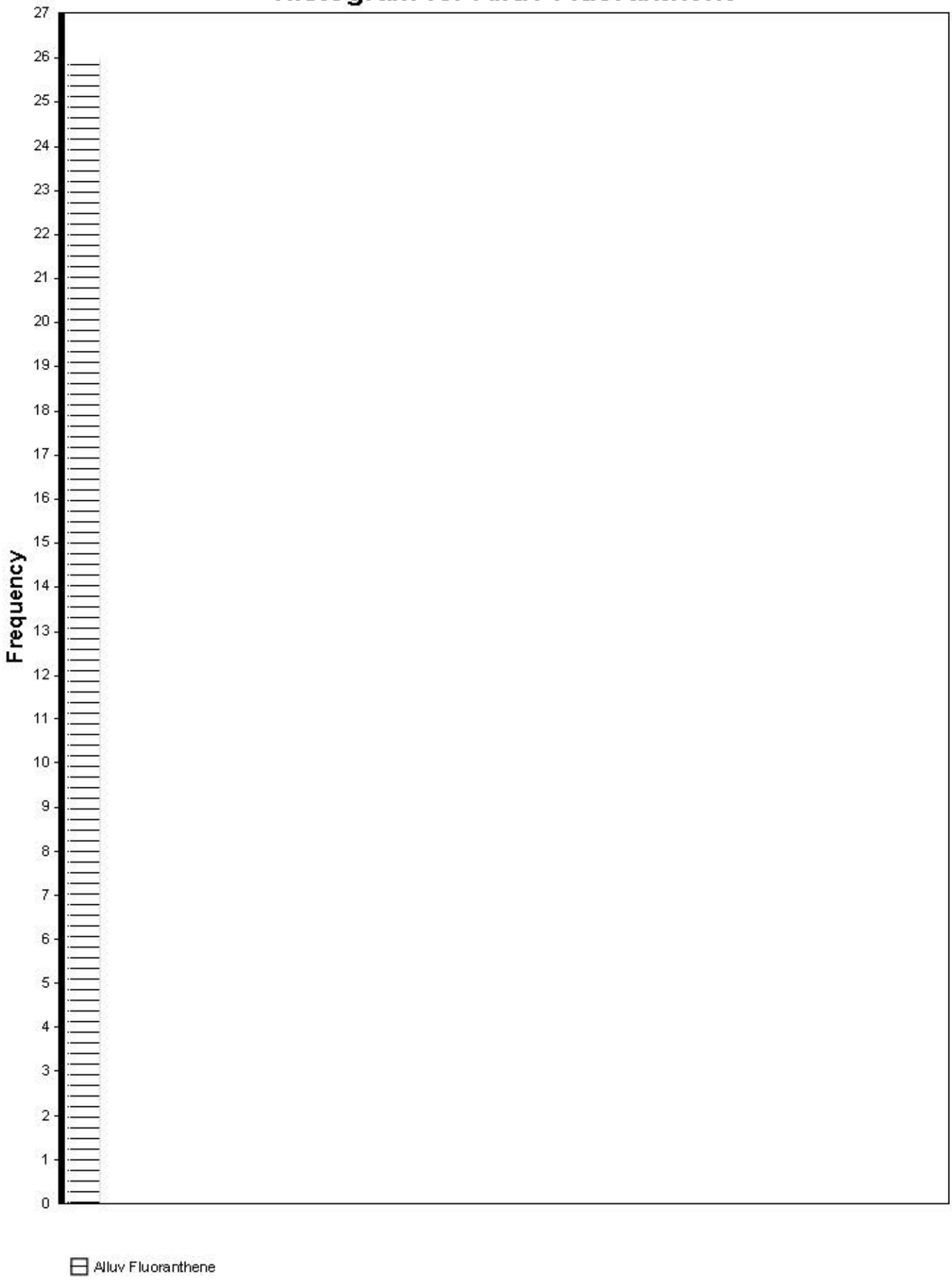
Gehan z Test Value	1.282
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.2

Conclusion with Alpha = 0.05

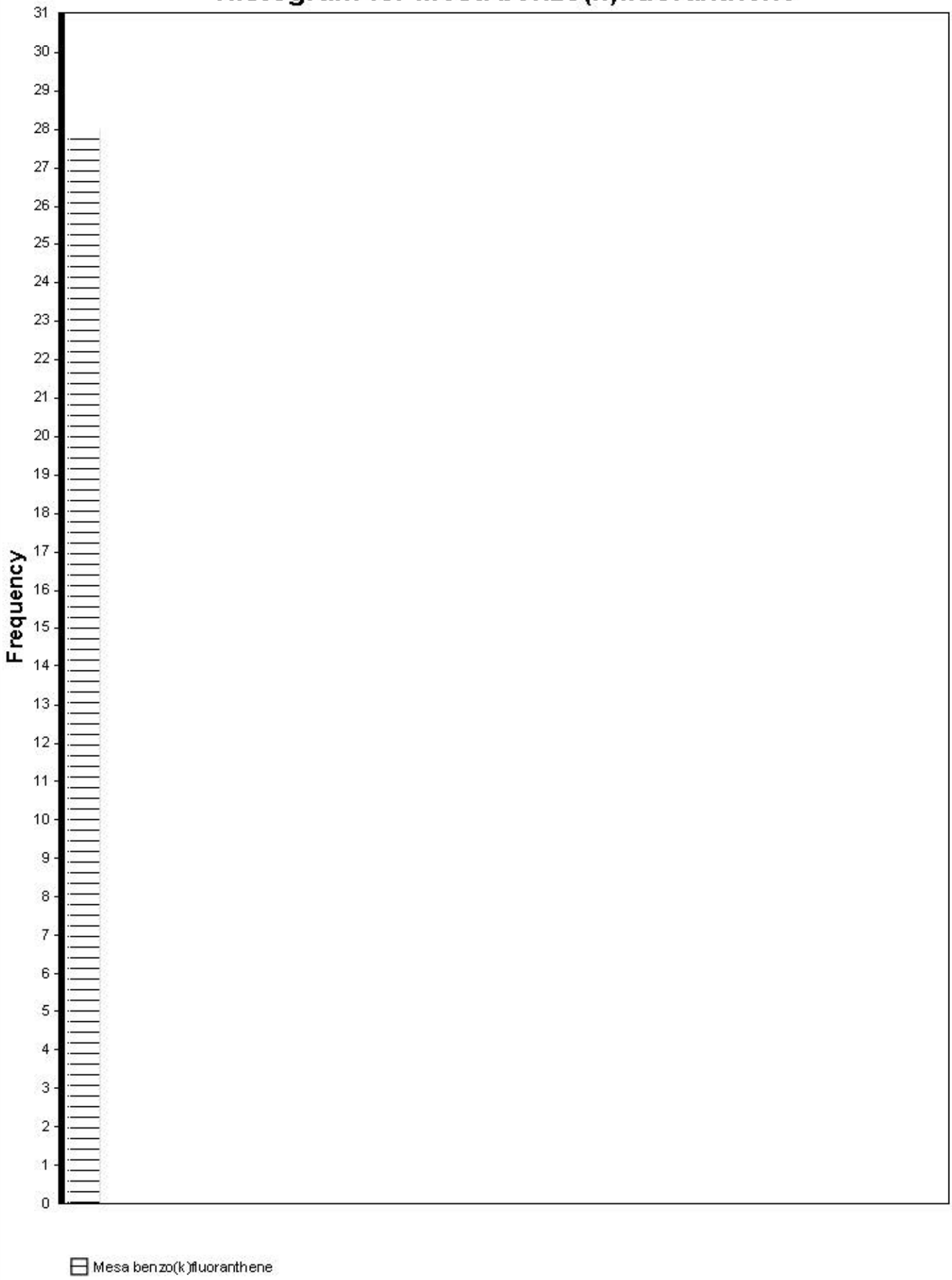
Do Not Reject H0, Conclude Site = Background

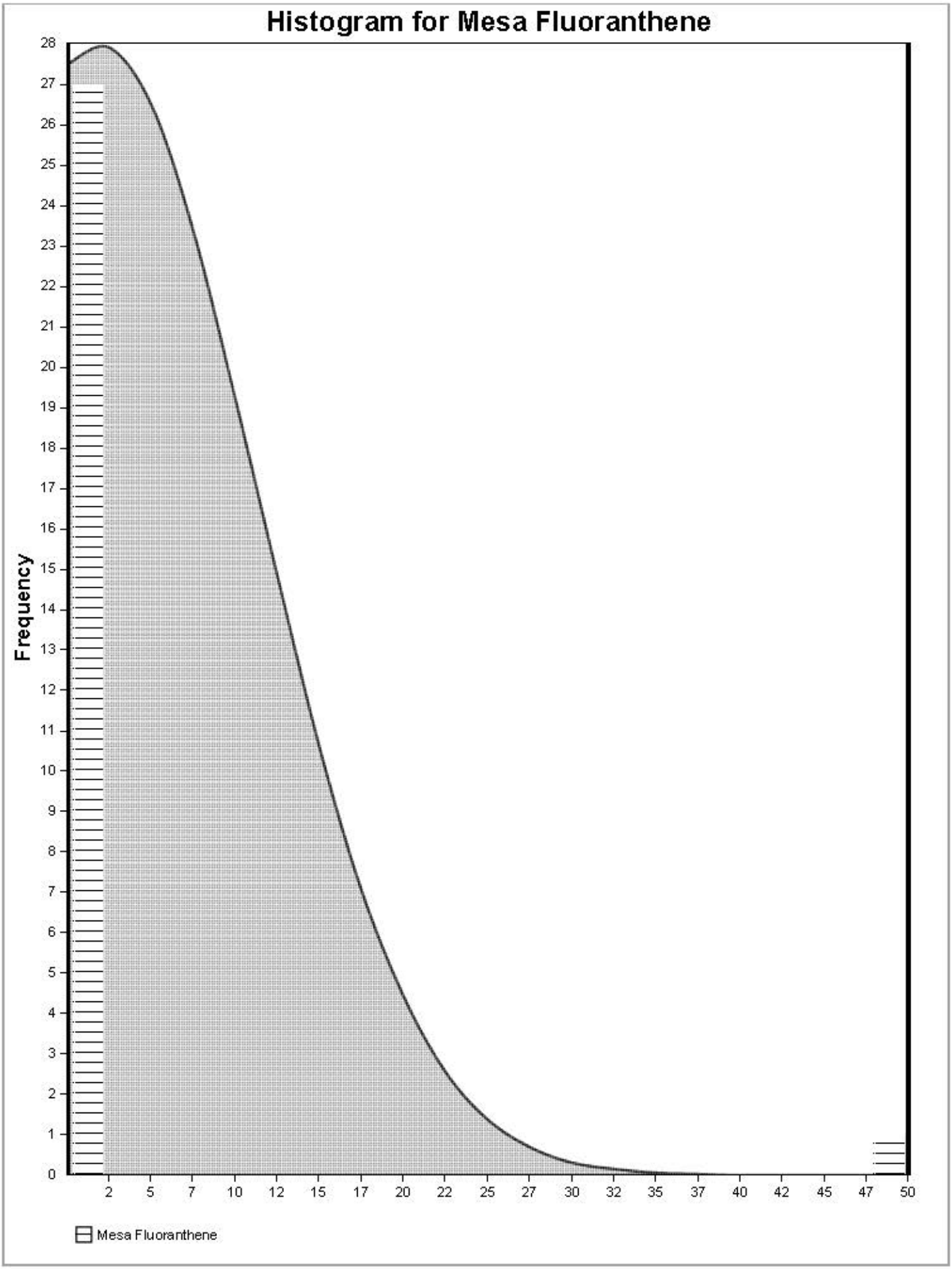
P-Value >= alpha (0.05)

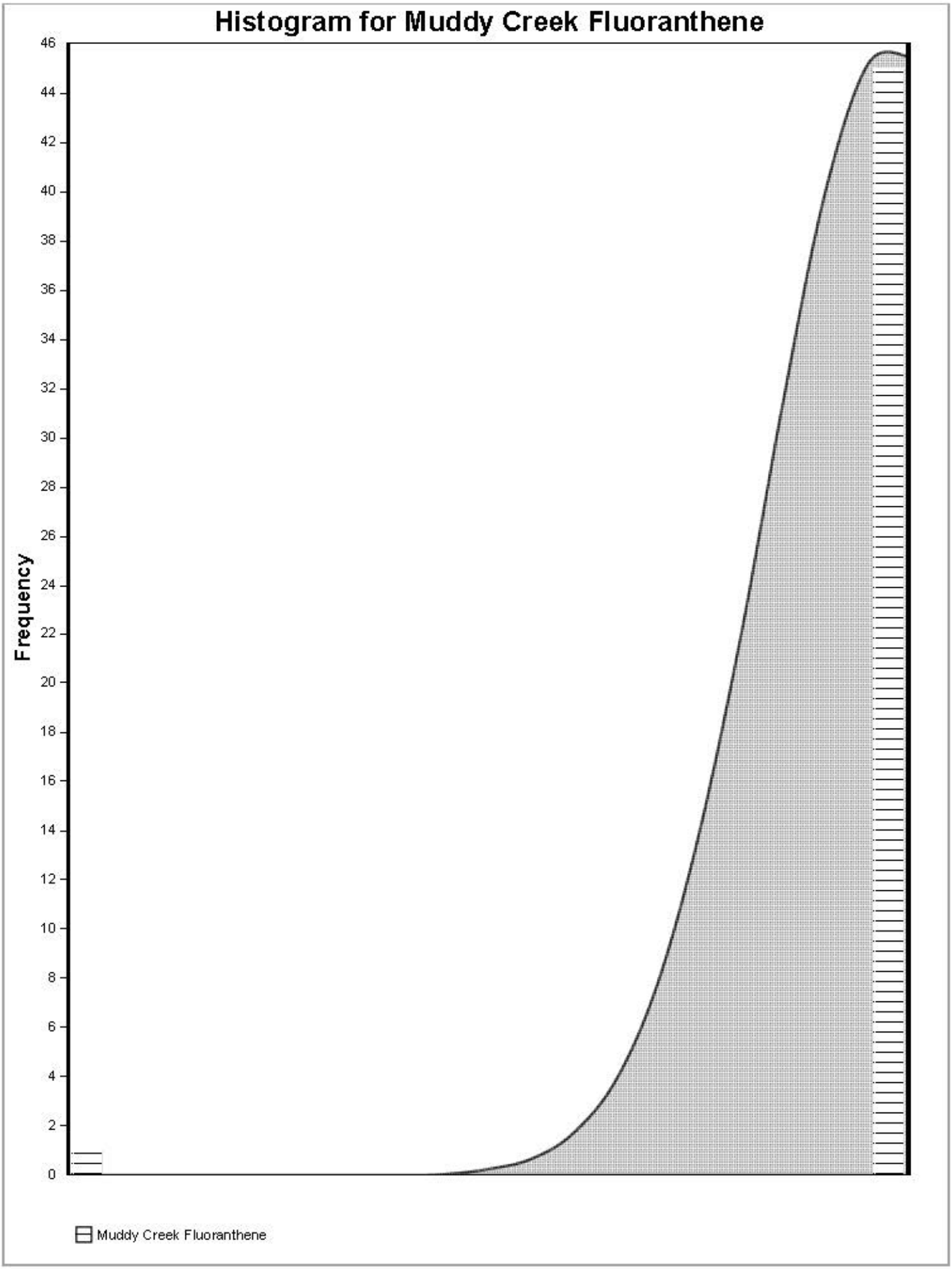
Histogram for Alluv Fluoranthene



Histogram for Mesa benzo(k)fluoranthene




Histogram for Mesa Fluoranthene
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
2
5
7
10
12
15
17
20
22
25
27
30
32
35
37
40
42
45
47
50
Mesa Fluoranthene


Histogram for Muddy Creek Fluoranthene
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
Muddy Creek Fluoranthene

Location Name	Sample Date	Alluv Fluoranthene	D_Alluv Fluoranthene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0

Location Name	Sample Date	Muddy Creek Fluoranthene	D_Muddy Creek Fluoranthene
BG-3S	11/27/2012	0.05	0
BG-3S	8/22/2012	0.05	0
BG-3S	5/23/2012	0.05	0
BG-3S	3/21/2012	0.05	0
BG-4S	11/27/2012	0.05	0
BG-4S	8/30/2012	0.05	0
BG-4S	5/30/2012	0.05	0
BG-4S	3/20/2012	0.05	0
BG-6S	11/27/2012	0.05	0
BG-6S	8/23/2012	0.05	0
BG-6S	5/25/2012	0.05	0
BG-6S	3/21/2012	0.05	0
BG-1M	11/26/2012	0.05	0
BG-1M	8/23/2012	0.05	0
BG-1M	5/24/2012	0.05	0
BG-1M	3/20/2012	0.05	0
BG-3M	11/27/2012	0.05	0
BG-3M	8/22/2012	0.05	0
BG-3M	5/24/2012	0.05	0
BG-3M	3/21/2012	0.05	0
BG-4M	11/27/2012	0.05	0
BG-4M	8/30/2012	0.05	0
BG-4M	5/30/2012	0.05	0
BG-4M	3/20/2012	0.05	0
BG-6M	11/27/2012	0.05	0
BG-6M	8/22/2012	0.05	0
BG-6M	5/25/2012	0.05	0
BG-6M	3/21/2012	0.05	0
BG-1D	11/26/2012	0.05	0
BG-1D	8/23/2012	0.05	0
BG-1D	5/24/2012	0.05	0
BG-1D	3/20/2012	0.05	0
BG-3D	11/27/2012	0.05	0
BG-3D	8/21/2012	0.05	0
BG-3D	5/23/2012	0.05	0
BG-3D	3/21/2012	0.05	0
BG-4D	11/27/2012	0.05	0
BG-4D	8/30/2012	0.05	0
BG-4D	5/30/2012	0.05	0
BG-4D	3/20/2012	0.012	1
BG-6D	11/27/2012	0.05	0
BG-6D	8/22/2012	0.05	0
BG-6D	5/25/2012	0.05	0
BG-6D	3/21/2012	0.05	0
IMW-3D	5/25/2012	0.05	0
IMW-3D	3/22/2012	0.05	0

Location Name	Sample Date	Mesa Fluoranthene	D_Mesa Fluoranthene
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	50	1
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Location Name	Sample Date	Alluv + Mesa Fluoranthene	D_Alluv + Mesa Fluoranthene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	50	1
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Fluoride_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Fluoride, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	26	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	26	2.7	4.6	3.592	3.6	0.452

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	64.73	57.29	0.0555	1.271	0.128	0.101

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.988	0.988	0.988	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.975	0.92	Data Appear Normal
Lilliefors (Full: no NDs)	0.132	0.174	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.987	0.987	0.987	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	0.317	0.743	
Kolmogorov-Smirnov (Full: no NDs)	0.123	0.171	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.985	0.985	0.985	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.97	0.92	Data Appear Lognormal
Lilliefors (Full: no NDs)	0.125	0.174	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Fluoride, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	46	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	46	0.5	3.7	1.166	0.71	0.901

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	2.521	2.371	0.463	-0.0576	0.605	-10.5

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.84	0.84	0.84	0.84

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.697	0.945	Data Not Normal
Lilliefors (Full: no NDs)	0.312	0.131	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.937	0.937	0.937	0.937

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	4.191	0.758	
Kolmogorov-Smirnov (Full: no NDs)	0.249	0.132	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.91	0.91	0.91	0.91

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.81	0.945	Data Not Lognormal
Lilliefors (Full: no NDs)	0.205	0.131	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Fluoride, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	0	31	30	1	3.23%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	30	1.2	4.1	2.25	2.2	0.786
Statistics (All: NDs treated as DL value)	31	0.1	4.1	2.181	2.1	0.863
Statistics (All: NDs treated as DL/2 value)	31	0.05	4.1	2.179	2.1	0.868
Statistics (Normal ROS Estimated Data)	31	0.285	4.1	2.187	2.1	0.849
Statistics (Gamma ROS Estimated Data)	31	0.27	4.1	2.186	2.1	0.85
Statistics (Lognormal ROS Estimated Data)	31	0.874	4.1	2.206	2.1	0.811

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	8.632	7.818	0.261	0.752	0.352	0.469
Statistics (NDs = DL)	4.119	3.742	0.529	0.653	0.649	0.993
Statistics (NDs = DL/2)	3.539	3.218	0.616	0.631	0.757	1.2
Statistics (Gamma ROS Estimates)	5.329	4.835	0.41	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.723	0.381	0.527

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.974	0.983	0.983	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.937	0.927	Data Appear Normal
Lilliefors (Detects Only)	0.109	0.162	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.972	0.929	Data Appear Normal
Lilliefors (NDs = DL)	0.108	0.159	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.972	0.929	Data Appear Normal
Lilliefors (NDs = DL/2)	0.108	0.159	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.972	0.929	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.106	0.159	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.987	0.972	0.967	0.884

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.374	0.746	
Kolmogorov-Smirnov (Detects Only)	0.097	0.16	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.983	0.75	
Kolmogorov-Smirnov (NDs = DL)	0.144	0.158	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL/2)	1.329	0.751	
Kolmogorov-Smirnov (NDs = DL/2)	0.17	0.159	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.534	0.747	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.102	0.158	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.984	0.815	0.763	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.952	0.927	Data Appear Lognormal
Lilliefors (Detects Only)	0.104	0.162	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.698	0.929	Data Not Lognormal
Lilliefors (NDs = DL)	0.202	0.159	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.619	0.929	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.244	0.159	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.968	0.929	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.107	0.159	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Fluoride_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Fluoride, Dissolved

General Statistics

Total Number of Observations	26	Number of Distinct Observations	14

Raw Statistics		Log-Transformed Statistics	
Minimum	2.7	Minimum	0.993
Maximum	4.6	Maximum	1.526
Second Largest	4.3	Second Largest	1.459
First Quartile	3.325	First Quartile	1.201
Median	3.6	Median	1.281
Third Quartile	3.875	Third Quartile	1.354
Mean	3.592	Mean	1.271
SD	0.452	SD	0.128
Coefficient of Variation	0.126		
Skewness	0.0431		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.975	Shapiro Wilk Test Statistic	0.97
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	4.62	95% UTL with 95% Coverage	4.767
95% UPL (t)	4.378	95% UPL (t)	4.452
90% Percentile (z)	4.171	90% Percentile (z)	4.199
95% Percentile (z)	4.335	95% Percentile (z)	4.398
99% Percentile (z)	4.643	99% Percentile (z)	4.798

Gamma Distribution Test		Data Distribution Test	
k star	57.29	Data appear Normal at 5% Significance Level	
Theta Star	0.0627		
MLE of Mean	3.592		
MLE of Standard Deviation	0.475		
nu star	2979		
A-D Test Statistic	0.317	Nonparametric Statistics	
5% A-D Critical Value	0.743	90% Percentile	4.1
K-S Test Statistic	0.123	95% Percentile	4.3
5% K-S Critical Value	0.171	99% Percentile	4.525
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	4.6
90% Percentile	4.212	95% Percentile Bootstrap UTL with 95% Coverage	4.6
95% Percentile	4.407	95% BCA Bootstrap UTL with 95% Coverage	4.525
99% Percentile	4.788	95% UPL	4.495
		95% Chebyshev UPL	5.598
95% WH Approx. Gamma UPL	4.423	Upper Threshold Limit Based upon IQR	4.7
95% HW Approx. Gamma UPL	4.43		
95% WH Approx. Gamma UTL with 95% Coverage	4.709		
95% HW Approx. Gamma UTL with 95% Coverage	4.722		

Muddy Creek Fluoride, Dissolved

General Statistics			
Total Number of Observations	46	Number of Distinct Observations	33
Raw Statistics		**Log-Transformed Statistics**	
Minimum	0.5	Minimum	-0.693
Maximum	3.7	Maximum	1.308
Second Largest	3.5	Second Largest	1.253
First Quartile	0.623	First Quartile	-0.474
Median	0.71	Median	-0.343
Third Quartile	1.225	Third Quartile	0.197
Mean	1.166	Mean	-0.0576
SD	0.901	SD	0.605
Coefficient of Variation	0.773		
Skewness	1.662		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.697	Shapiro Wilk Test Statistic	0.81
Shapiro Wilk Critical Value	0.945	Shapiro Wilk Critical Value	0.945
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	3.04	95% UTL with 95% Coverage	3.319
95% UPL (t)	2.696	95% UPL (t)	2.635
90% Percentile (z)	2.321	90% Percentile (z)	2.049
95% Percentile (z)	2.649	95% Percentile (z)	2.552
99% Percentile (z)	3.263	99% Percentile (z)	3.854
Gamma Distribution Test		**Data Distribution Test**	
k star	2.371	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.492		
MLE of Mean	1.166		
MLE of Standard Deviation	0.757		
nu star	218.1		
A-D Test Statistic	4.191	**Nonparametric Statistics**	
5% A-D Critical Value	0.758	90% Percentile	2.45
K-S Test Statistic	0.249	95% Percentile	3.3
5% K-S Critical Value	0.132	99% Percentile	3.61

Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	3.5
90% Percentile	2.18	95% Percentile Bootstrap UTL with 95% Coverage	3.6
95% Percentile	2.624	95% BCA Bootstrap UTL with 95% Coverage	3.5
99% Percentile	3.597	95% UPL	3.43
		95% Chebyshev UPL	5.137
95% WH Approx. Gamma UPL	2.634	Upper Threshold Limit Based upon IQR	2.129
95% HW Approx. Gamma UPL	2.631		
95% WH Approx. Gamma UTL with 95% Coverage	3.152		
95% HW Approx. Gamma UTL with 95% Coverage	3.184		

Mesa Fluoride, Dissolved

General Statistics			
Number of Valid Data	31	Number of Detected Data	30
Number of Distinct Detected Data	18	Number of Non-Detect Data	1
		Percent Non-Detects	3.23%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.2	Minimum Detected	0.182
Maximum Detected	4.1	Maximum Detected	1.411
Mean of Detected	2.25	Mean of Detected	0.752
SD of Detected	0.786	SD of Detected	0.352
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.937	Shapiro Wilk Test Statistic	0.952
5% Shapiro Wilk Critical Value	0.927	5% Shapiro Wilk Critical Value	0.927
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.179	Mean (Log Scale)	0.631
SD	0.868	SD (Log Scale)	0.757
95% UTL 95% Coverage	4.085	95% UTL 95% Coverage	9.917
95% UPL (t)	3.675	95% UPL (t)	6.934
90% Percentile (z)	3.291	90% Percentile (z)	4.959
95% Percentile (z)	3.606	95% Percentile (z)	6.528
99% Percentile (z)	4.197	99% Percentile (z)	10.94
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	2.171	Mean in Original Scale	2.206
SD	0.875	SD in Original Scale	0.811
95% UTL with 95% Coverage	4.094	95% UTL with 95% Coverage	4.763
		95% BCA UTL with 95% Coverage	4.1
		95% Bootstrap (%) UTL with 95% Coverage	4.1
95% UPL (t)	3.68	95% UPL (t)	3.978

90% Percentile (z)	3.293	90% Percentile (z)	3.36
95% Percentile (z)	3.611	95% Percentile (z)	3.859
99% Percentile (z)	4.207	99% Percentile (z)	5.004
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	7.791	Data appear Normal at 5% Significance Level	
Theta Star	0.289		
nu star	467.4		
A-D Test Statistic	0.374	Nonparametric Statistics	
5% A-D Critical Value	0.746	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.097	Mean	2.216
5% K-S Critical Value	0.16	SD	0.782
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.143
		95% KM UTL with 95% Coverage	3.934
Assuming Gamma Distribution		95% KM Chebyshev UPL	5.68
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	3.565
Mean	2.186	90% Percentile (z)	3.218
Median	2.1	95% Percentile (z)	3.503
SD	0.85	99% Percentile (z)	4.036
k star	4.835		
Theta star	0.452	Gamma ROS Limits with Extrapolated Data	
Nu star	299.7	95% Wilson Hilferty (WH) Approx. Gamma UPL	4.081
95% Percentile of Chisquare (2k)	17.85	95% Hawkins Wixley (HW) Approx. Gamma UPL	4.197
		95% WH Approx. Gamma UTL with 95% Coverage	4.804
90% Percentile	3.517	95% HW Approx. Gamma UTL with 95% Coverage	5.008
95% Percentile	4.036		
99% Percentile	5.133		

Note: DL/2 is not a recommended method.

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Fluoride_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Fluoride, Dissolved

Background Data: Alluv Fluoride, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	31	26
Number of Non-Detect Data	1	0
Number of Detect Data	30	26
Minimum Non-Detect	0.1	N/A
Maximum Non-Detect	0.1	N/A
Percent Non detects	3.23%	0.00%
Minimum Detected	1.2	2.7
Maximum Detected	4.1	4.6
Mean of Detected Data	2.25	3.592
Median of Detected Data	2.2	3.6
SD of Detected Data	0.786	0.452

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	561.5
WMW Test U-Stat	5.399
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	6.1172E-8

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Fluoride_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Fluoride, Dissolved

Background Data: Alluv Fluoride, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	46	26
Number of Distinct Observations	33	14
Minimum	0.5	2.7
Maximum	3.7	4.6
Mean	1.166	3.592
Median	0.71	3.6
SD	0.901	0.452
SE of Mean	0.133	0.0886

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1119
WMW Test U-Stat	6.565
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	4.801E-11

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Fluoride_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Fluoride, Dissolved

Background Data: Muddy Creek Fluoride, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	31	46
Number of Non-Detect Data	1	0
Number of Detect Data	30	46
Minimum Non-Detect	0.1	N/A
Maximum Non-Detect	0.1	N/A
Percent Non detects	3.23%	0.00%
Minimum Detected	1.2	0.5
Maximum Detected	4.1	3.7
Mean of Detected Data	2.25	1.166
Median of Detected Data	2.2	0.71
SD of Detected Data	0.786	0.901

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

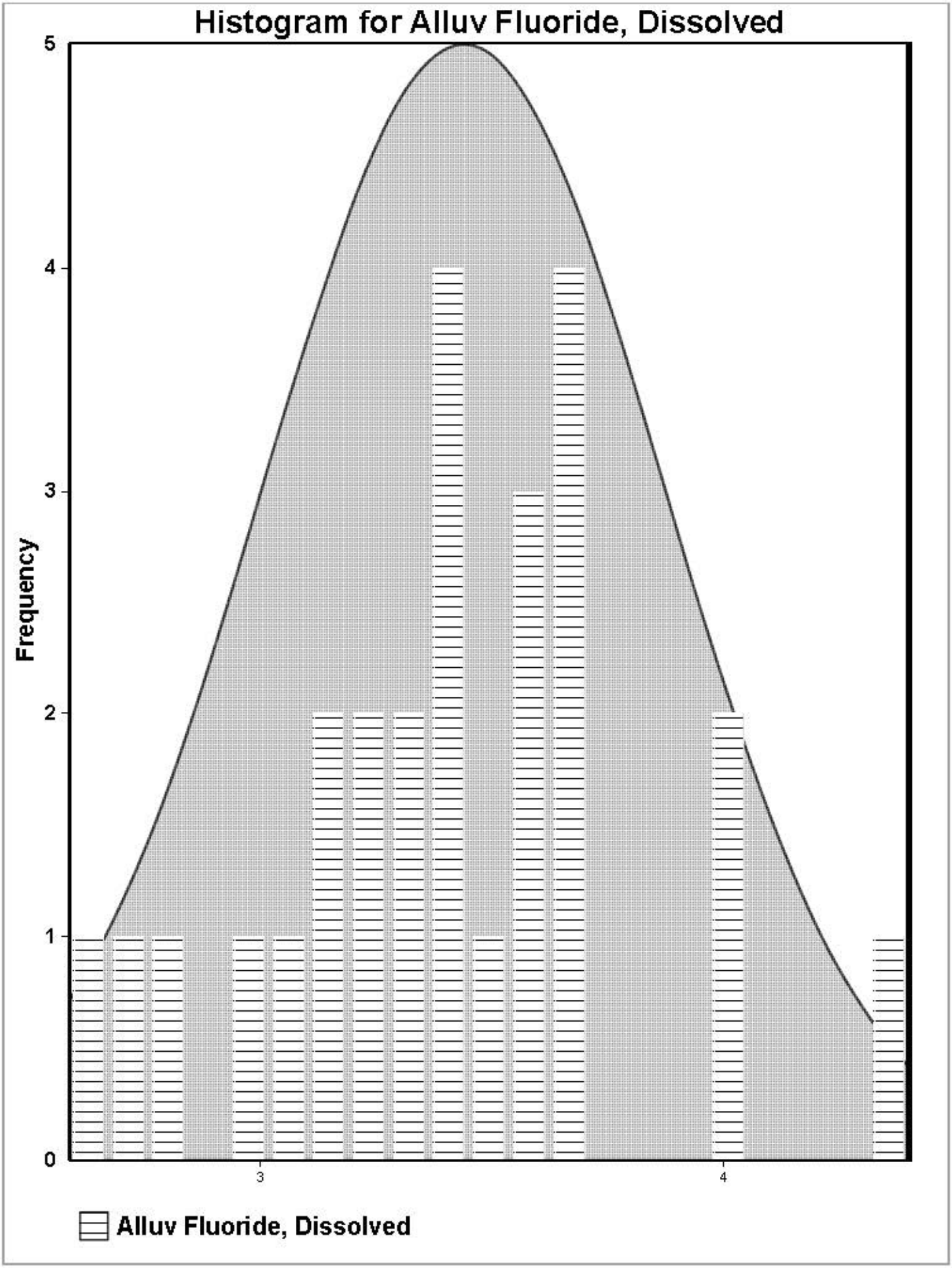
H0: Mean/Median of Site or AOC = Mean/Median of Background

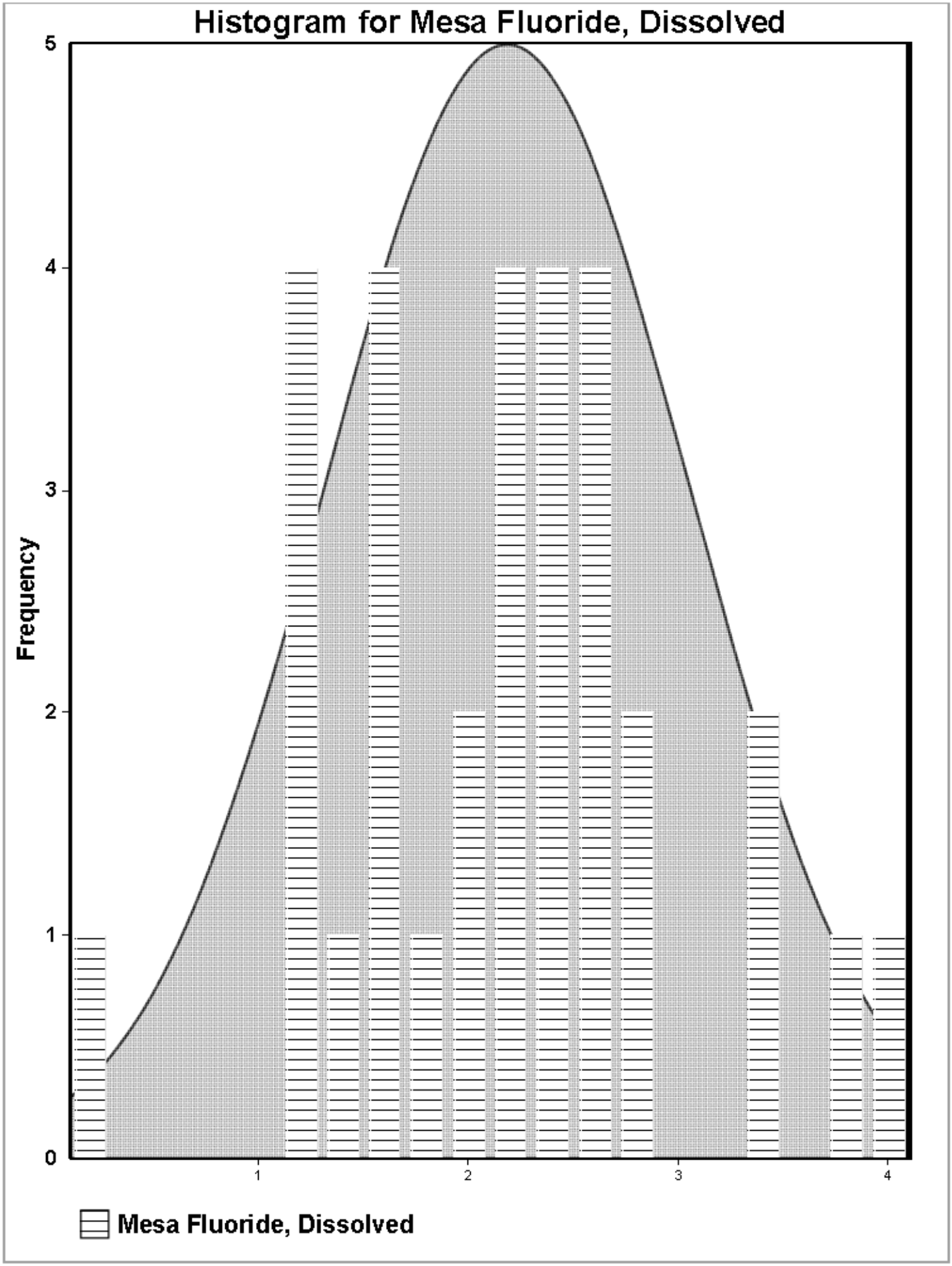
Site Rank Sum W-Stat	1670
WMW Test U-Stat	4.778
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	1.7709E-6

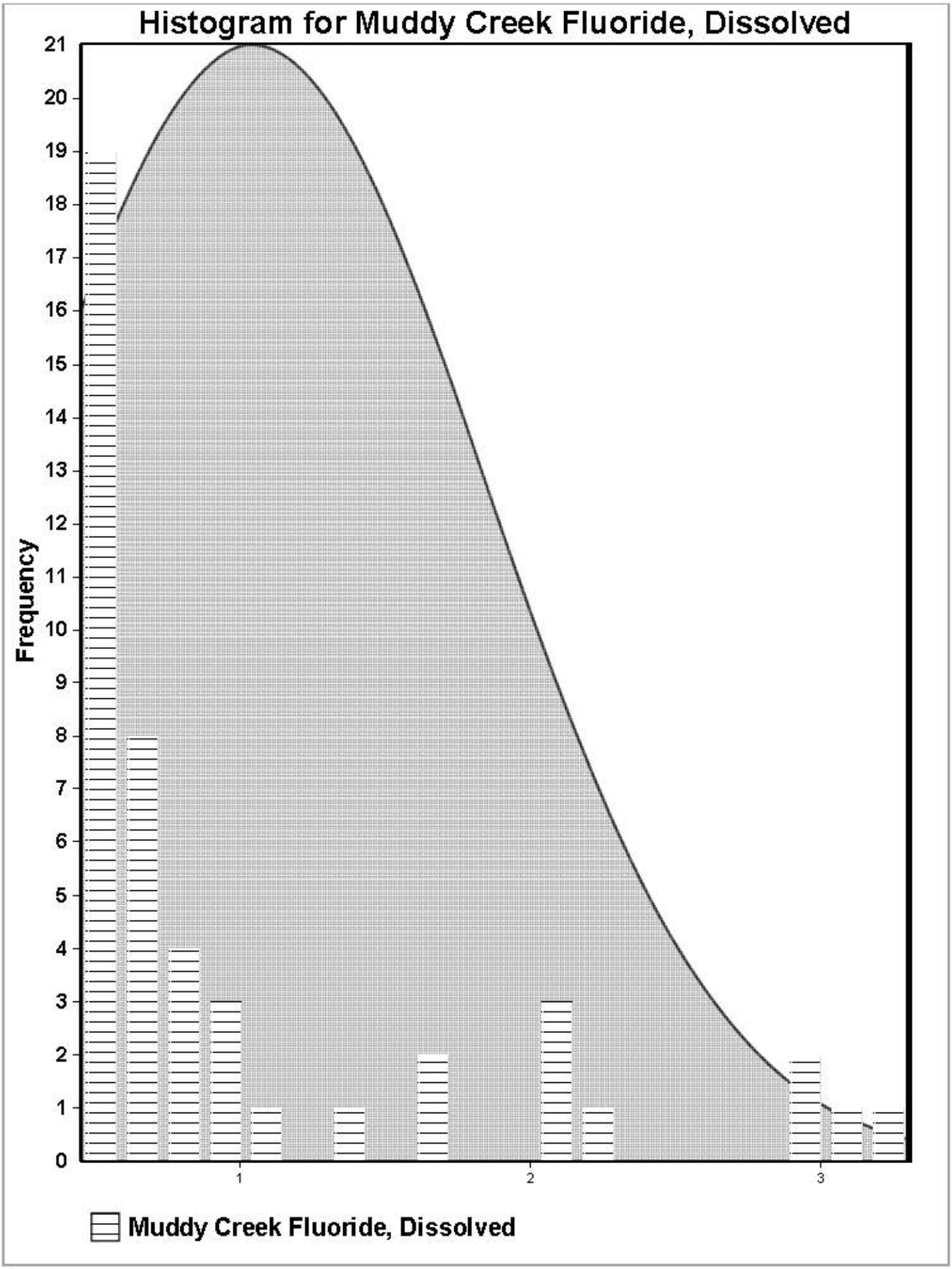
Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Fluoride, Dissolved
Frequency
0
1
2
3
4
5
3
4
Alluv Fluoride, Dissolved


Histogram for Mesa Fluoride, Dissolved
Frequency
0
1
2
3
4
5
1
2
3
4
Mesa Fluoride, Dissolved


Histogram for Muddy Creek Fluoride, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
1
2
3
Muddy Creek Fluoride, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Fluoride_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Fluoride, Dissolved

Mean	3.592
Standard Deviation	0.452
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3.592	0.443	4.6	12	2.276	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Fluoride, Dissolved

Mean	1.166
Standard Deviation	0.901
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.166	0.891	3.7	17	2.843	3.09	3.45

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Fluoride, Dissolved

Mean	2.179
Standard Deviation	0.868
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2.179	0.853	0.05	10	2.495	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Location Name	Sample Date	Alluv Fluoride, Dissolved	D_Alluv Fluoride, Dissolved
BG-1S	11/26/2012	2.7	1
BG-1S	8/23/2012	2.8	1
BG-1S	5/24/2012	2.9	1
BG-1S	3/20/2012	3.2	1
IMW-2.5D	11/26/2012	3.1	1
IMW-2.5D	8/24/2012	3.9	1
IMW-2.5D	5/21/2012	3.8	1
IMW-2.5D	3/21/2012	3.9	1
IMW-2.5S	11/26/2012	3.6	1
IMW-2.5S	8/24/2012	4.3	1
IMW-2.5S	5/21/2012	4.3	1
IMW-2.5S	3/21/2012	4.6	1
IMW-3S	5/21/2012	3.6	1
IMW-3S	3/20/2012	3.9	1
KMW-2D	11/26/2012	3.3	1
KMW-2D	8/24/2012	3.5	1
KMW-2D	5/21/2012	3.4	1
KMW-2D	3/23/2012	3.6	1
KMW-2M	11/26/2012	3.3	1
KMW-2M	8/24/2012	3.5	1
KMW-2M	5/21/2012	3.4	1
KMW-2M	3/23/2012	3.6	1
KMW-2S	11/26/2012	3.7	1
KMW-2S	8/24/2012	3.8	1
KMW-2S	5/21/2012	3.9	1
KMW-2S	3/23/2012	3.8	1

Location Name	Sample Date	Muddy Creek Fluoride, Dissolved	D_Muddy Creek Fluoride, Dissolved
BG-3S	11/27/2012	1.9	1
BG-3S	8/22/2012	1.5	1
BG-3S	5/23/2012	1.3	1
BG-3S	3/21/2012	1.9	1
BG-4S	11/27/2012	0.82	1
BG-4S	8/30/2012	0.56	1
BG-4S	5/30/2012	0.52	1
BG-4S	3/20/2012	0.54	1
BG-6S	11/27/2012	0.63	1
BG-6S	8/23/2012	0.66	1
BG-6S	5/25/2012	0.66	1
BG-6S	3/21/2012	0.67	1
BG-1M	11/26/2012	0.5	1
BG-1M	8/23/2012	0.59	1
BG-1M	5/24/2012	0.54	1
BG-1M	3/20/2012	0.58	1
BG-3M	11/27/2012	3.7	1
BG-3M	8/22/2012	3.3	1
BG-3M	5/24/2012	3.3	1
BG-3M	3/21/2012	3.5	1
BG-4M	11/27/2012	0.9	1
BG-4M	8/30/2012	0.66	1
BG-4M	5/30/2012	0.58	1
BG-4M	3/20/2012	0.66	1
BG-6M	11/27/2012	0.64	1
BG-6M	8/22/2012	0.67	1
BG-6M	5/25/2012	0.64	1
BG-6M	3/21/2012	0.67	1
BG-1D	11/26/2012	0.53	1
BG-1D	8/23/2012	0.6	1
BG-1D	5/24/2012	0.57	1
BG-1D	3/20/2012	0.62	1
BG-3D	11/27/2012	2.4	1
BG-3D	8/21/2012	2.4	1
BG-3D	5/23/2012	2.3	1
BG-3D	3/21/2012	2.5	1
BG-4D	11/27/2012	1	1
BG-4D	8/30/2012	1	1
BG-4D	5/30/2012	1	1
BG-4D	3/20/2012	0.88	1
BG-6D	11/27/2012	0.7	1
BG-6D	8/22/2012	0.76	1
BG-6D	5/25/2012	0.72	1
BG-6D	3/21/2012	0.75	1
IMW-3D	5/25/2012	0.86	1
IMW-3D	3/22/2012	0.96	1

Location Name	Sample Date	Mesa Fluoride, Dissolved	D_Mesa Fluoride, Dissolved
LMW-10	11/28/2012	1.4	1
LMW-10	8/27/2012	1.6	1
LMW-10	5/30/2012	1.6	1
LMW-10	3/22/2012	1.6	1
LMW-10	12/6/2011	1.5	1
LMW-11R	11/26/2012	1.7	1
LMW-11R	8/21/2012	2.1	1
LMW-11R	5/29/2012	1.9	1
LMW-11R	3/23/2012	2.1	1
LMW-7	11/28/2012	0.1	0
LMW-7	8/27/2012	1.2	1
LMW-7	5/31/2012	1.2	1
LMW-7	3/23/2012	1.2	1
LMW-7	12/5/2011	1.2	1
BG-2S	11/26/2012	3.5	1
BG-2S	8/23/2012	3.9	1
BG-2S	5/24/2012	3.4	1
BG-2S	3/21/2012	4.1	1
BG-2M	11/26/2012	2	1
BG-2M	8/23/2012	2.5	1
BG-2M	5/24/2012	2.3	1
BG-2M	3/21/2012	2.4	1
BG-2D	11/26/2012	2.4	1
BG-2D	8/23/2012	2.8	1
BG-2D	5/24/2012	2.7	1
BG-2D	3/21/2012	2.8	1
LMW-9	11/28/2012	2.1	1
LMW-9	8/27/2012	2.6	1
LMW-9	5/31/2012	2.6	1
LMW-9	3/23/2012	2.6	1
LMW-9	12/5/2011	2.5	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Indeno(1,2,3-cd)pyrene.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv indeno(1,2,3-cd)pyrene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	0	26	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv indeno(1,2,3-cd)pyrene was not processed!

Muddy Creek indeno(1,2,3-cd)pyrene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	0	46	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Muddy Creek indeno(1,2,3-cd)pyrene was not processed!

Mesa indeno(1,2,3-cd)pyrene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	0	28	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mesa indeno(1,2,3-cd)pyrene was not processed!

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Indeno(1,2,3-cd)pyrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv indeno(1,2,3-cd)pyrene

General Statistics

Number of Valid Data	26	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	26

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Alluv indeno(1,2,3-cd)pyrene was not processed!

Muddy Creek indeno(1,2,3-cd)pyrene

General Statistics

Number of Valid Data	46	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	46

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Muddy Creek indeno(1,2,3-cd)pyrene was not processed!

Mesa indeno(1,2,3-cd)pyrene

General Statistics

Number of Valid Data	28	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	28

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mesa indeno(1,2,3-cd)pyrene was not processed!

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Indeno(1,2,3-cd)pyrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa indeno(1,2,3-cd)pyrene

Background Data: Alluv indeno(1,2,3-cd)pyrene

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	28	26
Number of Detect Data	0	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	100.00%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Indeno(1,2,3-cd)pyrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek indeno(1,2,3-cd)pyrene

Background Data: Alluv indeno(1,2,3-cd)pyrene

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	46	26
Number of Detect Data	0	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	100.00%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

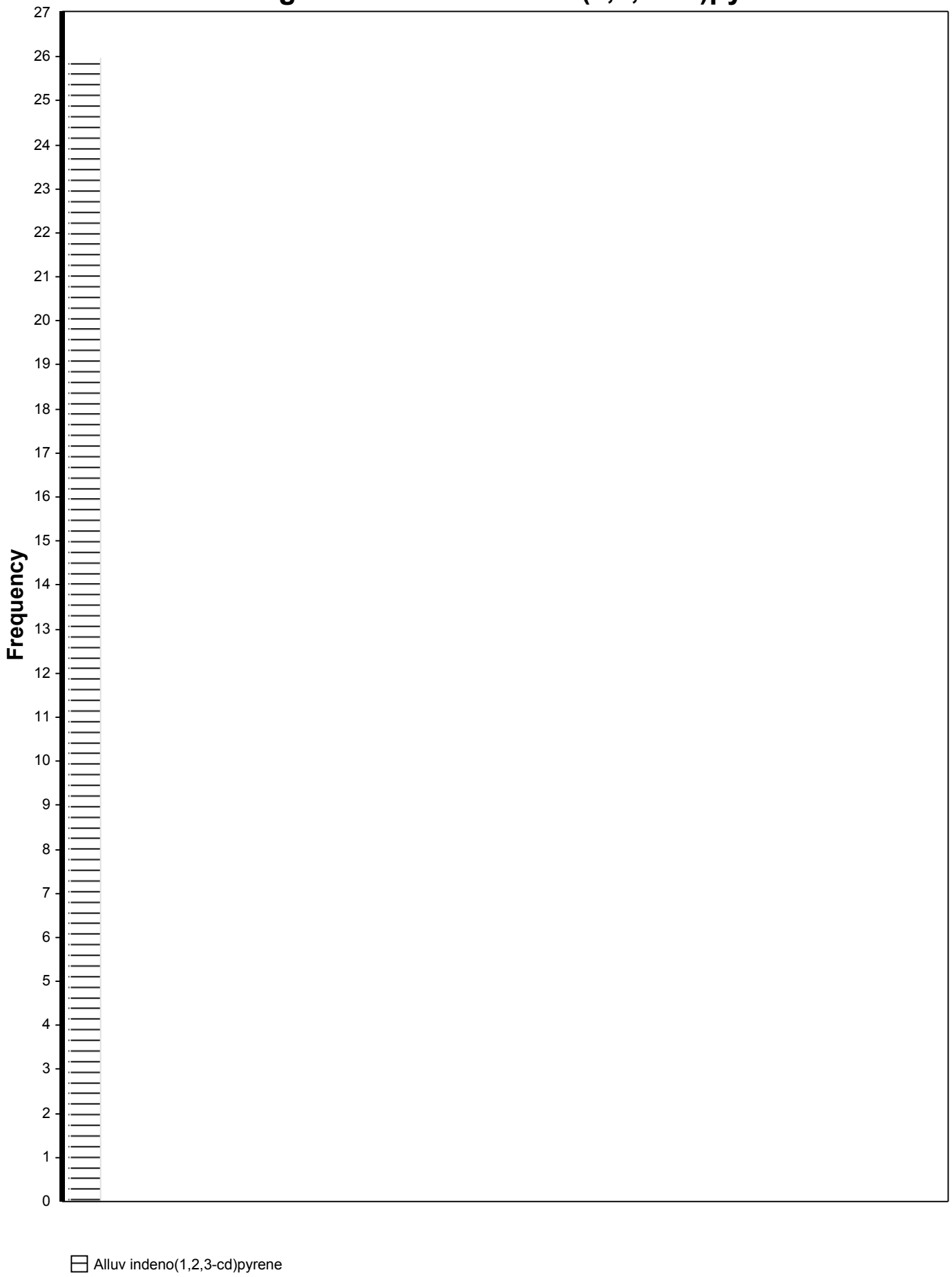
Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

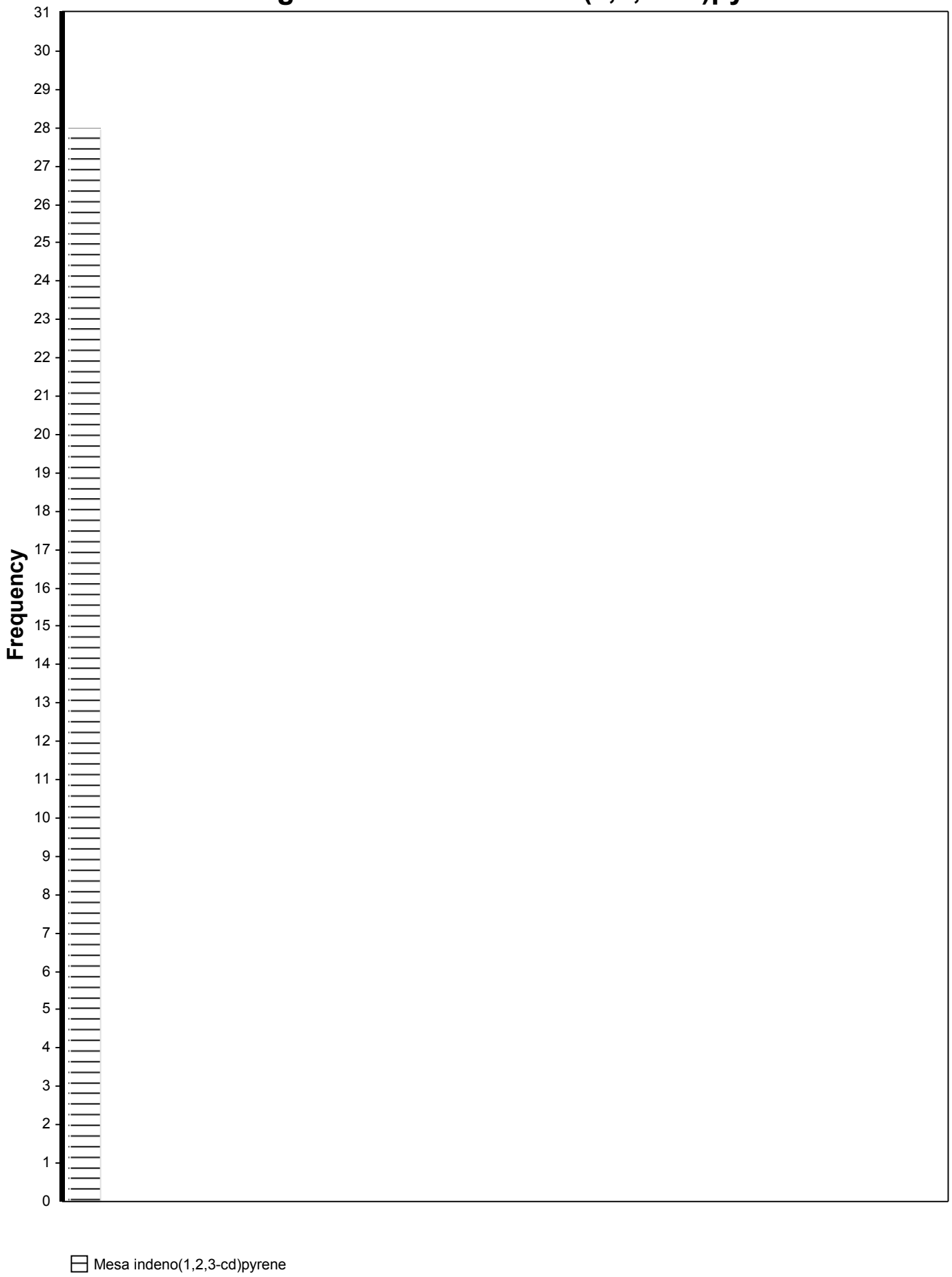
Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

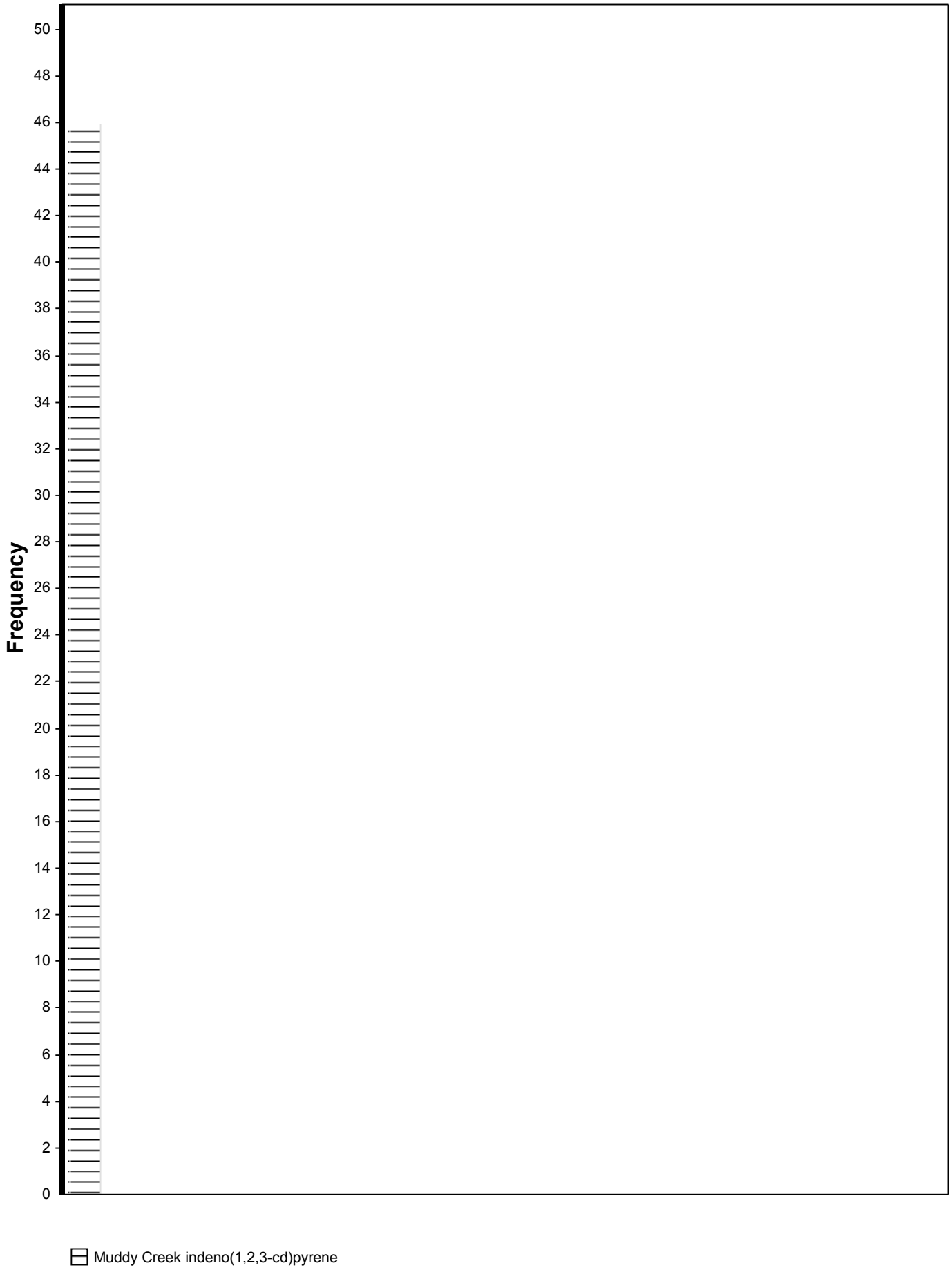
Histogram for Alluv indeno(1,2,3-cd)pyrene



Histogram for Mesa indeno(1,2,3-cd)pyrene



Histogram for Muddy Creek indeno(1,2,3-cd)pyrene



Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Indeno(1,2,3-cd)pyrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa indeno(1,2,3-cd)pyrene

Background Data: Muddy Creek indeno(1,2,3-cd)pyrene

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	28	46
Number of Detect Data	0	0
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	100.00%	100.00%
Minimum Detected	N/A	N/A
Maximum Detected	N/A	N/A
Mean of Detected Data	N/A	N/A
Median of Detected Data	N/A	N/A
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	N/A
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	N/A

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

	Outlier Tests for Selected Variables
User Selected Options	
From File	Indeno(1,2,3-cd)pyrene.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv indeno(1,2,3-cd)pyrene

Mean	0.025
Standard Deviation	7.076E-18

Rosner's Outlier Test for Muddy Creek indeno(1,2,3-cd)pyrene

Mean	0.025
Standard Deviation	3.508E-18

Rosner's Outlier Test for Mesa indeno(1,2,3-cd)pyrene

Mean	0.025
Standard Deviation	1.060E-17

Location Name	Sample Date	Alluv indeno(1,2,3-cd)pyrene	D_Alluv indeno(1,2,3-cd)pyrene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0

Location Name	Sample Date	Muddy Creek indeno(1,2,3-cd)pyrene	D_Muddy Creek indeno(1,2,3-cd)pyrene
BG-3S	#########	0.05	0
BG-3S	8/22/2012	0.05	0
BG-3S	5/23/2012	0.05	0
BG-3S	3/21/2012	0.05	0
BG-4S	#########	0.05	0
BG-4S	8/30/2012	0.05	0
BG-4S	5/30/2012	0.05	0
BG-4S	3/20/2012	0.05	0
BG-6S	#########	0.05	0
BG-6S	8/23/2012	0.05	0
BG-6S	5/25/2012	0.05	0
BG-6S	3/21/2012	0.05	0
BG-1M	#########	0.05	0
BG-1M	8/23/2012	0.05	0
BG-1M	5/24/2012	0.05	0
BG-1M	3/20/2012	0.05	0
BG-3M	#########	0.05	0
BG-3M	8/22/2012	0.05	0
BG-3M	5/24/2012	0.05	0
BG-3M	3/21/2012	0.05	0
BG-4M	#########	0.05	0
BG-4M	8/30/2012	0.05	0
BG-4M	5/30/2012	0.05	0
BG-4M	3/20/2012	0.05	0
BG-6M	#########	0.05	0
BG-6M	8/22/2012	0.05	0
BG-6M	5/25/2012	0.05	0
BG-6M	3/21/2012	0.05	0
BG-1D	#########	0.05	0
BG-1D	8/23/2012	0.05	0
BG-1D	5/24/2012	0.05	0
BG-1D	3/20/2012	0.05	0
BG-3D	#########	0.05	0
BG-3D	8/21/2012	0.05	0
BG-3D	5/23/2012	0.05	0
BG-3D	3/21/2012	0.05	0
BG-4D	#########	0.05	0
BG-4D	8/30/2012	0.05	0
BG-4D	5/30/2012	0.05	0
BG-4D	3/20/2012	0.05	0
BG-6D	#########	0.05	0
BG-6D	8/22/2012	0.05	0
BG-6D	5/25/2012	0.05	0
BG-6D	3/21/2012	0.05	0
IMW-3D	5/25/2012	0.05	0
IMW-3D	3/22/2012	0.05	0

Location Name	Sample Date	Mesa indeno(1,2,3-cd)pyrene	D_Mesa indeno(1,2,3-cd)pyrene
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Location Name	Sample Date	Alluv + Mesa indeno(1,2,3-cd)pyrene	D_Alluv + Mesa indeno(1,2,3-cd)pyrene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.05	0
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.05	0
KMW-2D	8/24/2012	0.05	0
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.05	0
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0
BG-2S	11/26/2012	0.05	0
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	50	1
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.05	0
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Iron_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Iron, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	8	18	69.23%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	18	0.1	0.1	0.1	0.1	2.856E-17
Statistics (Detects Only)	8	0.019	0.51	0.148	0.0775	0.169
Statistics (All: NDs treated as DL value)	26	0.019	0.51	0.115	0.1	0.0921
Statistics (All: NDs treated as DL/2 value)	26	0.019	0.51	0.0801	0.05	0.1
Statistics (Normal ROS Estimated Data)	26	-0.162	0.51	0.0667	0.0506	0.132
Statistics (Gamma ROS Estimated Data)	26	1.000E-12	0.51	0.117	0.101	0.109
Statistics (Lognormal ROS Estimated Data)	26	0.0068	0.51	0.0748	0.0395	0.105

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.039	0.945	0.142	-2.465	1.136	-0.461
Statistics (NDs = DL)	2.825	2.525	0.0406	-2.352	0.606	-0.258
Statistics (NDs = DL/2)	1.772	1.593	0.0452	-2.832	0.651	-0.23
Statistics (Gamma ROS Estimates)	0.306	0.297	0.382	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.127	0.992	-0.317

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.884	0.692	0.638	0.941

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.787	0.818	Data Not Normal
Lilliefors (Detects Only)	0.237	0.313	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.512	0.92	Data Not Normal
Lilliefors (NDs = DL)	0.448	0.174	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.435	0.92	Data Not Normal
Lilliefors (NDs = DL/2)	0.445	0.174	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.906	0.92	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.124	0.174	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.996	0.796	0.812	0.937

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.323	0.735	
Kolmogorov-Smirnov (Detects Only)	0.197	0.301	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	3.968	0.752	
Kolmogorov-Smirnov (NDs = DL)	0.394	0.173	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	5.233	0.759	
Kolmogorov-Smirnov (NDs = DL/2)	0.434	0.174	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.515	0.85	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.324	0.186	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.987	0.838	0.792	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.962	0.818	Data Appear Lognormal
Lilliefors (Detects Only)	0.15	0.313	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.734	0.92	Data Not Lognormal
Lilliefors (NDs = DL)	0.379	0.174	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.654	0.92	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.407	0.174	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.984	0.92	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0665	0.174	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Iron, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	7	39	84.78%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	39	0.1	0.1	0.1	0.1	5.624E-17
Statistics (Detects Only)	7	0.016	0.34	0.1	0.068	0.11
Statistics (All: NDs treated as DL value)	46	0.016	0.34	0.1	0.1	0.0401
Statistics (All: NDs treated as DL/2 value)	46	0.016	0.34	0.0576	0.05	0.0441
Statistics (Normal ROS Estimated Data)	46	-0.106	0.34	0.0736	0.0692	0.0854
Statistics (Gamma ROS Estimated Data)	46	0.016	0.34	0.0933	0.0921	0.0509
Statistics (Lognormal ROS Estimated Data)	46	0.01	0.34	0.0702	0.0522	0.0609

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.382	1.306	0.0724	-2.706	0.951	-0.351
Statistics (NDs = DL)	8.302	7.775	0.012	-2.364	0.377	-0.159
Statistics (NDs = DL/2)	5.284	4.954	0.0109	-2.952	0.363	-0.123
Statistics (Gamma ROS Estimates)	4.064	3.813	0.023	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.95	0.776	-0.263

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.829	0.548	0.477	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.711	0.803	Data Not Normal
Lilliefors (Detects Only)	0.364	0.335	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.357	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.478	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.274	0.945	Data Not Normal

Lilliefors (NDs = DL/2)	0.482	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.987	0.945	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0582	0.131	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.949	0.579	0.576	0.812

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.376	0.723	
Kolmogorov-Smirnov (Detects Only)	0.253	0.318	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	12.26	0.75	
Kolmogorov-Smirnov (NDs = DL)	0.432	0.131	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	12.27	0.753	
Kolmogorov-Smirnov (NDs = DL/2)	0.481	0.131	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.5	0.753	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.11	0.131	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.977	0.626	0.628	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.973	0.803	Data Appear Lognormal
Lilliefors (Detects Only)	0.201	0.335	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.452	0.945	Data Not Lognormal
Lilliefors (NDs = DL)	0.435	0.131	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.46	0.945	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.461	0.131	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.992	0.945	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0338	0.131	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Iron, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	0	31	6	25	80.65%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	25	0.1	0.1	0.1	0.1	2.833E-17
Statistics (Detects Only)	6	0.028	1	0.278	0.0635	0.395
Statistics (All: NDs treated as DL value)	31	0.028	1	0.134	0.1	0.176
Statistics (All: NDs treated as DL/2 value)	31	0.028	1	0.0941	0.05	0.185
Statistics (Normal ROS Estimated Data)	31	-0.425	1	0.115	0.085	0.283
Statistics (Gamma ROS Estimated Data)	31	1.000E-12	1	0.232	0.228	0.219
Statistics (Lognormal ROS Estimated Data)	31	0.00515	1	0.111	0.0469	0.191

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.641	0.6	0.433	-2.236	1.517	-0.678
Statistics (NDs = DL)	1.918	1.754	0.0701	-2.29	0.62	-0.271
Statistics (NDs = DL/2)	1.169	1.078	0.0804	-2.849	0.69	-0.242

Statistics (Gamma ROS Estimates)	0.149	0.156	1.556	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.939	1.179	-0.401

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.854	0.549	0.515	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.732	0.788	Data Not Normal
Lilliefors (Detects Only)	0.354	0.362	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.335	0.929	Data Not Normal
Lilliefors (NDs = DL)	0.513	0.159	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.296	0.929	Data Not Normal
Lilliefors (NDs = DL/2)	0.497	0.159	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.962	0.929	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0874	0.159	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.989	0.706	0.733	0.881

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.612	0.727	
Kolmogorov-Smirnov (Detects Only)	0.303	0.346	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	7.483	0.76	
Kolmogorov-Smirnov (NDs = DL)	0.492	0.16	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	9.237	0.772	
Kolmogorov-Smirnov (NDs = DL/2)	0.519	0.162	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	7.941	0.924	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.394	0.177	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.934	0.728	0.633	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.851	0.788	Data Appear Lognormal
Lilliefors (Detects Only)	0.231	0.362	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.568	0.929	Data Not Lognormal
Lilliefors (NDs = DL)	0.444	0.159	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.431	0.929	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.488	0.159	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.99	0.929	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0614	0.159	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

All Iron, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	103	0	103	21	82	79.61%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	82	0.1	0.1	0.1	0.1	1.676E-16
Statistics (Detects Only)	21	0.016	1	0.169	0.068	0.241
Statistics (All: NDs treated as DL value)	103	0.016	1	0.114	0.1	0.11
Statistics (All: NDs treated as DL/2 value)	103	0.016	1	0.0743	0.05	0.117
Statistics (Normal ROS Estimated Data)	103	-0.262	1	0.0863	0.0703	0.163
Statistics (Gamma ROS Estimated Data)	103	1.000E-12	1	0.138	0.119	0.132
Statistics (Lognormal ROS Estimated Data)	103	0.00569	1	0.0811	0.0477	0.122

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.84	0.822	0.201	-2.48	1.155	-0.466
Statistics (NDs = DL)	3.137	3.052	0.0364	-2.339	0.517	-0.221
Statistics (NDs = DL/2)	1.871	1.823	0.0397	-2.891	0.553	-0.191
Statistics (Gamma ROS Estimates)	0.28	0.278	0.491	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.997	0.922	-0.308

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.798	0.535	0.499	0.934

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.651	0.908	Data Not Normal
Lilliefors (Detects Only)	0.327	0.193	Data Not Normal
Lilliefors (NDs = DL)	0.493	0.0873	Data Not Normal
Lilliefors (NDs = DL/2)	0.466	0.0873	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0772	0.0873	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.972	0.651	0.681	0.892

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.155	0.778	
Kolmogorov-Smirnov (Detects Only)	0.239	0.196	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	22.92	0.758	
Kolmogorov-Smirnov (NDs = DL)	0.456	0.0892	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	27.02	0.766	
Kolmogorov-Smirnov (NDs = DL/2)	0.484	0.09	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	20.27	0.877	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.327	0.0966	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.972	0.742	0.685	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.939	0.908	Data Appear Lognormal
Lilliefors (Detects Only)	0.153	0.193	Data Appear Lognormal
Lilliefors (NDs = DL)	0.414	0.0873	Data Not Lognormal

Lilliefors (NDs = DL/2)	0.459	0.0873	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0357	0.0873	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Iron_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Iron, Dissolved

General Statistics

Number of Valid Data	26	Number of Detected Data	8
Number of Distinct Detected Data	8	Number of Non-Detect Data	18
		Percent Non-Detects	69.23%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.019	Minimum Detected	-3.963
Maximum Detected	0.51	Maximum Detected	-0.673
Mean of Detected	0.148	Mean of Detected	-2.465
SD of Detected	0.169	SD of Detected	1.136
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: There are only 8 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.787	Shapiro Wilk Test Statistic	0.962
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0801	Mean (Log Scale)	-2.832
SD	0.1	SD (Log Scale)	0.651
95% UTL 95% Coverage	0.309	95% UTL 95% Coverage	0.259
95% UPL (t)	0.255	95% UPL (t)	0.183
90% Percentile (z)	0.209	90% Percentile (z)	0.136
95% Percentile (z)	0.245	95% Percentile (z)	0.172
99% Percentile (z)	0.314	99% Percentile (z)	0.268
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.23	Mean in Original Scale	0.0748
SD	0.321	SD in Original Scale	0.105
95% UTL with 95% Coverage	0.5	95% UTL with 95% Coverage	0.419

		95% BCA UTL with 95% Coverage	0.51
		95% Bootstrap (%) UTL with 95% Coverage	0.51
95% UPL (t)	0.329	95% UPL (t)	0.247
90% Percentile (z)	0.181	90% Percentile (z)	0.156
95% Percentile (z)	0.298	95% Percentile (z)	0.224
99% Percentile (z)	0.517	99% Percentile (z)	0.441
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.733	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.202		
nu star	11.72		
A-D Test Statistic	0.323	Nonparametric Statistics	
5% A-D Critical Value	0.735	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.197	Mean	0.0703
5% K-S Critical Value	0.301	SD	0.102
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0221
		95% KM UTL with 95% Coverage	0.303
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.525
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.248
Mean	0.117	90% Percentile (z)	0.201
Median	0.101	95% Percentile (z)	0.238
SD	0.109	99% Percentile (z)	0.308
k star	0.297		
Theta star	0.394	Gamma ROS Limits with Extrapolated Data	
Nu star	15.43	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.423
95% Percentile of Chisquare (2k)	2.724	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.537
		95% WH Approx. Gamma UTL with 95% Coverage	0.612
90% Percentile	0.346	95% HW Approx. Gamma UTL with 95% Coverage	0.852
95% Percentile	0.537		
99% Percentile	1.036		

Note: DL/2 is not a recommended method.

Muddy Creek Iron, Dissolved

General Statistics			
Number of Valid Data	46	Number of Detected Data	7
Number of Distinct Detected Data	7	Number of Non-Detect Data	39
		Percent Non-Detects	84.78%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.016	Minimum Detected	-4.135
Maximum Detected	0.34	Maximum Detected	-1.079
Mean of Detected	0.1	Mean of Detected	-2.706
SD of Detected	0.11	SD of Detected	0.951
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: There are only 7 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.711	Shapiro Wilk Test Statistic	0.973
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0576	Mean (Log Scale)	-2.952
SD	0.0441	SD (Log Scale)	0.363
95% UTL 95% Coverage	0.149	95% UTL 95% Coverage	0.111
95% UPL (t)	0.132	95% UPL (t)	0.0967
90% Percentile (z)	0.114	90% Percentile (z)	0.0832
95% Percentile (z)	0.13	95% Percentile (z)	0.0949
99% Percentile (z)	0.16	99% Percentile (z)	0.122
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0702
		SD in Original Scale	0.0609
		Mean in Log Scale	-2.95
		SD in Log Scale	0.776
		95% UTL 95% Coverage	0.263
		95% UPL (t)	0.195
		90% Percentile (z)	0.142
		95% Percentile (z)	0.188
		99% Percentile (z)	0.318
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.885	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.113		
nu star	12.39		
A-D Test Statistic	0.376	Nonparametric Statistics	
5% A-D Critical Value	0.723	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.253	Mean	0.0661
5% K-S Critical Value	0.318	SD	0.0503
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0144
		95% KM UTL with 95% Coverage	0.171
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.288
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.151
Mean	0.0933	90% Percentile (z)	0.131
Median	0.0921	95% Percentile (z)	0.149
SD	0.0509	99% Percentile (z)	0.183
k star	3.813		
Theta star	0.0245	Gamma ROS Limits with Extrapolated Data	
Nu star	350.8	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.184
95% Percentile of Chisquare (2k)	14.97	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.187
		95% WH Approx. Gamma UTL with 95% Coverage	0.214

90% Percentile	0.157	95% HW Approx. Gamma UTL with 95% Coverage	0.219
95% Percentile	0.183		
99% Percentile	0.239		

Note: DL/2 is not a recommended method.

Mesa Iron, Dissolved

General Statistics

Number of Valid Data	31	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	25
		Percent Non-Detects	80.65%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.028	Minimum Detected	-3.576
Maximum Detected	1	Maximum Detected	0
Mean of Detected	0.278	Mean of Detected	-2.236
SD of Detected	0.395	SD of Detected	1.517
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: There are only 6 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.732	Shapiro Wilk Test Statistic	0.851
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0941	Mean (Log Scale)	-2.849
SD	0.185	SD (Log Scale)	0.69
95% UTL 95% Coverage	0.501	95% UTL 95% Coverage	0.264
95% UPL (t)	0.413	95% UPL (t)	0.19
90% Percentile (z)	0.331	90% Percentile (z)	0.14
95% Percentile (z)	0.399	95% Percentile (z)	0.18
99% Percentile (z)	0.525	99% Percentile (z)	0.289
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.111
		SD in Original Scale	0.191
		Mean in Log Scale	-2.939
		SD in Log Scale	1.179
		95% UTL 95% Coverage	0.705
		95% UPL (t)	0.404

		90% Percentile (z)	0.24
		95% Percentile (z)	0.368
		99% Percentile (z)	0.821
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.431	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.644		
nu star	5.178		
A-D Test Statistic	0.612	Nonparametric Statistics	
5% A-D Critical Value	0.727	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.303	Mean	0.0912
5% K-S Critical Value	0.346	SD	0.184
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0378
		95% KM UTL with 95% Coverage	0.496
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.906
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.409
Mean	0.232	90% Percentile (z)	0.327
Median	0.228	95% Percentile (z)	0.394
SD	0.219	99% Percentile (z)	0.519
k star	0.156		
Theta star	1.485	Gamma ROS Limits with Extrapolated Data	
Nu star	9.672	95% Wilson Hilferty (WH) Approx. Gamma UPL	1.008
95% Percentile of Chisquare (2k)	1.704	95% Hawkins Wixley (HW) Approx. Gamma UPL	1.404
		95% WH Approx. Gamma UTL with 95% Coverage	1.486
90% Percentile	0.691	95% HW Approx. Gamma UTL with 95% Coverage	2.321
95% Percentile	1.265		
99% Percentile	2.92		

Note: DL/2 is not a recommended method.

All Iron, Dissolved

General Statistics			
Number of Valid Data	103	Number of Detected Data	21
Number of Distinct Detected Data	21	Number of Non-Detect Data	82
		Percent Non-Detects	79.61%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.016	Minimum Detected	-4.135
Maximum Detected	1	Maximum Detected	0
Mean of Detected	0.169	Mean of Detected	-2.48
SD of Detected	0.241	SD of Detected	1.155
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303
Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.651	Shapiro Wilk Test Statistic	0.939
5% Shapiro Wilk Critical Value	0.908	5% Shapiro Wilk Critical Value	0.908
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0743	Mean (Log Scale)	-2.891
SD	0.117	SD (Log Scale)	0.553
95% UTL 95% Coverage	0.299	95% UTL 95% Coverage	0.16
95% UPL (t)	0.269	95% UPL (t)	0.14
90% Percentile (z)	0.224	90% Percentile (z)	0.113
95% Percentile (z)	0.267	95% Percentile (z)	0.138
99% Percentile (z)	0.346	99% Percentile (z)	0.201
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.953	Mean in Original Scale	0.0811
SD	0.706	SD in Original Scale	0.122
95% UTL with 95% Coverage	0.401	95% UTL with 95% Coverage	0.293
		95% BCA UTL with 95% Coverage	0.466
		95% Bootstrap (%) UTL with 95% Coverage	0.466
95% UPL (t)	0.224	95% UPL (t)	0.233
90% Percentile (z)	-0.0484	90% Percentile (z)	0.163
95% Percentile (z)	0.208	95% Percentile (z)	0.228
99% Percentile (z)	0.689	99% Percentile (z)	0.427
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.752	Data appear Lognormal at 5% Significance Level	
Theta Star	0.225		
nu star	31.57		
A-D Test Statistic	1.155	Nonparametric Statistics	
5% A-D Critical Value	0.778	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.239	Mean	0.0736
5% K-S Critical Value	0.196	SD	0.119
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0135
		95% KM UTL with 95% Coverage	0.302
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.594
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.272
Mean	0.138	90% Percentile (z)	0.226
Median	0.119	95% Percentile (z)	0.269
SD	0.132	99% Percentile (z)	0.35
k star	0.278		
Theta star	0.494	Gamma ROS Limits with Extrapolated Data	
Nu star	57.36	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.469
95% Percentile of Chisquare (2k)	2.608	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.595
		95% WH Approx. Gamma UTL with 95% Coverage	0.563
90% Percentile	0.409	95% HW Approx. Gamma UTL with 95% Coverage	0.748
95% Percentile	0.644		
99% Percentile	1.261		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Iron_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Iron, Dissolved

Background Data: Alluv Iron, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	31	26
Number of Non-Detect Data	25	18
Number of Detect Data	6	8
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	0.1	0.1
Percent Non detects	80.65%	69.23%
Minimum Detected	0.028	0.019
Maximum Detected	1	0.51
Mean of Detected Data	0.278	0.148
Median of Detected Data	0.0635	0.0775
SD of Detected Data	0.395	0.169

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-0.958
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.338

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Iron_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Iron, Dissolved

Background Data: Alluv Iron, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	39	18
Number of Detect Data	7	8
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	0.1	0.1
Percent Non detects	84.78%	69.23%
Minimum Detected	0.016	0.019
Maximum Detected	0.34	0.51
Mean of Detected Data	0.1	0.148
Median of Detected Data	0.068	0.0775
SD of Detected Data	0.11	0.169

Site vs Background Gehan Test

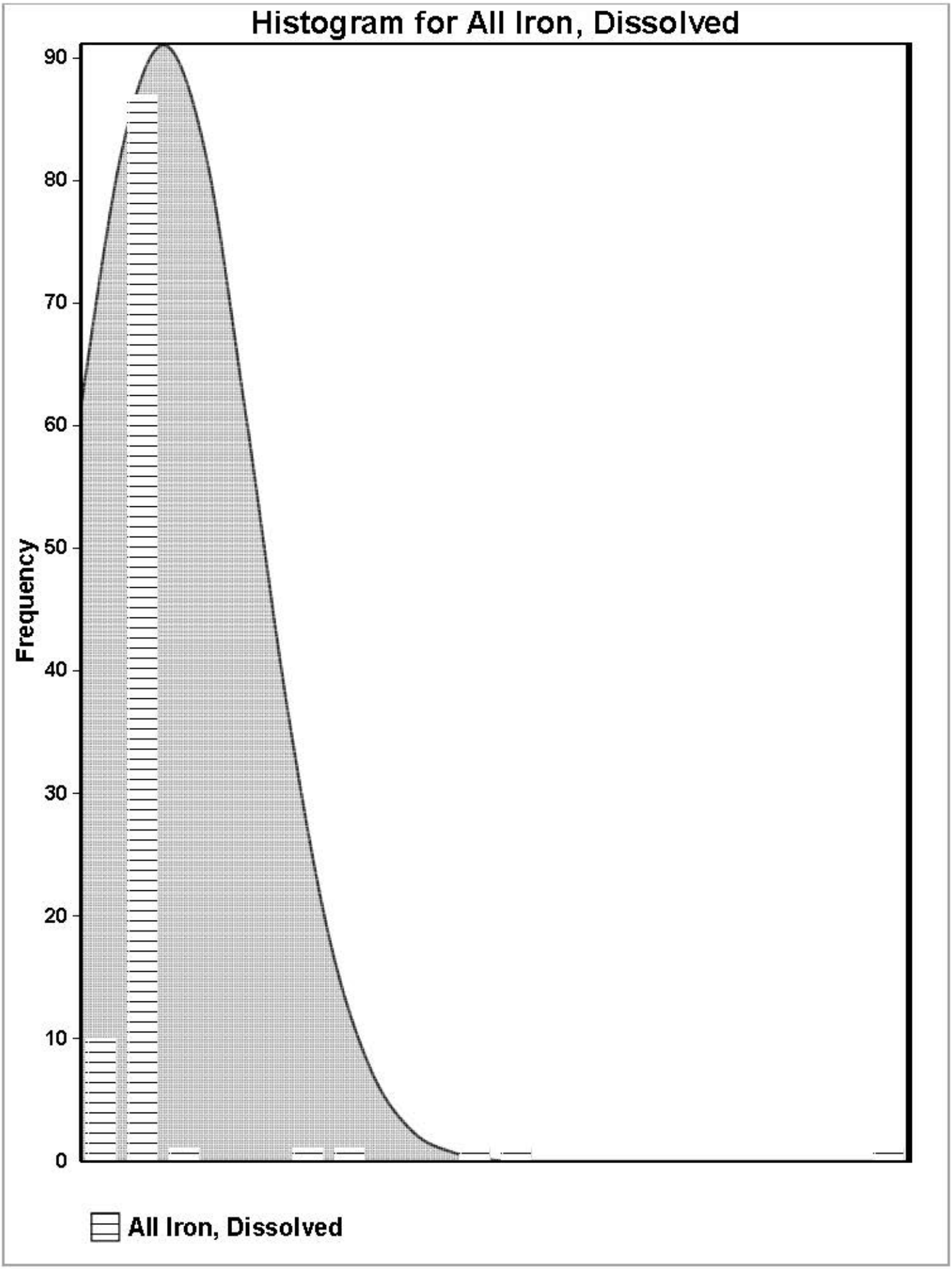
H0: Mu of Site or AOC = Mu of background

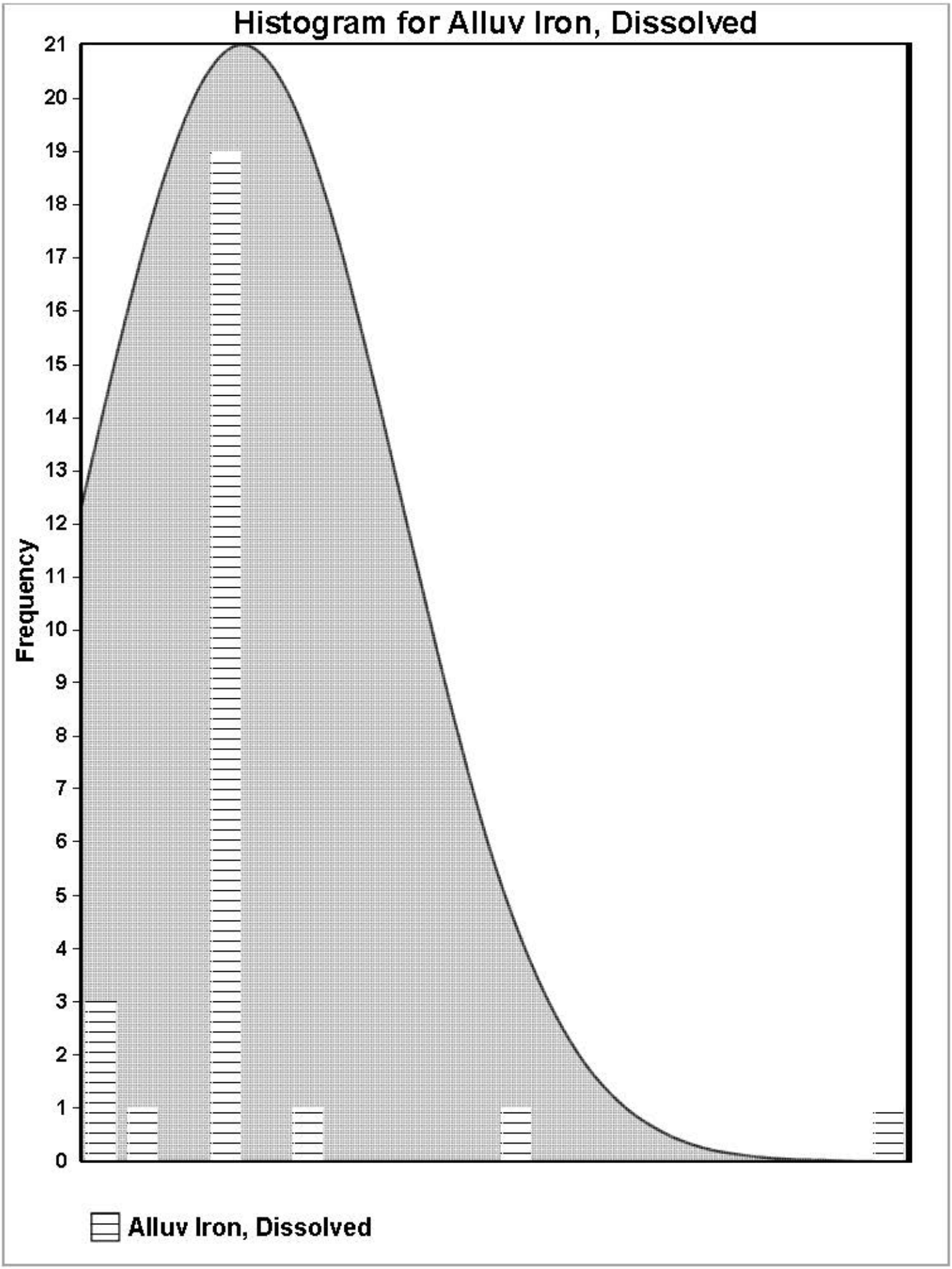
Gehan z Test Value	-1.902
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0571

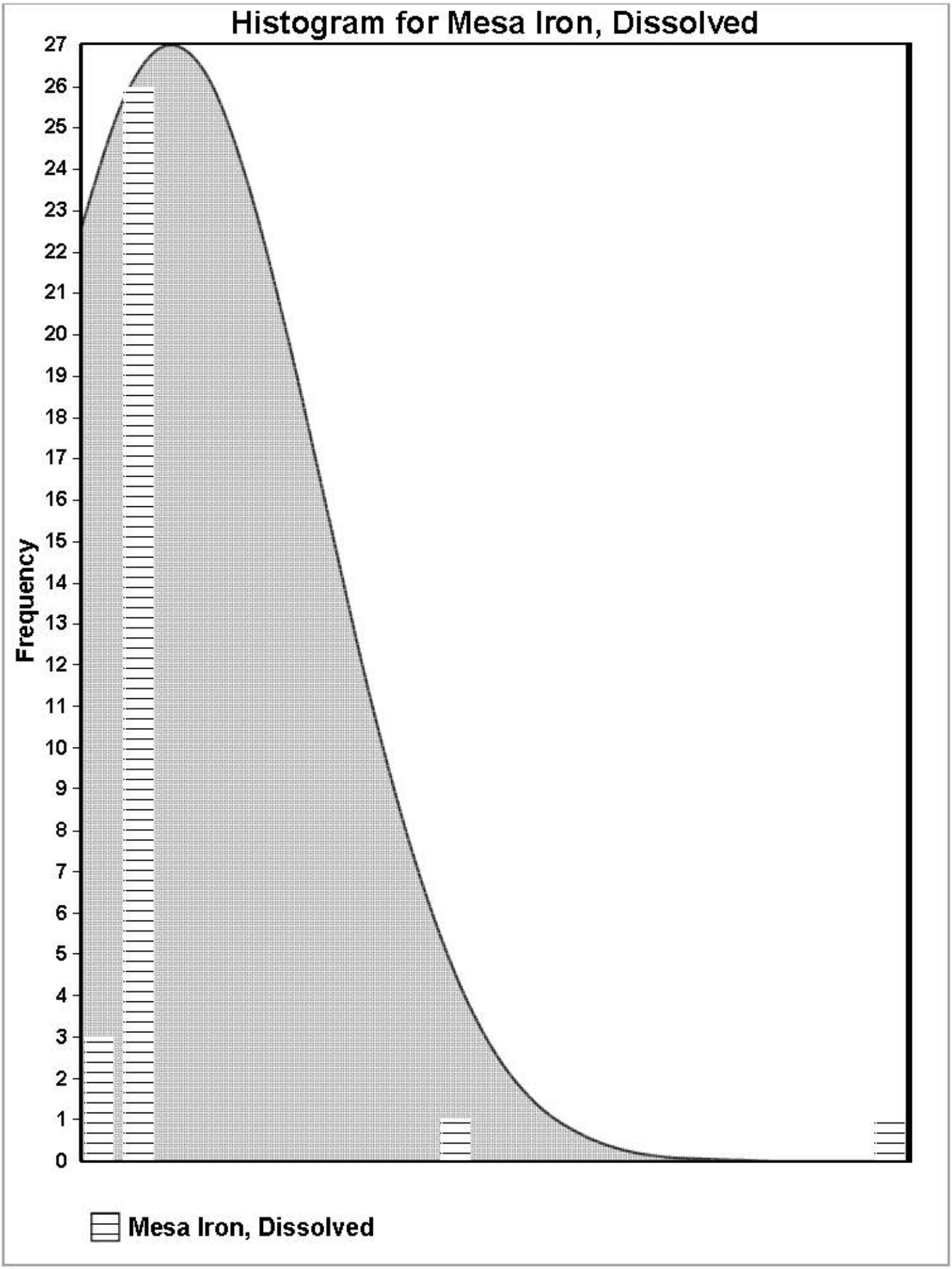
Conclusion with Alpha = 0.05

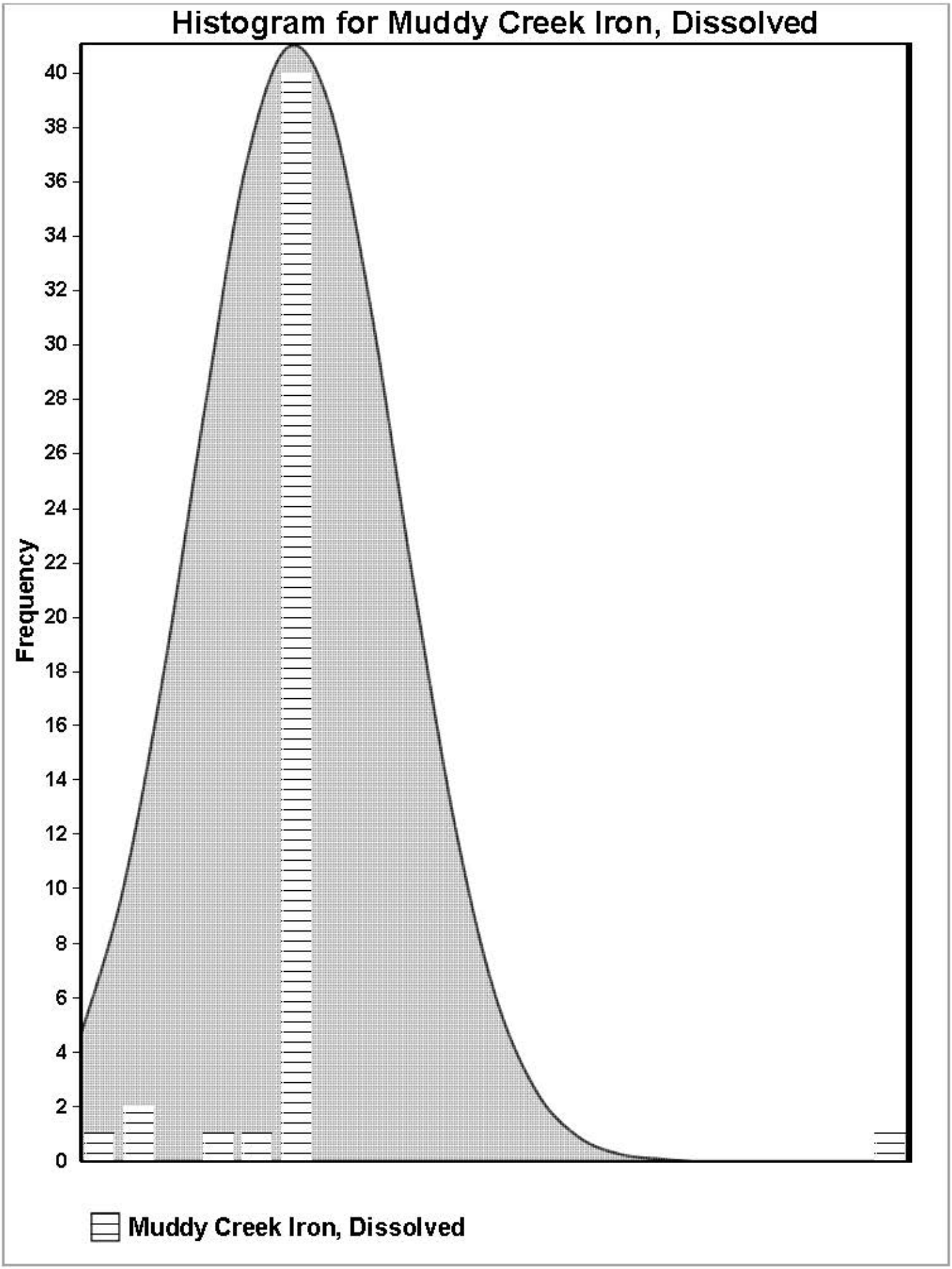
Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for All Iron, Dissolved
Frequency
90
80
70
60
50
40
30
20
10
0
All Iron, Dissolved


Histogram for Alluv Iron, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
Alluv Iron, Dissolved


Histogram for Mesa Iron, Dissolved
Frequency
27
26
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
Mesa Iron, Dissolved


Histogram for Muddy Creek Iron, Dissolved
Frequency
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
Muddy Creek Iron, Dissolved

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Iron_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Iron, Dissolved

Background Data: Muddy Creek Iron, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	31	46
Number of Non-Detect Data	25	39
Number of Detect Data	6	7
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	0.1	0.1
Percent Non detects	80.65%	84.78%
Minimum Detected	0.028	0.016
Maximum Detected	1	0.34
Mean of Detected Data	0.278	0.1
Median of Detected Data	0.0635	0.068
SD of Detected Data	0.395	0.11

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0.844
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.399

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Outlier Tests for Selected Variables

User Selected Options	
From File	Iron_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Iron, Dissolved

Mean	0.0801
Standard Deviation	0.1
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0801	0.0985	0.51	19	4.362	2.84	3.16

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.51 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.51 is a Potential Statistical Outlier

Rosner's Outlier Test for Muddy Creek Iron, Dissolved

Mean	0.0576
Standard Deviation	0.0441
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0576	0.0436	0.34	13	6.481	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.34 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.34 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Iron, Dissolved

Mean	0.0941
Standard Deviation	0.185
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0941	0.182	1	19	4.972	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1 is a Potential Statistical Outlier

Rosner's Outlier Test for All Iron, Dissolved

Mean	0.0743
Standard Deviation	0.117
Number of data	103
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0743	0.116	1	91	7.955	3.388	3.758

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1 is a Potential Statistical Outlier

Location Name	Sample Date	Alluv Iron, Dissolved	D_Alluv Iron, Dissolved
BG-1S	11/26/2012	0.1	0
BG-1S	8/23/2012	0.1	0
BG-1S	5/24/2012	0.1	0
BG-1S	3/20/2012	0.1	0
IMW-2.5D	11/26/2012	0.1	0
IMW-2.5D	8/24/2012	0.1	0
IMW-2.5D	5/21/2012	0.1	0
IMW-2.5D	3/21/2012	0.1	0
IMW-2.5S	11/26/2012	0.019	1
IMW-2.5S	8/24/2012	0.1	0
IMW-2.5S	5/21/2012	0.1	0
IMW-2.5S	3/21/2012	0.1	0
IMW-3S	5/21/2012	0.1	0
IMW-3S	3/20/2012	0.1	0
KMW-2D	11/26/2012	0.27	1
KMW-2D	8/24/2012	0.033	1
KMW-2D	5/21/2012	0.1	0
KMW-2D	3/23/2012	0.1	0
KMW-2M	11/26/2012	0.51	1
KMW-2M	8/24/2012	0.16	1
KMW-2M	5/21/2012	0.1	0
KMW-2M	3/23/2012	0.036	1
KMW-2S	11/26/2012	0.055	1
KMW-2S	8/24/2012	0.1	1
KMW-2S	5/21/2012	0.1	0
KMW-2S	3/23/2012	0.1	0

Location Name	Sample Date	Muddy Creek Iron, Dissolved	D_Muddy Creek Iron, Dissolved
BG-3S	11/27/2012	0.016	1
BG-3S	8/22/2012	0.1	0
BG-3S	5/23/2012	0.1	0
BG-3S	3/21/2012	0.1	0
BG-4S	11/27/2012	0.1	0
BG-4S	8/30/2012	0.1	0
BG-4S	5/30/2012	0.1	0
BG-4S	3/20/2012	0.1	0
BG-6S	11/27/2012	0.1	0
BG-6S	8/23/2012	0.1	0
BG-6S	5/25/2012	0.1	0
BG-6S	3/21/2012	0.1	0
BG-1M	11/26/2012	0.34	1
BG-1M	8/23/2012	0.1	0
BG-1M	5/24/2012	0.1	0
BG-1M	3/20/2012	0.047	1
BG-3M	11/27/2012	0.037	1
BG-3M	8/22/2012	0.1	0
BG-3M	5/24/2012	0.1	0
BG-3M	3/21/2012	0.1	0
BG-4M	11/27/2012	0.1	0
BG-4M	8/30/2012	0.1	0
BG-4M	5/30/2012	0.1	0
BG-4M	3/20/2012	0.1	0
BG-6M	11/27/2012	0.098	1
BG-6M	8/22/2012	0.1	0
BG-6M	5/25/2012	0.1	0
BG-6M	3/21/2012	0.1	0
BG-1D	11/26/2012	0.094	1
BG-1D	8/23/2012	0.1	0
BG-1D	5/24/2012	0.1	0
BG-1D	3/20/2012	0.1	0
BG-3D	11/27/2012	0.068	1
BG-3D	8/21/2012	0.1	0
BG-3D	5/23/2012	0.1	0
BG-3D	3/21/2012	0.1	0
BG-4D	11/27/2012	0.1	0
BG-4D	8/30/2012	0.1	0
BG-4D	5/30/2012	0.1	0
BG-4D	3/20/2012	0.1	0
BG-6D	11/27/2012	0.1	0
BG-6D	8/22/2012	0.1	0
BG-6D	5/25/2012	0.1	0
BG-6D	3/21/2012	0.1	0
IMW-3D	5/25/2012	0.1	0
IMW-3D	3/22/2012	0.1	0

Location Name	Sample Date	Mesa Iron, Dissolved	D_Mesa Iron, Dissolved
LMW-10	11/28/2012	0.1	0
LMW-10	8/27/2012	0.1	0
LMW-10	5/30/2012	0.1	0
LMW-10	3/22/2012	0.1	0
LMW-10	12/6/2011	0.1	0
LMW-11R	11/26/2012	0.1	0
LMW-11R	8/21/2012	0.1	0
LMW-11R	5/29/2012	0.1	0
LMW-11R	3/23/2012	0.031	1
LMW-7	11/28/2012	0.1	0
LMW-7	8/27/2012	0.1	0
LMW-7	5/31/2012	0.1	0
LMW-7	3/23/2012	0.1	0
LMW-7	12/5/2011	0.1	0
BG-2S	11/26/2012	0.48	1
BG-2S	8/23/2012	0.085	1
BG-2S	5/24/2012	0.1	0
BG-2S	3/21/2012	0.1	0
BG-2M	11/26/2012	1	1
BG-2M	8/23/2012	0.028	1
BG-2M	5/24/2012	0.1	0
BG-2M	3/21/2012	0.1	0
BG-2D	11/26/2012	0.1	0
BG-2D	8/23/2012	0.1	0
BG-2D	5/24/2012	0.1	0
BG-2D	3/21/2012	0.042	1
LMW-9	11/28/2012	0.1	0
LMW-9	8/27/2012	0.1	0
LMW-9	5/31/2012	0.1	0
LMW-9	3/23/2012	0.1	0
LMW-9	12/5/2011	0.1	0

Location Name	Sample Date	All Iron, Dissolved	D_All Iron, Dissolved
BG-1S	11/26/2012	0.1	0
BG-1S	8/23/2012	0.1	0
BG-1S	5/24/2012	0.1	0
BG-1S	3/20/2012	0.1	0
IMW-2.5D	11/26/2012	0.1	0
IMW-2.5D	8/24/2012	0.1	0
IMW-2.5D	5/21/2012	0.1	0
IMW-2.5D	3/21/2012	0.1	0
IMW-2.5S	11/26/2012	0.019	1
IMW-2.5S	8/24/2012	0.1	0
IMW-2.5S	5/21/2012	0.1	0
IMW-2.5S	3/21/2012	0.1	0
IMW-3S	5/21/2012	0.1	0
IMW-3S	3/20/2012	0.1	0
KMW-2D	11/26/2012	0.27	1
KMW-2D	8/24/2012	0.033	1
KMW-2D	5/21/2012	0.1	0
KMW-2D	3/23/2012	0.1	0
KMW-2M	11/26/2012	0.51	1
KMW-2M	8/24/2012	0.16	1
KMW-2M	5/21/2012	0.1	0
KMW-2M	3/23/2012	0.036	1
KMW-2S	11/26/2012	0.055	1
KMW-2S	8/24/2012	0.1	1
KMW-2S	5/21/2012	0.1	0
KMW-2S	3/23/2012	0.1	0
BG-3S	11/27/2012	0.016	1
BG-3S	8/22/2012	0.1	0
BG-3S	5/23/2012	0.1	0
BG-3S	3/21/2012	0.1	0
BG-4S	11/27/2012	0.1	0
BG-4S	8/30/2012	0.1	0
BG-4S	5/30/2012	0.1	0
BG-4S	3/20/2012	0.1	0
BG-6S	11/27/2012	0.1	0
BG-6S	8/23/2012	0.1	0
BG-6S	5/25/2012	0.1	0
BG-6S	3/21/2012	0.1	0
BG-1M	11/26/2012	0.34	1
BG-1M	8/23/2012	0.1	0
BG-1M	5/24/2012	0.1	0
BG-1M	3/20/2012	0.047	1
BG-3M	11/27/2012	0.037	1
BG-3M	8/22/2012	0.1	0
BG-3M	5/24/2012	0.1	0
BG-3M	3/21/2012	0.1	0
BG-4M	11/27/2012	0.1	0
BG-4M	8/30/2012	0.1	0
BG-4M	5/30/2012	0.1	0
BG-4M	3/20/2012	0.1	0
BG-6M	11/27/2012	0.098	1
BG-6M	8/22/2012	0.1	0
BG-6M	5/25/2012	0.1	0

						BG-6M	3/21/2012	0.1	0
						BG-1D	11/26/2012	0.094	1
						BG-1D	8/23/2012	0.1	0
						BG-1D	5/24/2012	0.1	0
						BG-1D	3/20/2012	0.1	0
						BG-3D	11/27/2012	0.068	1
						BG-3D	8/21/2012	0.1	0
						BG-3D	5/23/2012	0.1	0
						BG-3D	3/21/2012	0.1	0
						BG-4D	11/27/2012	0.1	0
						BG-4D	8/30/2012	0.1	0
						BG-4D	5/30/2012	0.1	0
						BG-4D	3/20/2012	0.1	0
						BG-6D	11/27/2012	0.1	0
						BG-6D	8/22/2012	0.1	0
						BG-6D	5/25/2012	0.1	0
						BG-6D	3/21/2012	0.1	0
						IMW-3D	5/25/2012	0.1	0
						IMW-3D	3/22/2012	0.1	0
						LMW-10	11/28/2012	0.1	0
						LMW-10	8/27/2012	0.1	0
						LMW-10	5/30/2012	0.1	0
						LMW-10	3/22/2012	0.1	0
						LMW-10	12/6/2011	0.1	0
						LMW-11R	11/26/2012	0.1	0
						LMW-11R	8/21/2012	0.1	0
						LMW-11R	5/29/2012	0.1	0
						LMW-11R	3/23/2012	0.031	1
						LMW-7	11/28/2012	0.1	0
						LMW-7	8/27/2012	0.1	0
						LMW-7	5/31/2012	0.1	0
						LMW-7	3/23/2012	0.1	0
						LMW-7	12/5/2011	0.1	0
						BG-2S	11/26/2012	0.48	1
						BG-2S	8/23/2012	0.085	1
						BG-2S	5/24/2012	0.1	0
						BG-2S	3/21/2012	0.1	0
						BG-2M	11/26/2012	1	1
						BG-2M	8/23/2012	0.028	1
						BG-2M	5/24/2012	0.1	0
						BG-2M	3/21/2012	0.1	0
						BG-2D	11/26/2012	0.1	0
						BG-2D	8/23/2012	0.1	0
						BG-2D	5/24/2012	0.1	0
						BG-2D	3/21/2012	0.042	1
						LMW-9	11/28/2012	0.1	0
						LMW-9	8/27/2012	0.1	0
						LMW-9	5/31/2012	0.1	0
						LMW-9	3/23/2012	0.1	0
						LMW-9	12/5/2011	0.1	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Lead_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Lead, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	2	24	92.31%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	24	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	26	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	26	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	26	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Shapiro-Wilks (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	
Shapiro-Wilks (NDs = DL/2)	N/A	N/A	
Lilliefors (NDs = DL/2)	N/A	N/A	
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A	
Lilliefors (Normal ROS Estimates)	N/A	N/A	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A	
Anderson-Darling (NDs = DL/2)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A	
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A	
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A	

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Lead, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs

Raw Statistics	46	0	46	16	30	65.22%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	30	0.005	0.005	0.005	0.005	1.764E-18
Statistics (Detects Only)	16	0.0018	0.017	0.00741	0.0048	0.0052
Statistics (All: NDs treated as DL value)	46	0.0018	0.017	0.00584	0.005	0.00322
Statistics (All: NDs treated as DL/2 value)	46	0.0018	0.017	0.00421	0.0025	0.00382
Statistics (Normal ROS Estimated Data)	46	-0.00365	0.017	0.00511	0.00473	0.00439
Statistics (Gamma ROS Estimated Data)	46	0.0018	0.017	0.00666	0.00575	0.00342
Statistics (Lognormal ROS Estimated Data)	46	0.00109	0.017	0.00507	0.00411	0.00375

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.209	2.079	0.00336	-5.148	0.734	-0.143
Statistics (NDs = DL)	5.026	4.713	0.00116	-5.246	0.43	-0.0819
Statistics (NDs = DL/2)	2.352	2.213	0.00179	-5.698	0.587	-0.103
Statistics (Gamma ROS Estimates)	4.41	4.137	0.00151	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.497	0.644	-0.117

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.937	0.759	0.732	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.861	0.887	Data Not Normal
Lilliefors (Detects Only)	0.255	0.222	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.591	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.451	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.542	0.945	Data Not Normal
Lilliefors (NDs = DL/2)	0.371	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.957	0.945	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.102	0.131	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.962	0.835	0.871	0.868

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.564	0.749	
Kolmogorov-Smirnov (Detects Only)	0.206	0.218	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	7.628	0.753	
Kolmogorov-Smirnov (NDs = DL)	0.422	0.131	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	8.536	0.759	
Kolmogorov-Smirnov (NDs = DL/2)	0.39	0.132	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.381	0.753	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0781	0.131	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.976	0.839	0.798	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.935	0.887	Data Appear Lognormal
Lilliefors (Detects Only)	0.165	0.222	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.723	0.945	Data Not Lognormal
Lilliefors (NDs = DL)	0.396	0.131	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.636	0.945	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.387	0.131	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.975	0.945	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0705	0.131	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Lead, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	0	31	10	21	67.74%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	21	0.005	0.025	0.00857	0.005	0.00655
Statistics (Detects Only)	10	0.0036	0.034	0.0164	0.0145	0.0112
Statistics (All: NDs treated as DL value)	31	0.0036	0.034	0.0111	0.005	0.00896
Statistics (All: NDs treated as DL/2 value)	31	0.0025	0.034	0.00819	0.0036	0.00884
Statistics (Normal ROS Estimated Data)	31	-0.0161	0.034	0.00566	0.0045	0.0114
Statistics (Gamma ROS Estimated Data)	31	0.0036	0.034	0.0189	0.019	0.00757
Statistics (Lognormal ROS Estimated Data)	31	0.00108	0.034	0.00825	0.00482	0.00858

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.157	1.97	0.0076	-4.36	0.788	-0.181
Statistics (NDs = DL)	2.06	1.882	0.00539	-4.763	0.702	-0.147
Statistics (NDs = DL/2)	1.309	1.204	0.00626	-5.233	0.888	-0.17
Statistics (Gamma ROS Estimates)	4.824	4.378	0.00393	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.176	0.848	-0.164

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.958	0.865	0.833	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.895	0.842	Data Appear Normal
Lilliefors (Detects Only)	0.179	0.28	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.742	0.929	Data Not Normal
Lilliefors (NDs = DL)	0.3	0.159	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.691	0.929	Data Not Normal
Lilliefors (NDs = DL/2)	0.26	0.159	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.945	0.929	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.135	0.159	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.962	0.954	0.963	0.854

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Anderson-Darling (Detects Only)	0.244	0.735	
Kolmogorov-Smirnov (Detects Only)	0.124	0.27	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.872	0.758	
Kolmogorov-Smirnov (NDs = DL)	0.326	0.16	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.546	0.768	
Kolmogorov-Smirnov (NDs = DL/2)	0.278	0.161	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.705	0.748	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.11	0.158	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.98	0.905	0.907	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.941	0.842	Data Appear Lognormal
Lilliefors (Detects Only)	0.146	0.28	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.804	0.929	Data Not Lognormal
Lilliefors (NDs = DL)	0.325	0.159	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.803	0.929	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.288	0.159	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.967	0.929	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.113	0.159	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek + Mesa Lead, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	77	0	77	26	51	66.23%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	51	0.005	0.025	0.00647	0.005	0.0045
Statistics (Detects Only)	26	0.0018	0.034	0.0109	0.0084	0.00903
Statistics (All: NDs treated as DL value)	77	0.0018	0.034	0.00796	0.005	0.00668
Statistics (All: NDs treated as DL/2 value)	77	0.0018	0.034	0.00581	0.0025	0.00659
Statistics (Normal ROS Estimated Data)	77	-0.0102	0.034	0.00594	0.0048	0.00761
Statistics (Gamma ROS Estimated Data)	77	0.0018	0.034	0.0101	0.00953	0.00536
Statistics (Lognormal ROS Estimated Data)	77	8.4575E-4	0.034	0.00639	0.00447	0.00632

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.696	1.639	0.00641	-4.845	0.836	-0.173
Statistics (NDs = DL)	2.451	2.364	0.00325	-5.052	0.601	-0.119
Statistics (NDs = DL/2)	1.523	1.472	0.00382	-5.511	0.754	-0.137
Statistics (Gamma ROS Estimates)	4.386	4.223	0.00231	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.366	0.76	-0.142

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.914	0.783	0.761	0.951

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.83	0.92	Data Not Normal

Lilliefors (Detects Only)	0.174	0.174	Data Not Normal
Lilliefors (NDs = DL)	0.398	0.101	Data Not Normal
Lilliefors (NDs = DL/2)	0.305	0.101	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.102	0.101	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.979	0.905	0.927	0.906

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.529	0.76	
Kolmogorov-Smirnov (Detects Only)	0.17	0.174	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	10.59	0.761	
Kolmogorov-Smirnov (NDs = DL)	0.402	0.103	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	10.53	0.77	
Kolmogorov-Smirnov (NDs = DL/2)	0.345	0.104	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.445	0.755	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.157	0.102	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.986	0.875	0.851	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.958	0.92	Data Appear Lognormal
Lilliefors (Detects Only)	0.146	0.174	Data Appear Lognormal
Lilliefors (NDs = DL)	0.387	0.101	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.349	0.101	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0703	0.101	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Lead_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Lead, Dissolved

General Statistics

Number of Valid Data	26	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	24
		Percent Non-Detects	92.31%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0033	Minimum Detected	-5.714
Maximum Detected	0.004	Maximum Detected	-5.521
Mean of Detected	0.00365	Mean of Detected	-5.618
SD of Detected	4.9497E-4	SD of Detected	0.136
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.005	Maximum Non-Detect	-5.298

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00259	Mean (Log Scale)	-5.963
SD	3.2781E-4	SD (Log Scale)	0.105
95% UTL 95% Coverage	0.00333	95% UTL 95% Coverage	0.00327
95% UPL (t)	0.00316	95% UPL (t)	0.00309
90% Percentile (z)	0.00301	90% Percentile (z)	0.00294

95% Percentile (z)	0.00313	95% Percentile (z)	0.00306
99% Percentile (z)	0.00335	99% Percentile (z)	0.00329
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		95% UTL 95% Coverage	N/A
		95% UPL (t)	N/A
		90% Percentile (z)	N/A
		95% Percentile (z)	N/A
		99% Percentile (z)	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.00365
5% K-S Critical Value	N/A	SD	3.5000E-4
Data not Gamma Distributed at 5% Significance Level		SE of Mean	3.5000E-4
		95% KM UTL with 95% Coverage	0.00445
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0052
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00426
Mean	N/A	90% Percentile (z)	0.0041
Median	N/A	95% Percentile (z)	0.00423
SD	N/A	99% Percentile (z)	0.00446
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

Muddy Creek Lead, Dissolved

General Statistics

Number of Valid Data	46	Number of Detected Data	16
Number of Distinct Detected Data	14	Number of Non-Detect Data	30
		Percent Non-Detects	65.22%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0018	Minimum Detected	-6.32
Maximum Detected	0.017	Maximum Detected	-4.075
Mean of Detected	0.00741	Mean of Detected	-5.148

SD of Detected	0.0052	SD of Detected	0.734
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.005	Maximum Non-Detect	-5.298

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.861	Shapiro Wilk Test Statistic	0.935
5% Shapiro Wilk Critical Value	0.887	5% Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00421	Mean (Log Scale)	-5.698
SD	0.00382	SD (Log Scale)	0.587
95% UTL 95% Coverage	0.0122	95% UTL 95% Coverage	0.0114
95% UPL (t)	0.0107	95% UPL (t)	0.00908
90% Percentile (z)	0.00911	90% Percentile (z)	0.00711
95% Percentile (z)	0.0105	95% Percentile (z)	0.0088
99% Percentile (z)	0.0131	99% Percentile (z)	0.0131
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.00778	Mean in Original Scale	0.00507
SD	0.0127	SD in Original Scale	0.00375
95% UTL with 95% Coverage	0.0186	95% UTL with 95% Coverage	0.0157
		95% BCA UTL with 95% Coverage	0.0168
		95% Bootstrap (%) UTL with 95% Coverage	0.0168
95% UPL (t)	0.0138	95% UPL (t)	0.0122
90% Percentile (z)	0.00848	90% Percentile (z)	0.00936
95% Percentile (z)	0.0131	95% Percentile (z)	0.0118
99% Percentile (z)	0.0217	99% Percentile (z)	0.0184
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.836	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.00404		
nu star	58.76		
A-D Test Statistic	0.564	Nonparametric Statistics	
5% A-D Critical Value	0.749	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.206	Mean	0.0049
5% K-S Critical Value	0.218	SD	0.00361
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	6.2074E-4
		95% KM UTL with 95% Coverage	0.0124
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0208
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.011
Mean	0.00666	90% Percentile (z)	0.00953
Median	0.00575	95% Percentile (z)	0.0108
SD	0.00342	99% Percentile (z)	0.0133
k star	4.137		
Theta star	0.00161	Gamma ROS Limits with Extrapolated Data	
Nu star	380.6	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0129
95% Percentile of Chisquare (2k)	15.9	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.013
		95% WH Approx. Gamma UTL with 95% Coverage	0.0149

90% Percentile	0.011	95% HW Approx. Gamma UTL with 95% Coverage	0.0152
95% Percentile	0.0128		
99% Percentile	0.0165		

Note: DL/2 is not a recommended method.

Mesa Lead, Dissolved

General Statistics

Number of Valid Data	31	Number of Detected Data	10
Number of Distinct Detected Data	9	Number of Non-Detect Data	21
		Percent Non-Detects	67.74%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0036	Minimum Detected	-5.627
Maximum Detected	0.034	Maximum Detected	-3.381
Mean of Detected	0.0164	Mean of Detected	-4.36
SD of Detected	0.0112	SD of Detected	0.788
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.025	Maximum Non-Detect	-3.689

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	28
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	3
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	90.32%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.895	Shapiro Wilk Test Statistic	0.941
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00819	Mean (Log Scale)	-5.233
SD	0.00884	SD (Log Scale)	0.888
95% UTL 95% Coverage	0.0276	95% UTL 95% Coverage	0.0375
95% UPL (t)	0.0234	95% UPL (t)	0.0247
90% Percentile (z)	0.0195	90% Percentile (z)	0.0167
95% Percentile (z)	0.0227	95% Percentile (z)	0.023
99% Percentile (z)	0.0288	99% Percentile (z)	0.0421
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00922	Mean in Original Scale	0.00825
SD	0.0122	SD in Original Scale	0.00858
95% UTL with 95% Coverage	0.036	95% UTL with 95% Coverage	0.0364
		95% BCA UTL with 95% Coverage	0.034
		95% Bootstrap (%) UTL with 95% Coverage	0.034
95% UPL (t)	0.0302	95% UPL (t)	0.0244
90% Percentile (z)	0.0248	90% Percentile (z)	0.0168
95% Percentile (z)	0.0293	95% Percentile (z)	0.0228
99% Percentile (z)	0.0376	99% Percentile (z)	0.0407

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.577	Data appear Normal at 5% Significance Level	
Theta Star	0.0104		
nu star	31.53		
A-D Test Statistic	0.244	Nonparametric Statistics	
5% A-D Critical Value	0.735	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.124	Mean	0.00825
5% K-S Critical Value	0.27	SD	0.00838
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00162
		95% KM UTL with 95% Coverage	0.0267
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0454
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0227
Mean	0.0189	90% Percentile (z)	0.019
Median	0.019	95% Percentile (z)	0.022
SD	0.00757	99% Percentile (z)	0.0277
k star	4.378		
Theta star	0.00433	Gamma ROS Limits with Extrapolated Data	
Nu star	271.5	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0364
95% Percentile of Chisquare (2k)	16.58	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0374
		95% WH Approx. Gamma UTL with 95% Coverage	0.0431
90% Percentile	0.0311	95% HW Approx. Gamma UTL with 95% Coverage	0.045
95% Percentile	0.0359		
99% Percentile	0.046		

Note: DL/2 is not a recommended method.

Muddy Creek + Mesa Lead, Dissolved

General Statistics

Number of Valid Data	77	Number of Detected Data	26
Number of Distinct Detected Data	20	Number of Non-Detect Data	51
		Percent Non-Detects	66.23%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0018	Minimum Detected	-6.32
Maximum Detected	0.034	Maximum Detected	-3.381
Mean of Detected	0.0109	Mean of Detected	-4.845
SD of Detected	0.00903	SD of Detected	0.836
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.025	Maximum Non-Detect	-3.689

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	74
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	3
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	96.10%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.83	Shapiro Wilk Test Statistic	0.958
5% Shapiro Wilk Critical Value	0.92	5% Shapiro Wilk Critical Value	0.92

Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00581	Mean (Log Scale)	-5.511
SD	0.00659	SD (Log Scale)	0.754
95% UTL 95% Coverage	0.0188	95% UTL 95% Coverage	0.0178
95% UPL (t)	0.0169	95% UPL (t)	0.0143
90% Percentile (z)	0.0143	90% Percentile (z)	0.0106
95% Percentile (z)	0.0166	95% Percentile (z)	0.014
99% Percentile (z)	0.0211	99% Percentile (z)	0.0233
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-2.079E-4	Mean in Original Scale	0.00639
SD	0.0143	SD in Original Scale	0.00632
95% UTL with 95% Coverage	0.028	95% UTL with 95% Coverage	0.0208
		95% BCA UTL with 95% Coverage	0.025
		95% Bootstrap (%) UTL with 95% Coverage	0.0268
95% UPL (t)	0.0238	95% UPL (t)	0.0167
90% Percentile (z)	0.0182	90% Percentile (z)	0.0124
95% Percentile (z)	0.0234	95% Percentile (z)	0.0163
99% Percentile (z)	0.0331	99% Percentile (z)	0.0274
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.526	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.00712		
nu star	79.36		
A-D Test Statistic	0.529	Nonparametric Statistics	
5% A-D Critical Value	0.76	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.17	Mean	0.00617
5% K-S Critical Value	0.174	SD	0.00626
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	7.6967E-4
		95% KM UTL with 95% Coverage	0.0185
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0336
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0167
Mean	0.0101	90% Percentile (z)	0.0142
Median	0.00953	95% Percentile (z)	0.0165
SD	0.00536	99% Percentile (z)	0.0207
k star	4.223		
Theta star	0.0024	Gamma ROS Limits with Extrapolated Data	
Nu star	650.4	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0194
95% Percentile of Chisquare (2k)	16.14	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0196
		95% WH Approx. Gamma UTL with 95% Coverage	0.0216
90% Percentile	0.0167	95% HW Approx. Gamma UTL with 95% Coverage	0.0221
95% Percentile	0.0194		
99% Percentile	0.0249		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Lead_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Lead, Dissolved

Background Data: Alluv Lead, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	31	26
Number of Non-Detect Data	21	24
Number of Detect Data	10	2
Minimum Non-Detect	0.005	0.005
Maximum Non-Detect	0.025	0.005
Percent Non detects	67.74%	92.31%
Minimum Detected	0.0036	0.0033
Maximum Detected	0.034	0.004
Mean of Detected Data	0.0164	0.00365
Median of Detected Data	0.0145	0.00365
SD of Detected Data	0.0112	4.9497E-4

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	2.919
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.00351

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Lead_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Lead, Dissolved

Background Data: Alluv Lead, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	30	24
Number of Detect Data	16	2
Minimum Non-Detect	0.005	0.005
Maximum Non-Detect	0.005	0.005
Percent Non detects	65.22%	92.31%
Minimum Detected	0.0018	0.0033
Maximum Detected	0.017	0.004
Mean of Detected Data	0.00741	0.00365
Median of Detected Data	0.0048	0.00365
SD of Detected Data	0.0052	4.9497E-4

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	2.062
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0392

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Lead_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Lead, Dissolved

Background Data: Muddy Creek Lead, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	31	46
Number of Non-Detect Data	21	30
Number of Detect Data	10	16
Minimum Non-Detect	0.005	0.005
Maximum Non-Detect	0.025	0.005
Percent Non detects	67.74%	65.22%
Minimum Detected	0.0036	0.0018
Maximum Detected	0.034	0.017
Mean of Detected Data	0.0164	0.00741
Median of Detected Data	0.0145	0.0048
SD of Detected Data	0.0112	0.0052

Site vs Background Gehan Test

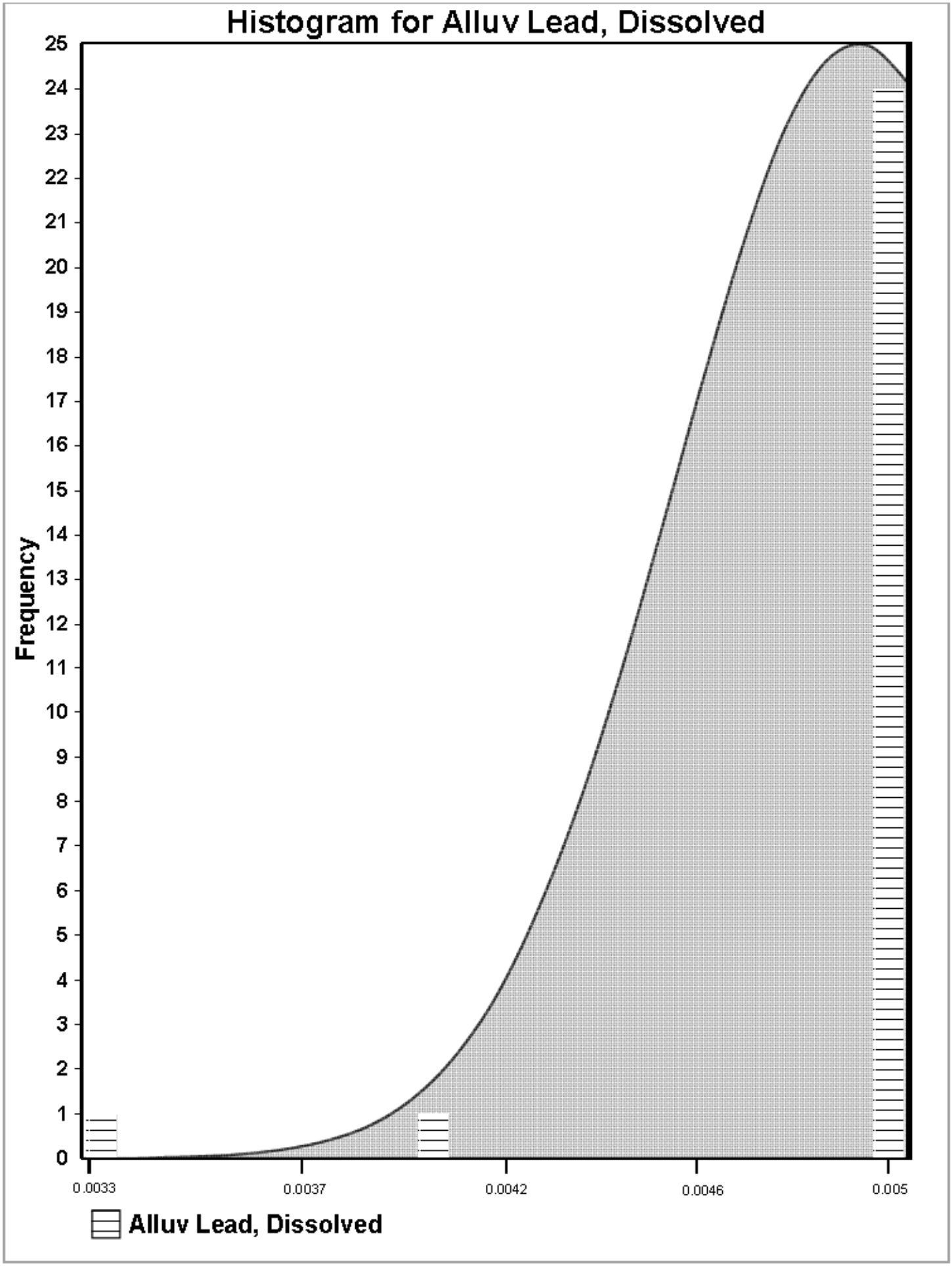
H0: Mu of Site or AOC = Mu of background

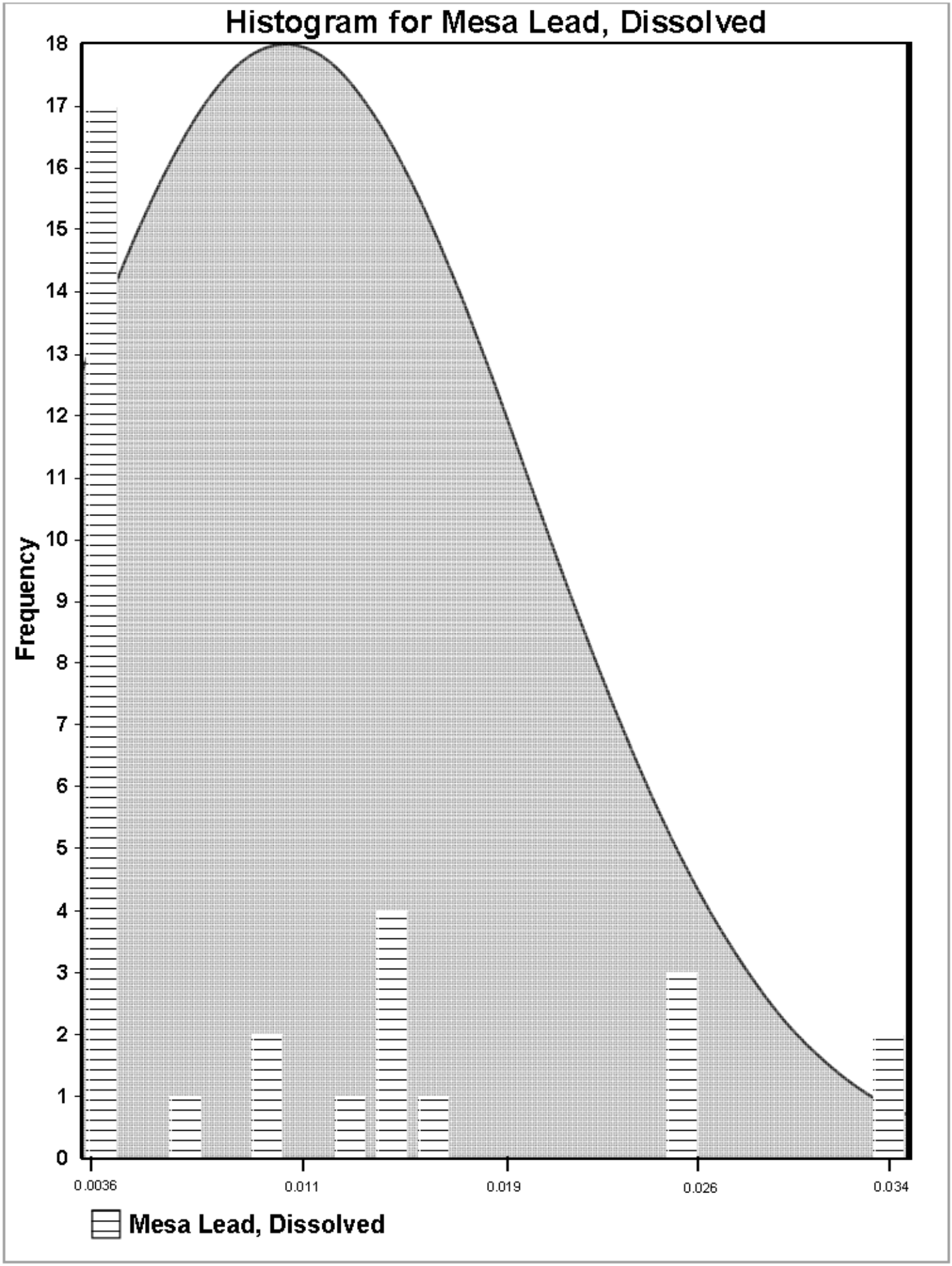
Gehan z Test Value	1.618
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.106

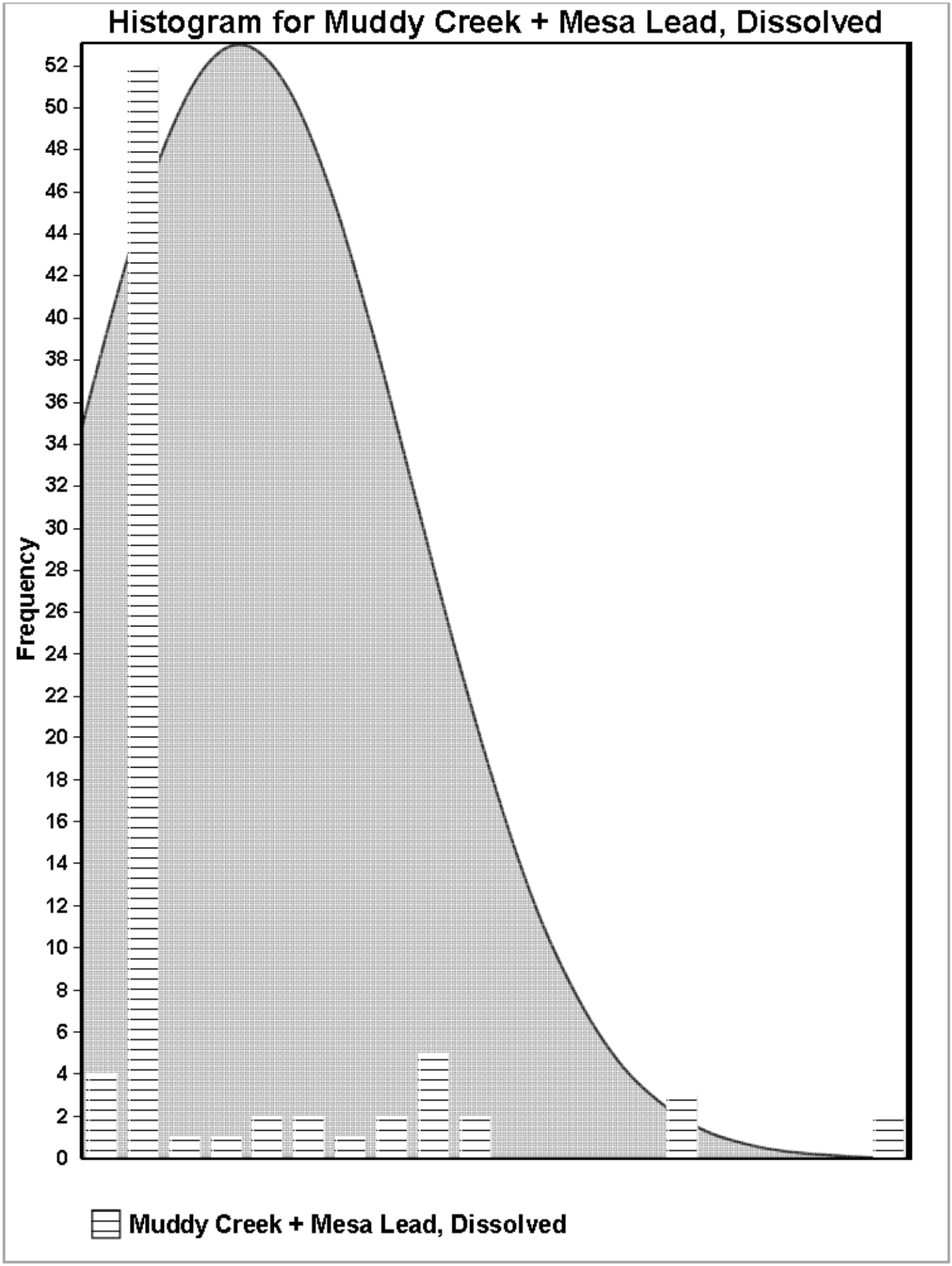
Conclusion with Alpha = 0.05

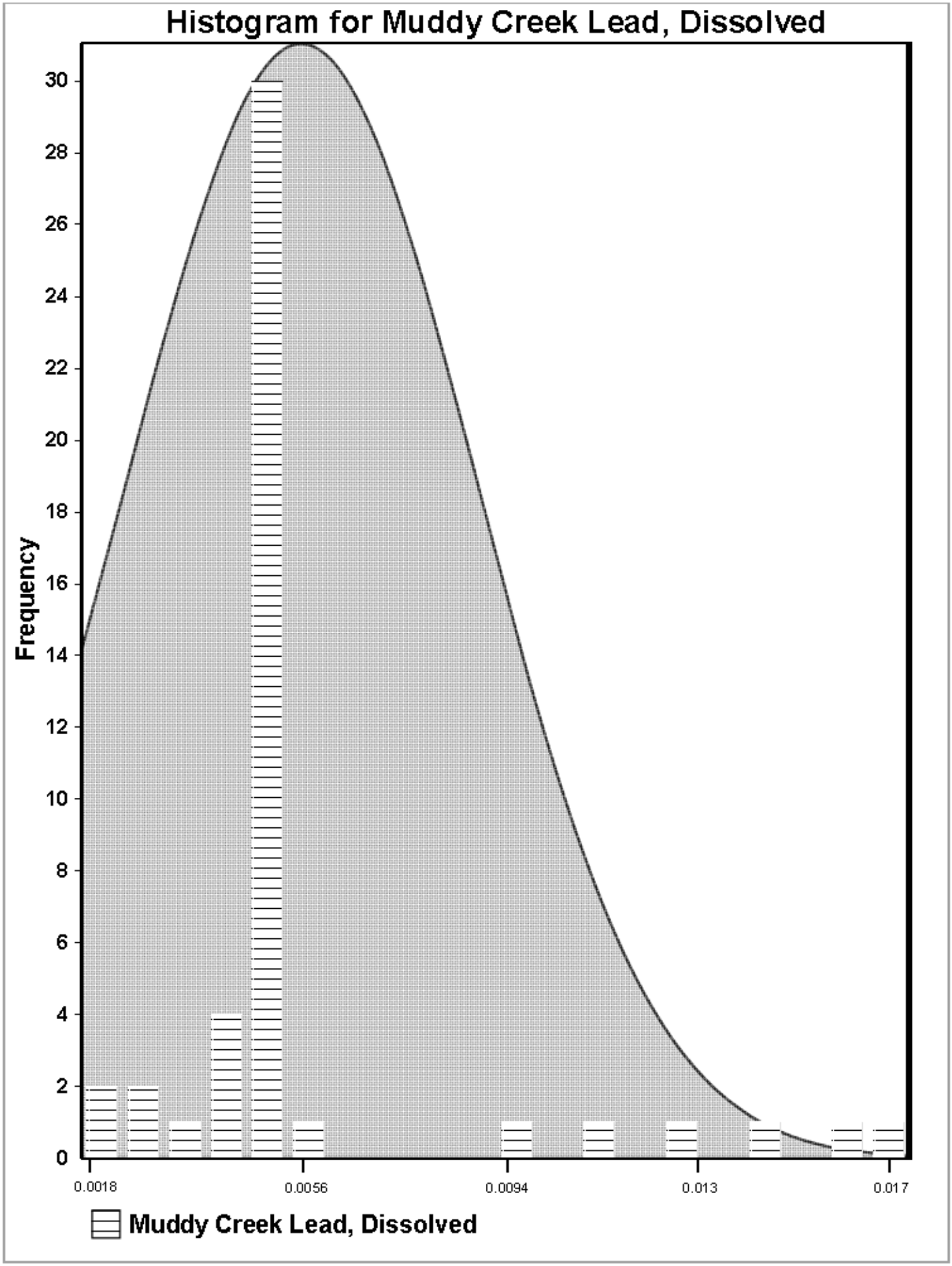
Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv Lead, Dissolved
Frequency
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
0.0033
0.0037
0.0042
0.0046
0.005
Alluv Lead, Dissolved


Histogram for Mesa Lead, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
0.0036
0.011
0.019
0.026
0.034
Mesa Lead, Dissolved


Histogram for Muddy Creek + Mesa Lead, Dissolved
Frequency
52
50
48
46
44
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
Muddy Creek + Mesa Lead, Dissolved


Histogram for Muddy Creek Lead, Dissolved
Frequency
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
0.0018
0.0056
0.0094
0.013
0.017
Muddy Creek Lead, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Lead_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Lead, Dissolved

Mean	0.00259
Standard Deviation	3.2781E-4
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00259	3.2145E-4	0.004	14	4.391	2.84	3.16

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.004 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.004 is a Potential Statistical Outlier

Rosner's Outlier Test for Muddy Creek Lead, Dissolved

Mean	0.00421
Standard Deviation	0.00382
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00421	0.00378	0.017	7	3.384	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.017 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Lead, Dissolved

Mean	0.00819
Standard Deviation	0.00884
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00819	0.0087	0.034	8	2.967	2.92	3.25

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.034 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek + Mesa Lead, Dissolved

Mean	0.00581
Standard Deviation	0.00659
Number of data	77
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00581	0.00654	0.034	54	4.308	3.295	3.655

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.034 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.034 is a Potential Statistical Outlier

Lead, Dissolved

Location Name	Sample Date	Alluv Lead, Dissolved	Location Name	Sample Date	Muddy Creek Lead, Dissolved	Location Name	Sample Date	Mesa Lead, Dissolved
BG-1S	11/26/2012	0.005*	BG-3S	11/27/2012	0.0021	LMW-10	11/28/2012	0.025*
BG-1S	8/23/2012	0.005*	BG-3S	8/22/2012	0.0097	LMW-10	8/27/2012	0.0071
BG-1S	5/24/2012	0.005*	BG-3S	5/23/2012	0.005*	LMW-10	5/30/2012	0.015
BG-1S	3/20/2012	0.0033	BG-3S	3/21/2012	0.005*	LMW-10	3/22/2012	0.025
IMW-2.5D	11/26/2012	0.005*	BG-4S	11/27/2012	0.005*	LMW-10	12/6/2011	0.015*
IMW-2.5D	8/24/2012	0.005*	BG-4S	8/30/2012	0.0044	LMW-11R	11/26/2012	0.005*
IMW-2.5D	5/21/2012	0.005*	BG-4S	5/30/2012	0.017	LMW-11R	8/21/2012	0.017
IMW-2.5D	3/21/2012	0.005*	BG-4S	3/20/2012	0.005*	LMW-11R	5/29/2012	0.034
IMW-2.5S	11/26/2012	0.005*	BG-6S	11/27/2012	0.005*	LMW-11R	3/23/2012	0.005*
IMW-2.5S	8/24/2012	0.005*	BG-6S	8/23/2012	0.005*	LMW-7	11/28/2012	0.01*
IMW-2.5S	5/21/2012	0.005*	BG-6S	5/25/2012	0.005*	LMW-7	8/27/2012	0.0098
IMW-2.5S	3/21/2012	0.005*	BG-6S	3/21/2012	0.005*	LMW-7	5/31/2012	0.005*
IMW-3S	5/21/2012	0.005*	BG-1M	11/26/2012	0.005*	LMW-7	3/23/2012	0.005*
IMW-3S	3/20/2012	0.004	BG-1M	8/23/2012	0.005*	LMW-7	12/5/2011	0.015*
KMW-2D	11/26/2012	0.005*	BG-1M	5/24/2012	0.005*	BG-2S	11/26/2012	0.005*
KMW-2D	8/24/2012	0.005*	BG-1M	3/20/2012	0.005*	BG-2S	8/23/2012	0.005*
KMW-2D	5/21/2012	0.005*	BG-3M	11/27/2012	0.005*	BG-2S	5/24/2012	0.005*
KMW-2D	3/23/2012	0.005*	BG-3M	8/22/2012	0.005*	BG-2S	3/21/2012	0.034
KMW-2M	11/26/2012	0.005*	BG-3M	5/24/2012	0.005*	BG-2M	11/26/2012	0.005*
KMW-2M	8/24/2012	0.005*	BG-3M	3/21/2012	0.0048	BG-2M	8/23/2012	0.005*
KMW-2M	5/21/2012	0.005*	BG-4M	11/27/2012	0.005*	BG-2M	5/24/2012	0.005*
KMW-2M	3/23/2012	0.005*	BG-4M	8/30/2012	0.0031	BG-2M	3/21/2012	0.0045
KMW-2S	11/26/2012	0.005*	BG-4M	5/30/2012	0.014	BG-2D	11/26/2012	0.005*
KMW-2S	8/24/2012	0.005*	BG-4M	3/20/2012	0.0027	BG-2D	8/23/2012	0.005*
KMW-2S	5/21/2012	0.005*	BG-6M	11/27/2012	0.005*	BG-2D	5/24/2012	0.005*
KMW-2S	3/23/2012	0.005*	BG-6M	8/22/2012	0.005*	BG-2D	3/21/2012	0.0036
			BG-6M	5/25/2012	0.005*	LMW-9	11/28/2012	0.025*
			BG-6M	3/21/2012	0.0048	LMW-9	8/27/2012	0.014
			BG-1D	11/26/2012	0.005*	LMW-9	5/31/2012	0.005*
			BG-1D	8/23/2012	0.005*	LMW-9	3/23/2012	0.005*
			BG-1D	5/24/2012	0.005*	LMW-9	12/5/2011	0.015*
			BG-1D	3/20/2012	0.0058			
			BG-3D	11/27/2012	0.005*			
			BG-3D	8/21/2012	0.011			
			BG-3D	5/23/2012	0.005*			
			BG-3D	3/21/2012	0.0018			
			BG-4D	11/27/2012	0.005*			
			BG-4D	8/30/2012	0.0036			
			BG-4D	5/30/2012	0.013			
			BG-4D	3/20/2012	0.005*			
			BG-6D	11/27/2012	0.005*			
			BG-6D	8/22/2012	0.005*			
			BG-6D	5/25/2012	0.005*			
			BG-6D	3/21/2012	0.0048			
			IMW-3D	5/25/2012	0.005*			
			IMW-3D	3/22/2012	0.016			

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Magnesium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Magnesium, Dissolved

Raw Statistics	
Number of Valid Observations	87
Number of Distinct Observations	35
Minimum	54
Maximum	210
Mean of Raw Data	137.8
Standard Deviation of Raw Data	31.67
Kstar	16.63
Mean of Log Transformed Data	4.896
Standard Deviation of Log Transformed Data	0.252

Normal Distribution Test Results	
Correlation Coefficient R	0.989
Approximate Shapiro Wilk Test Statistic	0.969
Approximate Shapiro Wilk P Value	0.158
Lilliefors Test Statistic	0.114
Lilliefors Critical (0.95) Value	0.095

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.975
A-D Test Statistic	1.419
A-D Critical (0.95) Value	0.75
K-S Test Statistic	0.145
K-S Critical(0.95) Value	0.0956

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.968
Approximate Shapiro Wilk Test Statistic	0.938
Approximate Shapiro Wilk P Value	5.0432E-4
Lilliefors Test Statistic	0.158
Lilliefors Critical (0.95) Value	0.095

Data not Lognormal at (0.05) Significance Level

Muddy Creek Magnesium, Dissolved

Raw Statistics	
Number of Valid Observations	53
Number of Distinct Observations	37
Minimum	27

Maximum	110
Mean of Raw Data	76.33
Standard Deviation of Raw Data	24.2
Kstar	7.303
Mean of Log Transformed Data	4.269
Standard Deviation of Log Transformed Data	0.397

Normal Distribution Test Results

Correlation Coefficient R	0.96
Approximate Shapiro Wilk Test Statistic	0.899
Approximate Shapiro Wilk P Value	1.3731E-4
Lilliefors Test Statistic	0.16
Lilliefors Critical (0.95) Value	0.122

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.918
A-D Test Statistic	2.767
A-D Critical (0.95) Value	0.752
K-S Test Statistic	0.212
K-S Critical(0.95) Value	0.122

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.917
Approximate Shapiro Wilk Test Statistic	0.824
Approximate Shapiro Wilk P Value	3.1983E-8
Lilliefors Test Statistic	0.233
Lilliefors Critical (0.95) Value	0.122

Data not Lognormal at (0.05) Significance Level

Mesa Magnesium, Dissolved

Raw Statistics

Number of Valid Observations	100
Number of Distinct Observations	28
Minimum	83
Maximum	290
Mean of Raw Data	145
Standard Deviation of Raw Data	40.28
Kstar	15.53
Mean of Log Transformed Data	4.945
Standard Deviation of Log Transformed Data	0.243

Normal Distribution Test Results

Correlation Coefficient R	0.904
Approximate Shapiro Wilk Test Statistic	0.817
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.224

Lilliefors Critical (0.95) Value	0.0886

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.939
A-D Test Statistic	3.086
A-D Critical (0.95) Value	0.751
K-S Test Statistic	0.184
K-S Critical(0.95) Value	0.0893

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.959
Approximate Shapiro Wilk Test Statistic	0.916
Approximate Shapiro Wilk P Value	5.8115E-7
Lilliefors Test Statistic	0.166
Lilliefors Critical (0.95) Value	0.0886

Data not Lognormal at (0.05) Significance Level

Alluv + Mesa Magnesium, Dissolved

Raw Statistics

Number of Valid Observations	198
Number of Distinct Observations	53
Minimum	54
Maximum	290
Mean of Raw Data	141.8
Standard Deviation of Raw Data	35.73
Kstar	16.82
Mean of Log Transformed Data	4.925
Standard Deviation of Log Transformed Data	0.243

Normal Distribution Test Results

Correlation Coefficient R	0.957
Approximate Shapiro Wilk Test Statistic	0.92
Approximate Shapiro Wilk P Value	1.554E-15
Lilliefors Test Statistic	0.124
Lilliefors Critical (0.95) Value	0.063

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.974
A-D Test Statistic	1.728
A-D Critical (0.95) Value	0.751
K-S Test Statistic	0.0963
K-S Critical(0.95) Value	0.064

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.985
Approximate Shapiro Wilk Test Statistic	0.975
Approximate Shapiro Wilk P Value	0.104
Lilliefors Test Statistic	0.0979
Lilliefors Critical (0.95) Value	0.063

Data not Lognormal at (0.05) Significance Level

General Background Statistics for Full Data Sets

User Selected Options	
From File	Magnesium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Magnesium, Dissolved

General Statistics

Total Number of Observations	87	Number of Distinct Observations	35

Raw Statistics		Log-Transformed Statistics	
Minimum	54	Minimum	3.989
Maximum	210	Maximum	5.347
Second Largest	200	Second Largest	5.298
First Quartile	110	First Quartile	4.7
Median	140	Median	4.942
Third Quartile	160	Third Quartile	5.075
Mean	137.8	Mean	4.896
SD	31.67	SD	0.252
Coefficient of Variation	0.23		
Skewness	-0.247		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.114	Lilliefors Test Statistic	0.158
Lilliefors Critical Value	0.095	Lilliefors Critical Value	0.095
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	199.4	95% UTL with 95% Coverage	218.6
95% UPL (t)	190.7	95% UPL (t)	204
90% Percentile (z)	178.4	90% Percentile (z)	184.9
95% Percentile (z)	189.9	95% Percentile (z)	202.6
99% Percentile (z)	211.4	99% Percentile (z)	240.6

Gamma Distribution Test		Data Distribution Test	
k star	16.63	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.282		
MLE of Mean	137.8		
MLE of Standard Deviation	33.78		
nu star	2894		
A-D Test Statistic	1.419	Nonparametric Statistics	
5% A-D Critical Value	0.75	90% Percentile	170.4
K-S Test Statistic	0.145	95% Percentile	180
5% K-S Critical Value	0.0956	99% Percentile	201.4
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	190
90% Percentile	182.4	95% Percentile Bootstrap UTL with 95% Coverage	190
95% Percentile	197.6	95% BCA Bootstrap UTL with 95% Coverage	180
99% Percentile	228.3	95% UPL	183
		95% Chebyshev UPL	276.6
95% WH Approx. Gamma UPL	198.1	Upper Threshold Limit Based upon IQR	235
95% HW Approx. Gamma UPL	199.4		
95% WH Approx. Gamma UTL with 95% Coverage	210		
95% HW Approx. Gamma UTL with 95% Coverage	211.8		

Muddy Creek Magnesium, Dissolved

General Statistics			
Total Number of Observations	53	Number of Distinct Observations	37
Raw Statistics		Log-Transformed Statistics	
Minimum	27	Minimum	3.296
Maximum	110	Maximum	4.7
Second Largest	110	Second Largest	4.7
First Quartile	62	First Quartile	4.127
Median	82	Median	4.407
Third Quartile	96	Third Quartile	4.564
Mean	76.33	Mean	4.269
SD	24.2	SD	0.397
Coefficient of Variation	0.317		
Skewness	-0.682		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.16	Lilliefors Test Statistic	0.233
Lilliefors Critical Value	0.122	Lilliefors Critical Value	0.122
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	125.8	95% UTL with 95% Coverage	161
95% UPL (t)	117.2	95% UPL (t)	139.9
90% Percentile (z)	107.3	90% Percentile (z)	118.9
95% Percentile (z)	116.1	95% Percentile (z)	137.4
99% Percentile (z)	132.6	99% Percentile (z)	180.1
Gamma Distribution Test		Data Distribution Test	
k star	7.303	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.45		
MLE of Mean	76.33		
MLE of Standard Deviation	28.25		
nu star	774.1		
A-D Test Statistic	2.767	Nonparametric Statistics	
5% A-D Critical Value	0.752	90% Percentile	99.8
K-S Test Statistic	0.212	95% Percentile	110
5% K-S Critical Value	0.122	99% Percentile	110

Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	110
90% Percentile	114	95% Percentile Bootstrap UTL with 95% Coverage	110
95% Percentile	127.9	95% BCA Bootstrap UTL with 95% Coverage	110
99% Percentile	156.9	95% UPL	110
		95% Chebyshev UPL	182.8
95% WH Approx. Gamma UPL	128.9	Upper Threshold Limit Based upon IQR	147
95% HW Approx. Gamma UPL	131.1		
95% WH Approx. Gamma UTL with 95% Coverage	143.3		
95% HW Approx. Gamma UTL with 95% Coverage	146.8		

Mesa Magnesium, Dissolved

General Statistics			
Total Number of Observations	100	Number of Distinct Observations	28
Raw Statistics		Log-Transformed Statistics	
Minimum	83	Minimum	4.419
Maximum	290	Maximum	5.67
Second Largest	280	Second Largest	5.635
First Quartile	120	First Quartile	4.787
Median	140	Median	4.942
Third Quartile	160	Third Quartile	5.075
Mean	145	Mean	4.945
SD	40.28	SD	0.243
Coefficient of Variation	0.278		
Skewness	1.797		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.224	Lilliefors Test Statistic	0.166
Lilliefors Critical Value	0.0886	Lilliefors Critical Value	0.0886
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	222.4	95% UTL with 95% Coverage	224
95% UPL (t)	212.2	95% UPL (t)	210.6
90% Percentile (z)	196.6	90% Percentile (z)	191.7
95% Percentile (z)	211.2	95% Percentile (z)	209.4
99% Percentile (z)	238.7	99% Percentile (z)	247.1
Gamma Distribution Test		Data Distribution Test	
k star	15.53	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.337		
MLE of Mean	145		
MLE of Standard Deviation	36.79		
nu star	3105		
A-D Test Statistic	3.086	Nonparametric Statistics	
5% A-D Critical Value	0.751	90% Percentile	200

K-S Test Statistic	0.184	95% Percentile	231.5
5% K-S Critical Value	0.0893	99% Percentile	280.1
Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	270
90% Percentile	193.7	95% Percentile Bootstrap UTL with 95% Coverage	270
95% Percentile	210.3	95% BCA Bootstrap UTL with 95% Coverage	270
99% Percentile	244	95% UPL	258.5
		95% Chebyshev UPL	321.4
95% WH Approx. Gamma UPL	210.6	Upper Threshold Limit Based upon IQR	220
95% HW Approx. Gamma UPL	210.5		
95% WH Approx. Gamma UTL with 95% Coverage	222.7		
95% HW Approx. Gamma UTL with 95% Coverage	222.9		

Alluv + Mesa Magnesium, Dissolved

General Statistics

Total Number of Observations	198	Number of Distinct Observations	53

Raw Statistics		Log-Transformed Statistics	
Minimum	54	Minimum	3.989
Maximum	290	Maximum	5.67
Second Largest	280	Second Largest	5.635
First Quartile	120	First Quartile	4.787
Median	140	Median	4.942
Third Quartile	160	Third Quartile	5.075
Mean	141.8	Mean	4.925
SD	35.73	SD	0.243
Coefficient of Variation	0.252		
Skewness	1.215		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.124	Lilliefors Test Statistic	0.0979
Lilliefors Critical Value	0.063	Lilliefors Critical Value	0.063
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	207.5	95% UTL with 95% Coverage	215.2
95% UPL (t)	201	95% UPL (t)	206
90% Percentile (z)	187.6	90% Percentile (z)	188
95% Percentile (z)	200.6	95% Percentile (z)	205.4
99% Percentile (z)	225	99% Percentile (z)	242.4
Gamma Distribution Test		Data Distribution Test	
k star	16.82	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.434		
MLE of Mean	141.8		
MLE of Standard Deviation	34.59		
nu star	6659		

A-D Test Statistic	1.728	Nonparametric Statistics	
5% A-D Critical Value	0.751	90% Percentile	180
K-S Test Statistic	0.0963	95% Percentile	200
5% K-S Critical Value	0.064	99% Percentile	270.3
Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	220
90% Percentile	187.6	95% Percentile Bootstrap UTL with 95% Coverage	220
95% Percentile	203.1	95% BCA Bootstrap UTL with 95% Coverage	200
99% Percentile	234.4	95% UPL	200
		95% Chebyshev UPL	298
95% WH Approx. Gamma UPL	203.2	Upper Threshold Limit Based upon IQR	220
95% HW Approx. Gamma UPL	203.8		
95% WH Approx. Gamma UTL with 95% Coverage	211.2		
95% HW Approx. Gamma UTL with 95% Coverage	212		

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Magnesium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Magnesium, Dissolved

Background Data: Alluv Magnesium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	100	87
Number of Distinct Observations	28	35
Minimum	83	54
Maximum	290	210
Mean	145	137.8
Median	140	140
SD	40.28	31.67
SE of Mean	4.028	3.396

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	9465
WMW Test U-Stat	0.173
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.862

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Magnesium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Magnesium, Dissolved

Background Data: Alluv Magnesium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	53	87
Number of Distinct Observations	37	35
Minimum	27	54
Maximum	110	210
Mean	76.33	137.8
Median	82	140
SD	24.2	31.67
SE of Mean	3.324	3.396

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1715
WMW Test U-Stat	8.683
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Magnesium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Magnesium, Dissolved

Background Data: Muddy Creek Magnesium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	100	53
Number of Distinct Observations	28	37
Minimum	83	27
Maximum	290	110
Mean	145	76.33
Median	140	82
SD	40.28	24.2
SE of Mean	4.028	3.324

Wilcoxon-Mann-Whitney (WMW) Test

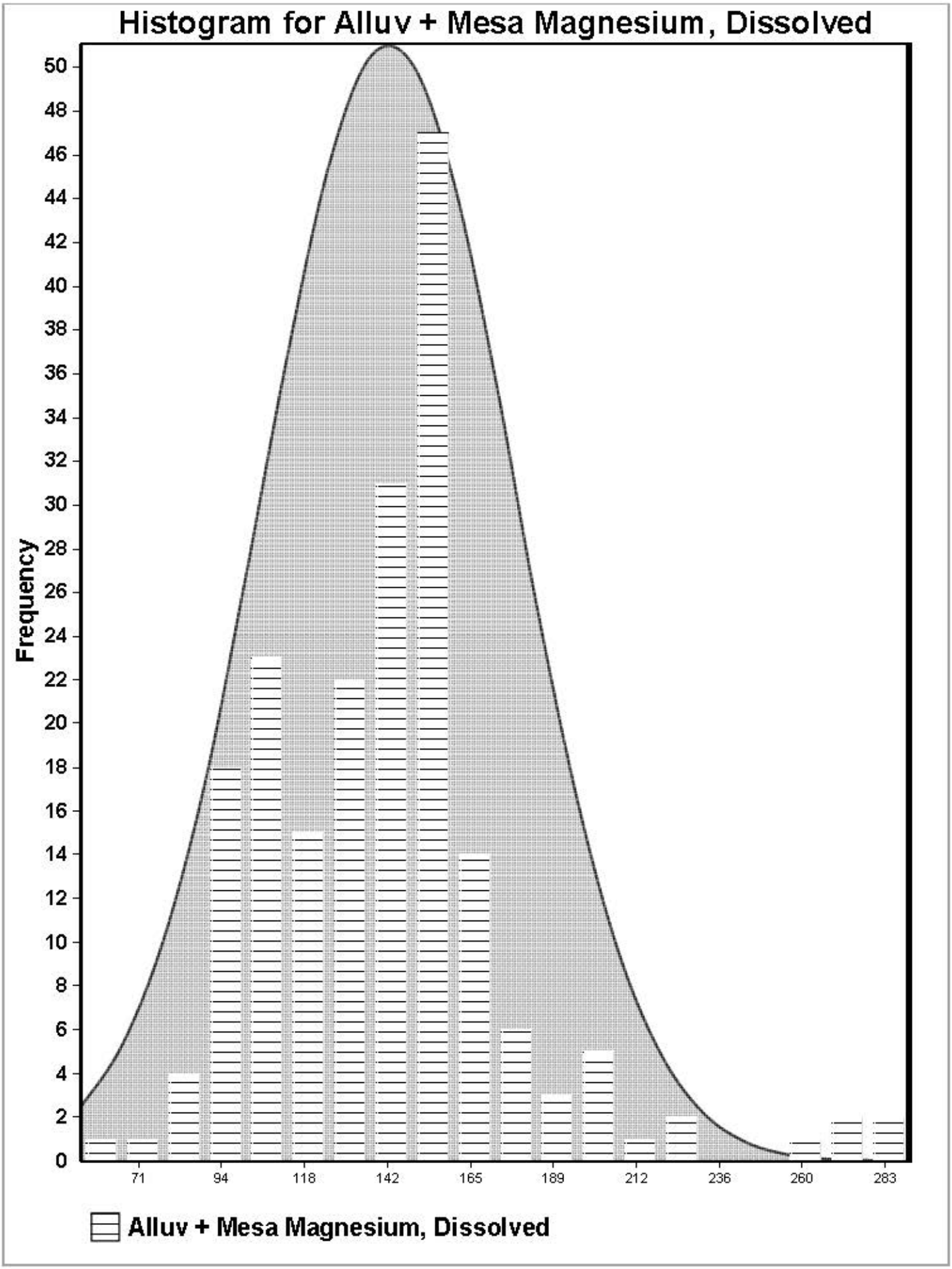
H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	10257
WMW Test U-Stat	9.801
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv + Mesa Magnesium, Dissolved
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
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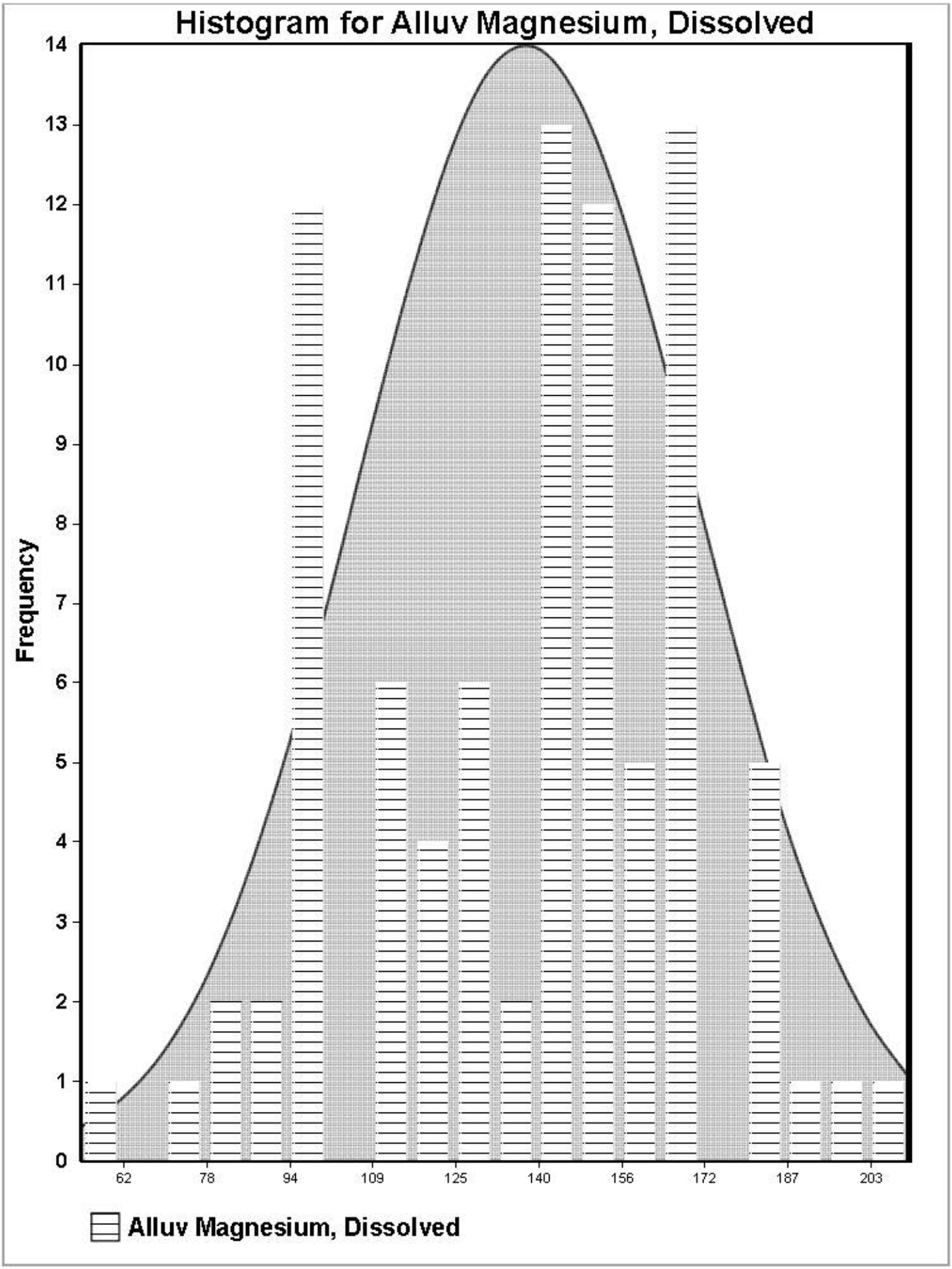
142
165
189
212
236
260
283
Alluv + Mesa Magnesium, Dissolved


Histogram for Alluv Magnesium, Dissolved
Frequency
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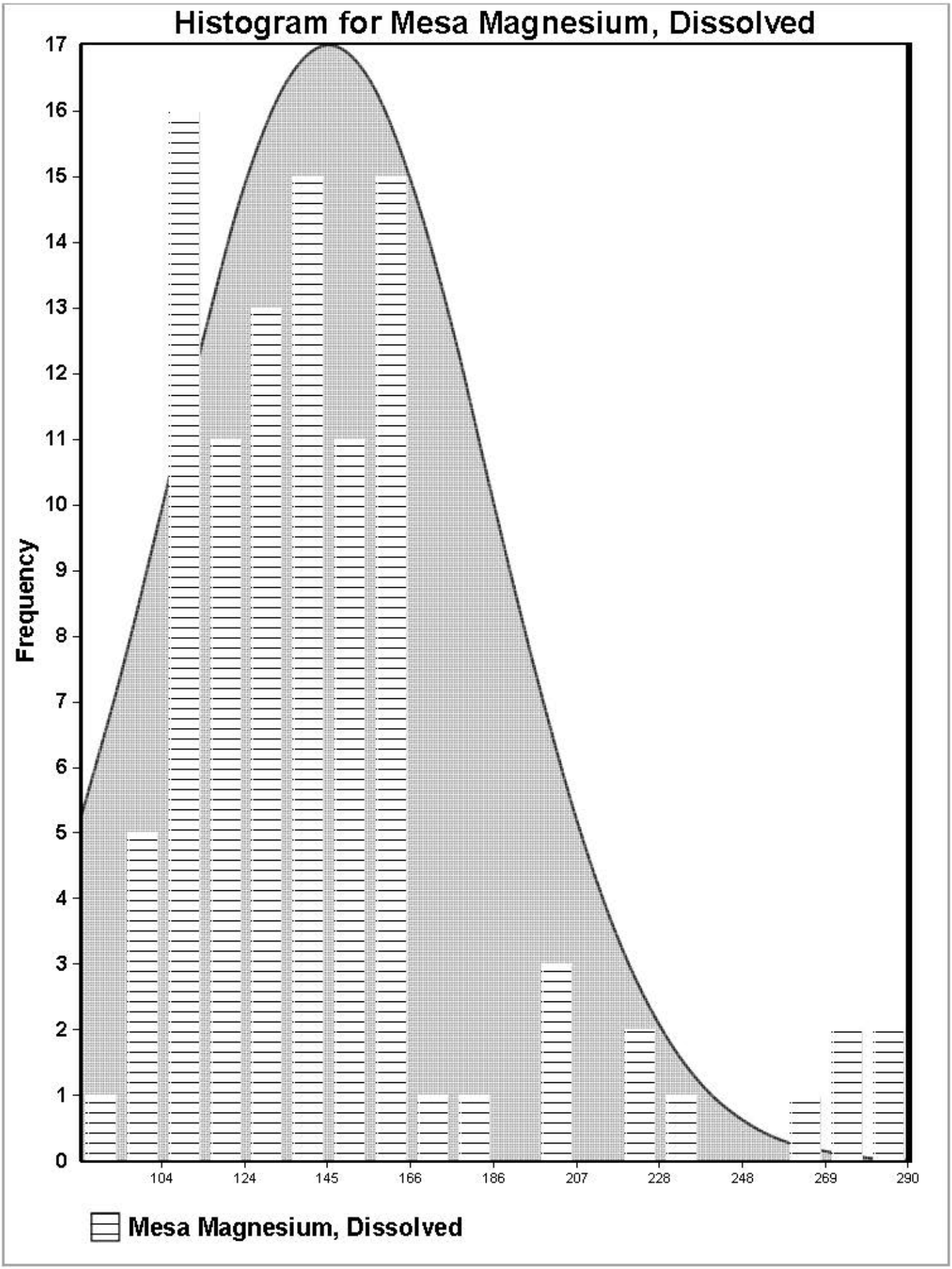
1
2
3
4
5
6
7
8
9
10
11
12
13
14
62
78
94
109
125
140
156
172
187
203
Alluv Magnesium, Dissolved


Histogram for Mesa Magnesium, Dissolved
Frequency
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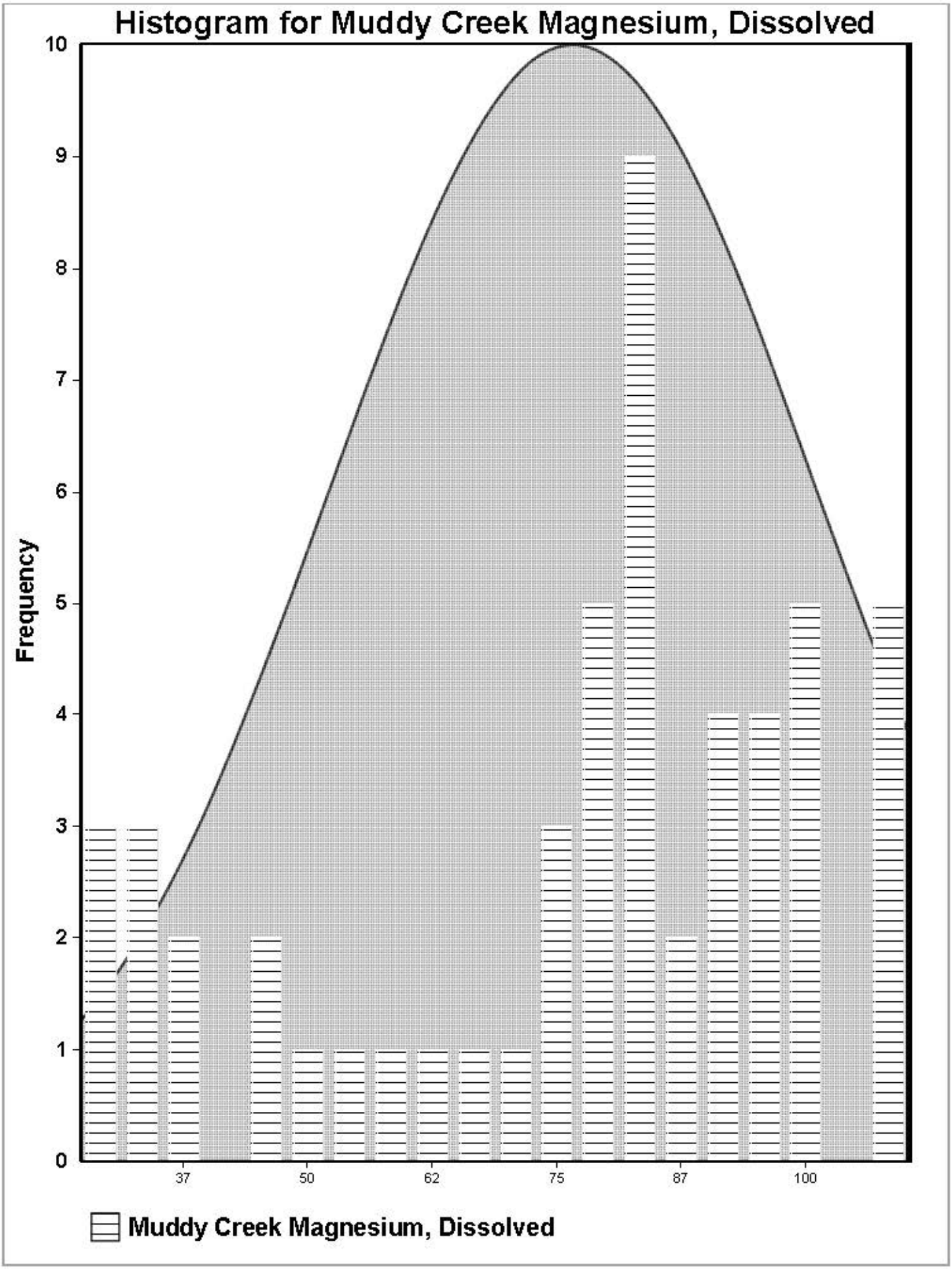
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
104
124
145
166
186
207
228
248
269
290
Mesa Magnesium, Dissolved


Histogram for Muddy Creek Magnesium, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
37
50
62
75
87
100
Muddy Creek Magnesium, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Magnesium_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for Alluv Magnesium, Dissolved

Mean	137.8
Standard Deviation	31.67
Number of data	87
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	137.8	31.49	54	73	2.66	3.338	3.705

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Magnesium, Dissolved

Mean	76.33
Standard Deviation	24.2
Number of data	53
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	76.33	23.97	27	20	2.058	3.151	3.504

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Magnesium, Dissolved

Mean	145
Standard Deviation	40.28
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	145	40.08	290	45	3.619	3.38	3.75

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 290 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Alluv + Mesa Magnesium, Dissolved

Mean	141.8
Standard Deviation	35.73
Number of data	198
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	141.8	35.64	290	143	4.157	3.606	3.976

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 290 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 290 is a Potential Statistical Outlier

Location Name	Sample Date	Alluv Magnesium, Dissolved	Location Name	Sample Date	Muddy Creek Magnesium, Dissolved	Location Name	Sample Date	Mesa Magnesium, Dissolved	Location Name	Sample Date	Alluv + Mesa Magnesium, Dissolved
BG-1S	11/26/2012	140	BG-3S	11/27/2012	60	LMW-10	11/28/2012	150	BG-1S	11/26/2012	140
BG-1S	8/23/2012	110	BG-3S	8/22/2012	62	LMW-10	8/27/2012	140	BG-1S	8/23/2012	110
BG-1S	5/24/2012	100	BG-3S	5/23/2012	56	LMW-10	5/30/2012	83	BG-1S	5/24/2012	100
BG-1S	3/20/2012	110	BG-3S	3/21/2012	46	LMW-10	3/22/2012	140	BG-1S	3/20/2012	110
IMW-2.5D	11/26/2012	170	BG-4S	11/27/2012	98	LMW-10	12/6/2011	140	IMW-2.5D	11/26/2012	170
IMW-2.5D	8/24/2012	140	BG-4S	8/30/2012	96	LMW-10	9/8/2011	140	IMW-2.5D	8/24/2012	140
IMW-2.5D	5/21/2012	140	BG-4S	5/30/2012	99	LMW-10	6/8/2011	133	IMW-2.5D	8/24/2012	130
IMW-2.5D	3/21/2012	140	BG-4S	3/20/2012	100	LMW-10	3/2/2011	133	IMW-2.5D	5/21/2012	140
IMW-2.5D	12/8/2011	140	BG-6S	11/27/2012	98	LMW-10	12/9/2010	141	IMW-2.5D	3/21/2012	140
IMW-2.5D	6/6/2011	136	BG-6S	8/23/2012	99	LMW-10	9/21/2010	142	IMW-2.5D	2/29/2012	150
IMW-2.5D	12/15/2010	78.8	BG-6S	5/25/2012	86	LMW-10	6/9/2010	140	IMW-2.5D	12/8/2011	140
IMW-2.5D	6/9/2010	81	BG-6S	3/21/2012	97	LMW-10	3/11/2010	130	IMW-2.5D	6/6/2011	136
IMW-2.5D	12/12/2009	75	BG-1M	11/26/2012	90	LMW-10	12/11/2009	140	IMW-2.5D	12/15/2010	78.8
IMW-2.5S	11/26/2012	180	BG-1M	8/23/2012	77	LMW-10	9/18/2009	130	IMW-2.5D	6/9/2010	81
IMW-2.5S	8/24/2012	140	BG-1M	5/24/2012	71	LMW-10	6/10/2009	130	IMW-2.5D	12/12/2009	75
IMW-2.5S	5/21/2012	140	BG-1M	3/20/2012	74	LMW-10	3/5/2009	140	IMW-2.5S	11/26/2012	180
IMW-2.5S	3/21/2012	130	BG-3M	11/27/2012	35	LMW-10	12/12/2008	130	IMW-2.5S	8/24/2012	140
IMW-2.5S	12/8/2011	120	BG-3M	8/22/2012	32	LMW-10	9/10/2008	120	IMW-2.5S	8/24/2012	140
IMW-2.5S	9/9/2011	130	BG-3M	5/24/2012	34	LMW-10	6/4/2008	130	IMW-2.5S	5/21/2012	140
IMW-2.5S	6/6/2011	126	BG-3M	3/21/2012	27	LMW-10	3/5/2008	140	IMW-2.5S	3/21/2012	130
IMW-2.5S	3/7/2011	118	BG-4M	11/27/2012	91	LMW-11R	11/26/2012	260	IMW-2.5S	2/29/2012	130
IMW-2.5S	12/15/2010	122	BG-4M	8/30/2012	91	LMW-11R	8/21/2012	230	IMW-2.5S	12/8/2011	120
IMW-2.5S	9/20/2010	129	BG-4M	5/30/2012	92	LMW-11R	5/29/2012	220	IMW-2.5S	9/9/2011	130
IMW-2.5S	6/9/2010	150	BG-4M	3/20/2012	97	LMW-11R	3/23/2012	220	IMW-2.5S	6/6/2011	126
IMW-2.5S	3/9/2010	140	BG-6M	11/27/2012	110	LMW-7	11/28/2012	130	IMW-2.5S	3/7/2011	118
IMW-2.5S	12/12/2009	150	BG-6M	8/22/2012	110	LMW-7	8/27/2012	110	IMW-2.5S	12/15/2010	122
IMW-2.5S	9/21/2009	150	BG-6M	5/25/2012	67	LMW-7	5/31/2012	120	IMW-2.5S	9/20/2010	129
IMW-3S	5/21/2012	98	BG-6M	3/21/2012	110	LMW-7	3/23/2012	110	IMW-2.5S	6/9/2010	150
IMW-3S	3/20/2012	98	BG-1D	11/26/2012	97	LMW-7	12/5/2011	110	IMW-2.5S	3/9/2010	140
IMW-3S	12/9/2011	91	BG-1D	8/23/2012	82	LMW-7	9/6/2011	110	IMW-2.5S	12/12/2009	150
IMW-3S	9/9/2011	95	BG-1D	5/24/2012	74	LMW-7	6/9/2011	99.6	IMW-2.5S	9/21/2009	150
IMW-3S	6/7/2011	87.7	BG-1D	3/20/2012	76	LMW-7	3/9/2011	102	IMW-3S	5/21/2012	98
IMW-3S	3/7/2011	96	BG-3D	11/27/2012	38	LMW-7	12/10/2010	104	IMW-3S	2/29/2012	100
IMW-3S	12/10/2010	95.9	BG-3D	8/21/2012	39	LMW-7	9/21/2010	116	IMW-3S	3/20/2012	98
IMW-3S	9/16/2010	99.8	BG-3D	5/23/2012	28	LMW-7	6/9/2010	110	IMW-3S	12/9/2011	91
IMW-3S	6/8/2010	110	BG-3D	3/21/2012	28	LMW-7	3/11/2010	100	IMW-3S	9/9/2011	95
IMW-3S	3/9/2010	100	BG-4D	11/27/2012	82	LMW-7	12/11/2009	110	IMW-3S	6/7/2011	87.7
IMW-3S	12/10/2009	100	BG-4D	8/30/2012	78	LMW-7	9/18/2009	120	IMW-3S	3/7/2011	96
IMW-3S	9/14/2009	100	BG-4D	5/30/2012	81	LMW-7	6/10/2009	110	IMW-3S	12/10/2010	95.9
IMW-3S	6/9/2009	110	BG-4D	3/20/2012	83	LMW-7	3/5/2009	110	IMW-3S	9/16/2010	99.8
IMW-3S	3/3/2009	110	BG-6D	11/27/2012	110	LMW-7	12/12/2008	110	IMW-3S	6/8/2010	110
IMW-3S	12/9/2008	100	BG-6D	8/22/2012	110	LMW-7	9/10/2008	120	IMW-3S	3/9/2010	100
IMW-3S	9/9/2008	100	BG-6D	5/25/2012	48	LMW-7	6/4/2008	110	IMW-3S	12/10/2009	100
IMW-3S	6/3/2008	120	BG-6D	3/21/2012	46	LMW-7	3/5/2008	120	IMW-3S	9/14/2009	100
IMW-3S	3/4/2008	110	IMW-3D	5/25/2012	84	BG-2S	11/26/2012	290	IMW-3S	6/9/2009	110
KMW-2D	11/26/2012	190	IMW-3D	3/22/2012	83	BG-2S	8/23/2012	280	IMW-3S	3/3/2009	110
KMW-2D	8/24/2012	150	IMW-3D	12/9/2011	78	BG-2S	5/24/2012	270	IMW-3S	12/9/2008	100
KMW-2D	5/21/2012	150	IMW-3D	6/7/2011	82.2	BG-2S	3/21/2012	270	IMW-3S	9/9/2008	100
KMW-2D	3/23/2012	150	IMW-3D	12/10/2010	77.5	BG-2M	11/26/2012	160	IMW-3S	6/3/2008	120
KMW-2D	12/8/2011	140	IMW-3D	6/8/2010	88	BG-2M	8/23/2012	120	IMW-3S	3/4/2008	110
KMW-2D	6/6/2011	138	IMW-3D	12/10/2009	83	BG-2M	5/24/2012	120	KMW-2D	11/26/2012	190

KMW-2D	12/13/2010	147
KMW-2D	6/8/2010	140
KMW-2D	12/8/2009	130
KMW-2D	12/10/2008	130
KMW-2D	6/3/2008	140
KMW-2M	11/26/2012	200
KMW-2M	8/24/2012	160
KMW-2M	5/21/2012	170
KMW-2M	3/23/2012	160
KMW-2M	12/8/2011	150
KMW-2M	6/6/2011	154
KMW-2M	12/13/2010	155
KMW-2M	6/8/2010	150
KMW-2M	12/8/2009	150
KMW-2M	12/10/2008	140
KMW-2M	6/3/2008	150
KMW-2S	11/26/2012	210
KMW-2S	8/24/2012	170
KMW-2S	5/21/2012	170
KMW-2S	3/23/2012	170
KMW-2S	12/8/2011	170
KMW-2S	9/9/2011	54
KMW-2S	6/6/2011	180
KMW-2S	3/8/2011	164
KMW-2S	12/13/2010	185
KMW-2S	9/15/2010	171
KMW-2S	6/8/2010	170
KMW-2S	3/9/2010	160
KMW-2S	12/8/2009	170
KMW-2S	9/16/2009	160
KMW-2S	6/10/2009	180
KMW-2S	3/3/2009	170
KMW-2S	12/10/2008	170
KMW-2S	9/8/2008	180
KMW-2S	6/3/2008	170
KMW-2S	3/4/2008	160

IMW-3D	12/9/2008	80
IMW-3D	6/3/2008	85

BG-2M	3/21/2012	120
BG-2D	11/26/2012	130
BG-2D	8/23/2012	110
BG-2D	5/24/2012	100
BG-2D	3/21/2012	110
LMW-9	11/28/2012	170
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LMW-9	9/21/2010	158
LMW-9	6/9/2010	160
LMW-9	3/11/2010	150
LMW-9	12/11/2009	150
LMW-9	9/18/2009	150
LMW-9	6/10/2009	160
LMW-9	3/5/2009	150
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LMW-9	3/5/2008	160
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LMW-11	12/6/2011	200
LMW-11	2/22/2012	200
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LMW-15	8/20/2012	140
LMW-15	10/22/2012	160
LMW-15	11/28/2012	160
LMW-16	5/29/2012	110
LMW-16	8/20/2012	100
LMW-16	10/22/2012	110
LMW-16	11/28/2012	110

KMW-2D	8/24/2012	140
KMW-2D	8/24/2012	150
KMW-2D	5/21/2012	150
KMW-2D	3/23/2012	150
KMW-2D	2/28/2012	160
KMW-2D	12/8/2011	140
KMW-2D	6/6/2011	138
KMW-2D	12/13/2010	147
KMW-2D	6/8/2010	140
KMW-2D	12/8/2009	130
KMW-2D	12/10/2008	130
KMW-2D	6/3/2008	140
KMW-2M	11/26/2012	200
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KMW-2M	8/24/2012	150
KMW-2M	5/21/2012	170
KMW-2M	3/23/2012	160
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KMW-2M	6/8/2010	150
KMW-2M	12/8/2009	150
KMW-2M	12/10/2008	140
KMW-2M	6/3/2008	150
KMW-2S	11/26/2012	210
KMW-2S	8/24/2012	170
KMW-2S	8/24/2012	160
KMW-2S	5/21/2012	170
KMW-2S	2/28/2012	190
KMW-2S	3/23/2012	170
KMW-2S	12/8/2011	170
KMW-2S	9/9/2011	54
KMW-2S	6/6/2011	180
KMW-2S	3/8/2011	164
KMW-2S	12/13/2010	185
KMW-2S	9/15/2010	171
KMW-2S	6/8/2010	170
KMW-2S	3/9/2010	160
KMW-2S	12/8/2009	170
KMW-2S	9/16/2009	160
KMW-2S	6/10/2009	180
KMW-2S	3/3/2009	170
KMW-2S	12/10/2008	170
KMW-2S	9/8/2008	180
KMW-2S	6/3/2008	170
KMW-2S	3/4/2008	160
LMW-10	11/28/2012	150
LMW-10	8/27/2012	140
LMW-10	5/30/2012	83
LMW-10	3/22/2012	140
LMW-10	12/6/2011	140
LMW-10	9/8/2011	140
LMW-10	6/8/2011	133

LMW-10	3/2/2011	133
LMW-10	12/9/2010	141
LMW-10	9/21/2010	142
LMW-10	6/9/2010	140
LMW-10	3/11/2010	130
LMW-10	12/11/2009	140
LMW-10	9/18/2009	130
LMW-10	6/10/2009	130
LMW-10	3/5/2009	140
LMW-10	12/12/2008	130
LMW-10	9/10/2008	120
LMW-10	6/4/2008	130
LMW-10	3/5/2008	140
LMW-11R	11/26/2012	260
LMW-11R	8/21/2012	200
LMW-11R	5/29/2012	220
LMW-11R	3/23/2012	220
LMW-7	11/28/2012	130
LMW-7	8/27/2012	110
LMW-7	5/31/2012	120
LMW-7	3/23/2012	110
LMW-7	12/5/2011	110
LMW-7	9/6/2011	110
LMW-7	6/9/2011	99.6
LMW-7	3/9/2011	102
LMW-7	12/10/2010	104
LMW-7	9/21/2010	116
LMW-7	6/9/2010	110
LMW-7	3/11/2010	100
LMW-7	12/11/2009	110
LMW-7	9/18/2009	120
LMW-7	6/10/2009	110
LMW-7	3/5/2009	110
LMW-7	12/12/2008	110
LMW-7	9/10/2008	120
LMW-7	6/4/2008	110
LMW-7	3/5/2008	120
BG-2S	11/26/2012	290
BG-2S	8/23/2012	280
BG-2S	5/24/2012	270
BG-2S	3/21/2012	270
BG-2M	11/26/2012	160
BG-2M	8/23/2012	120
BG-2M	5/24/2012	120
BG-2M	3/21/2012	120
BG-2D	11/26/2012	130
BG-2D	8/23/2012	110
BG-2D	5/24/2012	100
BG-2D	3/21/2012	110
LMW-9	11/28/2012	170
LMW-9	8/27/2012	160
LMW-9	5/31/2012	160
LMW-9	3/23/2012	150
LMW-9	12/5/2011	160

LMW-9	9/8/2011	160
LMW-9	6/8/2011	157
LMW-9	3/9/2011	145
LMW-9	12/10/2010	144
LMW-9	9/21/2010	158
LMW-9	6/9/2010	160
LMW-9	3/11/2010	150
LMW-9	12/11/2009	150
LMW-9	9/18/2009	150
LMW-9	6/10/2009	160
LMW-9	3/5/2009	150
LMW-9	12/12/2008	150
LMW-9	9/10/2008	160
LMW-9	6/4/2008	160
LMW-9	3/5/2008	160
LMW-11	3/2/2011	179
LMW-11	9/8/2011	200
LMW-11	12/6/2011	200
LMW-11	2/22/2012	200
LMW-12R	5/30/2012	120
LMW-12R	8/21/2012	120
LMW-12R	10/22/2012	130
LMW-12R	11/30/2012	130
LMW-13R	5/29/2012	140
LMW-13R	8/20/2012	130
LMW-13R	10/22/2012	150
LMW-13R	11/28/2012	160
LMW-14R	5/29/2012	140
LMW-14R	8/20/2012	130
LMW-14R	10/22/2012	150
LMW-14R	11/30/2012	150
LMW-15	5/29/2012	150
LMW-15	8/20/2012	140
LMW-15	10/22/2012	160
LMW-15	11/28/2012	160
LMW-16	5/29/2012	110
LMW-16	8/20/2012	100
LMW-16	10/22/2012	110
LMW-16	11/28/2012	110

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Manganese_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

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	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	87	0	87	58	29	33.33%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	29	0.005	0.1	0.0679	0.1	0.045
Statistics (Detects Only)	58	0.0065	0.36	0.206	0.22	0.0878
Statistics (All: NDs treated as DL value)	87	0.005	0.36	0.16	0.18	0.1
Statistics (All: NDs treated as DL/2 value)	87	0.0025	0.36	0.149	0.18	0.109
Statistics (Normal ROS Estimated Data)	87	-0.0933	0.36	0.146	0.18	0.116
Statistics (Gamma ROS Estimated Data)	87	0.0065	0.36	0.189	0.2	0.0802
Statistics (Lognormal ROS Estimated Data)	87	0.0065	0.36	0.151	0.18	0.107

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.277	2.206	0.0905	-1.816	0.929	-0.512
Statistics (NDs = DL)	1.233	1.198	0.13	-2.29	1.267	-0.553
Statistics (NDs = DL/2)	0.945	0.92	0.157	-2.522	1.469	-0.582
Statistics (Gamma ROS Estimates)	2.889	2.797	0.0655	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.318	1.075	-0.464

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.949	0.972	0.948	0.976

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.177	0.116	Data Not Normal
Lilliefors (NDs = DL)	0.15	0.095	Data Not Normal
Lilliefors (NDs = DL/2)	0.242	0.095	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.144	0.095	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.855	0.888	0.861	0.564

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	6.536	0.761	
Kolmogorov-Smirnov (Detects Only)	0.304	0.118	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	5.313	0.777	
Kolmogorov-Smirnov (NDs = DL)	0.225	0.0982	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	4.852	0.785	
Kolmogorov-Smirnov (NDs = DL/2)	0.232	0.0989	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	5.07	0.76	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.201	0.0966	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.798	0.878	0.899	0.936

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.338	0.116	Data Not Lognormal
Lilliefors (NDs = DL)	0.289	0.095	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.244	0.095	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.241	0.095	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Manganese, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	53	0	53	42	11	20.75%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	11	0.005	0.1	0.0414	0.01	0.0465
Statistics (Detects Only)	42	0.0046	0.22	0.0744	0.0515	0.065
Statistics (All: NDs treated as DL value)	53	0.0046	0.22	0.0675	0.045	0.0627
Statistics (All: NDs treated as DL/2 value)	53	0.0025	0.22	0.0632	0.045	0.0626
Statistics (Normal ROS Estimated Data)	53	-0.0839	0.22	0.0544	0.031	0.0735
Statistics (Gamma ROS Estimated Data)	53	1.000E-12	0.22	0.0664	0.039	0.0623
Statistics (Lognormal ROS Estimated Data)	53	0.00381	0.22	0.062	0.031	0.0631

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.292	1.232	0.0576	-3.033	1.014	-0.334
Statistics (NDs = DL)	1.08	1.032	0.0625	-3.225	1.14	-0.354
Statistics (NDs = DL/2)	0.955	0.914	0.0662	-3.368	1.263	-0.375
Statistics (Gamma ROS Estimates)	0.654	0.63	0.101	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.353	1.158	-0.345

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.929	0.928	0.916	0.975

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.804	0.942	Data Not Normal
Lilliefors (Detects Only)	0.176	0.137	Data Not Normal
Lilliefors (NDs = DL)	0.192	0.122	Data Not Normal
Lilliefors (NDs = DL/2)	0.2	0.122	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.134	0.122	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.965	0.967	0.969	0.837

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.656	0.771	

Kolmogorov-Smirnov (Detects Only)	0.14	0.14	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	0.786	0.778	
Kolmogorov-Smirnov (NDs = DL)	0.119	0.125	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL/2)	0.433	0.782	
Kolmogorov-Smirnov (NDs = DL/2)	0.0756	0.126	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.737	0.801	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.156	0.128	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.983	0.978	0.977	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.902	0.942	Data Not Lognormal
Lilliefors (Detects Only)	0.0971	0.137	Data Appear Lognormal
Lilliefors (NDs = DL)	0.128	0.122	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.107	0.122	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0833	0.122	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Manganese, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	31	69	69.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	69	0.005	0.1	0.0471	0.01	0.0468
Statistics (Detects Only)	31	0.0032	0.51	0.126	0.074	0.136
Statistics (All: NDs treated as DL value)	100	0.0032	0.51	0.0715	0.042	0.0917
Statistics (All: NDs treated as DL/2 value)	100	0.0025	0.51	0.0552	0.042	0.0906
Statistics (Normal ROS Estimated Data)	100	-0.407	0.51	-0.0446	-0.0423	0.17
Statistics (Gamma ROS Estimated Data)	100	1.000E-12	0.619	0.164	0.11	0.161
Statistics (Lognormal ROS Estimated Data)	100	9.3499E-5	0.51	0.0439	0.00628	0.0932

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.745	0.729	0.169	-2.878	1.518	-0.527
Statistics (NDs = DL)	0.653	0.64	0.109	-3.573	1.516	-0.424
Statistics (NDs = DL/2)	0.543	0.533	0.102	-4.051	1.644	-0.406
Statistics (Gamma ROS Estimates)	0.209	0.209	0.788	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.925	2.021	-0.41

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.91	0.827	0.764	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.823	0.929	Data Not Normal
Lilliefors (Detects Only)	0.224	0.159	Data Not Normal
Lilliefors (NDs = DL)	0.248	0.0886	Data Not Normal
Lilliefors (NDs = DL/2)	0.333	0.0886	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0713	0.0886	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.978	0.96	0.967	0.886

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.52	0.788	
Kolmogorov-Smirnov (Detects Only)	0.136	0.164	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	6.904	0.804	
Kolmogorov-Smirnov (NDs = DL)	0.245	0.0936	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.433	0.814	
Kolmogorov-Smirnov (NDs = DL/2)	0.194	0.0943	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	16.93	0.908	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.295	0.0989	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.967	0.915	0.931	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.917	0.929	Data Not Lognormal
Lilliefors (Detects Only)	0.155	0.159	Data Appear Lognormal
Lilliefors (NDs = DL)	0.233	0.0886	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.236	0.0886	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.081	0.0886	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Manganese_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

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General Statistics

Number of Valid Data	87	Number of Detected Data	58
Number of Distinct Detected Data	36	Number of Non-Detect Data	29
		Percent Non-Detects	33.33%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0065	Minimum Detected	-5.036
Maximum Detected	0.36	Maximum Detected	-1.022
Mean of Detected	0.206	Mean of Detected	-1.816
SD of Detected	0.0878	SD of Detected	0.929
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	37
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	50
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	42.53%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.177	Lilliefors Test Statistic	0.338
5% Lilliefors Critical Value	0.116	5% Lilliefors Critical Value	0.116
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.149	Mean (Log Scale)	-2.522
SD	0.109	SD (Log Scale)	1.469
95% UTL 95% Coverage	0.361	95% UTL 95% Coverage	1.4
95% UPL (t)	0.331	95% UPL (t)	0.936
90% Percentile (z)	0.288	90% Percentile (z)	0.528
95% Percentile (z)	0.328	95% Percentile (z)	0.899
99% Percentile (z)	0.403	99% Percentile (z)	2.447
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.142	Mean in Original Scale	0.151
SD	0.123	SD in Original Scale	0.107
95% UTL with 95% Coverage	0.382	95% UTL with 95% Coverage	0.798
		95% BCA UTL with 95% Coverage	0.33
		95% Bootstrap (%) UTL with 95% Coverage	0.33
95% UPL (t)	0.348	95% UPL (t)	0.595

90% Percentile (z)	0.3	90% Percentile (z)	0.391
95% Percentile (z)	0.344	95% Percentile (z)	0.577
99% Percentile (z)	0.428	99% Percentile (z)	1.202

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.17	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0949		
nu star	251.7		
A-D Test Statistic	6.536	Nonparametric Statistics	
5% A-D Critical Value	0.761	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.304	Mean	0.141
5% K-S Critical Value	0.118	SD	0.116
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0126
		95% KM UTL with 95% Coverage	0.367
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.65
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.335
Mean	0.189	90% Percentile (z)	0.29
Median	0.2	95% Percentile (z)	0.332
SD	0.0802	99% Percentile (z)	0.411
k star	2.797		
Theta star	0.0676	Gamma ROS Limits with Extrapolated Data	
Nu star	486.7	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.405
95% Percentile of Chisquare (2k)	11.98	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.431
		95% WH Approx. Gamma UTL with 95% Coverage	0.457
90% Percentile	0.341	95% HW Approx. Gamma UTL with 95% Coverage	0.493
95% Percentile	0.405		
99% Percentile	0.545		

Note: DL/2 is not a recommended method.

Muddy Creek Manganese, Dissolved

General Statistics

Number of Valid Data	53	Number of Detected Data	42
Number of Distinct Detected Data	36	Number of Non-Detect Data	11
		Percent Non-Detects	20.75%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0046	Minimum Detected	-5.382
Maximum Detected	0.22	Maximum Detected	-1.514
Mean of Detected	0.0744	Mean of Detected	-3.033
SD of Detected	0.065	SD of Detected	1.014
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	42
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	11
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	79.25%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.804	Shapiro Wilk Test Statistic	0.902
5% Shapiro Wilk Critical Value	0.942	5% Shapiro Wilk Critical Value	0.942
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0632	Mean (Log Scale)	-3.368
SD	0.0626	SD (Log Scale)	1.263
95% UTL 95% Coverage	0.191	95% UTL 95% Coverage	0.456
95% UPL (t)	0.169	95% UPL (t)	0.291
90% Percentile (z)	0.143	90% Percentile (z)	0.174
95% Percentile (z)	0.166	95% Percentile (z)	0.275
99% Percentile (z)	0.209	99% Percentile (z)	0.651
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0125	Mean in Original Scale	0.062
SD	0.11	SD in Original Scale	0.0631
95% UTL with 95% Coverage	0.238	95% UTL with 95% Coverage	0.373
		95% BCA UTL with 95% Coverage	0.21
		95% Bootstrap (%) UTL with 95% Coverage	0.214
95% UPL (t)	0.199	95% UPL (t)	0.248
90% Percentile (z)	0.154	90% Percentile (z)	0.154
95% Percentile (z)	0.194	95% Percentile (z)	0.235
99% Percentile (z)	0.269	99% Percentile (z)	0.517
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.216	Data follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.0612		
nu star	102.1		
A-D Test Statistic	0.656	Nonparametric Statistics	
5% A-D Critical Value	0.771	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.14	Mean	0.0622
5% K-S Critical Value	0.14	SD	0.0628
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	0.00881
		95% KM UTL with 95% Coverage	0.191
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.338
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.168
Mean	0.0664	90% Percentile (z)	0.143
Median	0.039	95% Percentile (z)	0.166
SD	0.0623	99% Percentile (z)	0.208
k star	0.63		
Theta star	0.105	Gamma ROS Limits with Extrapolated Data	
Nu star	66.75	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.204
95% Percentile of Chisquare (2k)	4.453	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.226
		95% WH Approx. Gamma UTL with 95% Coverage	0.258
90% Percentile	0.171	95% HW Approx. Gamma UTL with 95% Coverage	0.297
95% Percentile	0.235		
99% Percentile	0.389		

Note: DL/2 is not a recommended method.

Mesa Manganese, Dissolved

General Statistics			
Number of Valid Data	100	Number of Detected Data	31
Number of Distinct Detected Data	26	Number of Non-Detect Data	69
		Percent Non-Detects	69.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0032	Minimum Detected	-5.745
Maximum Detected	0.51	Maximum Detected	-0.673
Mean of Detected	0.126	Mean of Detected	-2.878
SD of Detected	0.136	SD of Detected	1.518
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	87
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	13
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	87.00%

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.823	Shapiro Wilk Test Statistic	0.917
5% Shapiro Wilk Critical Value	0.929	5% Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0552	Mean (Log Scale)	-4.051
SD	0.0906	SD (Log Scale)	1.644
95% UTL 95% Coverage	0.229	95% UTL 95% Coverage	0.411
95% UPL (t)	0.206	95% UPL (t)	0.271
90% Percentile (z)	0.171	90% Percentile (z)	0.143
95% Percentile (z)	0.204	95% Percentile (z)	0.26
99% Percentile (z)	0.266	99% Percentile (z)	0.798
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.23	Mean in Original Scale	0.0439
SD	0.294	SD in Original Scale	0.0932
95% UTL with 95% Coverage	0.335	95% UTL with 95% Coverage	0.354
		95% BCA UTL with 95% Coverage	0.29
		95% Bootstrap (%) UTL with 95% Coverage	0.29
95% UPL (t)	0.26	95% UPL (t)	0.211
90% Percentile (z)	0.146	90% Percentile (z)	0.0967
95% Percentile (z)	0.253	95% Percentile (z)	0.202
99% Percentile (z)	0.453	99% Percentile (z)	0.799
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.694	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.181		
nu star	43.04		

A-D Test Statistic	0.52	Nonparametric Statistics	
5% A-D Critical Value	0.788	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.136	Mean	0.0447
5% K-S Critical Value	0.164	SD	0.093
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0096
		95% KM UTL with 95% Coverage	0.224
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.452
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.2
Mean	0.164	90% Percentile (z)	0.164
Median	0.11	95% Percentile (z)	0.198
SD	0.161	99% Percentile (z)	0.261
k star	0.209		
Theta star	0.787	Gamma ROS Limits with Extrapolated Data	
Nu star	41.81	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.629
95% Percentile of Chisquare (2k)	2.129	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.807
		95% WH Approx. Gamma UTL with 95% Coverage	0.776
90% Percentile	0.497	95% HW Approx. Gamma UTL with 95% Coverage	1.05
95% Percentile	0.837		
99% Percentile	1.767		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Manganese_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Manganese, Dissolved

Background Data: Alluv Manganese, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	53	87
Number of Non-Detect Data	11	29
Number of Detect Data	42	58
Minimum Non-Detect	0.005	0.005
Maximum Non-Detect	0.1	0.1
Percent Non detects	20.75%	33.33%
Minimum Detected	0.0046	0.0065
Maximum Detected	0.22	0.36
Mean of Detected Data	0.0744	0.206
Median of Detected Data	0.0515	0.22
SD of Detected Data	0.065	0.0878

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-4.03
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	5.5779E-5

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Manganese_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Manganese, Dissolved

Background Data: Muddy Creek Manganese, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	53
Number of Non-Detect Data	69	11
Number of Detect Data	31	42
Minimum Non-Detect	0.005	0.005
Maximum Non-Detect	0.1	0.1
Percent Non detects	69.00%	20.75%
Minimum Detected	0.0032	0.0046
Maximum Detected	0.51	0.22
Mean of Detected Data	0.126	0.0744
Median of Detected Data	0.074	0.0515
SD of Detected Data	0.136	0.065

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-3.763
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	1.6767E-4

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Manganese_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Manganese, Dissolved

Background Data: Alluv Manganese, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	87
Number of Non-Detect Data	69	29
Number of Detect Data	31	58
Minimum Non-Detect	0.005	0.005
Maximum Non-Detect	0.1	0.1
Percent Non detects	69.00%	33.33%
Minimum Detected	0.0032	0.0065
Maximum Detected	0.51	0.36
Mean of Detected Data	0.126	0.206
Median of Detected Data	0.074	0.22
SD of Detected Data	0.136	0.0878

Site vs Background Gehan Test

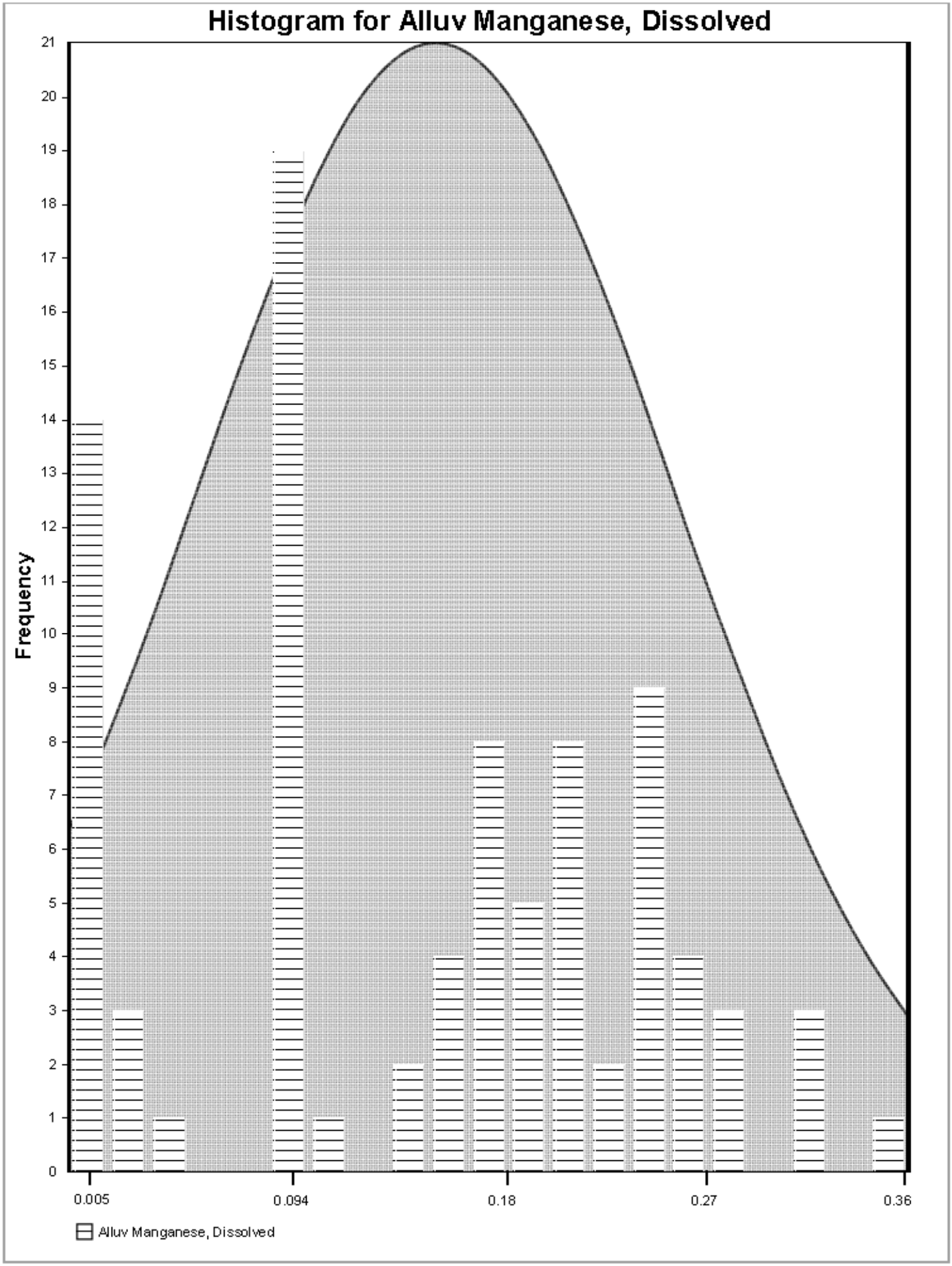
H0: Mu of Site or AOC = Mu of background

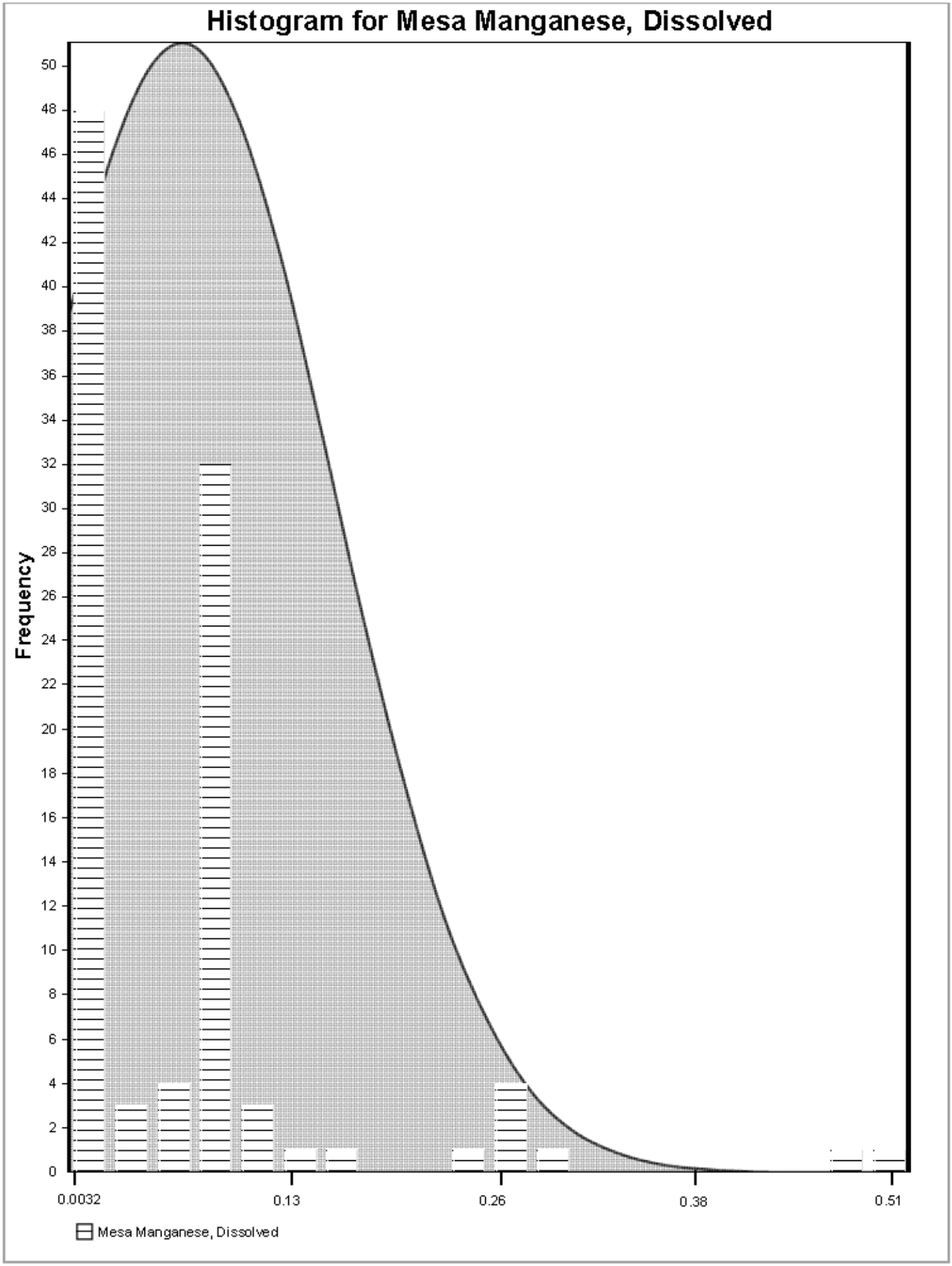
Gehan z Test Value	-6.283
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	3.315E-10

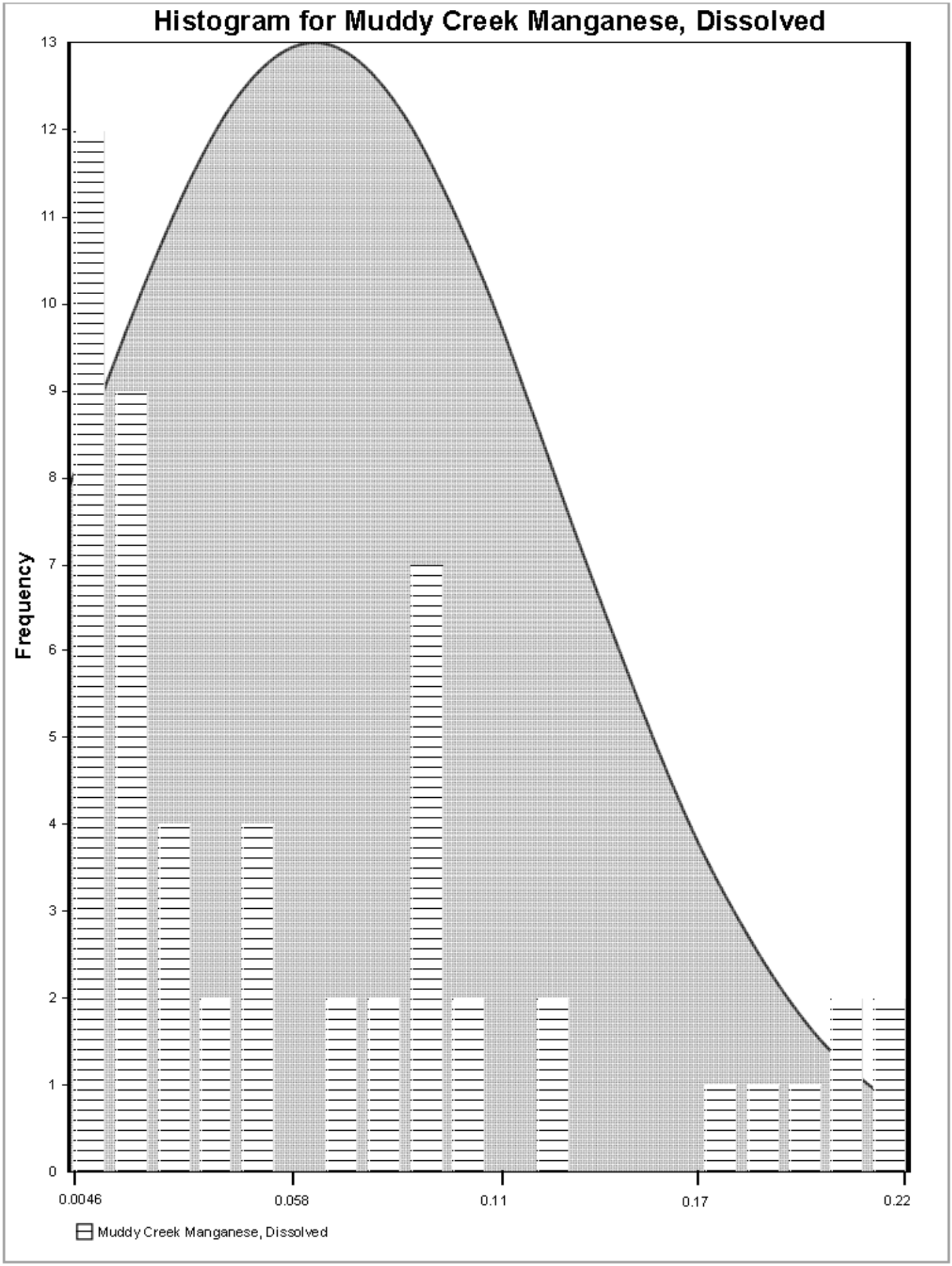
Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Manganese, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
0.005
0.094
0.18
0.27
0.36
Alluv Manganese, Dissolved


Histogram for Mesa Manganese, Dissolved
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50
0.0032
0.13
0.26
0.38
0.51
Mesa Manganese, Dissolved


Histogram for Muddy Creek Manganese, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
0.0046
0.058
0.11
0.17
0.22
Muddy Creek Manganese, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Manganese_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Manganese, Dissolved

Mean	0.149
Standard Deviation	0.109
Number of data	87
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.149	0.109	0.36	14	1.948	3.338	3.705

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Manganese, Dissolved

Mean	0.0632
Standard Deviation	0.0626
Number of data	53
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0632	0.062	0.22	16	2.527	3.151	3.504

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Manganese, Dissolved

Mean	0.0552
Standard Deviation	0.0906
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0552	0.0901	0.51	77	5.047	3.38	3.75

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.51 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.51 is a Potential Statistical Outlier

Location Name	Sample Date	Alluv Manganese, Dissolved	D_Alluv Manganese, Dissolved
BG-1S	11/26/2012	0.011	1
BG-1S	8/23/2012	0.01	0
BG-1S	5/24/2012	0.01	0
BG-1S	3/20/2012	0.0065	1
IMW-2.5D	11/26/2012	0.28	1
IMW-2.5D	8/24/2012	0.24	1
IMW-2.5D	5/21/2012	0.22	1
IMW-2.5D	3/21/2012	0.23	1
IMW-2.5D	12/8/2011	0.23	1
IMW-2.5D	6/6/2011	0.201	1
IMW-2.5D	12/15/2010	0.005	0
IMW-2.5D	6/9/2010	0.1	0
IMW-2.5D	12/12/2009	0.1	0
IMW-2.5S	11/26/2012	0.36	1
IMW-2.5S	8/24/2012	0.28	1
IMW-2.5S	5/21/2012	0.3	1
IMW-2.5S	3/21/2012	0.22	1
IMW-2.5S	12/8/2011	0.29	1
IMW-2.5S	9/9/2011	0.24	1
IMW-2.5S	6/6/2011	0.276	1
IMW-2.5S	3/7/2011	0.259	1
IMW-2.5S	12/15/2010	0.227	1
IMW-2.5S	9/20/2010	0.255	1
IMW-2.5S	6/9/2010	0.3	1
IMW-2.5S	3/9/2010	0.1	0
IMW-2.5S	12/12/2009	0.16	1
IMW-2.5S	9/21/2009	0.34	1
IMW-3S	5/21/2012	0.01	0
IMW-3S	3/20/2012	0.01	0
IMW-3S	12/9/2011	0.005	0
IMW-3S	9/9/2011	0.005	0
IMW-3S	6/7/2011	0.02	1
IMW-3S	3/7/2011	0.00817	1
IMW-3S	12/10/2010	0.005	0
IMW-3S	9/16/2010	0.005	0
IMW-3S	6/8/2010	0.1	0
IMW-3S	3/9/2010	0.1	0
IMW-3S	12/10/2009	0.1	0
IMW-3S	9/14/2009	0.1	0
IMW-3S	6/9/2009	0.1	0
IMW-3S	3/3/2009	0.1	0
IMW-3S	12/9/2008	0.1	0
IMW-3S	9/9/2008	0.1	0
IMW-3S	6/3/2008	0.1	0
IMW-3S	3/4/2008	0.1	0
KMW-2D	11/26/2012	0.33	1
KMW-2D	8/24/2012	0.26	1
KMW-2D	5/21/2012	0.26	1
KMW-2D	3/23/2012	0.26	1
KMW-2D	12/8/2011	0.035	1
KMW-2D	6/6/2011	0.0259	1
KMW-2D	12/13/2010	0.23	1
KMW-2D	6/8/2010	0.12	1
KMW-2D	12/8/2009	0.1	0
KMW-2D	12/10/2008	0.1	0
KMW-2D	6/3/2008	0.1	0
KMW-2M	11/26/2012	0.33	1
KMW-2M	8/24/2012	0.27	1
KMW-2M	5/21/2012	0.27	1
KMW-2M	3/23/2012	0.26	1
KMW-2M	12/8/2011	0.048	1
KMW-2M	6/6/2011	0.0317	1
KMW-2M	12/13/2010	0.288	1
KMW-2M	6/8/2010	0.16	1
KMW-2M	12/8/2009	0.1	0
KMW-2M	12/10/2008	0.1	0
KMW-2M	6/3/2008	0.1	0
KMW-2S	11/26/2012	0.27	1
KMW-2S	8/24/2012	0.2	1
KMW-2S	5/21/2012	0.2	1
KMW-2S	3/23/2012	0.18	1
KMW-2S	12/8/2011	0.22	1
KMW-2S	9/9/2011	0.005	0
KMW-2S	6/6/2011	0.205	1
KMW-2S	3/8/2011	0.198	1
KMW-2S	12/13/2010	0.206	1
KMW-2S	9/15/2010	0.222	1
KMW-2S	6/8/2010	0.19	1
KMW-2S	3/9/2010	0.18	1
KMW-2S	12/8/2009	0.19	1
KMW-2S	9/16/2009	0.21	1
KMW-2S	6/10/2009	0.21	1
KMW-2S	3/3/2009	0.19	1
KMW-2S	12/10/2008	0.2	1
KMW-2S	9/8/2008	0.19	1
KMW-2S	6/3/2008	0.17	1
KMW-2S	3/4/2008	0.18	1

Location Name	Sample Date	Muddy Creek Manganese, Dissolved	D_Muddy Creek Manganese, Dissolved
BG-3S	11/27/2012	0.022	1
BG-3S	8/22/2012	0.051	1
BG-3S	5/23/2012	0.098	1
BG-3S	3/21/2012	0.054	1
BG-4S	11/27/2012	0.0077	1
BG-4S	8/30/2012	0.0046	1
BG-4S	5/30/2012	0.021	1
BG-4S	3/20/2012	0.039	1
BG-6S	11/27/2012	0.058	1
BG-6S	8/23/2012	0.11	1
BG-6S	5/25/2012	0.2	1
BG-6S	3/21/2012	0.11	1
BG-1M	11/26/2012	0.17	1
BG-1M	8/23/2012	0.13	1
BG-1M	5/24/2012	0.21	1
BG-1M	3/20/2012	0.22	1
BG-3M	11/27/2012	0.017	1
BG-3M	8/22/2012	0.028	1
BG-3M	5/24/2012	0.019	1
BG-3M	3/21/2012	0.03	1
BG-4M	11/27/2012	0.031	1
BG-4M	8/30/2012	0.014	1
BG-4M	5/30/2012	0.015	1
BG-4M	3/20/2012	0.052	1
BG-6M	11/27/2012	0.026	1
BG-6M	8/22/2012	0.026	1
BG-6M	5/25/2012	0.2	1
BG-6M	3/21/2012	0.096	1
BG-1D	11/26/2012	0.077	1
BG-1D	8/23/2012	0.073	1
BG-1D	5/24/2012	0.086	1
BG-1D	3/20/2012	0.13	1
BG-3D	11/27/2012	0.018	1
BG-3D	8/21/2012	0.022	1
BG-3D	5/23/2012	0.18	1
BG-3D	3/21/2012	0.19	1
BG-4D	11/27/2012	0.025	1
BG-4D	8/30/2012	0.0072	1
BG-4D	5/30/2012	0.028	1
BG-4D	3/20/2012	0.045	1
BG-6D	11/27/2012	0.01	0
BG-6D	8/22/2012	0.01	0
BG-6D	5/25/2012	0.095	1
BG-6D	3/21/2012	0.089	1
IMW-3D	5/25/2012	0.01	0
IMW-3D	3/22/2012	0.01	0
IMW-3D	12/9/2011	0.005	0
IMW-3D	6/7/2011	0.005	0
IMW-3D	12/10/2010	0.005	0
IMW-3D	6/8/2010	0.1	0
IMW-3D	12/10/2009	0.1	0
IMW-3D	12/9/2008	0.1	0
IMW-3D	6/3/2008	0.1	0

Location Name	Sample Date	Mesa Manganese, Dissolved	D_Mesa Manganese, Dissolved
LMW-10	11/28/2012	0.01	0
LMW-10	8/27/2012	0.0085	1
LMW-10	5/30/2012	0.01	0
LMW-10	3/22/2012	0.01	0
LMW-10	12/6/2011	0.005	0
LMW-10	9/8/2011	0.005	0
LMW-10	6/8/2011	0.00898	1
LMW-10	3/2/2011	0.005	0
LMW-10	12/9/2010	0.0349	1
LMW-10	9/21/2010	0.005	0
LMW-10	6/9/2010	0.1	0
LMW-10	3/11/2010	0.1	0
LMW-10	12/11/2009	0.1	0
LMW-10	9/18/2009	0.1	0
LMW-10	6/10/2009	0.1	0
LMW-10	3/5/2009	0.1	0
LMW-10	12/12/2008	0.1	0
LMW-10	9/10/2008	0.1	0
LMW-10	6/4/2008	0.1	0
LMW-10	3/5/2008	0.1	0
LMW-11R	11/26/2012	0.01	0
LMW-11R	8/21/2012	0.0032	1
LMW-11R	5/29/2012	0.01	0
LMW-11R	3/23/2012	0.016	1
LMW-7	11/28/2012	0.01	0
LMW-7	8/27/2012	0.0039	1
LMW-7	5/31/2012	0.01	0
LMW-7	3/23/2012	0.01	0
LMW-7	12/5/2011	0.005	0
LMW-7	9/6/2011	0.005	0
LMW-7	6/9/2011	0.005	0
LMW-7	3/9/2011	0.005	0
LMW-7	12/10/2010	0.005	0
LMW-7	9/21/2010	0.005	0
LMW-7	6/9/2010	0.1	0
LMW-7	3/11/2010	0.1	0
LMW-7	12/11/2009	0.1	0
LMW-7	9/18/2009	0.1	0
LMW-7	6/10/2009	0.1	0
LMW-7	3/5/2009	0.1	0
LMW-7	12/12/2008	0.1	0
LMW-7	9/10/2008	0.1	0
LMW-7	6/4/2008	0.1	0
LMW-7	3/5/2008	0.1	0
BG-2S	11/26/2012	0.26	1
BG-2S	8/23/2012	0.27	1
BG-2S	5/24/2012	0.24	1
BG-2S	3/21/2012	0.28	1
BG-2M	11/26/2012	0.074	1
BG-2M	8/23/2012	0.074	1
BG-2M	5/24/2012	0.066	1
BG-2M	3/21/2012	0.11	1
BG-2D	11/26/2012	0.11	1
BG-2D	8/23/2012	0.091	1
BG-2D	5/24/2012	0.097	1
BG-2D	3/21/2012	0.11	1
LMW-9	11/28/2012	0.01	0
LMW-9	8/27/2012	0.0092	1
LMW-9	5/31/2012	0.01	0
LMW-9	3/23/2012	0.01	0
LMW-9	12/5/2011	0.005	0
LMW-9	9/8/2011	0.005	0
LMW-9	6/8/2011	0.005	0
LMW-9	3/9/2011	0.005	0
LMW-9	12/10/2010	0.005	0
LMW-9	9/21/2010	0.00698	1
LMW-9	6/9/2010	0.1	0
LMW-9	3/11/2010	0.1	0
LMW-9	12/11/2009	0.1	0
LMW-9	9/18/2009	0.1	0
LMW-9	6/10/2009	0.1	0
LMW-9	3/5/2009	0.1	0
LMW-9	12/12/2008	0.1	0
LMW-9	9/10/2008	0.1	0
LMW-9	6/4/2008	0.1	0
LMW-9	3/5/2008	0.1	0
LMW-11	3/2/2011	0.51	1
LMW-11	9/8/2011	0.29	1
LMW-11	12/6/2011	0.46	1
LMW-11	2/22/2012	0.28	1
LMW-12R	5/30/2012	0.005	0
LMW-12R	8/21/2012	0.005	0
LMW-12R	10/22/2012	0.005	0
LMW-12R	11/30/2012	0.005	0
LMW-13R	5/29/2012	0.005	0
LMW-13R	8/20/2012	0.005	0
LMW-13R	10/22/2012	0.005	0
LMW-13R	11/28/2012	0.005	0
LMW-14R	5/29/2012	0.15	1
LMW-14R	8/20/2012	0.07	1
LMW-14R	10/22/2012	0.049	1
LMW-14R	11/30/2012	0.032	1
LMW-15	5/29/2012	0.17	1
LMW-15	8/20/2012	0.0085	1
LMW-15	10/22/2012	0.0058	1
LMW-15	11/28/2012	0.005	0
LMW-16	5/29/2012	0.005	0
LMW-16	8/20/2012	0.005	0
LMW-16	10/22/2012	0.005	0
LMW-16	11/28/2012	0.005	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Mercury_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Mercury, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	3	23	88.46%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Alluv Mercury, Dissolved was not processed!

Muddy Creek Mercury, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	3	43	93.48%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Muddy Creek Mercury, Dissolved was not processed!

Mesa Mercury, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	30	0	30	6	24	80.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	24	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	2.769E-20
Statistics (Detects Only)	6	1.0000E-5	4.0000E-5	2.3333E-5	2.0000E-5	1.3663E-5
Statistics (All: NDs treated as DL value)	30	1.0000E-5	2.0000E-4	1.6467E-4	2.0000E-4	7.2098E-5
Statistics (All: NDs treated as DL/2 value)	30	1.0000E-5	1.0000E-4	8.4667E-5	1.0000E-4	3.1703E-5
Statistics (Normal ROS Estimated Data)	30	-5.410E-6	5.2077E-5	2.3333E-5	2.1682E-5	1.4380E-5
Statistics (Gamma ROS Estimated Data)	30	1.000E-12	4.2425E-5	2.3097E-5	2.2717E-5	1.3163E-5
Statistics (Lognormal ROS Estimated Data)	30	5.2990E-6	7.5486E-5	2.4601E-5	2.0000E-5	1.6540E-5

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.401	3.083	6.8603E-6	-10.82	0.62	-0.0573
Statistics (NDs = DL)	2.03	1.849	8.1128E-5	-8.978	0.972	-0.108
Statistics (NDs = DL/2)	3.374	3.059	2.5092E-5	-9.532	0.704	-0.0738
Statistics (Gamma ROS Estimates)	0.519	0.489	4.4504E-5	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-10.82	0.663	-0.0612

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.923	0.716	0.723	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.823	0.788	Data Appear Normal
Lilliefors (Detects Only)	0.263	0.362	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.506	0.927	Data Not Normal
Lilliefors (NDs = DL)	0.488	0.162	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.518	0.927	Data Not Normal
Lilliefors (NDs = DL/2)	0.486	0.162	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.984	0.927	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0719	0.162	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.922	0.538	0.582	0.779

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.502	0.701	
Kolmogorov-Smirnov (Detects Only)	0.23	0.334	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	7.564	0.758	
Kolmogorov-Smirnov (NDs = DL)	0.498	0.162	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.297	0.751	
Kolmogorov-Smirnov (NDs = DL/2)	0.49	0.161	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	5.388	0.808	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.324	0.169	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.94	0.725	0.718	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.853	0.788	Data Appear Lognormal
Lilliefors (Detects Only)	0.202	0.362	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.524	0.927	Data Not Lognormal
Lilliefors (NDs = DL)	0.482	0.162	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.517	0.927	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.476	0.162	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.986	0.927	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0657	0.162	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek + Mesa Mercury, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	76	0	76	9	67	88.16%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	67	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	1.365E-19
Statistics (Detects Only)	9	1.0000E-5	4.0000E-5	2.2222E-5	2.0000E-5	1.0929E-5

Statistics (All: NDs treated as DL value)	76	1.0000E-5	2.0000E-4	1.7895E-4	2.0000E-4	5.7933E-5
Statistics (All: NDs treated as DL/2 value)	76	1.0000E-5	1.0000E-4	9.0789E-5	1.0000E-4	2.5548E-5
Statistics (Normal ROS Estimated Data)	76	-3.564E-6	4.8008E-5	2.2222E-5	2.1129E-5	1.1175E-5
Statistics (Gamma ROS Estimated Data)	76	1.000E-12	4.0000E-5	2.1819E-5	2.2671E-5	1.0012E-5
Statistics (Lognormal ROS Estimated Data)	76	6.0749E-6	6.5845E-5	2.2766E-5	2.0000E-5	1.2068E-5

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.906	4.721	4.5294E-6	-10.82	0.49	-0.0453
Statistics (NDs = DL)	3.254	3.134	5.4991E-5	-8.79	0.766	-0.0871
Statistics (NDs = DL/2)	5.482	5.275	1.6560E-5	-9.401	0.547	-0.0582
Statistics (Gamma ROS Estimates)	0.966	0.937	2.2584E-5	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-10.82	0.515	-0.0476

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.89	0.619	0.622	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.785	0.829	Data Not Normal
Lilliefors (Detects Only)	0.358	0.295	Data Not Normal
Lilliefors (NDs = DL)	0.523	0.102	Data Not Normal
Lilliefors (NDs = DL/2)	0.522	0.102	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0515	0.102	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.911	0.469	0.505	0.834

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.853	0.723	
Kolmogorov-Smirnov (Detects Only)	0.308	0.28	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	23.82	0.758	
Kolmogorov-Smirnov (NDs = DL)	0.533	0.103	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	23.25	0.754	
Kolmogorov-Smirnov (NDs = DL/2)	0.527	0.103	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.36	0.783	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.263	0.106	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.917	0.624	0.62	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.834	0.829	Data Appear Lognormal
Lilliefors (Detects Only)	0.278	0.295	Data Appear Lognormal
Lilliefors (NDs = DL)	0.521	0.102	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.518	0.102	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0395	0.102	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Mercury_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Mercury, Dissolved

General Statistics

Number of Valid Data	26	Number of Detected Data	3
Number of Distinct Detected Data	1	Number of Non-Detect Data	23

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Alluv Mercury, Dissolved was not processed!

Muddy Creek Mercury, Dissolved

General Statistics

Number of Valid Data	46	Number of Detected Data	3
Number of Distinct Detected Data	1	Number of Non-Detect Data	43

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Muddy Creek Mercury, Dissolved was not processed!

Mesa Mercury, Dissolved

General Statistics

Number of Valid Data	30	Number of Detected Data	6
Number of Distinct Detected Data	3	Number of Non-Detect Data	24
		Percent Non-Detects	80.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.0000E-5	Minimum Detected	-11.51
Maximum Detected	4.0000E-5	Maximum Detected	-10.13
Mean of Detected	2.3333E-5	Mean of Detected	-10.82
SD of Detected	1.3663E-5	SD of Detected	0.62
Minimum Non-Detect	2.0000E-4	Minimum Non-Detect	-8.517
Maximum Non-Detect	2.0000E-4	Maximum Non-Detect	-8.517

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.823	Shapiro Wilk Test Statistic	0.853
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	8.4667E-5	Mean (Log Scale)	-9.532
SD	3.1703E-5	SD (Log Scale)	0.704
95% UTL 95% Coverage	1.5505E-4	95% UTL 95% Coverage	3.4557E-4
95% UPL (t)	1.3942E-4	95% UPL (t)	2.4432E-4
90% Percentile (z)	1.2530E-4	90% Percentile (z)	1.7856E-4
95% Percentile (z)	1.3681E-4	95% Percentile (z)	2.3057E-4
99% Percentile (z)	1.5842E-4	99% Percentile (z)	3.7242E-4
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	2.4601E-5
		SD in Original Scale	1.6540E-5
		Mean in Log Scale	-10.82
		SD in Log Scale	0.663
		95% UTL 95% Coverage	8.7080E-5
		95% UPL (t)	6.2820E-5
		90% Percentile (z)	4.6757E-5
		95% Percentile (z)	5.9484E-5
		99% Percentile (z)	9.3438E-5
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.812	Data appear Normal at 5% Significance Level	
Theta Star	1.2879E-5		
nu star	21.74		
A-D Test Statistic	0.502	Nonparametric Statistics	
5% A-D Critical Value	0.701	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.23	Mean	2.3333E-5
5% K-S Critical Value	0.334	SD	1.2472E-5
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	5.5777E-6
		95% KM UTL with 95% Coverage	5.1022E-5
Assuming Gamma Distribution		95% KM Chebyshev UPL	7.8597E-5
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	4.4875E-5
Mean	2.3097E-5	90% Percentile (z)	3.9317E-5
Median	2.2717E-5	95% Percentile (z)	4.3848E-5
SD	1.3163E-5	99% Percentile (z)	5.2348E-5
k star	0.489		
Theta star	4.7203E-5	Gamma ROS Limits with Extrapolated Data	

Nu star	29.36	95% Wilson Hilferty (WH) Approx. Gamma UPL	7.2191E-5
95% Percentile of Chisquare (2k)	3.788	95% Hawkins Wixley (HW) Approx. Gamma UPL	9.3051E-5
		95% WH Approx. Gamma UTL with 95% Coverage	9.7388E-5
90% Percentile	6.2769E-5	95% HW Approx. Gamma UTL with 95% Coverage	1.3586E-4
95% Percentile	8.9412E-5		
99% Percentile	1.5507E-4		

Note: DL/2 is not a recommended method.

Muddy Creek + Mesa Mercury, Dissolved

General Statistics

Number of Valid Data	76	Number of Detected Data	9
Number of Distinct Detected Data	3	Number of Non-Detect Data	67
		Percent Non-Detects	88.16%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.0000E-5	Minimum Detected	-11.51
Maximum Detected	4.0000E-5	Maximum Detected	-10.13
Mean of Detected	2.2222E-5	Mean of Detected	-10.82
SD of Detected	1.0929E-5	SD of Detected	0.49
Minimum Non-Detect	2.0000E-4	Minimum Non-Detect	-8.517
Maximum Non-Detect	2.0000E-4	Maximum Non-Detect	-8.517

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.785	Shapiro Wilk Test Statistic	0.834
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	9.0789E-5	Mean (Log Scale)	-9.401
SD	2.5548E-5	SD (Log Scale)	0.547
95% UTL 95% Coverage	1.4111E-4	95% UTL 95% Coverage	2.4295E-4
95% UPL (t)	1.3362E-4	95% UPL (t)	2.0690E-4
90% Percentile (z)	1.2353E-4	90% Percentile (z)	1.6668E-4
95% Percentile (z)	1.3281E-4	95% Percentile (z)	2.0336E-4
99% Percentile (z)	1.5022E-4	99% Percentile (z)	2.9531E-4
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	2.2766E-5

SD in Original Scale	1.2068E-5
Mean in Log Scale	-10.82
SD in Log Scale	0.515
95% UTL 95% Coverage	5.5140E-5
95% UPL (t)	4.7408E-5
90% Percentile (z)	3.8688E-5
95% Percentile (z)	4.6646E-5
99% Percentile (z)	6.6251E-5

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	3.345
Theta Star	6.6437E-6
nu star	60.21
A-D Test Statistic	0.853
5% A-D Critical Value	0.723
K-S Test Statistic	0.308
5% K-S Critical Value	0.28
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics with Extrapolated Data	
Mean	2.1819E-5
Median	2.2671E-5
SD	1.0012E-5
k star	0.937
Theta star	2.3292E-5
Nu star	142.4
95% Percentile of Chisquare (2k)	5.744
90% Percentile	5.1053E-5
95% Percentile	6.6894E-5
99% Percentile	1.0385E-4

Data Distribution Test with Detected Values Only	
Data appear Lognormal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	2.2222E-5
SD	1.0304E-5
SE of Mean	3.6430E-6
95% KM UTL with 95% Coverage	4.2519E-5
95% KM Chebyshev UPL	6.7431E-5
95% KM UPL (t)	3.9495E-5
90% Percentile (z)	3.5427E-5
95% Percentile (z)	3.9171E-5
99% Percentile (z)	4.6193E-5
Gamma ROS Limits with Extrapolated Data	
95% Wilson Hilferty (WH) Approx. Gamma UPL	5.5073E-5
95% Hawkins Wixley (HW) Approx. Gamma UPL	6.5670E-5
95% WH Approx. Gamma UTL with 95% Coverage	6.4238E-5
95% HW Approx. Gamma UTL with 95% Coverage	7.9318E-5

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Mercury_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Mercury, Dissolved

Background Data: Alluv Mercury, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	30	26
Number of Non-Detect Data	24	23
Number of Detect Data	6	3
Minimum Non-Detect	2.0000E-4	2.0000E-4
Maximum Non-Detect	2.0000E-4	2.0000E-4
Percent Non detects	80.00%	88.46%
Minimum Detected	1.0000E-5	1.0000E-5
Maximum Detected	4.0000E-5	1.0000E-5
Mean of Detected Data	2.3333E-5	1.0000E-5
Median of Detected Data	2.0000E-5	1.0000E-5
SD of Detected Data	1.3663E-5	0

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0.77
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.442

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Mercury_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Mercury, Dissolved

Background Data: Alluv Mercury, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	43	23
Number of Detect Data	3	3
Minimum Non-Detect	2.0000E-4	2.0000E-4
Maximum Non-Detect	2.0000E-4	2.0000E-4
Percent Non detects	93.48%	88.46%
Minimum Detected	2.0000E-5	1.0000E-5
Maximum Detected	2.0000E-5	1.0000E-5
Mean of Detected Data	2.0000E-5	1.0000E-5
Median of Detected Data	2.0000E-5	1.0000E-5
SD of Detected Data	0	0

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	2.224
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0262

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Mercury_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Mercury, Dissolved

Background Data: Muddy Creek Mercury, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	30	46
Number of Non-Detect Data	24	43
Number of Detect Data	6	3
Minimum Non-Detect	2.0000E-4	2.0000E-4
Maximum Non-Detect	2.0000E-4	2.0000E-4
Percent Non detects	80.00%	93.48%
Minimum Detected	1.0000E-5	2.0000E-5
Maximum Detected	4.0000E-5	2.0000E-5
Mean of Detected Data	2.3333E-5	2.0000E-5
Median of Detected Data	2.0000E-5	2.0000E-5
SD of Detected Data	1.3663E-5	0

Site vs Background Gehan Test

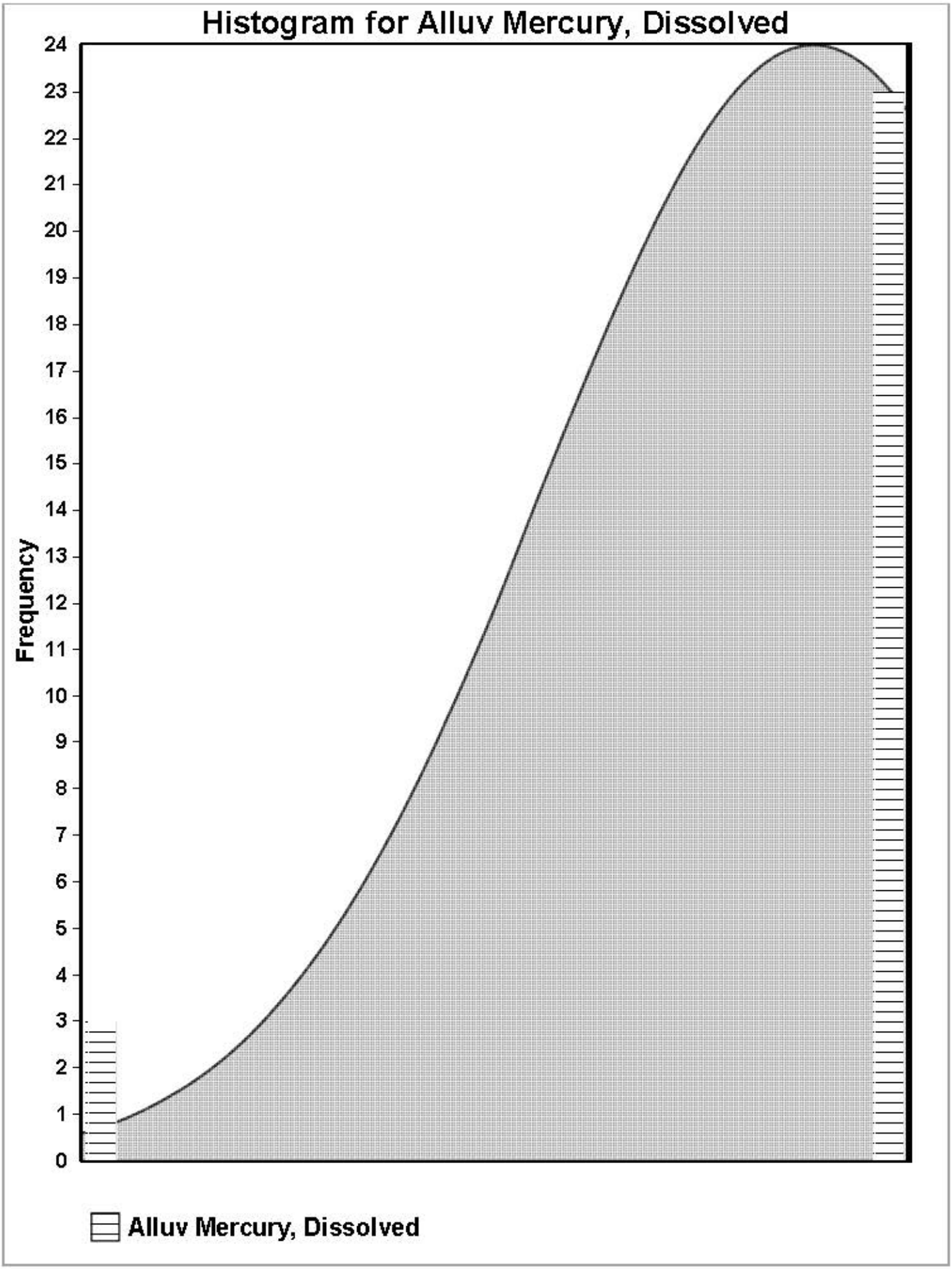
H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-0.787
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.431

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv Mercury, Dissolved
Frequency
0
1
2
3
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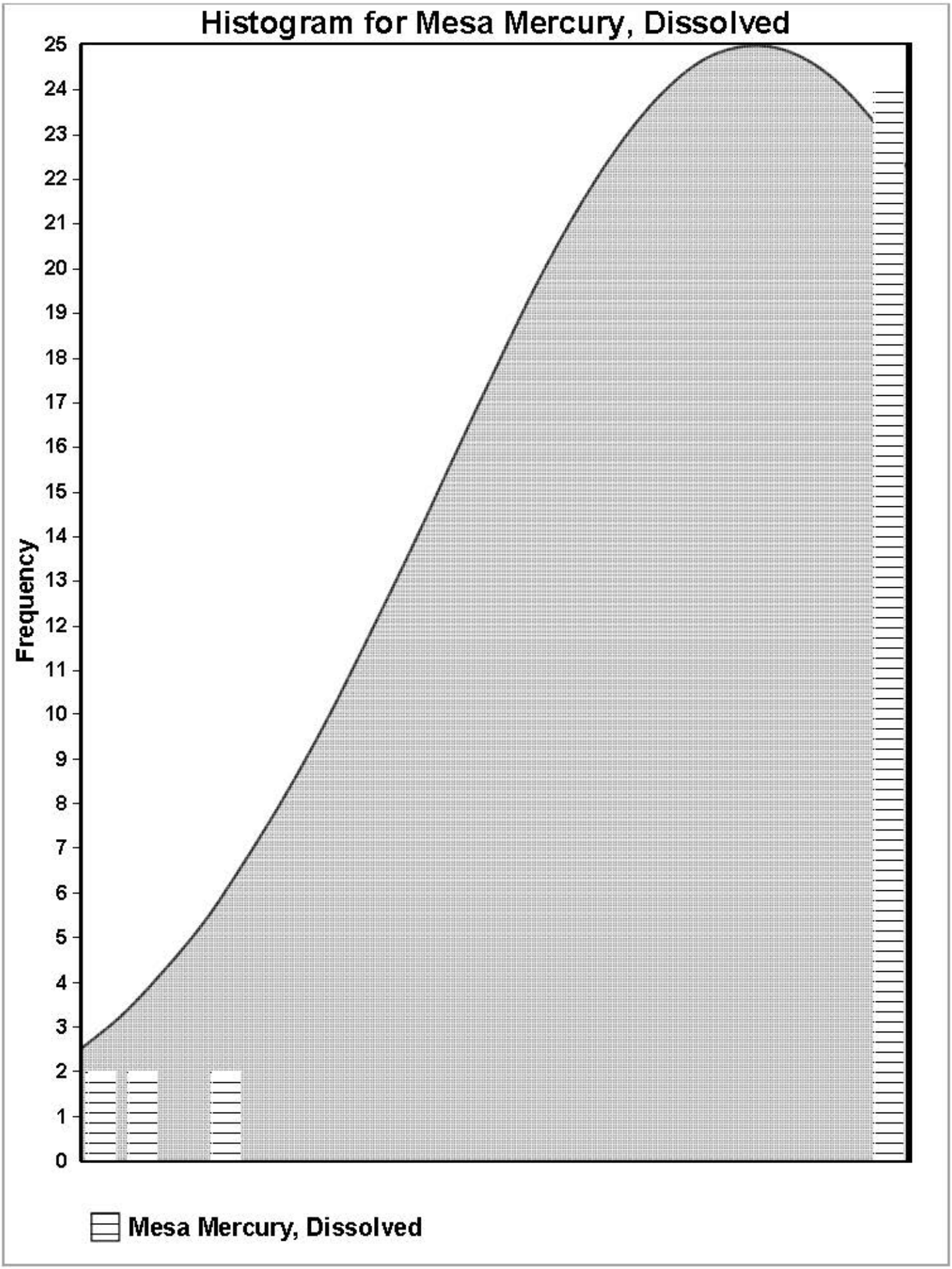
20
21
22
23
24
Alluv Mercury, Dissolved


Histogram for Mesa Mercury, Dissolved
Frequency
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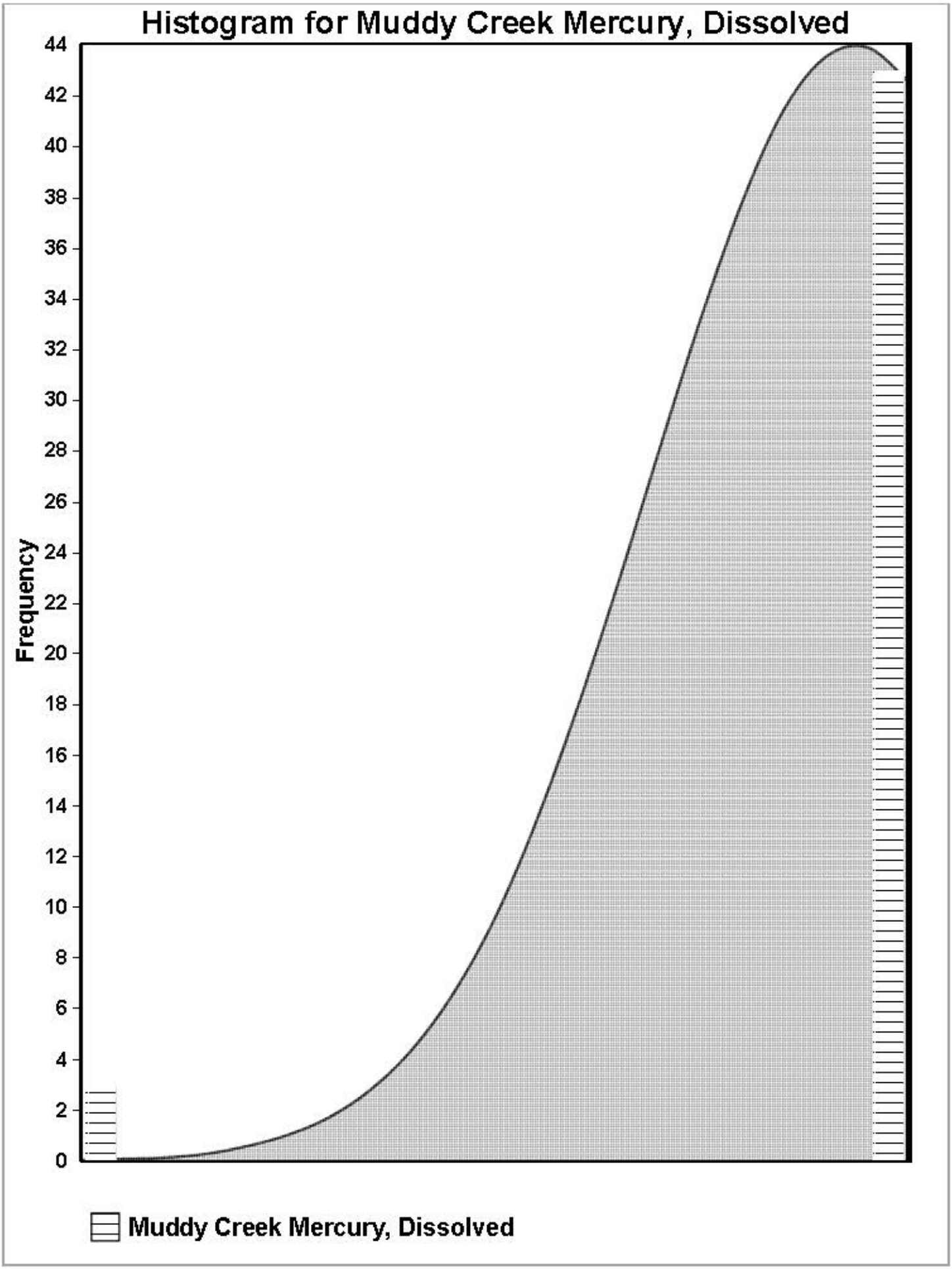
25
Mesa Mercury, Dissolved


Histogram for Muddy Creek Mercury, Dissolved
Frequency
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2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
Muddy Creek Mercury, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Mercury_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Mercury, Dissolved

Mean	8.9615E-5
Standard Deviation	2.9323E-5
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	8.9615E-5	2.8754E-5	1.0000E-5	18	2.769	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Mercury, Dissolved

Mean	9.4783E-5
Standard Deviation	1.9971E-5
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	9.4783E-5	1.9753E-5	2.0000E-5	3	3.786	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 2.0000E-5 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 2.0000E-5 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Mercury, Dissolved

Mean	8.4667E-5
Standard Deviation	3.1703E-5
Number of data	30
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical

#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	8.4667E-5	3.1170E-5	1.0000E-5	8	2.395	2.91	3.24

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek + Mesa Mercury, Dissolved

Mean	9.0789E-5
Standard Deviation	2.5548E-5
Number of data	76
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	9.0789E-5	2.5379E-5	1.0000E-5	54	3.183	3.29	3.65

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Location Name	Sample Date	Alluv Mercury, Dissolved	D_Alluv Mercury, Dissolved
BG-1S	11/26/2012	0.0002	0
BG-1S	8/23/2012	0.0002	0
BG-1S	5/24/2012	0.0002	0
BG-1S	3/20/2012	0.0002	0
IMW-2.5D	11/26/2012	0.0002	0
IMW-2.5D	8/24/2012	0.0002	0
IMW-2.5D	5/21/2012	0.0002	0
IMW-2.5D	3/21/2012	0.0002	0
IMW-2.5S	11/26/2012	0.0002	0
IMW-2.5S	8/24/2012	0.0002	0
IMW-2.5S	5/21/2012	0.0002	0
IMW-2.5S	3/21/2012	0.0002	0
IMW-3S	5/21/2012	0.0002	0
IMW-3S	3/20/2012	0.0002	0
KMW-2D	11/26/2012	0.0002	0
KMW-2D	8/24/2012	0.0002	0
KMW-2D	5/21/2012	0.0002	0
KMW-2D	3/23/2012	0.00001	1
KMW-2M	11/26/2012	0.0002	0
KMW-2M	8/24/2012	0.0002	0
KMW-2M	5/21/2012	0.0002	0
KMW-2M	3/23/2012	0.00001	1
KMW-2S	11/26/2012	0.0002	0
KMW-2S	8/24/2012	0.0002	0
KMW-2S	5/21/2012	0.0002	0
KMW-2S	3/23/2012	0.00001	1

Location Name	Sample Date	Muddy Creek Mercury, Dissolved	D_Muddy Creek Mercury, Dissolved
BG-3S	11/27/2012	0.0002	0
BG-3S	8/22/2012	0.0002	0
BG-3S	5/23/2012	0.00002	1
BG-3S	3/21/2012	0.0002	0
BG-4S	11/27/2012	0.0002	0
BG-4S	8/30/2012	0.0002	0
BG-4S	5/30/2012	0.0002	0
BG-4S	3/20/2012	0.0002	0
BG-6S	11/27/2012	0.0002	0
BG-6S	8/23/2012	0.0002	0
BG-6S	5/25/2012	0.0002	0
BG-6S	3/21/2012	0.0002	0
BG-1M	11/26/2012	0.0002	0
BG-1M	8/23/2012	0.0002	0
BG-1M	5/24/2012	0.0002	0
BG-1M	3/20/2012	0.0002	0
BG-3M	11/27/2012	0.0002	0
BG-3M	8/22/2012	0.0002	0
BG-3M	5/24/2012	0.0002	0
BG-3M	3/21/2012	0.0002	0
BG-4M	11/27/2012	0.0002	0
BG-4M	8/30/2012	0.0002	0
BG-4M	5/30/2012	0.0002	0
BG-4M	3/20/2012	0.0002	0
BG-6M	11/27/2012	0.0002	0
BG-6M	8/22/2012	0.00002	1
BG-6M	5/25/2012	0.0002	0
BG-6M	3/21/2012	0.0002	0
BG-1D	11/26/2012	0.0002	0
BG-1D	8/23/2012	0.0002	0
BG-1D	5/24/2012	0.0002	0
BG-1D	3/20/2012	0.0002	0
BG-3D	11/27/2012	0.0002	0
BG-3D	8/21/2012	0.0002	0
BG-3D	5/23/2012	0.0002	0
BG-3D	3/21/2012	0.0002	0
BG-4D	11/27/2012	0.0002	0
BG-4D	8/30/2012	0.0002	0
BG-4D	5/30/2012	0.00002	1
BG-4D	3/20/2012	0.0002	0
BG-6D	11/27/2012	0.0002	0
BG-6D	8/22/2012	0.0002	0
BG-6D	5/25/2012	0.0002	0
BG-6D	3/21/2012	0.0002	0
IMW-3D	5/25/2012	0.0002	0
IMW-3D	3/22/2012	0.0002	0

Location Name	Sample Date	Mesa Mercury, Dissolved	D_Mesa Mercury, Dissolved
LMW-10	11/28/2012	0.0002	0
LMW-10	8/27/2012	0.0002	0
LMW-10	5/30/2012	0.00002	1
LMW-10	3/22/2012	0.0002	0
LMW-11R	11/26/2012	0.0002	0
LMW-11R	8/21/2012	0.0002	0
LMW-11R	5/29/2012	0.00002	1
LMW-11R	3/23/2012	0.00001	1
LMW-7	11/28/2012	0.0002	0
LMW-7	8/27/2012	0.0002	0
LMW-7	5/31/2012	0.00004	1
LMW-7	3/23/2012	0.0002	0
LMW-7	12/5/2011	0.0002	0
BG-2S	11/26/2012	0.0002	0
BG-2S	8/23/2012	0.0002	0
BG-2S	5/24/2012	0.0002	0
BG-2S	3/21/2012	0.0002	0
BG-2M	11/26/2012	0.0002	0
BG-2M	8/23/2012	0.0002	0
BG-2M	5/24/2012	0.0002	0
BG-2M	3/21/2012	0.0002	0
BG-2D	11/26/2012	0.0002	0
BG-2D	8/23/2012	0.0002	0
BG-2D	5/24/2012	0.0002	0
BG-2D	3/21/2012	0.0002	0
LMW-9	11/28/2012	0.0002	0
LMW-9	8/27/2012	0.0002	0
LMW-9	5/31/2012	0.00004	1
LMW-9	3/23/2012	0.00001	1
LMW-9	12/5/2011	0.0002	0

Location Name	Sample Date	Muddy Creek + Mesa Mercury, Dissolved	D_Muddy Creek + Mesa Mercury, Dissolved
BG-3S	11/27/2012	0.0002	0
BG-3S	8/22/2012	0.0002	0
BG-3S	5/23/2012	0.00002	1
BG-3S	3/21/2012	0.0002	0
BG-4S	11/27/2012	0.0002	0
BG-4S	8/30/2012	0.0002	0
BG-4S	5/30/2012	0.0002	0
BG-4S	3/20/2012	0.0002	0
BG-6S	11/27/2012	0.0002	0
BG-6S	8/23/2012	0.0002	0
BG-6S	5/25/2012	0.0002	0
BG-6S	3/21/2012	0.0002	0
BG-1M	11/26/2012	0.0002	0
BG-1M	8/23/2012	0.0002	0
BG-1M	5/24/2012	0.0002	0
BG-1M	3/20/2012	0.0002	0
BG-3M	11/27/2012	0.0002	0
BG-3M	8/22/2012	0.0002	0
BG-3M	5/24/2012	0.0002	0
BG-3M	3/21/2012	0.0002	0
BG-4M	11/27/2012	0.0002	0
BG-4M	8/30/2012	0.0002	0
BG-4M	5/30/2012	0.0002	0
BG-4M	3/20/2012	0.0002	0
BG-6M	11/27/2012	0.0002	0
BG-6M	8/22/2012	0.00002	1
BG-6M	5/25/2012	0.0002	0
BG-6M	3/21/2012	0.0002	0
BG-1D	11/26/2012	0.0002	0
BG-1D	8/23/2012	0.0002	0
BG-1D	5/24/2012	0.0002	0
BG-1D	3/20/2012	0.0002	0
BG-3D	11/27/2012	0.0002	0
BG-3D	8/21/2012	0.0002	0
BG-3D	5/23/2012	0.0002	0
BG-3D	3/21/2012	0.0002	0
BG-4D	11/27/2012	0.0002	0
BG-4D	8/30/2012	0.0002	0
BG-4D	5/30/2012	0.00002	1
BG-4D	3/20/2012	0.0002	0
BG-6D	11/27/2012	0.0002	0
BG-6D	8/22/2012	0.0002	0
BG-6D	5/25/2012	0.0002	0
BG-6D	3/21/2012	0.0002	0
IMW-3D	5/25/2012	0.0002	0
IMW-3D	3/22/2012	0.0002	0
LMW-10	11/28/2012	0.0002	0
LMW-10	8/27/2012	0.0002	0
LMW-10	5/30/2012	0.00002	1
LMW-10	3/22/2012	0.0002	0

11R	11/26/2012	0.0002	0
11R	8/21/2012	0.0002	0
11R	5/29/2012	0.00002	1
11R	3/23/2012	0.00001	1
LMW-7	11/28/2012	0.0002	0
LMW-7	8/27/2012	0.0002	0
LMW-7	5/31/2012	0.00004	1
LMW-7	3/23/2012	0.0002	0
LMW-7	12/5/2011	0.0002	0
BG-2S	11/26/2012	0.0002	0
BG-2S	8/23/2012	0.0002	0
BG-2S	5/24/2012	0.0002	0
BG-2S	3/21/2012	0.0002	0
BG-2M	11/26/2012	0.0002	0
BG-2M	8/23/2012	0.0002	0
BG-2M	5/24/2012	0.0002	0
BG-2M	3/21/2012	0.0002	0
BG-2D	11/26/2012	0.0002	0
BG-2D	8/23/2012	0.0002	0
BG-2D	5/24/2012	0.0002	0
BG-2D	3/21/2012	0.0002	0
LMW-9	11/28/2012	0.0002	0
LMW-9	8/27/2012	0.0002	0
LMW-9	5/31/2012	0.00004	1
LMW-9	3/23/2012	0.00001	1
LMW-9	12/5/2011	0.0002	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Molybdenum_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Molybdenum, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	87	0	87	87	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	87	0.014	0.47	0.0384	0.033	0.0477

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	3.604	3.487	0.0107	-3.405	0.394	-0.116

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.441	0.441	0.441	0.441

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.36	0.095	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.543	0.543	0.543	0.543

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	8.017	0.757	
Kolmogorov-Smirnov (Full: no NDs)	0.209	0.0964	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.849	0.849	0.849	0.849

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Full: no NDs)	0.116	0.095	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Molybdenum, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	53	0	53	45	8	15.09%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	8	0.005	0.02	0.00875	0.005	0.00694
Statistics (Detects Only)	45	0.0016	0.078	0.0173	0.015	0.0162
Statistics (All: NDs treated as DL value)	53	0.0016	0.078	0.016	0.014	0.0154

Statistics (All: NDs treated as DL/2 value)	53	0.0016	0.078	0.0154	0.012	0.0156
Statistics (Normal ROS Estimated Data)	53	-0.0149	0.078	0.0144	0.012	0.0168
Statistics (Gamma ROS Estimated Data)	53	1.000E-12	0.078	0.0156	0.012	0.0157
Statistics (Lognormal ROS Estimated Data)	53	0.0016	0.078	0.0154	0.012	0.0156

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.621	1.542	0.0107	-4.395	0.859	-0.196
Statistics (NDs = DL)	1.594	1.516	0.0101	-4.479	0.849	-0.19
Statistics (NDs = DL/2)	1.368	1.303	0.0112	-4.584	0.94	-0.205
Statistics (Gamma ROS Estimates)	0.517	0.501	0.0302	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.576	0.925	-0.202

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.848	0.84	0.843	0.897

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.729	0.945	Data Not Normal
Lilliefors (Detects Only)	0.214	0.132	Data Not Normal
Lilliefors (NDs = DL)	0.209	0.122	Data Not Normal
Lilliefors (NDs = DL/2)	0.201	0.122	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.184	0.122	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.951	0.949	0.957	0.954

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.528	0.766	
Kolmogorov-Smirnov (Detects Only)	0.107	0.134	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.83	0.767	
Kolmogorov-Smirnov (NDs = DL)	0.103	0.124	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL/2)	0.585	0.771	
Kolmogorov-Smirnov (NDs = DL/2)	0.0867	0.125	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.89	0.813	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.25	0.129	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.987	0.986	0.986	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.97	0.945	Data Appear Lognormal
Lilliefors (Detects Only)	0.114	0.132	Data Appear Lognormal
Lilliefors (NDs = DL)	0.11	0.122	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.103	0.122	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.102	0.122	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Molybdenum, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	96	4	4.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	4	0.02	0.02	0.02	0.02	0
Statistics (Detects Only)	96	0.0052	0.41	0.119	0.101	0.0867
Statistics (All: NDs treated as DL value)	100	0.0052	0.41	0.115	0.1	0.0871
Statistics (All: NDs treated as DL/2 value)	100	0.0052	0.41	0.115	0.1	0.0876
Statistics (Normal ROS Estimated Data)	100	-0.0812	0.41	0.112	0.1	0.0913
Statistics (Gamma ROS Estimated Data)	100	1.000E-12	0.41	0.114	0.1	0.0881
Statistics (Lognormal ROS Estimated Data)	100	0.0052	0.41	0.115	0.1	0.0873

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.829	1.78	0.0651	-2.425	0.849	-0.35
Statistics (NDs = DL)	1.694	1.65	0.068	-2.485	0.881	-0.355
Statistics (NDs = DL/2)	1.585	1.544	0.0724	-2.513	0.936	-0.372
Statistics (Gamma ROS Estimates)	0.502	0.493	0.228	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.493	0.897	-0.36

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.945	0.942	0.946	0.965

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.152	0.0904	Data Not Normal
Lilliefors (NDs = DL)	0.148	0.0886	Data Not Normal
Lilliefors (NDs = DL/2)	0.146	0.0886	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.137	0.0886	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.988	0.987	0.987	0.944

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.584	0.767	
Kolmogorov-Smirnov (Detects Only)	0.0808	0.0927	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.765	0.768	
Kolmogorov-Smirnov (NDs = DL)	0.0798	0.0909	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.627	0.769	
Kolmogorov-Smirnov (NDs = DL/2)	0.0779	0.091	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	12.19	0.818	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.253	0.0946	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.979	0.979	0.976	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.117	0.0904	Data Not Lognormal

			Lilliefors (NDs = DL)	0.12	0.0886	Data Not Lognormal					
			Lilliefors (NDs = DL/2)	0.128	0.0886	Data Not Lognormal					
			Lilliefors (Lognormal ROS Estimates)	0.122	0.0886	Data Not Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.											

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Molybdenum_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Molybdenum, Dissolved

General Statistics

Total Number of Observations	87	Number of Distinct Observations	46

Raw Statistics		Log-Transformed Statistics	
Minimum	0.014	Minimum	-4.269
Maximum	0.47	Maximum	-0.755
Second Largest	0.054	Second Largest	-2.919
First Quartile	0.0266	First Quartile	-3.627
Median	0.033	Median	-3.411
Third Quartile	0.039	Third Quartile	-3.244
Mean	0.0384	Mean	-3.405
SD	0.0477	SD	0.394
Coefficient of Variation	1.241		
Skewness	8.829		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.36	Lilliefors Test Statistic	0.116
Lilliefors Critical Value	0.095	Lilliefors Critical Value	0.095
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	0.131	95% UTL with 95% Coverage	0.0715
95% UPL (t)	0.118	95% UPL (t)	0.0642
90% Percentile (z)	0.0995	90% Percentile (z)	0.055
95% Percentile (z)	0.117	95% Percentile (z)	0.0635
99% Percentile (z)	0.149	99% Percentile (z)	0.083

Gamma Distribution Test		Data Distribution Test	
k star	3.487	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.011		
MLE of Mean	0.0384		
MLE of Standard Deviation	0.0206		
nu star	606.8		
A-D Test Statistic	8.017	Nonparametric Statistics	
5% A-D Critical Value	0.757	90% Percentile	0.0476
K-S Test Statistic	0.209	95% Percentile	0.0517
5% K-S Critical Value	0.0964	99% Percentile	0.112
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	0.053
90% Percentile	0.066	95% Percentile Bootstrap UTL with 95% Coverage	0.0534
95% Percentile	0.0772	95% BCA Bootstrap UTL with 95% Coverage	0.053
99% Percentile	0.101	95% UPL	0.052
		95% Chebyshev UPL	0.247
95% WH Approx. Gamma UPL	0.0739	Upper Threshold Limit Based upon IQR	0.0576
95% HW Approx. Gamma UPL	0.0708		
95% WH Approx. Gamma UTL with 95% Coverage	0.0825		
95% HW Approx. Gamma UTL with 95% Coverage	0.0789		

Muddy Creek Molybdenum, Dissolved

General Statistics			
Number of Valid Data	53	Number of Detected Data	45
Number of Distinct Detected Data	34	Number of Non-Detect Data	8
		Percent Non-Detects	15.09%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0016	Minimum Detected	-6.438
Maximum Detected	0.078	Maximum Detected	-2.551
Mean of Detected	0.0173	Mean of Detected	-4.395
SD of Detected	0.0162	SD of Detected	0.859
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	42
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	11
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	79.25%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.729	Shapiro Wilk Test Statistic	0.97
5% Shapiro Wilk Critical Value	0.945	5% Shapiro Wilk Critical Value	0.945
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0154	Mean (Log Scale)	-4.584
SD	0.0156	SD (Log Scale)	0.94
95% UTL 95% Coverage	0.0473	95% UTL 95% Coverage	0.0699
95% UPL (t)	0.0418	95% UPL (t)	0.0501
90% Percentile (z)	0.0354	90% Percentile (z)	0.0341
95% Percentile (z)	0.0411	95% Percentile (z)	0.048
99% Percentile (z)	0.0517	99% Percentile (z)	0.0911
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.00949	Mean in Original Scale	0.0154
SD	0.0351	SD in Original Scale	0.0156
95% UTL with 95% Coverage	0.0623	95% UTL with 95% Coverage	0.0683
		95% BCA UTL with 95% Coverage	0.078

		95% Bootstrap (%) UTL with 95% Coverage	0.078
95% UPL (t)	0.0499	95% UPL (t)	0.0492
90% Percentile (z)	0.0355	90% Percentile (z)	0.0337
95% Percentile (z)	0.0483	95% Percentile (z)	0.0472
99% Percentile (z)	0.0722	99% Percentile (z)	0.0886
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.528	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0113		
nu star	137.5		
A-D Test Statistic	0.528	Nonparametric Statistics	
5% A-D Critical Value	0.766	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.107	Mean	0.0154
5% K-S Critical Value	0.134	SD	0.0155
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00216
		95% KM UTL with 95% Coverage	0.0471
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0837
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0416
Mean	0.0156	90% Percentile (z)	0.0353
Median	0.012	95% Percentile (z)	0.0409
SD	0.0157	99% Percentile (z)	0.0515
k star	0.501		
Theta star	0.0312	Gamma ROS Limits with Extrapolated Data	
Nu star	53.05	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0479
95% Percentile of Chisquare (2k)	3.844	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0556
		95% WH Approx. Gamma UTL with 95% Coverage	0.0604
90% Percentile	0.0422	95% HW Approx. Gamma UTL with 95% Coverage	0.0733
95% Percentile	0.06		
99% Percentile	0.104		

Note: DL/2 is not a recommended method.

Mesa Molybdenum, Dissolved

General Statistics

Number of Valid Data	100	Number of Detected Data	96
Number of Distinct Detected Data	60	Number of Non-Detect Data	4
		Percent Non-Detects	4.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0052	Minimum Detected	-5.259
Maximum Detected	0.41	Maximum Detected	-0.892
Mean of Detected	0.119	Mean of Detected	-2.425
SD of Detected	0.0867	SD of Detected	0.849
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.152	Lilliefors Test Statistic	0.117

5% Lilliefors Critical Value	0.0904	5% Lilliefors Critical Value	0.0904
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.115	Mean (Log Scale)	-2.513
SD	0.0876	SD (Log Scale)	0.936
95% UTL 95% Coverage	0.283	95% UTL 95% Coverage	0.49
95% UPL (t)	0.261	95% UPL (t)	0.386
90% Percentile (z)	0.227	90% Percentile (z)	0.269
95% Percentile (z)	0.259	95% Percentile (z)	0.378
99% Percentile (z)	0.319	99% Percentile (z)	0.715
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.112	Mean in Original Scale	0.115
SD	0.0923	SD in Original Scale	0.0873
95% UTL with 95% Coverage	0.289	95% UTL with 95% Coverage	0.464
		95% BCA UTL with 95% Coverage	0.371
		95% Bootstrap (%) UTL with 95% Coverage	0.37
95% UPL (t)	0.266	95% UPL (t)	0.369
90% Percentile (z)	0.23	90% Percentile (z)	0.261
95% Percentile (z)	0.263	95% Percentile (z)	0.361
99% Percentile (z)	0.326	99% Percentile (z)	0.666
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.778	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.067		
nu star	341.5		
A-D Test Statistic	0.584	Nonparametric Statistics	
5% A-D Critical Value	0.767	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.0808	Mean	0.115
5% K-S Critical Value	0.0927	SD	0.087
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00875
		95% KM UTL with 95% Coverage	0.282
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.496
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.26
Mean	0.114	90% Percentile (z)	0.226
Median	0.1	95% Percentile (z)	0.258
SD	0.0881	99% Percentile (z)	0.317
k star	0.493		
Theta star	0.232	Gamma ROS Limits with Extrapolated Data	
Nu star	98.68	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.334
95% Percentile of Chisquare (2k)	3.809	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.395
		95% WH Approx. Gamma UTL with 95% Coverage	0.392
90% Percentile	0.31	95% HW Approx. Gamma UTL with 95% Coverage	0.479
95% Percentile	0.441		
99% Percentile	0.764		
Note: DL/2 is not a recommended method.			

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Molybdenum_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Molybdenum, Dissolved

Background Data: Alluv Molybdenum, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	87
Number of Non-Detect Data	4	0
Number of Detect Data	96	87
Minimum Non-Detect	0.02	N/A
Maximum Non-Detect	0.02	N/A
Percent Non detects	4.00%	0.00%
Minimum Detected	0.0052	0.014
Maximum Detected	0.41	0.47
Mean of Detected Data	0.119	0.0384
Median of Detected Data	0.101	0.033
SD of Detected Data	0.0867	0.0477

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	12059
WMW Test U-Stat	7.201
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	5.980E-13

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Molybdenum_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Molybdenum, Dissolved

Background Data: Alluv Molybdenum, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	53	87
Number of Non-Detect Data	8	0
Number of Detect Data	45	87
Minimum Non-Detect	0.005	N/A
Maximum Non-Detect	0.02	N/A
Percent Non detects	15.09%	0.00%
Minimum Detected	0.0016	0.014
Maximum Detected	0.078	0.47
Mean of Detected Data	0.0173	0.0384
Median of Detected Data	0.015	0.033
SD of Detected Data	0.0162	0.0477

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-8.054
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	8.007E-16

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Molybdenum_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Molybdenum, Dissolved

Background Data: Muddy Creek Molybdenum, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	53
Number of Non-Detect Data	4	8
Number of Detect Data	96	45
Minimum Non-Detect	0.02	0.005
Maximum Non-Detect	0.02	0.02
Percent Non detects	4.00%	15.09%
Minimum Detected	0.0052	0.0016
Maximum Detected	0.41	0.078
Mean of Detected Data	0.119	0.0173
Median of Detected Data	0.101	0.015
SD of Detected Data	0.0867	0.0162

Site vs Background Gehan Test

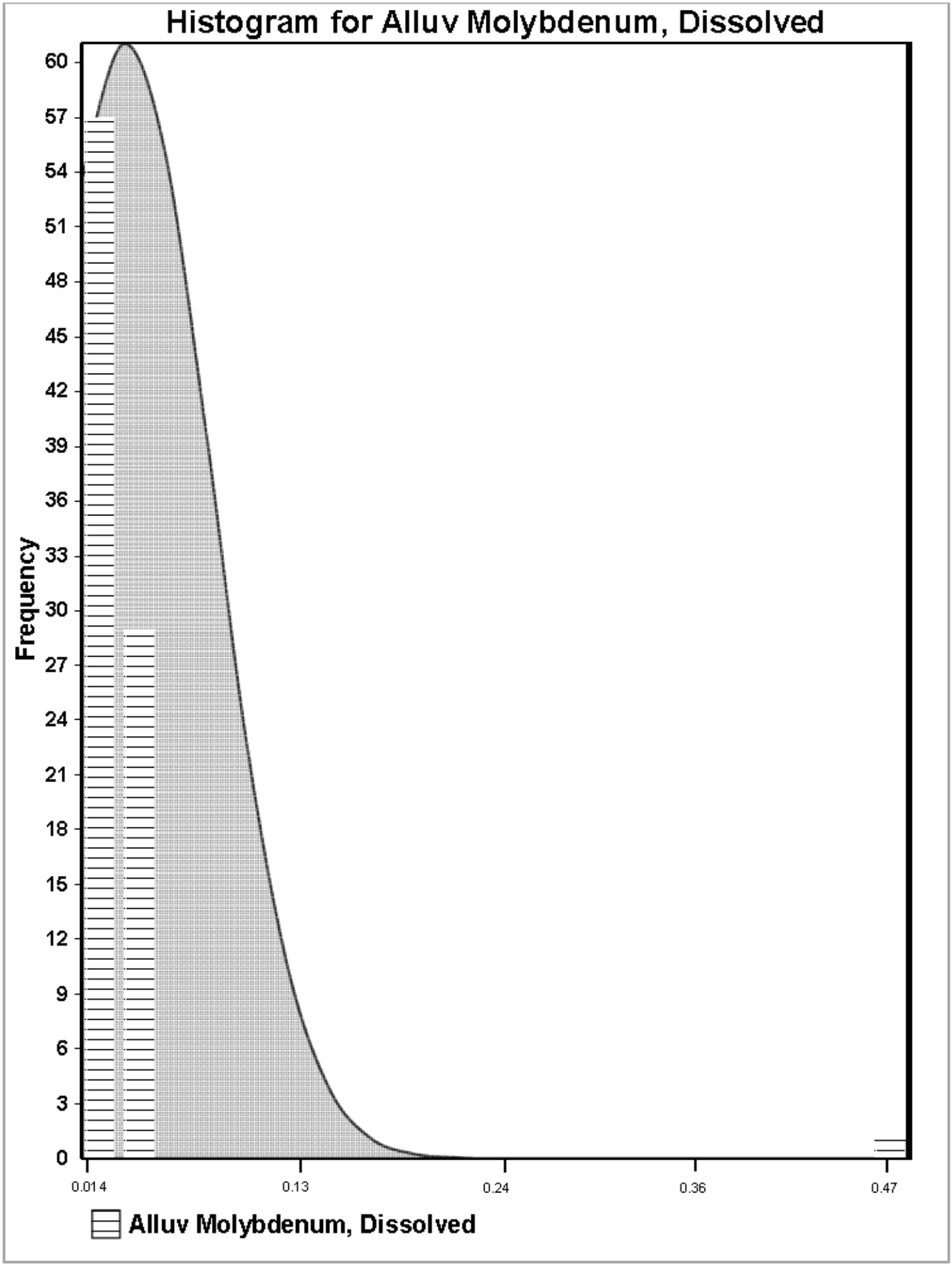
H0: Mu of Site or AOC = Mu of background

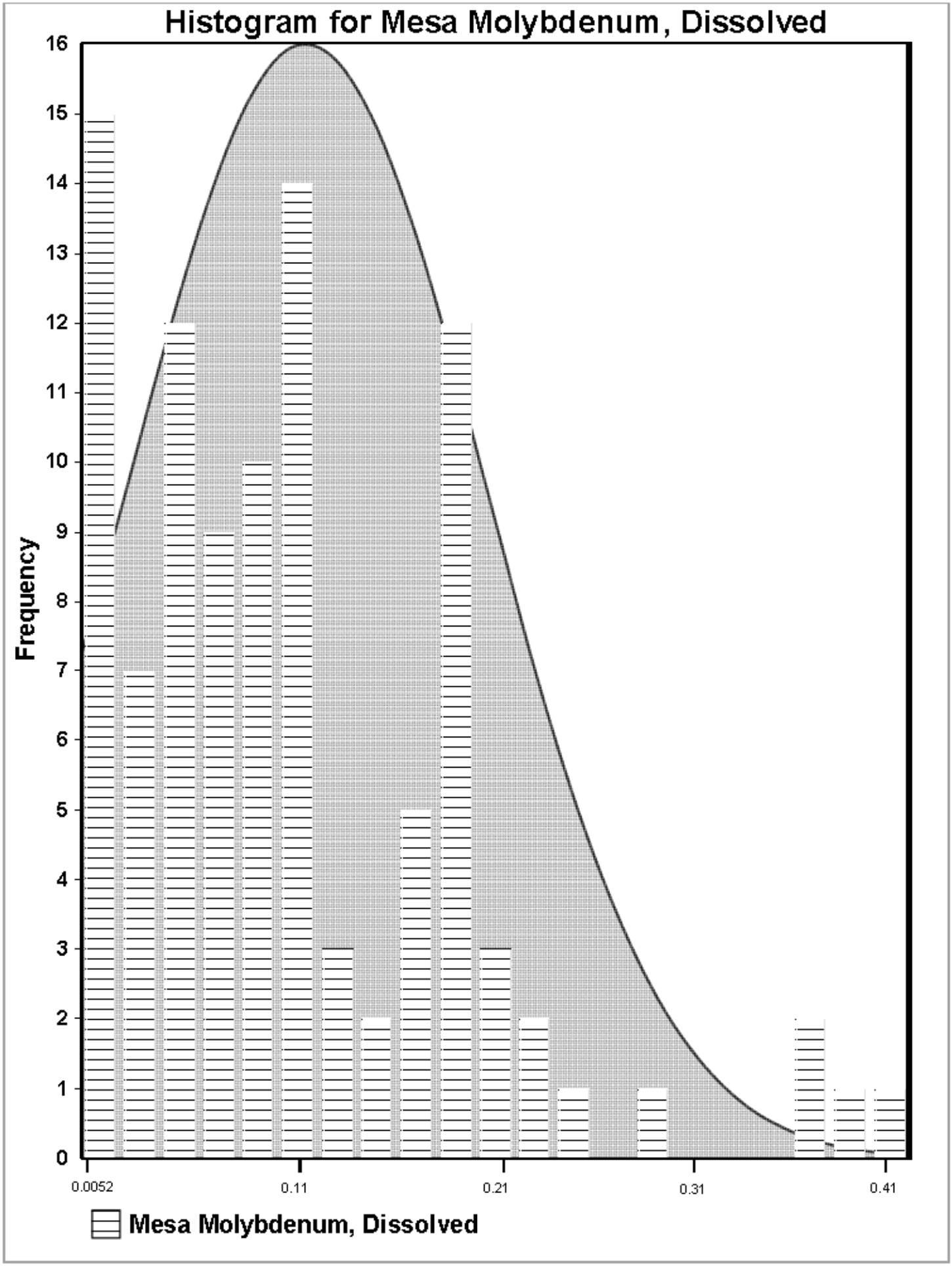
Gehan z Test Value	8.801
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0

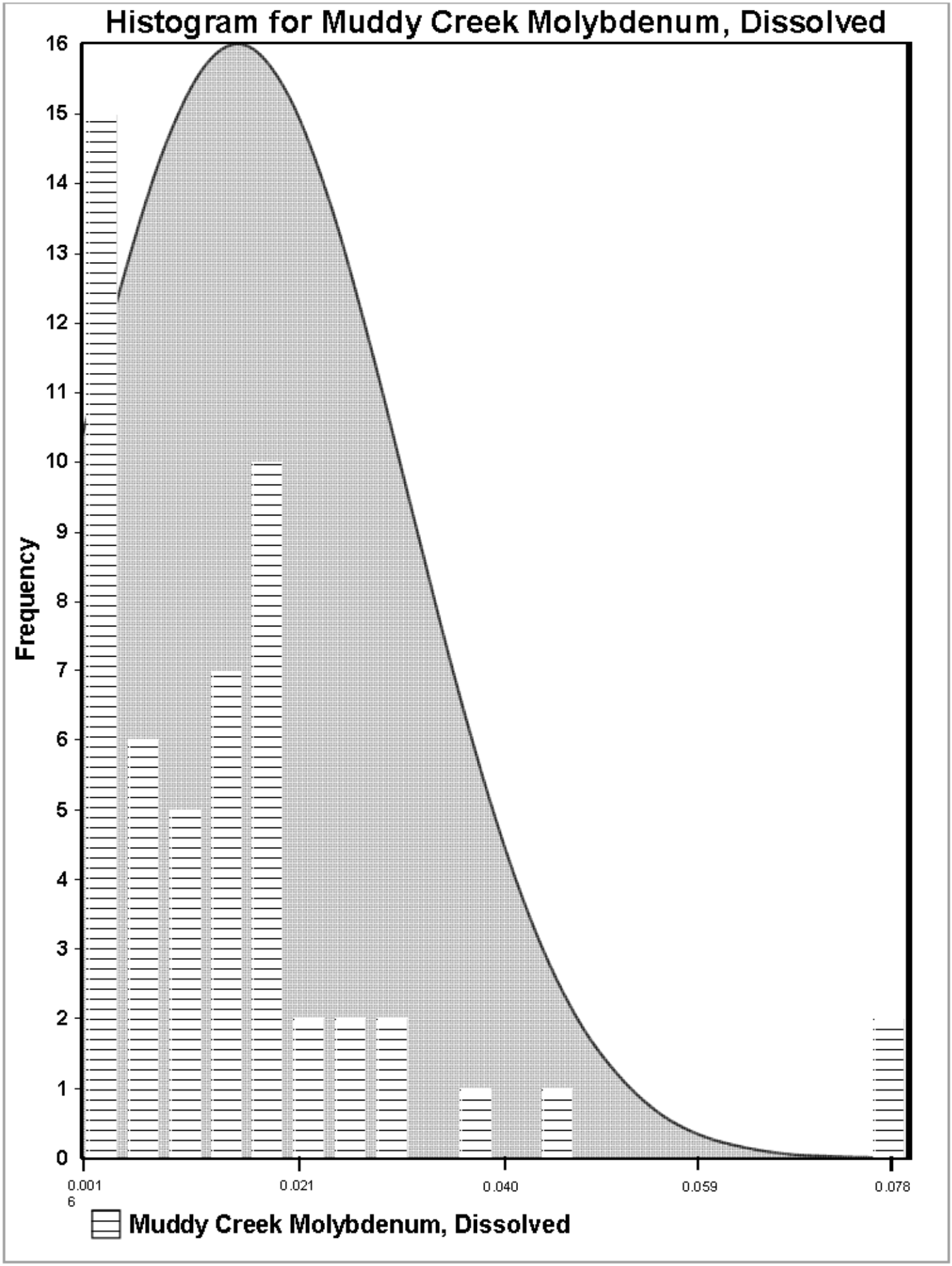
Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Molybdenum, Dissolved
Frequency
60
57
54
51
48
45
42
39
36
33
30
27
24
21
18
15
12
9
6
3
0
0.014
0.13
0.24
0.36
0.47
Alluv Molybdenum, Dissolved


Histogram for Mesa Molybdenum, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
0.0052
0.11
0.21
0.31
0.41
Mesa Molybdenum, Dissolved


Histogram for Muddy Creek Molybdenum, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
0.001
6
0.021
0.040
0.059
0.078
Muddy Creek Molybdenum, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Molybdenum_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Molybdenum, Dissolved

Mean	0.0384
Standard Deviation	0.0477
Number of data	87
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0384	0.0474	0.47	73	9.108	3.338	3.705

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.47 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.47 is a Potential Statistical Outlier

Rosner's Outlier Test for Muddy Creek Molybdenum, Dissolved

Mean	0.0154
Standard Deviation	0.0156
Number of data	53
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0154	0.0155	0.078	33	4.043	3.151	3.504

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.078 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.078 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Molybdenum, Dissolved

Mean	0.115
Standard Deviation	0.0876
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.115	0.0872	0.41	45	3.388	3.38	3.75

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.41 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Molybdenum, Dissolved

Location Name	Sample Date	Alluv Molybdenum, Dissolved	Location Name	Sample Date	Alluv Molybdenum, Dissolved	Location Name	Sample Date	Muddy Creek Molybdenum, Dissolved	Location Name	Sample Date	Mesa Molybdenum, Dissolved	Location Name	Sample Date	Mesa Molybdenum, Dissolved
BG-1S	11/26/2012	0.037	KMW-2D	12/8/2009	0.032	BG-3S	11/27/2012	0.022	LMW-10	11/28/2012	0.12	BG-2D	8/23/2012	0.23
BG-1S	8/23/2012	0.026	KMW-2D	12/10/2008	0.038	BG-3S	8/22/2012	0.019	LMW-10	8/27/2012	0.13	BG-2D	5/24/2012	0.23
BG-1S	5/24/2012	0.014	KMW-2D	6/3/2008	0.042	BG-3S	5/23/2012	0.0068	LMW-10	5/30/2012	0.046	BG-2D	3/21/2012	0.25
BG-1S	3/20/2012	0.026	KMW-2M	11/26/2012	0.044	BG-3S	3/21/2012	0.029	LMW-10	3/22/2012	0.12	LMW-9	11/28/2012	0.2
IMW-2.5D	11/26/2012	0.051	KMW-2M	8/24/2012	0.034	BG-4S	11/27/2012	0.014	LMW-10	12/6/2011	0.12	LMW-9	8/27/2012	0.22
IMW-2.5D	8/24/2012	0.042	KMW-2M	5/21/2012	0.021	BG-4S	8/30/2012	0.0016	LMW-10	9/8/2011	0.093	LMW-9	5/31/2012	0.18
IMW-2.5D	5/21/2012	0.025	KMW-2M	3/23/2012	0.034	BG-4S	5/30/2012	0.005*	LMW-10	6/8/2011	0.109	LMW-9	3/23/2012	0.2
IMW-2.5D	3/21/2012	0.046	KMW-2M	12/8/2011	0.029	BG-4S	3/20/2012	0.0045	LMW-10	3/2/2011	0.113	LMW-9	12/5/2011	0.18
IMW-2.5D	12/8/2011	0.033	KMW-2M	6/6/2011	0.035	BG-6S	11/27/2012	0.023	LMW-10	12/9/2010	0.12	LMW-9	9/8/2011	0.17
IMW-2.5D	6/6/2011	0.0381	KMW-2M	12/13/2010	0.034	BG-6S	8/23/2012	0.016	LMW-10	9/21/2010	0.101	LMW-9	6/8/2011	0.188
IMW-2.5D	12/15/2010	0.0225	KMW-2M	6/8/2010	0.038	BG-6S	5/25/2012	0.0073	LMW-10	6/9/2010	0.11	LMW-9	3/9/2011	0.194
IMW-2.5D	6/9/2010	0.025	KMW-2M	12/8/2009	0.033	BG-6S	3/21/2012	0.018	LMW-10	3/11/2010	0.1	LMW-9	12/10/2010	0.191
IMW-2.5D	12/12/2009	0.024	KMW-2M	12/10/2008	0.038	BG-1M	11/26/2012	0.012	LMW-10	12/11/2009	0.11	LMW-9	9/21/2010	0.183
IMW-2.5S	11/26/2012	0.052	KMW-2M	6/3/2008	0.043	BG-1M	8/23/2012	0.0052	LMW-10	9/18/2009	0.1	LMW-9	6/9/2010	0.2
IMW-2.5S	8/24/2012	0.044	KMW-2S	11/26/2012	0.041	BG-1M	5/24/2012	0.005*	LMW-10	6/10/2009	0.11	LMW-9	3/11/2010	0.19
IMW-2.5S	5/21/2012	0.025	KMW-2S	8/24/2012	0.028	BG-1M	3/20/2012	0.0056	LMW-10	3/5/2009	0.12	LMW-9	12/11/2009	0.2
IMW-2.5S	3/21/2012	0.042	KMW-2S	5/21/2012	0.023	BG-3M	11/27/2012	0.036	LMW-10	12/12/2008	0.1	LMW-9	9/18/2009	0.18
IMW-2.5S	12/8/2011	0.036	KMW-2S	3/23/2012	0.036	BG-3M	8/22/2012	0.026	LMW-10	9/10/2008	0.096	LMW-9	6/10/2009	0.2
IMW-2.5S	9/9/2011	0.034	KMW-2S	12/8/2011	0.028	BG-3M	5/24/2012	0.02	LMW-10	6/4/2008	0.11	LMW-9	3/5/2009	0.19
IMW-2.5S	6/6/2011	0.0427	KMW-2S	9/9/2011	0.47	BG-3M	3/21/2012	0.03	LMW-10	3/5/2008	0.11	LMW-9	12/12/2008	0.19
IMW-2.5S	3/7/2011	0.0444	KMW-2S	6/6/2011	0.0364	BG-4M	11/27/2012	0.016	LMW-11R	11/26/2012	0.16	LMW-9	9/10/2008	0.2
IMW-2.5S	12/15/2010	0.0434	KMW-2S	3/8/2011	0.0369	BG-4M	8/30/2012	0.0017	LMW-11R	8/21/2012	0.15	LMW-9	6/4/2008	0.22
IMW-2.5S	9/20/2010	0.0506	KMW-2S	12/13/2010	0.028	BG-4M	5/30/2012	0.005*	LMW-11R	5/29/2012	0.11	LMW-9	3/5/2008	0.21
IMW-2.5S	6/9/2010	0.053	KMW-2S	9/15/2010	0.029	BG-4M	3/20/2012	0.0069	LMW-11R	3/23/2012	0.13	LMW-11	3/2/2011	0.0353
IMW-2.5S	3/9/2010	0.051	KMW-2S	6/8/2010	0.028	BG-6M	11/27/2012	0.017	LMW-7	11/28/2012	0.026	LMW-11	9/8/2011	0.037
IMW-2.5S	12/12/2009	0.054	KMW-2S	3/9/2010	0.021	BG-6M	8/22/2012	0.0053	LMW-7	8/27/2012	0.03	LMW-11	12/6/2011	0.047
IMW-2.5S	9/21/2009	0.05	KMW-2S	12/8/2009	0.027	BG-6M	5/25/2012	0.0095	LMW-7	5/31/2012	0.0052	LMW-11	2/22/2012	0.057
IMW-3S	5/21/2012	0.018	KMW-2S	9/16/2009	0.028	BG-6M	3/21/2012	0.012	LMW-7	3/23/2012	0.021	LMW-12R	5/30/2012	0.095
IMW-3S	3/20/2012	0.033	KMW-2S	6/10/2009	0.03	BG-1D	11/26/2012	0.01	LMW-7	12/5/2011	0.015	LMW-12R	8/21/2012	0.1
IMW-3S	12/9/2011	0.027	KMW-2S	3/3/2009	0.03	BG-1D	8/23/2012	0.0032	LMW-7	9/6/2011	0.017	LMW-12R	10/22/2012	0.1
IMW-3S	9/9/2011	0.026	KMW-2S	12/10/2008	0.028	BG-1D	5/24/2012	0.005*	LMW-7	6/9/2011	0.02*	LMW-12R	11/30/2012	0.11
IMW-3S	6/7/2011	0.0234	KMW-2S	9/8/2008	0.042	BG-1D	3/20/2012	0.0085	LMW-7	3/9/2011	0.02*	LMW-13R	5/29/2012	0.073
IMW-3S	3/7/2011	0.0272	KMW-2S	6/3/2008	0.031	BG-3D	11/27/2012	0.078	LMW-7	12/10/2010	0.02*	LMW-13R	8/20/2012	0.072
IMW-3S	12/10/2010	0.0262	KMW-2S	3/4/2008	0.024	BG-3D	8/21/2012	0.078	LMW-7	9/21/2010	0.02*	LMW-13R	10/22/2012	0.072
IMW-3S	9/16/2010	0.0241				BG-3D	5/23/2012	0.026	LMW-7	6/9/2010	0.02	LMW-13R	11/28/2012	0.068
IMW-3S	6/8/2010	0.029				BG-3D	3/21/2012	0.045	LMW-7	3/11/2010	0.018	LMW-14R	5/29/2012	0.04
IMW-3S	3/9/2010	0.025				BG-4D	11/27/2012	0.017	LMW-7	12/11/2009	0.021	LMW-14R	8/20/2012	0.05
IMW-3S	12/10/2009	0.027				BG-4D	8/30/2012	0.0054	LMW-7	9/18/2009	0.05	LMW-14R	10/22/2012	0.05
IMW-3S	9/14/2009	0.024				BG-4D	5/30/2012	0.005*	LMW-7	6/10/2009	0.024	LMW-14R	11/30/2012	0.05
IMW-3S	6/9/2009	0.026				BG-4D	3/20/2012	0.011	LMW-7	3/5/2009	0.028	LMW-15	5/29/2012	0.056
IMW-3S	3/3/2009	0.03				BG-6D	11/27/2012	0.016	LMW-7	12/12/2008	0.022	LMW-15	8/20/2012	0.062
IMW-3S	12/9/2008	0.027				BG-6D	8/22/2012	0.005*	LMW-7	9/10/2008	0.023	LMW-15	10/22/2012	0.06
IMW-3S	9/9/2008	0.026				BG-6D	5/25/2012	0.0051	LMW-7	6/4/2008	0.028	LMW-15	11/28/2012	0.055
IMW-3S	6/3/2008	0.033				BG-6D	3/21/2012	0.014	LMW-7	3/5/2008	0.025	LMW-16	5/29/2012	0.06
IMW-3S	3/4/2008	0.027				IMW-3D	5/25/2012	0.0029	BG-2S	11/26/2012	0.41	LMW-16	8/20/2012	0.075
KMW-2D	11/26/2012	0.052				IMW-3D	3/22/2012	0.019	BG-2S	8/23/2012	0.39	LMW-16	10/22/2012	0.073
KMW-2D	8/24/2012	0.039				IMW-3D	12/9/2011	0.0088	BG-2S	5/24/2012	0.37	LMW-16	11/28/2012	0.069
KMW-2D	5/21/2012	0.022				IMW-3D	6/7/2011	0.02*	BG-2S	3/21/2012	0.37			
KMW-2D	3/23/2012	0.037				IMW-3D	12/10/2010	0.02*	BG-2M	11/26/2012	0.098			
KMW-2D	12/8/2011	0.032				IMW-3D	6/8/2010	0.017	BG-2M	8/23/2012	0.13			
KMW-2D	6/6/2011	0.0336				IMW-3D	12/10/2009	0.015	BG-2M	5/24/2012	0.067			
KMW-2D	12/13/2010	0.0352				IMW-3D	12/9/2008	0.016	BG-2M	3/21/2012	0.086			
KMW-2D	6/8/2010	0.039				IMW-3D	6/3/2008	0.019	BG-2D	11/26/2012	0.29		* non-detect	

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Naphthalene.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Naphthalene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	8	18	69.23%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	18	0.25	0.25	0.25	0.25	0
Statistics (Detects Only)	8	0.018	0.04	0.0281	0.0265	0.00843
Statistics (All: NDs treated as DL value)	26	0.018	0.25	0.182	0.25	0.105
Statistics (All: NDs treated as DL/2 value)	26	0.018	0.125	0.0952	0.125	0.0458
Statistics (Normal ROS Estimated Data)	26	0.0116	0.0446	0.0281	0.0281	0.00866
Statistics (Gamma ROS Estimated Data)	26	0.00833	0.04	0.0279	0.029	0.00841
Statistics (Lognormal ROS Estimated Data)	26	0.0149	0.0491	0.0283	0.027	0.00885

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	12.75	11.3	0.00221	-3.611	0.302	-0.0837
Statistics (NDs = DL)	1.513	1.364	0.12	-2.071	1.059	-0.511
Statistics (NDs = DL/2)	2.67	2.388	0.0356	-2.551	0.738	-0.289
Statistics (Gamma ROS Estimates)	9.071	8.05	0.00307	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.611	0.312	-0.0865

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.972	0.784	0.794	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.92	0.818	Data Appear Normal
Lilliefors (Detects Only)	0.188	0.313	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.597	0.92	Data Not Normal
Lilliefors (NDs = DL)	0.435	0.174	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.614	0.92	Data Not Normal
Lilliefors (NDs = DL/2)	0.435	0.174	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.981	0.92	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0768	0.174	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.973	0.616	0.669	0.949

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.312	0.715	
Kolmogorov-Smirnov (Detects Only)	0.176	0.294	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	5.154	0.761	
Kolmogorov-Smirnov (NDs = DL)	0.444	0.174	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	4.872	0.753	
Kolmogorov-Smirnov (NDs = DL/2)	0.44	0.173	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.595	0.745	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.128	0.171	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.979	0.803	0.81	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.934	0.818	Data Appear Lognormal
Lilliefors (Detects Only)	0.153	0.313	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.63	0.92	Data Not Lognormal
Lilliefors (NDs = DL)	0.433	0.174	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.643	0.92	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.431	0.174	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.983	0.92	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0764	0.174	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Naphthalene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	28	18	39.13%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	18	0.25	0.25	0.25	0.25	0
Statistics (Detects Only)	28	0.015	1.1	0.156	0.023	0.337
Statistics (All: NDs treated as DL value)	46	0.015	1.1	0.193	0.0335	0.265
Statistics (All: NDs treated as DL/2 value)	46	0.015	1.1	0.144	0.0335	0.261
Statistics (Normal ROS Estimated Data)	46	-0.256	1.1	0.132	0.025	0.285
Statistics (Gamma ROS Estimated Data)	46	1.000E-12	1.1	0.154	0.0256	0.268
Statistics (Lognormal ROS Estimated Data)	46	0.00629	1.1	0.11	0.025	0.268

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.462	0.446	0.338	-3.247	1.339	-0.412
Statistics (NDs = DL)	0.692	0.662	0.279	-2.519	1.385	-0.55
Statistics (NDs = DL/2)	0.707	0.676	0.204	-2.79	1.186	-0.425
Statistics (Gamma ROS Estimates)	0.278	0.274	0.554	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.355	1.155	-0.344

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.665	0.79	0.682	0.808

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.447	0.924	Data Not Normal
Lilliefors (Detects Only)	0.498	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.628	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.328	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.476	0.945	Data Not Normal

Lilliefors (NDs = DL/2)	0.442	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.667	0.945	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.307	0.131	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.891	0.931	0.885	0.946

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	7.142	0.819	
Kolmogorov-Smirnov (Detects Only)	0.474	0.176	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.291	0.796	
Kolmogorov-Smirnov (NDs = DL)	0.273	0.136	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	4.854	0.794	
Kolmogorov-Smirnov (NDs = DL/2)	0.3	0.136	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.557	0.872	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.34	0.142	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.739	0.899	0.904	0.852

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.547	0.924	Data Not Lognormal
Lilliefors (Detects Only)	0.388	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.787	0.945	Data Not Lognormal
Lilliefors (NDs = DL)	0.272	0.131	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.805	0.945	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.212	0.131	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.732	0.945	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.24	0.131	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Naphthalene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	13	15	53.57%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	15	0.25	0.25	0.25	0.25	0
Statistics (Detects Only)	13	0.021	0.18	0.0481	0.03	0.0439
Statistics (All: NDs treated as DL value)	28	0.021	0.25	0.156	0.25	0.107
Statistics (All: NDs treated as DL/2 value)	28	0.021	0.18	0.0893	0.125	0.0488
Statistics (Normal ROS Estimated Data)	28	-0.0115	0.18	0.0481	0.0368	0.038
Statistics (Gamma ROS Estimated Data)	28	1.000E-12	0.18	0.0483	0.0384	0.0357
Statistics (Lognormal ROS Estimated Data)	28	0.0146	0.18	0.046	0.0331	0.0342

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.399	2.166	0.02	-3.258	0.609	-0.187
Statistics (NDs = DL)	1.397	1.271	0.112	-2.255	1.034	-0.458
Statistics (NDs = DL/2)	2.529	2.282	0.0353	-2.626	0.723	-0.275

Statistics (Gamma ROS Estimates)	0.592	0.552	0.0815	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.258	0.567	-0.174

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.767	0.845	0.883	0.924

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.611	0.866	Data Not Normal
Lilliefors (Detects Only)	0.324	0.246	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.688	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.346	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.77	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.339	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.873	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.171	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.901	0.723	0.823	0.966

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.414	0.742	
Kolmogorov-Smirnov (Detects Only)	0.274	0.239	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.737	0.765	
Kolmogorov-Smirnov (NDs = DL)	0.345	0.169	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.341	0.756	
Kolmogorov-Smirnov (NDs = DL/2)	0.351	0.167	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.047	0.801	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.35	0.174	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.893	0.863	0.88	0.974

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.808	0.866	Data Not Lognormal
Lilliefors (Detects Only)	0.254	0.246	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.722	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.335	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.759	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.347	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.952	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.139	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

All Naphthalene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	49	51	51.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	51	0.25	0.25	0.25	0.25	0
Statistics (Detects Only)	49	0.015	1.1	0.107	0.025	0.26
Statistics (All: NDs treated as DL value)	100	0.015	1.1	0.18	0.25	0.195
Statistics (All: NDs treated as DL/2 value)	100	0.015	1.1	0.116	0.125	0.181
Statistics (Normal ROS Estimated Data)	100	-0.24	1.1	0.0923	0.0295	0.207
Statistics (Gamma ROS Estimated Data)	100	1.000E-12	1.1	0.104	0.038	0.187
Statistics (Lognormal ROS Estimated Data)	100	0.00597	1.1	0.0727	0.0278	0.185

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.58	0.569	0.184	-3.309	1.064	-0.322
Statistics (NDs = DL)	0.948	0.926	0.19	-2.329	1.218	-0.523
Statistics (NDs = DL/2)	1.083	1.057	0.107	-2.682	0.965	-0.36
Statistics (Gamma ROS Estimates)	0.328	0.324	0.319	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.385	0.906	-0.268

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.595	0.782	0.629	0.799

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.368	0.947	Data Not Normal
Lilliefors (Detects Only)	0.455	0.127	Data Not Normal
Lilliefors (NDs = DL)	0.319	0.0886	Data Not Normal
Lilliefors (NDs = DL/2)	0.43	0.0886	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.22	0.0886	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.856	0.868	0.795	0.97

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	11.46	0.807	
Kolmogorov-Smirnov (Detects Only)	0.418	0.133	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	10.17	0.785	
Kolmogorov-Smirnov (NDs = DL)	0.301	0.0923	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	8.956	0.781	
Kolmogorov-Smirnov (NDs = DL/2)	0.294	0.092	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	11.52	0.861	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.34	0.0967	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.77	0.888	0.902	0.904

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.598	0.947	Data Not Lognormal
Lilliefors (Detects Only)	0.305	0.127	Data Not Lognormal
Lilliefors (NDs = DL)	0.331	0.0886	Data Not Lognormal

			Lilliefors (NDs = DL/2)	0.294	0.0886	Data Not Lognormal					
			Lilliefors (Lognormal ROS Estimates)	0.152	0.0886	Data Not Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.											

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Naphthalene.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Naphthalene

General Statistics

Number of Valid Data	26	Number of Detected Data	8
Number of Distinct Detected Data	8	Number of Non-Detect Data	18
		Percent Non-Detects	69.23%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.018	Minimum Detected	-4.017
Maximum Detected	0.04	Maximum Detected	-3.219
Mean of Detected	0.0281	Mean of Detected	-3.611
SD of Detected	0.00843	SD of Detected	0.302
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.25	Maximum Non-Detect	-1.386

Warning: There are only 8 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.92	Shapiro Wilk Test Statistic	0.934
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0952	Mean (Log Scale)	-2.551
SD	0.0458	SD (Log Scale)	0.738
95% UTL 95% Coverage	0.199	95% UTL 95% Coverage	0.419
95% UPL (t)	0.175	95% UPL (t)	0.282
90% Percentile (z)	0.154	90% Percentile (z)	0.201
95% Percentile (z)	0.171	95% Percentile (z)	0.263
99% Percentile (z)	0.202	99% Percentile (z)	0.435
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0283
		SD in Original Scale	0.00885
		Mean in Log Scale	-3.611

		SD in Log Scale	0.312
		95% UTL 95% Coverage	0.055
		95% UPL (t)	0.0466
		90% Percentile (z)	0.0403
		95% Percentile (z)	0.0452
		99% Percentile (z)	0.0559
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	8.049	Data appear Normal at 5% Significance Level	
Theta Star	0.00349		
nu star	128.8		
A-D Test Statistic	0.312	Nonparametric Statistics	
5% A-D Critical Value	0.715	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.176	Mean	0.0281
5% K-S Critical Value	0.294	SD	0.00788
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00298
		95% KM UTL with 95% Coverage	0.0461
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0631
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0418
Mean	0.0279	90% Percentile (z)	0.0382
Median	0.029	95% Percentile (z)	0.0411
SD	0.00841	99% Percentile (z)	0.0465
k star	8.05		
Theta star	0.00346	Gamma ROS Limits with Extrapolated Data	
Nu star	418.6	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0463
95% Percentile of Chisquare (2k)	26.42	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.047
		95% WH Approx. Gamma UTL with 95% Coverage	0.0537
90% Percentile	0.041	95% HW Approx. Gamma UTL with 95% Coverage	0.0551
95% Percentile	0.0457		
99% Percentile	0.0556		

Note: DL/2 is not a recommended method.

Muddy Creek Naphthalene

General Statistics

Number of Valid Data	46	Number of Detected Data	28
Number of Distinct Detected Data	16	Number of Non-Detect Data	18
		Percent Non-Detects	39.13%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.015	Minimum Detected	-4.2
Maximum Detected	1.1	Maximum Detected	0.0953
Mean of Detected	0.156	Mean of Detected	-3.247
SD of Detected	0.337	SD of Detected	1.339
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.25	Maximum Non-Detect	-1.386

Background Statistics

Normal Distribution Test with Detected Values Only	Lognormal Distribution Test with Detected Values Only

Shapiro Wilk Test Statistic	0.447	Shapiro Wilk Test Statistic	0.547
5% Shapiro Wilk Critical Value	0.924	5% Shapiro Wilk Critical Value	0.924
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.144	Mean (Log Scale)	-2.79
SD	0.261	SD (Log Scale)	1.186
95% UTL 95% Coverage	0.687	95% UTL 95% Coverage	0.724
95% UPL (t)	0.588	95% UPL (t)	0.46
90% Percentile (z)	0.479	90% Percentile (z)	0.281
95% Percentile (z)	0.574	95% Percentile (z)	0.432
99% Percentile (z)	0.752	99% Percentile (z)	0.97
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0882	Mean in Original Scale	0.11
SD	0.795	SD in Original Scale	0.268
95% UTL with 95% Coverage	1.741	95% UTL with 95% Coverage	0.385
		95% BCA UTL with 95% Coverage	1.1
		95% Bootstrap (%) UTL with 95% Coverage	1.1
95% UPL (t)	1.438	95% UPL (t)	0.248
90% Percentile (z)	1.107	90% Percentile (z)	0.153
95% Percentile (z)	1.396	95% Percentile (z)	0.233
99% Percentile (z)	1.938	99% Percentile (z)	0.512
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.436	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.358		
nu star	24.44		
A-D Test Statistic	7.142	Nonparametric Statistics	
5% A-D Critical Value	0.819	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.474	Mean	0.104
5% K-S Critical Value	0.176	SD	0.266
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0399
		95% KM UTL with 95% Coverage	0.657
Assuming Gamma Distribution		95% KM Chebyshev UPL	1.276
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.556
Mean	0.154	90% Percentile (z)	0.445
Median	0.0256	95% Percentile (z)	0.542
SD	0.268	99% Percentile (z)	0.723
k star	0.274		
Theta star	0.561	Gamma ROS Limits with Extrapolated Data	
Nu star	25.22	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.56
95% Percentile of Chisquare (2k)	2.58	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.621
		95% WH Approx. Gamma UTL with 95% Coverage	0.771
90% Percentile	0.458	95% HW Approx. Gamma UTL with 95% Coverage	0.907
95% Percentile	0.724		
99% Percentile	1.423		

Note: DL/2 is not a recommended method.

Mesa Naphthalene

General Statistics			
Number of Valid Data	28	Number of Detected Data	13
Number of Distinct Detected Data	11	Number of Non-Detect Data	15
		Percent Non-Detects	53.57%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.021	Minimum Detected	-3.863
Maximum Detected	0.18	Maximum Detected	-1.715
Mean of Detected	0.0481	Mean of Detected	-3.258
SD of Detected	0.0439	SD of Detected	0.609
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.25	Maximum Non-Detect	-1.386

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.611	Shapiro Wilk Test Statistic	0.808
5% Shapiro Wilk Critical Value	0.866	5% Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0893	Mean (Log Scale)	-2.626
SD	0.0488	SD (Log Scale)	0.723
95% UTL 95% Coverage	0.199	95% UTL 95% Coverage	0.367
95% UPL (t)	0.174	95% UPL (t)	0.253
90% Percentile (z)	0.152	90% Percentile (z)	0.183
95% Percentile (z)	0.17	95% Percentile (z)	0.238
99% Percentile (z)	0.203	99% Percentile (z)	0.389
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.046
		SD in Original Scale	0.0342
		Mean in Log Scale	-3.258
		SD in Log Scale	0.567
		95% UTL 95% Coverage	0.137
		95% UPL (t)	0.103
		90% Percentile (z)	0.0796
		95% Percentile (z)	0.0978
		99% Percentile (z)	0.144
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.897	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0253		
nu star	49.32		
A-D Test Statistic	1.414	Nonparametric Statistics	
5% A-D Critical Value	0.742	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.274	Mean	0.0481
5% K-S Critical Value	0.239	SD	0.0422
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0122

		95% KM UTL with 95% Coverage	0.143
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.235
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.121
Mean	0.0483	90% Percentile (z)	0.102
Median	0.0384	95% Percentile (z)	0.117
SD	0.0357	99% Percentile (z)	0.146
k star	0.552		
Theta star	0.0874	Gamma ROS Limits with Extrapolated Data	
Nu star	30.94	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.137
95% Percentile of Chisquare (2k)	4.096	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.163
		95% WH Approx. Gamma UTL with 95% Coverage	0.183
90% Percentile	0.128	95% HW Approx. Gamma UTL with 95% Coverage	0.232
95% Percentile	0.179		
99% Percentile	0.303		

Note: DL/2 is not a recommended method.

All Naphthalene

General Statistics			
Number of Valid Data	100	Number of Detected Data	49
Number of Distinct Detected Data	27	Number of Non-Detect Data	51
		Percent Non-Detects	51.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.015	Minimum Detected	-4.2
Maximum Detected	1.1	Maximum Detected	0.0953
Mean of Detected	0.107	Mean of Detected	-3.309
SD of Detected	0.26	SD of Detected	1.064
Minimum Non-Detect	0.25	Minimum Non-Detect	-1.386
Maximum Non-Detect	0.25	Maximum Non-Detect	-1.386

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.368	Shapiro Wilk Test Statistic	0.598
5% Shapiro Wilk Critical Value	0.947	5% Shapiro Wilk Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.116	Mean (Log Scale)	-2.682
SD	0.181	SD (Log Scale)	0.965
95% UTL 95% Coverage	0.465	95% UTL 95% Coverage	0.438
95% UPL (t)	0.419	95% UPL (t)	0.342
90% Percentile (z)	0.348	90% Percentile (z)	0.236
95% Percentile (z)	0.414	95% Percentile (z)	0.335
99% Percentile (z)	0.538	99% Percentile (z)	0.646
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.0634	Mean in Original Scale	0.0727
SD	0.86	SD in Original Scale	0.185

95% UTL with 95% Coverage	1.59	95% UTL with 95% Coverage	0.193
		95% BCA UTL with 95% Coverage	0.82
		95% Bootstrap (%) UTL with 95% Coverage	0.82
95% UPL (t)	1.371	95% UPL (t)	0.154
90% Percentile (z)	1.038	90% Percentile (z)	0.108
95% Percentile (z)	1.351	95% Percentile (z)	0.15
99% Percentile (z)	1.937	99% Percentile (z)	0.279
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.558	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.191		
nu star	54.65		
A-D Test Statistic	11.46	Nonparametric Statistics	
5% A-D Critical Value	0.807	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.418	Mean	0.0682
5% K-S Critical Value	0.133	SD	0.185
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.0189
		95% KM UTL with 95% Coverage	0.424
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.879
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.377
Mean	0.104	90% Percentile (z)	0.305
Median	0.038	95% Percentile (z)	0.373
SD	0.187	99% Percentile (z)	0.499
k star	0.324		
Theta star	0.322	Gamma ROS Limits with Extrapolated Data	
Nu star	64.88	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.344
95% Percentile of Chisquare (2k)	2.894	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.388
		95% WH Approx. Gamma UTL with 95% Coverage	0.42
90% Percentile	0.305	95% HW Approx. Gamma UTL with 95% Coverage	0.49
95% Percentile	0.466		
99% Percentile	0.88		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Naphthalene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Naphthalene

Background Data: Alluv Naphthalene

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	15	18
Number of Detect Data	13	8
Minimum Non-Detect	0.25	0.25
Maximum Non-Detect	0.25	0.25
Percent Non detects	53.57%	69.23%
Minimum Detected	0.021	0.018
Maximum Detected	0.18	0.04
Mean of Detected Data	0.0481	0.0281
Median of Detected Data	0.03	0.0265
SD of Detected Data	0.0439	0.00843

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	1.215
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.224

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Naphthalene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Naphthalene

Background Data: Alluv Naphthalene

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	18	18
Number of Detect Data	28	8
Minimum Non-Detect	0.25	0.25
Maximum Non-Detect	0.25	0.25
Percent Non detects	39.13%	69.23%
Minimum Detected	0.015	0.018
Maximum Detected	1.1	0.04
Mean of Detected Data	0.156	0.0281
Median of Detected Data	0.023	0.0265
SD of Detected Data	0.337	0.00843

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0.473
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.636

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Naphthalene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Naphthalene

Background Data: Muddy Creek Naphthalene

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	15	18
Number of Detect Data	13	28
Minimum Non-Detect	0.25	0.25
Maximum Non-Detect	0.25	0.25
Percent Non detects	53.57%	39.13%
Minimum Detected	0.021	0.015
Maximum Detected	0.18	1.1
Mean of Detected Data	0.0481	0.156
Median of Detected Data	0.03	0.023
SD of Detected Data	0.0439	0.337

Site vs Background Gehan Test

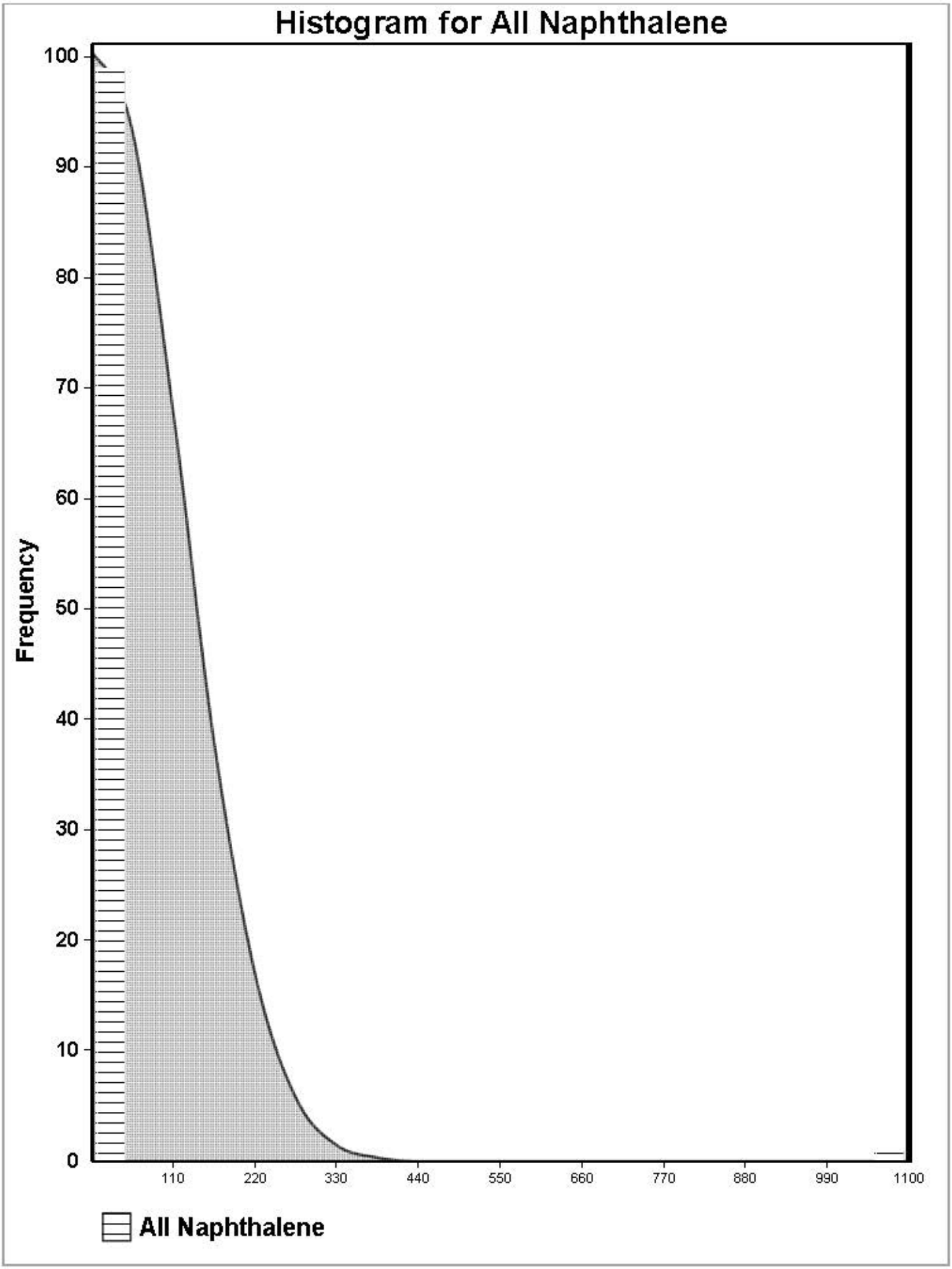
H0: Mu of Site or AOC = Mu of background

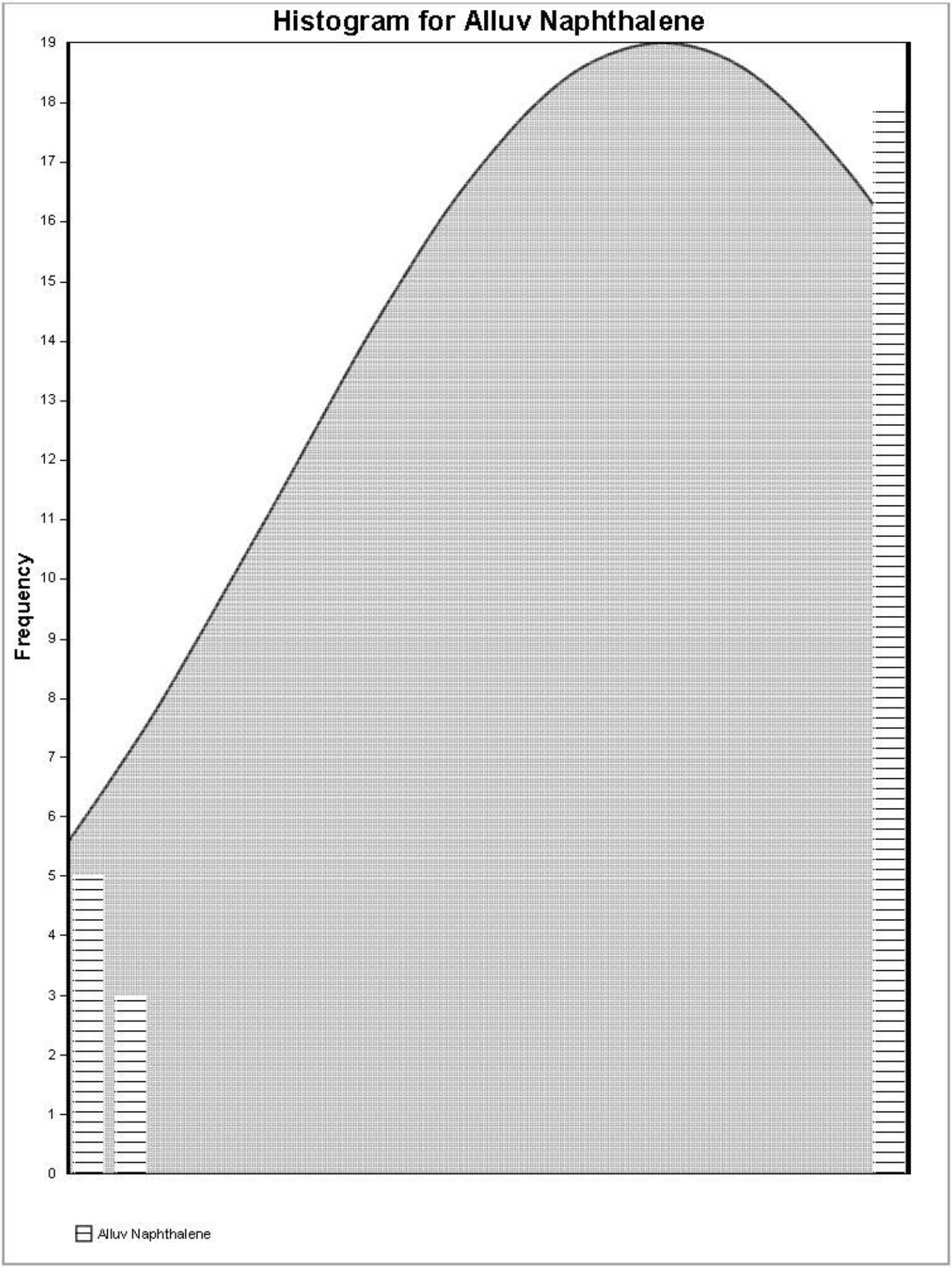
Gehan z Test Value	1.119
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.263

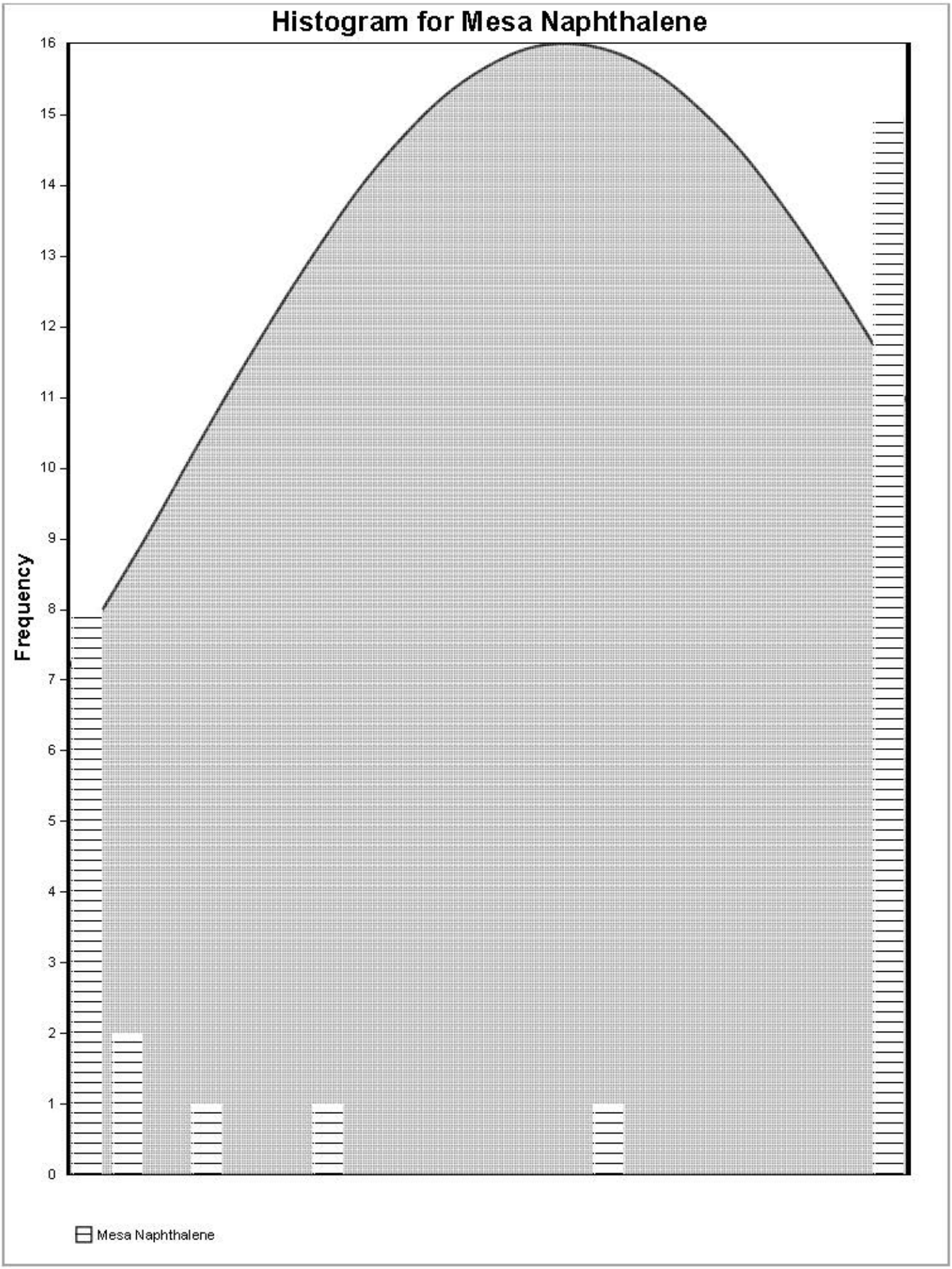
Conclusion with Alpha = 0.05

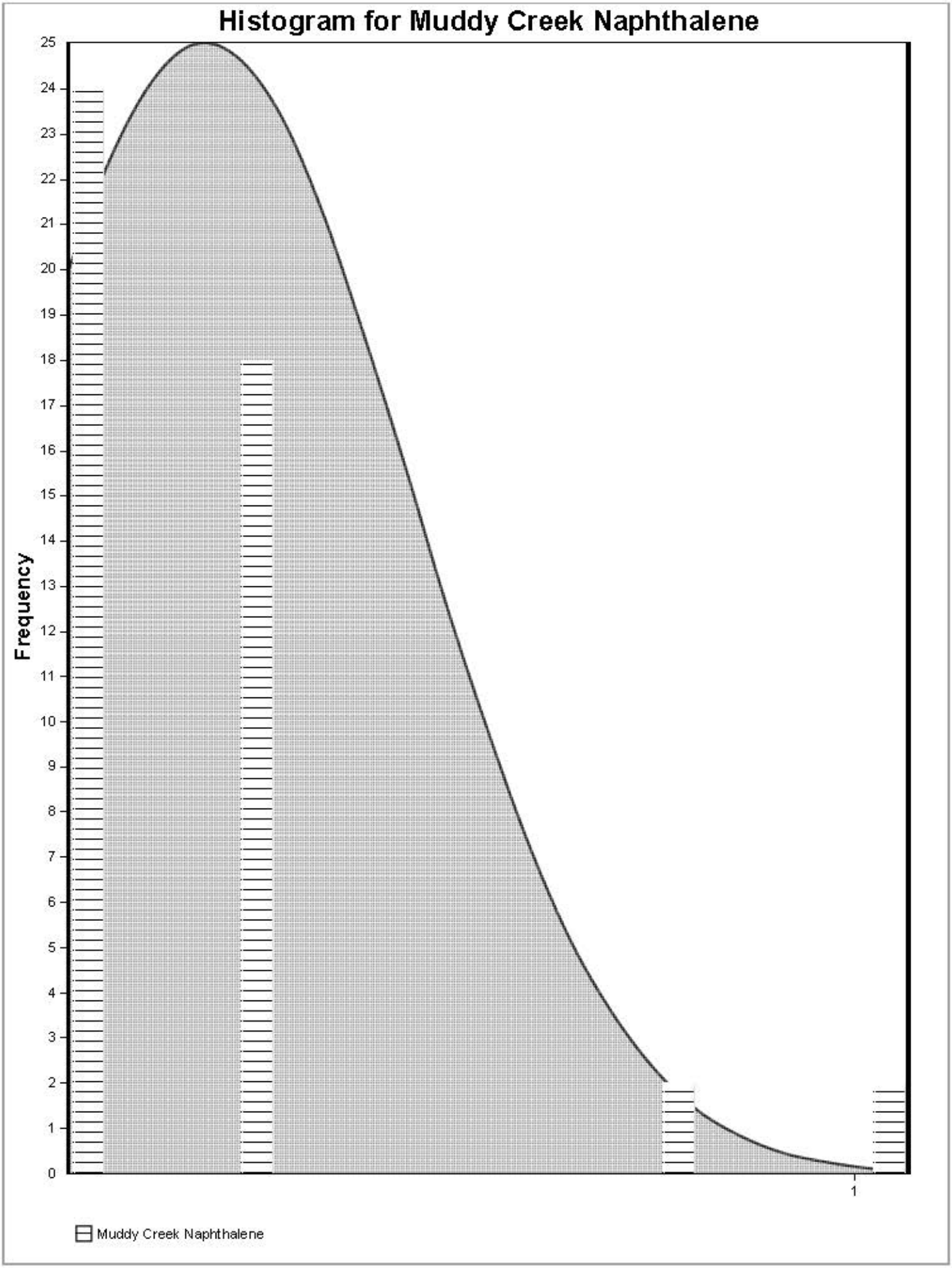
Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for All Naphthalene
Frequency
100
90
80
70
60
50
40
30
20
10
0
110
220
330
440
550
660
770
880
990
1100
All Naphthalene


Histogram for Alluv Naphthalene
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
Alluv Naphthalene


Histogram for Mesa Naphthalene
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Mesa Naphthalene


Histogram for Muddy Creek Naphthalene
Frequency
25
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1
Muddy Creek Naphthalene

Outlier Tests for Selected Variables

User Selected Options	
From File	Naphthalene.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Naphthalene

Mean	0.0952
Standard Deviation	0.0458
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0952	0.0449	0.018	4	1.718	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Naphthalene

Mean	0.144
Standard Deviation	0.261
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.144	0.258	1.1	20	3.699	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1.1 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1.1 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Naphthalene

Mean	0.0893
Standard Deviation	0.0488
Number of data	28
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical

#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.0893	0.0479	0.18	13	1.893	2.88	3.2

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for All Naphthalene

Mean	0.116
Standard Deviation	0.181
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.116	0.18	1.1	46	5.453	3.38	3.75

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1.1 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1.1 is a Potential Statistical Outlier

Naphthalene

Location Name	Sample Date	Alluv Naphthalene	Location Name	Sample Date	Muddy Creek Naphthalene	Location Name	Sample Date	Mesa Naphthalene	Location Name	Sample Date	All Naphthalene	Location Name	Sample Date	All Naphthalene
BG-1S	11/26/2012	0.25 *	BG-3S	11/27/2012	0.022	BG-2S	11/26/2012	0.042	BG-1S	11/26/2012	0.25 *	BG-6M	11/27/2012	0.025
BG-1S	8/23/2012	0.034	BG-3S	8/22/2012	0.25 *	BG-2S	8/23/2012	0.021	BG-1S	8/23/2012	0.034	BG-6M	8/22/2012	0.035
BG-1S	5/24/2012	0.25 *	BG-3S	5/23/2012	0.25 *	BG-2S	5/24/2012	0.091	BG-1S	5/24/2012	0.25 *	BG-6M	5/25/2012	0.021
BG-1S	3/20/2012	0.018	BG-3S	3/21/2012	0.026	BG-2S	3/21/2012	0.25 *	BG-1S	3/20/2012	0.018	BG-6M	3/21/2012	1.1
IMW-2.5D	11/26/2012	0.25 *	BG-4S	11/27/2012	0.021	BG-2M	11/26/2012	0.028	IMW-2.5D	11/26/2012	0.25 *	BG-1D	11/26/2012	0.25 *
IMW-2.5D	8/24/2012	0.25 *	BG-4S	8/30/2012	0.023	BG-2M	8/23/2012	0.031	IMW-2.5D	8/24/2012	0.25 *	BG-1D	8/23/2012	0.25 *
IMW-2.5D	5/21/2012	0.022	BG-4S	5/30/2012	0.25 *	BG-2M	5/24/2012	0.25 *	IMW-2.5D	5/21/2012	0.022	BG-1D	5/24/2012	0.25 *
IMW-2.5D	3/21/2012	0.04	BG-4S	3/20/2012	0.02	BG-2M	3/21/2012	0.25 *	IMW-2.5D	3/21/2012	0.04	BG-1D	3/20/2012	0.019
IMW-2.5S	11/26/2012	0.25 *	BG-6S	11/27/2012	0.031	BG-2D	11/26/2012	0.25 *	IMW-2.5S	11/26/2012	0.25 *	BG-3D	11/27/2012	0.25 *
IMW-2.5S	8/24/2012	0.25 *	BG-6S	8/23/2012	0.027	BG-2D	8/23/2012	0.024	IMW-2.5S	8/24/2012	0.25 *	BG-3D	8/21/2012	0.25 *
IMW-2.5S	5/21/2012	0.25 *	BG-6S	5/25/2012	0.02	BG-2D	5/24/2012	0.25 *	IMW-2.5S	5/21/2012	0.25 *	BG-3D	5/23/2012	0.25 *
IMW-2.5S	3/21/2012	0.25 *	BG-6S	3/21/2012	0.023	BG-2D	3/21/2012	0.25 *	IMW-2.5S	3/21/2012	0.25 *	BG-3D	3/21/2012	0.025
IMW-3S	5/21/2012	0.25 *	BG-1M	11/26/2012	0.25 *	LMW-10	11/28/2012	0.18	IMW-3S	5/21/2012	0.25 *	BG-4D	11/27/2012	0.025
IMW-3S	3/20/2012	0.024	BG-1M	8/23/2012	0.032	LMW-10	8/27/2012	0.03	IMW-3S	3/20/2012	0.024	BG-4D	8/30/2012	0.25 *
KMW-2D	11/26/2012	0.25 *	BG-1M	5/24/2012	0.021	LMW-10	5/30/2012	0.25 *	KMW-2D	11/26/2012	0.25 *	BG-4D	5/30/2012	0.25 *
KMW-2D	8/24/2012	0.02	BG-1M	3/20/2012	0.018	LMW-10	3/22/2012	0.25 *	KMW-2D	8/24/2012	0.02	BG-4D	3/20/2012	0.8
KMW-2D	5/21/2012	0.038	BG-3M	11/27/2012	0.021	LMW-11R	11/26/2012	0.25 *	KMW-2D	5/21/2012	0.038	BG-6D	11/27/2012	0.25 *
KMW-2D	3/23/2012	0.25 *	BG-3M	8/22/2012	0.022	LMW-11R	8/21/2012	0.25 *	KMW-2D	3/23/2012	0.25 *	BG-6D	8/22/2012	0.25 *
KMW-2M	11/26/2012	0.25 *	BG-3M	5/24/2012	0.25 *	LMW-11R	5/29/2012	0.028	KMW-2M	11/26/2012	0.25 *	BG-6D	5/25/2012	0.02
KMW-2M	8/24/2012	0.25 *	BG-3M	3/21/2012	1.1	LMW-11R	3/23/2012	0.25 *	KMW-2M	8/24/2012	0.25 *	BG-6D	3/21/2012	0.015
KMW-2M	5/21/2012	0.029	BG-4M	11/27/2012	0.025	LMW-7	11/28/2012	0.038	KMW-2M	5/21/2012	0.029	IMW-3D	5/25/2012	0.021
KMW-2M	3/23/2012	0.25 *	BG-4M	8/30/2012	0.25 *	LMW-7	8/27/2012	0.25 *	KMW-2M	3/23/2012	0.25 *	IMW-3D	3/22/2012	0.25 *
KMW-2S	11/26/2012	0.25 *	BG-4M	5/30/2012	0.25 *	LMW-7	5/31/2012	0.026	KMW-2S	11/26/2012	0.25 *	BG-2S	11/26/2012	0.042
KMW-2S	8/24/2012	0.25 *	BG-4M	3/20/2012	0.82	LMW-7	3/23/2012	0.25 *	KMW-2S	8/24/2012	0.25 *	BG-2S	8/23/2012	0.021
KMW-2S	5/21/2012	0.25 *	BG-6M	11/27/2012	0.025	LMW-9	11/28/2012	0.058	KMW-2S	5/21/2012	0.25 *	BG-2S	5/24/2012	0.091
KMW-2S	3/23/2012	0.25 *	BG-6M	8/22/2012	0.035	LMW-9	8/27/2012	0.25 *	KMW-2S	3/23/2012	0.25 *	BG-2S	3/21/2012	0.25 *
			BG-6M	5/25/2012	0.021	LMW-9	5/31/2012	0.028	BG-3S	41240	0.022	BG-2M	11/26/2012	0.028
			BG-6M	3/21/2012	1.1	LMW-9	3/23/2012	0.25 *	BG-3S	41143	0.25 *	BG-2M	8/23/2012	0.031
			BG-1D	11/26/2012	0.25 *				BG-3S	41052	0.25 *	BG-2M	5/24/2012	0.25 *
			BG-1D	8/23/2012	0.25 *				BG-3S	40989	0.026	BG-2M	3/21/2012	0.25 *
			BG-1D	5/24/2012	0.25 *				BG-4S	41240	0.021	BG-2D	11/26/2012	0.25 *
			BG-1D	3/20/2012	0.019				BG-4S	41151	0.023	BG-2D	8/23/2012	0.024
			BG-3D	11/27/2012	0.25 *				BG-4S	41059	0.25 *	BG-2D	5/24/2012	0.25 *
			BG-3D	8/21/2012	0.25 *				BG-4S	40988	0.02	BG-2D	3/21/2012	0.25 *
			BG-3D	5/23/2012	0.25 *				BG-6S	41240	0.031	LMW-10	11/28/2012	0.18
			BG-3D	3/21/2012	0.025				BG-6S	41144	0.027	LMW-10	8/27/2012	0.03
			BG-4D	11/27/2012	0.025				BG-6S	41054	0.02	LMW-10	5/30/2012	0.25 *
			BG-4D	8/30/2012	0.25 *				BG-6S	40989	0.023	LMW-10	3/22/2012	0.25 *
			BG-4D	5/30/2012	0.25 *				BG-1M	41239	0.25 *	LMW-11R	11/26/2012	0.25 *
			BG-4D	3/20/2012	0.8				BG-1M	41144	0.032	LMW-11R	8/21/2012	0.25 *
			BG-6D	11/27/2012	0.25 *				BG-1M	41053	0.021	LMW-11R	5/29/2012	0.028
			BG-6D	8/22/2012	0.25 *				BG-1M	40988	0.018	LMW-11R	3/23/2012	0.25 *
			BG-6D	5/25/2012	0.02				BG-3M	41240	0.021	LMW-7	11/28/2012	0.038
			BG-6D	3/21/2012	0.015				BG-3M	41143	0.022	LMW-7	8/27/2012	0.25 *
			IMW-3D	5/25/2012	0.021				BG-3M	41053	0.25 *	LMW-7	5/31/2012	0.026
			IMW-3D	3/22/2012	0.25 *				BG-3M	40989	1.1	LMW-7	3/23/2012	0.25 *
									BG-4M	41240	0.025	LMW-9	11/28/2012	0.058
									BG-4M	41151	0.25 *	LMW-9	8/27/2012	0.25 *
									BG-4M	41059	0.25 *	LMW-9	5/31/2012	0.028
* non-detect									BG-4M	40988	0.82	LMW-9	3/23/2012	0.25 *

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nickel_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Nickel, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	88	0	88	12	76	86.36%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	76	0.005	0.02	0.00776	0.005	0.00585
Statistics (Detects Only)	12	0.0053	0.016	0.00878	0.0077	0.003
Statistics (All: NDs treated as DL value)	88	0.005	0.02	0.0079	0.005	0.00555
Statistics (All: NDs treated as DL/2 value)	88	0.0025	0.016	0.00455	0.0025	0.00337
Statistics (Normal ROS Estimated Data)	88	-0.0204	0.016	-0.00289	-0.00293	0.00747
Statistics (Gamma ROS Estimated Data)	88	0.00361	0.0207	0.0145	0.0157	0.00439
Statistics (Lognormal ROS Estimated Data)	88	3.8527E-4	0.016	0.00331	0.00244	0.00281

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	10.66	10.3	8.2392E-4	-4.783	0.315	-0.0659
Statistics (NDs = DL)	3.154	3.054	0.00251	-5.007	0.522	-0.104
Statistics (NDs = DL/2)	2.497	2.419	0.00182	-5.606	0.611	-0.109
Statistics (Gamma ROS Estimates)	8.58	8.295	0.00169	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-6.012	0.787	-0.131

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.938	0.741	0.792	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.888	0.859	Data Appear Normal
Lilliefors (Detects Only)	0.224	0.256	Data Appear Normal
Lilliefors (NDs = DL)	0.404	0.0944	Data Not Normal
Lilliefors (NDs = DL/2)	0.433	0.0944	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0252	0.0944	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.97	0.833	0.882	0.821

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.353	0.73	
Kolmogorov-Smirnov (Detects Only)	0.208	0.245	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	18.53	0.759	
Kolmogorov-Smirnov (NDs = DL)	0.417	0.0959	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	16.98	0.762	
Kolmogorov-Smirnov (NDs = DL/2)	0.443	0.0963	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.217	0.753	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.143	0.0953	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.978	0.763	0.789	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.958	0.859	Data Appear Lognormal
Lilliefors (Detects Only)	0.188	0.256	Data Appear Lognormal
Lilliefors (NDs = DL)	0.416	0.0944	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.44	0.0944	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0244	0.0944	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Nickel, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	54	0	54	19	35	64.81%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	35	0.005	0.02	0.0166	0.02	0.00639
Statistics (Detects Only)	19	0.0052	0.012	0.00771	0.0073	0.00181
Statistics (All: NDs treated as DL value)	54	0.005	0.02	0.0135	0.016	0.00675
Statistics (All: NDs treated as DL/2 value)	54	0.0025	0.012	0.00808	0.01	0.00278
Statistics (Normal ROS Estimated Data)	54	0.00126	0.012	0.0064	0.00645	0.00256
Statistics (Gamma ROS Estimated Data)	54	0.00402	0.012	0.00784	0.00785	0.00181
Statistics (Lognormal ROS Estimated Data)	54	0.00334	0.012	0.00671	0.00644	0.00215

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	20.39	19.27	3.7787E-4	-4.891	0.226	-0.0463
Statistics (NDs = DL)	3.424	3.246	0.00393	-4.462	0.586	-0.131
Statistics (NDs = DL/2)	5.55	5.254	0.00146	-4.911	0.491	-0.1
Statistics (Gamma ROS Estimates)	17.93	16.94	4.3723E-4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.055	0.321	-0.0636

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.971	0.861	0.883	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.941	0.901	Data Appear Normal
Lilliefors (Detects Only)	0.115	0.203	Data Appear Normal
Lilliefors (NDs = DL)	0.334	0.121	Data Not Normal
Lilliefors (NDs = DL/2)	0.292	0.121	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0405	0.121	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.985	0.806	0.806	0.662

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.239	0.74	
Kolmogorov-Smirnov (Detects Only)	0.0936	0.198	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	5.841	0.756	
Kolmogorov-Smirnov (NDs = DL)	0.332	0.122	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	6.56	0.753	
Kolmogorov-Smirnov (NDs = DL/2)	0.282	0.121	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.35	0.749	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0773	0.121	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.989	0.882	0.831	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.974	0.901	Data Appear Lognormal
Lilliefors (Detects Only)	0.094	0.203	Data Appear Lognormal
Lilliefors (NDs = DL)	0.326	0.121	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.27	0.121	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0482	0.121	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Nickel, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	11	89	89.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	89	0.005	0.02	0.00809	0.005	0.00605
Statistics (Detects Only)	11	0.0052	0.024	0.0107	0.0082	0.00544
Statistics (All: NDs treated as DL value)	100	0.005	0.024	0.00837	0.005	0.00602
Statistics (All: NDs treated as DL/2 value)	100	0.0025	0.024	0.00477	0.0025	0.00393
Statistics (Normal ROS Estimated Data)	100	-0.0372	0.024	-0.00929	-0.00954	0.0118
Statistics (Gamma ROS Estimated Data)	100	0.0025	0.0364	0.0236	0.0256	0.00892
Statistics (Lognormal ROS Estimated Data)	100	2.0730E-4	0.024	0.00306	0.00191	0.00353

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	5.423	5.267	0.00197	-4.636	0.436	-0.0941
Statistics (NDs = DL)	2.84	2.762	0.00295	-4.969	0.559	-0.113
Statistics (NDs = DL/2)	2.226	2.166	0.00214	-5.586	0.641	-0.115
Statistics (Gamma ROS Estimates)	4.855	4.716	0.00486	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-6.238	0.949	-0.152

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.888	0.761	0.783	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.803	0.85	Data Not Normal
Lilliefors (Detects Only)	0.284	0.267	Data Not Normal
Lilliefors (NDs = DL)	0.412	0.0886	Data Not Normal

Lilliefors (NDs = DL/2)	0.418	0.0886	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0299	0.0886	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.952	0.849	0.899	0.919

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.678	0.731	
Kolmogorov-Smirnov (Detects Only)	0.268	0.256	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	20.42	0.76	
Kolmogorov-Smirnov (NDs = DL)	0.424	0.0902	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	18.32	0.764	
Kolmogorov-Smirnov (NDs = DL/2)	0.438	0.0905	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.178	0.755	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.145	0.0896	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.95	0.774	0.796	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.911	0.85	Data Appear Lognormal
Lilliefors (Detects Only)	0.245	0.267	Data Appear Lognormal
Lilliefors (NDs = DL)	0.422	0.0886	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.436	0.0886	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0277	0.0886	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Alluv + Mesa Nickel, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	198	0	198	23	175	88.38%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	175	0.005	0.02	0.00777	0.005	0.00581
Statistics (Detects Only)	23	0.0052	0.024	0.00968	0.0079	0.00435
Statistics (All: NDs treated as DL value)	198	0.005	0.024	0.00799	0.005	0.00569
Statistics (All: NDs treated as DL/2 value)	198	0.0025	0.024	0.00456	0.0025	0.00361
Statistics (Normal ROS Estimated Data)	198	-0.0308	0.024	-0.00603	-0.00613	0.00959
Statistics (Gamma ROS Estimated Data)	198	0.00183	0.0263	0.0181	0.0196	0.00592
Statistics (Lognormal ROS Estimated Data)	198	2.6216E-4	0.024	0.00323	0.00226	0.00315

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	6.829	6.729	0.00142	-4.712	0.376	-0.0799
Statistics (NDs = DL)	3.037	2.994	0.00263	-5.003	0.532	-0.106
Statistics (NDs = DL/2)	2.378	2.346	0.00192	-5.615	0.616	-0.11
Statistics (Gamma ROS Estimates)	6.668	6.57	0.00271	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-6.083	0.837	-0.138

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.889	0.742	0.777	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.802	0.914	Data Not Normal
Lilliefors (Detects Only)	0.21	0.185	Data Not Normal
Lilliefors (NDs = DL)	0.418	0.063	Data Not Normal
Lilliefors (NDs = DL/2)	0.433	0.063	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0239	0.063	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.947	0.835	0.888	0.872

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.893	0.746	
Kolmogorov-Smirnov (Detects Only)	0.18	0.182	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	42.52	0.76	
Kolmogorov-Smirnov (NDs = DL)	0.429	0.0646	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	38.65	0.764	
Kolmogorov-Smirnov (NDs = DL/2)	0.448	0.0648	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	8.674	0.754	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.144	0.0642	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.963	0.758	0.783	1

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.929	0.914	Data Appear Lognormal
Lilliefors (Detects Only)	0.161	0.185	Data Appear Lognormal
Lilliefors (NDs = DL)	0.428	0.063	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.446	0.063	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.021	0.063	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nickel_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Nickel, Dissolved

General Statistics

Number of Valid Data	88	Number of Detected Data	12
Number of Distinct Detected Data	10	Number of Non-Detect Data	76
		Percent Non-Detects	86.36%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0053	Minimum Detected	-5.24
Maximum Detected	0.016	Maximum Detected	-4.135
Mean of Detected	0.00878	Mean of Detected	-4.783
SD of Detected	0.003	SD of Detected	0.315
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	88
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.888	Shapiro Wilk Test Statistic	0.958
5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00455	Mean (Log Scale)	-5.606
SD	0.00337	SD (Log Scale)	0.611
95% UTL 95% Coverage	0.0111	95% UTL 95% Coverage	0.0121
95% UPL (t)	0.0102	95% UPL (t)	0.0102
90% Percentile (z)	0.00887	90% Percentile (z)	0.00804
95% Percentile (z)	0.0101	95% Percentile (z)	0.01
99% Percentile (z)	0.0124	99% Percentile (z)	0.0152
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00331
		SD in Original Scale	0.00281
		Mean in Log Scale	-6.012
		SD in Log Scale	0.787
		95% UTL 95% Coverage	0.0113
		95% UPL (t)	0.00914

		90% Percentile (z)	0.00672
		95% Percentile (z)	0.00894
		99% Percentile (z)	0.0153
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	8.051	Data appear Normal at 5% Significance Level	
Theta Star	0.00109		
nu star	193.2		
A-D Test Statistic	0.353	Nonparametric Statistics	
5% A-D Critical Value	0.73	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.208	Mean	0.00586
5% K-S Critical Value	0.245	SD	0.00173
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	2.0992E-4
		95% KM UTL with 95% Coverage	0.00923
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0134
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00876
Mean	0.0145	90% Percentile (z)	0.00808
Median	0.0157	95% Percentile (z)	0.00871
SD	0.00439	99% Percentile (z)	0.00989
k star	8.295		
Theta star	0.00175	Gamma ROS Limits with Extrapolated Data	
Nu star	1460	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0237
95% Percentile of Chisquare (2k)	27.06	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0241
		95% WH Approx. Gamma UTL with 95% Coverage	0.0257
90% Percentile	0.0212	95% HW Approx. Gamma UTL with 95% Coverage	0.0262
95% Percentile	0.0236		
99% Percentile	0.0287		

Note: DL/2 is not a recommended method.

Muddy Creek Nickel, Dissolved

General Statistics			
Number of Valid Data	54	Number of Detected Data	19
Number of Distinct Detected Data	17	Number of Non-Detect Data	35
		Percent Non-Detects	64.81%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0052	Minimum Detected	-5.259
Maximum Detected	0.012	Maximum Detected	-4.423
Mean of Detected	0.00771	Mean of Detected	-4.891
SD of Detected	0.00181	SD of Detected	0.226
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912
Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	54
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
Background Statistics			

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.941	Shapiro Wilk Test Statistic	0.974
5% Shapiro Wilk Critical Value	0.901	5% Shapiro Wilk Critical Value	0.901
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00808	Mean (Log Scale)	-4.911
SD	0.00278	SD (Log Scale)	0.491
95% UTL 95% Coverage	0.0138	95% UTL 95% Coverage	0.0201
95% UPL (t)	0.0128	95% UPL (t)	0.0169
90% Percentile (z)	0.0116	90% Percentile (z)	0.0138
95% Percentile (z)	0.0127	95% Percentile (z)	0.0165
99% Percentile (z)	0.0146	99% Percentile (z)	0.0231
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00671
		SD in Original Scale	0.00215
		Mean in Log Scale	-5.055
		SD in Log Scale	0.321
		95% UTL 95% Coverage	0.0123
		95% UPL (t)	0.011
		90% Percentile (z)	0.00963
		95% Percentile (z)	0.0108
		99% Percentile (z)	0.0135
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	17.21	Data appear Normal at 5% Significance Level	
Theta Star	4.4781E-4		
nu star	653.9		
A-D Test Statistic	0.239	Nonparametric Statistics	
5% A-D Critical Value	0.74	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.0936	Mean	0.00696
5% K-S Critical Value	0.198	SD	0.00187
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	3.6897E-4
		95% KM UTL with 95% Coverage	0.0108
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0152
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0101
Mean	0.00784	90% Percentile (z)	0.00935
Median	0.00785	95% Percentile (z)	0.01
SD	0.00181	99% Percentile (z)	0.0113
k star	16.94		
Theta star	4.6261E-4	Gamma ROS Limits with Extrapolated Data	
Nu star	1830	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0113
95% Percentile of Chisquare (2k)	48.47	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0113
		95% WH Approx. Gamma UTL with 95% Coverage	0.0121
90% Percentile	0.0104	95% HW Approx. Gamma UTL with 95% Coverage	0.0122
95% Percentile	0.0112		
99% Percentile	0.0129		

Note: DL/2 is not a recommended method.

Mesa Nickel, Dissolved

General Statistics			
Number of Valid Data	100	Number of Detected Data	11
Number of Distinct Detected Data	11	Number of Non-Detect Data	89
		Percent Non-Detects	89.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0052	Minimum Detected	-5.259
Maximum Detected	0.024	Maximum Detected	-3.73
Mean of Detected	0.0107	Mean of Detected	-4.636
SD of Detected	0.00544	SD of Detected	0.436
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	99
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	99.00%

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.803	Shapiro Wilk Test Statistic	0.911
5% Shapiro Wilk Critical Value	0.85	5% Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00477	Mean (Log Scale)	-5.586
SD	0.00393	SD (Log Scale)	0.641
95% UTL 95% Coverage	0.0123	95% UTL 95% Coverage	0.0129
95% UPL (t)	0.0113	95% UPL (t)	0.0109
90% Percentile (z)	0.00981	90% Percentile (z)	0.00853
95% Percentile (z)	0.0112	95% Percentile (z)	0.0108
99% Percentile (z)	0.0139	99% Percentile (z)	0.0167
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00306
		SD in Original Scale	0.00353
		Mean in Log Scale	-6.238
		SD in Log Scale	0.949
		95% UTL 95% Coverage	0.0121
		95% UPL (t)	0.00951
		90% Percentile (z)	0.00659
		95% Percentile (z)	0.0093
		99% Percentile (z)	0.0177
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	4.004	Data follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.00266		
nu star	88.1		

A-D Test Statistic	0.678	Nonparametric Statistics	
5% A-D Critical Value	0.731	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.268	Mean	0.0059
5% K-S Critical Value	0.256	SD	0.00252
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	2.7864E-4
		95% KM UTL with 95% Coverage	0.0107
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.017
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0101
Mean	0.0236	90% Percentile (z)	0.00913
Median	0.0256	95% Percentile (z)	0.01
SD	0.00892	99% Percentile (z)	0.0118
k star	4.716		
Theta star	0.00501	Gamma ROS Limits with Extrapolated Data	
Nu star	943.2	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0441
95% Percentile of Chisquare (2k)	17.52	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0453
		95% WH Approx. Gamma UTL with 95% Coverage	0.0483
90% Percentile	0.0382	95% HW Approx. Gamma UTL with 95% Coverage	0.0501
95% Percentile	0.0439		
99% Percentile	0.0559		

Note: DL/2 is not a recommended method.

Alluv + Mesa Nickel, Dissolved

General Statistics

Number of Valid Data	198	Number of Detected Data	23
Number of Distinct Detected Data	20	Number of Non-Detect Data	175
		Percent Non-Detects	88.38%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0052	Minimum Detected	-5.259
Maximum Detected	0.024	Maximum Detected	-3.73
Mean of Detected	0.00968	Mean of Detected	-4.712
SD of Detected	0.00435	SD of Detected	0.376
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	197
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	99.49%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.802	Shapiro Wilk Test Statistic	0.929
5% Shapiro Wilk Critical Value	0.914	5% Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00456	Mean (Log Scale)	-5.615
SD	0.00361	SD (Log Scale)	0.616

95% UTL 95% Coverage	0.0112	95% UTL 95% Coverage	0.0113
95% UPL (t)	0.0105	95% UPL (t)	0.0101
90% Percentile (z)	0.00919	90% Percentile (z)	0.00802
95% Percentile (z)	0.0105	95% Percentile (z)	0.01
99% Percentile (z)	0.013	99% Percentile (z)	0.0153
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00323
		SD in Original Scale	0.00315
		Mean in Log Scale	-6.083
		SD in Log Scale	0.837
		95% UTL 95% Coverage	0.0106
		95% UPL (t)	0.00912
		90% Percentile (z)	0.00667
		95% Percentile (z)	0.00903
		99% Percentile (z)	0.016
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	5.967	Data follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.00162		
nu star	274.5		
A-D Test Statistic	0.893	Nonparametric Statistics	
5% A-D Critical Value	0.746	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.18	Mean	0.0058
5% K-S Critical Value	0.182	SD	0.00214
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	1.6496E-4
		95% KM UTL with 95% Coverage	0.00974
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0152
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00935
Mean	0.0181	90% Percentile (z)	0.00855
Median	0.0196	95% Percentile (z)	0.00933
SD	0.00592	99% Percentile (z)	0.0108
k star	6.57		
Theta star	0.00275	Gamma ROS Limits with Extrapolated Data	
Nu star	2602	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0311
95% Percentile of Chisquare (2k)	22.55	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0318
		95% WH Approx. Gamma UTL with 95% Coverage	0.0329
90% Percentile	0.0275	95% HW Approx. Gamma UTL with 95% Coverage	0.0338
95% Percentile	0.031		
99% Percentile	0.0384		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nickel_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Nickel, Dissolved

Background Data: Alluv Nickel, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	88
Number of Non-Detect Data	89	76
Number of Detect Data	11	12
Minimum Non-Detect	0.005	0.005
Maximum Non-Detect	0.02	0.02
Percent Non detects	89.00%	86.36%
Minimum Detected	0.0052	0.0053
Maximum Detected	0.024	0.016
Mean of Detected Data	0.0107	0.00878
Median of Detected Data	0.0082	0.0077
SD of Detected Data	0.00544	0.003

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-0.346
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.729

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nickel_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Nickel, Dissolved

Background Data: Alluv Nickel, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	88
Number of Non-Detect Data	89	76
Number of Detect Data	11	12
Minimum Non-Detect	0.005	0.005
Maximum Non-Detect	0.02	0.02
Percent Non detects	89.00%	86.36%
Minimum Detected	0.0052	0.0053
Maximum Detected	0.024	0.016
Mean of Detected Data	0.0107	0.00878
Median of Detected Data	0.0082	0.0077
SD of Detected Data	0.00544	0.003

Site vs Background Gehan Test

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Gehan z Test Value	-0.346
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.729

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nickel_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Nickel, Dissolved

Background Data: Muddy Creek Nickel, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	54
Number of Non-Detect Data	89	35
Number of Detect Data	11	19
Minimum Non-Detect	0.005	0.005
Maximum Non-Detect	0.02	0.02
Percent Non detects	89.00%	64.81%
Minimum Detected	0.0052	0.0052
Maximum Detected	0.024	0.012
Mean of Detected Data	0.0107	0.00771
Median of Detected Data	0.0082	0.0073
SD of Detected Data	0.00544	0.00181

Site vs Background Gehan Test

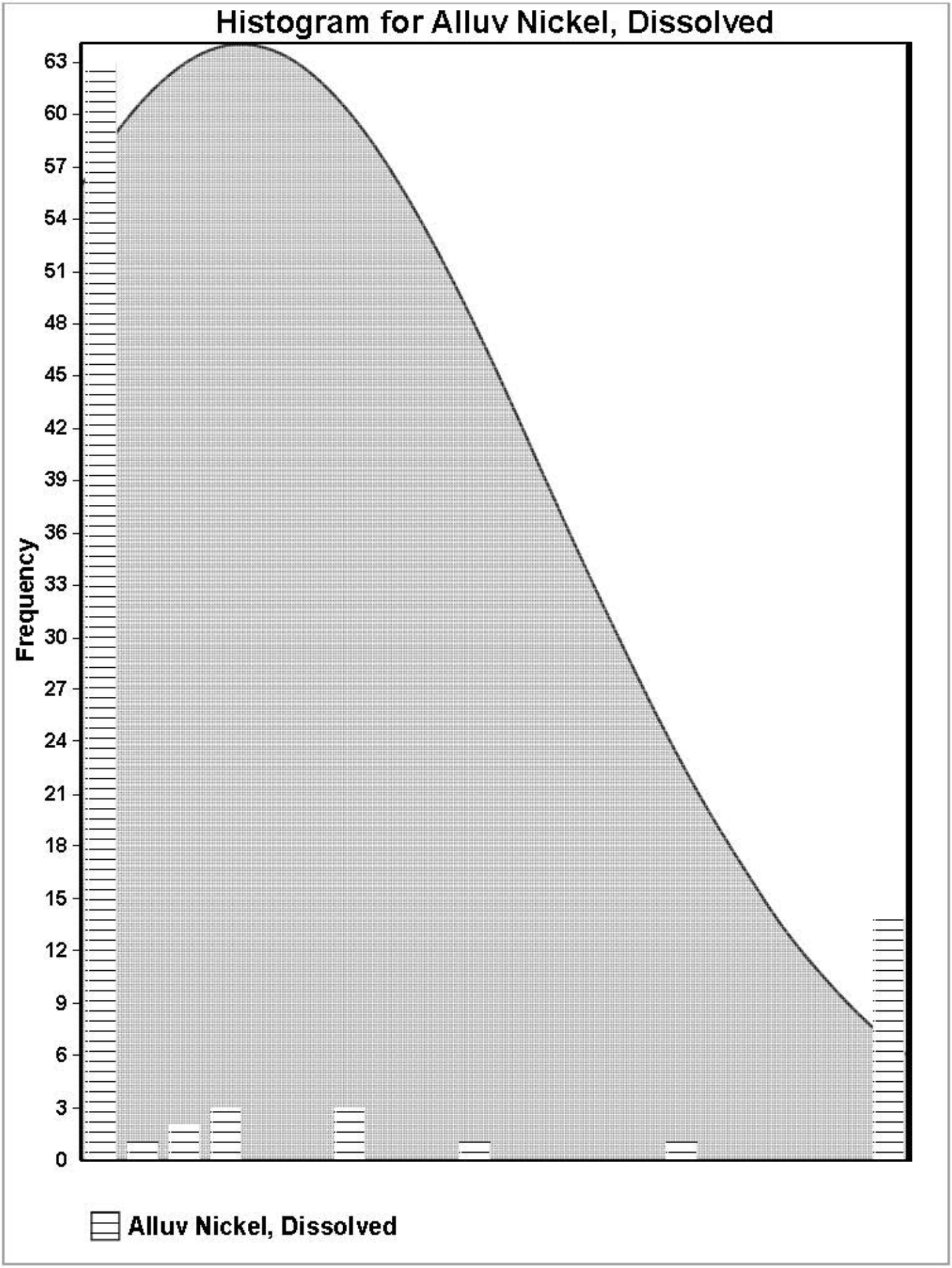
H0: Mu of Site or AOC = Mu of background

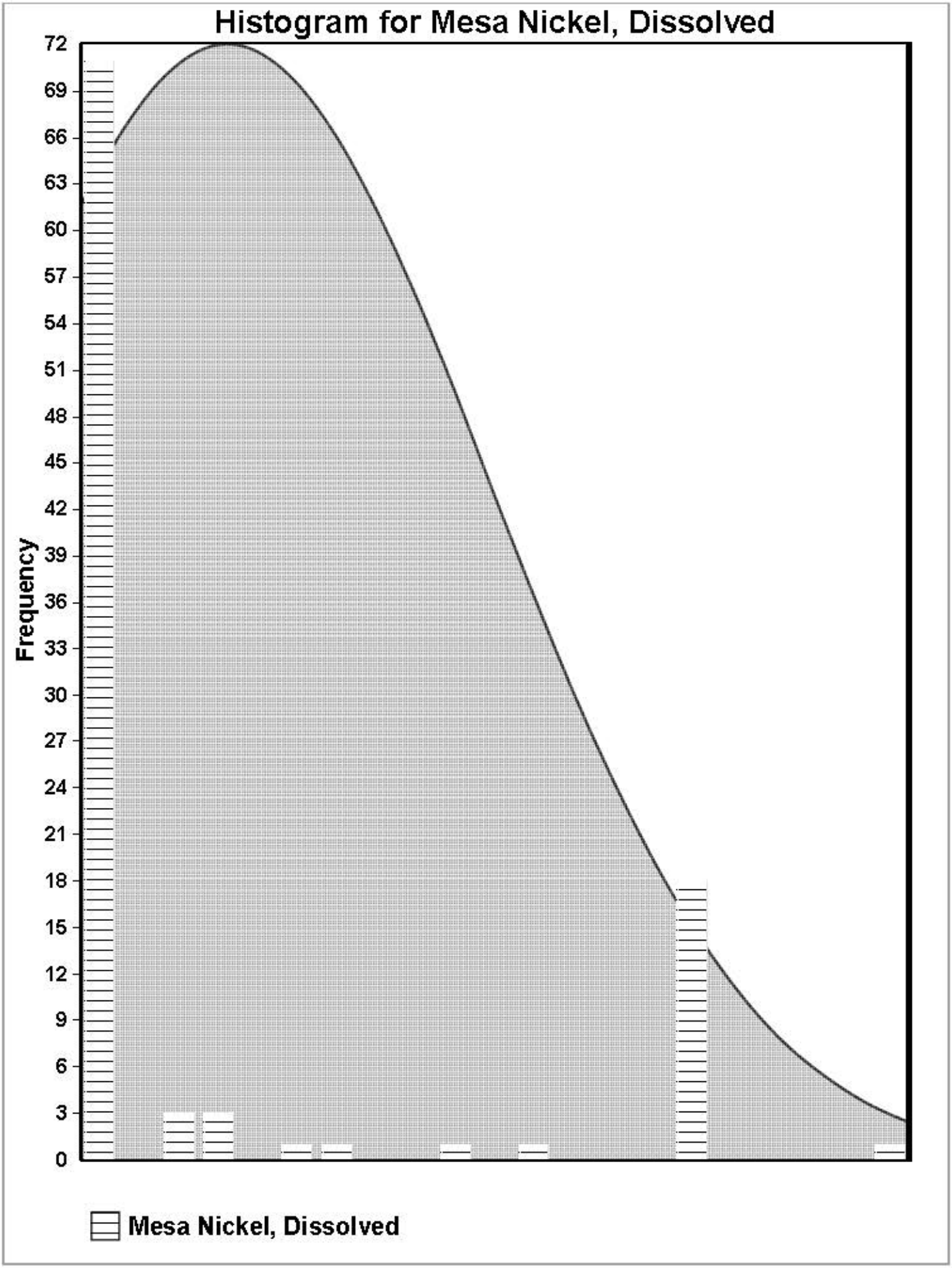
Gehan z Test Value	-4.583
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	4.5892E-6

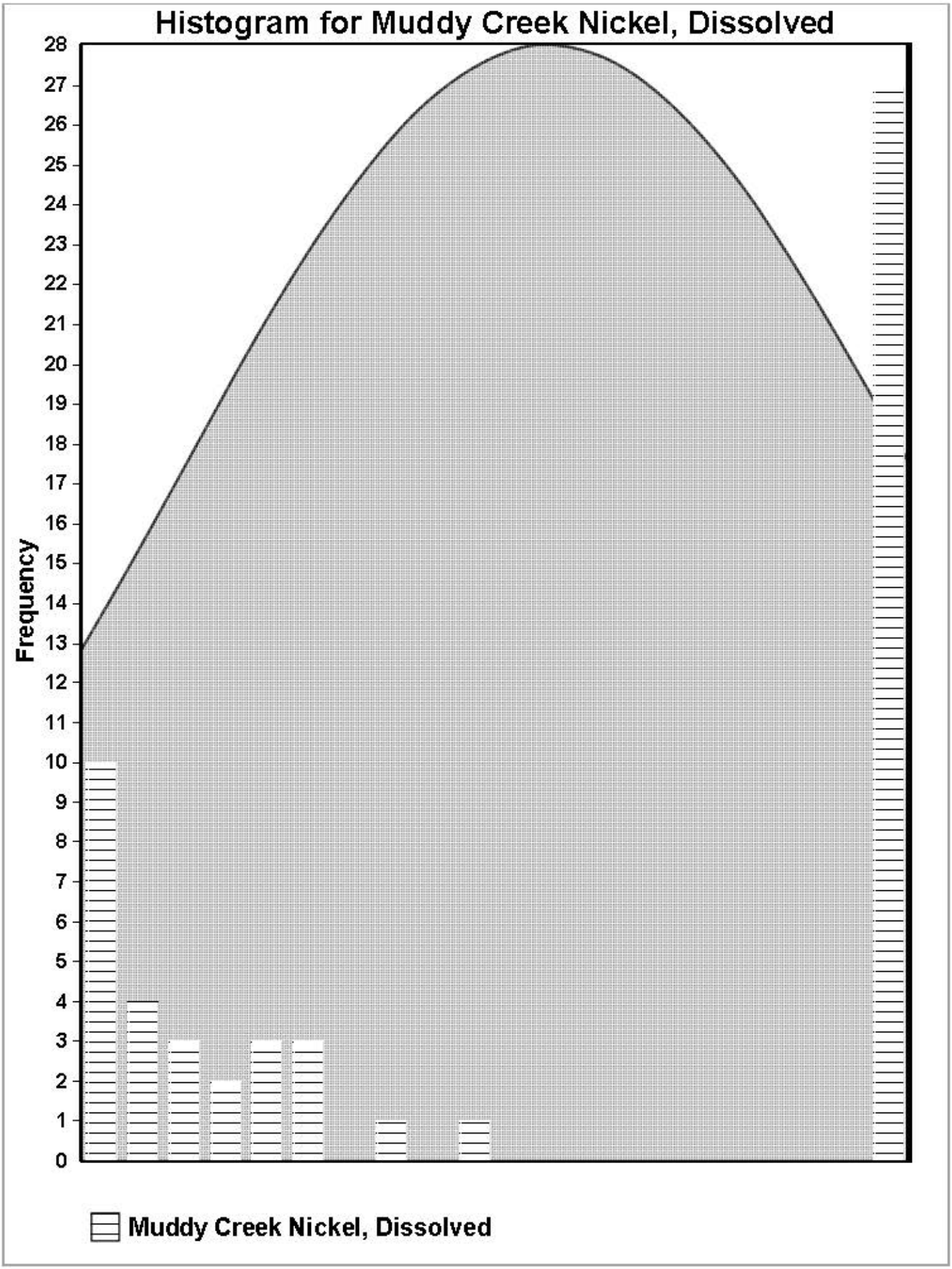
Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Nickel, Dissolved
Frequency
63
60
57
54
51
48
45
42
39
36
33
30
27
24
21
18
15
12
9
6
3
0
Alluv Nickel, Dissolved


Histogram for Mesa Nickel, Dissolved
Frequency
72
69
66
63
60
57
54
51
48
45
42
39
36
33
30
27
24
21
18
15
12
9
6
3
0
Mesa Nickel, Dissolved


Histogram for Muddy Creek Nickel, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
Muddy Creek Nickel, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Nickel_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Nickel, Dissolved

Mean	0.00455
Standard Deviation	0.00337
Number of data	88
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00455	0.00336	0.016	49	3.413	3.342	3.71

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.016 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Nickel, Dissolved

Mean	0.00808
Standard Deviation	0.00278
Number of data	54
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00808	0.00276	0.0025	46	2.026	3.158	3.512

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Nickel, Dissolved

Mean	0.00477
Standard Deviation	0.00393
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

1	0.00477	0.00391	0.024	22	4.913	3.38	3.75

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.024 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.024 is a Potential Statistical Outlier

Rosner's Outlier Test for Alluv + Mesa Nickel, Dissolved

Mean	0.00456
Standard Deviation	0.00361
Number of data	198
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00456	0.0036	0.024	120	5.397	3.606	3.976

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.024 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.024 is a Potential Statistical Outlier

Location Name	Sample Date	Alluv Nickel, Dissolved	D_Alluv Nickel, Dissolved
BG-1S	11/26/2012	0.02	0
BG-1S	8/23/2012	0.02	0
BG-1S	5/24/2012	0.007	1
BG-1S	3/20/2012	0.0099	1
IMW-2.5D	11/26/2012	0.02	0
IMW-2.5D	8/24/2012	0.02	0
IMW-2.5D	5/21/2012	0.0067	1
IMW-2.5D	3/21/2012	0.0053	1
IMW-2.5D	12/8/2011	0.005	0
IMW-2.5D	6/6/2011	0.005	0
IMW-2.5D	12/15/2010	0.005	0
IMW-2.5D	6/9/2010	0.005	0
IMW-2.5D	12/12/2009	0.005	0
IMW-2.5S	11/26/2012	0.02	0
IMW-2.5S	8/24/2012	0.02	0
IMW-2.5S	5/21/2012	0.0099	1
IMW-2.5S	3/21/2012	0.0077	1
IMW-2.5S	12/8/2011	0.005	0
IMW-2.5S	9/9/2011	0.005	0
IMW-2.5S	6/6/2011	0.005	0
IMW-2.5S	3/7/2011	0.005	0
IMW-2.5S	12/15/2010	0.005	0
IMW-2.5S	9/20/2010	0.005	0
IMW-2.5S	6/9/2010	0.005	0
IMW-2.5S	3/9/2010	0.005	0
IMW-2.5S	12/12/2009	0.005	0
IMW-2.5S	9/21/2009	0.005	0
IMW-3S	5/21/2012	0.0074	1
IMW-3S	2/29/2012	0.005	0
IMW-3S	3/20/2012	0.0077	1
IMW-3S	12/9/2011	0.005	0
IMW-3S	9/9/2011	0.005	0
IMW-3S	6/7/2011	0.005	0
IMW-3S	3/7/2011	0.005	0
IMW-3S	12/10/2010	0.005	0
IMW-3S	9/16/2010	0.005	0
IMW-3S	6/8/2010	0.005	0
IMW-3S	3/9/2010	0.005	0
IMW-3S	12/10/2009	0.005	0
IMW-3S	9/14/2009	0.005	0
IMW-3S	6/9/2009	0.005	0
IMW-3S	3/3/2009	0.005	0
IMW-3S	12/9/2008	0.005	0
IMW-3S	9/9/2008	0.005	0
IMW-3S	6/3/2008	0.005	0
IMW-3S	3/4/2008	0.005	0
KMW-2D	11/26/2012	0.02	0
KMW-2D	8/24/2012	0.02	0
KMW-2D	5/21/2012	0.016	1
KMW-2D	3/23/2012	0.02	0

Location Name	Sample Date	Muddy Creek Nickel, Dissolved	D_Muddy Creek Nickel, Dissolved
BG-3S	11/27/2012	0.02	0
BG-3S	8/22/2012	0.0091	1
BG-3S	5/23/2012	0.0061	1
BG-3S	3/21/2012	0.0061	1
BG-4S	11/27/2012	0.02	0
BG-4S	8/30/2012	0.02	0
BG-4S	5/30/2012	0.02	0
BG-4S	3/20/2012	0.0089	1
BG-6S	11/27/2012	0.02	0
BG-6S	8/23/2012	0.02	0
BG-6S	5/25/2012	0.0069	1
BG-6S	3/21/2012	0.0052	1
BG-1M	11/26/2012	0.02	0
BG-1M	8/23/2012	0.02	0
BG-1M	5/24/2012	0.0071	1
BG-1M	3/20/2012	0.0086	1
BG-3M	11/27/2012	0.02	0
BG-3M	8/22/2012	0.02	0
BG-3M	5/24/2012	0.0055	1
BG-3M	3/21/2012	0.02	0
BG-4M	11/27/2012	0.02	0
BG-4M	8/30/2012	0.02	0
BG-4M	5/30/2012	0.02	0
BG-4M	3/20/2012	0.0078	1
BG-6M	11/27/2012	0.02	0
BG-6M	8/22/2012	0.02	0
BG-6M	5/25/2012	0.0089	1
BG-6M	3/21/2012	0.02	0
BG-1D	11/26/2012	0.02	0
BG-1D	8/23/2012	0.02	0
BG-1D	5/24/2012	0.0073	1
BG-1D	3/20/2012	0.0065	1
BG-3D	11/27/2012	0.02	0
BG-3D	8/21/2012	0.012	1
BG-3D	5/23/2012	0.0058	1
BG-3D	3/21/2012	0.0082	1
BG-4D	11/27/2012	0.02	0
BG-4D	8/30/2012	0.02	0
BG-4D	5/30/2012	0.02	0
BG-4D	3/20/2012	0.007	1
BG-6D	11/27/2012	0.02	0
BG-6D	8/22/2012	0.02	0
BG-6D	5/25/2012	0.011	1
BG-6D	3/21/2012	0.02	0
IMW-3D	5/25/2012	0.0084	1
IMW-3D	2/29/2012	0.005	0
IMW-3D	3/22/2012	0.02	0
IMW-3D	12/9/2011	0.005	0
IMW-3D	6/7/2011	0.005	0
IMW-3D	12/10/2010	0.005	0

Location Name	Sample Date	Mesa Nickel, Dissolved	D_Mesa Nickel, Dissolved
LMW-10	11/28/2012	0.02	0
LMW-10	8/27/2012	0.02	0
LMW-10	5/30/2012	0.02	0
LMW-10	3/22/2012	0.02	0
LMW-10	12/6/2011	0.005	0
LMW-10	9/8/2011	0.005	0
LMW-10	6/8/2011	0.005	0
LMW-10	3/2/2011	0.005	0
LMW-10	12/9/2010	0.01	0
LMW-10	9/21/2010	0.005	0
LMW-10	6/9/2010	0.005	0
LMW-10	3/11/2010	0.005	0
LMW-10	12/11/2009	0.005	0
LMW-10	9/18/2009	0.005	0
LMW-10	6/10/2009	0.005	0
LMW-10	3/5/2009	0.005	0
LMW-10	12/12/2008	0.005	0
LMW-10	9/10/2008	0.005	0
LMW-10	6/4/2008	0.005	0
LMW-10	3/5/2008	0.005	0
LMW-11R	11/26/2012	0.02	0
LMW-11R	8/21/2012	0.024	1
LMW-11R	5/29/2012	0.02	0
LMW-11R	3/23/2012	0.0076	1
LMW-7	11/28/2012	0.02	0
LMW-7	8/27/2012	0.02	0
LMW-7	5/31/2012	0.016	1
LMW-7	3/23/2012	0.02	0
LMW-7	12/5/2011	0.005	0
LMW-7	9/6/2011	0.005	0
LMW-7	6/9/2011	0.005	0
LMW-7	3/9/2011	0.005	0
LMW-7	12/10/2010	0.005	0
LMW-7	9/21/2010	0.005	0
LMW-7	6/9/2010	0.005	0
LMW-7	3/11/2010	0.005	0
LMW-7	12/11/2009	0.005	0
LMW-7	9/18/2009	0.005	0
LMW-7	6/10/2009	0.005	0
LMW-7	3/5/2009	0.005	0
LMW-7	12/12/2008	0.005	0
LMW-7	9/10/2008	0.005	0
LMW-7	6/4/2008	0.005	0
LMW-7	3/5/2008	0.005	0
BG-2S	11/26/2012	0.02	0
BG-2S	8/23/2012	0.02	0
BG-2S	5/24/2012	0.014	1
BG-2S	3/21/2012	0.011	1
BG-2M	11/26/2012	0.02	0
BG-2M	8/23/2012	0.02	0

Location Name	Sample Date	Alluv + Mesa Nickel, Dissolved	D_Alluv + Mesa Nickel, Dissolved
BG-1S	11/26/2012	0.02	0
BG-1S	8/23/2012	0.02	0
BG-1S	5/24/2012	0.007	1
BG-1S	3/20/2012	0.0099	1
IMW-2.5D	11/26/2012	0.02	0
IMW-2.5D	8/24/2012	0.02	0
IMW-2.5D	8/24/2012	0.005	0
IMW-2.5D	5/21/2012	0.0067	1
IMW-2.5D	2/29/2012	0.005	0
IMW-2.5D	3/21/2012	0.0053	1
IMW-2.5D	12/8/2011	0.005	0
IMW-2.5D	6/6/2011	0.005	0
IMW-2.5D	12/15/2010	0.005	0
IMW-2.5D	6/9/2010	0.005	0
IMW-2.5D	12/12/2009	0.005	0
IMW-2.5S	11/26/2012	0.02	0
IMW-2.5S	8/24/2012	0.02	0
IMW-2.5S	8/24/2012	0.005	0
IMW-2.5S	5/21/2012	0.0099	1
IMW-2.5S	3/21/2012	0.0077	1
IMW-2.5S	2/29/2012	0.005	0
IMW-2.5S	12/8/2011	0.005	0
IMW-2.5S	9/9/2011	0.005	0
IMW-2.5S	6/6/2011	0.005	0
IMW-2.5S	3/7/2011	0.005	0
IMW-2.5S	12/15/2010	0.005	0
IMW-2.5S	9/20/2010	0.005	0
IMW-2.5S	6/9/2010	0.005	0
IMW-2.5S	3/9/2010	0.005	0
IMW-2.5S	12/12/2009	0.005	0
IMW-2.5S	9/21/2009	0.005	0
IMW-3S	5/21/2012	0.0074	1
IMW-3S	2/29/2012	0.005	0
IMW-3S	3/20/2012	0.0077	1
IMW-3S	12/9/2011	0.005	0
IMW-3S	9/9/2011	0.005	0
IMW-3S	6/7/2011	0.005	0
IMW-3S	3/7/2011	0.005	0
IMW-3S	12/10/2010	0.005	0
IMW-3S	9/16/2010	0.005	0
IMW-3S	6/8/2010	0.005	0
IMW-3S	3/9/2010	0.005	0
IMW-3S	12/10/2009	0.005	0
IMW-3S	9/14/2009	0.005	0
IMW-3S	6/9/2009	0.005	0
IMW-3S	3/3/2009	0.005	0
IMW-3S	12/9/2008	0.005	0
IMW-3S	9/9/2008	0.005	0
IMW-3S	6/3/2008	0.005	0
IMW-3S	3/4/2008	0.005	0

KMW-2D	12/8/2011	0.005	0
KMW-2D	6/6/2011	0.005	0
KMW-2D	12/13/2010	0.005	0
KMW-2D	6/8/2010	0.005	0
KMW-2D	12/8/2009	0.005	0
KMW-2D	12/10/2008	0.005	0
KMW-2D	6/3/2008	0.005	0
KMW-2M	11/26/2012	0.02	0
KMW-2M	8/24/2012	0.02	0
KMW-2M	5/21/2012	0.012	1
KMW-2M	3/23/2012	0.0058	1
KMW-2M	12/8/2011	0.005	0
KMW-2M	6/6/2011	0.005	0
KMW-2M	12/13/2010	0.005	0
KMW-2M	6/8/2010	0.005	0
KMW-2M	12/8/2009	0.005	0
KMW-2M	12/10/2008	0.005	0
KMW-2M	6/3/2008	0.005	0
KMW-2S	11/26/2012	0.02	0
KMW-2S	8/24/2012	0.02	0
KMW-2S	5/21/2012	0.01	1
KMW-2S	3/23/2012	0.02	0
KMW-2S	12/8/2011	0.005	0
KMW-2S	9/9/2011	0.005	0
KMW-2S	6/6/2011	0.005	0
KMW-2S	3/8/2011	0.005	0
KMW-2S	12/13/2010	0.005	0
KMW-2S	9/15/2010	0.005	0
KMW-2S	6/8/2010	0.005	0
KMW-2S	3/9/2010	0.005	0
KMW-2S	12/8/2009	0.005	0
KMW-2S	9/16/2009	0.005	0
KMW-2S	6/10/2009	0.005	0
KMW-2S	3/3/2009	0.005	0
KMW-2S	12/10/2008	0.005	0
KMW-2S	9/8/2008	0.005	0
KMW-2S	6/3/2008	0.005	0
KMW-2S	3/4/2008	0.005	0

IMW-3D	6/8/2010	0.005	0
IMW-3D	12/10/2009	0.005	0
IMW-3D	12/9/2008	0.005	0
IMW-3D	6/3/2008	0.005	0

BG-2M	5/24/2012	0.0086	1
BG-2M	3/21/2012	0.0073	1
BG-2D	11/26/2012	0.02	0
BG-2D	8/23/2012	0.02	0
BG-2D	5/24/2012	0.0079	1
BG-2D	3/21/2012	0.02	0
LMW-9	11/28/2012	0.02	0
LMW-9	8/27/2012	0.02	0
LMW-9	5/31/2012	0.0082	1
LMW-9	3/23/2012	0.0052	1
LMW-9	12/5/2011	0.005	0
LMW-9	9/8/2011	0.005	0
LMW-9	6/8/2011	0.005	0
LMW-9	3/9/2011	0.005	0
LMW-9	12/10/2010	0.005	0
LMW-9	9/21/2010	0.005	0
LMW-9	6/9/2010	0.005	0
LMW-9	3/11/2010	0.005	0
LMW-9	12/11/2009	0.005	0
LMW-9	9/18/2009	0.005	0
LMW-9	6/10/2009	0.005	0
LMW-9	3/5/2009	0.005	0
LMW-9	12/12/2008	0.005	0
LMW-9	9/10/2008	0.005	0
LMW-9	6/4/2008	0.005	0
LMW-9	3/5/2008	0.005	0
LMW-11	3/2/2011	0.005	0
LMW-11	9/8/2011	0.005	0
LMW-11	12/6/2011	0.005	0
LMW-11	2/22/2012	0.005	0
LMW-12R	5/30/2012	0.005	0
LMW-12R	8/21/2012	0.005	0
LMW-12R	10/22/2012	0.005	0
LMW-12R	11/30/2012	0.005	0
LMW-13R	5/29/2012	0.005	0
LMW-13R	8/20/2012	0.005	0
LMW-13R	10/22/2012	0.005	0
LMW-13R	11/28/2012	0.005	0
LMW-14R	5/29/2012	0.005	0
LMW-14R	8/20/2012	0.005	0
LMW-14R	10/22/2012	0.005	0
LMW-14R	11/30/2012	0.005	0
LMW-15	5/29/2012	0.005	0
LMW-15	8/20/2012	0.005	0
LMW-15	10/22/2012	0.005	0
LMW-15	11/28/2012	0.005	0
LMW-16	5/29/2012	0.005	0
LMW-16	8/20/2012	0.0075	1
LMW-16	10/22/2012	0.005	0
LMW-16	11/28/2012	0.005	0

KMW-2D	11/26/2012	0.02	0
KMW-2D	8/24/2012	0.005	0
KMW-2D	8/24/2012	0.02	0
KMW-2D	5/21/2012	0.016	1
KMW-2D	3/23/2012	0.02	0
KMW-2D	2/28/2012	0.005	0
KMW-2D	12/8/2011	0.005	0
KMW-2D	6/6/2011	0.005	0
KMW-2D	12/13/2010	0.005	0
KMW-2D	6/8/2010	0.005	0
KMW-2D	12/8/2009	0.005	0
KMW-2D	12/10/2008	0.005	0
KMW-2D	6/3/2008	0.005	0
KMW-2M	11/26/2012	0.02	0
KMW-2M	8/24/2012	0.02	0
KMW-2M	8/24/2012	0.005	0
KMW-2M	5/21/2012	0.012	1
KMW-2M	3/23/2012	0.0058	1
KMW-2M	2/28/2012	0.005	0
KMW-2M	12/8/2011	0.005	0
KMW-2M	6/6/2011	0.005	0
KMW-2M	12/13/2010	0.005	0
KMW-2M	6/8/2010	0.005	0
KMW-2M	12/8/2009	0.005	0
KMW-2M	12/10/2008	0.005	0
KMW-2M	6/3/2008	0.005	0
KMW-2S	11/26/2012	0.02	0
KMW-2S	8/24/2012	0.02	0
KMW-2S	8/24/2012	0.005	0
KMW-2S	5/21/2012	0.01	1
KMW-2S	2/28/2012	0.005	0
KMW-2S	3/23/2012	0.02	0
KMW-2S	12/8/2011	0.005	0
KMW-2S	9/9/2011	0.005	0
KMW-2S	6/6/2011	0.005	0
KMW-2S	3/8/2011	0.005	0
KMW-2S	12/13/2010	0.005	0
KMW-2S	9/15/2010	0.005	0
KMW-2S	6/8/2010	0.005	0
KMW-2S	3/9/2010	0.005	0
KMW-2S	12/8/2009	0.005	0
KMW-2S	9/16/2009	0.005	0
KMW-2S	6/10/2009	0.005	0
KMW-2S	3/3/2009	0.005	0
KMW-2S	12/10/2008	0.005	0
KMW-2S	9/8/2008	0.005	0
KMW-2S	6/3/2008	0.005	0
KMW-2S	3/4/2008	0.005	0
LMW-10	11/28/2012	0.02	0
LMW-10	8/27/2012	0.02	0
LMW-10	5/30/2012	0.02	0
LMW-10	3/22/2012	0.02	0

LMW-10	12/6/2011	0.005	0
LMW-10	9/8/2011	0.005	0
LMW-10	6/8/2011	0.005	0
LMW-10	3/2/2011	0.005	0
LMW-10	12/9/2010	0.01	0
LMW-10	9/21/2010	0.005	0
LMW-10	6/9/2010	0.005	0
LMW-10	3/11/2010	0.005	0
LMW-10	12/11/2009	0.005	0
LMW-10	9/18/2009	0.005	0
LMW-10	6/10/2009	0.005	0
LMW-10	3/5/2009	0.005	0
LMW-10	12/12/2008	0.005	0
LMW-10	9/10/2008	0.005	0
LMW-10	6/4/2008	0.005	0
LMW-10	3/5/2008	0.005	0
LMW-11R	11/26/2012	0.02	0
LMW-11R	8/21/2012	0.024	1
LMW-11R	5/29/2012	0.02	0
LMW-11R	3/23/2012	0.0076	1
LMW-7	11/28/2012	0.02	0
LMW-7	8/27/2012	0.02	0
LMW-7	5/31/2012	0.016	1
LMW-7	3/23/2012	0.02	0
LMW-7	12/5/2011	0.005	0
LMW-7	9/6/2011	0.005	0
LMW-7	6/9/2011	0.005	0
LMW-7	3/9/2011	0.005	0
LMW-7	12/10/2010	0.005	0
LMW-7	9/21/2010	0.005	0
LMW-7	6/9/2010	0.005	0
LMW-7	3/11/2010	0.005	0
LMW-7	12/11/2009	0.005	0
LMW-7	9/18/2009	0.005	0
LMW-7	6/10/2009	0.005	0
LMW-7	3/5/2009	0.005	0
LMW-7	12/12/2008	0.005	0
LMW-7	9/10/2008	0.005	0
LMW-7	6/4/2008	0.005	0
LMW-7	3/5/2008	0.005	0
BG-2S	11/26/2012	0.02	0
BG-2S	8/23/2012	0.02	0
BG-2S	5/24/2012	0.014	1
BG-2S	3/21/2012	0.011	1
BG-2M	11/26/2012	0.02	0
BG-2M	8/23/2012	0.02	0
BG-2M	5/24/2012	0.0086	1
BG-2M	3/21/2012	0.0073	1
BG-2D	11/26/2012	0.02	0
BG-2D	8/23/2012	0.02	0
BG-2D	5/24/2012	0.0079	1
BG-2D	3/21/2012	0.02	0

LMW-9	11/28/2012	0.02	0
LMW-9	8/27/2012	0.02	0
LMW-9	5/31/2012	0.0082	1
LMW-9	3/23/2012	0.0052	1
LMW-9	12/5/2011	0.005	0
LMW-9	9/8/2011	0.005	0
LMW-9	6/8/2011	0.005	0
LMW-9	3/9/2011	0.005	0
LMW-9	12/10/2010	0.005	0
LMW-9	9/21/2010	0.005	0
LMW-9	6/9/2010	0.005	0
LMW-9	3/11/2010	0.005	0
LMW-9	12/11/2009	0.005	0
LMW-9	9/18/2009	0.005	0
LMW-9	6/10/2009	0.005	0
LMW-9	3/5/2009	0.005	0
LMW-9	12/12/2008	0.005	0
LMW-9	9/10/2008	0.005	0
LMW-9	6/4/2008	0.005	0
LMW-9	3/5/2008	0.005	0
LMW-11	3/2/2011	0.005	0
LMW-11	9/8/2011	0.005	0
LMW-11	12/6/2011	0.005	0
LMW-11	2/22/2012	0.005	0
LMW-12R	5/30/2012	0.005	0
LMW-12R	8/21/2012	0.005	0
LMW-12R	10/22/2012	0.005	0
LMW-12R	11/30/2012	0.005	0
LMW-13R	5/29/2012	0.005	0
LMW-13R	8/20/2012	0.005	0
LMW-13R	10/22/2012	0.005	0
LMW-13R	11/28/2012	0.005	0
LMW-14R	5/29/2012	0.005	0
LMW-14R	8/20/2012	0.005	0
LMW-14R	10/22/2012	0.005	0
LMW-14R	11/30/2012	0.005	0
LMW-15	5/29/2012	0.005	0
LMW-15	8/20/2012	0.005	0
LMW-15	10/22/2012	0.005	0
LMW-15	11/28/2012	0.005	0
LMW-16	5/29/2012	0.005	0
LMW-16	8/20/2012	0.0075	1
LMW-16	10/22/2012	0.005	0
LMW-16	11/28/2012	0.005	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nitrogen_Ammonia.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Nitrogen, Ammonia

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	19	7	26.92%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	7	0.1	0.1	0.1	0.1	1.499E-17
Statistics (Detects Only)	19	0.09	0.83	0.369	0.37	0.174
Statistics (All: NDs treated as DL value)	26	0.09	0.83	0.297	0.305	0.191
Statistics (All: NDs treated as DL/2 value)	26	0.05	0.83	0.283	0.305	0.207
Statistics (Normal ROS Estimated Data)	26	-0.151	0.83	0.273	0.305	0.224
Statistics (Gamma ROS Estimated Data)	26	0.045	0.83	0.327	0.32	0.171
Statistics (Lognormal ROS Estimated Data)	26	0.0655	0.83	0.3	0.305	0.189

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.194	3.735	0.0881	-1.12	0.55	-0.491
Statistics (NDs = DL)	2.387	2.137	0.124	-1.438	0.71	-0.494
Statistics (NDs = DL/2)	1.519	1.369	0.187	-1.625	0.968	-0.596
Statistics (Gamma ROS Estimates)	3.261	2.91	0.1	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.417	0.699	-0.493

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.972	0.944	0.954	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.954	0.901	Data Appear Normal
Lilliefors (Detects Only)	0.105	0.203	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.888	0.92	Data Not Normal
Lilliefors (NDs = DL)	0.168	0.174	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.905	0.92	Data Not Normal
Lilliefors (NDs = DL/2)	0.14	0.174	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.98	0.92	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0907	0.174	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.978	0.973	0.96	0.775

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.37	0.745	
Kolmogorov-Smirnov (Detects Only)	0.14	0.199	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.137	0.755	
Kolmogorov-Smirnov (NDs = DL)	0.191	0.173	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	1.217	0.761	
Kolmogorov-Smirnov (NDs = DL/2)	0.184	0.174	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.297	0.75	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.129	0.172	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.962	0.944	0.93	0.976

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.932	0.901	Data Appear Lognormal
Lilliefors (Detects Only)	0.176	0.203	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.874	0.92	Data Not Lognormal
Lilliefors (NDs = DL)	0.196	0.174	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.845	0.92	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.206	0.174	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.942	0.92	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.158	0.174	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Nitrogen, Ammonia

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	27	19	41.30%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	19	0.1	0.1	0.1	0.1	2.852E-17
Statistics (Detects Only)	27	0.047	0.14	0.0899	0.091	0.0247
Statistics (All: NDs treated as DL value)	46	0.047	0.14	0.0941	0.1	0.0194
Statistics (All: NDs treated as DL/2 value)	46	0.047	0.14	0.0734	0.063	0.0273
Statistics (Normal ROS Estimated Data)	46	0.0403	0.14	0.0837	0.0818	0.0228
Statistics (Gamma ROS Estimated Data)	46	0.047	0.14	0.0905	0.092	0.019
Statistics (Lognormal ROS Estimated Data)	46	0.047	0.14	0.0833	0.0804	0.0222

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	13.31	12.45	0.00676	-2.447	0.286	-0.117
Statistics (NDs = DL)	21.26	19.88	0.00443	-2.387	0.229	-0.0958
Statistics (NDs = DL/2)	8.204	7.683	0.00895	-2.674	0.349	-0.131
Statistics (Gamma ROS Estimates)	21.96	20.54	0.00412	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.519	0.264	-0.105

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.991	0.95	0.915	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.973	0.923	Data Appear Normal
Lilliefors (Detects Only)	0.107	0.171	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.907	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.252	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.82	0.945	Data Not Normal

Lilliefors (NDs = DL/2)	0.239	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.978	0.945	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0731	0.131	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.989	0.937	0.951	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.243	0.744	
Kolmogorov-Smirnov (Detects Only)	0.0988	0.168	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.834	0.748	
Kolmogorov-Smirnov (NDs = DL)	0.273	0.13	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.032	0.75	
Kolmogorov-Smirnov (NDs = DL/2)	0.255	0.131	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.778	0.748	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.118	0.13	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.99	0.929	0.922	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.972	0.923	Data Appear Lognormal
Lilliefors (Detects Only)	0.0955	0.171	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.868	0.945	Data Not Lognormal
Lilliefors (NDs = DL)	0.28	0.131	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.828	0.945	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.257	0.131	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.982	0.945	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0551	0.131	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Nitrogen, Ammonia

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	9	19	67.86%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	19	0.1	0.1	0.1	0.1	2.852E-17
Statistics (Detects Only)	9	0.049	0.16	0.0911	0.076	0.0417
Statistics (All: NDs treated as DL value)	28	0.049	0.16	0.0971	0.1	0.0231
Statistics (All: NDs treated as DL/2 value)	28	0.049	0.16	0.0632	0.05	0.03
Statistics (Normal ROS Estimated Data)	28	0.00601	0.16	0.0709	0.0657	0.0349
Statistics (Gamma ROS Estimated Data)	28	0.049	0.16	0.0833	0.0761	0.0276
Statistics (Lognormal ROS Estimated Data)	28	0.0324	0.16	0.0717	0.0631	0.0304

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	5.766	5.172	0.0158	-2.485	0.443	-0.178
Statistics (NDs = DL)	17.05	15.25	0.0057	-2.361	0.256	-0.109
Statistics (NDs = DL/2)	7.274	6.519	0.00869	-2.832	0.342	-0.121

Statistics (Gamma ROS Estimates)	10.91	9.764	0.00764	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.709	0.381	-0.141

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.945	0.84	0.715	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.874	0.829	Data Appear Normal
Lilliefors (Detects Only)	0.202	0.295	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.726	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.371	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.52	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.385	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.961	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0853	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.97	0.84	0.807	0.885

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.416	0.723	
Kolmogorov-Smirnov (Detects Only)	0.21	0.28	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	4.275	0.745	
Kolmogorov-Smirnov (NDs = DL)	0.401	0.165	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.897	0.747	
Kolmogorov-Smirnov (NDs = DL/2)	0.4	0.166	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.498	0.745	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.112	0.165	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.969	0.838	0.746	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.915	0.829	Data Appear Lognormal
Lilliefors (Detects Only)	0.192	0.295	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.719	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.412	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.56	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.399	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.978	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0745	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek + Mesa Nitrogen, Ammonia

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	74	0	74	36	38	51.35%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	38	0.1	0.1	0.1	0.1	4.219E-17
Statistics (Detects Only)	36	0.047	0.16	0.0902	0.0865	0.0292
Statistics (All: NDs treated as DL value)	74	0.047	0.16	0.0952	0.1	0.0208
Statistics (All: NDs treated as DL/2 value)	74	0.047	0.16	0.0696	0.05	0.0286
Statistics (Normal ROS Estimated Data)	74	0.0247	0.16	0.0808	0.079	0.0264
Statistics (Gamma ROS Estimated Data)	74	0.047	0.16	0.0902	0.09	0.0202
Statistics (Lognormal ROS Estimated Data)	74	0.0406	0.16	0.0805	0.0764	0.0249

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	9.996	9.599	0.00903	-2.456	0.325	-0.132
Statistics (NDs = DL)	19.35	18.58	0.00492	-2.377	0.238	-0.1
Statistics (NDs = DL/2)	7.53	7.234	0.00924	-2.733	0.353	-0.129
Statistics (Gamma ROS Estimates)	20.37	19.56	0.00443	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.564	0.297	-0.116

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.982	0.918	0.861	0.988

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.953	0.935	Data Appear Normal
Lilliefors (Detects Only)	0.111	0.148	Data Appear Normal
Lilliefors (NDs = DL)	0.293	0.103	Data Not Normal
Lilliefors (NDs = DL/2)	0.294	0.103	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0626	0.103	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.993	0.911	0.923	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.277	0.748	
Kolmogorov-Smirnov (Detects Only)	0.0795	0.147	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	6.619	0.75	
Kolmogorov-Smirnov (NDs = DL)	0.317	0.103	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.761	0.752	
Kolmogorov-Smirnov (NDs = DL/2)	0.309	0.104	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.732	0.75	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.278	0.103	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.993	0.904	0.879	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.97	0.935	Data Appear Lognormal
Lilliefors (Detects Only)	0.0874	0.148	Data Appear Lognormal
Lilliefors (NDs = DL)	0.326	0.103	Data Not Lognormal

Lilliefors (NDs = DL/2)	0.312	0.103	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0404	0.103	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nitrogen_Ammonia.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Nitrogen, Ammonia

General Statistics

Number of Valid Data	26	Number of Detected Data	19
Number of Distinct Detected Data	19	Number of Non-Detect Data	7
		Percent Non-Detects	26.92%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.09	Minimum Detected	-2.408
Maximum Detected	0.83	Maximum Detected	-0.186
Mean of Detected	0.369	Mean of Detected	-1.12
SD of Detected	0.174	SD of Detected	0.55
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.954	Shapiro Wilk Test Statistic	0.932
5% Shapiro Wilk Critical Value	0.901	5% Shapiro Wilk Critical Value	0.901
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.283	Mean (Log Scale)	-1.625
SD	0.207	SD (Log Scale)	0.968
95% UTL 95% Coverage	0.753	95% UTL 95% Coverage	1.783
95% UPL (t)	0.643	95% UPL (t)	1.063
90% Percentile (z)	0.548	90% Percentile (z)	0.681
95% Percentile (z)	0.623	95% Percentile (z)	0.969
99% Percentile (z)	0.764	99% Percentile (z)	1.874
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.249	Mean in Original Scale	0.3
SD	0.254	SD in Original Scale	0.189
95% UTL with 95% Coverage	0.826	95% UTL with 95% Coverage	1.189
		95% BCA UTL with 95% Coverage	0.83
		95% Bootstrap (%) UTL with 95% Coverage	0.83
95% UPL (t)	0.691	95% UPL (t)	0.819
90% Percentile (z)	0.574	90% Percentile (z)	0.594
95% Percentile (z)	0.667	95% Percentile (z)	0.766
99% Percentile (z)	0.839	99% Percentile (z)	1.233

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.567	Data appear Normal at 5% Significance Level	
Theta Star	0.104		
nu star	135.5		
A-D Test Statistic	0.37	Nonparametric Statistics	
5% A-D Critical Value	0.745	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.14	Mean	0.294
5% K-S Critical Value	0.199	SD	0.191
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0384
		95% KM UTL with 95% Coverage	0.728
Assuming Gamma Distribution		95% KM Chebyshev UPL	1.141
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.626
Mean	0.327	90% Percentile (z)	0.538
Median	0.32	95% Percentile (z)	0.608
SD	0.171	99% Percentile (z)	0.738
k star	2.91		
Theta star	0.112	Gamma ROS Limits with Extrapolated Data	
Nu star	151.3	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.707
95% Percentile of Chisquare (2k)	12.32	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.73
		95% WH Approx. Gamma UTL with 95% Coverage	0.884
90% Percentile	0.584	95% HW Approx. Gamma UTL with 95% Coverage	0.932
95% Percentile	0.692		
99% Percentile	0.927		

Note: DL/2 is not a recommended method.

Muddy Creek Nitrogen, Ammonia

General Statistics			
Number of Valid Data	46	Number of Detected Data	27
Number of Distinct Detected Data	19	Number of Non-Detect Data	19
		Percent Non-Detects	41.30%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.047	Minimum Detected	-3.058
Maximum Detected	0.14	Maximum Detected	-1.966
Mean of Detected	0.0899	Mean of Detected	-2.447
SD of Detected	0.0247	SD of Detected	0.286
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.973	Shapiro Wilk Test Statistic	0.972
5% Shapiro Wilk Critical Value	0.923	5% Shapiro Wilk Critical Value	0.923
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0734	Mean (Log Scale)	-2.674

SD	0.0273	SD (Log Scale)	0.349
95% UTL 95% Coverage	0.13	95% UTL 95% Coverage	0.143
95% UPL (t)	0.12	95% UPL (t)	0.125
90% Percentile (z)	0.108	90% Percentile (z)	0.108
95% Percentile (z)	0.118	95% Percentile (z)	0.123
99% Percentile (z)	0.137	99% Percentile (z)	0.155
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.079	Mean in Original Scale	0.0833
SD	0.0271	SD in Original Scale	0.0222
95% UTL with 95% Coverage	0.135	95% UTL with 95% Coverage	0.139
		95% BCA UTL with 95% Coverage	0.12
		95% Bootstrap (%) UTL with 95% Coverage	0.135
95% UPL (t)	0.125	95% UPL (t)	0.126
90% Percentile (z)	0.114	90% Percentile (z)	0.113
95% Percentile (z)	0.124	95% Percentile (z)	0.124
99% Percentile (z)	0.142	99% Percentile (z)	0.149
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	11.85	Data appear Normal at 5% Significance Level	
Theta Star	0.00759		
nu star	640		
A-D Test Statistic	0.243	Nonparametric Statistics	
5% A-D Critical Value	0.744	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.0988	Mean	0.0836
5% K-S Critical Value	0.168	SD	0.0221
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0039
		95% KM UTL with 95% Coverage	0.13
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.181
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.121
Mean	0.0905	90% Percentile (z)	0.112
Median	0.092	95% Percentile (z)	0.12
SD	0.019	99% Percentile (z)	0.135
k star	20.54		
Theta star	0.0044	Gamma ROS Limits with Extrapolated Data	
Nu star	1890	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.126
95% Percentile of Chisquare (2k)	57.04	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.127
		95% WH Approx. Gamma UTL with 95% Coverage	0.136
90% Percentile	0.117	95% HW Approx. Gamma UTL with 95% Coverage	0.137
95% Percentile	0.126		
99% Percentile	0.143		

Note: DL/2 is not a recommended method.

Mesa Nitrogen, Ammonia

General Statistics

Number of Valid Data	28	Number of Detected Data	9
Number of Distinct Detected Data	9	Number of Non-Detect Data	19
		Percent Non-Detects	67.86%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.049	Minimum Detected	-3.016
Maximum Detected	0.16	Maximum Detected	-1.833
Mean of Detected	0.0911	Mean of Detected	-2.485
SD of Detected	0.0417	SD of Detected	0.443
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.874	Shapiro Wilk Test Statistic	0.915
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0632	Mean (Log Scale)	-2.832
SD	0.03	SD (Log Scale)	0.342
95% UTL 95% Coverage	0.131	95% UTL 95% Coverage	0.127
95% UPL (t)	0.115	95% UPL (t)	0.107
90% Percentile (z)	0.102	90% Percentile (z)	0.0914
95% Percentile (z)	0.112	95% Percentile (z)	0.103
99% Percentile (z)	0.133	99% Percentile (z)	0.131
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0376	Mean in Original Scale	0.0717
SD	0.0585	SD in Original Scale	0.0304
95% UTL with 95% Coverage	0.169	95% UTL with 95% Coverage	0.157
		95% BCA UTL with 95% Coverage	0.16
		95% Bootstrap (%) UTL with 95% Coverage	0.16
95% UPL (t)	0.139	95% UPL (t)	0.129
90% Percentile (z)	0.113	90% Percentile (z)	0.109
95% Percentile (z)	0.134	95% Percentile (z)	0.125
99% Percentile (z)	0.174	99% Percentile (z)	0.162
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.918	Data appear Normal at 5% Significance Level	
Theta Star	0.0233		
nu star	70.52		
A-D Test Statistic	0.416	Nonparametric Statistics	
5% A-D Critical Value	0.723	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.21	Mean	0.07
5% K-S Critical Value	0.28	SD	0.0277
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00648

		95% KM UTL with 95% Coverage	0.132
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.193
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.118
Mean	0.0833	90% Percentile (z)	0.105
Median	0.0761	95% Percentile (z)	0.116
SD	0.0276	99% Percentile (z)	0.134
k star	9.764		
Theta star	0.00853	Gamma ROS Limits with Extrapolated Data	
Nu star	546.8	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.133
95% Percentile of Chisquare (2k)	30.81	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.133
		95% WH Approx. Gamma UTL with 95% Coverage	0.151
90% Percentile	0.119	95% HW Approx. Gamma UTL with 95% Coverage	0.153
95% Percentile	0.131		
99% Percentile	0.158		

Note: DL/2 is not a recommended method.

Muddy Creek + Mesa Nitrogen, Ammonia

General Statistics			
Number of Valid Data	74	Number of Detected Data	36
Number of Distinct Detected Data	25	Number of Non-Detect Data	38
		Percent Non-Detects	51.35%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.047	Minimum Detected	-3.058
Maximum Detected	0.16	Maximum Detected	-1.833
Mean of Detected	0.0902	Mean of Detected	-2.456
SD of Detected	0.0292	SD of Detected	0.325
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.953	Shapiro Wilk Test Statistic	0.97
5% Shapiro Wilk Critical Value	0.935	5% Shapiro Wilk Critical Value	0.935
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0696	Mean (Log Scale)	-2.733
SD	0.0286	SD (Log Scale)	0.353
95% UTL 95% Coverage	0.126	95% UTL 95% Coverage	0.13
95% UPL (t)	0.118	95% UPL (t)	0.117
90% Percentile (z)	0.106	90% Percentile (z)	0.102
95% Percentile (z)	0.117	95% Percentile (z)	0.116
99% Percentile (z)	0.136	99% Percentile (z)	0.148
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.067	Mean in Original Scale	0.0805
SD	0.0373	SD in Original Scale	0.0249

95% UTL with 95% Coverage	0.141	95% UTL with 95% Coverage	0.138
		95% BCA UTL with 95% Coverage	0.144
		95% Bootstrap (%) UTL with 95% Coverage	0.147
95% UPL (t)	0.129	95% UPL (t)	0.127
90% Percentile (z)	0.115	90% Percentile (z)	0.113
95% Percentile (z)	0.128	95% Percentile (z)	0.125
99% Percentile (z)	0.154	99% Percentile (z)	0.154
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	9.181	Data appear Normal at 5% Significance Level	
Theta Star	0.00983		
nu star	661		
A-D Test Statistic	0.277	Nonparametric Statistics	
5% A-D Critical Value	0.748	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.0795	Mean	0.0805
5% K-S Critical Value	0.147	SD	0.0246
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00357
		95% KM UTL with 95% Coverage	0.129
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.188
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.122
Mean	0.0902	90% Percentile (z)	0.112
Median	0.09	95% Percentile (z)	0.121
SD	0.0202	99% Percentile (z)	0.138
k star	19.56		
Theta star	0.00461	Gamma ROS Limits with Extrapolated Data	
Nu star	2894	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.126
95% Percentile of Chisquare (2k)	54.71	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.127
		95% WH Approx. Gamma UTL with 95% Coverage	0.134
90% Percentile	0.117	95% HW Approx. Gamma UTL with 95% Coverage	0.135
95% Percentile	0.126		
99% Percentile	0.144		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nitrogen_Ammonia.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Nitrogen, Ammonia

Background Data: Alluv Nitrogen, Ammonia

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	19	7
Number of Detect Data	9	19
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	0.1	0.1
Percent Non detects	67.86%	26.92%
Minimum Detected	0.049	0.09
Maximum Detected	0.16	0.83
Mean of Detected Data	0.0911	0.369
Median of Detected Data	0.076	0.37
SD of Detected Data	0.0417	0.174

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-4.597
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	4.2942E-6

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nitrogen_Ammonia.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Nitrogen, Ammonia

Background Data: Alluv Nitrogen, Ammonia

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	19	7
Number of Detect Data	27	19
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	0.1	0.1
Percent Non detects	41.30%	26.92%
Minimum Detected	0.047	0.09
Maximum Detected	0.14	0.83
Mean of Detected Data	0.0899	0.369
Median of Detected Data	0.091	0.37
SD of Detected Data	0.0247	0.174

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-4.974
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	6.5520E-7

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nitrogen_Ammonia.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Nitrogen, Ammonia

Background Data: Muddy Creek Nitrogen, Ammonia

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	19	19
Number of Detect Data	9	27
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	0.1	0.1
Percent Non detects	67.86%	41.30%
Minimum Detected	0.049	0.047
Maximum Detected	0.16	0.14
Mean of Detected Data	0.0911	0.0899
Median of Detected Data	0.076	0.091
SD of Detected Data	0.0417	0.0247

Site vs Background Gehan Test

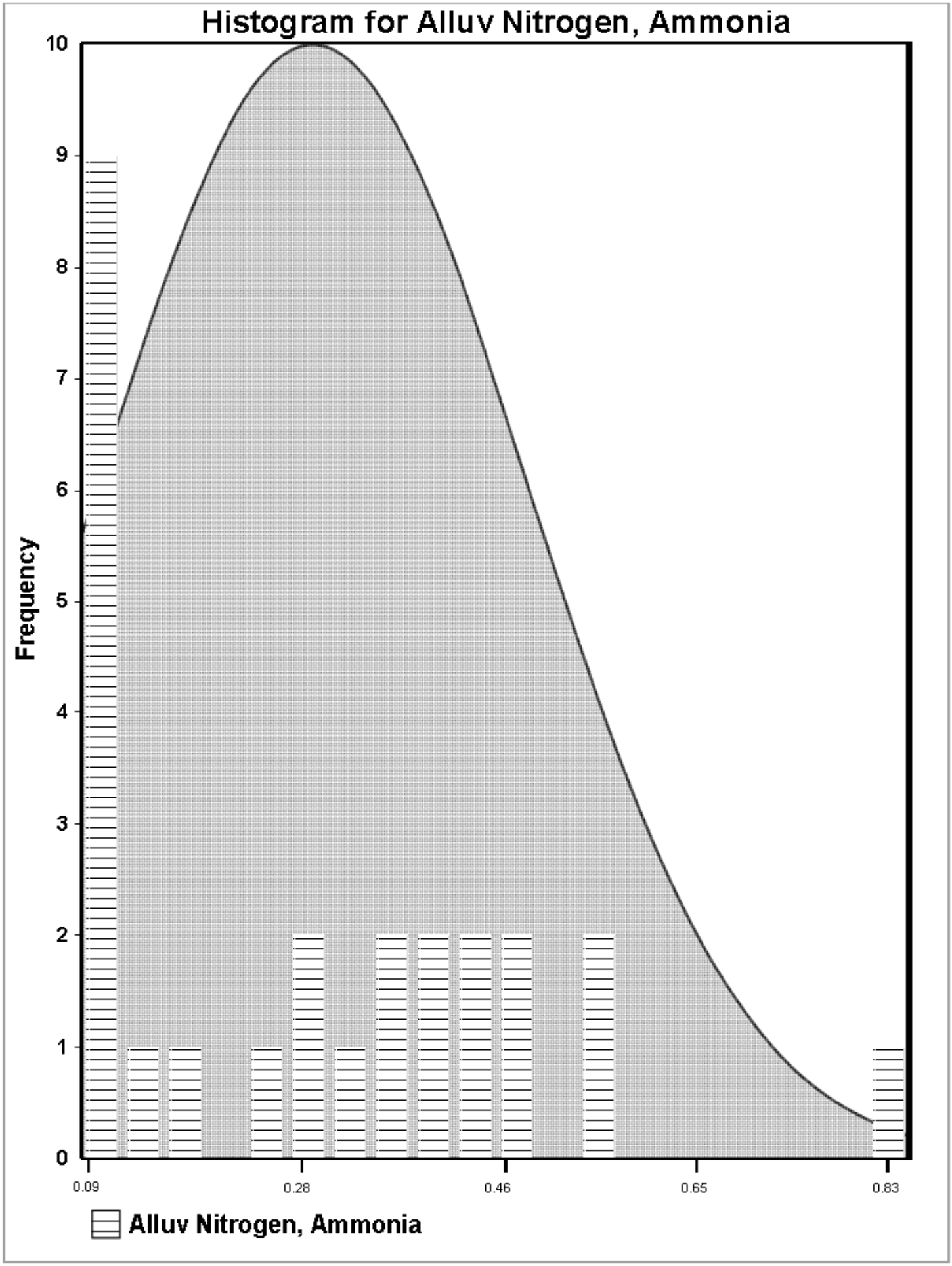
H0: Mu of Site or AOC = Mu of background

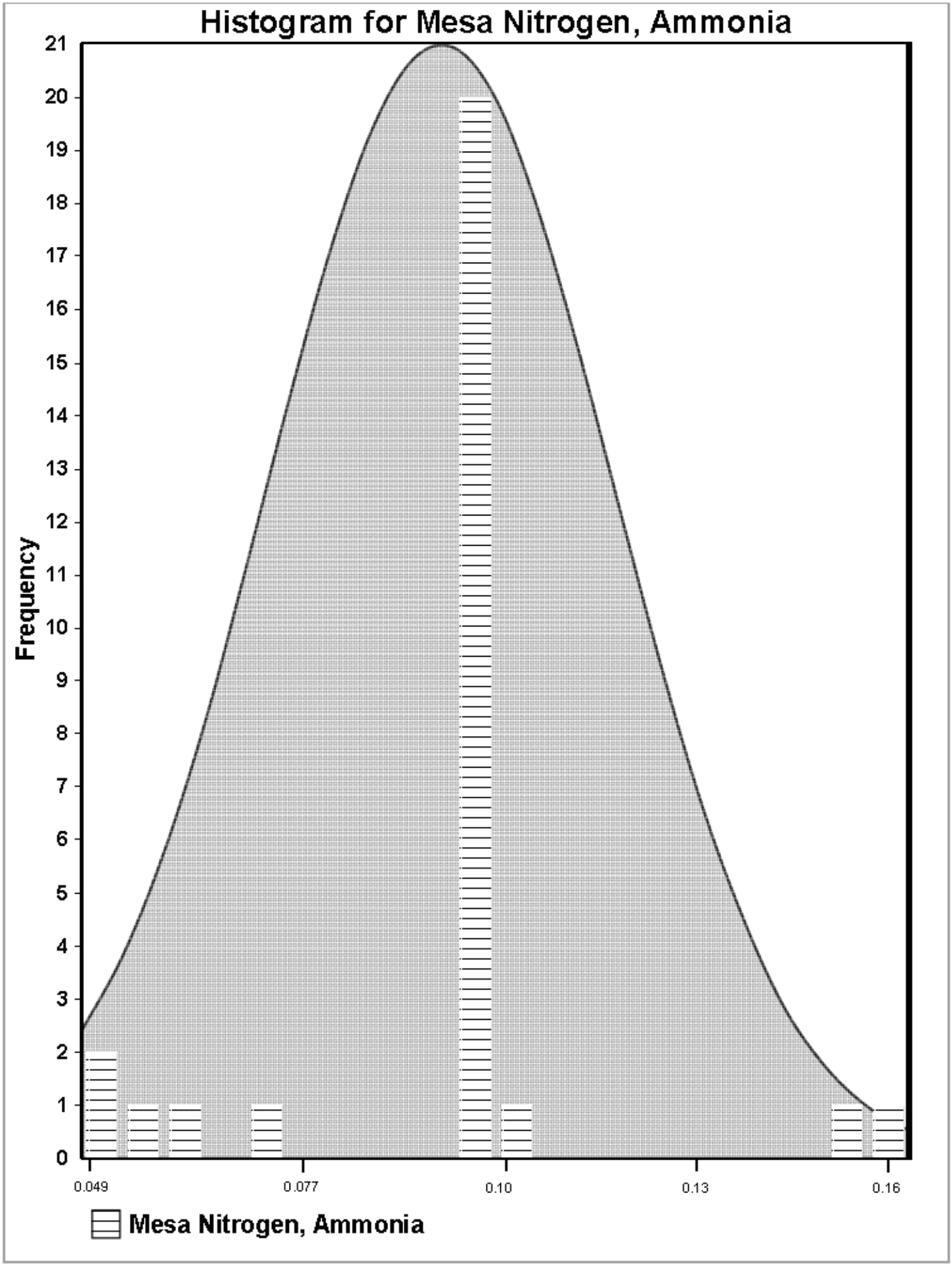
Gehan z Test Value	-1.119
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.263

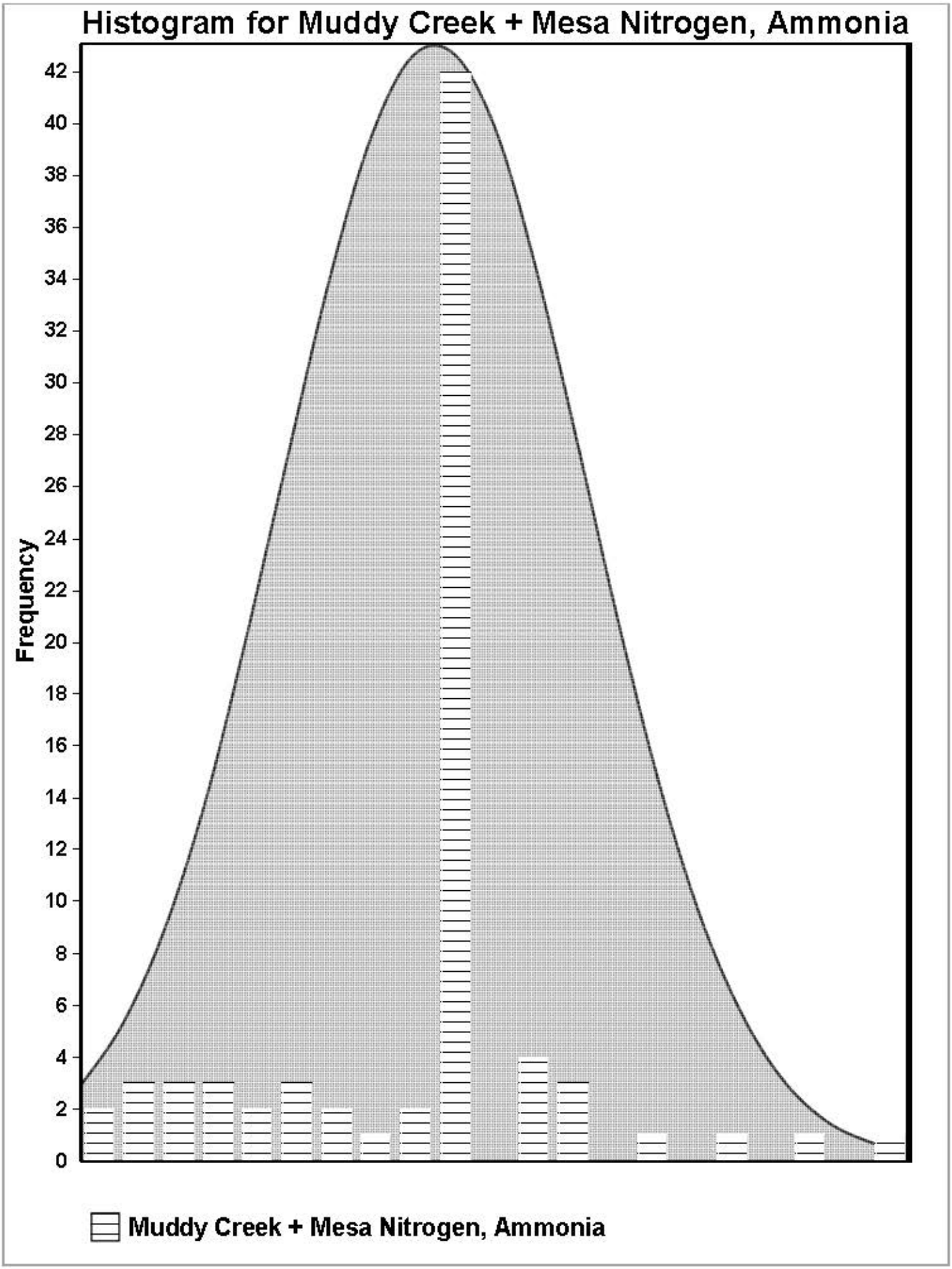
Conclusion with Alpha = 0.05

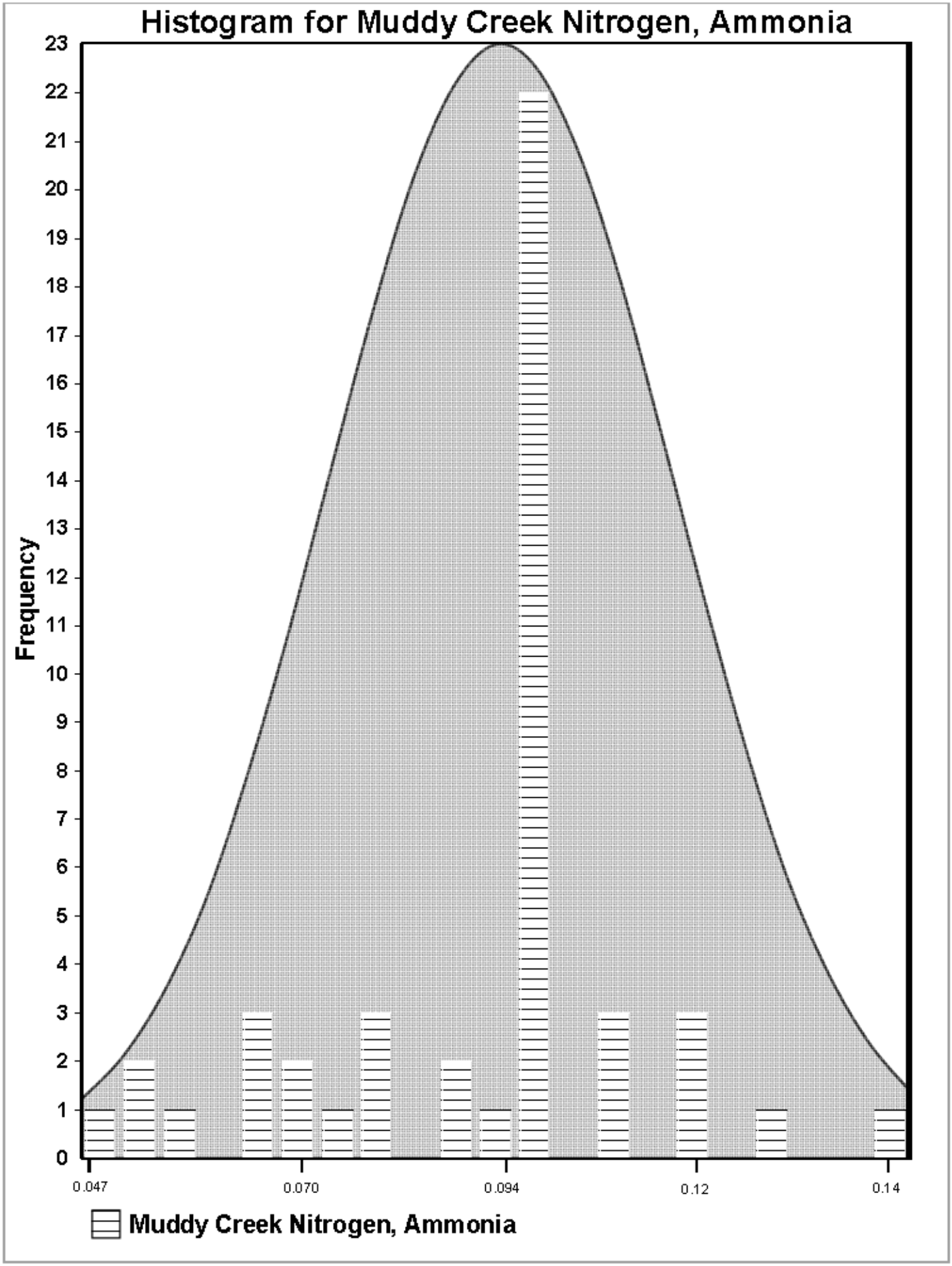
Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv Nitrogen, Ammonia
Frequency
10
9
8
7
6
5
4
3
2
1
0
0.09
0.28
0.46
0.65
0.83
Alluv Nitrogen, Ammonia


Histogram for Mesa Nitrogen, Ammonia
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
0.049
0.077
0.10
0.13
0.16
Mesa Nitrogen, Ammonia


Histogram for Muddy Creek + Mesa Nitrogen, Ammonia
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
Muddy Creek + Mesa Nitrogen, Ammonia


Histogram for Muddy Creek Nitrogen, Ammonia
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
0.047
0.070
0.094
0.12
0.14
Muddy Creek Nitrogen, Ammonia

Outlier Tests for Selected Variables

User Selected Options	
From File	Nitrogen_Ammonia.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Nitrogen, Ammonia

Mean	0.283
Standard Deviation	0.207
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.283	0.203	0.83	25	2.698	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Nitrogen, Ammonia

Mean	0.0734
Standard Deviation	0.0273
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0734	0.027	0.14	7	2.462	3.09	3.45

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Nitrogen, Ammonia

Mean	0.0632
Standard Deviation	0.03
Number of data	28
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0632	0.0294	0.16	2	3.289	2.88	3.2

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.16 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.16 is a Potential Statistical Outlier

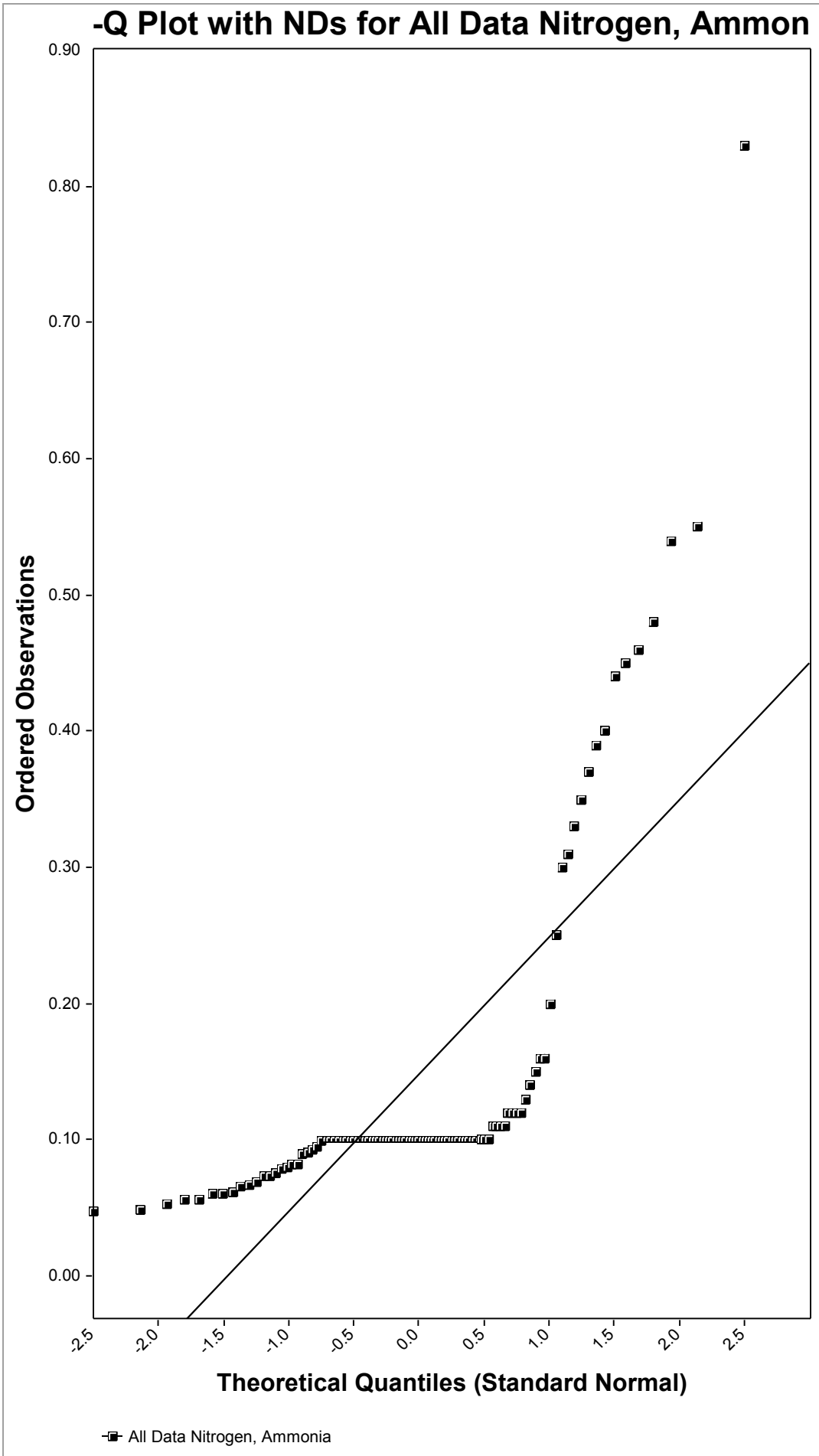
Rosner's Outlier Test for Muddy Creek + Mesa Nitrogen, Ammonia

Mean	0.0696
Standard Deviation	0.0286
Number of data	74
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0696	0.0284	0.16	48	3.184	3.28	3.64

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier



All Data Nitrogen, Ammonia

Total Number of Data = 100

Number of Non-Detects = 45

Number of Detects = 55

Mean = 0.1477

Sd = 0.1322

Slope = 0.1008

Intercept = 0.1477

Correlation, R = 0.7545

Location Name	Sample Date	Alluv Nitrogen, Ammonia	D_Alluv Nitrogen, Ammonia
BG-1S	11/26/2012	0.1	0
BG-1S	8/23/2012	0.12	1
BG-1S	5/24/2012	0.09	1
BG-1S	3/20/2012	0.1	0
IMW-2.5D	11/26/2012	0.35	1
IMW-2.5D	8/24/2012	0.46	1
IMW-2.5D	5/21/2012	0.54	1
IMW-2.5D	3/21/2012	0.3	1
IMW-2.5S	11/26/2012	0.2	1
IMW-2.5S	8/24/2012	0.45	1
IMW-2.5S	5/21/2012	0.39	1
IMW-2.5S	3/21/2012	0.16	1
IMW-3S	5/21/2012	0.1	0
IMW-3S	3/20/2012	0.1	0
KMW-2D	11/26/2012	0.25	1
KMW-2D	8/24/2012	0.44	1
KMW-2D	5/21/2012	0.31	1
KMW-2D	3/23/2012	0.1	0
KMW-2M	11/26/2012	0.33	1
KMW-2M	8/24/2012	0.48	1
KMW-2M	5/21/2012	0.37	1
KMW-2M	3/23/2012	0.1	0
KMW-2S	11/26/2012	0.4	1
KMW-2S	8/24/2012	0.55	1
KMW-2S	5/21/2012	0.83	1
KMW-2S	3/23/2012	0.1	0

Location Name	Sample Date	Muddy Creek Nitrogen, Ammonia	D_Muddy Creek Nitrogen, Ammonia
BG-3S	11/27/2012	0.1	0
BG-3S	8/22/2012	0.056	1
BG-3S	5/23/2012	0.047	1
BG-3S	3/21/2012	0.1	0
BG-4S	11/27/2012	0.1	0
BG-4S	8/30/2012	0.067	1
BG-4S	5/30/2012	0.14	1
BG-4S	3/20/2012	0.1	0
BG-6S	11/27/2012	0.066	1
BG-6S	8/23/2012	0.12	1
BG-6S	5/25/2012	0.1	0
BG-6S	3/21/2012	0.1	0
BG-1M	11/26/2012	0.1	0
BG-1M	8/23/2012	0.11	1
BG-1M	5/24/2012	0.069	1
BG-1M	3/20/2012	0.1	0
BG-3M	11/27/2012	0.079	1
BG-3M	8/22/2012	0.11	1
BG-3M	5/24/2012	0.073	1
BG-3M	3/21/2012	0.1	0
BG-4M	11/27/2012	0.1	0
BG-4M	8/30/2012	0.091	1
BG-4M	5/30/2012	0.082	1
BG-4M	3/20/2012	0.1	0
BG-6M	11/27/2012	0.056	1
BG-6M	8/22/2012	0.099	1
BG-6M	5/25/2012	0.095	1
BG-6M	3/21/2012	0.1	0
BG-1D	11/26/2012	0.1	0
BG-1D	8/23/2012	0.13	1
BG-1D	5/24/2012	0.1	1
BG-1D	3/20/2012	0.1	0
BG-3D	11/27/2012	0.1	0
BG-3D	8/21/2012	0.093	1
BG-3D	5/23/2012	0.073	1
BG-3D	3/21/2012	0.1	0
BG-4D	11/27/2012	0.12	1
BG-4D	8/30/2012	0.11	1
BG-4D	5/30/2012	0.1	1
BG-4D	3/20/2012	0.1	0
BG-6D	11/27/2012	0.1	0
BG-6D	8/22/2012	0.12	1
BG-6D	5/25/2012	0.06	1
BG-6D	3/21/2012	0.1	0
IMW-3D	5/25/2012	0.08	1
IMW-3D	3/22/2012	0.082	1

Location Name	Sample Date	Mesa Nitrogen, Ammonia	D_Mesa Nitrogen, Ammonia
BG-2S	11/26/2012	0.1	0
BG-2S	8/23/2012	0.16	1
BG-2S	5/24/2012	0.049	1
BG-2S	3/21/2012	0.1	0
BG-2M	11/26/2012	0.1	0
BG-2M	8/23/2012	0.11	1
BG-2M	5/24/2012	0.076	1
BG-2M	3/21/2012	0.1	0
BG-2D	11/26/2012	0.1	0
BG-2D	8/23/2012	0.1	1
BG-2D	5/24/2012	0.1	0
BG-2D	3/21/2012	0.1	0
LMW-10	11/28/2012	0.1	0
LMW-10	8/27/2012	0.062	1
LMW-10	5/30/2012	0.06	1
LMW-10	3/22/2012	0.1	0
LMW-11R	11/26/2012	0.1	0
LMW-11R	8/21/2012	0.053	1
LMW-11R	5/29/2012	0.15	1
LMW-11R	3/23/2012	0.1	0
LMW-7	11/28/2012	0.1	0
LMW-7	8/27/2012	0.1	0
LMW-7	5/31/2012	0.1	0
LMW-7	3/23/2012	0.1	0
LMW-9	11/28/2012	0.1	0
LMW-9	8/27/2012	0.1	0
LMW-9	5/31/2012	0.1	0
LMW-9	3/23/2012	0.1	0

Location Name	Sample Date	All Data Nitrogen, Ammonia	D_All Data Nitrogen, Ammonia
BG-1S	11/26/2012	0.1	0
BG-1S	8/23/2012	0.12	1
BG-1S	5/24/2012	0.09	1
BG-1S	3/20/2012	0.1	0
IMW-2.5D	11/26/2012	0.35	1
IMW-2.5D	8/24/2012	0.46	1
IMW-2.5D	5/21/2012	0.54	1
IMW-2.5D	3/21/2012	0.3	1
IMW-2.5S	11/26/2012	0.2	1
IMW-2.5S	8/24/2012	0.45	1
IMW-2.5S	5/21/2012	0.39	1
IMW-2.5S	3/21/2012	0.16	1
IMW-3S	5/21/2012	0.1	0
IMW-3S	3/20/2012	0.1	0
KMW-2D	11/26/2012	0.25	1
KMW-2D	8/24/2012	0.44	1
KMW-2D	5/21/2012	0.31	1
KMW-2D	3/23/2012	0.1	0
KMW-2M	11/26/2012	0.33	1
KMW-2M	8/24/2012	0.48	1
KMW-2M	5/21/2012	0.37	1
KMW-2M	3/23/2012	0.1	0
KMW-2S	11/26/2012	0.4	1
KMW-2S	8/24/2012	0.55	1
KMW-2S	5/21/2012	0.83	1
KMW-2S	3/23/2012	0.1	0
BG-3S	11/27/2012	0.1	0
BG-3S	8/22/2012	0.056	1
BG-3S	5/23/2012	0.047	1
BG-3S	3/21/2012	0.1	0
BG-4S	11/27/2012	0.1	0
BG-4S	8/30/2012	0.067	1
BG-4S	5/30/2012	0.14	1
BG-4S	3/20/2012	0.1	0
BG-6S	11/27/2012	0.066	1
BG-6S	8/23/2012	0.12	1
BG-6S	5/25/2012	0.1	0
BG-6S	3/21/2012	0.1	0
BG-1M	11/26/2012	0.1	0
BG-1M	8/23/2012	0.11	1
BG-1M	5/24/2012	0.069	1
BG-1M	3/20/2012	0.1	0
BG-3M	11/27/2012	0.079	1
BG-3M	8/22/2012	0.11	1
BG-3M	5/24/2012	0.073	1
BG-3M	3/21/2012	0.1	0
BG-4M	11/27/2012	0.1	0
BG-4M	8/30/2012	0.091	1
BG-4M	5/30/2012	0.082	1
BG-4M	3/20/2012	0.1	0
BG-6M	11/27/2012	0.056	1
BG-6M	8/22/2012	0.099	1
BG-6M	5/25/2012	0.095	1
BG-6M	3/21/2012	0.1	0
BG-1D	11/26/2012	0.1	0
BG-1D	8/23/2012	0.13	1
BG-1D	5/24/2012	0.1	1
BG-1D	3/20/2012	0.1	0
BG-3D	11/27/2012	0.1	0
BG-3D	8/21/2012	0.093	1
BG-3D	5/23/2012	0.073	1
BG-3D	3/21/2012	0.1	0
BG-4D	11/27/2012	0.12	1
BG-4D	8/30/2012	0.11	1
BG-4D	5/30/2012	0.1	1
BG-4D	3/20/2012	0.1	0
BG-6D	11/27/2012	0.1	0
BG-6D	8/22/2012	0.12	1
BG-6D	5/25/2012	0.06	1
BG-6D	3/21/2012	0.1	0
IMW-3D	5/25/2012	0.08	1
IMW-3D	3/22/2012	0.082	1
BG-2S	11/26/2012	0.1	0
BG-2S	8/23/2012	0.16	1
BG-2S	5/24/2012	0.049	1
BG-2S	3/21/2012	0.1	0
BG-2M	11/26/2012	0.1	0
BG-2M	8/23/2012	0.11	1
BG-2M	5/24/2012	0.076	1
BG-2M	3/21/2012	0.1	0
BG-2D	11/26/2012	0.1	0
BG-2D	8/23/2012	0.1	1
BG-2D	5/24/2012	0.1	0
BG-2D	3/21/2012	0.1	0
LMW-10	11/28/2012	0.1	0
LMW-10	8/27/2012	0.062	1
LMW-10	5/30/2012	0.06	1
LMW-10	3/22/2012	0.1	0
LMW-11R	11/26/2012	0.1	0
LMW-11R	8/21/2012	0.053	1
LMW-11R	5/29/2012	0.15	1
LMW-11R	3/23/2012	0.1	0
LMW-7	11/28/2012	0.1	0
LMW-7	8/27/2012	0.1	0
LMW-7	5/31/2012	0.1	0
LMW-7	3/23/2012	0.1	0
LMW-9	11/28/2012	0.1	0
LMW-9	8/27/2012	0.1	0
LMW-9	5/31/2012	0.1	0
LMW-9	3/23/2012	0.1	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nitrogen_Nitrate.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Nitrogen, Nitrate

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	87	0	87	43	44	50.57%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	44	0.1	2	0.323	0.1	0.451
Statistics (Detects Only)	43	0.027	78	2.225	0.36	11.83
Statistics (All: NDs treated as DL value)	87	0.027	78	1.263	0.27	8.331
Statistics (All: NDs treated as DL/2 value)	87	0.027	78	1.181	0.25	8.336
Statistics (Normal ROS Estimated Data)	87	-20.48	78	-3.188	0.11	10.47
Statistics (Gamma ROS Estimated Data)	87	1.000E-12	78	2.719	0.35	9.543
Statistics (Lognormal ROS Estimated Data)	87	0.00638	78	1.141	0.14	8.34

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.38	0.375	5.854	-0.945	1.082	-1.144
Statistics (NDs = DL)	0.418	0.412	3.018	-1.328	1.082	-0.815
Statistics (NDs = DL/2)	0.362	0.358	3.26	-1.678	1.248	-0.744
Statistics (Gamma ROS Estimates)	0.0929	0.0974	29.26	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.925	1.386	-0.72

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.368	0.305	0.297	0.706

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.17	0.943	Data Not Normal
Lilliefors (Detects Only)	0.498	0.135	Data Not Normal
Lilliefors (NDs = DL)	0.467	0.095	Data Not Normal
Lilliefors (NDs = DL/2)	0.486	0.095	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.308	0.095	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.676	0.581	0.588	0.795

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	10.16	0.841	
Kolmogorov-Smirnov (Detects Only)	0.421	0.145	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	14.74	0.838	
Kolmogorov-Smirnov (NDs = DL)	0.321	0.102	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	14.04	0.852	
Kolmogorov-Smirnov (NDs = DL/2)	0.32	0.103	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.6	1.155	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.336	0.114	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.849	0.905	0.914	0.964

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.776	0.943	Data Not Lognormal
Lilliefors (Detects Only)	0.196	0.135	Data Not Lognormal
Lilliefors (NDs = DL)	0.173	0.095	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.211	0.095	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0807	0.095	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Nitrogen, Nitrate

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	53	0	53	21	32	60.38%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	32	0.1	1	0.128	0.1	0.159
Statistics (Detects Only)	21	0.052	0.51	0.237	0.25	0.137
Statistics (All: NDs treated as DL value)	53	0.052	1	0.171	0.1	0.159
Statistics (All: NDs treated as DL/2 value)	53	0.05	0.51	0.133	0.05	0.135
Statistics (Normal ROS Estimated Data)	53	-0.192	0.51	0.123	0.11	0.148
Statistics (Gamma ROS Estimated Data)	53	0.052	0.51	0.25	0.26	0.0898
Statistics (Lognormal ROS Estimated Data)	53	0.0177	0.51	0.14	0.099	0.119

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.493	2.364	0.095	-1.654	0.732	-0.443
Statistics (NDs = DL)	2.26	2.144	0.0758	-2.002	0.621	-0.31
Statistics (NDs = DL/2)	1.394	1.328	0.0951	-2.421	0.836	-0.345
Statistics (Gamma ROS Estimates)	5.632	5.326	0.0444	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.286	0.81	-0.355

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.981	0.756	0.82	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.95	0.908	Data Appear Normal
Lilliefors (Detects Only)	0.116	0.193	Data Appear Normal
Lilliefors (NDs = DL)	0.352	0.122	Data Not Normal
Lilliefors (NDs = DL/2)	0.356	0.122	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0865	0.122	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.966	0.894	0.941	0.813

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.554	0.752	
Kolmogorov-Smirnov (Detects Only)	0.164	0.191	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	6.629	0.761	
Kolmogorov-Smirnov (NDs = DL)	0.374	0.123	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.848	0.77	
Kolmogorov-Smirnov (NDs = DL/2)	0.364	0.125	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.029	0.753	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.194	0.122	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.958	0.879	0.836	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.903	0.908	Data Not Lognormal
Lilliefors (Detects Only)	0.195	0.193	Data Not Lognormal
Lilliefors (NDs = DL)	0.365	0.122	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.355	0.122	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0817	0.122	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Nitrogen, Nitrate

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	74	26	26.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	26	0.1	5	0.788	0.1	1.562
Statistics (Detects Only)	74	0.06	10.9	5.267	5.1	2.766
Statistics (All: NDs treated as DL value)	100	0.06	10.9	4.103	4.7	3.187
Statistics (All: NDs treated as DL/2 value)	100	0.05	10.9	4	4.6	3.227
Statistics (Normal ROS Estimated Data)	100	-4.143	10.9	3.77	4.6	3.574
Statistics (Gamma ROS Estimated Data)	100	1.000E-12	10.9	4.595	4.65	2.736
Statistics (Lognormal ROS Estimated Data)	100	0.06	10.9	4.141	4.6	3.055

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.174	2.116	2.422	1.414	0.9	0.637
Statistics (NDs = DL)	0.824	0.806	4.98	0.694	1.59	2.29
Statistics (NDs = DL/2)	0.694	0.679	5.768	0.514	1.835	3.571
Statistics (Gamma ROS Estimates)	1.058	1.033	4.342	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.006	1.062	1.057

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.973	0.954	0.955	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.157	0.103	Data Not Normal
Lilliefors (NDs = DL)	0.151	0.0886	Data Not Normal
Lilliefors (NDs = DL/2)	0.141	0.0886	Data Not Normal

Lilliefors (Normal ROS Estimates)	0.12	0.0886	Data Not Normal	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.931	0.886	0.877	0.619

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	3.486	0.762	
Kolmogorov-Smirnov (Detects Only)	0.234	0.105	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	5.839	0.791	
Kolmogorov-Smirnov (NDs = DL)	0.253	0.0927	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.883	0.8	
Kolmogorov-Smirnov (NDs = DL/2)	0.242	0.0933	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	6.089	0.781	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.195	0.092	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.873	0.899	0.891	0.946

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.279	0.103	Data Not Lognormal
Lilliefors (NDs = DL)	0.279	0.0886	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.262	0.0886	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.227	0.0886	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nitrogen_Nitrate.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Nitrogen, Nitrate

General Statistics

Number of Valid Data	87	Number of Detected Data	43
Number of Distinct Detected Data	34	Number of Non-Detect Data	44
		Percent Non-Detects	50.57%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.027	Minimum Detected	-3.612
Maximum Detected	78	Maximum Detected	4.357
Mean of Detected	2.225	Mean of Detected	-0.945
SD of Detected	11.83	SD of Detected	1.082
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	2	Maximum Non-Detect	0.693

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	86
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	98.85%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.17	Shapiro Wilk Test Statistic	0.776
5% Shapiro Wilk Critical Value	0.943	5% Shapiro Wilk Critical Value	0.943
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.181	Mean (Log Scale)	-1.678
SD	8.336	SD (Log Scale)	1.248
95% UTL 95% Coverage	17.4	95% UTL 95% Coverage	2.117
95% UPL (t)	15.12	95% UPL (t)	1.505
90% Percentile (z)	11.86	90% Percentile (z)	0.924
95% Percentile (z)	14.89	95% Percentile (z)	1.454
99% Percentile (z)	20.57	99% Percentile (z)	3.404
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	1.141
		SD in Original Scale	8.34
		Mean in Log Scale	-1.925
		SD in Log Scale	1.386
		95% UTL 95% Coverage	2.163
		95% UPL (t)	1.48

		90% Percentile (z)	0.861
		95% Percentile (z)	1.425
		99% Percentile (z)	3.663
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.369	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.029		
nu star	31.74		
A-D Test Statistic	10.16	Nonparametric Statistics	
5% A-D Critical Value	0.841	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.421	Mean	1.137
5% K-S Critical Value	0.145	SD	8.293
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.9
		95% KM UTL with 95% Coverage	17.27
Assuming Gamma Distribution		95% KM Chebyshev UPL	37.49
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	15.01
Mean	2.719	90% Percentile (z)	11.76
Median	0.35	95% Percentile (z)	14.78
SD	9.543	99% Percentile (z)	20.43
k star	0.0974		
Theta star	27.92	Gamma ROS Limits with Extrapolated Data	
Nu star	16.94	95% Wilson Hilferty (WH) Approx. Gamma UPL	8.994
95% Percentile of Chisquare (2k)	1.132	95% Hawkins Wixley (HW) Approx. Gamma UPL	9.65
		95% WH Approx. Gamma UTL with 95% Coverage	12.07
90% Percentile	7.155	95% HW Approx. Gamma UTL with 95% Coverage	13.89
95% Percentile	15.8		
99% Percentile	43.77		

Note: DL/2 is not a recommended method.

Muddy Creek Nitrogen, Nitrate

General Statistics			
Number of Valid Data	53	Number of Detected Data	21
Number of Distinct Detected Data	19	Number of Non-Detect Data	32
		Percent Non-Detects	60.38%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.052	Minimum Detected	-2.957
Maximum Detected	0.51	Maximum Detected	-0.673
Mean of Detected	0.237	Mean of Detected	-1.654
SD of Detected	0.137	SD of Detected	0.732
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	1	Maximum Non-Detect	0
Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	53
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
Background Statistics			

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.95	Shapiro Wilk Test Statistic	0.903
5% Shapiro Wilk Critical Value	0.908	5% Shapiro Wilk Critical Value	0.908
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.133	Mean (Log Scale)	-2.421
SD	0.135	SD (Log Scale)	0.836
95% UTL 95% Coverage	0.409	95% UTL 95% Coverage	0.49
95% UPL (t)	0.361	95% UPL (t)	0.365
90% Percentile (z)	0.306	90% Percentile (z)	0.259
95% Percentile (z)	0.355	95% Percentile (z)	0.351
99% Percentile (z)	0.447	99% Percentile (z)	0.621
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.14
		SD in Original Scale	0.119
		Mean in Log Scale	-2.286
		SD in Log Scale	0.81
		95% UTL 95% Coverage	0.533
		95% UPL (t)	0.4
		90% Percentile (z)	0.287
		95% Percentile (z)	0.386
		99% Percentile (z)	0.67
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.169	Data appear Normal at 5% Significance Level	
Theta Star	0.109		
nu star	91.08		
A-D Test Statistic	0.554	Nonparametric Statistics	
5% A-D Critical Value	0.752	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.164	Mean	0.135
5% K-S Critical Value	0.191	SD	0.12
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0178
		95% KM UTL with 95% Coverage	0.381
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.663
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.338
Mean	0.25	90% Percentile (z)	0.289
Median	0.26	95% Percentile (z)	0.333
SD	0.0898	99% Percentile (z)	0.414
k star	5.326		
Theta star	0.0469	Gamma ROS Limits with Extrapolated Data	
Nu star	564.6	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.454
95% Percentile of Chisquare (2k)	19.2	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.466
		95% WH Approx. Gamma UTL with 95% Coverage	0.512
90% Percentile	0.395	95% HW Approx. Gamma UTL with 95% Coverage	0.531
95% Percentile	0.45		
99% Percentile	0.568		

Note: DL/2 is not a recommended method.

Mesa Nitrogen, Nitrate

General Statistics			
Number of Valid Data	100	Number of Detected Data	74
Number of Distinct Detected Data	42	Number of Non-Detect Data	26
		Percent Non-Detects	26.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.06	Minimum Detected	-2.813
Maximum Detected	10.9	Maximum Detected	2.389
Mean of Detected	5.267	Mean of Detected	1.414
SD of Detected	2.766	SD of Detected	0.9
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	5	Maximum Non-Detect	1.609

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	57
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	43
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	57.00%

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.157	Lilliefors Test Statistic	0.279
5% Lilliefors Critical Value	0.103	5% Lilliefors Critical Value	0.103
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	4	Mean (Log Scale)	0.514
SD	3.227	SD (Log Scale)	1.835
95% UTL 95% Coverage	10.21	95% UTL 95% Coverage	57
95% UPL (t)	9.385	95% UPL (t)	35.71
90% Percentile (z)	8.136	90% Percentile (z)	17.55
95% Percentile (z)	9.308	95% Percentile (z)	34.19
99% Percentile (z)	11.51	99% Percentile (z)	119.4
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	4.339	Mean in Original Scale	4.141
SD	3.017	SD in Original Scale	3.055
95% UTL with 95% Coverage	10.14	95% UTL with 95% Coverage	21.09
		95% BCA UTL with 95% Coverage	10
		95% Bootstrap (%) UTL with 95% Coverage	10
95% UPL (t)	9.372	95% UPL (t)	16.09
90% Percentile (z)	8.205	90% Percentile (z)	10.67
95% Percentile (z)	9.301	95% Percentile (z)	15.69
99% Percentile (z)	11.36	99% Percentile (z)	32.36
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.095	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.514		
nu star	310.1		

A-D Test Statistic	3.486	Nonparametric Statistics	
5% A-D Critical Value	0.762	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.234	Mean	3.962
5% K-S Critical Value	0.105	SD	3.258
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.33
		95% KM UTL with 95% Coverage	10.23
Assuming Gamma Distribution		95% KM Chebyshev UPL	18.23
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	9.398
Mean	4.595	90% Percentile (z)	8.137
Median	4.65	95% Percentile (z)	9.321
SD	2.736	99% Percentile (z)	11.54
k star	1.033		
Theta star	4.447	Gamma ROS Limits with Extrapolated Data	
Nu star	206.6	95% Wilson Hilferty (WH) Approx. Gamma UPL	11.53
95% Percentile of Chisquare (2k)	6.119	95% Hawkins Wixley (HW) Approx. Gamma UPL	12.75
		95% WH Approx. Gamma UTL with 95% Coverage	13.22
90% Percentile	10.49	95% HW Approx. Gamma UTL with 95% Coverage	14.93
95% Percentile	13.61		
99% Percentile	20.82		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nitrogen_Nitrate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Nitrogen, Nitrate

Background Data: Alluv Nitrogen, Nitrate

Raw Statistics

	Site	Background
Number of Valid Data	100	87
Number of Non-Detect Data	26	44
Number of Detect Data	74	43
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	5	2
Percent Non detects	26.00%	50.57%
Minimum Detected	0.06	0.027
Maximum Detected	10.9	78
Mean of Detected Data	5.267	2.225
Median of Detected Data	5.1	0.36
SD of Detected Data	2.766	11.83

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	7.658
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	1.887E-14

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nitrogen_Nitrate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Nitrogen, Nitrate

Background Data: Alluv Nitrogen, Nitrate

Raw Statistics

	Site	Background
Number of Valid Data	53	87
Number of Non-Detect Data	32	44
Number of Detect Data	21	43
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	1	2
Percent Non detects	60.38%	50.57%
Minimum Detected	0.052	0.027
Maximum Detected	0.51	78
Mean of Detected Data	0.237	2.225
Median of Detected Data	0.25	0.36
SD of Detected Data	0.137	11.83

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-3.308
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	9.3818E-4

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nitrogen_Nitrate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Nitrogen, Nitrate

Background Data: Muddy Creek Nitrogen, Nitrate

Raw Statistics

	Site	Background
Number of Valid Data	100	53
Number of Non-Detect Data	26	32
Number of Detect Data	74	21
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	5	1
Percent Non detects	26.00%	60.38%
Minimum Detected	0.06	0.052
Maximum Detected	10.9	0.51
Mean of Detected Data	5.267	0.237
Median of Detected Data	5.1	0.25
SD of Detected Data	2.766	0.137

Site vs Background Gehan Test

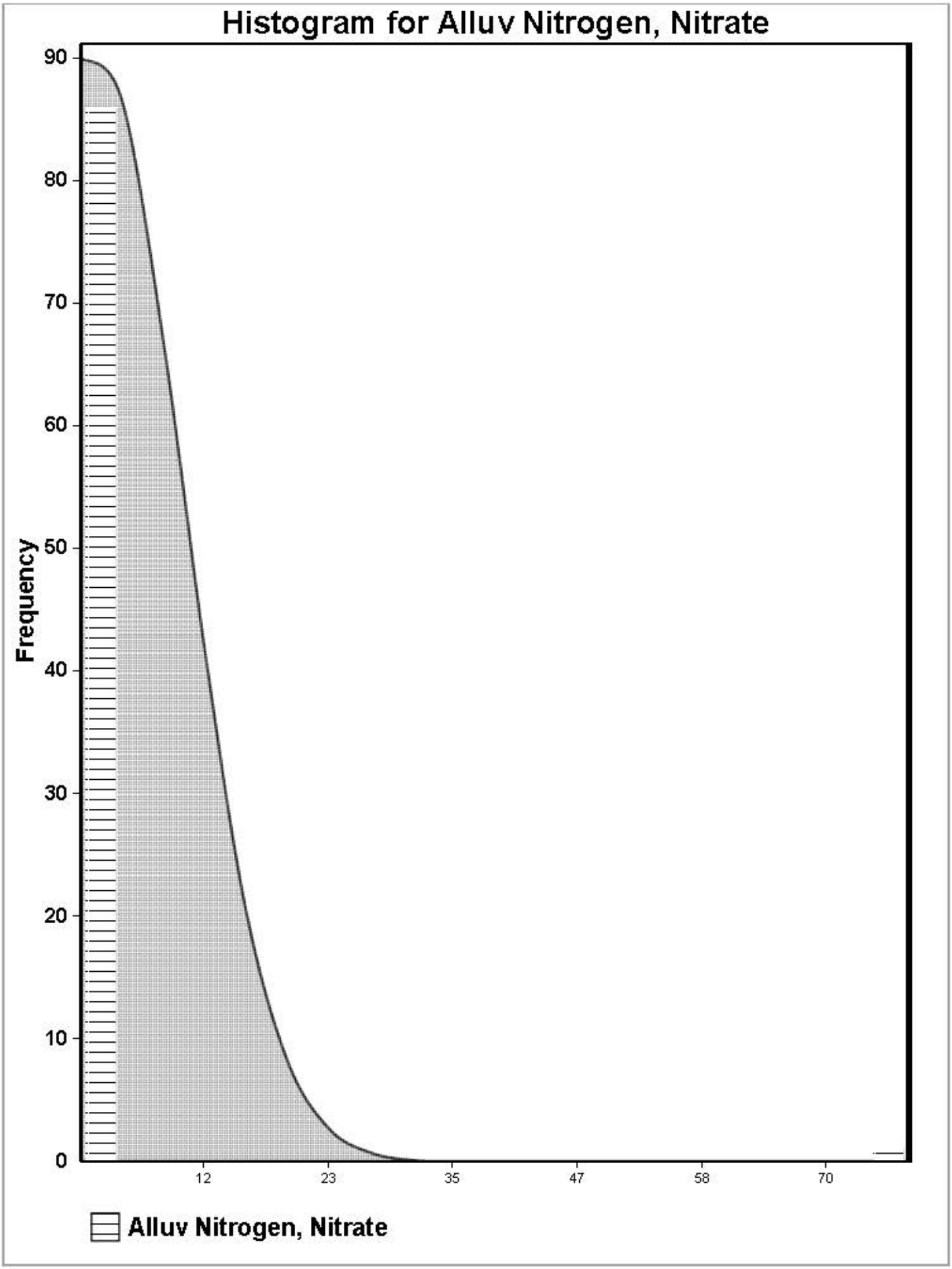
H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	7.305
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	2.776E-13

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Nitrogen, Nitrate
Frequency
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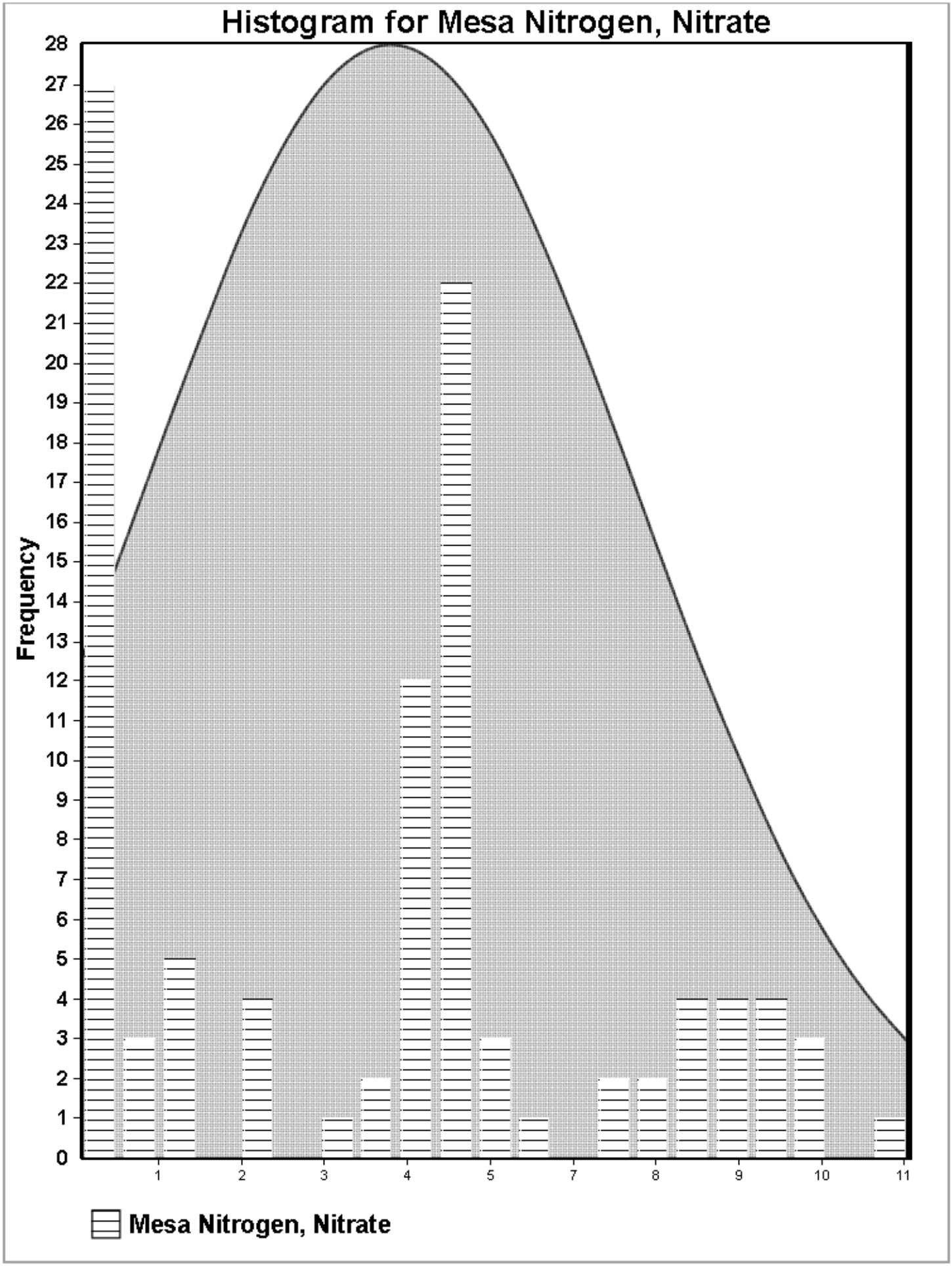
80
70
60
50
40
30
20
10
0
12
23
35
47
58
70
Alluv Nitrogen, Nitrate


Histogram for Mesa Nitrogen, Nitrate
Frequency
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1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
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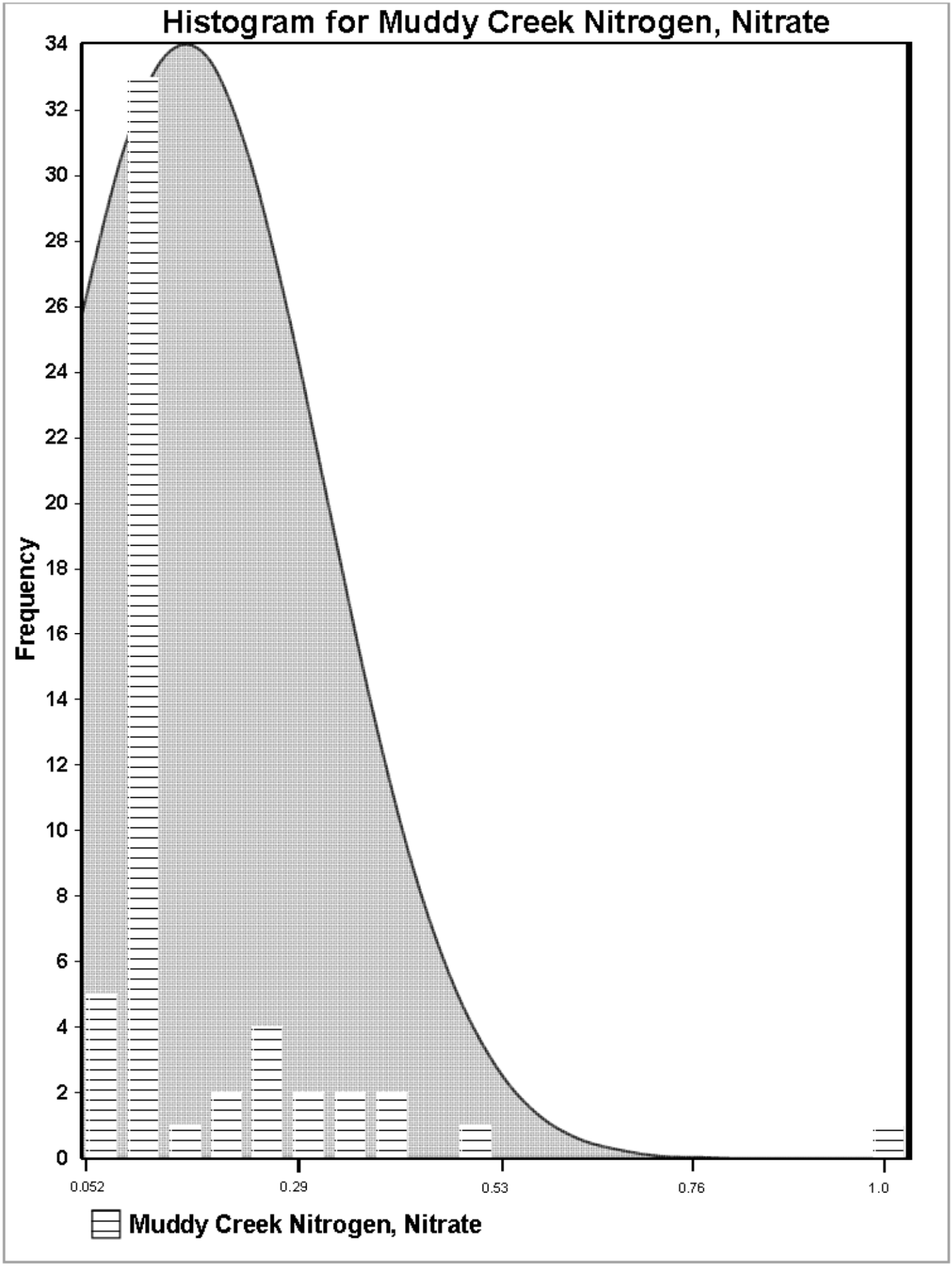
1
2
3
4
5
7
8
9
10
11
Mesa Nitrogen, Nitrate


Histogram for Muddy Creek Nitrogen, Nitrate
Frequency
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
0.052
0.29
0.53
0.76
1.0
Muddy Creek Nitrogen, Nitrate

Outlier Tests for Selected Variables

User Selected Options	
From File	Nitrogen_Nitrate.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Nitrogen, Nitrate

Mean	1.181
Standard Deviation	8.336
Number of data	87
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1.181	8.288	78	35	9.268	3.338	3.705

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 78 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 78 is a Potential Statistical Outlier

Rosner's Outlier Test for Muddy Creek Nitrogen, Nitrate

Mean	0.133
Standard Deviation	0.135
Number of data	53
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.133	0.134	0.51	48	2.819	3.151	3.504

For 5% Significance Level, there is no Potential Outlier

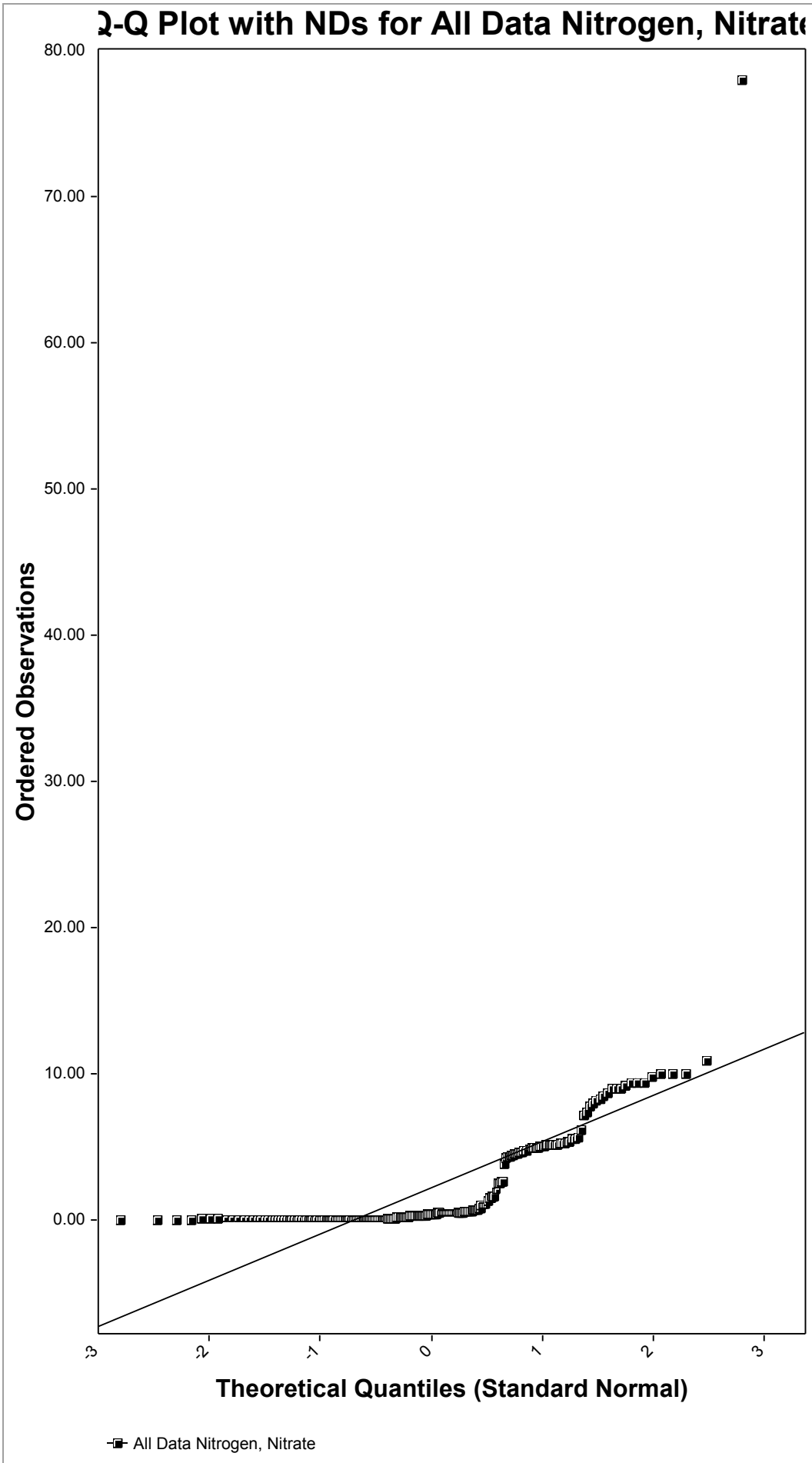
For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Nitrogen, Nitrate

Mean	4
Standard Deviation	3.227
Number of data	100
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical

#	Mean	sd	outlier	Number	value	value (5%)	value (1%)				
1	4	3.211	10.9	21	2.149	3.38	3.75				
For 5% Significance Level, there is no Potential Outlier											
For 1% Significance Level, there is no Potential Outlier											



All Data Nitrogen, Nitrate

Total Number of Data = 240

Number of Non-Detects = 102

Number of Detects = 138

Mean = 2.2052

Sd = 5.6512

Slope = 3.1651

Intercept = 2.2052

Correlation, R = 0.5571

Location Name	Sample Date	Alluv Nitrogen, Nitrate	D_Alluv Nitrogen, Nitrate
BG-1S	11/26/2012	0.35	1
BG-1S	8/23/2012	0.44	1
BG-1S	5/24/2012	0.27	1
BG-1S	3/20/2012	0.48	1
IMW-2.5D	11/26/2012	0.1	0
IMW-2.5D	8/24/2012	0.1	0
IMW-2.5D	5/21/2012	0.1	0
IMW-2.5D	3/21/2012	0.1	0
IMW-2.5D	12/8/2011	0.1	0
IMW-2.5D	6/6/2011	0.5	0
IMW-2.5D	12/15/2010	0.8	1
IMW-2.5D	6/9/2010	0.39	1
IMW-2.5D	12/12/2009	0.19	1
IMW-2.5S	11/26/2012	0.027	1
IMW-2.5S	8/24/2012	0.1	0
IMW-2.5S	5/21/2012	0.1	0
IMW-2.5S	3/21/2012	0.1	0
IMW-2.5S	12/8/2011	0.1	0
IMW-2.5S	9/9/2011	2	0
IMW-2.5S	6/6/2011	0.5	0
IMW-2.5S	3/7/2011	0.5	0
IMW-2.5S	12/15/2010	0.22	1
IMW-2.5S	9/20/2010	1	0
IMW-2.5S	6/9/2010	0.2	0
IMW-2.5S	3/9/2010	0.28	1
IMW-2.5S	12/12/2009	0.33	1
IMW-2.5S	9/21/2009	0.1	0
IMW-3S	5/21/2012	0.38	1
IMW-3S	3/20/2012	0.71	1
IMW-3S	12/9/2011	0.68	1
IMW-3S	9/9/2011	0.98	1
IMW-3S	6/7/2011	0.56	1
IMW-3S	3/7/2011	0.5	0
IMW-3S	12/10/2010	1.6	1
IMW-3S	9/16/2010	78	1
IMW-3S	6/8/2010	0.67	1
IMW-3S	3/9/2010	0.45	1
IMW-3S	12/10/2009	0.48	1
IMW-3S	9/14/2009	0.57	1
IMW-3S	6/9/2009	0.66	1
IMW-3S	3/3/2009	0.58	1
IMW-3S	12/9/2008	0.57	1
IMW-3S	9/9/2008	0.6	1
IMW-3S	6/3/2008	0.5	1
IMW-3S	3/4/2008	0.39	1
KMW-2D	11/26/2012	0.1	0
KMW-2D	8/24/2012	0.1	0
KMW-2D	5/21/2012	0.1	0
KMW-2D	3/23/2012	0.1	0
KMW-2D	12/8/2011	0.29	1
KMW-2D	6/6/2011	0.5	0
KMW-2D	12/13/2010	0.25	1
KMW-2D	6/8/2010	0.14	1
KMW-2D	12/8/2009	0.26	1
KMW-2D	12/10/2008	0.36	1
KMW-2D	6/3/2008	0.29	1
KMW-2M	11/26/2012	0.1	0
KMW-2M	8/24/2012	0.1	0
KMW-2M	5/21/2012	0.1	0
KMW-2M	3/23/2012	0.1	0
KMW-2M	12/8/2011	0.28	1
KMW-2M	6/6/2011	0.5	0
KMW-2M	12/13/2010	1	0
KMW-2M	6/8/2010	0.11	1
KMW-2M	12/8/2009	0.36	1
KMW-2M	12/10/2008	0.2	1
KMW-2M	6/3/2008	0.35	1
KMW-2S	11/26/2012	0.1	0
KMW-2S	8/24/2012	0.1	0
KMW-2S	5/21/2012	0.1	0
KMW-2S	3/23/2012	0.1	0
KMW-2S	12/8/2011	0.1	0
KMW-2S	9/9/2011	2	0
KMW-2S	6/6/2011	0.5	0
KMW-2S	3/8/2011	0.5	0
KMW-2S	12/13/2010	1	0
KMW-2S	9/15/2010	0.1	0
KMW-2S	6/8/2010	0.1	0
KMW-2S	3/9/2010	0.1	0
KMW-2S	12/8/2009	0.1	0
KMW-2S	9/16/2009	0.1	0
KMW-2S	6/10/2009	0.13	1
KMW-2S	3/3/2009	0.1	0
KMW-2S	12/10/2008	0.22	1
KMW-2S	9/8/2008	0.14	1
KMW-2S	6/3/2008	0.15	1
KMW-2S	3/4/2008	0.1	0

Location Name	Sample Date	Muddy Creek Nitrogen, Nitrate	D_Muddy Creek Nitrogen, Nitrate
BG-3S	11/27/2012	0.1	0
BG-3S	8/22/2012	0.1	0
BG-3S	5/23/2012	0.1	0
BG-3S	3/21/2012	0.1	0
BG-4S	11/27/2012	0.25	1
BG-4S	8/30/2012	0.42	1
BG-4S	5/30/2012	0.052	1
BG-4S	3/20/2012	0.056	1
BG-6S	11/27/2012	0.11	1
BG-6S	8/23/2012	0.17	1
BG-6S	5/25/2012	0.1	0
BG-6S	3/21/2012	0.1	0
BG-1M	11/26/2012	0.1	0
BG-1M	8/23/2012	0.1	0
BG-1M	5/24/2012	0.1	0
BG-1M	3/20/2012	0.1	0
BG-3M	11/27/2012	0.1	0
BG-3M	8/22/2012	0.1	0
BG-3M	5/24/2012	0.1	0
BG-3M	3/21/2012	0.1	0
BG-4M	11/27/2012	0.1	0
BG-4M	8/30/2012	0.1	0
BG-4M	5/30/2012	0.1	0
BG-4M	3/20/2012	0.1	0
BG-6M	11/27/2012	0.25	1
BG-6M	8/22/2012	0.26	1
BG-6M	5/25/2012	0.099	0
BG-6M	3/21/2012	0.053	1
BG-1D	11/26/2012	0.1	0
BG-1D	8/23/2012	0.1	0
BG-1D	5/24/2012	0.1	0
BG-1D	3/20/2012	0.1	0
BG-3D	11/27/2012	0.1	0
BG-3D	8/21/2012	0.1	0
BG-3D	5/23/2012	0.1	0
BG-3D	3/21/2012	0.1	0
BG-4D	11/27/2012	0.1	0
BG-4D	8/30/2012	0.1	0
BG-4D	5/30/2012	0.1	0
BG-4D	3/20/2012	0.1	0
BG-6D	11/27/2012	0.31	1
BG-6D	8/22/2012	0.24	1
BG-6D	5/25/2012	0.13	1
BG-6D	3/21/2012	0.1	0
IMW-3D	5/25/2012	0.074	1
IMW-3D	3/22/2012	0.22	1
IMW-3D	12/9/2011	0.27	1
IMW-3D	6/7/2011	0.51	1
IMW-3D	12/10/2010	1	0
IMW-3D	6/8/2010	0.33	1
IMW-3D	12/10/2009	0.37	1
IMW-3D	12/9/2008	0.43	1
IMW-3D	6/3/2008	0.37	1

Location Name	Sample Date	Mesa Nitrogen, Nitrate	D_Mesa Nitrogen, Nitrate
BG-2S	11/26/2012	0.1	0
BG-2S	8/23/2012	0.1	0
BG-2S	5/24/2012	0.1	0
BG-2S	3/21/2012	0.1	0
BG-2M	11/26/2012	0.1	1
BG-2M	8/23/2012	0.1	1
BG-2M	5/24/2012	0.1	1
BG-2M	3/21/2012	0.1	1
BG-2D	11/26/2012	0.06	1
BG-2D	8/23/2012	0.1	1
BG-2D	5/24/2012	0.1	0
BG-2D	3/21/2012	0.1	0
LMW-10	11/28/2012	10	0
LMW-10	8/27/2012	9.4	0
LMW-10	5/30/2012	5.2	0
LMW-10	3/22/2012	9	0
LMW-10	12/6/2011	10	0
LMW-10	9/8/2011	7.4	0
LMW-10	6/8/2011	10	0
LMW-10	3/2/2011	9	0
LMW-10	12/9/2010	10.9	0
LMW-10	9/21/2010	9	0
LMW-10	6/9/2010	9.2	0
LMW-10	3/11/2010	8.2	0
LMW-10	12/11/2009	7.2	1
LMW-10	9/18/2009	8.5	1
LMW-10	6/10/2009	9.8	1
LMW-10	3/5/2009	9.4	1
LMW-10	12/12/2008	9.4	0
LMW-10	9/10/2008	8.7	0
LMW-10	6/4/2008	8	0
LMW-10	3/5/2008	8.3	0
LMW-11R	11/26/2012	0.1	0
LMW-11R	8/21/2012	0.1	0
LMW-11R	5/29/2012	0.1	0
LMW-11R	3/23/2012	0.1	0
LMW-7	11/28/2012	5.7	0
LMW-7	8/27/2012	5.4	0
LMW-7	5/31/2012	1.3	0
LMW-7	3/23/2012	3.8	0
LMW-7	12/5/2011	5.6	1
LMW-7	9/6/2011	5.2	1
LMW-7	6/9/2011	5.1	1
LMW-7	3/9/2011	5.6	0
LMW-7	12/10/2010	5	1
LMW-7	9/21/2010	6.2	1
LMW-7	6/9/2010	5.2	1
LMW-7	3/11/2010	4.8	1
LMW-7	12/11/2009	5.3	0
LMW-7	9/18/2009	5.4	1
LMW-7	6/10/2009	5.2	1
LMW-7	3/5/2009	5.2	1
LMW-7	12/12/2008	5.2	1
LMW-7	9/10/2008	5.3	1
LMW-7	6/4/2008	5.1	1
LMW-7	3/5/2008	5.2	1
LMW-9	11/28/2012	5	1
LMW-9	8/27/2012	4.8	1
LMW-9	5/31/2012	0.78	1
LMW-9	3/23/2012	2.5	1
LMW-9	12/5/2011	4.7	1
LMW-9	9/8/2011	4.2	1
LMW-9	6/8/2011	5.1	1
LMW-9	3/9/2011	5	1
LMW-9	12/10/2010	5.3	1
LMW-9	9/21/2010	5	1
LMW-9	6/9/2010	4.6	1
LMW-9	3/11/2010	4.5	1
LMW-9	12/11/2009	4.7	1
LMW-9	9/18/2009	4.7	1
LMW-9	6/10/2009	4.5	1
LMW-9	3/5/2009	4.4	1
LMW-9	12/12/2008	4.6	1
LMW-9	9/10/2008	4.6	1
LMW-9	6/4/2008	4.4	1
LMW-9	3/5/2008	4.3	1
LMW-11	2/22/2012	5	0
LMW-11	12/6/2011	5	0
LMW-11	9/8/2011	5	0
LMW-11	3/2/2011	0.5	0
LMW-12R	11/30/2012	1.5	1
LMW-12R	10/22/2012	1.5	1
LMW-12R	8/21/2012	1.6	1
LMW-12R	5/30/2012	1.5	1
LMW-13R	11/28/2012	0.5	1
LMW-13R	10/22/2012	0.58	1
LMW-13R	8/20/2012	0.59	1
LMW-13R	5/29/2012	0.74	1
LMW-14R	11/30/2012	0.5	0
LMW-14R	10/22/2012	0.5	0
LMW-14R	8/20/2012	0.63	1
LMW-14R	5/29/2012	0.5	0
LMW-15	11/28/2012	0.5	0
LMW-15	10/22/2012	0.5	0
LMW-15	8/20/2012	0.5	0
LMW-15	5/29/2012	0.5	0
LMW-16	11/28/2012	7.8	1
LMW-16	10/22/2012	2.6	1
LMW-16	8/20/2012	2.5	1
LMW-16	5/29/2012	2.6	1

Location Name	Sample Date	All Data Nitrogen, Nitrate	D_All Data Nitrogen, Nitrate
BG-1S	11/26/2012	0.35	1
BG-1S	8/23/2012	0.44	1
BG-1S	5/24/2012	0.27	1
BG-1S	3/20/2012	0.48	1
IMW-2.5D	11/26/2012	0.1	0
IMW-2.5D	8/24/2012	0.1	0
IMW-2.5D	5/21/2012	0.1	0
IMW-2.5D	3/21/2012	0.1	0
IMW-2.5D	12/8/2011	0.1	0
IMW-2.5D	6/6/2011	0.5	0
IMW-2.5D	12/15/2010	0.8	1
IMW-2.5D	6/9/2010	0.39	1
IMW-2.5D	12/12/2009	0.19	1
IMW-2.5S	11/26/2012	0.027	1
IMW-2.5S	8/24/2012	0.1	0
IMW-2.5S	5/21/2012	0.1	0
IMW-2.5S	3/21/2012	0.1	0
IMW-2.5S	12/8/2011	0.1	0
IMW-2.5S	9/9/2011	2	0
IMW-2.5S	6/6/2011	0.5	0
IMW-2.5S	3/7/2011	0.5	0
IMW-2.5S	12/15/2010	0.22	1
IMW-2.5S	9/20/2010	1	0
IMW-2.5S	6/9/2010	0.2	0
IMW-2.5S	3/9/2010	0.28	1
IMW-2.5S	12/12/2009	0.33	1
IMW-2.5S	9/21/2009	0.1	0
IMW-3S	5/21/2012	0.38	1
IMW-3S	3/20/2012	0.71	1
IMW-3S	12/9/2011	0.68	1
IMW-3S	9/9/2011	0.98	1
IMW-3S	6/7/2011	0.56	1
IMW-3S	3/7/2011	0.5	0
IMW-3S	12/10/2010	1.6	1
IMW-3S	9/16/2010	78	1
IMW-3S	6/8/2010	0.67	1
IMW-3S	3/9/2010	0.45	1
IMW-3S	12/10/2009	0.48	1
IMW-3S	9/14/2009	0.57	1
IMW-3S	6/9/2009	0.66	1
IMW-3S	3/3/2009	0.58	1
IMW-3S	12/9/2008	0.57	1
IMW-3S	9/9/2008	0.6	1
IMW-3S	6/3/2008	0.5	1
IMW-3S	3/4/2008	0.39	1
KMW-2D	11/26/2012	0.1	0
KMW-2D	8/24/2012	0.1	0
KMW-2D	5/21/2012	0.1	0
KMW-2D	3/23/2012	0.1	0
KMW-2D	12/8/2011	0.29	1
KMW-2D	6/6/2011	0.5	0
KMW-2D	12/13/2010	0.25	1
KMW-2D	6/8/2010	0.14	1
KMW-2D	12/8/2009	0.26	1
KMW-2D	12/10/2008	0.36	1
KMW-2D	6/3/2008	0.29	1
KMW-2M	11/26/2012	0.1	0
KMW-2M	8/24/2012	0.1	0
KMW-2M	5/21/2012	0.1	0
KMW-2M	3/23/2012	0.1	0
KMW-2M	12/8/2011	0.28	1
KMW-2M	6/6/2011	0.5	0
KMW-2M	12/13/2010	1	0
KMW-2M	6/8/2010	0.11	1
KMW-2M	12/8/2009	0.36	1
KMW-2M	12/10/2008	0.2	1
KMW-2M	6/3/2008	0.35	1
KMW-2S	11/26/2012	0.1	0
KMW-2S	8/24/2012	0.1	0
KMW-2S	5/21/2012	0.1	0
KMW-2S	3/23/2012	0.1	0
KMW-2S	12/8/2011	0.1	0
KMW-2S	9/9/2011	2	0
KMW-2S	6/6/2011	0.5	0
KMW-2S	3/8/2011	0.5	0
KMW-2S	12/13/2010	1	0
KMW-2S	9/15/2010	0.1	0
KMW-2S	6/8/2010	0.1	0
KMW-2S	3/9/2010	0.1	0
KMW-2S	12/8/2009	0.1	0
KMW-2S	9/16/2009	0.1	0
KMW-2S	6/10/2009	0.13	1
KMW-2S	3/3/2009	0.1	0
KMW-2S	12/10/2008	0.22	1
KMW-2S	9/8/2008	0.14	1
KMW-2S	6/3/2008	0.15	1
KMW-2S	3/4/2008	0.1	0
BG-3S	11/27/2012	0.1	0
BG-3S	8/22/2012	0.1	0
BG-3S	5/23/2012	0.1	0
BG-3S	3/21/2012	0.1	0
BG-4S	11/27/2012	0.25	1
BG-4S	8/30/2012	0.42	1
BG-4S	5/30/2012	0.052	1
BG-4S	3/20/2012	0.056	1
BG-6S	11/27/2012	0.11	1
BG-6S	8/23/2012	0.17	1
BG-6S	5/25/2012	0.1	0
BG-6S	3/21/2012	0.1	0
BG-1M	11/26/2012	0.1	0
BG-1M	8/23/2012	0.1	0
BG-1M	5/24/2012	0.1	0
BG-1M	3/20/2012	0.1	0

BG-3M	11/27/2012	0.1	0
BG-3M	8/22/2012	0.1	0
BG-3M	5/24/2012	0.1	0
BG-3M	3/21/2012	0.1	0
BG-4M	11/27/2012	0.1	0
BG-4M	8/30/2012	0.1	0
BG-4M	5/30/2012	0.1	0
BG-4M	3/20/2012	0.1	0
BG-6M	11/27/2012	0.25	1
BG-6M	8/22/2012	0.26	1
BG-6M	5/25/2012	0.099	1
BG-6M	3/21/2012	0.053	1
BG-1D	11/26/2012	0.1	0
BG-1D	8/23/2012	0.1	0
BG-1D	5/24/2012	0.1	0
BG-1D	3/20/2012	0.1	0
BG-3D	11/27/2012	0.1	0
BG-3D	8/21/2012	0.1	0
BG-3D	5/23/2012	0.1	0
BG-3D	3/21/2012	0.1	0
BG-4D	11/27/2012	0.1	0
BG-4D	8/30/2012	0.1	0
BG-4D	5/30/2012	0.1	0
BG-4D	3/20/2012	0.1	0
BG-6D	11/27/2012	0.31	1
BG-6D	8/22/2012	0.24	1
BG-6D	5/25/2012	0.13	1
BG-6D	3/21/2012	0.1	0
IMW-3D	5/25/2012	0.074	1
IMW-3D	3/22/2012	0.22	1
IMW-3D	12/9/2011	0.27	1
IMW-3D	6/7/2011	0.51	1
IMW-3D	12/10/2010	1	0
IMW-3D	6/8/2010	0.33	1
IMW-3D	12/10/2009	0.37	1
IMW-3D	12/9/2008	0.43	1
IMW-3D	6/3/2008	0.37	1
BG-2S	11/26/2012	0.1	0
BG-2S	8/23/2012	0.1	0
BG-2S	5/24/2012	0.1	0
BG-2S	3/21/2012	0.1	0
BG-2M	11/26/2012	0.1	0
BG-2M	8/23/2012	0.1	0
BG-2M	5/24/2012	0.1	0
BG-2M	3/21/2012	0.1	0
BG-2D	11/26/2012	0.06	1
BG-2D	8/23/2012	0.1	0
BG-2D	5/24/2012	0.1	0
BG-2D	3/21/2012	0.1	0
LMW-10	11/28/2012	10	1
LMW-10	8/27/2012	9.4	1
LMW-10	5/30/2012	5.2	1
LMW-10	3/22/2012	9	1
LMW-10	12/6/2011	10	1
LMW-10	9/8/2011	7.4	1
LMW-10	6/8/2011	10	1
LMW-10	3/2/2011	9	1
LMW-10	12/9/2010	10.9	1
LMW-10	9/21/2010	9	1
LMW-10	6/9/2010	9.2	1
LMW-10	3/11/2010	8.2	1
LMW-10	12/11/2009	7.2	1
LMW-10	9/18/2009	8.5	1
LMW-10	6/10/2009	9.8	1
LMW-10	3/5/2009	9.4	1
LMW-10	12/12/2008	9.4	1
LMW-10	9/10/2008	8.7	1
LMW-10	6/4/2008	8	1
LMW-10	3/5/2008	8.3	1
LMW-11R	11/26/2012	0.1	0
LMW-11R	8/21/2012	0.1	0
LMW-11R	5/29/2012	0.1	0
LMW-11R	3/23/2012	0.1	0
LMW-7	11/28/2012	5.7	1
LMW-7	8/27/2012	5.4	1
LMW-7	5/31/2012	1.3	1
LMW-7	3/23/2012	3.8	1
LMW-7	12/5/2011	5.6	1
LMW-7	9/6/2011	5.2	1
LMW-7	6/9/2011	5.1	1
LMW-7	3/9/2011	5.6	1
LMW-7	12/10/2010	5	1
LMW-7	9/21/2010	6.2	1
LMW-7	6/9/2010	5.2	1
LMW-7	3/11/2010	4.8	1
LMW-7	12/11/2009	5.3	1
LMW-7	9/18/2009	5.4	1
LMW-7	6/10/2009	5.2	1
LMW-7	3/5/2009	5.2	1
LMW-7	12/12/2008	5.2	1
LMW-7	9/10/2008	5.3	1
LMW-7	6/4/2008	5.1	1
LMW-7	3/5/2008	5.2	1
LMW-9	11/28/2012	5	1
LMW-9	8/27/2012	4.8	1
LMW-9	5/31/2012	0.78	1
LMW-9	3/23/2012	2.5	1
LMW-9	12/5/2011	4.7	1
LMW-9	9/8/2011	4.2	1
LMW-9	6/8/2011	5.1	1
LMW-9	3/9/2011	5	1
LMW-9	12/10/2010	5.3	1
LMW-9	9/21/2010	5	1
LMW-9	6/9/2010	4.6	1

LMW-9	3/11/2010	4.5	1
LMW-9	12/11/2009	4.7	1
LMW-9	9/18/2009	4.7	1
LMW-9	6/10/2009	4.5	1
LMW-9	3/5/2009	4.4	1
LMW-9	12/12/2008	4.6	1
LMW-9	9/10/2008	4.6	1
LMW-9	6/4/2008	4.4	1
LMW-9	3/5/2008	4.3	1
LMW-11	2/22/2012	5	0
LMW-11	12/6/2011	5	0
LMW-11	9/8/2011	5	0
LMW-11	3/2/2011	0.5	0
LMW-12R	11/30/2012	1.5	1
LMW-12R	10/22/2012	1.5	1
LMW-12R	8/21/2012	1.6	1
LMW-12R	5/30/2012	1.5	1
LMW-13R	11/28/2012	0.5	1
LMW-13R	10/22/2012	0.58	1
LMW-13R	8/20/2012	0.59	1
LMW-13R	5/29/2012	0.74	1
LMW-14R	11/30/2012	0.5	0
LMW-14R	10/22/2012	0.5	0
LMW-14R	8/20/2012	0.63	1
LMW-14R	5/29/2012	0.5	0
LMW-15	11/28/2012	0.5	0
LMW-15	10/22/2012	0.5	0
LMW-15	8/20/2012	0.5	0
LMW-15	5/29/2012	0.5	0
LMW-16	11/28/2012	7.8	1
LMW-16	10/22/2012	2.6	1
LMW-16	8/20/2012	2.5	1
LMW-16	5/29/2012	2.6	1

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nitrogen_Nitrite.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Nitrogen, Nitrite

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	5	21	80.77%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	21	0.1	0.1	0.1	0.1	1.422E-17
Statistics (Detects Only)	5	0.014	0.019	0.017	0.018	0.002
Statistics (All: NDs treated as DL value)	26	0.014	0.1	0.084	0.1	0.0334
Statistics (All: NDs treated as DL/2 value)	26	0.014	0.05	0.0437	0.05	0.0133
Statistics (Normal ROS Estimated Data)	26	0.0127	0.0213	0.017	0.0171	0.00218
Statistics (Gamma ROS Estimated Data)	26	0.011	0.0196	0.0168	0.0175	0.00228
Statistics (Lognormal ROS Estimated Data)	26	0.013	0.0219	0.017	0.0171	0.00225

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	85.67	75.81	1.9843E-4	-4.08	0.123	-0.03
Statistics (NDs = DL)	3.133	2.797	0.0268	-2.644	0.716	-0.271
Statistics (NDs = DL/2)	7.025	6.24	0.00621	-3.204	0.439	-0.137
Statistics (Gamma ROS Estimates)	51.04	45.17	3.2957E-4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.08	0.133	-0.0326

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.952	0.704	0.709	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.905	0.762	Data Appear Normal
Lilliefors (Detects Only)	0.291	0.396	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.49	0.92	Data Not Normal
Lilliefors (NDs = DL)	0.491	0.174	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.498	0.92	Data Not Normal
Lilliefors (NDs = DL/2)	0.491	0.174	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.989	0.92	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0805	0.174	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.939	0.566	0.618	0.943

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.406	0.678	
Kolmogorov-Smirnov (Detects Only)	0.316	0.357	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	6.984	0.75	
Kolmogorov-Smirnov (NDs = DL)	0.5	0.172	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	6.812	0.745	
Kolmogorov-Smirnov (NDs = DL/2)	0.497	0.171	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.858	0.743	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.153	0.171	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.944	0.71	0.714	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.891	0.762	Data Appear Lognormal
Lilliefors (Detects Only)	0.296	0.396	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.5	0.92	Data Not Lognormal
Lilliefors (NDs = DL)	0.491	0.174	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.508	0.92	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.49	0.174	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.988	0.92	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0804	0.174	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Nitrogen, Nitrite

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	9	37	80.43%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	37	0.1	0.1	0.1	0.1	4.221E-17
Statistics (Detects Only)	9	0.011	0.091	0.0327	0.016	0.027
Statistics (All: NDs treated as DL value)	46	0.011	0.1	0.0868	0.1	0.0293
Statistics (All: NDs treated as DL/2 value)	46	0.011	0.091	0.0466	0.05	0.0134
Statistics (Normal ROS Estimated Data)	46	-0.0242	0.091	0.0327	0.0299	0.0269
Statistics (Gamma ROS Estimated Data)	46	1.000E-12	0.091	0.0331	0.0312	0.0232
Statistics (Lognormal ROS Estimated Data)	46	0.00477	0.133	0.0337	0.0244	0.0277

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.059	1.939	0.0159	-3.684	0.74	-0.201
Statistics (NDs = DL)	4.037	3.789	0.0215	-2.573	0.636	-0.247
Statistics (NDs = DL/2)	7.935	7.432	0.00587	-3.13	0.417	-0.133
Statistics (Gamma ROS Estimates)	0.259	0.257	0.128	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.684	0.778	-0.211

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.891	0.7	0.733	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.796	0.829	Data Not Normal
Lilliefors (Detects Only)	0.287	0.295	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.486	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.478	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.571	0.945	Data Not Normal

Lilliefors (NDs = DL/2)	0.448	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.982	0.945	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0753	0.131	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.979	0.567	0.693	0.776

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.635	0.73	
Kolmogorov-Smirnov (Detects Only)	0.304	0.282	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	11.99	0.753	
Kolmogorov-Smirnov (NDs = DL)	0.48	0.131	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	11.36	0.751	
Kolmogorov-Smirnov (NDs = DL/2)	0.473	0.131	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	11.46	0.88	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.402	0.143	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.948	0.689	0.704	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.888	0.829	Data Appear Lognormal
Lilliefors (Detects Only)	0.285	0.295	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.476	0.945	Data Not Lognormal
Lilliefors (NDs = DL)	0.469	0.131	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.518	0.945	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.474	0.131	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.985	0.945	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0711	0.131	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Nitrogen, Nitrite

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	5	23	82.14%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	23	0.1	0.1	0.1	0.1	2.838E-17
Statistics (Detects Only)	5	0.01	0.16	0.0562	0.017	0.0656
Statistics (All: NDs treated as DL value)	28	0.01	0.16	0.0922	0.1	0.0305
Statistics (All: NDs treated as DL/2 value)	28	0.01	0.16	0.0511	0.05	0.0254
Statistics (Normal ROS Estimated Data)	28	-0.0612	0.16	0.036	0.0301	0.0501
Statistics (Gamma ROS Estimated Data)	28	0.01	0.16	0.0546	0.0555	0.0259
Statistics (Lognormal ROS Estimated Data)	28	0.00322	0.16	0.032	0.0184	0.0346

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.934	0.857	0.0602	-3.502	1.262	-0.36
Statistics (NDs = DL)	3.925	3.528	0.0235	-2.517	0.675	-0.268
Statistics (NDs = DL/2)	4.611	4.141	0.0111	-3.086	0.524	-0.17

Statistics (Gamma ROS Estimates)	4.424	3.974	0.0124	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.887	0.957	-0.246

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.896	0.714	0.69	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.796	0.762	Data Appear Normal
Lilliefors (Detects Only)	0.325	0.396	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.537	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.458	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.517	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.446	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.99	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0769	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.986	0.638	0.738	0.801

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.515	0.693	
Kolmogorov-Smirnov (Detects Only)	0.324	0.365	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	7.616	0.75	
Kolmogorov-Smirnov (NDs = DL)	0.487	0.166	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	6.034	0.749	
Kolmogorov-Smirnov (NDs = DL/2)	0.436	0.166	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.84	0.749	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.269	0.166	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.935	0.656	0.741	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.852	0.762	Data Appear Lognormal
Lilliefors (Detects Only)	0.275	0.396	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.448	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.482	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.58	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.461	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.989	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0685	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

All Nitrogen, Nitrite

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	19	81	81.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	81	0.1	0.1	0.1	0.1	1.676E-16
Statistics (Detects Only)	19	0.01	0.16	0.0347	0.017	0.0387
Statistics (All: NDs treated as DL value)	100	0.01	0.16	0.0876	0.1	0.0306
Statistics (All: NDs treated as DL/2 value)	100	0.01	0.16	0.0471	0.05	0.0176
Statistics (Normal ROS Estimated Data)	100	-0.0422	0.16	0.031	0.0271	0.032
Statistics (Gamma ROS Estimated Data)	100	0.01	0.16	0.035	0.0346	0.0168
Statistics (Lognormal ROS Estimated Data)	100	0.00416	0.16	0.0283	0.02	0.0238

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.459	1.422	0.0238	-3.74	0.807	-0.216
Statistics (NDs = DL)	3.71	3.606	0.0236	-2.576	0.663	-0.257
Statistics (NDs = DL/2)	6.281	6.1	0.0075	-3.137	0.452	-0.144
Statistics (Gamma ROS Estimates)	6.68	6.486	0.00524	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.824	0.709	-0.185

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.799	0.715	0.703	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.652	0.901	Data Not Normal
Lilliefors (Detects Only)	0.342	0.203	Data Not Normal
Lilliefors (NDs = DL)	0.477	0.0886	Data Not Normal
Lilliefors (NDs = DL/2)	0.416	0.0886	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0711	0.0886	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.948	0.6	0.701	0.824

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.874	0.758	
Kolmogorov-Smirnov (Detects Only)	0.329	0.202	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	26.36	0.757	
Kolmogorov-Smirnov (NDs = DL)	0.487	0.0899	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	23	0.754	
Kolmogorov-Smirnov (NDs = DL/2)	0.462	0.0895	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	7.707	0.754	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.245	0.0895	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.915	0.695	0.736	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.834	0.901	Data Not Lognormal
Lilliefors (Detects Only)	0.293	0.203	Data Not Lognormal
Lilliefors (NDs = DL)	0.48	0.0886	Data Not Lognormal

			Lilliefors (NDs = DL/2)	0.473	0.0886	Data Not Lognormal					
			Lilliefors (Lognormal ROS Estimates)	0.0591	0.0886	Data Appear Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.											

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Nitrogen_Nitrite.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Nitrogen, Nitrite

General Statistics

Number of Valid Data	26	Number of Detected Data	5
Number of Distinct Detected Data	4	Number of Non-Detect Data	21
		Percent Non-Detects	80.77%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.014	Minimum Detected	-4.269
Maximum Detected	0.019	Maximum Detected	-3.963
Mean of Detected	0.017	Mean of Detected	-4.08
SD of Detected	0.002	SD of Detected	0.123
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.905	Shapiro Wilk Test Statistic	0.891
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0437	Mean (Log Scale)	-3.204
SD	0.0133	SD (Log Scale)	0.439
95% UTL 95% Coverage	0.0739	95% UTL 95% Coverage	0.11
95% UPL (t)	0.0668	95% UPL (t)	0.0871
90% Percentile (z)	0.0607	90% Percentile (z)	0.0712
95% Percentile (z)	0.0655	95% Percentile (z)	0.0835
99% Percentile (z)	0.0746	99% Percentile (z)	0.113
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.017
		SD in Original Scale	0.00225
		Mean in Log Scale	-4.08

		SD in Log Scale	0.133
		95% UTL 95% Coverage	0.0229
		95% UPL (t)	0.0213
		90% Percentile (z)	0.02
		95% Percentile (z)	0.021
		99% Percentile (z)	0.023
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	34.4	Data appear Normal at 5% Significance Level	
Theta Star	4.9416E-4		
nu star	344		
A-D Test Statistic	0.406	Nonparametric Statistics	
5% A-D Critical Value	0.678	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.316	Mean	0.017
5% K-S Critical Value	0.357	SD	0.00179
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	8.9443E-4
		95% KM UTL with 95% Coverage	0.0211
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0249
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0201
Mean	0.0168	90% Percentile (z)	0.0193
Median	0.0175	95% Percentile (z)	0.0199
SD	0.00228	99% Percentile (z)	0.0212
k star	45.17		
Theta star	3.7235E-4	Gamma ROS Limits with Extrapolated Data	
Nu star	2349	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0212
95% Percentile of Chisquare (2k)	113.5	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0213
		95% WH Approx. Gamma UTL with 95% Coverage	0.0228
90% Percentile	0.0201	95% HW Approx. Gamma UTL with 95% Coverage	0.0229
95% Percentile	0.0211		
99% Percentile	0.0232		

Note: DL/2 is not a recommended method.

Muddy Creek Nitrogen, Nitrite

General Statistics

Number of Valid Data	46	Number of Detected Data	9
Number of Distinct Detected Data	8	Number of Non-Detect Data	37
		Percent Non-Detects	80.43%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.011	Minimum Detected	-4.51
Maximum Detected	0.091	Maximum Detected	-2.397
Mean of Detected	0.0327	Mean of Detected	-3.684
SD of Detected	0.027	SD of Detected	0.74
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: There are only 9 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.796	Shapiro Wilk Test Statistic	0.888
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0466	Mean (Log Scale)	-3.13
SD	0.0134	SD (Log Scale)	0.417
95% UTL 95% Coverage	0.0744	95% UTL 95% Coverage	0.104
95% UPL (t)	0.0693	95% UPL (t)	0.0886
90% Percentile (z)	0.0637	90% Percentile (z)	0.0745
95% Percentile (z)	0.0686	95% Percentile (z)	0.0867
99% Percentile (z)	0.0777	99% Percentile (z)	0.115
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0337
		SD in Original Scale	0.0277
		Mean in Log Scale	-3.684
		SD in Log Scale	0.778
		95% UTL 95% Coverage	0.127
		95% UPL (t)	0.0942
		90% Percentile (z)	0.0681
		95% Percentile (z)	0.0904
		99% Percentile (z)	0.154
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.446	Data follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.0226		
nu star	26.04		
A-D Test Statistic	0.635	Nonparametric Statistics	
5% A-D Critical Value	0.73	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.304	Mean	0.0327
5% K-S Critical Value	0.282	SD	0.0255
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	0.00901
		95% KM UTL with 95% Coverage	0.0857
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.145
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0759
Mean	0.0331	90% Percentile (z)	0.0653
Median	0.0312	95% Percentile (z)	0.0746
SD	0.0232	99% Percentile (z)	0.092
k star	0.257		
Theta star	0.129	Gamma ROS Limits with Extrapolated Data	
Nu star	23.61	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.118
95% Percentile of Chisquare (2k)	2.465	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.158
		95% WH Approx. Gamma UTL with 95% Coverage	0.154

90% Percentile	0.0991	95% HW Approx. Gamma UTL with 95% Coverage	0.223
95% Percentile	0.159		
99% Percentile	0.317		

Note: DL/2 is not a recommended method.

Mesa Nitrogen, Nitrite

General Statistics

Number of Valid Data	28	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	23
		Percent Non-Detects	82.14%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.01	Minimum Detected	-4.605
Maximum Detected	0.16	Maximum Detected	-1.833
Mean of Detected	0.0562	Mean of Detected	-3.502
SD of Detected	0.0656	SD of Detected	1.262
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Warning: There are only 5 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.796	Shapiro Wilk Test Statistic	0.852
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0511	Mean (Log Scale)	-3.086
SD	0.0254	SD (Log Scale)	0.524
95% UTL 95% Coverage	0.108	95% UTL 95% Coverage	0.148
95% UPL (t)	0.0951	95% UPL (t)	0.113
90% Percentile (z)	0.0836	90% Percentile (z)	0.0895
95% Percentile (z)	0.0928	95% Percentile (z)	0.108
99% Percentile (z)	0.11	99% Percentile (z)	0.155
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.032
		SD in Original Scale	0.0346
		Mean in Log Scale	-3.887
		SD in Log Scale	0.957
		95% UTL 95% Coverage	0.176
		95% UPL (t)	0.108

		90% Percentile (z)	0.0699
		95% Percentile (z)	0.099
		99% Percentile (z)	0.19
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.507	Data appear Normal at 5% Significance Level	
Theta Star	0.111		
nu star	5.068		
A-D Test Statistic	0.515	Nonparametric Statistics	
5% A-D Critical Value	0.693	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.324	Mean	0.0349
5% K-S Critical Value	0.365	SD	0.0385
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0172
		95% KM UTL with 95% Coverage	0.121
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.206
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.102
Mean	0.0546	90% Percentile (z)	0.0842
Median	0.0555	95% Percentile (z)	0.0982
SD	0.0259	99% Percentile (z)	0.124
k star	3.974		
Theta star	0.0138	Gamma ROS Limits with Extrapolated Data	
Nu star	222.5	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.108
95% Percentile of Chisquare (2k)	15.43	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.111
		95% WH Approx. Gamma UTL with 95% Coverage	0.13
90% Percentile	0.0914	95% HW Approx. Gamma UTL with 95% Coverage	0.136
95% Percentile	0.106		
99% Percentile	0.138		

Note: DL/2 is not a recommended method.

All Nitrogen, Nitrite

General Statistics			
Number of Valid Data	100	Number of Detected Data	19
Number of Distinct Detected Data	14	Number of Non-Detect Data	81
		Percent Non-Detects	81.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.01	Minimum Detected	-4.605
Maximum Detected	0.16	Maximum Detected	-1.833
Mean of Detected	0.0347	Mean of Detected	-3.74
SD of Detected	0.0387	SD of Detected	0.807
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303
Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.652	Shapiro Wilk Test Statistic	0.834
5% Shapiro Wilk Critical Value	0.901	5% Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0471	Mean (Log Scale)	-3.137
SD	0.0176	SD (Log Scale)	0.452
95% UTL 95% Coverage	0.0809	95% UTL 95% Coverage	0.104
95% UPL (t)	0.0764	95% UPL (t)	0.0923
90% Percentile (z)	0.0696	90% Percentile (z)	0.0775
95% Percentile (z)	0.076	95% Percentile (z)	0.0913
99% Percentile (z)	0.088	99% Percentile (z)	0.124
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0283
		SD in Original Scale	0.0238
		Mean in Log Scale	-3.824
		SD in Log Scale	0.709
		95% UTL 95% Coverage	0.0854
		95% UPL (t)	0.0713
		90% Percentile (z)	0.0542
		95% Percentile (z)	0.0701
		99% Percentile (z)	0.114
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.264	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0275		
nu star	48.02		
A-D Test Statistic	1.874	Nonparametric Statistics	
5% A-D Critical Value	0.758	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.329	Mean	0.0291
5% K-S Critical Value	0.202	SD	0.0273
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00592
		95% KM UTL with 95% Coverage	0.0816
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.149
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0747
Mean	0.035	90% Percentile (z)	0.0641
Median	0.0346	95% Percentile (z)	0.074
SD	0.0168	99% Percentile (z)	0.0926
k star	6.486		
Theta star	0.0054	Gamma ROS Limits with Extrapolated Data	
Nu star	1297	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0601
95% Percentile of Chisquare (2k)	22.33	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0603
		95% WH Approx. Gamma UTL with 95% Coverage	0.0652
90% Percentile	0.0534	95% HW Approx. Gamma UTL with 95% Coverage	0.0656
95% Percentile	0.0603		
99% Percentile	0.0746		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nitrogen_Nitrite.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Nitrogen, Nitrite

Background Data: Alluv Nitrogen, Nitrite

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	23	21
Number of Detect Data	5	5
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	0.1	0.1
Percent Non detects	82.14%	80.77%
Minimum Detected	0.01	0.014
Maximum Detected	0.16	0.019
Mean of Detected Data	0.0562	0.017
Median of Detected Data	0.017	0.018
SD of Detected Data	0.0656	0.002

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0.712
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.476

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nitrogen_Nitrite.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Nitrogen, Nitrite

Background Data: Alluv Nitrogen, Nitrite

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	37	21
Number of Detect Data	9	5
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	0.1	0.1
Percent Non detects	80.43%	80.77%
Minimum Detected	0.011	0.014
Maximum Detected	0.091	0.019
Mean of Detected Data	0.0327	0.017
Median of Detected Data	0.016	0.018
SD of Detected Data	0.027	0.002

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0.0685
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.945

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Nitrogen_Nitrite.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Nitrogen, Nitrite

Background Data: Muddy Creek Nitrogen, Nitrite

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	23	37
Number of Detect Data	5	9
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	0.1	0.1
Percent Non detects	82.14%	80.43%
Minimum Detected	0.01	0.011
Maximum Detected	0.16	0.091
Mean of Detected Data	0.0562	0.0327
Median of Detected Data	0.017	0.016
SD of Detected Data	0.0656	0.027

Site vs Background Gehan Test

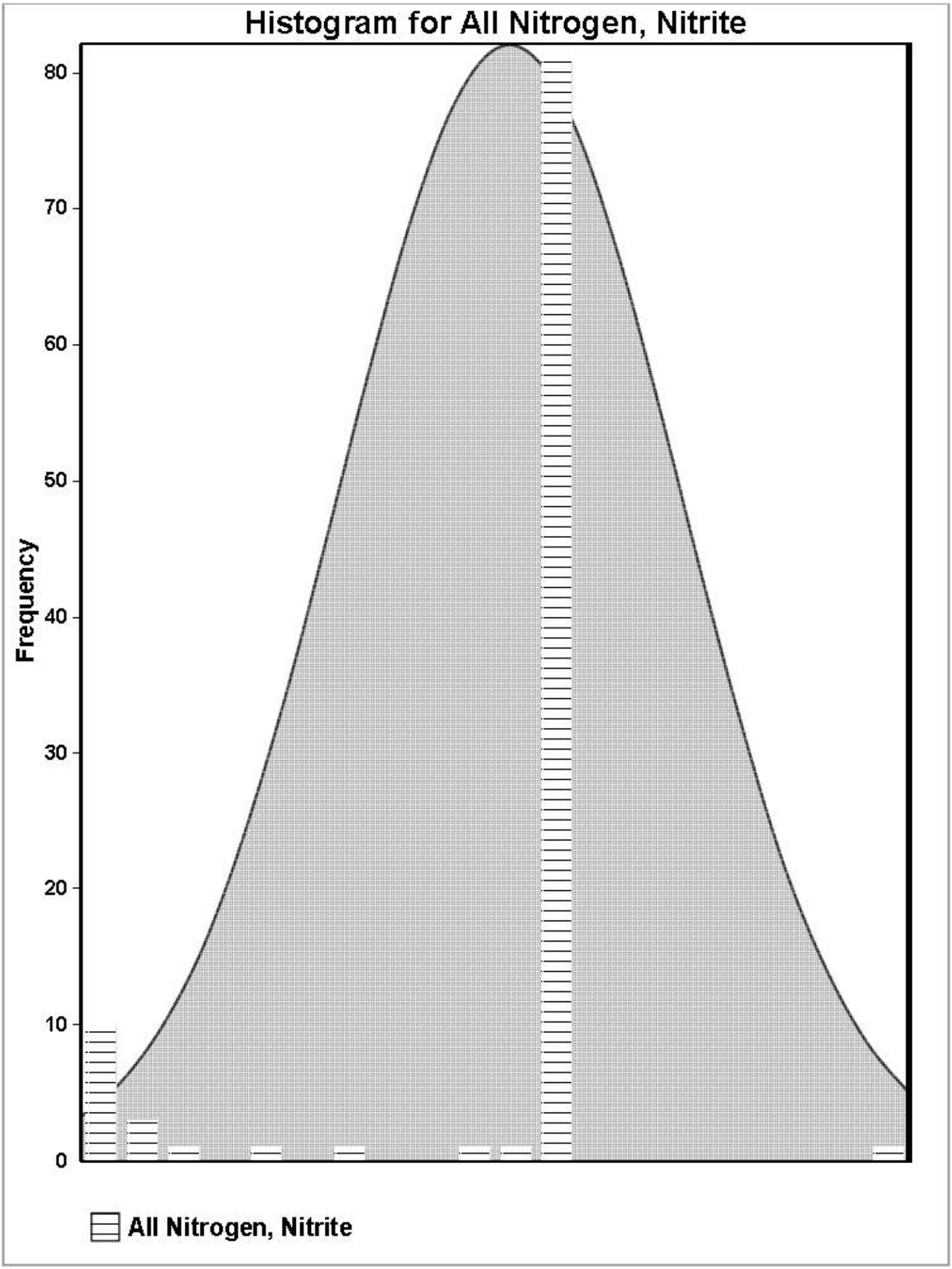
H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0.942
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.346

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for All Nitrogen, Nitrite
Frequency
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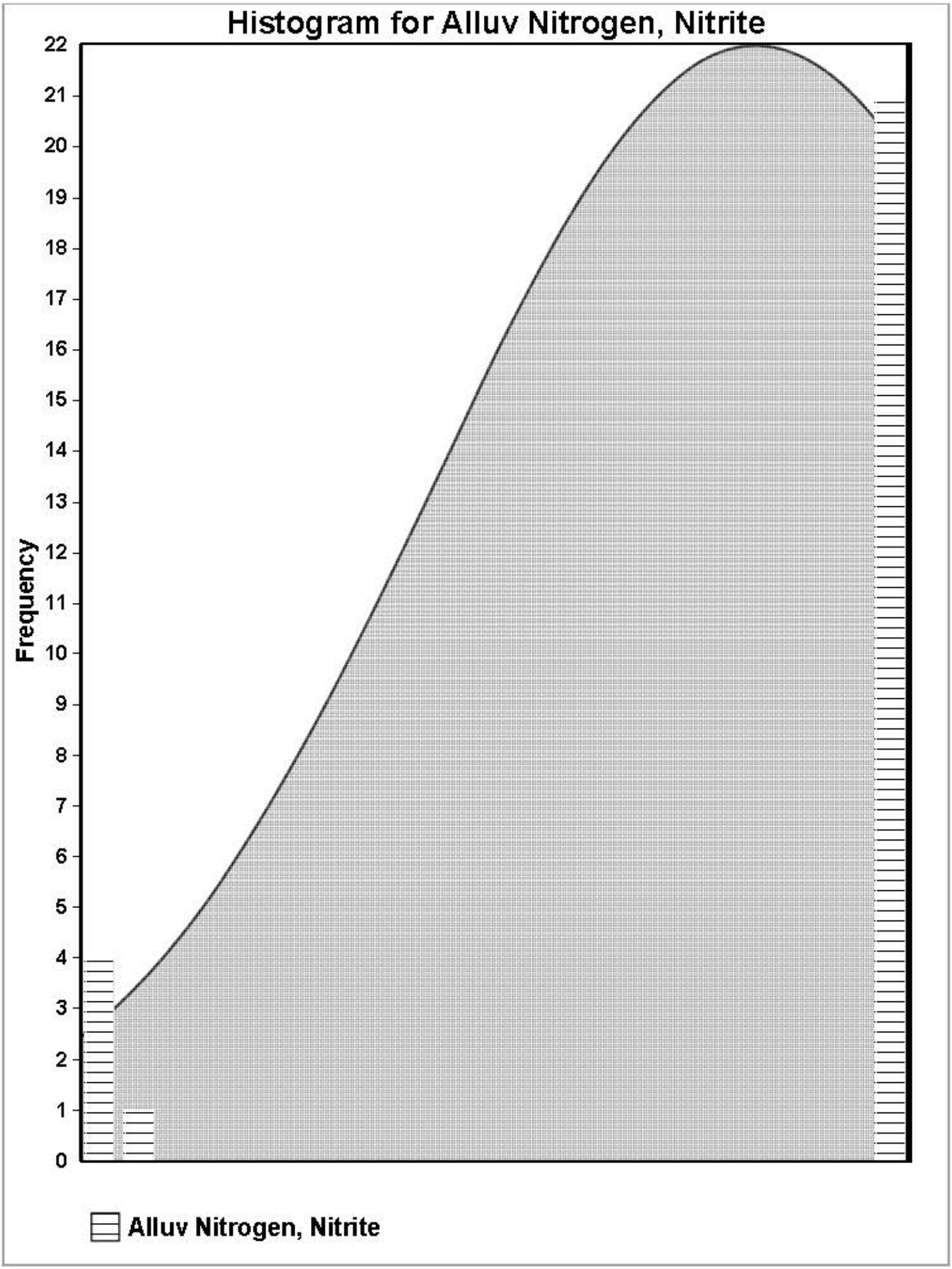
70
60
50
40
30
20
10
0
All Nitrogen, Nitrite


Histogram for Alluv Nitrogen, Nitrite
Frequency
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2
3
4
5
6
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8
9
10
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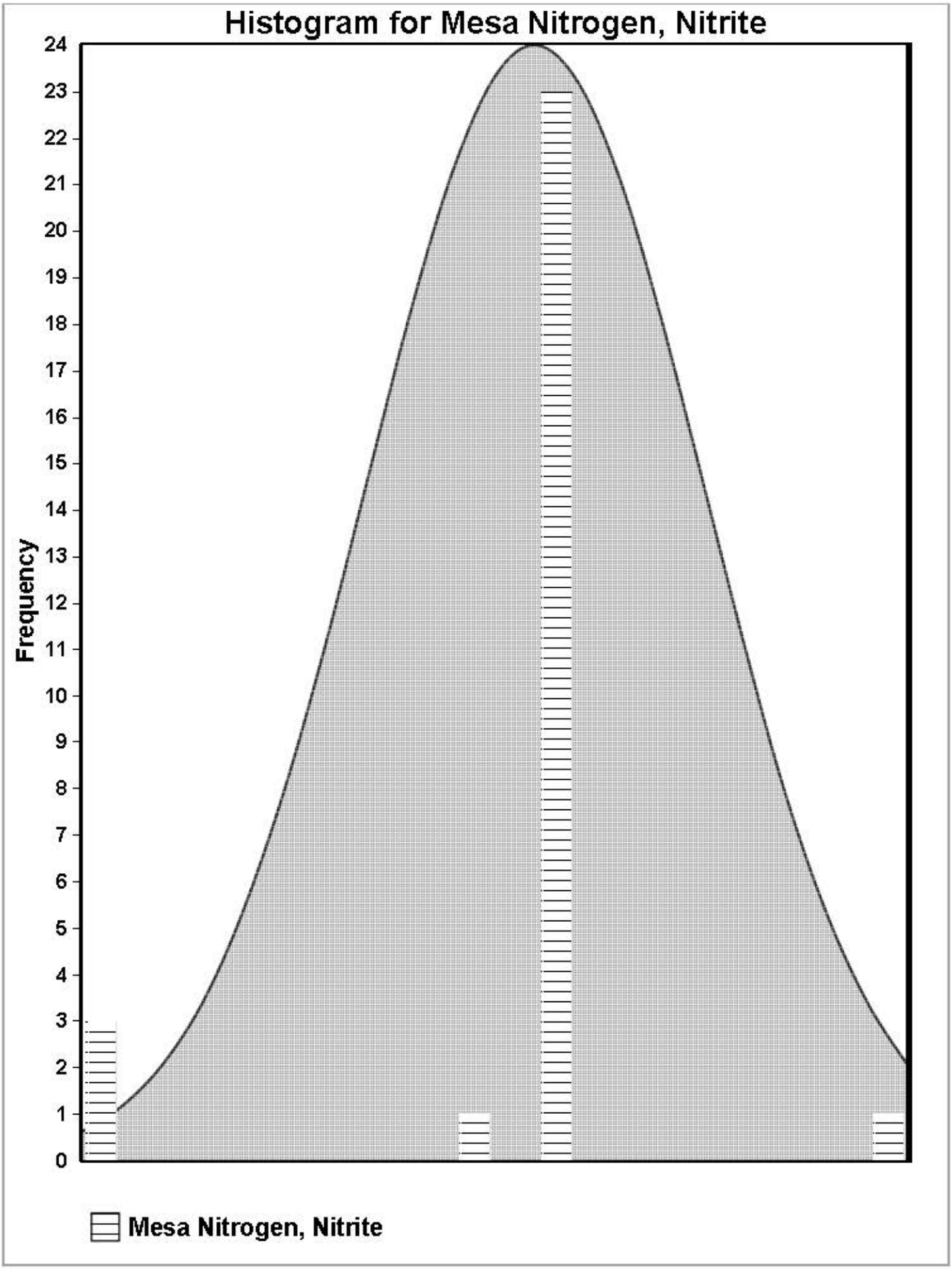
12
13
14
15
16
17
18
19
20
21
22
Alluv Nitrogen, Nitrite


Histogram for Mesa Nitrogen, Nitrite
Frequency
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2
3
4
5
6
7
8
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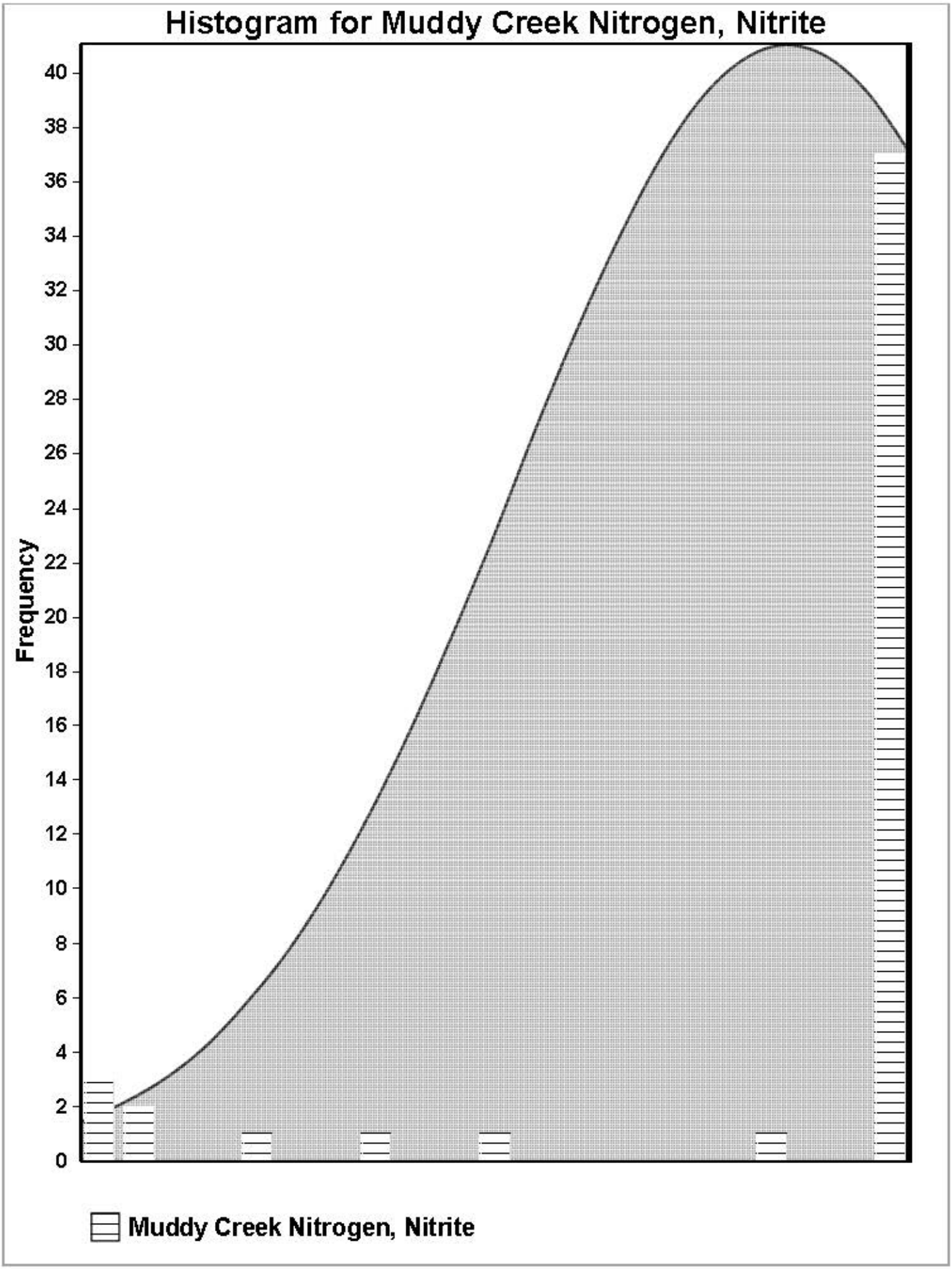
20
21
22
23
24
Mesa Nitrogen, Nitrite


Histogram for Muddy Creek Nitrogen, Nitrite
Frequency
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2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
Muddy Creek Nitrogen, Nitrite

Outlier Tests for Selected Variables

User Selected Options	
From File	Nitrogen_Nitrite.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Nitrogen, Nitrite

Mean	0.0437
Standard Deviation	0.0133
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0437	0.013	0.014	14	2.276	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Nitrogen, Nitrite

Mean	0.0466
Standard Deviation	0.0134
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0466	0.0132	0.091	22	3.362	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.091 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Nitrogen, Nitrite

Mean	0.0511
Standard Deviation	0.0254
Number of data	28
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

1	0.0511	0.0249	0.16	9	4.373	2.88	3.2

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.16 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.16 is a Potential Statistical Outlier

Rosner's Outlier Test for All Nitrogen, Nitrite

Mean	0.0471
Standard Deviation	0.0176
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0471	0.0175	0.16	81	6.457	3.38	3.75

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.16 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.16 is a Potential Statistical Outlier

Location Name	Sample Date	Alluv Nitrogen, Nitrite	D_Alluv Nitrogen, Nitrite
BG-1S	11/26/2012	0.1	0
BG-1S	8/23/2012	0.1	0
BG-1S	5/24/2012	0.1	0
BG-1S	3/20/2012	0.016	1
IMW-2.5D	11/26/2012	0.1	0
IMW-2.5D	8/24/2012	0.1	0
IMW-2.5D	5/21/2012	0.1	0
IMW-2.5D	3/21/2012	0.1	0
IMW-2.5S	11/26/2012	0.1	0
IMW-2.5S	8/24/2012	0.019	1
IMW-2.5S	5/21/2012	0.1	0
IMW-2.5S	3/21/2012	0.1	0
IMW-3S	5/21/2012	0.1	0
IMW-3S	3/20/2012	0.014	1
KMW-2D	11/26/2012	0.1	0
KMW-2D	8/24/2012	0.018	1
KMW-2D	5/21/2012	0.1	0
KMW-2D	3/23/2012	0.1	0
KMW-2M	11/26/2012	0.1	0
KMW-2M	8/24/2012	0.018	1
KMW-2M	5/21/2012	0.1	0
KMW-2M	3/23/2012	0.1	0
KMW-2S	11/26/2012	0.1	0
KMW-2S	8/24/2012	0.1	0
KMW-2S	5/21/2012	0.1	0
KMW-2S	3/23/2012	0.1	0

Location Name	Sample Date	Muddy Creek Nitrogen, Nitrite	D_Muddy Creek Nitrogen, Nitrite
BG-3S	11/27/2012	0.1	0
BG-3S	8/22/2012	0.1	0
BG-3S	5/23/2012	0.1	0
BG-3S	3/21/2012	0.1	0
BG-4S	11/27/2012	0.1	0
BG-4S	8/30/2012	0.1	0
BG-4S	5/30/2012	0.1	0
BG-4S	3/20/2012	0.016	1
BG-6S	11/27/2012	0.1	0
BG-6S	8/23/2012	0.1	0
BG-6S	5/25/2012	0.1	0
BG-6S	3/21/2012	0.1	0
BG-1M	11/26/2012	0.1	0
BG-1M	8/23/2012	0.1	0
BG-1M	5/24/2012	0.1	0
BG-1M	3/20/2012	0.016	1
BG-3M	11/27/2012	0.1	0
BG-3M	8/22/2012	0.1	0
BG-3M	5/24/2012	0.1	0
BG-3M	3/21/2012	0.1	0
BG-4M	11/27/2012	0.057	1
BG-4M	8/30/2012	0.091	1
BG-4M	5/30/2012	0.029	1
BG-4M	3/20/2012	0.045	1
BG-6M	11/27/2012	0.1	0
BG-6M	8/22/2012	0.1	0
BG-6M	5/25/2012	0.1	0
BG-6M	3/21/2012	0.1	0
BG-1D	11/26/2012	0.1	0
BG-1D	8/23/2012	0.1	0
BG-1D	5/24/2012	0.1	0
BG-1D	3/20/2012	0.015	1
BG-3D	11/27/2012	0.1	0
BG-3D	8/21/2012	0.1	0
BG-3D	5/23/2012	0.1	0
BG-3D	3/21/2012	0.1	0
BG-4D	11/27/2012	0.1	0
BG-4D	8/30/2012	0.1	0
BG-4D	5/30/2012	0.1	0
BG-4D	3/20/2012	0.014	1
BG-6D	11/27/2012	0.1	0
BG-6D	8/22/2012	0.1	0
BG-6D	5/25/2012	0.1	0
BG-6D	3/21/2012	0.1	0
IMW-3D	5/25/2012	0.1	0
IMW-3D	3/22/2012	0.011	1

Location Name	Sample Date	Mesa Nitrogen, Nitrite	D_Mesa Nitrogen, Nitrite
BG-2S	11/26/2012	0.1	0
BG-2S	8/23/2012	0.1	0
BG-2S	5/24/2012	0.1	0
BG-2S	3/21/2012	0.011	1
BG-2M	11/26/2012	0.1	0
BG-2M	8/23/2012	0.1	0
BG-2M	5/24/2012	0.1	0
BG-2M	3/21/2012	0.1	0
BG-2D	11/26/2012	0.16	1
BG-2D	8/23/2012	0.1	0
BG-2D	5/24/2012	0.1	0
BG-2D	3/21/2012	0.1	0
LMW-10	11/28/2012	0.1	0
LMW-10	8/27/2012	0.083	1
LMW-10	5/30/2012	0.1	0
LMW-10	3/22/2012	0.01	1
LMW-11R	11/26/2012	0.1	0
LMW-11R	8/21/2012	0.017	1
LMW-11R	5/29/2012	0.1	0
LMW-11R	3/23/2012	0.1	0
LMW-7	11/28/2012	0.1	0
LMW-7	8/27/2012	0.1	0
LMW-7	5/31/2012	0.1	0
LMW-7	3/23/2012	0.1	0
LMW-9	11/28/2012	0.1	0
LMW-9	8/27/2012	0.1	0
LMW-9	5/31/2012	0.1	0
LMW-9	3/23/2012	0.1	0

Location Name	Sample Date	All Nitrogen, Nitrite	D_All Nitrogen, Nitrite
BG-1S	11/26/2012	0.1	0
BG-1S	8/23/2012	0.1	0
BG-1S	5/24/2012	0.1	0
BG-1S	3/20/2012	0.016	1
IMW-2.5D	11/26/2012	0.1	0
IMW-2.5D	8/24/2012	0.1	0
IMW-2.5D	5/21/2012	0.1	0
IMW-2.5D	3/21/2012	0.1	0
IMW-2.5S	11/26/2012	0.1	0
IMW-2.5S	8/24/2012	0.019	1
IMW-2.5S	5/21/2012	0.1	0
IMW-2.5S	3/21/2012	0.1	0
IMW-3S	5/21/2012	0.1	0
IMW-3S	3/20/2012	0.014	1
KMW-2D	11/26/2012	0.1	0
KMW-2D	8/24/2012	0.018	1
KMW-2D	5/21/2012	0.1	0
KMW-2D	3/23/2012	0.1	0
KMW-2M	11/26/2012	0.1	0
KMW-2M	8/24/2012	0.018	1
KMW-2M	5/21/2012	0.1	0
KMW-2M	3/23/2012	0.1	0
KMW-2S	11/26/2012	0.1	0
KMW-2S	8/24/2012	0.1	0
KMW-2S	5/21/2012	0.1	0
KMW-2S	3/23/2012	0.1	0
BG-3S	11/27/2012	0.1	0
BG-3S	8/22/2012	0.1	0
BG-3S	5/23/2012	0.1	0
BG-3S	3/21/2012	0.1	0
BG-4S	11/27/2012	0.1	0
BG-4S	8/30/2012	0.1	0
BG-4S	5/30/2012	0.1	0
BG-4S	3/20/2012	0.016	1
BG-6S	11/27/2012	0.1	0
BG-6S	8/23/2012	0.1	0
BG-6S	5/25/2012	0.1	0
BG-6S	3/21/2012	0.1	0
BG-1M	11/26/2012	0.1	0
BG-1M	8/23/2012	0.1	0
BG-1M	5/24/2012	0.1	0
BG-1M	3/20/2012	0.016	1
BG-3M	11/27/2012	0.1	0
BG-3M	8/22/2012	0.1	0
BG-3M	5/24/2012	0.1	0
BG-3M	3/21/2012	0.1	0
BG-4M	11/27/2012	0.057	1
BG-4M	8/30/2012	0.091	1
BG-4M	5/30/2012	0.029	1
BG-4M	3/20/2012	0.045	1

BG-6M	11/27/2012	0.1	0
BG-6M	8/22/2012	0.1	0
BG-6M	5/25/2012	0.1	0
BG-6M	3/21/2012	0.1	0
BG-1D	11/26/2012	0.1	0
BG-1D	8/23/2012	0.1	0
BG-1D	5/24/2012	0.1	0
BG-1D	3/20/2012	0.015	1
BG-3D	11/27/2012	0.1	0
BG-3D	8/21/2012	0.1	0
BG-3D	5/23/2012	0.1	0
BG-3D	3/21/2012	0.1	0
BG-4D	11/27/2012	0.1	0
BG-4D	8/30/2012	0.1	0
BG-4D	5/30/2012	0.1	0
BG-4D	3/20/2012	0.014	1
BG-6D	11/27/2012	0.1	0
BG-6D	8/22/2012	0.1	0
BG-6D	5/25/2012	0.1	0
BG-6D	3/21/2012	0.1	0
IMW-3D	5/25/2012	0.1	0
IMW-3D	3/22/2012	0.011	1
BG-2S	11/26/2012	0.1	0
BG-2S	8/23/2012	0.1	0
BG-2S	5/24/2012	0.1	0
BG-2S	3/21/2012	0.011	1
BG-2M	11/26/2012	0.1	0
BG-2M	8/23/2012	0.1	0
BG-2M	5/24/2012	0.1	0
BG-2M	3/21/2012	0.1	0
BG-2D	11/26/2012	0.16	1
BG-2D	8/23/2012	0.1	0
BG-2D	5/24/2012	0.1	0
BG-2D	3/21/2012	0.1	0
LMW-10	11/28/2012	0.1	0
LMW-10	8/27/2012	0.083	1
LMW-10	5/30/2012	0.1	0
LMW-10	3/22/2012	0.01	1
LMW-11R	11/26/2012	0.1	0
LMW-11R	8/21/2012	0.017	1
LMW-11R	5/29/2012	0.1	0
LMW-11R	3/23/2012	0.1	0
LMW-7	11/28/2012	0.1	0
LMW-7	8/27/2012	0.1	0
LMW-7	5/31/2012	0.1	0
LMW-7	3/23/2012	0.1	0
LMW-9	11/28/2012	0.1	0
LMW-9	8/27/2012	0.1	0
LMW-9	5/31/2012	0.1	0
LMW-9	3/23/2012	0.1	0

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	pH_Field.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv pH, Field

Raw Statistics	
Number of Valid Observations	33
Number of Distinct Observations	23
Minimum	6.98
Maximum	7.67
Mean of Raw Data	7.3
Standard Deviation of Raw Data	0.15
Kstar	2239
Mean of Log Transformed Data	1.988
Standard Deviation of Log Transformed Data	0.0204

Normal Distribution Test Results	
Correlation Coefficient R	0.989
Shapiro Wilk Test Statistic	0.982
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.882
Lilliefors Test Statistic	0.106
Lilliefors Critical (0.95) Value	0.154

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.991
A-D Test Statistic	0.315
A-D Critical (0.95) Value	0.746
K-S Test Statistic	0.125
K-S Critical(0.95) Value	0.153

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.99
Shapiro Wilk Test Statistic	0.984
Shapiro Wilk Critical (0.95) Value	0.931
Approximate Shapiro Wilk P Value	0.919
Lilliefors Test Statistic	0.102
Lilliefors Critical (0.95) Value	0.154

Data appear Lognormal at (0.05) Significance Level

Muddy Creek pH, Field

Raw Statistics	
Number of Valid Observations	47

Number of Distinct Observations	29
Minimum	7.05
Maximum	7.77
Mean of Raw Data	7.437
Standard Deviation of Raw Data	0.142
Kstar	2618
Mean of Log Transformed Data	2.006
Standard Deviation of Log Transformed Data	0.0191

Normal Distribution Test Results

Correlation Coefficient R	0.981
Shapiro Wilk Test Statistic	0.968
Shapiro Wilk Critical (0.95) Value	0.946
Approximate Shapiro Wilk P Value	0.349
Lilliefors Test Statistic	0.104
Lilliefors Critical (0.95) Value	0.129

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.981
A-D Test Statistic	0.503
A-D Critical (0.95) Value	0.748
K-S Test Statistic	0.106
K-S Critical(0.95) Value	0.129

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.979
Shapiro Wilk Test Statistic	0.965
Shapiro Wilk Critical (0.95) Value	0.946
Approximate Shapiro Wilk P Value	0.259
Lilliefors Test Statistic	0.107
Lilliefors Critical (0.95) Value	0.129

Data appear Lognormal at (0.05) Significance Level

Mesa pH, Field

Raw Statistics

Number of Valid Observations	46
Number of Distinct Observations	30
Minimum	6.89
Maximum	7.65
Mean of Raw Data	7.325
Standard Deviation of Raw Data	0.178
Kstar	1609
Mean of Log Transformed Data	1.991
Standard Deviation of Log Transformed Data	0.0244

Normal Distribution Test Results

Correlation Coefficient R	0.991
Shapiro Wilk Test Statistic	0.973
Shapiro Wilk Critical (0.95) Value	0.945
Approximate Shapiro Wilk P Value	0.496
Lilliefors Test Statistic	0.0896
Lilliefors Critical (0.95) Value	0.131

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.99
A-D Test Statistic	0.335
A-D Critical (0.95) Value	0.747
K-S Test Statistic	0.0925
K-S Critical(0.95) Value	0.13

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.991
Shapiro Wilk Test Statistic	0.972
Shapiro Wilk Critical (0.95) Value	0.945
Approximate Shapiro Wilk P Value	0.483
Lilliefors Test Statistic	0.09
Lilliefors Critical (0.95) Value	0.131

Data appear Lognormal at (0.05) Significance Level

Alluv + Mesa pH, Field

Raw Statistics

Number of Valid Observations	99
Number of Distinct Observations	51
Minimum	6.89
Maximum	7.73
Mean of Raw Data	7.35
Standard Deviation of Raw Data	0.171
Kstar	1808
Mean of Log Transformed Data	1.994
Standard Deviation of Log Transformed Data	0.0233

Normal Distribution Test Results

Correlation Coefficient R	0.996
Approximate Shapiro Wilk Test Statistic	0.981
Approximate Shapiro Wilk P Value	0.571
Lilliefors Test Statistic	0.0701
Lilliefors Critical (0.95) Value	0.089

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.995
A-D Test Statistic	0.372

A-D Critical (0.95) Value	0.75
K-S Test Statistic	0.0719
K-S Critical(0.95) Value	0.0897
Data appear Gamma Distributed at (0.05) Significance Level	
Lognormal Distribution Test Results	
Correlation Coefficient R	0.995
Approximate Shapiro Wilk Test Statistic	0.98
Approximate Shapiro Wilk P Value	0.529
Lilliefors Test Statistic	0.071
Lilliefors Critical (0.95) Value	0.089
Data appear Lognormal at (0.05) Significance Level	

General Background Statistics for Full Data Sets

User Selected Options	
From File	pH_Field.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv pH, Field

General Statistics

Total Number of Observations	33	Number of Distinct Observations	23

Raw Statistics		Log-Transformed Statistics	
Minimum	6.98	Minimum	1.943
Maximum	7.67	Maximum	2.037
Second Largest	7.6	Second Largest	2.028
First Quartile	7.2	First Quartile	1.974
Median	7.27	Median	1.984
Third Quartile	7.42	Third Quartile	2.004
Mean	7.3	Mean	1.988
SD	0.15	SD	0.0204
Coefficient of Variation	0.0205		
Skewness	0.314		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.982	Shapiro Wilk Test Statistic	0.984
Shapiro Wilk Critical Value	0.931	Shapiro Wilk Critical Value	0.931
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	7.626	95% UTL with 95% Coverage	7.631
95% UPL (t)	7.557	95% UPL (t)	7.56
90% Percentile (z)	7.492	90% Percentile (z)	7.492
95% Percentile (z)	7.546	95% Percentile (z)	7.548
99% Percentile (z)	7.648	99% Percentile (z)	7.654

Gamma Distribution Test		Data Distribution Test	
k star	2239	Data appear Normal at 5% Significance Level	
Theta Star	0.00326		
MLE of Mean	7.3		
MLE of Standard Deviation	0.154		
nu star	147797		
A-D Test Statistic	0.315	Nonparametric Statistics	
5% A-D Critical Value	0.746	90% Percentile	7.458
K-S Test Statistic	0.125	95% Percentile	7.54
5% K-S Critical Value	0.153	99% Percentile	7.648
Data appear Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	7.67
90% Percentile	7.498	95% Percentile Bootstrap UTL with 95% Coverage	7.67
95% Percentile	7.556	95% BCA Bootstrap UTL with 95% Coverage	7.67
99% Percentile	7.664	95% UPL	7.621
		95% Chebyshev UPL	7.962
95% WH Approx. Gamma UPL	7.559	Upper Threshold Limit Based upon IQR	7.75
95% HW Approx. Gamma UPL	7.559		
95% WH Approx. Gamma UTL with 95% Coverage	7.629		
95% HW Approx. Gamma UTL with 95% Coverage	7.629		

Muddy Creek pH, Field

General Statistics			
Total Number of Observations	47	Number of Distinct Observations	29
Raw Statistics		**Log-Transformed Statistics**	
Minimum	7.05	Minimum	1.953
Maximum	7.77	Maximum	2.05
Second Largest	7.64	Second Largest	2.033
First Quartile	7.355	First Quartile	1.995
Median	7.45	Median	2.008
Third Quartile	7.525	Third Quartile	2.018
Mean	7.437	Mean	2.006
SD	0.142	SD	0.0191
Coefficient of Variation	0.019		
Skewness	-0.531		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.968	Shapiro Wilk Test Statistic	0.965
Shapiro Wilk Critical Value	0.946	Shapiro Wilk Critical Value	0.946
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	7.731	95% UTL with 95% Coverage	7.737
95% UPL (t)	7.678	95% UPL (t)	7.681
90% Percentile (z)	7.619	90% Percentile (z)	7.621
95% Percentile (z)	7.67	95% Percentile (z)	7.674
99% Percentile (z)	7.767	99% Percentile (z)	7.775
Gamma Distribution Test		**Data Distribution Test**	
k star	2618	Data appear Normal at 5% Significance Level	
Theta Star	0.00284		
MLE of Mean	7.437		
MLE of Standard Deviation	0.145		
nu star	246139		
A-D Test Statistic	0.503	**Nonparametric Statistics**	
5% A-D Critical Value	0.748	90% Percentile	7.596
K-S Test Statistic	0.106	95% Percentile	7.63
5% K-S Critical Value	0.129	99% Percentile	7.71

Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	7.64
90% Percentile	7.624	95% Percentile Bootstrap UTL with 95% Coverage	7.731
95% Percentile	7.678	95% BCA Bootstrap UTL with 95% Coverage	7.64
99% Percentile	7.78	95% UPL	7.636
		95% Chebyshev UPL	8.061
95% WH Approx. Gamma UPL	7.68	Upper Threshold Limit Based upon IQR	7.78
95% HW Approx. Gamma UPL	7.68		
95% WH Approx. Gamma UTL with 95% Coverage	7.735		
95% HW Approx. Gamma UTL with 95% Coverage	7.736		

Mesa pH, Field

General Statistics			
Total Number of Observations	46	Number of Distinct Observations	30
Raw Statistics		Log-Transformed Statistics	
Minimum	6.89	Minimum	1.93
Maximum	7.65	Maximum	2.035
Second Largest	7.62	Second Largest	2.031
First Quartile	7.208	First Quartile	1.975
Median	7.305	Median	1.989
Third Quartile	7.488	Third Quartile	2.013
Mean	7.325	Mean	1.991
SD	0.178	SD	0.0244
Coefficient of Variation	0.0243		
Skewness	-0.122		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.973	Shapiro Wilk Test Statistic	0.972
Shapiro Wilk Critical Value	0.945	Shapiro Wilk Critical Value	0.945
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	7.696	95% UTL with 95% Coverage	7.704
95% UPL (t)	7.628	95% UPL (t)	7.633
90% Percentile (z)	7.554	90% Percentile (z)	7.556
95% Percentile (z)	7.619	95% Percentile (z)	7.623
99% Percentile (z)	7.74	99% Percentile (z)	7.751
Gamma Distribution Test		Data Distribution Test	
k star	1609	Data appear Normal at 5% Significance Level	
Theta Star	0.00455		
MLE of Mean	7.325		
MLE of Standard Deviation	0.183		
nu star	148068		
A-D Test Statistic	0.335	Nonparametric Statistics	
5% A-D Critical Value	0.747	90% Percentile	7.56

K-S Test Statistic	0.0925	95% Percentile	7.61
5% K-S Critical Value	0.13	99% Percentile	7.637
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	7.62
90% Percentile	7.56	95% Percentile Bootstrap UTL with 95% Coverage	7.64
95% Percentile	7.628	95% BCA Bootstrap UTL with 95% Coverage	7.62
99% Percentile	7.757	95% UPL	7.617
		95% Chebyshev UPL	8.111
95% WH Approx. Gamma UPL	7.631	Upper Threshold Limit Based upon IQR	7.908
95% HW Approx. Gamma UPL	7.632		
95% WH Approx. Gamma UTL with 95% Coverage	7.701		
95% HW Approx. Gamma UTL with 95% Coverage	7.702		

Alluv + Mesa pH, Field

General Statistics

Total Number of Observations	99	Number of Distinct Observations	51
Raw Statistics		Log-Transformed Statistics	
Minimum	6.89	Minimum	1.93
Maximum	7.73	Maximum	2.045
Second Largest	7.67	Second Largest	2.037
First Quartile	7.245	First Quartile	1.98
Median	7.35	Median	1.995
Third Quartile	7.495	Third Quartile	2.014
Mean	7.35	Mean	1.994
SD	0.171	SD	0.0233
Coefficient of Variation	0.0232		
Skewness	-0.148		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.0701	Lilliefors Test Statistic	0.071
Lilliefors Critical Value	0.089	Lilliefors Critical Value	0.089
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	7.679	95% UTL with 95% Coverage	7.685
95% UPL (t)	7.635	95% UPL (t)	7.639
90% Percentile (z)	7.569	90% Percentile (z)	7.57
95% Percentile (z)	7.631	95% Percentile (z)	7.635
99% Percentile (z)	7.747	99% Percentile (z)	7.757
Gamma Distribution Test		Data Distribution Test	
k star	1808	Data appear Normal at 5% Significance Level	
Theta Star	0.00407		
MLE of Mean	7.35		
MLE of Standard Deviation	0.173		
nu star	357909		

A-D Test Statistic	0.372	Nonparametric Statistics	
5% A-D Critical Value	0.75	90% Percentile	7.57
K-S Test Statistic	0.0719	95% Percentile	7.61
5% K-S Critical Value	0.0897	99% Percentile	7.671
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	7.65
90% Percentile	7.572	95% Percentile Bootstrap UTL with 95% Coverage	7.65
95% Percentile	7.636	95% BCA Bootstrap UTL with 95% Coverage	7.623
99% Percentile	7.758	95% UPL	7.61
		95% Chebyshev UPL	8.098
95% WH Approx. Gamma UPL	7.638	Upper Threshold Limit Based upon IQR	7.87
95% HW Approx. Gamma UPL	7.638		
95% WH Approx. Gamma UTL with 95% Coverage	7.683		
95% HW Approx. Gamma UTL with 95% Coverage	7.683		

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	pH_Field.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa pH, Field

Background Data: Alluv pH, Field

Raw Statistics

	Site	Background
Number of Valid Observations	46	33
Number of Distinct Observations	30	23
Minimum	6.89	6.98
Maximum	7.65	7.67
Mean	7.325	7.3
Median	7.305	7.27
SD	0.178	0.15
SE of Mean	0.0263	0.026

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1925
WMW Test U-Stat	0.835
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.404

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	pH_Field.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek pH, Field

Background Data: Alluv pH, Field

Raw Statistics

	Site	Background
Number of Valid Observations	47	33
Number of Distinct Observations	29	23
Minimum	7.05	6.98
Maximum	7.77	7.67
Mean	7.437	7.3
Median	7.45	7.27
SD	0.142	0.15
SE of Mean	0.0207	0.026

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	2322
WMW Test U-Stat	4.08
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	4.4966E-5

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

t-Test Site vs Background Comparison for Full Data Sets without NDs

User Selected Options	
From File	pH_Field.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean Equal to Background Mean (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean Not Equal to Background Mean

Area of Concern Data: Mesa pH, Field

Background Data: Muddy Creek pH, Field

Raw Statistics

	Site	Background
Number of Valid Observations	46	47
Number of Distinct Observations	30	29
Minimum	6.89	7.05
Maximum	7.65	7.77
Mean	7.325	7.437
Median	7.305	7.45
SD	0.178	0.142
SE of Mean	0.0263	0.0207

Site vs Background Two-Sample t-Test

H0: Mu of Site = Mu of Background

Method	DF	t-Test Value	Critical t (0.050)	P-Value
Pooled (Equal Variance)	91	-3.352	1.987	0.001
Welch-Satterthwaite (Unequal Vari	85.8	-3.344	1.988	0.001

Pooled SD: 0.161

Conclusion with Alpha = 0.050

* Student t (Pooled): Reject H0, Conclude Site <> Background
* Welch-Satterthwaite: Reject H0, Conclude Site <> Background

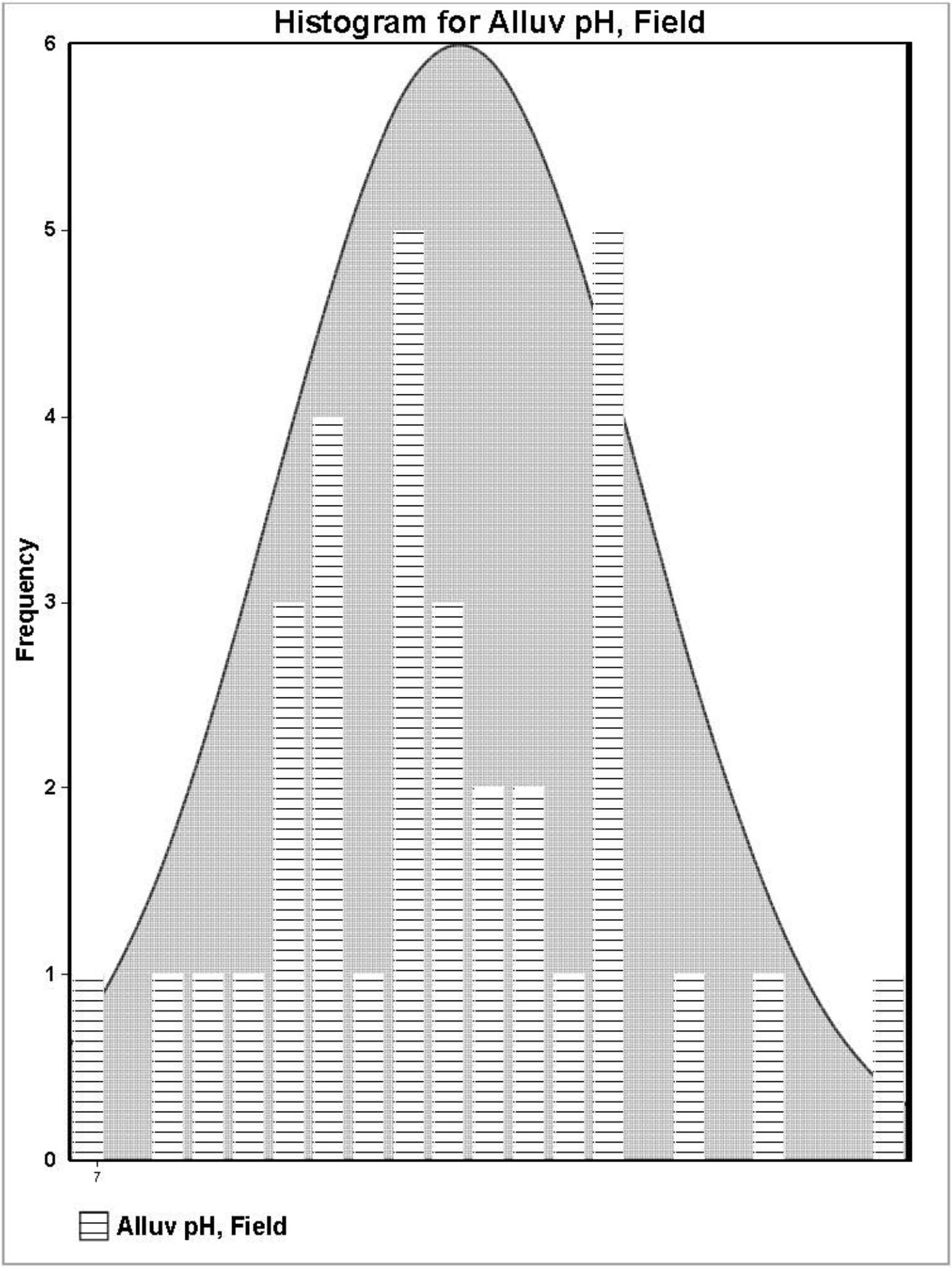
Test of Equality of Variances

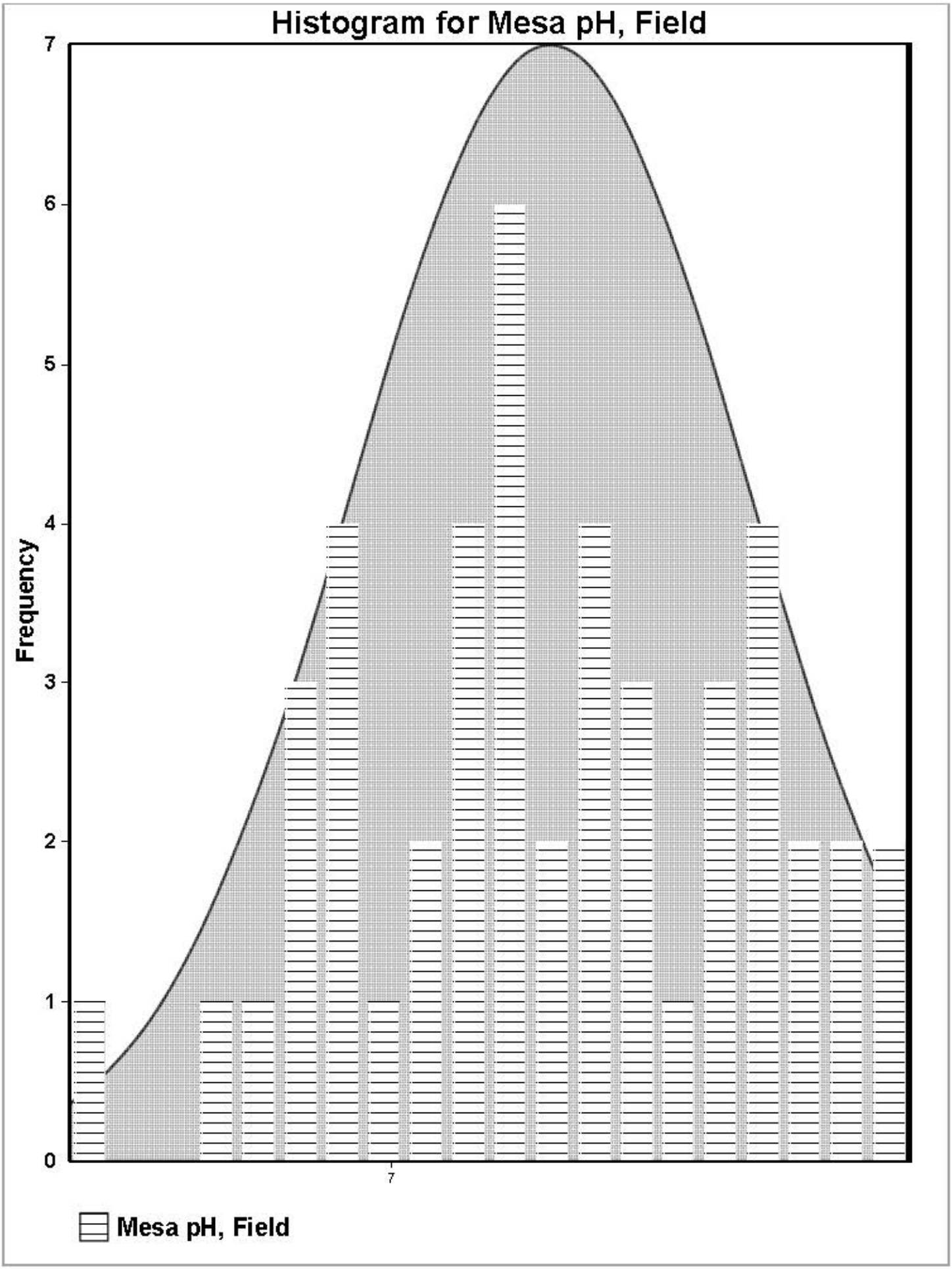
Variance of Site	0.0318
Variance of Background	0.0201

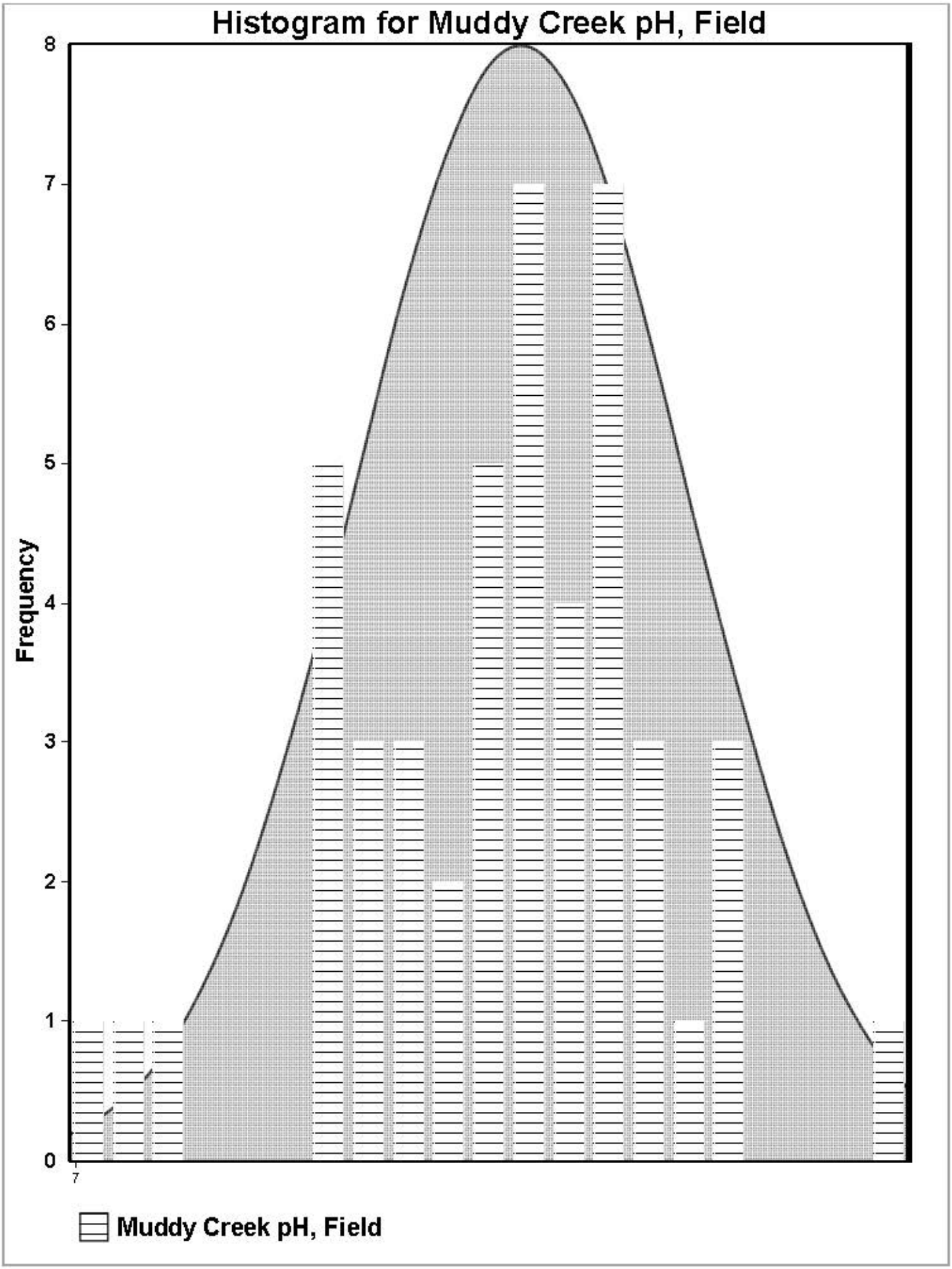
Numerator DF	Denominator DF	F-Test Value	P-Value
45	46	1.584	0.124

Conclusion with Alpha = 0.05

* Two variances appear to be equal


Histogram for Alluv pH, Field
Frequency
0
1
2
3
4
5
6
7
Alluv pH, Field


Histogram for Mesa pH, Field
Frequency
0
1
2
3
4
5
6
7
7
Mesa pH, Field


Histogram for Muddy Creek pH, Field
Frequency
0
1
2
3
4
5
6
7
8
7
Muddy Creek pH, Field

Outlier Tests for Selected Variables

User Selected Options	
From File	pH_Field.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for Alluv pH, Field

Mean	7.3
Standard Deviation	0.15
Number of data	33
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.3	0.147	7.67	11	2.511	2.95	3.29

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek pH, Field

Mean	7.437
Standard Deviation	0.142
Number of data	47
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.437	0.14	7.05	45	2.763	3.1	3.46

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa pH, Field

Mean	7.325
Standard Deviation	0.178
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.325	0.176	6.89	1	2.47	3.09	3.45

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Alluv + Mesa pH, Field

Mean	7.35
Standard Deviation	0.171
Number of data	99
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	7.35	0.17	6.89	42	2.704	3.377	3.747

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Location Name	Sample Date	Alluv pH, Field
BG-1S	11/26/2012	6.98
BG-1S	8/23/2012	7.22
BG-1S	5/24/2012	7.05
BG-1S	3/20/2012	7.24
IMW-2.5D	11/26/2012	7.36
IMW-2.5D	5/21/2012	7.26
IMW-2.5D	3/21/2012	7.43
IMW-2.5D	12/8/2011	7.3
IMW-2.5S	11/26/2012	7.35
IMW-2.5S	5/21/2012	7.46
IMW-2.5S	3/21/2012	7.67
IMW-2.5S	12/8/2011	7.38
IMW-2.5S	9/9/2011	7.6
IMW-3S	5/21/2012	7.09
IMW-3S	3/20/2012	7.19
IMW-3S	12/9/2011	7.45
IMW-3S	9/9/2011	7.5
KMW-2D	11/26/2012	7.33
KMW-2D	8/24/2012	7.3
KMW-2D	5/21/2012	7.18
KMW-2D	3/23/2012	7.18
KMW-2D	12/8/2011	7.43
KMW-2M	11/26/2012	7.27
KMW-2M	8/24/2012	7.27
KMW-2M	5/21/2012	7.18
KMW-2M	3/23/2012	7.14
KMW-2M	12/8/2011	7.42
KMW-2S	11/26/2012	7.26
KMW-2S	8/24/2012	7.26
KMW-2S	5/21/2012	7.2
KMW-2S	3/23/2012	7.22
KMW-2S	12/8/2011	7.43
KMW-2S	9/9/2011	7.3

Location Name	Sample Date	Muddy Creek pH, Field
BG-3S	11/27/2012	7.44
BG-3S	8/22/2012	7.54
BG-3S	5/23/2012	7.31
BG-3S	3/21/2012	7.63
BG-4S	11/27/2012	7.29
BG-4S	8/30/2012	7.53
BG-4S	5/30/2012	7.5
BG-4S	3/20/2012	7.42
BG-6S	11/27/2012	7.46
BG-6S	8/23/2012	7.58
BG-6S	5/25/2012	7.35
BG-6S	3/21/2012	7.52
BG-1M	11/26/2012	7.11
BG-1M	8/23/2012	7.36
BG-1M	5/24/2012	7.13
BG-1M	3/20/2012	7.28
BG-3M	11/27/2012	7.41
BG-3M	8/22/2012	7.49
BG-3M	5/24/2012	7.52
BG-3M	3/21/2012	7.49
BG-4M	11/27/2012	7.37
BG-4M	8/30/2012	7.62
BG-4M	5/30/2012	7.53
BG-4M	3/20/2012	7.46
BG-6M	11/27/2012	7.49
BG-6M	8/22/2012	7.45
BG-6M	5/25/2012	7.47
BG-6M	3/21/2012	7.45
BG-1D	11/26/2012	7.29
BG-1D	8/23/2012	7.38
BG-1D	5/24/2012	7.42
BG-1D	3/20/2012	7.29
BG-3D	11/27/2012	7.47
BG-3D	8/21/2012	7.52
BG-3D	5/23/2012	7.54
BG-3D	3/21/2012	7.44
BG-4D	11/27/2012	7.58
BG-4D	8/30/2012	7.77
BG-4D	5/30/2012	7.64
BG-4D	3/20/2012	7.56
BG-6D	11/27/2012	7.31
BG-6D	8/22/2012	7.4
BG-6D	5/25/2012	7.45
BG-6D	3/21/2012	7.31
IMW-3D	5/25/2012	7.05
IMW-3D	3/22/2012	7.3
IMW-3D	12/9/2011	7.63

Location Name	Sample Date	Mesa pH, Field
BG-2S	11/26/2012	6.89
BG-2S	8/23/2012	7.12
BG-2S	5/24/2012	7.02
BG-2S	3/21/2012	7.11
BG-2M	11/26/2012	7.12
BG-2M	8/23/2012	7.25
BG-2M	5/24/2012	7.13
BG-2M	3/21/2012	7.26
BG-2D	11/26/2012	7.35
BG-2D	8/23/2012	7.36
BG-2D	5/24/2012	7.48
BG-2D	3/21/2012	7.3
LMW-10	3/22/2012	7.49
LMW-10	12/6/2011	7.65
LMW-10	9/8/2011	7.5
LMW-7	3/23/2012	7.27
LMW-7	12/5/2011	7.61
LMW-7	9/6/2011	7.4
LMW-9	3/23/2012	7.39
LMW-9	12/5/2011	7.62
LMW-9	9/8/2011	7.5
LMW-11	2/22/2012	7.5
LMW-11	12/6/2011	7.1
LMW-11	9/8/2011	7.3
LMW-11	3/2/2011	7.3
LMW-12R	11/30/2012	7.36
LMW-12R	10/22/2012	7.56
LMW-12R	8/21/2012	7.39
LMW-12R	5/30/2012	7.44
LMW-11R	3/23/2012	7.25
LMW-13R	11/28/2012	7.36
LMW-13R	10/22/2012	7.31
LMW-13R	8/20/2012	7.2
LMW-13R	5/29/2012	7.28
LMW-14R	11/30/2012	7.07
LMW-14R	10/22/2012	7.28
LMW-14R	8/20/2012	7.13
LMW-14R	5/29/2012	7.19
LMW-15	11/28/2012	7.1
LMW-15	10/22/2012	7.34
LMW-15	8/20/2012	7.23
LMW-15	5/29/2012	7.28
LMW-16	11/28/2012	7.56
LMW-16	10/22/2012	7.61
LMW-16	8/20/2012	7.49
LMW-16	5/29/2012	7.52

Location Name	Sample Date	Alluv + Mesa pH, Field
BG-1S	11/26/2012	6.98
BG-1S	8/23/2012	7.22
BG-1S	5/24/2012	7.05
BG-1S	3/20/2012	7.24
IMW-2.5D	11/26/2012	7.36
IMW-2.5D	8/24/2012	7.57
IMW-2.5D	5/21/2012	7.26
IMW-2.5D	2/29/2012	7.6
IMW-2.5D	3/21/2012	7.43
IMW-2.5D	12/8/2011	7.3
IMW-2.5S	11/26/2012	7.35
IMW-2.5S	8/24/2012	7.57
IMW-2.5S	5/21/2012	7.46
IMW-2.5S	2/29/2012	7.73
IMW-2.5S	3/21/2012	7.67
IMW-2.5S	12/8/2011	7.38
IMW-2.5S	9/9/2011	7.6
IMW-3S	5/21/2012	7.09
IMW-3S	3/20/2012	7.19
IMW-3S	2/29/2012	7.5
IMW-3S	12/9/2011	7.45
IMW-3S	9/9/2011	7.5
KMW-2D	11/26/2012	7.33
KMW-2D	8/24/2012	7.3
KMW-2D	5/21/2012	7.18
KMW-2D	3/23/2012	7.18
KMW-2D	2/28/2012	7.4
KMW-2D	12/8/2011	7.43
KMW-2M	11/26/2012	7.27
KMW-2M	8/24/2012	7.27
KMW-2M	5/21/2012	7.18
KMW-2M	3/23/2012	7.14
KMW-2M	2/28/2012	7.38
KMW-2M	12/8/2011	7.42
KMW-2S	11/26/2012	7.26
KMW-2S	8/24/2012	7.26
KMW-2S	5/21/2012	7.2
KMW-2S	2/28/2012	7.41
KMW-2S	3/23/2012	7.22
KMW-2S	12/8/2011	7.43
KMW-2S	9/9/2011	7.3
BG-2S	11/26/2012	6.89
BG-2S	8/23/2012	7.12
BG-2S	5/24/2012	7.02
BG-2S	3/21/2012	7.11
BG-2M	11/26/2012	7.12
BG-2M	8/23/2012	7.25
BG-2M	5/24/2012	7.13
BG-2M	3/21/2012	7.26
BG-2D	11/26/2012	7.35
BG-2D	8/23/2012	7.36

BG-2D	5/24/2012	7.48
BG-2D	3/21/2012	7.3
LMW-10	8/27/2012	7.52
LMW-10	5/30/2012	7.27
LMW-10	2/22/2012	7.58
LMW-10	3/22/2012	7.49
LMW-10	12/6/2011	7.65
LMW-10	9/8/2011	7.5
LMW-7	8/27/2012	7.53
LMW-7	5/31/2012	7.44
LMW-7	2/22/2012	7.51
LMW-7	3/23/2012	7.27
LMW-7	12/5/2011	7.61
LMW-7	9/6/2011	7.4
LMW-9	8/27/2012	7.5
LMW-9	5/31/2012	7.52
LMW-9	3/23/2012	7.39
LMW-9	2/23/2012	7.56
LMW-9	12/5/2011	7.62
LMW-9	9/8/2011	7.5
LMW-11	2/22/2012	7.5
LMW-11	12/6/2011	7.1
LMW-11	9/8/2011	7.3
LMW-12R	11/30/2012	7.36
LMW-12R	10/22/2012	7.56
LMW-12R	8/21/2012	7.39
LMW-12R	5/30/2012	7.44
LMW-11R	11/26/2012	7.36
LMW-11R	10/23/2012	7.48
LMW-11R	8/21/2012	7.27
LMW-11R	5/29/2012	7.35
LMW-11R	3/23/2012	7.25
LMW-13R	11/28/2012	7.36
LMW-13R	10/22/2012	7.31
LMW-13R	8/20/2012	7.2
LMW-13R	5/29/2012	7.28
LMW-14R	11/30/2012	7.07
LMW-14R	10/22/2012	7.28
LMW-14R	8/20/2012	7.13
LMW-14R	5/29/2012	7.19
LMW-15	11/28/2012	7.1
LMW-15	10/22/2012	7.34
LMW-15	8/20/2012	7.23
LMW-15	5/29/2012	7.28
LMW-16	11/28/2012	7.56
LMW-16	10/22/2012	7.61
LMW-16	8/20/2012	7.49
LMW-16	5/29/2012	7.52

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Phenanthrene.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Phenanthrene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	2	24	92.31%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	24	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	26	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	26	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	26	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	N/A	N/A	
Lilliefors (Detects Only)	N/A	N/A	
Shapiro-Wilks (NDs = DL)	N/A	N/A	
Lilliefors (NDs = DL)	N/A	N/A	
Shapiro-Wilks (NDs = DL/2)	N/A	N/A	
Lilliefors (NDs = DL/2)	N/A	N/A	
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A	
Lilliefors (Normal ROS Estimates)	N/A	N/A	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A	
Anderson-Darling (NDs = DL/2)	N/A	N/A	
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A	
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A	
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A	

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Phenanthrene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs

Raw Statistics	46	0	46	6	40	86.96%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	40	0.05	0.05	0.05	0.05	2.108E-17
Statistics (Detects Only)	6	0.012	0.044	0.019	0.015	0.0123
Statistics (All: NDs treated as DL value)	46	0.012	0.05	0.046	0.05	0.0113
Statistics (All: NDs treated as DL/2 value)	46	0.012	0.044	0.0242	0.025	0.00458
Statistics (Normal ROS Estimated Data)	46	-0.0043	0.044	0.019	0.0175	0.0111
Statistics (Gamma ROS Estimated Data)	46	1.000E-12	0.044	0.0186	0.0186	0.00938
Statistics (Lognormal ROS Estimated Data)	46	0.00641	0.0445	0.0187	0.0159	0.0091

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.394	4.122	0.00432	-4.081	0.478	-0.117
Statistics (NDs = DL)	8.892	8.327	0.00517	-3.137	0.403	-0.128
Statistics (NDs = DL/2)	25.95	24.27	9.3326E-4	-3.74	0.208	-0.0556
Statistics (Gamma ROS Estimates)	0.855	0.814	0.0218	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.081	0.456	-0.112

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.75	0.616	0.669	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.59	0.788	Data Not Normal
Lilliefors (Detects Only)	0.461	0.362	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.384	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.509	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.495	0.945	Data Not Normal
Lilliefors (NDs = DL/2)	0.459	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.983	0.945	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0761	0.131	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.851	0.528	0.661	0.887

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.192	0.699	
Kolmogorov-Smirnov (Detects Only)	0.457	0.333	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	14.35	0.75	
Kolmogorov-Smirnov (NDs = DL)	0.513	0.13	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	12.26	0.748	
Kolmogorov-Smirnov (NDs = DL/2)	0.482	0.13	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	6.042	0.785	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.289	0.135	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.802	0.614	0.68	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.67	0.788	Data Not Lognormal
Lilliefors (Detects Only)	0.431	0.362	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.383	0.945	Data Not Lognormal
Lilliefors (NDs = DL)	0.507	0.131	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.501	0.945	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.488	0.131	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.982	0.945	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0703	0.131	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Phenanthrene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	3	25	89.29%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	25	0.05	0.05	0.05	0.05	1.416E-17
Statistics (Detects Only)	3	0.0096	0.1	0.0405	0.012	0.0515
Statistics (All: NDs treated as DL value)	28	0.0096	0.1	0.049	0.05	0.0143
Statistics (All: NDs treated as DL/2 value)	28	0.0096	0.1	0.0267	0.025	0.0148
Statistics (Normal ROS Estimated Data)	28	-0.0518	0.1	0.0158	0.0129	0.0344
Statistics (Gamma ROS Estimated Data)	28	1.000E-12	0.1	0.00434	1.000E-12	0.019
Statistics (Lognormal ROS Estimated Data)	28	0.00214	0.1	0.0177	0.0117	0.0196

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.988	0.906	0.041	-3.79	1.293	-0.341
Statistics (NDs = DL)	7.896	7.074	0.0062	-3.081	0.432	-0.14
Statistics (NDs = DL/2)	6.799	6.095	0.00392	-3.7	0.353	-0.0955
Statistics (Gamma ROS Estimates)	0.045	0.064	0.0966	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.423	0.877	-0.198

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.877	0.643	0.52	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.77	0.767	Data Appear Normal
Lilliefors (Detects Only)	0.377	0.512	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.46	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.457	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.311	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.509	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.994	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0595	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.638	0.587	0.966

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	8.123	0.747	
Kolmogorov-Smirnov (NDs = DL)	0.499	0.165	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.785	0.747	
Kolmogorov-Smirnov (NDs = DL/2)	0.479	0.166	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	9.083	1.397	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.564	0.216	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.906	0.615	0.633	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.821	0.767	Data Appear Lognormal
Lilliefors (Detects Only)	0.354	0.512	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.412	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.507	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.451	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.452	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.995	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0547	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

All Phenanthrene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	11	89	89.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	89	0.05	0.05	0.05	0.05	9.072E-17
Statistics (Detects Only)	11	0.0092	0.1	0.0231	0.013	0.0273
Statistics (All: NDs treated as DL value)	100	0.0092	0.1	0.047	0.05	0.0121
Statistics (All: NDs treated as DL/2 value)	100	0.0092	0.1	0.0248	0.025	0.0087
Statistics (Normal ROS Estimated Data)	100	-0.0294	0.1	0.0186	0.0163	0.0205
Statistics (Gamma ROS Estimated Data)	100	0.0092	0.1	0.022	0.0204	0.0113
Statistics (Lognormal ROS Estimated Data)	100	0.00348	0.1	0.0173	0.0141	0.0128

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.604	1.563	0.0144	-4.11	0.738	-0.18
Statistics (NDs = DL)	8.275	8.033	0.00569	-3.118	0.422	-0.135
Statistics (NDs = DL/2)	13.31	12.92	0.00186	-3.735	0.269	-0.0721
Statistics (Gamma ROS Estimates)	5.325	5.172	0.00413	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.243	0.597	-0.141

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.727	0.625	0.514	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.552	0.85	Data Not Normal

Lilliefors (Detects Only)	0.435	0.267	Data Not Normal
Lilliefors (NDs = DL)	0.496	0.0886	Data Not Normal
Lilliefors (NDs = DL/2)	0.47	0.0886	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0524	0.0886	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.891	0.57	0.54	0.786

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.688	0.742	
Kolmogorov-Smirnov (Detects Only)	0.412	0.259	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	30.89	0.753	
Kolmogorov-Smirnov (NDs = DL)	0.515	0.0895	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	26.84	0.751	
Kolmogorov-Smirnov (NDs = DL/2)	0.459	0.0894	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.719	0.754	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0604	0.0896	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.849	0.61	0.641	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.732	0.85	Data Not Lognormal
Lilliefors (Detects Only)	0.366	0.267	Data Not Lognormal
Lilliefors (NDs = DL)	0.514	0.0886	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.478	0.0886	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0409	0.0886	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Phenanthrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Phenanthrene

General Statistics

Number of Valid Data	26	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	24
		Percent Non-Detects	92.31%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0092	Minimum Detected	-4.689
Maximum Detected	0.0094	Maximum Detected	-4.667
Mean of Detected	0.0093	Mean of Detected	-4.678
SD of Detected	1.4142E-4	SD of Detected	0.0152
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0238	Mean (Log Scale)	-3.765
SD	0.00427	SD (Log Scale)	0.269
95% UTL 95% Coverage	0.0335	95% UTL 95% Coverage	0.0427
95% UPL (t)	0.0312	95% UPL (t)	0.037
90% Percentile (z)	0.0293	90% Percentile (z)	0.0327

95% Percentile (z)	0.0308	95% Percentile (z)	0.036
99% Percentile (z)	0.0337	99% Percentile (z)	0.0433
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		95% UTL 95% Coverage	N/A
		95% UPL (t)	N/A
		90% Percentile (z)	N/A
		95% Percentile (z)	N/A
		99% Percentile (z)	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.0093
5% K-S Critical Value	N/A	SD	1.0000E-4
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.0000E-4
		95% KM UTL with 95% Coverage	0.00953
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.00974
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00947
Mean	N/A	90% Percentile (z)	0.00943
Median	N/A	95% Percentile (z)	0.00946
SD	N/A	99% Percentile (z)	0.00953
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

Muddy Creek Phenanthrene

General Statistics			
Number of Valid Data	46	Number of Detected Data	6
Number of Distinct Detected Data	4	Number of Non-Detect Data	40
		Percent Non-Detects	86.96%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.012	Minimum Detected	-4.423
Maximum Detected	0.044	Maximum Detected	-3.124
Mean of Detected	0.019	Mean of Detected	-4.081

SD of Detected	0.0123	SD of Detected	0.478
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.59	Shapiro Wilk Test Statistic	0.67
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0242	Mean (Log Scale)	-3.74
SD	0.00458	SD (Log Scale)	0.208
95% UTL 95% Coverage	0.0338	95% UTL 95% Coverage	0.0366
95% UPL (t)	0.032	95% UPL (t)	0.0338
90% Percentile (z)	0.0301	90% Percentile (z)	0.031
95% Percentile (z)	0.0318	95% Percentile (z)	0.0334
99% Percentile (z)	0.0349	99% Percentile (z)	0.0385
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0187
		SD in Original Scale	0.0091
		Mean in Log Scale	-4.081
		SD in Log Scale	0.456
		95% UTL 95% Coverage	0.0436
		95% UPL (t)	0.0366
		90% Percentile (z)	0.0303
		95% Percentile (z)	0.0357
		99% Percentile (z)	0.0487
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.308	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00823		
nu star	27.7		
A-D Test Statistic	1.192	Nonparametric Statistics	
5% A-D Critical Value	0.699	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.457	Mean	0.019
5% K-S Critical Value	0.333	SD	0.0112
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00503
		95% KM UTL with 95% Coverage	0.0424
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0685
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0381
Mean	0.0186	90% Percentile (z)	0.0334

Median	0.0186	95% Percentile (z)	0.0375
SD	0.00938	99% Percentile (z)	0.0451
k star	0.814		
Theta star	0.0229	Gamma ROS Limits with Extrapolated Data	
Nu star	74.85	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0475
95% Percentile of Chisquare (2k)	5.247	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0558
		95% WH Approx. Gamma UTL with 95% Coverage	0.058
90% Percentile	0.0451	95% HW Approx. Gamma UTL with 95% Coverage	0.071
95% Percentile	0.06		
99% Percentile	0.0952		

Note: DL/2 is not a recommended method.

Mesa Phenanthrene

General Statistics

Number of Valid Data	28	Number of Detected Data	3
Number of Distinct Detected Data	3	Number of Non-Detect Data	25
		Percent Non-Detects	89.29%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0096	Minimum Detected	-4.646
Maximum Detected	0.1	Maximum Detected	-2.303
Mean of Detected	0.0405	Mean of Detected	-3.79
SD of Detected	0.0515	SD of Detected	1.293
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.77	Shapiro Wilk Test Statistic	0.821
5% Shapiro Wilk Critical Value	0.767	5% Shapiro Wilk Critical Value	0.767
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0267	Mean (Log Scale)	-3.7
SD	0.0148	SD (Log Scale)	0.353
95% UTL 95% Coverage	0.06	95% UTL 95% Coverage	0.0547
95% UPL (t)	0.0524	95% UPL (t)	0.0456
90% Percentile (z)	0.0457	90% Percentile (z)	0.0389
95% Percentile (z)	0.0511	95% Percentile (z)	0.0442

99% Percentile (z)	0.0612	99% Percentile (z)	0.0563
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0177
		SD in Original Scale	0.0196
		Mean in Log Scale	-4.423
		SD in Log Scale	0.877
		95% UTL 95% Coverage	0.086
		95% UPL (t)	0.0549
		90% Percentile (z)	0.0369
		95% Percentile (z)	0.0508
		99% Percentile (z)	0.0923
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data appear Normal at 5% Significance Level	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.014
5% K-S Critical Value	N/A	SD	0.0166
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00396
		95% KM UTL with 95% Coverage	0.0513
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0876
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0428
Mean	N/A	90% Percentile (z)	0.0353
Median	N/A	95% Percentile (z)	0.0413
SD	N/A	99% Percentile (z)	0.0526
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

All Phenanthrene

General Statistics			
Number of Valid Data	100	Number of Detected Data	11
Number of Distinct Detected Data	8	Number of Non-Detect Data	89
		Percent Non-Detects	89.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0092	Minimum Detected	-4.689
Maximum Detected	0.1	Maximum Detected	-2.303
Mean of Detected	0.0231	Mean of Detected	-4.11
SD of Detected	0.0273	SD of Detected	0.738

Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.552	Shapiro Wilk Test Statistic	0.732
5% Shapiro Wilk Critical Value	0.85	5% Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0248	Mean (Log Scale)	-3.735
SD	0.0087	SD (Log Scale)	0.269
95% UTL 95% Coverage	0.0415	95% UTL 95% Coverage	0.0401
95% UPL (t)	0.0393	95% UPL (t)	0.0374
90% Percentile (z)	0.0359	90% Percentile (z)	0.0337
95% Percentile (z)	0.0391	95% Percentile (z)	0.0372
99% Percentile (z)	0.045	99% Percentile (z)	0.0447
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0173
		SD in Original Scale	0.0128
		Mean in Log Scale	-4.243
		SD in Log Scale	0.597
		95% UTL 95% Coverage	0.0453
		95% UPL (t)	0.0389
		90% Percentile (z)	0.0309
		95% Percentile (z)	0.0383
		99% Percentile (z)	0.0576
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.227	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0188		
nu star	27		
A-D Test Statistic	1.688	Nonparametric Statistics	
5% A-D Critical Value	0.742	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.412	Mean	0.0163
5% K-S Critical Value	0.259	SD	0.0129
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00333
		95% KM UTL with 95% Coverage	0.041
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0726
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0377
Mean	0.022	90% Percentile (z)	0.0327
Median	0.0204	95% Percentile (z)	0.0374
SD	0.0113	99% Percentile (z)	0.0462
k star	5.172		
Theta star	0.00425	Gamma ROS Limits with Extrapolated Data	
Nu star	1034	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0399
95% Percentile of Chisquare (2k)	18.78	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0401
		95% WH Approx. Gamma UTL with 95% Coverage	0.0437
90% Percentile	0.0349	95% HW Approx. Gamma UTL with 95% Coverage	0.044

				95% Percentile	0.0399						
				99% Percentile	0.0505						
Note: DL/2 is not a recommended method.											

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Phenanthrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Phenanthrene

Background Data: Alluv Phenanthrene

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	25	24
Number of Detect Data	3	2
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	89.29%	92.31%
Minimum Detected	0.0096	0.0092
Maximum Detected	0.1	0.0094
Mean of Detected Data	0.0405	0.0093
Median of Detected Data	0.012	0.0093
SD of Detected Data	0.0515	1.4142E-4

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	1.108
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.268

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Phenanthrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Phenanthrene

Background Data: Alluv Phenanthrene

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	40	24
Number of Detect Data	6	2
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	86.96%	92.31%
Minimum Detected	0.012	0.0092
Maximum Detected	0.044	0.0094
Mean of Detected Data	0.019	0.0093
Median of Detected Data	0.015	0.0093
SD of Detected Data	0.0123	1.4142E-4

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	1.914
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0556

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Phenanthrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Phenanthrene

Background Data: Muddy Creek Phenanthrene

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	25	40
Number of Detect Data	3	6
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	89.29%	86.96%
Minimum Detected	0.0096	0.012
Maximum Detected	0.1	0.044
Mean of Detected Data	0.0405	0.019
Median of Detected Data	0.012	0.015
SD of Detected Data	0.0515	0.0123

Site vs Background Gehan Test

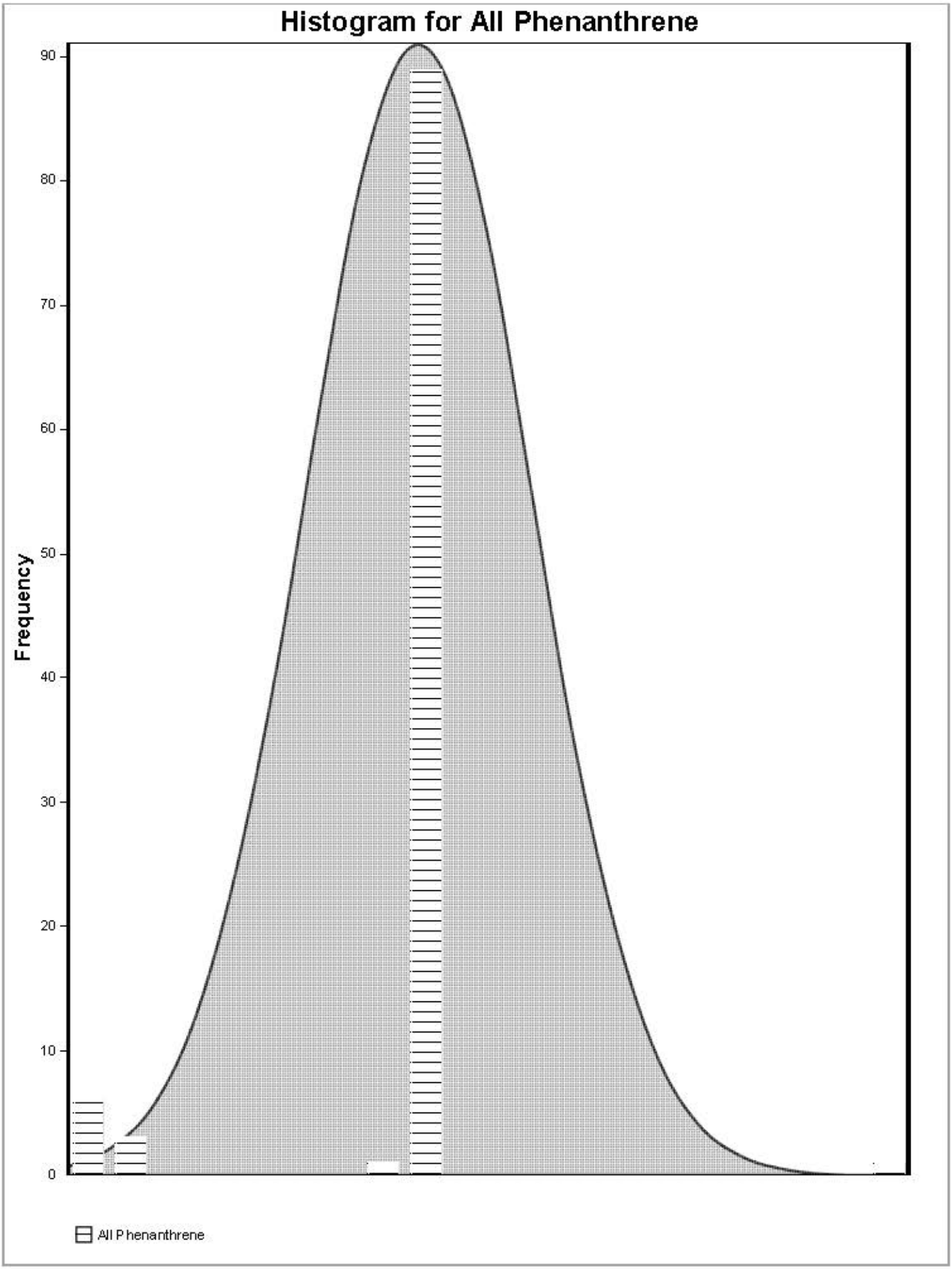
H0: Mu of Site or AOC = Mu of background

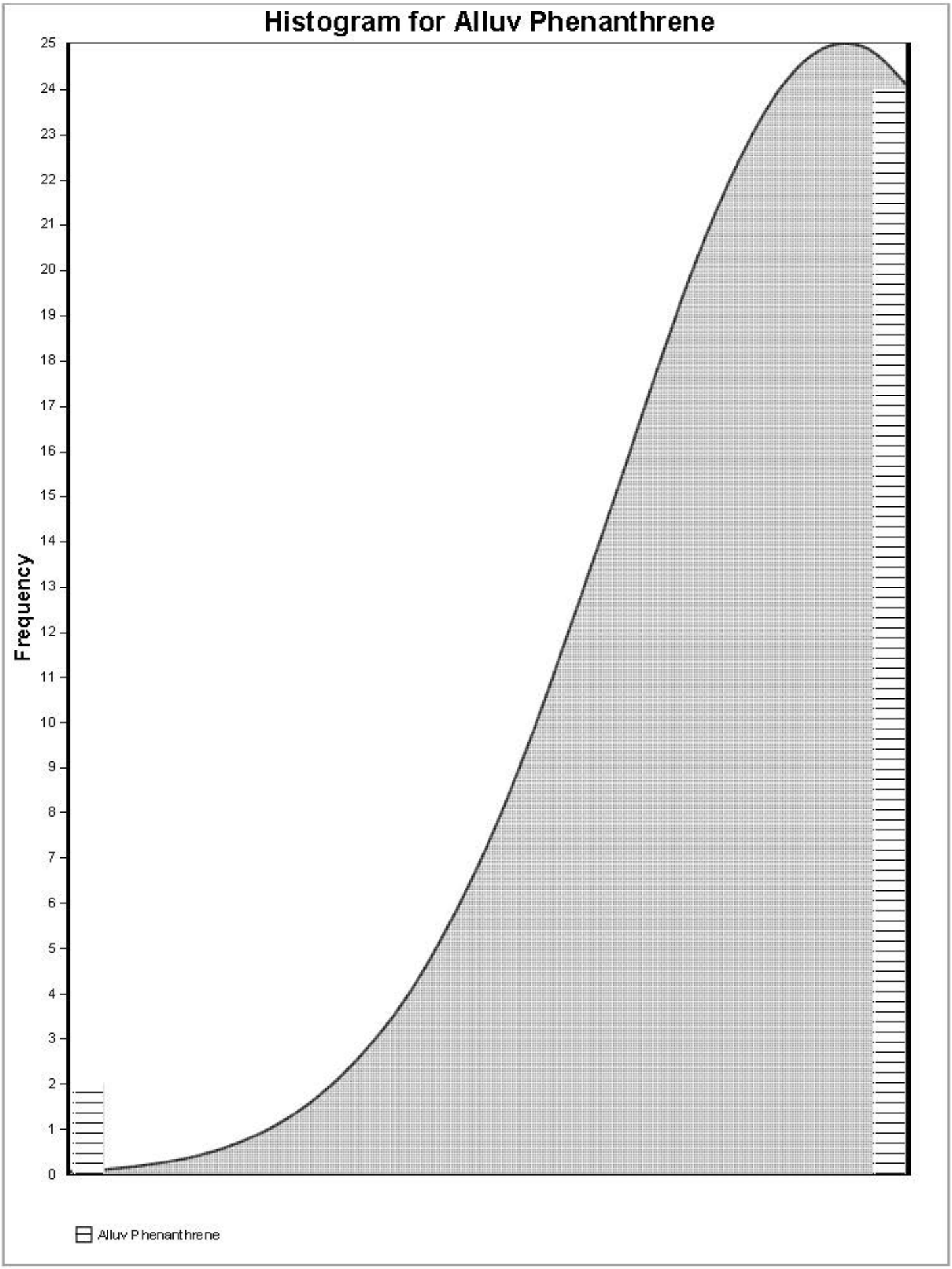
Gehan z Test Value	0.933
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.351

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for All Phenanthrene
Frequency
90
80
70
60
50
40
30
20
10
0
All Phenanthrene


Histogram for Alluv Phenanthrene
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
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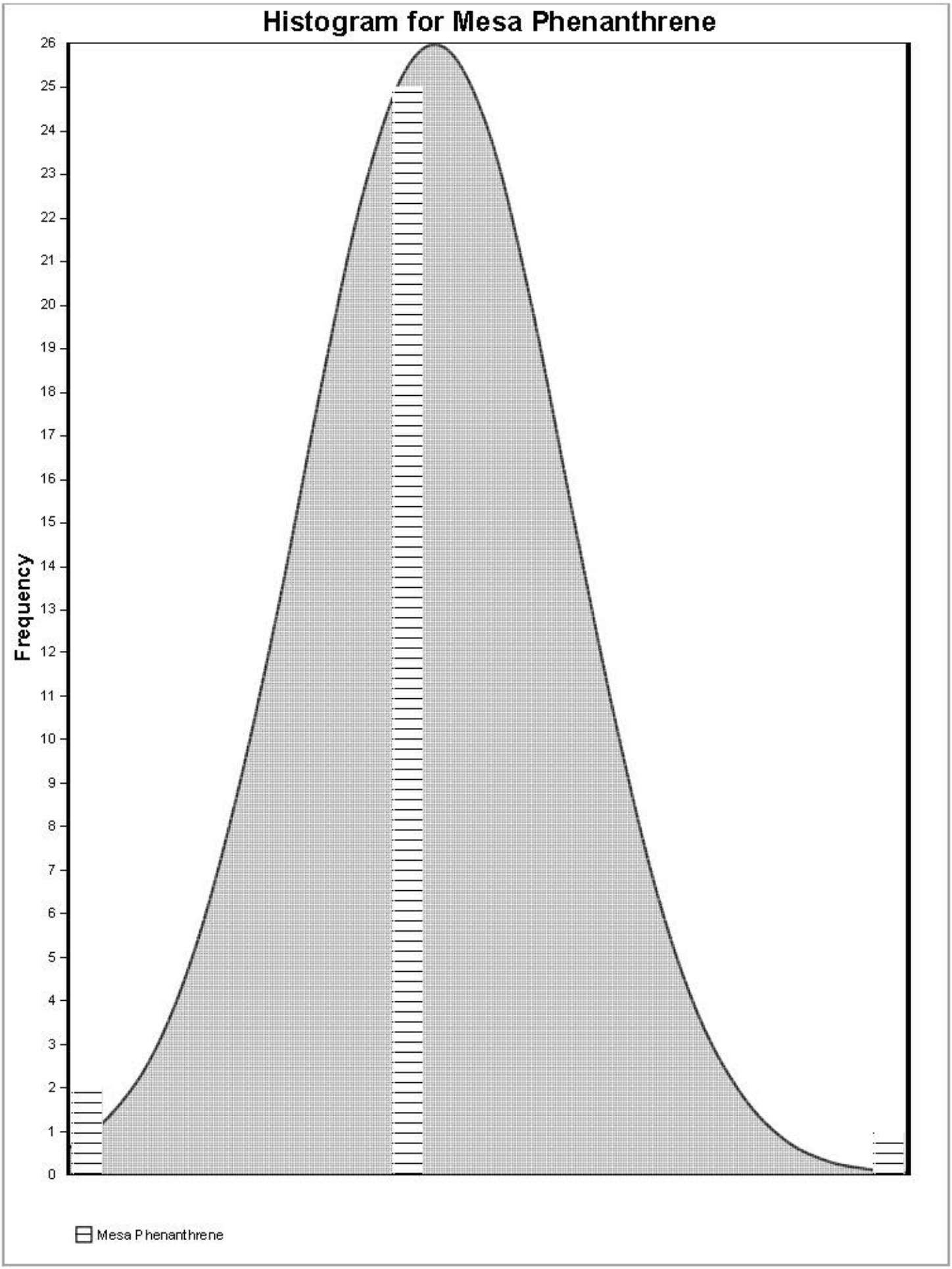
14
15
16
17
18
19
20
21
22
23
24
25
Alluv Phenanthrene


Histogram for Mesa Phenanthrene
Frequency
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2
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14
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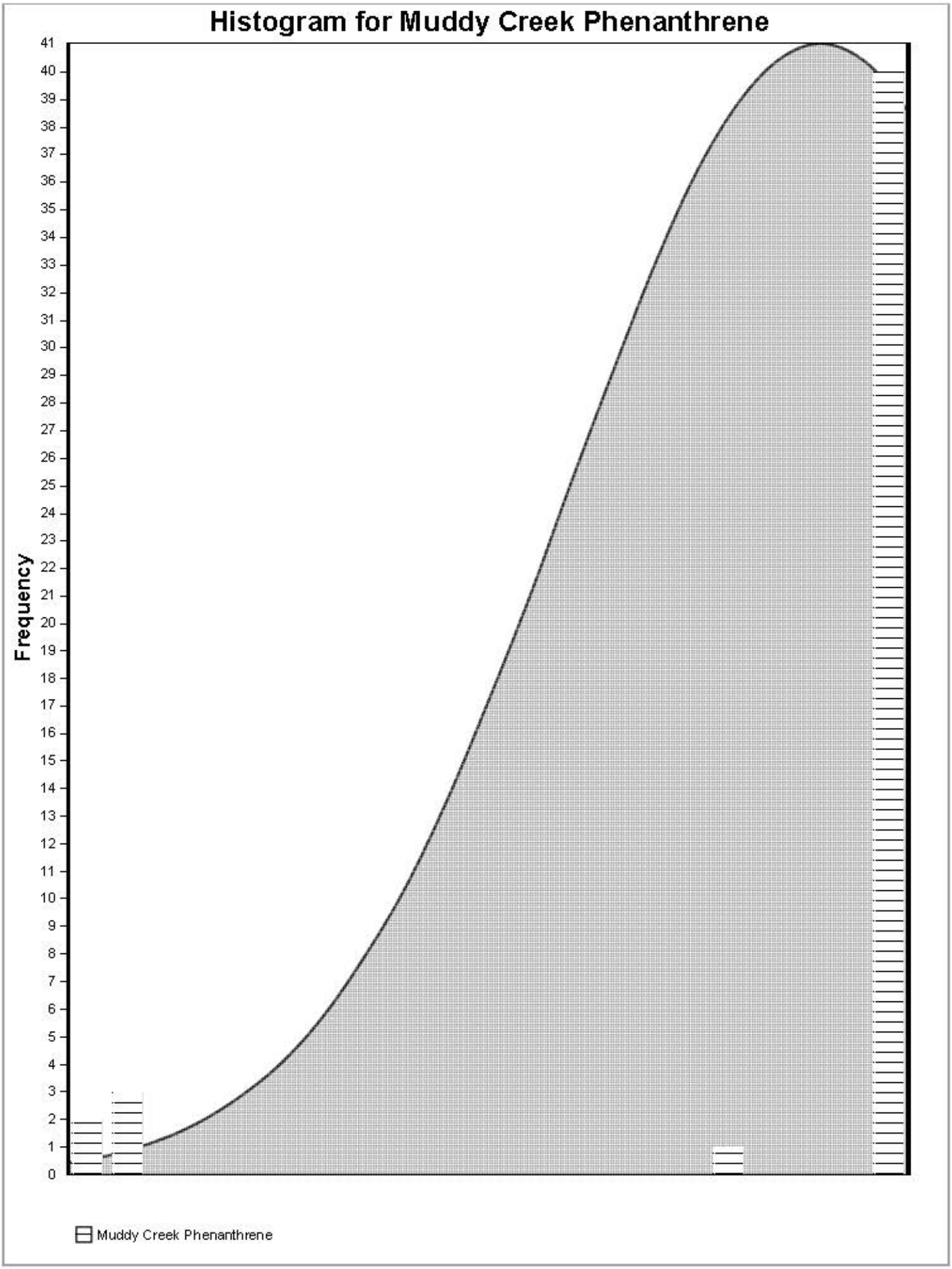
23
24
25
26
Mesa Phenanthrene


Histogram for Muddy Creek Phenanthrene
Frequency
0
1
2
3
4
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14
15
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20
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39
40
41
Muddy Creek Phenanthrene

Outlier Tests for Selected Variables

User Selected Options	
From File	Phenanthrene.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Phenanthrene

Mean	0.0238
Standard Deviation	0.00427
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0238	0.00418	0.0092	15	3.488	2.84	3.16

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.0092 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.0092 is a Potential Statistical Outlier

Rosner's Outlier Test for Muddy Creek Phenanthrene

Mean	0.0242
Standard Deviation	0.00458
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0242	0.00453	0.044	18	4.363	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.044 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.044 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Phenanthrene

Mean	0.0267
Standard Deviation	0.0148
Number of data	28
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0267	0.0146	0.1	13	5.029	2.88	3.2

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.1 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.1 is a Potential Statistical Outlier

Rosner's Outlier Test for All Phenanthrene

Mean	0.0248
Standard Deviation	0.0087
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0248	0.00866	0.1	85	8.688	3.38	3.75

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.1 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.1 is a Potential Statistical Outlier

Phenanthrene

Location Name	Sample Date	Alluv Phenanthrene	Location Name	Sample Date	Muddy Creek Phenanthrene	Location Name	Sample Date	Mesa Phenanthrene	Location Name	Sample Date	All Phenanthrene	Location Name	Sample Date	All Phenanthrene
BG-1S	11/26/2012	0.05*	BG-3S	11/27/2012	0.05*	BG-2S	11/26/2012	0.012	BG-1S	11/26/2012	0.05*	BG-6M	11/27/2012	0.05*
BG-1S	8/23/2012	0.05*	BG-3S	8/22/2012	0.05*	BG-2S	8/23/2012	0.05*	BG-1S	8/23/2012	0.05*	BG-6M	8/22/2012	0.015
BG-1S	5/24/2012	0.05*	BG-3S	5/23/2012	0.05*	BG-2S	5/24/2012	0.05*	BG-1S	5/24/2012	0.05*	BG-6M	5/25/2012	0.05*
BG-1S	3/20/2012	0.05*	BG-3S	3/21/2012	0.05*	BG-2S	3/21/2012	0.05*	BG-1S	3/20/2012	0.05*	BG-6M	3/21/2012	0.012
IMW-2.5D	11/26/2012	0.05*	BG-4S	11/27/2012	0.05*	BG-2M	11/26/2012	0.05*	IMW-2.5D	11/26/2012	0.05*	BG-1D	11/26/2012	0.05*
IMW-2.5D	8/24/2012	0.05*	BG-4S	8/30/2012	0.05*	BG-2M	8/23/2012	0.05*	IMW-2.5D	8/24/2012	0.05*	BG-1D	8/23/2012	0.05*
IMW-2.5D	5/21/2012	0.05*	BG-4S	5/30/2012	0.05*	BG-2M	5/24/2012	0.05*	IMW-2.5D	5/21/2012	0.05*	BG-1D	5/24/2012	0.05*
IMW-2.5D	3/21/2012	0.05*	BG-4S	3/20/2012	0.05*	BG-2M	3/21/2012	0.05*	IMW-2.5D	3/21/2012	0.05*	BG-1D	3/20/2012	0.05*
IMW-2.5S	11/26/2012	0.05*	BG-6S	11/27/2012	0.05*	BG-2D	11/26/2012	0.05*	IMW-2.5S	11/26/2012	0.05*	BG-3D	11/27/2012	0.05*
IMW-2.5S	8/24/2012	0.05*	BG-6S	8/23/2012	0.05*	BG-2D	8/23/2012	0.05*	IMW-2.5S	8/24/2012	0.05*	BG-3D	8/21/2012	0.05*
IMW-2.5S	5/21/2012	0.05*	BG-6S	5/25/2012	0.05*	BG-2D	5/24/2012	0.05*	IMW-2.5S	5/21/2012	0.05*	BG-3D	5/23/2012	0.05*
IMW-2.5S	3/21/2012	0.05*	BG-6S	3/21/2012	0.05*	BG-2D	3/21/2012	0.05*	IMW-2.5S	3/21/2012	0.05*	BG-3D	3/21/2012	0.05*
IMW-3S	5/21/2012	0.05*	BG-1M	11/26/2012	0.05*	LMW-10	11/28/2012	0.1	IMW-3S	5/21/2012	0.05*	BG-4D	11/27/2012	0.05*
IMW-3S	3/20/2012	0.05*	BG-1M	8/23/2012	0.05*	LMW-10	8/27/2012	0.05*	IMW-3S	3/20/2012	0.05*	BG-4D	8/30/2012	0.05*
KMW-2D	11/26/2012	0.0092	BG-1M	5/24/2012	0.05*	LMW-10	5/30/2012	0.05*	KMW-2D	11/26/2012	0.0092	BG-4D	5/30/2012	0.05*
KMW-2D	8/24/2012	0.0094	BG-1M	3/20/2012	0.05*	LMW-10	3/22/2012	0.05*	KMW-2D	8/24/2012	0.0094	BG-4D	3/20/2012	0.05*
KMW-2D	5/21/2012	0.05*	BG-3M	11/27/2012	0.05*	LMW-11R	11/26/2012	0.05*	KMW-2D	5/21/2012	0.05*	BG-6D	11/27/2012	0.05*
KMW-2D	3/23/2012	0.05*	BG-3M	8/22/2012	0.044	LMW-11R	8/21/2012	0.05*	KMW-2D	3/23/2012	0.05*	BG-6D	8/22/2012	0.015
KMW-2M	11/26/2012	0.05*	BG-3M	5/24/2012	0.05*	LMW-11R	5/29/2012	0.05*	KMW-2M	11/26/2012	0.05*	BG-6D	5/25/2012	0.05*
KMW-2M	8/24/2012	0.05*	BG-3M	3/21/2012	0.013	LMW-11R	3/23/2012	0.05*	KMW-2M	8/24/2012	0.05*	BG-6D	3/21/2012	0.05*
KMW-2M	5/21/2012	0.05*	BG-4M	11/27/2012	0.05*	LMW-7	11/28/2012	0.05*	KMW-2M	5/21/2012	0.05*	IMW-3D	5/25/2012	0.05*
KMW-2M	3/23/2012	0.05*	BG-4M	8/30/2012	0.05*	LMW-7	8/27/2012	0.05*	KMW-2M	3/23/2012	0.05*	IMW-3D	3/22/2012	0.05*
KMW-2S	11/26/2012	0.05*	BG-4M	5/30/2012	0.05*	LMW-7	5/31/2012	0.05*	KMW-2S	11/26/2012	0.05*	BG-2S	11/26/2012	0.012
KMW-2S	8/24/2012	0.05*	BG-4M	3/20/2012	0.015	LMW-7	3/23/2012	0.05*	KMW-2S	8/24/2012	0.05*	BG-2S	8/23/2012	0.05*
KMW-2S	5/21/2012	0.05*	BG-6M	11/27/2012	0.05*	LMW-9	11/28/2012	0.05*	KMW-2S	5/21/2012	0.05*	BG-2S	5/24/2012	0.05*
KMW-2S	3/23/2012	0.05*	BG-6M	8/22/2012	0.015	LMW-9	8/27/2012	0.0096	KMW-2S	3/23/2012	0.05*	BG-2S	3/21/2012	0.05*
			BG-6M	5/25/2012	0.05*	LMW-9	5/31/2012	0.05*	BG-3S	11/27/2012	0.05*	BG-2M	11/26/2012	0.05*
			BG-6M	3/21/2012	0.012	LMW-9	3/23/2012	0.05*	BG-3S	8/22/2012	0.05*	BG-2M	8/23/2012	0.05*
			BG-1D	11/26/2012	0.05*				BG-3S	5/23/2012	0.05*	BG-2M	5/24/2012	0.05*
			BG-1D	8/23/2012	0.05*				BG-3S	3/21/2012	0.05*	BG-2M	3/21/2012	0.05*
			BG-1D	5/24/2012	0.05*				BG-4S	11/27/2012	0.05*	BG-2D	11/26/2012	0.05*
			BG-1D	3/20/2012	0.05*				BG-4S	8/30/2012	0.05*	BG-2D	8/23/2012	0.05*
			BG-3D	11/27/2012	0.05*				BG-4S	5/30/2012	0.05*	BG-2D	5/24/2012	0.05*
			BG-3D	8/21/2012	0.05*				BG-4S	3/20/2012	0.05*	BG-2D	3/21/2012	0.05*
			BG-3D	5/23/2012	0.05*				BG-6S	11/27/2012	0.05*	LMW-10	11/28/2012	0.1
			BG-3D	3/21/2012	0.05*				BG-6S	8/23/2012	0.05*	LMW-10	8/27/2012	0.05*
			BG-4D	11/27/2012	0.05*				BG-6S	5/25/2012	0.05*	LMW-10	5/30/2012	0.05*
			BG-4D	8/30/2012	0.05*				BG-6S	3/21/2012	0.05*	LMW-10	3/22/2012	0.05*
			BG-4D	5/30/2012	0.05*				BG-1M	11/26/2012	0.05*	LMW-11R	11/26/2012	0.05*
			BG-4D	3/20/2012	0.05*				BG-1M	8/23/2012	0.05*	LMW-11R	8/21/2012	0.05*
			BG-6D	11/27/2012	0.05*				BG-1M	5/24/2012	0.05*	LMW-11R	5/29/2012	0.05*
			BG-6D	8/22/2012	0.015				BG-1M	3/20/2012	0.05*	LMW-11R	3/23/2012	0.05*
			BG-6D	5/25/2012	0.05*				BG-3M	11/27/2012	0.05*	LMW-7	11/28/2012	0.05*
			BG-6D	3/21/2012	0.05*				BG-3M	8/22/2012	0.044	LMW-7	8/27/2012	0.05*
			IMW-3D	5/25/2012	0.05*				BG-3M	5/24/2012	0.05*	LMW-7	5/31/2012	0.05*
			IMW-3D	3/22/2012	0.05*				BG-3M	3/21/2012	0.013	LMW-7	3/23/2012	0.05*
									BG-4M	11/27/2012	0.05*	LMW-9	11/28/2012	0.05*
									BG-4M	8/30/2012	0.05*	LMW-9	8/27/2012	0.0096
									BG-4M	5/30/2012	0.05*	LMW-9	5/31/2012	0.05*
									BG-4M	3/20/2012	0.015	LMW-9	3/23/2012	0.05*

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Phosphorous_Total.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Phosphorous, Total

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	26	0	0.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Full: no NDs)	26	0.042	2.4	0.227	0.12	0.454

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Full: no NDs)	1.04	0.945	0.218	-2.037	0.837	-0.411

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.572	0.572	0.572	0.572

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.359	0.92	Data Not Normal
Lilliefors (Full: no NDs)	0.376	0.174	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.78	0.78	0.78	0.78

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Full: no NDs)	2.647	0.772	
Kolmogorov-Smirnov (Full: no NDs)	0.262	0.176	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.921	0.921	0.921	0.921

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Full: no NDs)	0.865	0.92	Data Not Lognormal
Lilliefors (Full: no NDs)	0.194	0.174	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Phosphorous, Total

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	42	4	8.70%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	4	0.1	0.1	0.1	0.1	0

Statistics (Detects Only)	42	0.019	0.33	0.0748	0.059	0.057
Statistics (All: NDs treated as DL value)	46	0.019	0.33	0.077	0.0625	0.0549
Statistics (All: NDs treated as DL/2 value)	46	0.019	0.33	0.0726	0.053	0.0548
Statistics (Normal ROS Estimated Data)	46	0.019	0.33	0.0734	0.059	0.0551
Statistics (Gamma ROS Estimated Data)	46	0.019	0.33	0.0744	0.0605	0.055
Statistics (Lognormal ROS Estimated Data)	46	0.019	0.33	0.0728	0.0578	0.055

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.567	2.414	0.0291	-2.8	0.632	-0.226
Statistics (NDs = DL)	2.748	2.583	0.028	-2.757	0.62	-0.225
Statistics (NDs = DL/2)	2.719	2.556	0.0267	-2.817	0.606	-0.215
Statistics (Gamma ROS Estimates)	2.695	2.534	0.0276	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-2.818	0.614	-0.218

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.863	0.878	0.85	0.863

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.743	0.942	Data Not Normal
Lilliefors (Detects Only)	0.195	0.137	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.794	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.163	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.747	0.945	Data Not Normal
Lilliefors (NDs = DL/2)	0.2	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.768	0.945	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.184	0.131	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.955	0.958	0.945	0.955

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.637	0.757	
Kolmogorov-Smirnov (Detects Only)	0.113	0.138	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.411	0.757	
Kolmogorov-Smirnov (NDs = DL)	0.0834	0.132	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.989	0.757	
Kolmogorov-Smirnov (NDs = DL/2)	0.134	0.132	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.549	0.757	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.103	0.132	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.991	0.993	0.986	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.941	0.942	Data Not Lognormal
Lilliefors (Detects Only)	0.0673	0.137	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.982	0.945	Data Appear Lognormal

Lilliefors (NDs = DL)	0.0625	0.131	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.971	0.945	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.1	0.131	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.978	0.945	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0708	0.131	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Phosphorous, Total

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	25	3	10.71%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	0.1	0.1	0.1	0.1	1.700E-17
Statistics (Detects Only)	25	0.02	2.6	0.521	0.11	0.754
Statistics (All: NDs treated as DL value)	28	0.02	2.6	0.476	0.1	0.723
Statistics (All: NDs treated as DL/2 value)	28	0.02	2.6	0.471	0.086	0.726
Statistics (Normal ROS Estimated Data)	28	-0.277	2.6	0.468	0.1	0.732
Statistics (Gamma ROS Estimated Data)	28	1.000E-12	2.6	0.474	0.1	0.726
Statistics (Lognormal ROS Estimated Data)	28	0.02	2.6	0.472	0.0927	0.726

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.546	0.512	0.955	-1.798	1.593	-0.886
Statistics (NDs = DL)	0.562	0.525	0.848	-1.852	1.51	-0.815
Statistics (NDs = DL/2)	0.536	0.502	0.879	-1.927	1.548	-0.804
Statistics (Gamma ROS Estimates)	0.247	0.244	1.92	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.929	1.562	-0.81

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.839	0.817	0.816	0.845

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.702	0.918	Data Not Normal
Lilliefors (Detects Only)	0.343	0.177	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.669	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.367	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.666	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.364	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.719	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.326	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.973	0.973	0.973	0.954

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.697	0.803	
Kolmogorov-Smirnov (Detects Only)	0.293	0.184	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.155	0.804	
Kolmogorov-Smirnov (NDs = DL)	0.322	0.174	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	2.353	0.807	
Kolmogorov-Smirnov (NDs = DL/2)	0.309	0.175	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.18	0.877	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.285	0.181	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.951	0.95	0.939	0.947

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.887	0.918	Data Not Lognormal
Lilliefors (Detects Only)	0.22	0.177	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.885	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.249	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.865	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.228	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.878	0.924	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.227	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Alluv + Mesa Phosphorous, Total

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	54	0	54	51	3	5.56%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	0.1	0.1	0.1	0.1	1.700E-17
Statistics (Detects Only)	51	0.02	2.6	0.371	0.12	0.631
Statistics (All: NDs treated as DL value)	54	0.02	2.6	0.356	0.105	0.616
Statistics (All: NDs treated as DL/2 value)	54	0.02	2.6	0.353	0.105	0.617
Statistics (Normal ROS Estimated Data)	54	-0.227	2.6	0.35	0.115	0.621
Statistics (Gamma ROS Estimated Data)	54	1.000E-12	2.6	0.352	0.105	0.618
Statistics (Lognormal ROS Estimated Data)	54	0.02	2.6	0.354	0.105	0.617

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.657	0.632	0.565	-1.92	1.258	-0.655
Statistics (NDs = DL)	0.669	0.644	0.532	-1.941	1.225	-0.631
Statistics (NDs = DL/2)	0.65	0.626	0.543	-1.98	1.247	-0.63
Statistics (Gamma ROS Estimates)	0.364	0.356	0.968	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.976	1.248	-0.631

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.752	0.741	0.742	0.759

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.342	0.124	Data Not Normal
Lilliefors (NDs = DL)	0.345	0.121	Data Not Normal
Lilliefors (NDs = DL/2)	0.344	0.121	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.341	0.121	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.953	0.947	0.949	0.967

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	4.229	0.801	
Kolmogorov-Smirnov (Detects Only)	0.28	0.13	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.853	0.8	
Kolmogorov-Smirnov (NDs = DL)	0.293	0.127	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	4.752	0.802	
Kolmogorov-Smirnov (NDs = DL/2)	0.285	0.127	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.282	0.847	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.255	0.13	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.957	0.952	0.952	0.954

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.21	0.124	Data Not Lognormal
Lilliefors (NDs = DL)	0.225	0.121	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.211	0.121	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.213	0.121	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Phosphorous_Total.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Phosphorous, Total

General Statistics

Total Number of Observations	26	Number of Distinct Observations	21

Raw Statistics		Log-Transformed Statistics	
Minimum	0.042	Minimum	-3.17
Maximum	2.4	Maximum	0.875
Second Largest	0.48	Second Largest	-0.734
First Quartile	0.0838	First Quartile	-2.48
Median	0.12	Median	-2.12
Third Quartile	0.18	Third Quartile	-1.715
Mean	0.227	Mean	-2.037
SD	0.454	SD	0.837
Coefficient of Variation	2.002		
Skewness	4.751		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.359	Shapiro Wilk Test Statistic	0.865
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	1.259	95% UTL with 95% Coverage	0.875
95% UPL (t)	1.016	95% UPL (t)	0.56
90% Percentile (z)	0.808	90% Percentile (z)	0.381
95% Percentile (z)	0.973	95% Percentile (z)	0.516
99% Percentile (z)	1.282	99% Percentile (z)	0.913

Gamma Distribution Test		Data Distribution Test	
k star	0.945	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.24		
MLE of Mean	0.227		
MLE of Standard Deviation	0.233		
nu star	49.16		
A-D Test Statistic	2.647	Nonparametric Statistics	
5% A-D Critical Value	0.772	90% Percentile	0.275
K-S Test Statistic	0.262	95% Percentile	0.43
5% K-S Critical Value	0.176	99% Percentile	1.92
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	2.4
90% Percentile	0.529	95% Percentile Bootstrap UTL with 95% Coverage	2.4
95% Percentile	0.692	95% BCA Bootstrap UTL with 95% Coverage	2.4
99% Percentile	1.073	95% UPL	1.728
		95% Chebyshev UPL	2.241
95% WH Approx. Gamma UPL	0.653	Upper Threshold Limit Based upon IQR	0.324
95% HW Approx. Gamma UPL	0.622		
95% WH Approx. Gamma UTL with 95% Coverage	0.916		
95% HW Approx. Gamma UTL with 95% Coverage	0.891		

Muddy Creek Phosphorous, Total

General Statistics			
Number of Valid Data	46	Number of Detected Data	42
Number of Distinct Detected Data	31	Number of Non-Detect Data	4
		Percent Non-Detects	8.70%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.019	Minimum Detected	-3.963
Maximum Detected	0.33	Maximum Detected	-1.109
Mean of Detected	0.0748	Mean of Detected	-2.8
SD of Detected	0.057	SD of Detected	0.632
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.743	Shapiro Wilk Test Statistic	0.941
5% Shapiro Wilk Critical Value	0.942	5% Shapiro Wilk Critical Value	0.942
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0726	Mean (Log Scale)	-2.817
SD	0.0548	SD (Log Scale)	0.606
95% UTL 95% Coverage	0.187	95% UTL 95% Coverage	0.211
95% UPL (t)	0.166	95% UPL (t)	0.167
90% Percentile (z)	0.143	90% Percentile (z)	0.13
95% Percentile (z)	0.163	95% Percentile (z)	0.162
99% Percentile (z)	0.2	99% Percentile (z)	0.245
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.00326	Mean in Original Scale	0.0728
SD	0.118	SD in Original Scale	0.055
95% UTL with 95% Coverage	0.241	95% UTL with 95% Coverage	0.214
		95% BCA UTL with 95% Coverage	0.15
		95% Bootstrap (%) UTL with 95% Coverage	0.295
95% UPL (t)	0.197	95% UPL (t)	0.169
90% Percentile (z)	0.148	90% Percentile (z)	0.131
95% Percentile (z)	0.19	95% Percentile (z)	0.164

99% Percentile (z)	0.27	99% Percentile (z)	0.249

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.399	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0312		
nu star	201.6		
A-D Test Statistic	0.637	Nonparametric Statistics	
5% A-D Critical Value	0.757	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.113	Mean	0.0728
5% K-S Critical Value	0.138	SD	0.0545
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00819
		95% KM UTL with 95% Coverage	0.186
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.313
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.165
Mean	0.0744	90% Percentile (z)	0.143
Median	0.0605	95% Percentile (z)	0.162
SD	0.055	99% Percentile (z)	0.2
k star	2.534		
Theta star	0.0294	Gamma ROS Limits with Extrapolated Data	
Nu star	233.1	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.165
95% Percentile of Chisquare (2k)	11.18	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.166
		95% WH Approx. Gamma UTL with 95% Coverage	0.196
90% Percentile	0.137	95% HW Approx. Gamma UTL with 95% Coverage	0.2
95% Percentile	0.164		
99% Percentile	0.223		

Note: DL/2 is not a recommended method.

Mesa Phosphorous, Total

General Statistics

Number of Valid Data	28	Number of Detected Data	25
Number of Distinct Detected Data	22	Number of Non-Detect Data	3
		Percent Non-Detects	10.71%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.02	Minimum Detected	-3.912
Maximum Detected	2.6	Maximum Detected	0.956
Mean of Detected	0.521	Mean of Detected	-1.798
SD of Detected	0.754	SD of Detected	1.593
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.702	Shapiro Wilk Test Statistic	0.887
5% Shapiro Wilk Critical Value	0.918	5% Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	

DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.471	Mean (Log Scale)	-1.927
SD	0.726	SD (Log Scale)	1.548
95% UTL 95% Coverage	2.102	95% UTL 95% Coverage	4.717
95% UPL (t)	1.73	95% UPL (t)	2.133
90% Percentile (z)	1.402	90% Percentile (z)	1.06
95% Percentile (z)	1.666	95% Percentile (z)	1.86
99% Percentile (z)	2.161	99% Percentile (z)	5.342
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.0628	Mean in Original Scale	0.472
SD	1.236	SD in Original Scale	0.726
95% UTL with 95% Coverage	2.714	95% UTL with 95% Coverage	4.851
		95% BCA UTL with 95% Coverage	2.6
		95% Bootstrap (%) UTL with 95% Coverage	2.6
95% UPL (t)	2.08	95% UPL (t)	2.178
90% Percentile (z)	1.522	90% Percentile (z)	1.075
95% Percentile (z)	1.971	95% Percentile (z)	1.897
99% Percentile (z)	2.813	99% Percentile (z)	5.499
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.507	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.028		
nu star	25.37		
A-D Test Statistic	1.697	Nonparametric Statistics	
5% A-D Critical Value	0.803	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.293	Mean	0.471
5% K-S Critical Value	0.184	SD	0.713
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.138
		95% KM UTL with 95% Coverage	2.073
Assuming Gamma Distribution		95% KM Chebyshev UPL	3.635
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.707
Mean	0.474	90% Percentile (z)	1.385
Median	0.1	95% Percentile (z)	1.644
SD	0.726	99% Percentile (z)	2.13
k star	0.244		
Theta star	1.941	Gamma ROS Limits with Extrapolated Data	
Nu star	13.67	95% Wilson Hilferty (WH) Approx. Gamma UPL	1.897
95% Percentile of Chisquare (2k)	2.38	95% Hawkins Wixley (HW) Approx. Gamma UPL	2.155
		95% WH Approx. Gamma UTL with 95% Coverage	2.926
90% Percentile	1.425	95% HW Approx. Gamma UTL with 95% Coverage	3.629
95% Percentile	2.31		
99% Percentile	4.675		

Note: DL/2 is not a recommended method.

Alluv + Mesa Phosphorous, Total

General Statistics			
Number of Valid Data	54	Number of Detected Data	51
Number of Distinct Detected Data	41	Number of Non-Detect Data	3

		Percent Non-Detects	5.56%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.02	Minimum Detected	-3.912
Maximum Detected	2.6	Maximum Detected	0.956
Mean of Detected	0.371	Mean of Detected	-1.92
SD of Detected	0.631	SD of Detected	1.258
Minimum Non-Detect	0.1	Minimum Non-Detect	-2.303
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303
Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.342	Lilliefors Test Statistic	0.21
5% Lilliefors Critical Value	0.124	5% Lilliefors Critical Value	0.124
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.353	Mean (Log Scale)	-1.98
SD	0.617	SD (Log Scale)	1.247
95% UTL 95% Coverage	1.613	95% UTL 95% Coverage	1.758
95% UPL (t)	1.396	95% UPL (t)	1.135
90% Percentile (z)	1.144	90% Percentile (z)	0.683
95% Percentile (z)	1.369	95% Percentile (z)	1.074
99% Percentile (z)	1.789	99% Percentile (z)	2.511
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.012	Mean in Original Scale	0.354
SD	0.95	SD in Original Scale	0.617
95% UTL with 95% Coverage	1.926	95% UTL with 95% Coverage	1.768
		95% BCA UTL with 95% Coverage	2.47
		95% Bootstrap (%) UTL with 95% Coverage	2.47
95% UPL (t)	1.593	95% UPL (t)	1.141
90% Percentile (z)	1.205	90% Percentile (z)	0.686
95% Percentile (z)	1.55	95% Percentile (z)	1.079
99% Percentile (z)	2.197	99% Percentile (z)	2.526
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.631	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.588		
nu star	64.36		
A-D Test Statistic	4.229	Nonparametric Statistics	
5% A-D Critical Value	0.801	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.28	Mean	0.354
5% K-S Critical Value	0.13	SD	0.611
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.084
		95% KM UTL with 95% Coverage	1.601
Assuming Gamma Distribution		95% KM Chebyshev UPL	3.043
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	1.387
Mean	0.352	90% Percentile (z)	1.137
Median	0.105	95% Percentile (z)	1.359

SD	0.618	99% Percentile (z)	1.776
k star	0.356		
Theta star	0.99	**Gamma ROS Limits with Extrapolated Data**	
Nu star	38.45	95% Wilson Hilferty (WH) Approx. Gamma UPL	1.208
95% Percentile of Chisquare (2k)	3.079	95% Hawkins Wixley (HW) Approx. Gamma UPL	1.278
		95% WH Approx. Gamma UTL with 95% Coverage	1.604
90% Percentile	1.015	95% HW Approx. Gamma UTL with 95% Coverage	1.773
95% Percentile	1.524		
99% Percentile	2.819		

Note: DL/2 is not a recommended method.

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Phosphorous_Total.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Phosphorous, Total

Background Data: Alluv Phosphorous, Total

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	3	0
Number of Detect Data	25	26
Minimum Non-Detect	0.1	N/A
Maximum Non-Detect	0.1	N/A
Percent Non detects	10.71%	0.00%
Minimum Detected	0.02	0.042
Maximum Detected	2.6	2.4
Mean of Detected Data	0.521	0.227
Median of Detected Data	0.11	0.12
SD of Detected Data	0.754	0.454

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	776.5
WMW Test U-Stat	0.104
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.917

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Phosphorous_Total.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Phosphorous, Total

Background Data: Alluv Phosphorous, Total

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	4	0
Number of Detect Data	42	26
Minimum Non-Detect	0.1	N/A
Maximum Non-Detect	0.1	N/A
Percent Non detects	8.70%	0.00%
Minimum Detected	0.019	0.042
Maximum Detected	0.33	2.4
Mean of Detected Data	0.0748	0.227
Median of Detected Data	0.059	0.12
SD of Detected Data	0.057	0.454

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1451
WMW Test U-Stat	2.667
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.00739

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options	
From File	Phosphorous_Total.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (2 Sided Alternative
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Phosphorous, Total

Background Data: Muddy Creek Phosphorous, Total

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	3	4
Number of Detect Data	25	42
Minimum Non-Detect	0.1	0.1
Maximum Non-Detect	0.1	0.1
Percent Non detects	10.71%	8.70%
Minimum Detected	0.02	0.019
Maximum Detected	2.6	0.33
Mean of Detected Data	0.521	0.0748
Median of Detected Data	0.11	0.059
SD of Detected Data	0.754	0.057

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.1 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

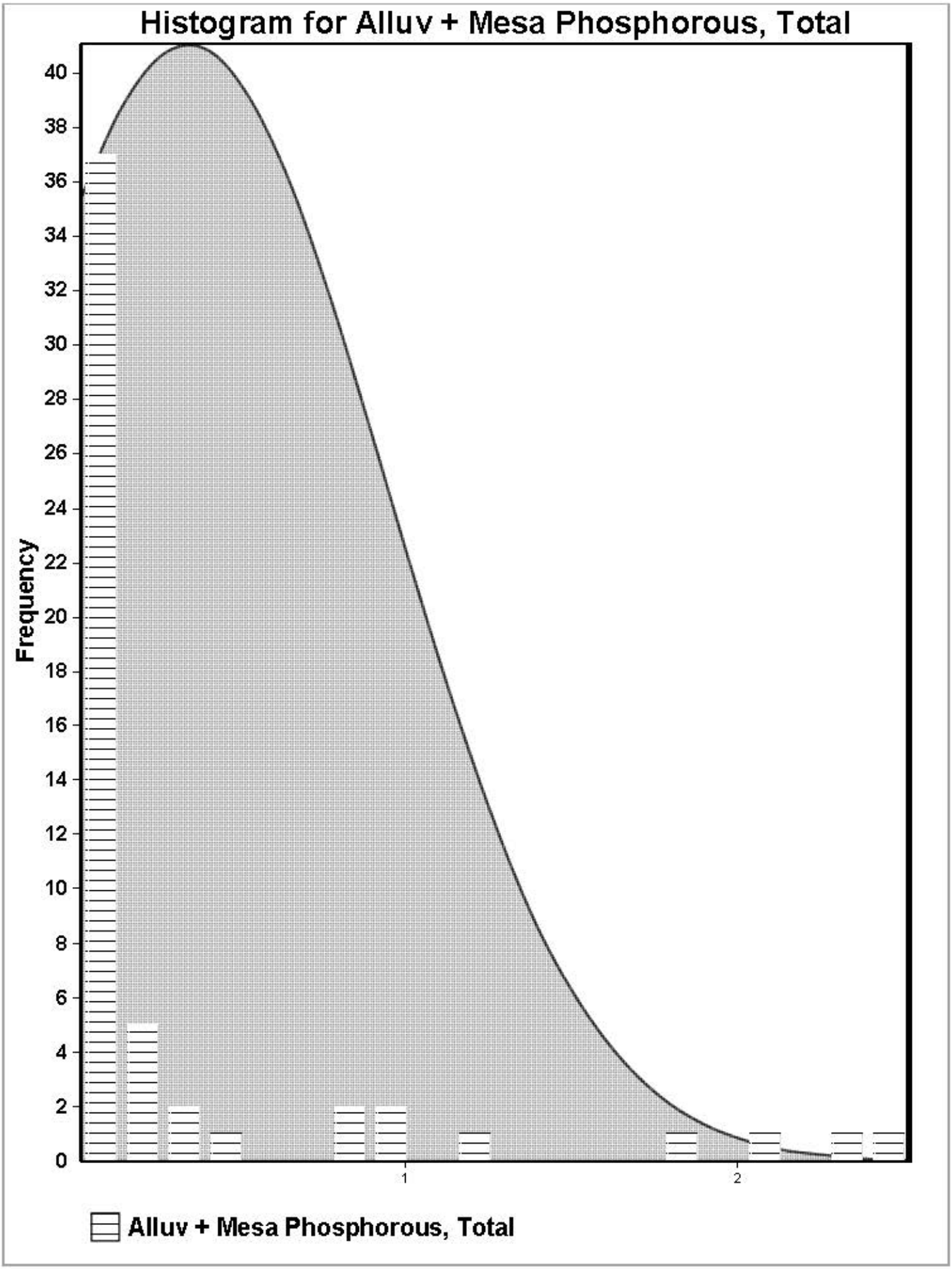
H0: Mean/Median of Site or AOC = Mean/Median of Background

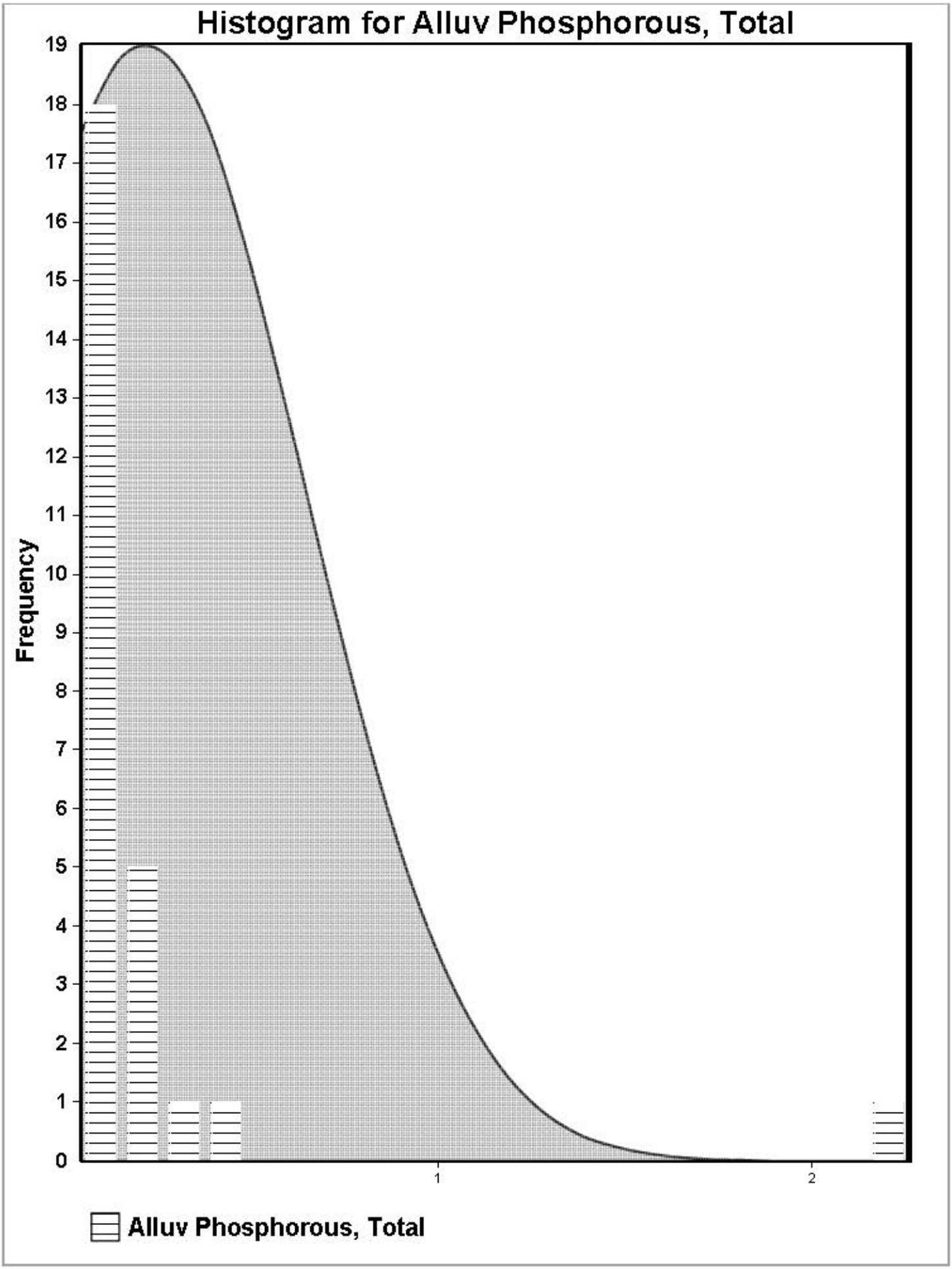
Site Rank Sum W-Stat	1262
WMW Test U-Stat	2.357
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.0184

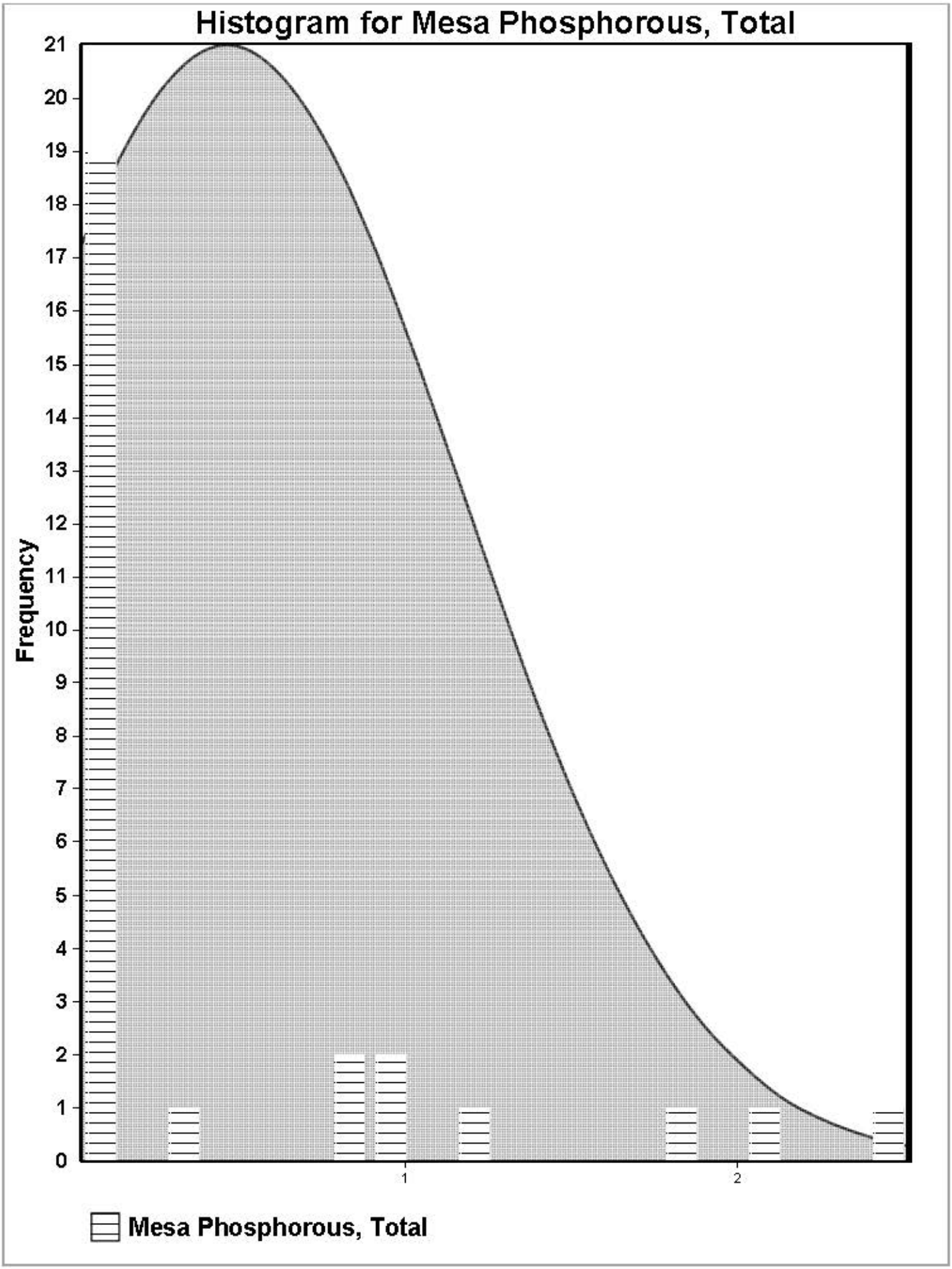
Conclusion with Alpha = 0.05

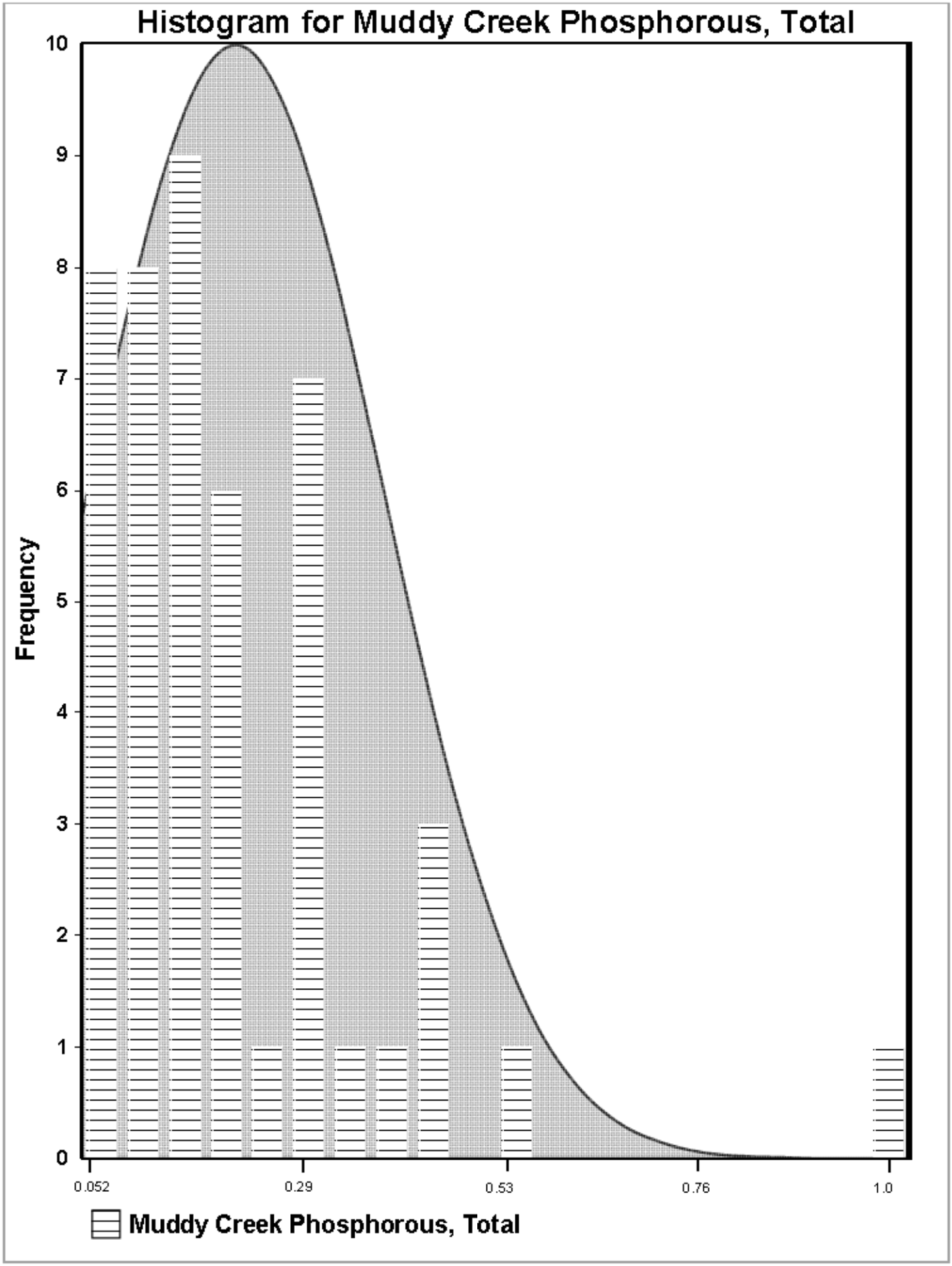
Reject H0, Conclude Site <> Background

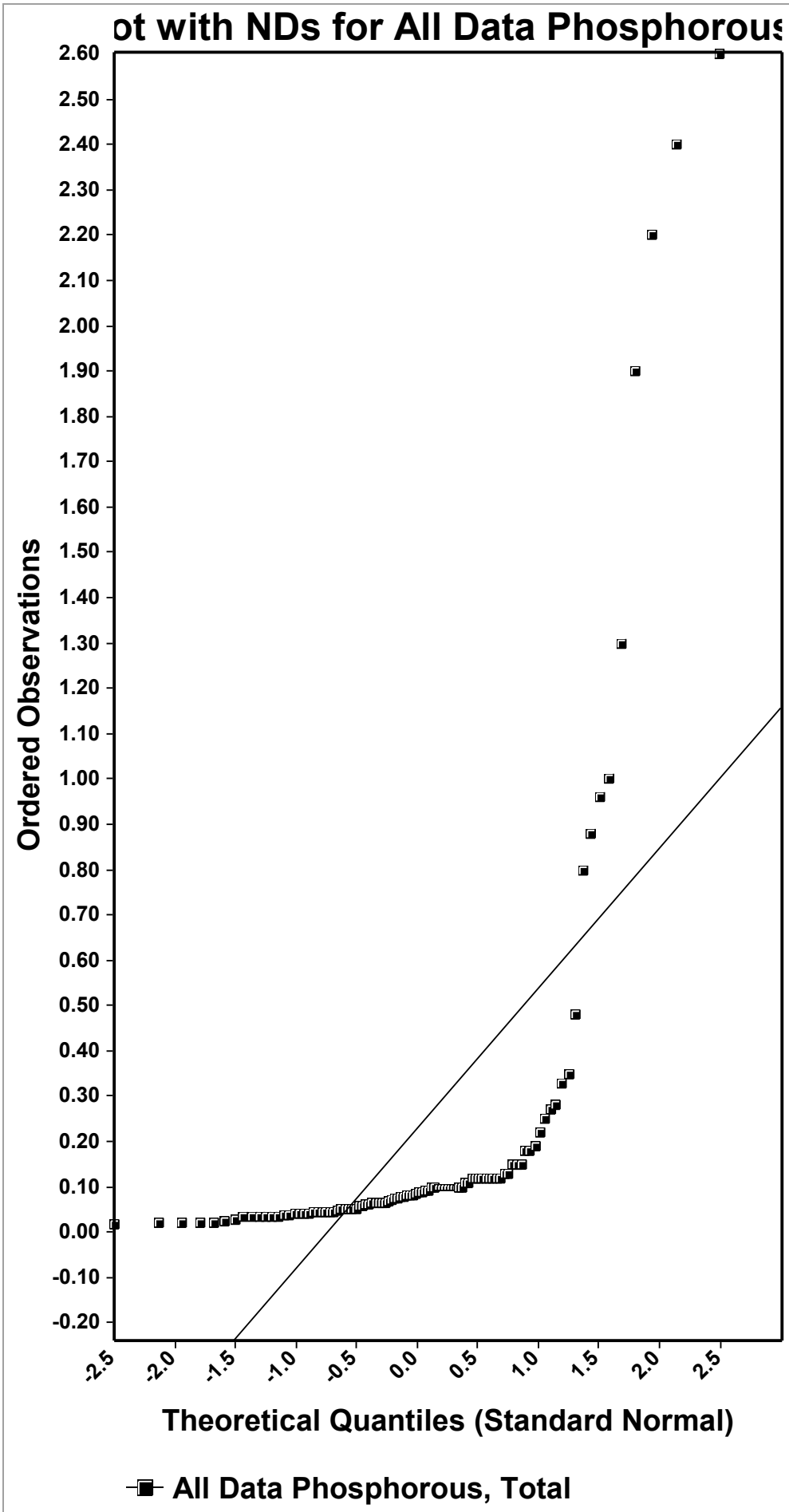
P-Value < alpha (0.05)


Histogram for Alluv + Mesa Phosphorous, Total
Frequency
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
1
2
Alluv + Mesa Phosphorous, Total


Histogram for Alluv Phosphorous, Total
Frequency
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1
2
Alluv Phosphorous, Total


Histogram for Mesa Phosphorous, Total
Frequency
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1
2
Mesa Phosphorous, Total


Histogram for Muddy Creek Phosphorous, Total
Frequency
10
9
8
7
6
5
4
3
2
1
0
0.052
0.29
0.53
0.76
1.0
Muddy Creek Phosphorous, Total



All Data Phosphorous, Total

Total Number of Data = 100

Number of Non-Detects = 7

Number of Detects = 93

Mean = 0.2277

Sd = 0.4733

Slope = 0.3100

Intercept = 0.2277

Correlation, R = 0.6479

Outlier Tests for Selected Variables

User Selected Options	
From File	Phosphorous_Total.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Phosphorous, Total

Mean	0.227
Standard Deviation	0.454
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.227	0.445	2.4	23	4.886	2.84	3.16

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 2.4 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 2.4 is a Potential Statistical Outlier

Rosner's Outlier Test for Muddy Creek Phosphorous, Total

Mean	0.0726
Standard Deviation	0.0548
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0726	0.0542	0.33	6	4.745	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.33 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.33 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Phosphorous, Total

Mean	0.471
Standard Deviation	0.726
Number of data	28
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.471	0.713	2.6	24	2.985	2.88	3.2

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 2.6 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Alluv + Mesa Phosphorous, Total

Mean	0.353
Standard Deviation	0.617
Number of data	54
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.353	0.612	2.6	50	3.674	3.158	3.512

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 2.6 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 2.6 is a Potential Statistical Outlier

Location Name	Sample Date	Phosphorous, Total	Phosphorous, Total
BG-1S	11/26/2012	0.052	1
BG-1S	8/23/2012	0.064	1
BG-1S	5/24/2012	0.092	1
BG-1S	3/20/2012	0.077	1
IMW-2.5D	11/26/2012	0.18	1
IMW-2.5D	8/24/2012	0.13	1
IMW-2.5D	5/21/2012	0.099	1
IMW-2.5D	3/21/2012	0.12	1
IMW-2.5S	11/26/2012	0.25	1
IMW-2.5S	8/24/2012	0.27	1
IMW-2.5S	5/21/2012	0.18	1
IMW-2.5S	3/21/2012	0.28	1
IMW-3S	5/21/2012	0.043	1
IMW-3S	3/20/2012	0.042	1
KMW-2D	11/26/2012	0.072	1
KMW-2D	8/24/2012	0.12	1
KMW-2D	5/21/2012	0.086	1
KMW-2D	3/23/2012	0.083	1
KMW-2M	11/26/2012	0.12	1
KMW-2M	8/24/2012	0.1	1
KMW-2M	5/21/2012	0.12	1
KMW-2M	3/23/2012	0.12	1
KMW-2S	11/26/2012	2.4	1
KMW-2S	8/24/2012	0.091	1
KMW-2S	5/21/2012	0.48	1
KMW-2S	3/23/2012	0.22	1

Location Name	Sample Date	Creek Phospho	Creek Phosphoro
BG-3S	11/27/2012	0.09	1
BG-3S	8/22/2012	0.081	1
BG-3S	5/23/2012	0.19	1
BG-3S	3/21/2012	0.15	1
BG-4S	11/27/2012	0.06	1
BG-4S	8/30/2012	0.33	1
BG-4S	5/30/2012	0.064	1
BG-4S	3/20/2012	0.065	1
BG-6S	11/27/2012	0.12	1
BG-6S	8/23/2012	0.061	1
BG-6S	5/25/2012	0.15	1
BG-6S	3/21/2012	0.098	1
BG-1M	11/26/2012	0.042	1
BG-1M	8/23/2012	0.053	1
BG-1M	5/24/2012	0.058	1
BG-1M	3/20/2012	0.046	1
BG-3M	11/27/2012	0.035	1
BG-3M	8/22/2012	0.069	1
BG-3M	5/24/2012	0.078	1
BG-3M	3/21/2012	0.1	1
BG-4M	11/27/2012	0.11	1
BG-4M	8/30/2012	0.034	1
BG-4M	5/30/2012	0.019	1
BG-4M	3/20/2012	0.047	1
BG-6M	11/27/2012	0.02	1
BG-6M	8/22/2012	0.033	1
BG-6M	5/25/2012	0.053	1
BG-6M	3/21/2012	0.075	1
BG-1D	11/26/2012	0.1	0
BG-1D	8/23/2012	0.1	0
BG-1D	5/24/2012	0.045	1
BG-1D	3/20/2012	0.042	1
BG-3D	11/27/2012	0.075	1
BG-3D	8/21/2012	0.053	1
BG-3D	5/23/2012	0.13	1
BG-3D	3/21/2012	0.15	1
BG-4D	11/27/2012	0.046	1
BG-4D	8/30/2012	0.033	1
BG-4D	5/30/2012	0.028	1
BG-4D	3/20/2012	0.046	1
BG-6D	11/27/2012	0.1	0
BG-6D	8/22/2012	0.023	1
BG-6D	5/25/2012	0.1	0
BG-6D	3/21/2012	0.053	1
IMW-3D	5/25/2012	0.02	1
IMW-3D	3/22/2012	0.066	1

Location Name	Sample Date	Phosphorous, Total	Phosphorous, Total
BG-2S	11/26/2012	0.082	1
BG-2S	8/23/2012	0.12	1
BG-2S	5/24/2012	0.064	1
BG-2S	3/21/2012	0.11	1
BG-2M	11/26/2012	0.02	1
BG-2M	8/23/2012	0.1	0
BG-2M	5/24/2012	0.034	1
BG-2M	3/21/2012	0.062	1
BG-2D	11/26/2012	0.022	1
BG-2D	8/23/2012	0.1	0
BG-2D	5/24/2012	0.046	1
BG-2D	3/21/2012	0.045	1
LMW-10	11/28/2012	0.88	1
LMW-10	8/27/2012	1.3	1
LMW-10	5/30/2012	1.9	1
LMW-10	3/22/2012	0.8	1
LMW-11R	11/26/2012	0.1	0
LMW-11R	8/21/2012	0.036	1
LMW-11R	5/29/2012	0.038	1
LMW-11R	3/23/2012	0.038	1
LMW-7	11/28/2012	0.96	1
LMW-7	8/27/2012	1	1
LMW-7	5/31/2012	2.2	1
LMW-7	3/23/2012	2.6	1
LMW-9	11/28/2012	0.12	1
LMW-9	8/27/2012	0.09	1
LMW-9	5/31/2012	0.35	1
LMW-9	3/23/2012	0.12	1

Location Name	Sample Date	Phosphorous, Total	Phosphorous, Total
BG-3S	11/27/2012	0.09	1
BG-3S	8/22/2012	0.081	1
BG-3S	5/23/2012	0.19	1
BG-3S	3/21/2012	0.15	1
BG-4S	11/27/2012	0.06	1
BG-4S	8/30/2012	0.33	1
BG-4S	5/30/2012	0.064	1
BG-4S	3/20/2012	0.065	1
BG-6S	11/27/2012	0.12	1
BG-6S	8/23/2012	0.061	1
BG-6S	5/25/2012	0.15	1
BG-6S	3/21/2012	0.098	1
BG-1M	11/26/2012	0.042	1
BG-1M	8/23/2012	0.053	1
BG-1M	5/24/2012	0.058	1
BG-1M	3/20/2012	0.046	1
BG-3M	11/27/2012	0.035	1
BG-3M	8/22/2012	0.069	1
BG-3M	5/24/2012	0.078	1
BG-3M	3/21/2012	0.1	1
BG-4M	11/27/2012	0.11	1
BG-4M	8/30/2012	0.034	1
BG-4M	5/30/2012	0.019	1
BG-4M	3/20/2012	0.047	1
BG-6M	11/27/2012	0.02	1
BG-6M	8/22/2012	0.033	1
BG-6M	5/25/2012	0.053	1
BG-6M	3/21/2012	0.075	1
BG-1D	11/26/2012	0.1	0
BG-1D	8/23/2012	0.1	0
BG-1D	5/24/2012	0.045	1
BG-1D	3/20/2012	0.042	1
BG-3D	11/27/2012	0.075	1
BG-3D	8/21/2012	0.053	1
BG-3D	5/23/2012	0.13	1
BG-3D	3/21/2012	0.15	1
BG-4D	11/27/2012	0.046	1
BG-4D	8/30/2012	0.033	1
BG-4D	5/30/2012	0.028	1
BG-4D	3/20/2012	0.046	1
BG-6D	11/27/2012	0.1	0
BG-6D	8/22/2012	0.023	1
BG-6D	5/25/2012	0.1	0
BG-6D	3/21/2012	0.053	1
IMW-3D	5/25/2012	0.02	1
IMW-3D	3/22/2012	0.066	1
BG-2S	11/26/2012	0.082	1
BG-2S	8/23/2012	0.12	1

BG-2S	5/24/2012	0.064	1
BG-2S	3/21/2012	0.11	1
BG-2M	11/26/2012	0.02	1
BG-2M	8/23/2012	0.1	0
BG-2M	5/24/2012	0.034	1
BG-2M	3/21/2012	0.062	1
BG-2D	11/26/2012	0.022	1
BG-2D	8/23/2012	0.1	0
BG-2D	5/24/2012	0.046	1
BG-2D	3/21/2012	0.045	1
LMW-10	11/28/2012	0.88	1
LMW-10	8/27/2012	1.3	1
LMW-10	5/30/2012	1.9	1
LMW-10	3/22/2012	0.8	1
LMW-11R	11/26/2012	0.1	0
LMW-11R	8/21/2012	0.036	1
LMW-11R	5/29/2012	0.038	1
LMW-11R	3/23/2012	0.038	1
LMW-7	11/28/2012	0.96	1
LMW-7	8/27/2012	1	1
LMW-7	5/31/2012	2.2	1
LMW-7	3/23/2012	2.6	1
LMW-9	11/28/2012	0.12	1
LMW-9	8/27/2012	0.09	1
LMW-9	5/31/2012	0.35	1
LMW-9	3/23/2012	0.12	1
BG-1S	11/26/2012	0.052	1
BG-1S	8/23/2012	0.064	1
BG-1S	5/24/2012	0.092	1
BG-1S	3/20/2012	0.077	1
IMW-2.5D	11/26/2012	0.18	1
IMW-2.5D	8/24/2012	0.13	1
IMW-2.5D	5/21/2012	0.099	1
IMW-2.5D	3/21/2012	0.12	1
IMW-2.5S	11/26/2012	0.25	1
IMW-2.5S	8/24/2012	0.27	1
IMW-2.5S	5/21/2012	0.18	1
IMW-2.5S	3/21/2012	0.28	1
IMW-3S	5/21/2012	0.043	1
IMW-3S	3/20/2012	0.042	1
KMW-2D	11/26/2012	0.072	1
KMW-2D	8/24/2012	0.12	1

KMW-2D	5/21/2012	0.086	1
KMW-2D	3/23/2012	0.083	1
KMW-2M	11/26/2012	0.12	1
KMW-2M	8/24/2012	0.1	1
KMW-2M	5/21/2012	0.12	1
KMW-2M	5/21/2012	0.12	1
KMW-2M	3/23/2012	0.12	1
KMW-2S	11/26/2012	2.4	1
KMW-2S	8/24/2012	0.091	1
KMW-2S	5/21/2012	0.48	1
KMW-2S	3/23/2012	0.22	1

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Potassium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Potassium, Dissolved

Raw Statistics	
Number of Valid Observations	87
Number of Distinct Observations	54
Minimum	20
Maximum	61
Mean of Raw Data	37.9
Standard Deviation of Raw Data	10.17
Kstar	13.69
Mean of Log Transformed Data	3.599
Standard Deviation of Log Transformed Data	0.27

Normal Distribution Test Results	
Correlation Coefficient R	0.986
Approximate Shapiro Wilk Test Statistic	0.951
Approximate Shapiro Wilk P Value	0.00704
Lilliefors Test Statistic	0.101
Lilliefors Critical (0.95) Value	0.095

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.992
A-D Test Statistic	0.322
A-D Critical (0.95) Value	0.751
K-S Test Statistic	0.0657
K-S Critical(0.95) Value	0.0957

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.995
Approximate Shapiro Wilk Test Statistic	0.968
Approximate Shapiro Wilk P Value	0.141
Lilliefors Test Statistic	0.052
Lilliefors Critical (0.95) Value	0.095

Data appear Lognormal at (0.05) Significance Level

Muddy Creed Potassium, Dissolved

Raw Statistics	
Number of Valid Observations	53
Number of Distinct Observations	27
Minimum	12

Maximum	52
Mean of Raw Data	26.42
Standard Deviation of Raw Data	11.63
Kstar	5.598
Mean of Log Transformed Data	3.187
Standard Deviation of Log Transformed Data	0.413

Normal Distribution Test Results

Correlation Coefficient R	0.937
Approximate Shapiro Wilk Test Statistic	0.857
Approximate Shapiro Wilk P Value	1.1855E-6
Lilliefors Test Statistic	0.182
Lilliefors Critical (0.95) Value	0.122

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.967
A-D Test Statistic	1.585
A-D Critical (0.95) Value	0.753
K-S Test Statistic	0.142
K-S Critical(0.95) Value	0.122

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.972
Approximate Shapiro Wilk Test Statistic	0.922
Approximate Shapiro Wilk P Value	0.00196
Lilliefors Test Statistic	0.116
Lilliefors Critical (0.95) Value	0.122

Data appear Lognormal at (0.05) Significance Level

Mesa Potassium, Dissolved

Raw Statistics

Number of Valid Observations	100
Number of Distinct Observations	64
Minimum	25
Maximum	110
Mean of Raw Data	58.64
Standard Deviation of Raw Data	20.76
Kstar	7.792
Mean of Log Transformed Data	4.008
Standard Deviation of Log Transformed Data	0.363

Normal Distribution Test Results

Correlation Coefficient R	0.982
Approximate Shapiro Wilk Test Statistic	0.944
Approximate Shapiro Wilk P Value	6.3100E-4
Lilliefors Test Statistic	0.0815

Lilliefors Critical (0.95) Value	0.0886
Data appear Normal at (0.05) Significance Level	
Gamma Distribution Test Results	
Correlation Coefficient R	0.99
A-D Test Statistic	0.525
A-D Critical (0.95) Value	0.753
K-S Test Statistic	0.0704
K-S Critical(0.95) Value	0.0895
Data appear Gamma Distributed at (0.05) Significance Level	
Lognormal Distribution Test Results	
Correlation Coefficient R	0.992
Approximate Shapiro Wilk Test Statistic	0.961
Approximate Shapiro Wilk P Value	0.0279
Lilliefors Test Statistic	0.0664
Lilliefors Critical (0.95) Value	0.0886
Data appear Lognormal at (0.05) Significance Level	

General Background Statistics for Full Data Sets

User Selected Options	
From File	Potassium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Potassium, Dissolved

General Statistics

Total Number of Observations	87	Number of Distinct Observations	54

Raw Statistics		Log-Transformed Statistics	
Minimum	20	Minimum	2.996
Maximum	61	Maximum	4.111
Second Largest	60	Second Largest	4.094
First Quartile	31	First Quartile	3.434
Median	36	Median	3.584
Third Quartile	44.45	Third Quartile	3.794
Mean	37.9	Mean	3.599
SD	10.17	SD	0.27
Coefficient of Variation	0.268		
Skewness	0.456		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.101	Lilliefors Test Statistic	0.052
Lilliefors Critical Value	0.095	Lilliefors Critical Value	0.095
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	57.69	95% UTL with 95% Coverage	61.88
95% UPL (t)	54.91	95% UPL (t)	57.47
90% Percentile (z)	50.93	90% Percentile (z)	51.71
95% Percentile (z)	54.63	95% Percentile (z)	57.04
99% Percentile (z)	61.56	99% Percentile (z)	68.58

Gamma Distribution Test		Data Distribution Test
k star	13.69	Data appear Gamma Distributed at 5% Significance Level
Theta Star	2.768	
MLE of Mean	37.9	
MLE of Standard Deviation	10.24	
nu star	2382	
A-D Test Statistic	0.322	Nonparametric Statistics
5% A-D Critical Value	0.751	90% Percentile 53
K-S Test Statistic	0.0657	95% Percentile 57
5% K-S Critical Value	0.0957	99% Percentile 60.14
Data appear Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	59
90% Percentile	51.47	95% Percentile Bootstrap UTL with 95% Coverage	59.4
95% Percentile	56.17	95% BCA Bootstrap UTL with 95% Coverage	58.7
99% Percentile	65.7	95% UPL	57.6
		95% Chebyshev UPL	82.49
95% WH Approx. Gamma UPL	56.31	Upper Threshold Limit Based upon IQR	64.63
95% HW Approx. Gamma UPL	56.57		
95% WH Approx. Gamma UTL with 95% Coverage	60		
95% HW Approx. Gamma UTL with 95% Coverage	60.41		

Muddy Creed Potassium, Dissolved

General Statistics			
Total Number of Observations	53	Number of Distinct Observations	27
Raw Statistics		Log-Transformed Statistics	
Minimum	12	Minimum	2.485
Maximum	52	Maximum	3.951
Second Largest	52	Second Largest	3.951
First Quartile	17	First Quartile	2.833
Median	23	Median	3.135
Third Quartile	31	Third Quartile	3.434
Mean	26.42	Mean	3.187
SD	11.63	SD	0.413
Coefficient of Variation	0.44		
Skewness	0.908		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.182	Lilliefors Test Statistic	0.116
Lilliefors Critical Value	0.122	Lilliefors Critical Value	0.122
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	50.2	95% UTL with 95% Coverage	56.33
95% UPL (t)	46.08	95% UPL (t)	48.67
90% Percentile (z)	41.33	90% Percentile (z)	41.11
95% Percentile (z)	45.55	95% Percentile (z)	47.76
99% Percentile (z)	53.48	99% Percentile (z)	63.28
Gamma Distribution Test		Data Distribution Test	
k star	5.598	Data appear Lognormal at 5% Significance Level	
Theta Star	4.72		
MLE of Mean	26.42		
MLE of Standard Deviation	11.17		
nu star	593.4		
A-D Test Statistic	1.585	Nonparametric Statistics	
5% A-D Critical Value	0.753	90% Percentile	44.8
K-S Test Statistic	0.142	95% Percentile	49.2
5% K-S Critical Value	0.122	99% Percentile	52

Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	52
90% Percentile	41.36	95% Percentile Bootstrap UTL with 95% Coverage	52
95% Percentile	47.06	95% BCA Bootstrap UTL with 95% Coverage	52
99% Percentile	59.04	95% UPL	51.3
		95% Chebyshev UPL	77.59
95% WH Approx. Gamma UPL	47.36	Upper Threshold Limit Based upon IQR	52
95% HW Approx. Gamma UPL	47.63		
95% WH Approx. Gamma UTL with 95% Coverage	53.33		
95% HW Approx. Gamma UTL with 95% Coverage	53.95		

Mesa Potassium, Dissolved

General Statistics			
Total Number of Observations	100	Number of Distinct Observations	64
Raw Statistics		Log-Transformed Statistics	
Minimum	25	Minimum	3.219
Maximum	110	Maximum	4.7
Second Largest	110	Second Largest	4.7
First Quartile	42.5	First Quartile	3.749
Median	55.35	Median	4.014
Third Quartile	72.75	Third Quartile	4.287
Mean	58.64	Mean	4.008
SD	20.76	SD	0.363
Coefficient of Variation	0.354		
Skewness	0.469		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.0815	Lilliefors Test Statistic	0.0664
Lilliefors Critical Value	0.0886	Lilliefors Critical Value	0.0886
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	98.56	95% UTL with 95% Coverage	110.7
95% UPL (t)	93.27	95% UPL (t)	100.9
90% Percentile (z)	85.24	90% Percentile (z)	87.65
95% Percentile (z)	92.78	95% Percentile (z)	100
99% Percentile (z)	106.9	99% Percentile (z)	128.1
Gamma Distribution Test		Data Distribution Test	
k star	7.792	Data appear Normal at 5% Significance Level	
Theta Star	7.525		
MLE of Mean	58.64		
MLE of Standard Deviation	21.01		
nu star	1558		
A-D Test Statistic	0.525	Nonparametric Statistics	
5% A-D Critical Value	0.753	90% Percentile	88.1

K-S Test Statistic	0.0704	95% Percentile	93
5% K-S Critical Value	0.0895	99% Percentile	110
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	100
90% Percentile	86.65	95% Percentile Bootstrap UTL with 95% Coverage	100
95% Percentile	96.92	95% BCA Bootstrap UTL with 95% Coverage	93.15
99% Percentile	118.2	95% UPL	93
		95% Chebyshev UPL	149.6
95% WH Approx. Gamma UPL	97.22	Upper Threshold Limit Based upon IQR	118.1
95% HW Approx. Gamma UPL	97.99		
95% WH Approx. Gamma UTL with 95% Coverage	104.8		
95% HW Approx. Gamma UTL with 95% Coverage	106.1		

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Potassium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creed Potassium, Dissolved

Background Data: Alluv Potassium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	53	87
Number of Distinct Observations	27	54
Minimum	12	20
Maximum	52	61
Mean	26.42	37.9
Median	23	36
SD	11.63	10.17
SE of Mean	1.597	1.091

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	2428
WMW Test U-Stat	5.619
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	1.8690E-8

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Potassium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Potassium, Dissolved

Background Data: Muddy Creed Potassium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	100	53
Number of Distinct Observations	64	27
Minimum	25	12
Maximum	110	52
Mean	58.64	26.42
Median	55.35	23
SD	20.76	11.63
SE of Mean	2.076	1.597

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	9945
WMW Test U-Stat	8.604
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Potassium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Potassium, Dissolved

Background Data: Alluv Potassium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	100	87
Number of Distinct Observations	64	54
Minimum	25	20
Maximum	110	61
Mean	58.64	37.9
Median	55.35	36
SD	20.76	10.17
SE of Mean	2.076	1.091

Wilcoxon-Mann-Whitney (WMW) Test

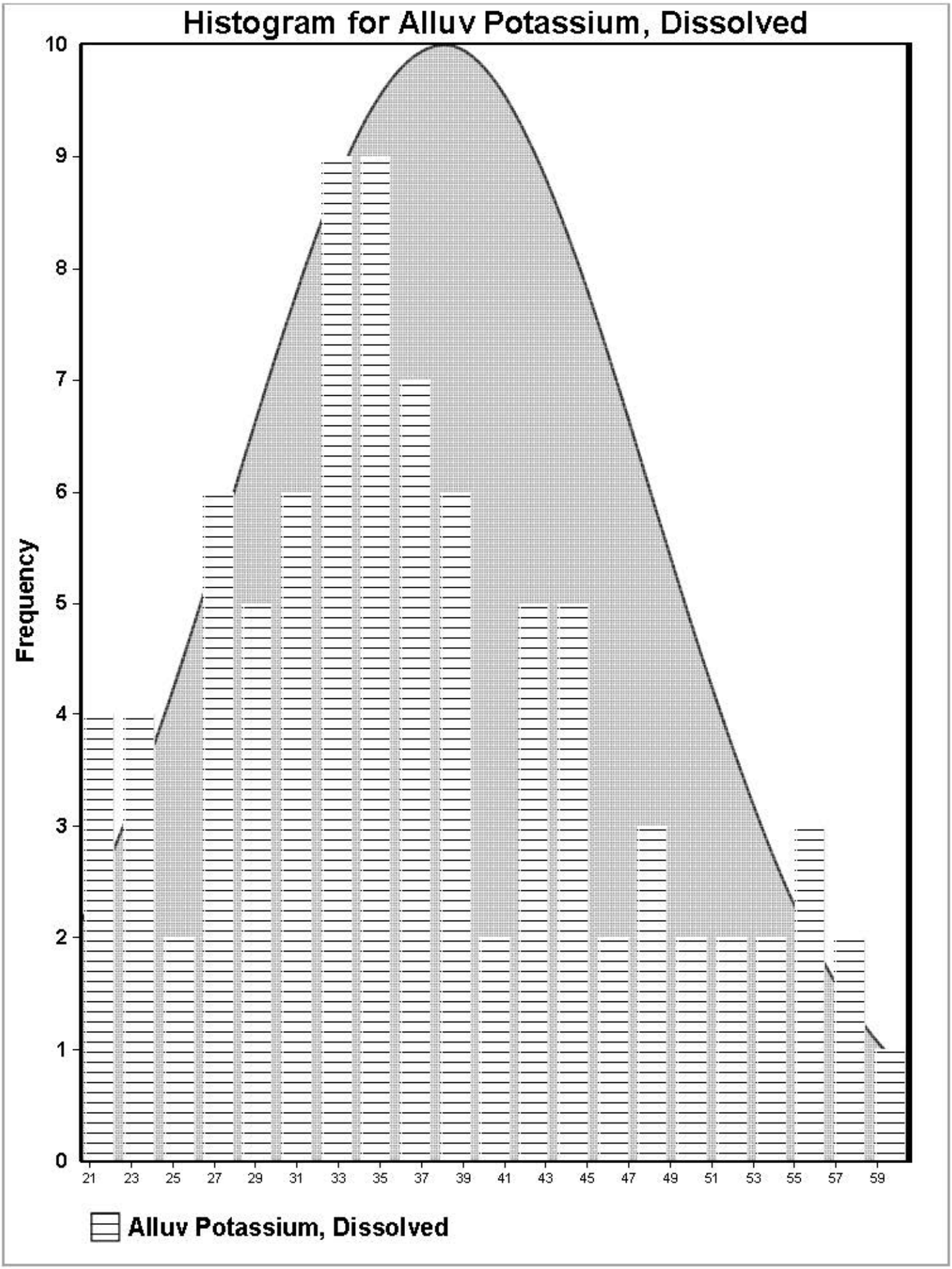
H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	12069
WMW Test U-Stat	7.228
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	4.901E-13

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Potassium, Dissolved
Frequency
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2
3
4
5
6
7
8
9
10
21
23
25
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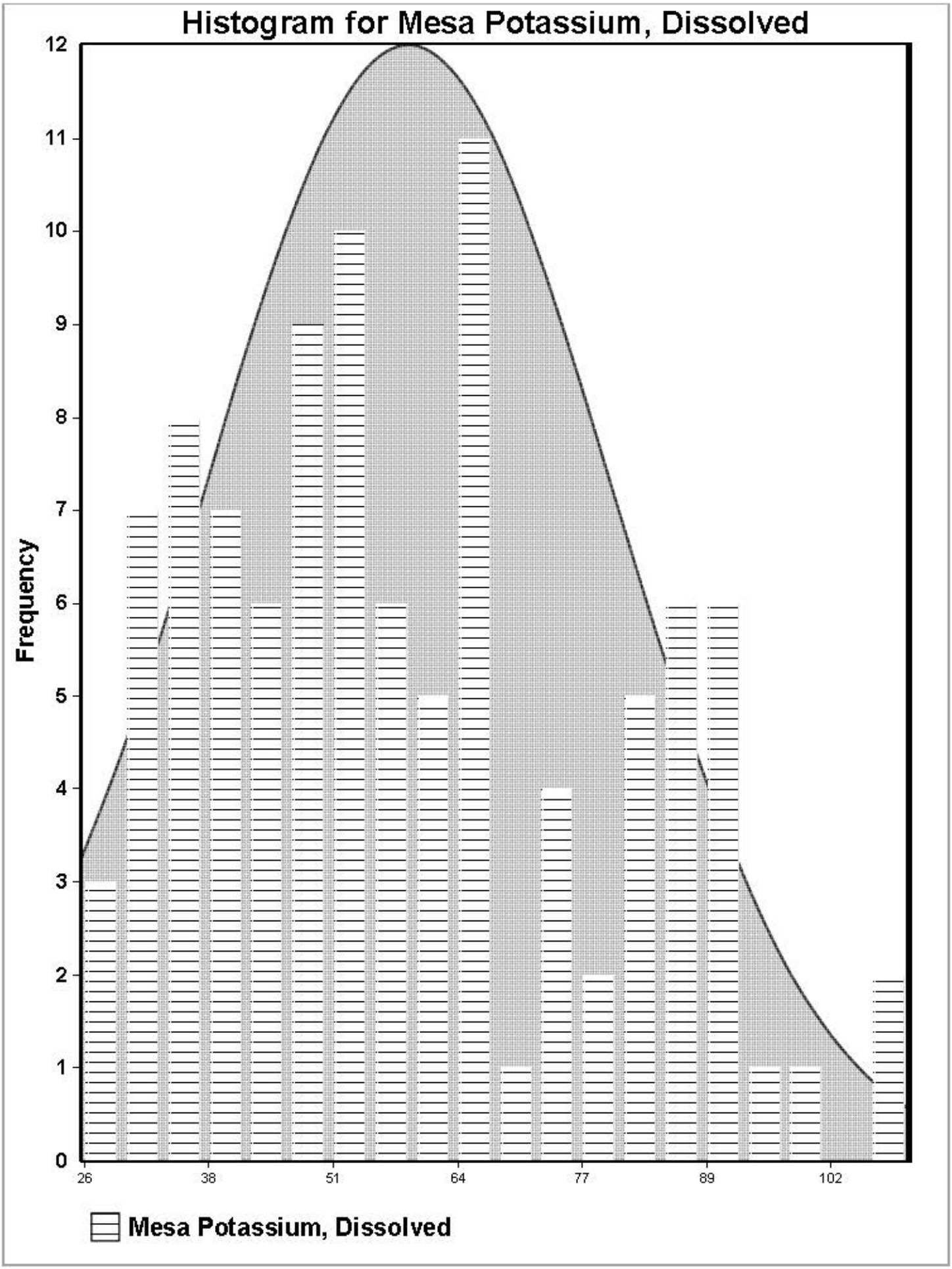
43
45
47
49
51
53
55
57
59
Alluv Potassium, Dissolved


Histogram for Mesa Potassium, Dissolved
Frequency
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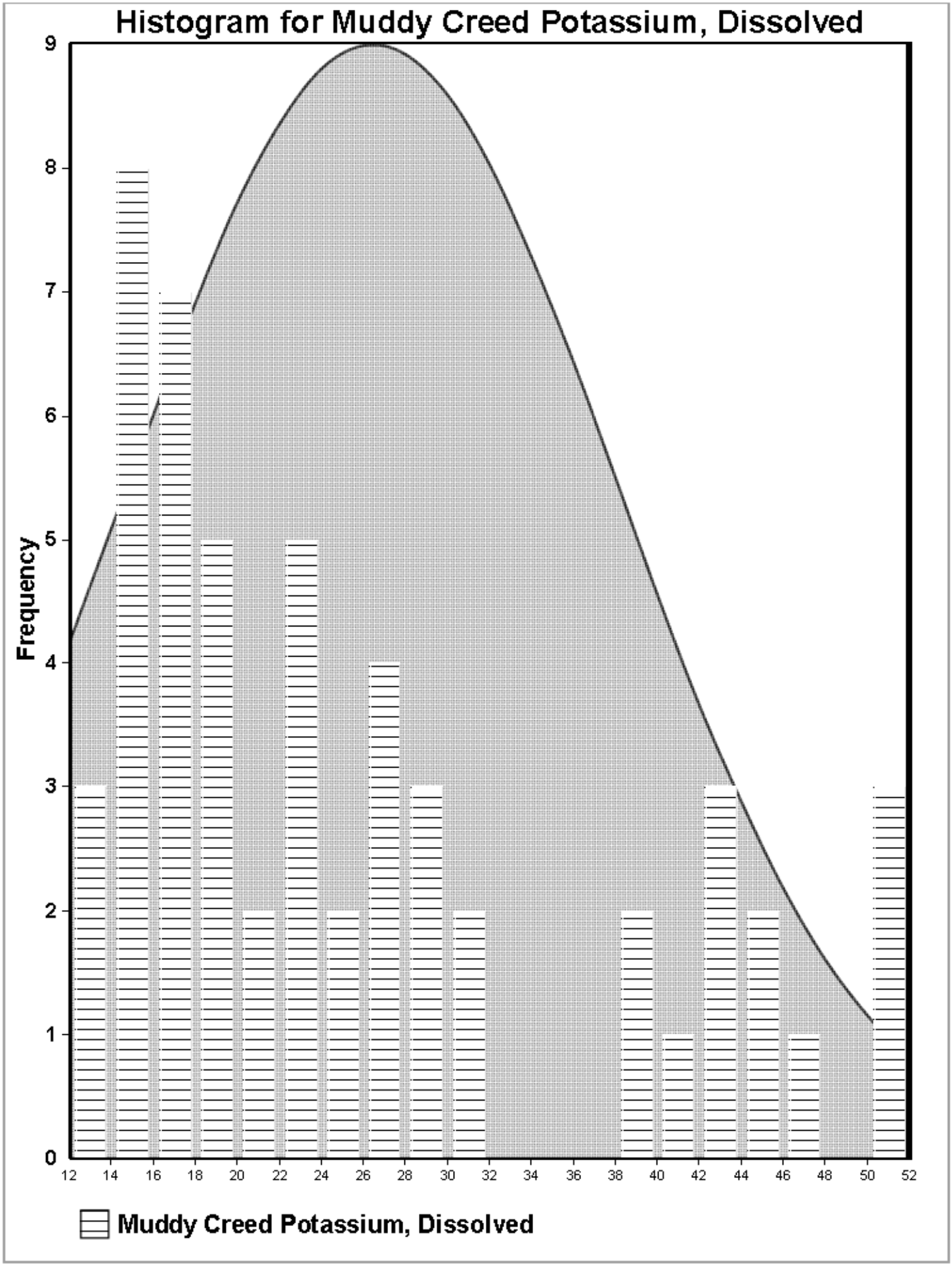
1
2
3
4
5
6
7
8
9
10
11
12
26
38
51
64
77
89
102
Mesa Potassium, Dissolved


Histogram for Muddy Creed Potassium, Dissolved
Frequency
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Muddy Creed Potassium, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Potassium_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for Alluv Potassium, Dissolved

Mean	37.9
Standard Deviation	10.17
Number of data	87
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	37.9	10.11	61	86	2.284	3.338	3.705

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creed Potassium, Dissolved

Mean	26.42
Standard Deviation	11.63
Number of data	53
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	26.42	11.52	52	22	2.22	3.151	3.504

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Potassium, Dissolved

Mean	58.64
Standard Deviation	20.76
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	58.64	20.65	110	26	2.487	3.38	3.75

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Location Name	Sample Date	Alluv Potassium, Dissolved
BG-1S	11/26/2012	26
BG-1S	8/23/2012	22
BG-1S	5/24/2012	22
BG-1S	3/20/2012	20
IMW-2.5D	11/26/2012	34
IMW-2.5D	8/24/2012	32
IMW-2.5D	5/21/2012	27
IMW-2.5D	3/21/2012	30
IMW-2.5D	12/8/2011	31
IMW-2.5D	6/6/2011	28.1
IMW-2.5D	12/15/2010	41.2
IMW-2.5D	6/9/2010	49
IMW-2.5D	12/12/2009	44
IMW-2.5S	11/26/2012	38
IMW-2.5S	8/24/2012	36
IMW-2.5S	5/21/2012	32
IMW-2.5S	3/21/2012	35
IMW-2.5S	12/8/2011	36
IMW-2.5S	9/9/2011	36
IMW-2.5S	6/6/2011	33.7
IMW-2.5S	3/7/2011	36.3
IMW-2.5S	12/15/2010	32.4
IMW-2.5S	9/20/2010	38.9
IMW-2.5S	6/9/2010	50
IMW-2.5S	3/9/2010	57
IMW-2.5S	12/12/2009	42
IMW-2.5S	9/21/2009	55
IMW-3S	5/21/2012	23
IMW-3S	3/20/2012	23
IMW-3S	12/9/2011	25
IMW-3S	9/9/2011	24
IMW-3S	6/7/2011	21.2
IMW-3S	3/7/2011	26.3
IMW-3S	12/10/2010	24
IMW-3S	9/16/2010	27.2
IMW-3S	6/8/2010	32
IMW-3S	3/9/2010	33
IMW-3S	12/10/2009	34
IMW-3S	9/14/2009	37
IMW-3S	6/9/2009	38
IMW-3S	3/3/2009	40
IMW-3S	12/9/2008	32
IMW-3S	9/9/2008	33
IMW-3S	6/3/2008	36
IMW-3S	3/4/2008	33
KMW-2D	11/26/2012	34
KMW-2D	8/24/2012	30
KMW-2D	5/21/2012	28
KMW-2D	3/23/2012	29
KMW-2D	12/8/2011	31
KMW-2D	6/6/2011	26.8

Location Name	Sample Date	Muddy Creed Potassium, Dissolved
BG-3S	11/27/2012	23
BG-3S	8/22/2012	22
BG-3S	5/23/2012	19
BG-3S	3/21/2012	16
BG-4S	11/27/2012	46
BG-4S	8/30/2012	45
BG-4S	5/30/2012	44
BG-4S	3/20/2012	42
BG-6S	11/27/2012	23
BG-6S	8/23/2012	20
BG-6S	5/25/2012	17
BG-6S	3/21/2012	20
BG-1M	11/26/2012	20
BG-1M	8/23/2012	18
BG-1M	5/24/2012	16
BG-1M	3/20/2012	16
BG-3M	11/27/2012	17
BG-3M	8/22/2012	16
BG-3M	5/24/2012	15
BG-3M	3/21/2012	14
BG-4M	11/27/2012	51
BG-4M	8/30/2012	52
BG-4M	5/30/2012	48
BG-4M	3/20/2012	52
BG-6M	11/27/2012	28
BG-6M	8/22/2012	27
BG-6M	5/25/2012	18
BG-6M	3/21/2012	27
BG-1D	11/26/2012	22
BG-1D	8/23/2012	19
BG-1D	5/24/2012	17
BG-1D	3/20/2012	17
BG-3D	11/27/2012	17
BG-3D	8/21/2012	16
BG-3D	5/23/2012	13
BG-3D	3/21/2012	12
BG-4D	11/27/2012	43
BG-4D	8/30/2012	43
BG-4D	5/30/2012	40
BG-4D	3/20/2012	40
BG-6D	11/27/2012	30
BG-6D	8/22/2012	29
BG-6D	5/25/2012	16
BG-6D	3/21/2012	15
IMW-3D	5/25/2012	23
IMW-3D	3/22/2012	23
IMW-3D	12/9/2011	23
IMW-3D	6/7/2011	24.5
IMW-3D	12/10/2010	25.9
IMW-3D	6/8/2010	30
IMW-3D	12/10/2009	31

Location Name	Sample Date	Mesa Potassium, Dissolved
BG-2S	11/26/2012	86
BG-2S	8/23/2012	86
BG-2S	5/24/2012	84
BG-2S	3/21/2012	84
BG-2M	11/26/2012	51
BG-2M	8/23/2012	36
BG-2M	5/24/2012	40
BG-2M	3/21/2012	44
BG-2D	11/26/2012	30
BG-2D	8/23/2012	25
BG-2D	5/24/2012	25
BG-2D	3/21/2012	26
LMW-10	11/28/2012	81
LMW-10	8/27/2012	86
LMW-10	5/30/2012	82
LMW-10	3/22/2012	76
LMW-10	12/6/2011	92
LMW-10	9/8/2011	93
LMW-10	6/8/2011	72.4
LMW-10	3/2/2011	85.5
LMW-10	12/9/2010	78.8
LMW-10	9/21/2010	73.8
LMW-10	6/9/2010	93
LMW-10	3/11/2010	88
LMW-10	12/11/2009	82
LMW-10	9/18/2009	110
LMW-10	6/10/2009	100
LMW-10	3/5/2009	110
LMW-10	12/12/2008	93
LMW-10	9/10/2008	89
LMW-10	6/4/2008	96
LMW-10	3/5/2008	91
LMW-11R	11/26/2012	64
LMW-11R	8/21/2012	57
LMW-11R	5/29/2012	56
LMW-11R	3/23/2012	56
LMW-7	11/28/2012	64
LMW-7	8/27/2012	63
LMW-7	5/31/2012	60
LMW-7	3/23/2012	61
LMW-7	12/5/2011	64
LMW-7	9/6/2011	64
LMW-7	6/9/2011	54.2
LMW-7	3/9/2011	56.3
LMW-7	12/10/2010	56.7
LMW-7	9/21/2010	54.7
LMW-7	6/9/2010	67
LMW-7	3/11/2010	62
LMW-7	12/11/2009	64
LMW-7	9/18/2009	77
LMW-7	6/10/2009	85

KMW-2D	12/13/2010	29.3
KMW-2D	6/8/2010	37
KMW-2D	12/8/2009	38
KMW-2D	12/10/2008	29
KMW-2D	6/3/2008	35
KMW-2M	11/26/2012	44
KMW-2M	8/24/2012	40
KMW-2M	5/21/2012	37
KMW-2M	3/23/2012	39
KMW-2M	12/8/2011	36
KMW-2M	6/6/2011	33.5
KMW-2M	12/13/2010	35.1
KMW-2M	6/8/2010	46
KMW-2M	12/8/2009	51
KMW-2M	12/10/2008	38
KMW-2M	6/3/2008	39
KMW-2S	11/26/2012	50
KMW-2S	8/24/2012	46
KMW-2S	5/21/2012	39
KMW-2S	3/23/2012	43
KMW-2S	12/8/2011	47
KMW-2S	9/9/2011	44
KMW-2S	6/6/2011	44.1
KMW-2S	3/8/2011	45.4
KMW-2S	12/13/2010	45.9
KMW-2S	9/15/2010	44.8
KMW-2S	6/8/2010	60
KMW-2S	3/9/2010	53
KMW-2S	12/8/2009	59
KMW-2S	9/16/2009	53
KMW-2S	6/10/2009	47
KMW-2S	3/3/2009	58
KMW-2S	12/10/2008	57
KMW-2S	9/8/2008	56
KMW-2S	6/3/2008	61
KMW-2S	3/4/2008	52

IMW-3D	12/9/2008	28
IMW-3D	6/3/2008	31

LMW-7	3/5/2009	72
LMW-7	12/12/2008	66
LMW-7	9/10/2008	67
LMW-7	6/4/2008	68
LMW-7	3/5/2008	63
LMW-9	11/28/2012	45
LMW-9	8/27/2012	46
LMW-9	5/31/2012	43
LMW-9	3/23/2012	44
LMW-9	12/5/2011	48
LMW-9	9/8/2011	47
LMW-9	6/8/2011	41
LMW-9	3/9/2011	44
LMW-9	12/10/2010	39.4
LMW-9	9/21/2010	40.4
LMW-9	6/9/2010	52
LMW-9	3/11/2010	48
LMW-9	12/11/2009	48
LMW-9	9/18/2009	53
LMW-9	6/10/2009	66
LMW-9	3/5/2009	54
LMW-9	12/12/2008	51
LMW-9	9/10/2008	52
LMW-9	6/4/2008	54
LMW-9	3/5/2008	48
LMW-11	2/22/2012	54
LMW-11	12/6/2011	65
LMW-11	9/8/2011	64
LMW-11	3/2/2011	46.8
LMW-12R	11/30/2012	35
LMW-12R	10/22/2012	40
LMW-12R	8/21/2012	32
LMW-12R	5/30/2012	36
LMW-13R	11/28/2012	33
LMW-13R	10/22/2012	37
LMW-13R	8/20/2012	30
LMW-13R	5/29/2012	31
LMW-14R	11/30/2012	35
LMW-14R	10/22/2012	41
LMW-14R	8/20/2012	34
LMW-14R	5/29/2012	34
LMW-15	11/28/2012	35
LMW-15	10/22/2012	39
LMW-15	8/20/2012	31
LMW-15	5/29/2012	32
LMW-16	11/28/2012	50
LMW-16	10/22/2012	58
LMW-16	8/20/2012	49
LMW-16	5/29/2012	47

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Pyrene.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Pyrene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	4	22	84.62%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	22	0.05	0.05	0.05	0.05	1.420E-17
Statistics (Detects Only)	4	0.013	0.039	0.024	0.022	0.0111
Statistics (All: NDs treated as DL value)	26	0.013	0.05	0.046	0.05	0.0103
Statistics (All: NDs treated as DL/2 value)	26	0.013	0.039	0.0248	0.025	0.00387
Statistics (Normal ROS Estimated Data)	26	-0.00193	0.0499	0.024	0.024	0.013
Statistics (Gamma ROS Estimated Data)	26	1.000E-12	0.0408	0.0235	0.0245	0.0118
Statistics (Lognormal ROS Estimated Data)	26	0.00736	0.0666	0.0256	0.0222	0.0144

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	6.404	5.691	0.00375	-3.81	0.463	-0.121
Statistics (NDs = DL)	12.11	10.74	0.0038	-3.121	0.34	-0.109
Statistics (NDs = DL/2)	40.39	35.76	6.1514E-4	-3.707	0.166	-0.0449
Statistics (Gamma ROS Estimates)	0.607	0.563	0.0387	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.81	0.553	-0.145

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.977	0.66	0.646	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.958	0.748	Data Appear Normal
Lilliefors (Detects Only)	0.214	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.446	0.92	Data Not Normal
Lilliefors (NDs = DL)	0.497	0.174	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.47	0.92	Data Not Normal
Lilliefors (NDs = DL/2)	0.446	0.174	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.992	0.92	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0544	0.174	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.999	0.583	0.654	0.798

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.207	0.658	
Kolmogorov-Smirnov (Detects Only)	0.178	0.396	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	7.141	0.744	
Kolmogorov-Smirnov (NDs = DL)	0.498	0.171	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	6.94	0.743	
Kolmogorov-Smirnov (NDs = DL/2)	0.46	0.171	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.902	0.798	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.335	0.18	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.999	0.645	0.644	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.999	0.748	Data Appear Lognormal
Lilliefors (Detects Only)	0.147	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.433	0.92	Data Not Lognormal
Lilliefors (NDs = DL)	0.49	0.174	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.466	0.92	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.468	0.174	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.993	0.92	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0489	0.174	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Pyrene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	4	42	91.30%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	42	0.05	0.05	0.05	0.05	7.023E-18
Statistics (Detects Only)	4	0.014	0.034	0.0235	0.023	0.011
Statistics (All: NDs treated as DL value)	46	0.014	0.05	0.0477	0.05	0.00807
Statistics (All: NDs treated as DL/2 value)	46	0.014	0.034	0.0249	0.025	0.00287
Statistics (Normal ROS Estimated Data)	46	-0.00406	0.0511	0.0235	0.0235	0.0127
Statistics (Gamma ROS Estimated Data)	46	1.000E-12	0.04	0.023	0.0242	0.0113
Statistics (Lognormal ROS Estimated Data)	46	0.00627	0.0737	0.0251	0.0215	0.0146

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	5.751	5.391	0.00409	-3.84	0.495	-0.129
Statistics (NDs = DL)	19.21	17.97	0.00248	-3.069	0.272	-0.0888
Statistics (NDs = DL/2)	63.24	59.13	3.9327E-4	-3.702	0.135	-0.0365
Statistics (Gamma ROS Estimates)	0.884	0.84	0.026	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.84	0.567	-0.148

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.897	0.551	0.606	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.774	0.748	Data Appear Normal
Lilliefors (Detects Only)	0.306	0.443	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.322	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.525	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.414	0.945	Data Not Normal

Lilliefors (NDs = DL/2)	0.475	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.989	0.945	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0459	0.131	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.883	0.491	0.607	0.827

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.649	0.659	
Kolmogorov-Smirnov (Detects Only)	0.341	0.396	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	14.73	0.748	
Kolmogorov-Smirnov (NDs = DL)	0.525	0.13	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	13.79	0.747	
Kolmogorov-Smirnov (NDs = DL/2)	0.49	0.13	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	5.797	0.784	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.258	0.135	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.89	0.53	0.581	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.761	0.748	Data Appear Lognormal
Lilliefors (Detects Only)	0.306	0.443	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.302	0.945	Data Not Lognormal
Lilliefors (NDs = DL)	0.519	0.131	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.379	0.945	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.495	0.131	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.989	0.945	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0458	0.131	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Pyrene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	2	26	92.86%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	26	N/A	N/A	N/A	N/A	N/A
Statistics (Detects Only)	2	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL value)	28	N/A	N/A	N/A	N/A	N/A
Statistics (All: NDs treated as DL/2 value)	28	N/A	N/A	N/A	N/A	N/A
Statistics (Normal ROS Estimated Data)	28	N/A	N/A	N/A	N/A	N/A

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	N/A	N/A	N/A	N/A

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Shapiro-Wilks (Detects Only)	N/A	N/A				
Lilliefors (Detects Only)	N/A	N/A				
Shapiro-Wilks (NDs = DL)	N/A	N/A				
Lilliefors (NDs = DL)	N/A	N/A				
Shapiro-Wilks (NDs = DL/2)	N/A	N/A				
Lilliefors (NDs = DL/2)	N/A	N/A				
Shapiro-Wilks (Normal ROS Estimates)	N/A	N/A				
Lilliefors (Normal ROS Estimates)	N/A	N/A				

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS		
Correlation Coefficient R	N/A	N/A	N/A	N/A		

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Anderson-Darling (Detects Only)	N/A	N/A				
Kolmogorov-Smirnov (Detects Only)	N/A	N/A				
Anderson-Darling (NDs = DL)	N/A	N/A				
Kolmogorov-Smirnov (NDs = DL)	N/A	N/A				
Anderson-Darling (NDs = DL/2)	N/A	N/A				
Kolmogorov-Smirnov (NDs = DL/2)	N/A	N/A				
Anderson-Darling (Gamma ROS Estimates)	N/A	N/A				
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	N/A				

Note: Substitution methods such as DL or DL/2 are not recommended.

All Pyrene

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	10	90	90.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	90	0.05	0.05	0.05	0.05	9.071E-17
Statistics (Detects Only)	10	0.013	0.054	0.027	0.0255	0.0131
Statistics (All: NDs treated as DL value)	100	0.013	0.054	0.0477	0.05	0.00798
Statistics (All: NDs treated as DL/2 value)	100	0.013	0.054	0.0252	0.025	0.004
Statistics (Normal ROS Estimated Data)	100	-0.00235	0.054	0.0242	0.0244	0.0111
Statistics (Gamma ROS Estimated Data)	100	0.013	0.054	0.0268	0.0265	0.00407
Statistics (Lognormal ROS Estimated Data)	100	0.00845	0.054	0.0238	0.0221	0.00962

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.926	4.785	0.00548	-3.717	0.485	-0.13
Statistics (NDs = DL)	20.15	19.55	0.00237	-3.068	0.262	-0.0854
Statistics (NDs = DL/2)	46.61	45.22	5.4060E-4	-3.692	0.146	-0.0397
Statistics (Gamma ROS Estimates)	45.12	43.78	5.9382E-4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.816	0.4	-0.105

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS		
Correlation Coefficient R	0.959	0.576	0.561	0.999		

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Shapiro-Wilks (Detects Only)	0.916	0.842	Data Appear Normal			

Lilliefors (Detects Only)	0.143	0.28	Data Appear Normal
Lilliefors (NDs = DL)	0.523	0.0886	Data Not Normal
Lilliefors (NDs = DL/2)	0.47	0.0886	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0255	0.0886	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.989	0.517	0.58	0.742

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.291	0.729	
Kolmogorov-Smirnov (Detects Only)	0.176	0.267	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	31.25	0.75	
Kolmogorov-Smirnov (NDs = DL)	0.523	0.0892	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	29.28	0.75	
Kolmogorov-Smirnov (NDs = DL/2)	0.458	0.0892	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	14.31	0.75	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.335	0.0892	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.977	0.556	0.591	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.94	0.842	Data Appear Lognormal
Lilliefors (Detects Only)	0.173	0.28	Data Appear Lognormal
Lilliefors (NDs = DL)	0.518	0.0886	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.468	0.0886	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.029	0.0886	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Pyrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Pyrene

General Statistics

Number of Valid Data	26	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	22
		Percent Non-Detects	84.62%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.013	Minimum Detected	-4.343
Maximum Detected	0.039	Maximum Detected	-3.244
Mean of Detected	0.024	Mean of Detected	-3.81
SD of Detected	0.0111	SD of Detected	0.463
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Test Statistic	0.999
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0248	Mean (Log Scale)	-3.707
SD	0.00387	SD (Log Scale)	0.166
95% UTL 95% Coverage	0.0337	95% UTL 95% Coverage	0.0358
95% UPL (t)	0.0316	95% UPL (t)	0.0328
90% Percentile (z)	0.0298	90% Percentile (z)	0.0304
95% Percentile (z)	0.0312	95% Percentile (z)	0.0323
99% Percentile (z)	0.0339	99% Percentile (z)	0.0361
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0256
		SD in Original Scale	0.0144
		Mean in Log Scale	-3.81

		SD in Log Scale	0.553
		95% UTL 95% Coverage	0.078
		95% UPL (t)	0.058
		90% Percentile (z)	0.045
		95% Percentile (z)	0.055
		99% Percentile (z)	0.0802

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.768	Data appear Normal at 5% Significance Level	
Theta Star	0.0136		
nu star	14.14		
A-D Test Statistic	0.207	Nonparametric Statistics	
5% A-D Critical Value	0.658	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.178	Mean	0.024
5% K-S Critical Value	0.396	SD	0.00964
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00557
		95% KM UTL with 95% Coverage	0.0459
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0668
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0408
Mean	0.0235	90% Percentile (z)	0.0364
Median	0.0245	95% Percentile (z)	0.0399
SD	0.0118	99% Percentile (z)	0.0464
k star	0.563		
Theta star	0.0418	Gamma ROS Limits with Extrapolated Data	
Nu star	29.28	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0644
95% Percentile of Chisquare (2k)	4.146	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0796
		95% WH Approx. Gamma UTL with 95% Coverage	0.0855
90% Percentile	0.062	95% HW Approx. Gamma UTL with 95% Coverage	0.113
95% Percentile	0.0865		
99% Percentile	0.146		

Note: DL/2 is not a recommended method.

Muddy Creek Pyrene

General Statistics

Number of Valid Data	46	Number of Detected Data	4
Number of Distinct Detected Data	3	Number of Non-Detect Data	42
		Percent Non-Detects	91.30%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.014	Minimum Detected	-4.269
Maximum Detected	0.034	Maximum Detected	-3.381
Mean of Detected	0.0235	Mean of Detected	-3.84
SD of Detected	0.011	SD of Detected	0.495
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Warning: There are only 3 Distinct Detected Values in this data set

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.774	Shapiro Wilk Test Statistic	0.761
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0249	Mean (Log Scale)	-3.702
SD	0.00287	SD (Log Scale)	0.135
95% UTL 95% Coverage	0.0308	95% UTL 95% Coverage	0.0327
95% UPL (t)	0.0297	95% UPL (t)	0.031
90% Percentile (z)	0.0286	90% Percentile (z)	0.0293
95% Percentile (z)	0.0296	95% Percentile (z)	0.0308
99% Percentile (z)	0.0316	99% Percentile (z)	0.0338
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0251
		SD in Original Scale	0.0146
		Mean in Log Scale	-3.84
		SD in Log Scale	0.567
		95% UTL 95% Coverage	0.0698
		95% UPL (t)	0.0562
		90% Percentile (z)	0.0444
		95% Percentile (z)	0.0546
		99% Percentile (z)	0.0803
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.605	Data appear Normal at 5% Significance Level	
Theta Star	0.0146		
nu star	12.84		
A-D Test Statistic	0.649	Nonparametric Statistics	
5% A-D Critical Value	0.659	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.341	Mean	0.0235
5% K-S Critical Value	0.396	SD	0.00953
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0055
		95% KM UTL with 95% Coverage	0.0433
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0655
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0397
Mean	0.023	90% Percentile (z)	0.0357
Median	0.0242	95% Percentile (z)	0.0392
SD	0.0113	99% Percentile (z)	0.0457
k star	0.84		
Theta star	0.0273	Gamma ROS Limits with Extrapolated Data	
Nu star	77.32	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0573

95% Percentile of Chisquare (2k)	5.357	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0667
		95% WH Approx. Gamma UTL with 95% Coverage	0.0695
90% Percentile	0.0552	95% HW Approx. Gamma UTL with 95% Coverage	0.0842
95% Percentile	0.0733		
99% Percentile	0.116		

Note: DL/2 is not a recommended method.

Mesa Pyrene

General Statistics

Number of Valid Data	28	Number of Detected Data	2
Number of Distinct Detected Data	2	Number of Non-Detect Data	26
		Percent Non-Detects	92.86%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.026	Minimum Detected	-3.65
Maximum Detected	0.054	Maximum Detected	-2.919
Mean of Detected	0.04	Mean of Detected	-3.284
SD of Detected	0.0198	SD of Detected	0.517
Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Warning: Data set has only 2 Distinct Detected Values.

This may not be adequate enough to compute meaningful and reliable test statistics and estimates.

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Unless Data Quality Objectives (DQOs) have been met, it is suggested to collect additional observations.

The number of detected data may not be adequate enough to perform GOF tests, bootstrap, and ROS methods.

Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values for bootstrap methods.

However, results obtained using 4 to 9 distinct values may not be reliable.

It is recommended to have 10 to 15 or more observations for accurate and meaningful results and estimates.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	N/A	Shapiro Wilk Test Statistic	N/A
5% Shapiro Wilk Critical Value	N/A	5% Shapiro Wilk Critical Value	N/A
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0261	Mean (Log Scale)	-3.66
SD	0.00548	SD (Log Scale)	0.145
95% UTL 95% Coverage	0.0384	95% UTL 95% Coverage	0.0357
95% UPL (t)	0.0356	95% UPL (t)	0.0331
90% Percentile (z)	0.0331	90% Percentile (z)	0.031
95% Percentile (z)	0.0351	95% Percentile (z)	0.0327

99% Percentile (z)	0.0388	99% Percentile (z)	0.0361
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	N/A
		SD in Original Scale	N/A
		Mean in Log Scale	N/A
		SD in Log Scale	N/A
		95% UTL 95% Coverage	N/A
		95% UPL (t)	N/A
		90% Percentile (z)	N/A
		95% Percentile (z)	N/A
		99% Percentile (z)	N/A
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	N/A	Data do not follow a Discernable Distribution (0.05)	
Theta Star	N/A		
nu star	N/A		
A-D Test Statistic	N/A	Nonparametric Statistics	
5% A-D Critical Value	N/A	Kaplan-Meier (KM) Method	
K-S Test Statistic	N/A	Mean	0.027
5% K-S Critical Value	N/A	SD	0.0052
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00139
		95% KM UTL with 95% Coverage	0.0387
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0501
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.036
Mean	N/A	90% Percentile (z)	0.0337
Median	N/A	95% Percentile (z)	0.0355
SD	N/A	99% Percentile (z)	0.0391
k star	N/A		
Theta star	N/A	Gamma ROS Limits with Extrapolated Data	
Nu star	N/A	95% Wilson Hilferty (WH) Approx. Gamma UPL	N/A
95% Percentile of Chisquare (2k)	N/A	95% Hawkins Wixley (HW) Approx. Gamma UPL	N/A
		95% WH Approx. Gamma UTL with 95% Coverage	N/A
90% Percentile	N/A	95% HW Approx. Gamma UTL with 95% Coverage	N/A
95% Percentile	N/A		
99% Percentile	N/A		

Note: DL/2 is not a recommended method.

All Pyrene

General Statistics			
Number of Valid Data	100	Number of Detected Data	10
Number of Distinct Detected Data	9	Number of Non-Detect Data	90
		Percent Non-Detects	90.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.013	Minimum Detected	-4.343
Maximum Detected	0.054	Maximum Detected	-2.919
Mean of Detected	0.027	Mean of Detected	-3.717
SD of Detected	0.0131	SD of Detected	0.485

Minimum Non-Detect	0.05	Minimum Non-Detect	-2.996
Maximum Non-Detect	0.05	Maximum Non-Detect	-2.996

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.916	Shapiro Wilk Test Statistic	0.94
5% Shapiro Wilk Critical Value	0.842	5% Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0252	Mean (Log Scale)	-3.692
SD	0.004	SD (Log Scale)	0.146
95% UTL 95% Coverage	0.0329	95% UTL 95% Coverage	0.033
95% UPL (t)	0.0319	95% UPL (t)	0.0318
90% Percentile (z)	0.0303	90% Percentile (z)	0.0301
95% Percentile (z)	0.0318	95% Percentile (z)	0.0317
99% Percentile (z)	0.0345	99% Percentile (z)	0.035
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0238
		SD in Original Scale	0.00962
		Mean in Log Scale	-3.816
		SD in Log Scale	0.4
		95% UTL 95% Coverage	0.0475
		95% UPL (t)	0.0429
		90% Percentile (z)	0.0368
		95% Percentile (z)	0.0425
		99% Percentile (z)	0.0558

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	3.515	Data appear Normal at 5% Significance Level	
Theta Star	0.00768		
nu star	70.3		
A-D Test Statistic	0.291	Nonparametric Statistics	
5% A-D Critical Value	0.729	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.176	Mean	0.0243
5% K-S Critical Value	0.267	SD	0.0095
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00317
		95% KM UTL with 95% Coverage	0.0426
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0659
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0402
Mean	0.0268	90% Percentile (z)	0.0365
Median	0.0265	95% Percentile (z)	0.0399
SD	0.00407	99% Percentile (z)	0.0464
k star	43.78		
Theta star	6.1209E-4	Gamma ROS Limits with Extrapolated Data	
Nu star	8755	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0338
95% Percentile of Chisquare (2k)	110.4	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0339
		95% WH Approx. Gamma UTL with 95% Coverage	0.035
90% Percentile	0.0321	95% HW Approx. Gamma UTL with 95% Coverage	0.0351

				95% Percentile	0.0338						
				99% Percentile	0.0371						
Note: DL/2 is not a recommended method.											

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Pyrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Pyrene

Background Data: Alluv Pyrene

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	26	22
Number of Detect Data	2	4
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	92.86%	84.62%
Minimum Detected	0.026	0.013
Maximum Detected	0.054	0.039
Mean of Detected Data	0.04	0.024
Median of Detected Data	0.04	0.022
SD of Detected Data	0.0198	0.0111

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	1.031
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.303

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Pyrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Pyrene

Background Data: Alluv Pyrene

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	42	22
Number of Detect Data	4	4
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	91.30%	84.62%
Minimum Detected	0.014	0.013
Maximum Detected	0.034	0.039
Mean of Detected Data	0.0235	0.024
Median of Detected Data	0.023	0.022
SD of Detected Data	0.011	0.0111

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	1

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Pyrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Pyrene

Background Data: Muddy Creek Pyrene

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	26	42
Number of Detect Data	2	4
Minimum Non-Detect	0.05	0.05
Maximum Non-Detect	0.05	0.05
Percent Non detects	92.86%	91.30%
Minimum Detected	0.026	0.014
Maximum Detected	0.054	0.034
Mean of Detected Data	0.04	0.0235
Median of Detected Data	0.04	0.023
SD of Detected Data	0.0198	0.011

Site vs Background Gehan Test

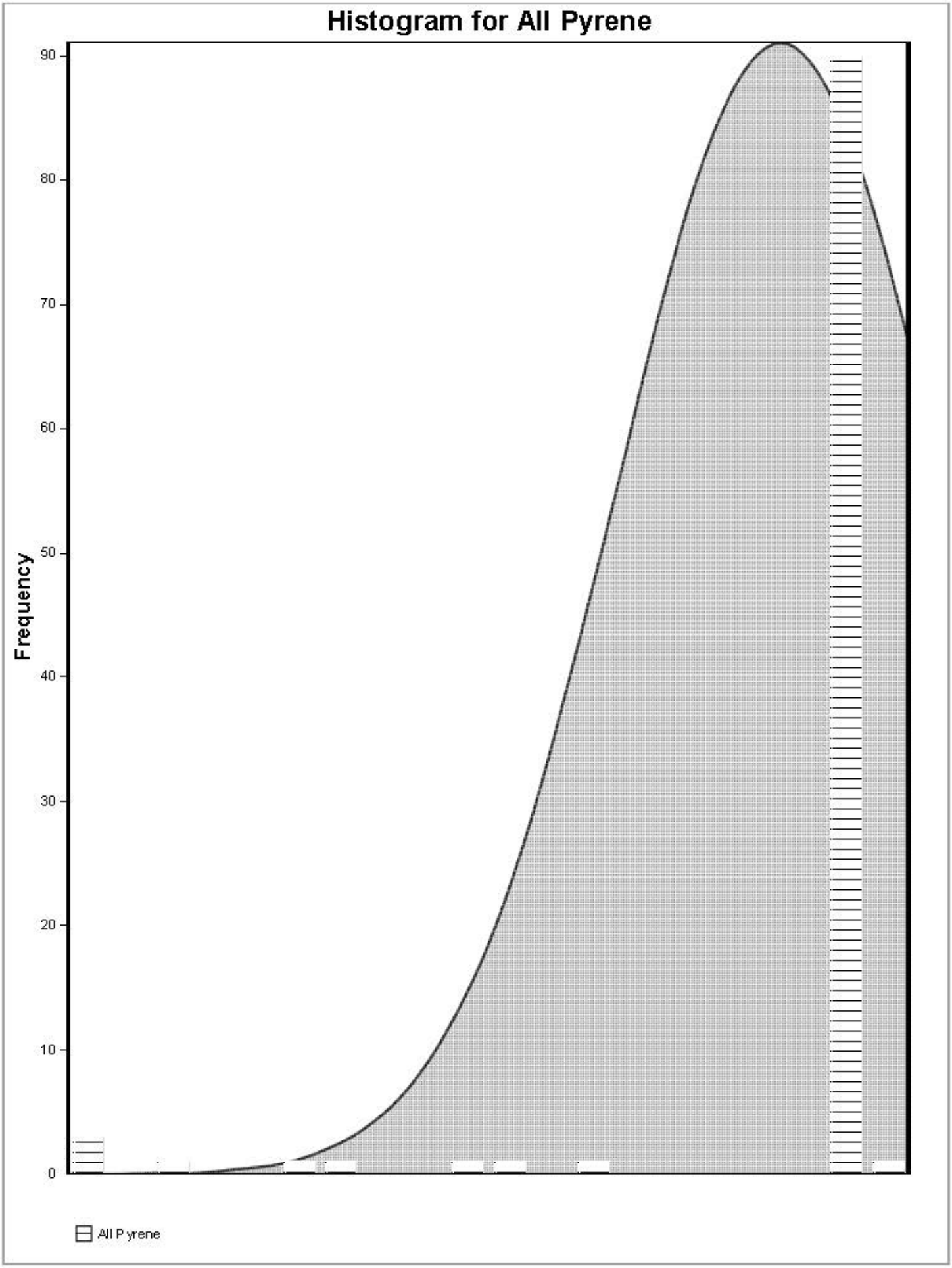
H0: Mu of Site or AOC = Mu of background

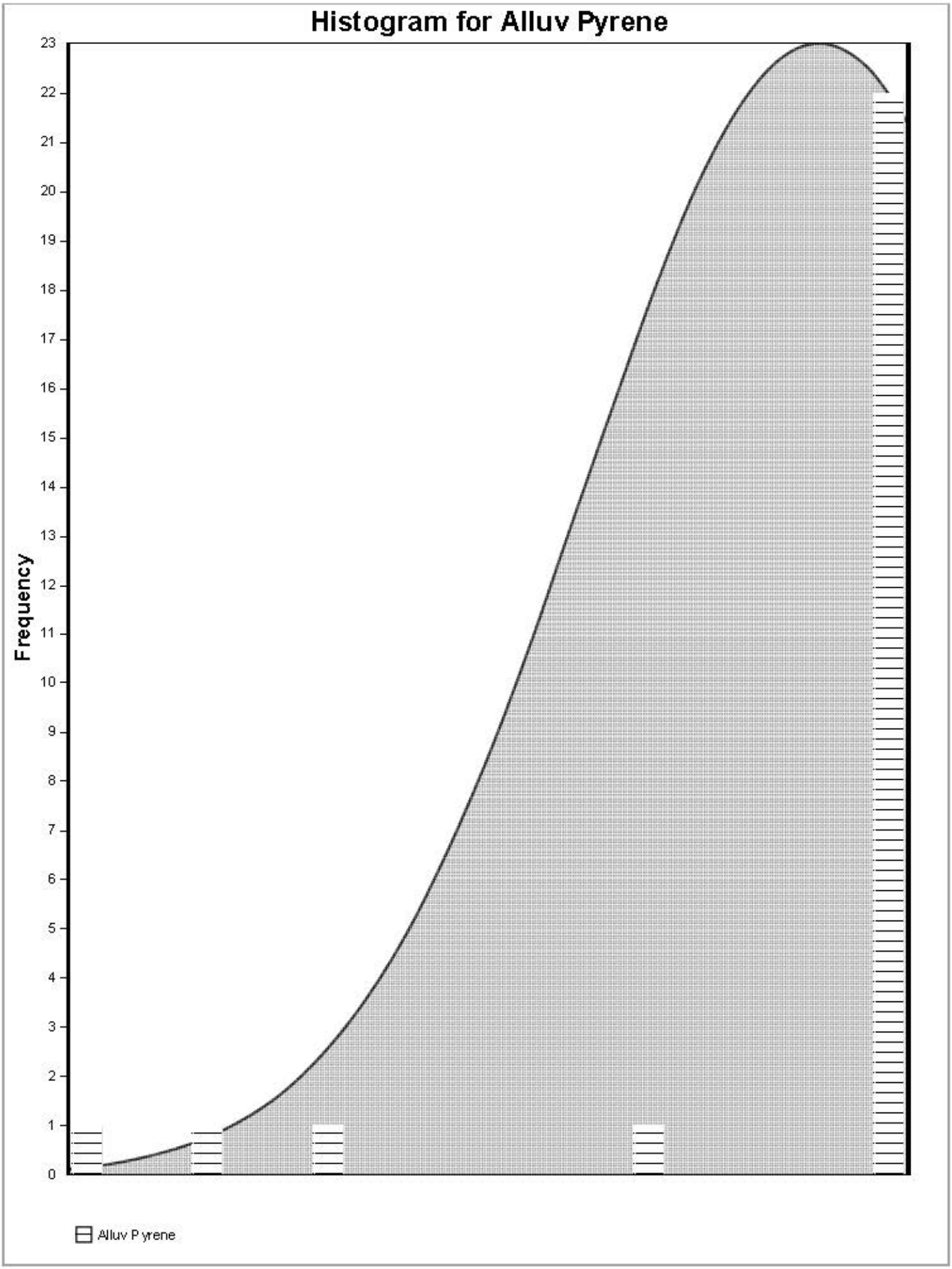
Gehan z Test Value	1.277
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.202

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for All Pyrene
Frequency
90
80
70
60
50
40
30
20
10
0
All Pyrene


Histogram for Alluv Pyrene
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
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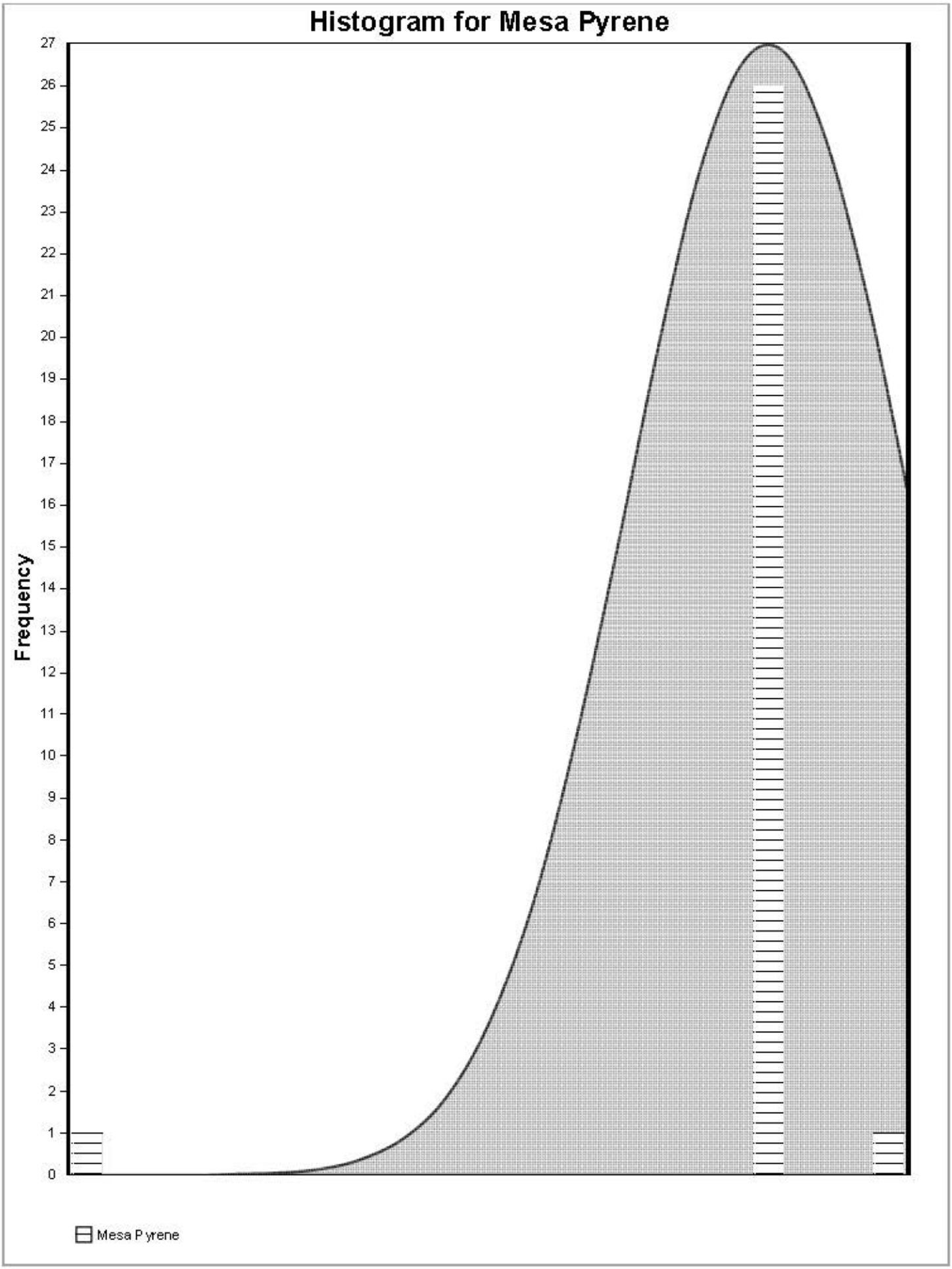
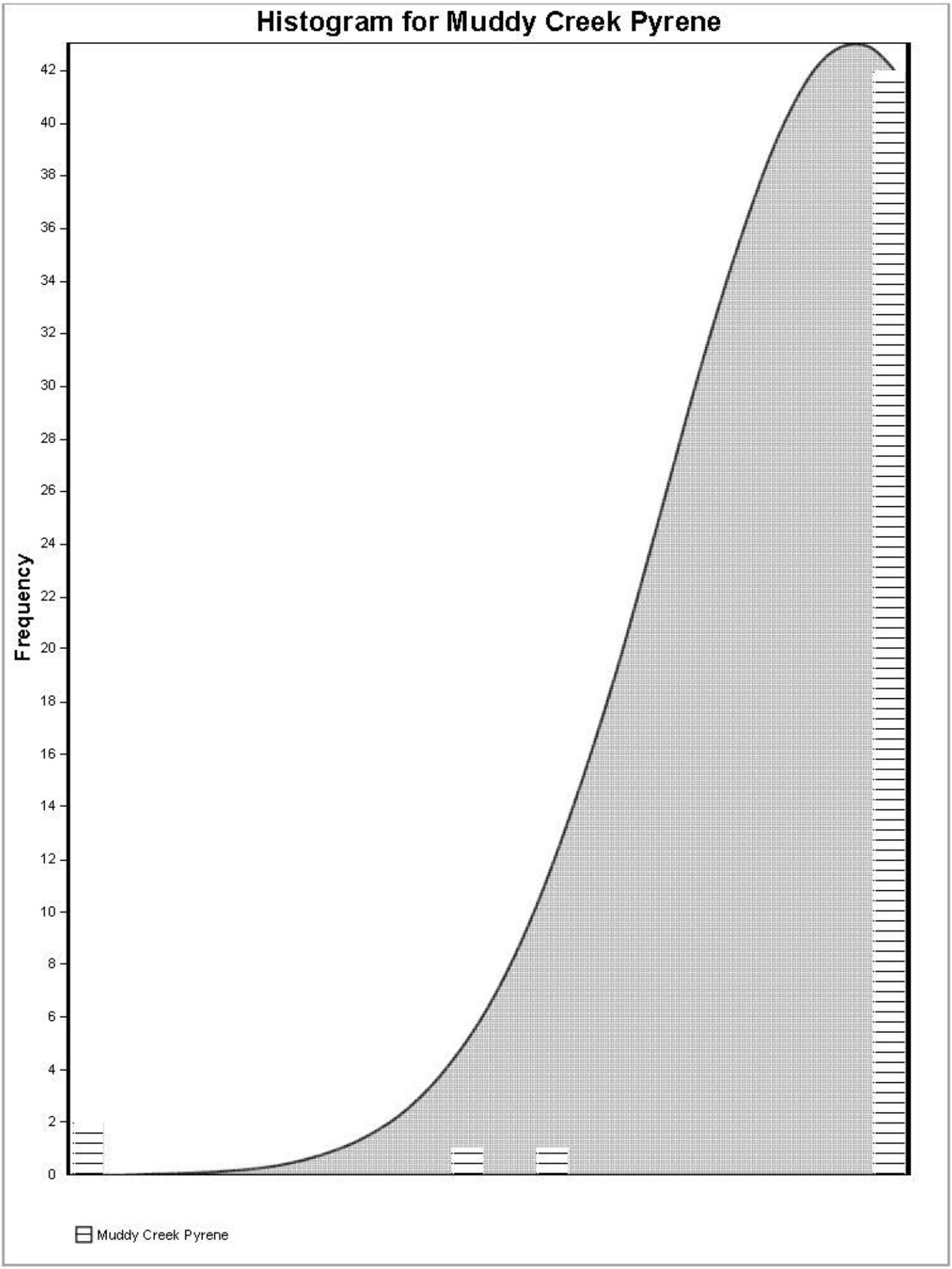
16
17
18
19
20
21
22
23
Alluv Pyrene


Histogram for Mesa Pyrene
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
Mesa Pyrene


Histogram for Muddy Creek Pyrene
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
Muddy Creek Pyrene

Outlier Tests for Selected Variables

User Selected Options	
From File	Pyrene.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Pyrene

Mean	0.0248
Standard Deviation	0.00387
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0248	0.0038	0.039	16	3.725	2.84	3.16

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.039 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.039 is a Potential Statistical Outlier

Rosner's Outlier Test for Muddy Creek Pyrene

Mean	0.0249
Standard Deviation	0.00287
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0249	0.00284	0.014	14	3.826	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.014 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.014 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Pyrene

Mean	0.0261
Standard Deviation	0.00548
Number of data	28
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0261	0.00538	0.054	1	5.193	2.88	3.2

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.054 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.054 is a Potential Statistical Outlier

Rosner's Outlier Test for All Pyrene

Mean	0.0252
Standard Deviation	0.004
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0252	0.00398	0.054	73	7.232	3.38	3.75

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.054 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.054 is a Potential Statistical Outlier

Location Name	Sample Date	Alluv Pyrene	D_Alluv Pyrene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
IMW-2.5D	11/26/2012	0.05	0
IMW-2.5D	8/24/2012	0.05	0
IMW-2.5D	5/21/2012	0.05	0
IMW-2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.025	1
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.019	1
KMW-2D	8/24/2012	0.039	1
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.013	1
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0

Location Name	Sample Date	Muddy Creek Pyrene	D_Muddy Creek Pyrene
BG-3S	11/27/2012	0.05	0
BG-3S	8/22/2012	0.05	0
BG-3S	5/23/2012	0.05	0
BG-3S	3/21/2012	0.05	0
BG-4S	11/27/2012	0.05	0
BG-4S	8/30/2012	0.05	0
BG-4S	5/30/2012	0.05	0
BG-4S	3/20/2012	0.05	0
BG-6S	11/27/2012	0.05	0
BG-6S	8/23/2012	0.05	0
BG-6S	5/25/2012	0.05	0
BG-6S	3/21/2012	0.05	0
BG-1M	11/26/2012	0.05	0
BG-1M	8/23/2012	0.014	1
BG-1M	5/24/2012	0.05	0
BG-1M	3/20/2012	0.05	0
BG-3M	11/27/2012	0.05	0
BG-3M	8/22/2012	0.032	1
BG-3M	5/24/2012	0.05	0
BG-3M	3/21/2012	0.05	0
BG-4M	11/27/2012	0.05	0
BG-4M	8/30/2012	0.05	0
BG-4M	5/30/2012	0.05	0
BG-4M	3/20/2012	0.014	1
BG-6M	11/27/2012	0.05	0
BG-6M	8/22/2012	0.034	1
BG-6M	5/25/2012	0.05	0
BG-6M	3/21/2012	0.05	0
BG-1D	11/26/2012	0.05	0
BG-1D	8/23/2012	0.05	0
BG-1D	5/24/2012	0.05	0
BG-1D	3/20/2012	0.05	0
BG-3D	11/27/2012	0.05	0
BG-3D	8/21/2012	0.05	0
BG-3D	5/23/2012	0.05	0
BG-3D	3/21/2012	0.05	0
BG-4D	11/27/2012	0.05	0
BG-4D	8/30/2012	0.05	0
BG-4D	5/30/2012	0.05	0
BG-4D	3/20/2012	0.014	1
BG-6D	11/27/2012	0.05	0
BG-6D	8/22/2012	0.05	0
BG-6D	5/25/2012	0.05	0
BG-6D	3/21/2012	0.05	0
IMW-3D	5/25/2012	0.05	0
IMW-3D	3/22/2012	0.05	0

Location Name	Sample Date	Mesa Pyrene	D_Mesa Pyrene
BG-2S	11/26/2012	0.054	1
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.026	1
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Location Name	Sample Date	All Pyrene	D_All Pyrene
BG-1S	11/26/2012	0.05	0
BG-1S	8/23/2012	0.05	0
BG-1S	5/24/2012	0.05	0
BG-1S	3/20/2012	0.05	0
2.5D	11/26/2012	0.05	0
2.5D	8/24/2012	0.05	0
2.5D	5/21/2012	0.05	0
2.5D	3/21/2012	0.05	0
IMW-2.5S	11/26/2012	0.05	0
IMW-2.5S	8/24/2012	0.05	0
IMW-2.5S	5/21/2012	0.025	1
IMW-2.5S	3/21/2012	0.05	0
IMW-3S	5/21/2012	0.05	0
IMW-3S	3/20/2012	0.05	0
KMW-2D	11/26/2012	0.019	1
KMW-2D	8/24/2012	0.039	1
KMW-2D	5/21/2012	0.05	0
KMW-2D	3/23/2012	0.05	0
KMW-2M	11/26/2012	0.013	1
KMW-2M	8/24/2012	0.05	0
KMW-2M	5/21/2012	0.05	0
KMW-2M	3/23/2012	0.05	0
KMW-2S	11/26/2012	0.05	0
KMW-2S	8/24/2012	0.05	0
KMW-2S	5/21/2012	0.05	0
KMW-2S	3/23/2012	0.05	0
BG-3S	11/27/2012	0.05	0
BG-3S	8/22/2012	0.05	0
BG-3S	5/23/2012	0.05	0
BG-3S	3/21/2012	0.05	0
BG-4S	11/27/2012	0.05	0
BG-4S	8/30/2012	0.05	0
BG-4S	5/30/2012	0.05	0
BG-4S	3/20/2012	0.05	0
BG-6S	11/27/2012	0.05	0
BG-6S	8/23/2012	0.05	0
BG-6S	5/25/2012	0.05	0
BG-6S	3/21/2012	0.05	0
BG-1M	11/26/2012	0.05	0
BG-1M	8/23/2012	0.014	1
BG-1M	5/24/2012	0.05	0
BG-1M	3/20/2012	0.05	0
BG-3M	11/27/2012	0.05	0
BG-3M	8/22/2012	0.032	1
BG-3M	5/24/2012	0.05	0
BG-3M	3/21/2012	0.05	0
BG-4M	11/27/2012	0.05	0
BG-4M	8/30/2012	0.05	0
BG-4M	5/30/2012	0.05	0
BG-4M	3/20/2012	0.05	0

BG-6M	11/27/2012	0.05	0
BG-6M	8/22/2012	0.034	1
BG-6M	5/25/2012	0.05	0
BG-6M	3/21/2012	0.05	0
BG-1D	11/26/2012	0.05	0
BG-1D	8/23/2012	0.05	0
BG-1D	5/24/2012	0.05	0
BG-1D	3/20/2012	0.05	0
BG-3D	11/27/2012	0.05	0
BG-3D	8/21/2012	0.05	0
BG-3D	5/23/2012	0.05	0
BG-3D	3/21/2012	0.05	0
BG-4D	11/27/2012	0.05	0
BG-4D	8/30/2012	0.05	0
BG-4D	5/30/2012	0.05	0
BG-4D	3/20/2012	0.014	1
BG-6D	11/27/2012	0.05	0
BG-6D	8/22/2012	0.05	0
BG-6D	5/25/2012	0.05	0
BG-6D	3/21/2012	0.05	0
IMW-3D	5/25/2012	0.05	0
IMW-3D	3/22/2012	0.05	0
BG-2S	11/26/2012	0.054	1
BG-2S	8/23/2012	0.05	0
BG-2S	5/24/2012	0.05	0
BG-2S	3/21/2012	0.05	0
BG-2M	11/26/2012	0.05	0
BG-2M	8/23/2012	0.05	0
BG-2M	5/24/2012	0.05	0
BG-2M	3/21/2012	0.05	0
BG-2D	11/26/2012	0.05	0
BG-2D	8/23/2012	0.05	0
BG-2D	5/24/2012	0.05	0
BG-2D	3/21/2012	0.05	0
LMW-10	11/28/2012	0.05	0
LMW-10	8/27/2012	0.05	0
LMW-10	5/30/2012	0.05	0
LMW-10	3/22/2012	0.05	0
LMW-11R	11/26/2012	0.05	0
LMW-11R	8/21/2012	0.05	0
LMW-11R	5/29/2012	0.05	0
LMW-11R	3/23/2012	0.05	0
LMW-7	11/28/2012	0.05	0
LMW-7	8/27/2012	0.05	0
LMW-7	5/31/2012	0.05	0
LMW-7	3/23/2012	0.05	0
LMW-9	11/28/2012	0.05	0
LMW-9	8/27/2012	0.026	1
LMW-9	5/31/2012	0.05	0
LMW-9	3/23/2012	0.05	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Selenium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Selenium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	87	0	87	18	69	79.31%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	69	0.005	0.2	0.032	0.015	0.0401
Statistics (Detects Only)	18	0.003	0.2	0.0743	0.026	0.0841
Statistics (All: NDs treated as DL value)	87	0.003	0.2	0.0407	0.015	0.0545
Statistics (All: NDs treated as DL/2 value)	87	0.0025	0.2	0.028	0.0075	0.0477
Statistics (Normal ROS Estimated Data)	87	-0.115	0.2	0.00954	0.00615	0.065
Statistics (Gamma ROS Estimated Data)	87	1.000E-12	0.2	0.06	0.0572	0.0477
Statistics (Lognormal ROS Estimated Data)	87	3.3297E-4	0.2	0.0208	0.00571	0.0468

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.632	0.618	0.117	-3.57	1.623	-0.455
Statistics (NDs = DL)	0.856	0.834	0.0476	-3.889	1.108	-0.285
Statistics (NDs = DL/2)	0.699	0.683	0.0401	-4.439	1.183	-0.267
Statistics (Gamma ROS Estimates)	0.337	0.333	0.178	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.086	1.44	-0.283

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.862	0.8	0.729	0.951

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.721	0.897	Data Not Normal
Lilliefors (Detects Only)	0.28	0.209	Data Not Normal
Lilliefors (NDs = DL)	0.361	0.095	Data Not Normal
Lilliefors (NDs = DL/2)	0.352	0.095	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.116	0.095	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.838	0.936	0.922	0.837

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.083	0.788	
Kolmogorov-Smirnov (Detects Only)	0.222	0.213	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	8.474	0.789	
Kolmogorov-Smirnov (NDs = DL)	0.295	0.0993	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	9.224	0.799	
Kolmogorov-Smirnov (NDs = DL/2)	0.324	0.1	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	14.85	0.858	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.301	0.104	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.947	0.931	0.915	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.869	0.897	Data Not Lognormal
Lilliefors (Detects Only)	0.207	0.209	Data Appear Lognormal
Lilliefors (NDs = DL)	0.231	0.095	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.257	0.095	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0609	0.095	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Selenium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	53	0	53	20	33	62.26%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	33	0.01	0.1	0.0394	0.02	0.0331
Statistics (Detects Only)	20	0.0063	0.19	0.0615	0.0205	0.069
Statistics (All: NDs treated as DL value)	53	0.0063	0.19	0.0477	0.02	0.0503
Statistics (All: NDs treated as DL/2 value)	53	0.005	0.19	0.0355	0.015	0.0482
Statistics (Normal ROS Estimated Data)	53	-0.0835	0.19	0.0216	0.015	0.0606
Statistics (Gamma ROS Estimated Data)	53	0.0063	0.19	0.0575	0.05	0.0452
Statistics (Lognormal ROS Estimated Data)	53	0.00182	0.19	0.0306	0.013	0.0488

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.896	0.858	0.0686	-3.442	1.185	-0.344
Statistics (NDs = DL)	1.248	1.19	0.0382	-3.494	0.925	-0.265
Statistics (NDs = DL/2)	0.987	0.943	0.0359	-3.925	0.999	-0.254
Statistics (Gamma ROS Estimates)	1.737	1.652	0.0331	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.231	1.126	-0.266

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.865	0.851	0.778	0.938

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.733	0.905	Data Not Normal
Lilliefors (Detects Only)	0.289	0.198	Data Not Normal
Lilliefors (NDs = DL)	0.297	0.122	Data Not Normal
Lilliefors (NDs = DL/2)	0.316	0.122	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.167	0.122	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.919	0.955	0.935	0.853

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.311	0.773	
Kolmogorov-Smirnov (Detects Only)	0.237	0.2	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.391	0.774	
Kolmogorov-Smirnov (NDs = DL)	0.273	0.125	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.941	0.78	
Kolmogorov-Smirnov (NDs = DL/2)	0.249	0.126	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.51	0.765	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.097	0.124	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.954	0.956	0.946	0.972

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.89	0.905	Data Not Lognormal
Lilliefors (Detects Only)	0.189	0.198	Data Appear Lognormal
Lilliefors (NDs = DL)	0.241	0.122	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.186	0.122	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.108	0.122	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Selenium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	64	36	36.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	36	0.0025	0.2	0.0417	0.02	0.052
Statistics (Detects Only)	64	0.014	0.24	0.0645	0.0405	0.0574
Statistics (All: NDs treated as DL value)	100	0.0025	0.24	0.0563	0.0335	0.0563
Statistics (All: NDs treated as DL/2 value)	100	0.00125	0.24	0.0488	0.033	0.0527
Statistics (Normal ROS Estimated Data)	100	-0.126	0.24	0.0282	0.032	0.0724
Statistics (Gamma ROS Estimated Data)	100	1.000E-12	0.24	0.0556	0.04	0.0522
Statistics (Lognormal ROS Estimated Data)	100	0.00334	0.24	0.0466	0.032	0.0523

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.792	1.745	0.036	-3.045	0.753	-0.247
Statistics (NDs = DL)	1.304	1.271	0.0432	-3.307	0.936	-0.283
Statistics (NDs = DL/2)	1.068	1.042	0.0457	-3.557	1.106	-0.311
Statistics (Gamma ROS Estimates)	0.427	0.421	0.13	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.553	0.986	-0.278

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.865	0.876	0.867	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.249	0.111	Data Not Normal
Lilliefors (NDs = DL)	0.207	0.0886	Data Not Normal
Lilliefors (NDs = DL/2)	0.203	0.0886	Data Not Normal

Lilliefors (Normal ROS Estimates)	0.137	0.0886	Data Not Normal	

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.957	0.972	0.975	0.845

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.5	0.766	
Kolmogorov-Smirnov (Detects Only)	0.149	0.113	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.349	0.775	
Kolmogorov-Smirnov (NDs = DL)	0.117	0.0915	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.231	0.781	
Kolmogorov-Smirnov (NDs = DL/2)	0.0886	0.092	Data appear Approximate Gamma Distribution
Anderson-Darling (Gamma ROS Estimates)	13.61	0.836	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.324	0.0955	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.975	0.984	0.984	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.094	0.111	Data Appear Lognormal
Lilliefors (NDs = DL)	0.0836	0.0886	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.111	0.0886	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0647	0.0886	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Selenium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Selenium, Dissolved

General Statistics

Number of Valid Data	87	Number of Detected Data	18
Number of Distinct Detected Data	13	Number of Non-Detect Data	69
		Percent Non-Detects	79.31%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.003	Minimum Detected	-5.809
Maximum Detected	0.2	Maximum Detected	-1.609
Mean of Detected	0.0743	Mean of Detected	-3.57
SD of Detected	0.0841	SD of Detected	1.623
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.2	Maximum Non-Detect	-1.609

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	86
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	1
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	98.85%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.721	Shapiro Wilk Test Statistic	0.869
5% Shapiro Wilk Critical Value	0.897	5% Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.028	Mean (Log Scale)	-4.439
SD	0.0477	SD (Log Scale)	1.183
95% UTL 95% Coverage	0.121	95% UTL 95% Coverage	0.118
95% UPL (t)	0.108	95% UPL (t)	0.0854
90% Percentile (z)	0.0892	90% Percentile (z)	0.0538
95% Percentile (z)	0.107	95% Percentile (z)	0.0827
99% Percentile (z)	0.139	99% Percentile (z)	0.185
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.0208
		SD in Original Scale	0.0468
		Mean in Log Scale	-5.086
		SD in Log Scale	1.44
		95% UTL 95% Coverage	0.102
		95% UPL (t)	0.0686

		90% Percentile (z)	0.0391
		95% Percentile (z)	0.066
		99% Percentile (z)	0.176
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.564	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.132		
nu star	20.3		
A-D Test Statistic	1.083	Nonparametric Statistics	
5% A-D Critical Value	0.788	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.222	Mean	0.0194
5% K-S Critical Value	0.213	SD	0.0469
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00526
		95% KM UTL with 95% Coverage	0.111
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.225
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0979
Mean	0.06	90% Percentile (z)	0.0796
Median	0.0572	95% Percentile (z)	0.0966
SD	0.0477	99% Percentile (z)	0.129
k star	0.333		
Theta star	0.18	Gamma ROS Limits with Extrapolated Data	
Nu star	57.94	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.2
95% Percentile of Chisquare (2k)	2.945	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.251
		95% WH Approx. Gamma UTL with 95% Coverage	0.243
90% Percentile	0.175	95% HW Approx. Gamma UTL with 95% Coverage	0.319
95% Percentile	0.265		
99% Percentile	0.498		

Note: DL/2 is not a recommended method.

Muddy Creek Selenium, Dissolved

General Statistics			
Number of Valid Data	53	Number of Detected Data	20
Number of Distinct Detected Data	18	Number of Non-Detect Data	33
		Percent Non-Detects	62.26%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0063	Minimum Detected	-5.067
Maximum Detected	0.19	Maximum Detected	-1.661
Mean of Detected	0.0615	Mean of Detected	-3.442
SD of Detected	0.069	SD of Detected	1.185
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303
Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	47
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	6
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	88.68%
Background Statistics			

Normal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.733
5% Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level	

Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.89
5% Shapiro Wilk Critical Value	0.905
Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution	
DL/2 Substitution Method	
Mean	0.0355
SD	0.0482
95% UTL 95% Coverage	0.134
95% UPL (t)	0.117
90% Percentile (z)	0.0973
95% Percentile (z)	0.115
99% Percentile (z)	0.148
Maximum Likelihood Estimate(MLE) Method	
Mean	-0.0337
SD	0.112
95% UTL with 95% Coverage	0.195
95% UPL (t)	0.155
90% Percentile (z)	0.11
95% Percentile (z)	0.15
99% Percentile (z)	0.227

Assuming Lognormal Distribution	
DL/2 Substitution Method	
Mean (Log Scale)	-3.925
SD (Log Scale)	0.999
95% UTL 95% Coverage	0.152
95% UPL (t)	0.107
90% Percentile (z)	0.071
95% Percentile (z)	0.102
99% Percentile (z)	0.202
Log ROS Method	
Mean in Original Scale	0.0306
SD in Original Scale	0.0488
95% UTL with 95% Coverage	0.145
95% BCA UTL with 95% Coverage	0.184
95% Bootstrap (%) UTL with 95% Coverage	0.184
95% UPL (t)	0.0975
90% Percentile (z)	0.0615
95% Percentile (z)	0.0927
99% Percentile (z)	0.2

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.795
Theta Star	0.0773
nu star	31.81
A-D Test Statistic	1.311
5% A-D Critical Value	0.773
K-S Test Statistic	0.237
5% K-S Critical Value	0.2
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics with Extrapolated Data	
Mean	0.0575
Median	0.05
SD	0.0452
k star	1.652
Theta star	0.0348
Nu star	175.1
95% Percentile of Chisquare (2k)	8.334
90% Percentile	0.117
95% Percentile	0.145
99% Percentile	0.208

Data Distribution Test with Detected Values Only	
Data do not follow a Discernable Distribution (0.05)	

Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.0301
SD	0.0482
SE of Mean	0.00686
95% KM UTL with 95% Coverage	0.129
95% KM Chebyshev UPL	0.242
95% KM UPL (t)	0.112
90% Percentile (z)	0.092
95% Percentile (z)	0.109
99% Percentile (z)	0.142
Gamma ROS Limits with Extrapolated Data	
95% Wilson Hilferty (WH) Approx. Gamma UPL	0.146
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.151
95% WH Approx. Gamma UTL with 95% Coverage	0.177
95% HW Approx. Gamma UTL with 95% Coverage	0.186

Note: DL/2 is not a recommended method.

Mesa Selenium, Dissolved

General Statistics			
Number of Valid Data	100	Number of Detected Data	64
Number of Distinct Detected Data	46	Number of Non-Detect Data	36
		Percent Non-Detects	36.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.014	Minimum Detected	-4.269
Maximum Detected	0.24	Maximum Detected	-1.427
Mean of Detected	0.0645	Mean of Detected	-3.045
SD of Detected	0.0574	SD of Detected	0.753
Minimum Non-Detect	0.0025	Minimum Non-Detect	-5.991
Maximum Non-Detect	0.2	Maximum Non-Detect	-1.609

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	96
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	4
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	96.00%

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.249	Lilliefors Test Statistic	0.094
5% Lilliefors Critical Value	0.111	5% Lilliefors Critical Value	0.111
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0488	Mean (Log Scale)	-3.557
SD	0.0527	SD (Log Scale)	1.106
95% UTL 95% Coverage	0.15	95% UTL 95% Coverage	0.24
95% UPL (t)	0.137	95% UPL (t)	0.181
90% Percentile (z)	0.116	90% Percentile (z)	0.118
95% Percentile (z)	0.136	95% Percentile (z)	0.176
99% Percentile (z)	0.171	99% Percentile (z)	0.374
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.14	Mean in Original Scale	0.0466
SD	0.0344	SD in Original Scale	0.0523
95% UTL with 95% Coverage	0.206	95% UTL with 95% Coverage	0.191
		95% BCA UTL with 95% Coverage	0.18
		95% Bootstrap (%) UTL with 95% Coverage	0.2
95% UPL (t)	0.197	95% UPL (t)	0.149
90% Percentile (z)	0.184	90% Percentile (z)	0.101
95% Percentile (z)	0.196	95% Percentile (z)	0.145
99% Percentile (z)	0.22	99% Percentile (z)	0.284
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.718	Data appear Lognormal at 5% Significance Level	
Theta Star	0.0375		
nu star	219.9		

A-D Test Statistic	2.5	Nonparametric Statistics	
5% A-D Critical Value	0.766	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.149	Mean	0.0482
5% K-S Critical Value	0.113	SD	0.0513
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00524
		95% KM UTL with 95% Coverage	0.147
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.273
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.134
Mean	0.0556	90% Percentile (z)	0.114
Median	0.04	95% Percentile (z)	0.133
SD	0.0522	99% Percentile (z)	0.168
k star	0.421		
Theta star	0.132	Gamma ROS Limits with Extrapolated Data	
Nu star	84.27	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.171
95% Percentile of Chisquare (2k)	3.439	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.203
		95% WH Approx. Gamma UTL with 95% Coverage	0.202
90% Percentile	0.156	95% HW Approx. Gamma UTL with 95% Coverage	0.25
95% Percentile	0.227		
99% Percentile	0.405		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Selenium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Selenium, Dissolved

Background Data: Alluv Selenium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	53	87
Number of Non-Detect Data	33	69
Number of Detect Data	20	18
Minimum Non-Detect	0.01	0.005
Maximum Non-Detect	0.1	0.2
Percent Non detects	62.26%	79.31%
Minimum Detected	0.0063	0.003
Maximum Detected	0.19	0.2
Mean of Detected Data	0.0615	0.0743
Median of Detected Data	0.0205	0.026
SD of Detected Data	0.069	0.0841

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	2.197
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.028

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Selenium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Selenium, Dissolved

Background Data: Alluv Selenium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	87
Number of Non-Detect Data	36	69
Number of Detect Data	64	18
Minimum Non-Detect	0.0025	0.005
Maximum Non-Detect	0.2	0.2
Percent Non detects	36.00%	79.31%
Minimum Detected	0.014	0.003
Maximum Detected	0.24	0.2
Mean of Detected Data	0.0645	0.0743
Median of Detected Data	0.0405	0.026
SD of Detected Data	0.0574	0.0841

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	5.991
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	2.0849E-9

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Selenium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Selenium, Dissolved

Background Data: Muddy Creek Selenium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	53
Number of Non-Detect Data	36	33
Number of Detect Data	64	20
Minimum Non-Detect	0.0025	0.01
Maximum Non-Detect	0.2	0.1
Percent Non detects	36.00%	62.26%
Minimum Detected	0.014	0.0063
Maximum Detected	0.24	0.19
Mean of Detected Data	0.0645	0.0615
Median of Detected Data	0.0405	0.0205
SD of Detected Data	0.0574	0.069

Site vs Background Gehan Test

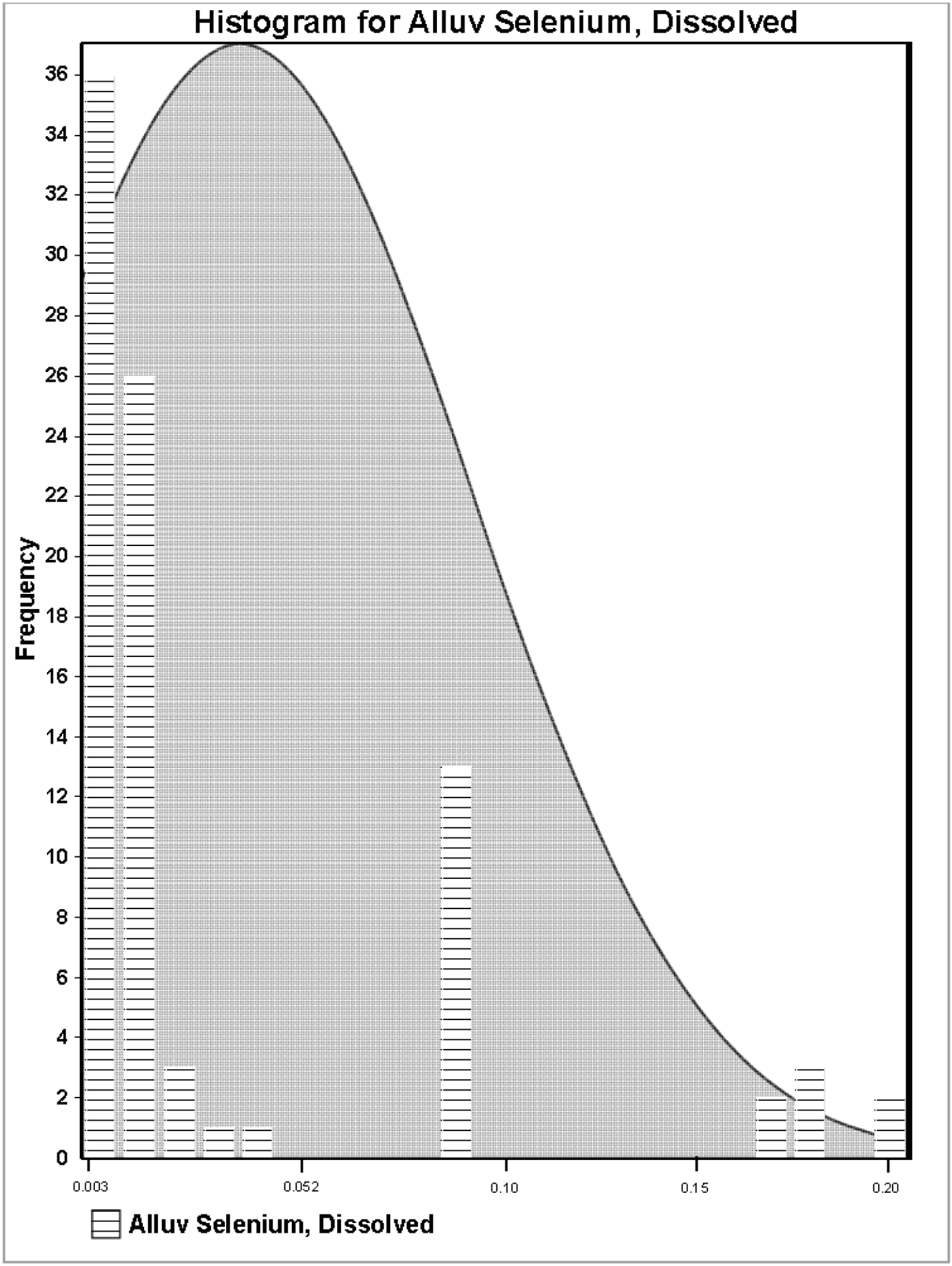
H0: Mu of Site or AOC = Mu of background

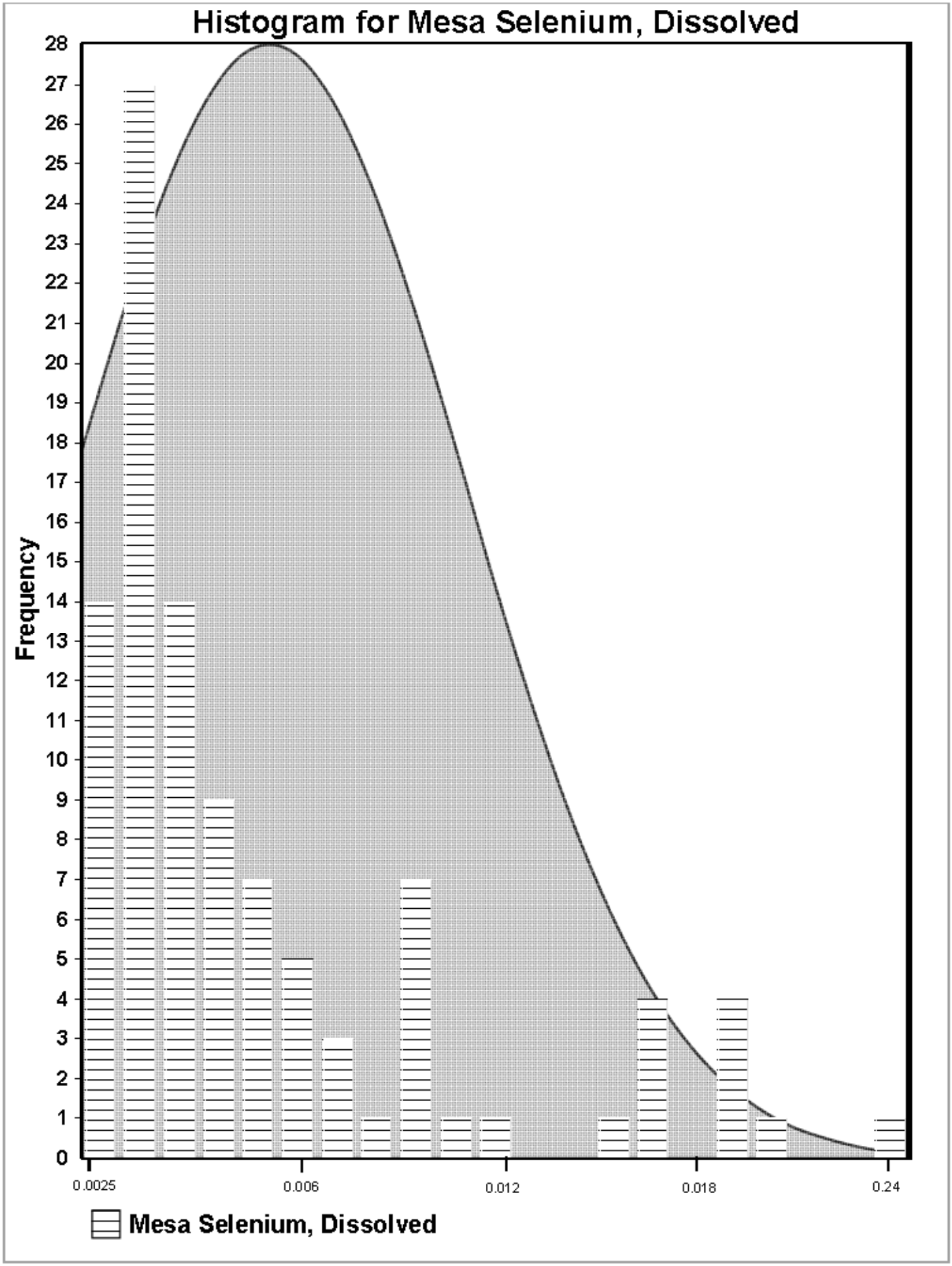
Gehan z Test Value	3.226
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.00125

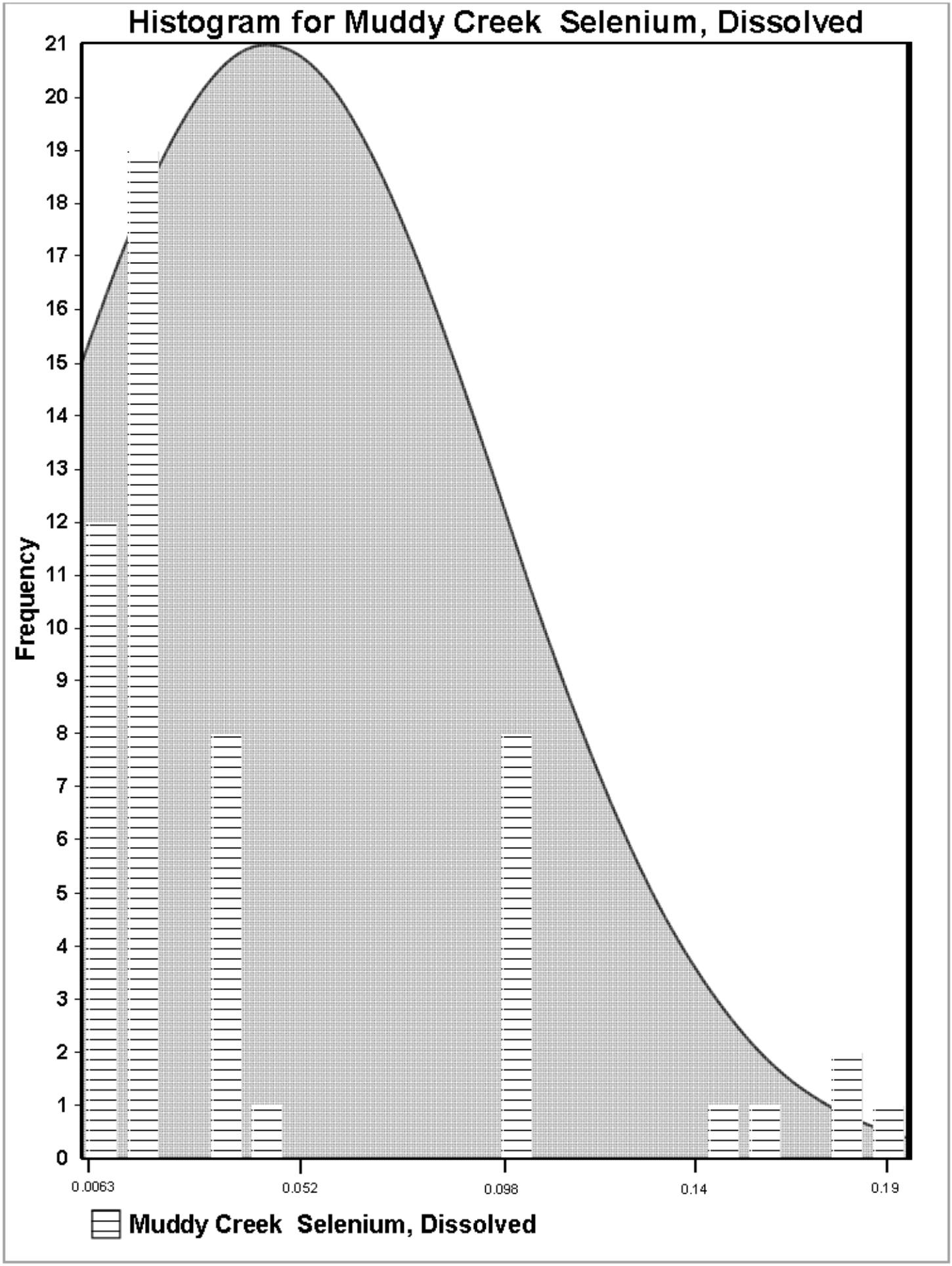
Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Selenium, Dissolved
Frequency
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
0.003
0.052
0.10
0.15
0.20
Alluv Selenium, Dissolved


Histogram for Mesa Selenium, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
0.0025
0.006
0.012
0.018
0.24
Mesa Selenium, Dissolved


Histogram for Muddy Creek Selenium, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
0.0063
0.052
0.098
0.14
0.19
Muddy Creek Selenium, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Selenium_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Selenium, Dissolved

Mean	0.028
Standard Deviation	0.0477
Number of data	87
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.028	0.0475	0.2	58	3.623	3.338	3.705

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.2 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Selenium, Dissolved

Mean	0.0355
Standard Deviation	0.0482
Number of data	53
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0355	0.0478	0.19	26	3.234	3.151	3.504

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.19 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Selenium, Dissolved

Mean	0.0488
Standard Deviation	0.0527
Number of data	100
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical

#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.0488	0.0525	0.24	2	3.644	3.38	3.75

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.24 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Location Name	Sample Date	Alluv Selenium, Dissolved	D_Alluv Selenium, Dissolved
BG-1S	11/26/2012	0.011	1
BG-1S	8/23/2012	0.18	1
BG-1S	5/24/2012	0.1	0
BG-1S	3/20/2012	0.1	0
IMW-2.5D	11/26/2012	0.024	1
IMW-2.5D	8/24/2012	0.19	1
IMW-2.5D	5/21/2012	0.1	0
IMW-2.5D	3/21/2012	0.1	0
IMW-2.5D	12/8/2011	0.02	0
IMW-2.5D	6/6/2011	0.015	0
IMW-2.5D	12/15/2010	0.015	0
IMW-2.5D	6/9/2010	0.01	0
IMW-2.5D	12/12/2009	0.01	0
IMW-2.5S	11/26/2012	0.039	1
IMW-2.5S	8/24/2012	0.18	1
IMW-2.5S	5/21/2012	0.1	0
IMW-2.5S	3/21/2012	0.1	0
IMW-2.5S	12/8/2011	0.02	0
IMW-2.5S	9/9/2011	0.024	1
IMW-2.5S	6/6/2011	0.015	0
IMW-2.5S	3/7/2011	0.015	0
IMW-2.5S	12/15/2010	0.015	0
IMW-2.5S	9/20/2010	0.015	0
IMW-2.5S	6/9/2010	0.01	0
IMW-2.5S	3/9/2010	0.01	0
IMW-2.5S	12/12/2009	0.01	0
IMW-2.5S	9/21/2009	0.01	0
IMW-3S	5/21/2012	0.1	0
IMW-3S	3/20/2012	0.1	0
IMW-3S	12/9/2011	0.02	0
IMW-3S	9/9/2011	0.02	0
IMW-3S	6/7/2011	0.015	0
IMW-3S	3/7/2011	0.015	0
IMW-3S	12/10/2010	0.015	0
IMW-3S	9/16/2010	0.015	0
IMW-3S	6/8/2010	0.01	0
IMW-3S	3/9/2010	0.01	0
IMW-3S	12/10/2009	0.01	0
IMW-3S	9/14/2009	0.01	0
IMW-3S	6/9/2009	0.01	0
IMW-3S	3/3/2009	0.01	0
IMW-3S	12/9/2008	0.01	0
IMW-3S	9/9/2008	0.005	0
IMW-3S	6/3/2008	0.0088	1
IMW-3S	3/4/2008	0.005	0
KMW-2D	11/26/2012	0.05	1
KMW-2D	8/24/2012	0.19	1
KMW-2D	5/21/2012	0.1	0
KMW-2D	3/23/2012	0.1	0
KMW-2D	12/8/2011	0.02	0
KMW-2D	6/6/2011	0.015	0
KMW-2D	12/13/2010	0.015	0
KMW-2D	6/8/2010	0.01	0
KMW-2D	12/8/2009	0.01	0
KMW-2D	12/10/2008	0.01	0
KMW-2D	6/3/2008	0.003	1
KMW-2M	11/26/2012	0.009	1
KMW-2M	8/24/2012	0.2	1
KMW-2M	5/21/2012	0.1	0
KMW-2M	3/23/2012	0.2	0
KMW-2M	12/8/2011	0.02	0
KMW-2M	6/6/2011	0.015	0
KMW-2M	12/13/2010	0.015	0
KMW-2M	6/8/2010	0.01	0
KMW-2M	12/8/2009	0.01	0
KMW-2M	12/10/2008	0.01	0
KMW-2M	6/3/2008	0.0033	1
KMW-2S	11/26/2012	0.028	1
KMW-2S	8/24/2012	0.19	1
KMW-2S	5/21/2012	0.1	0
KMW-2S	3/23/2012	0.1	0
KMW-2S	12/8/2011	0.02	0
KMW-2S	9/9/2011	0.02	0
KMW-2S	6/6/2011	0.015	0
KMW-2S	3/8/2011	0.015	0
KMW-2S	12/13/2010	0.015	0
KMW-2S	9/15/2010	0.015	0
KMW-2S	6/8/2010	0.01	0
KMW-2S	3/9/2010	0.01	0
KMW-2S	12/8/2009	0.01	0
KMW-2S	9/16/2009	0.01	0
KMW-2S	6/10/2009	0.01	0
KMW-2S	3/3/2009	0.01	0
KMW-2S	12/10/2008	0.01	0
KMW-2S	9/8/2008	0.0031	1
KMW-2S	6/3/2008	0.0033	1
KMW-2S	3/4/2008	0.005	0

Location Name	Sample Date	Muddy Creek Selenium, Dissolved	D_Muddy Creek Selenium, Dissolved
BG-3S	11/27/2012	0.02	0
BG-3S	8/22/2012	0.02	0
BG-3S	5/23/2012	0.04	0
BG-3S	3/21/2012	0.02	0
BG-4S	11/27/2012	0.021	1
BG-4S	8/30/2012	0.037	1
BG-4S	5/30/2012	0.047	1
BG-4S	3/20/2012	0.1	0
BG-6S	11/27/2012	0.011	1
BG-6S	8/23/2012	0.18	1
BG-6S	5/25/2012	0.04	0
BG-6S	3/21/2012	0.1	0
BG-1M	11/26/2012	0.0074	1
BG-1M	8/23/2012	0.15	1
BG-1M	5/24/2012	0.02	0
BG-1M	3/20/2012	0.1	0
BG-3M	11/27/2012	0.012	1
BG-3M	8/22/2012	0.1	1
BG-3M	5/24/2012	0.02	0
BG-3M	3/21/2012	0.02	0
BG-4M	11/27/2012	0.02	0
BG-4M	8/30/2012	0.017	1
BG-4M	5/30/2012	0.035	1
BG-4M	3/20/2012	0.1	0
BG-6M	11/27/2012	0.02	1
BG-6M	8/22/2012	0.19	1
BG-6M	5/25/2012	0.04	0
BG-6M	3/21/2012	0.1	0
BG-1D	11/26/2012	0.02	0
BG-1D	8/23/2012	0.16	1
BG-1D	5/24/2012	0.04	0
BG-1D	3/20/2012	0.1	0
BG-3D	11/27/2012	0.02	0
BG-3D	8/21/2012	0.02	0
BG-3D	5/23/2012	0.02	0
BG-3D	3/21/2012	0.02	0
BG-4D	11/27/2012	0.02	0
BG-4D	8/30/2012	0.018	0
BG-4D	5/30/2012	0.008	0
BG-4D	3/20/2012	0.1	0
BG-6D	11/27/2012	0.015	0
BG-6D	8/22/2012	0.18	0
BG-6D	5/25/2012	0.02	0
BG-6D	3/21/2012	0.04	1
IMW-3D	5/25/2012	0.04	0
IMW-3D	3/22/2012	0.015	1
IMW-3D	12/9/2011	0.02	1
IMW-3D	6/7/2011	0.015	0
IMW-3D	12/10/2010	0.015	0
IMW-3D	6/8/2010	0.01	0
IMW-3D	12/10/2009	0.01	0
IMW-3D	12/9/2008	0.01	0
IMW-3D	6/3/2008	0.0063	1

Location Name	Sample Date	Mesa Selenium, Dissolved	D_Mesa Selenium, Dissolved
BG-2S	11/26/2012	0.016	1
BG-2S	8/23/2012	0.24	1
BG-2S	5/24/2012	0.2	0
BG-2S	3/21/2012	0.03	1
BG-2M	11/26/2012	0.02	0
BG-2M	8/23/2012	0.18	1
BG-2M	5/24/2012	0.1	0
BG-2M	3/21/2012	0.1	0
BG-2D	11/26/2012	0.02	0
BG-2D	8/23/2012	0.18	1
BG-2D	5/24/2012	0.04	0
BG-2D	3/21/2012	0.1	0
LMW-10	11/28/2012	0.16	1
LMW-10	8/27/2012	0.086	1
LMW-10	5/30/2012	0.051	1
LMW-10	3/22/2012	0.084	1
LMW-10	12/6/2011	0.04	1
LMW-10	9/8/2011	0.076	1
LMW-10	6/8/2011	0.0614	1
LMW-10	3/2/2011	0.0591	1
LMW-10	12/9/2010	0.0647	1
LMW-10	9/21/2010	0.0579	1
LMW-10	6/9/2010	0.037	1
LMW-10	3/11/2010	0.037	1
LMW-10	12/11/2009	0.056	1
LMW-10	9/18/2009	0.01	0
LMW-10	6/10/2009	0.04	1
LMW-10	3/5/2009	0.02	0
LMW-10	12/12/2008	0.014	1
LMW-10	9/10/2008	0.07	1
LMW-10	6/4/2008	0.018	1
LMW-10	3/5/2008	0.075	1
LMW-11R	11/26/2012	0.02	0
LMW-11R	8/21/2012	0.02	0
LMW-11R	5/29/2012	0.022	1
LMW-11R	3/23/2012	0.1	0
LMW-7	11/28/2012	0.12	1
LMW-7	8/27/2012	0.032	1
LMW-7	5/31/2012	0.1	0
LMW-7	3/23/2012	0.1	0
LMW-7	12/5/2011	0.02	0
LMW-7	9/6/2011	0.032	1
LMW-7	6/9/2011	0.015	0
LMW-7	3/9/2011	0.015	0
LMW-7	12/10/2010	0.0152	1
LMW-7	9/21/2010	0.015	0
LMW-7	6/9/2010	0.01	0
LMW-7	3/11/2010	0.01	0
LMW-7	12/11/2009	0.01	0
LMW-7	9/18/2009	0.01	0
LMW-7	6/10/2009	0.01	0
LMW-7	3/5/2009	0.01	0
LMW-7	12/12/2008	0.01	0
LMW-7	9/10/2008	0.02	1
LMW-7	6/4/2008	0.0025	0
LMW-7	3/5/2008	0.018	1
LMW-9	11/28/2012	0.13	1
LMW-9	8/27/2012	0.034	1
LMW-9	5/31/2012	0.1	0
LMW-9	3/23/2012	0.2	0
LMW-9	12/5/2011	0.02	0
LMW-9	9/8/2011	0.044	1
LMW-9	6/8/2011	0.0222	1
LMW-9	3/9/2011	0.0228	1
LMW-9	12/10/2010	0.0248	1
LMW-9	9/21/2010	0.0214	1
LMW-9	6/9/2010	0.015	1
LMW-9	3/11/2010	0.01	0
LMW-9	12/11/2009	0.019	1
LMW-9	9/18/2009	0.01	0
LMW-9	6/10/2009	0.033	1
LMW-9	3/5/2009	0.01	0
LMW-9	12/12/2008	0.01	0
LMW-9	9/10/2008	0.035	1
LMW-9	6/4/2008	0.032	1
LMW-9	3/5/2008	0.033	1
LMW-11	2/22/2012	0.02	0
LMW-11	12/6/2011	0.025	1
LMW-11	9/8/2011	0.022	1
LMW-11	3/2/2011	0.015	0
LMW-12R	11/30/2012	0.033	1
LMW-12R	10/22/2012	0.055	1
LMW-12R	8/21/2012	0.18	1
LMW-12R	5/30/2012	0.041	1
LMW-13R	11/28/2012	0.046	1
LMW-13R	10/22/2012	0.057	1
LMW-13R	8/20/2012	0.2	1
LMW-13R	5/29/2012	0.033	1
LMW-14R	11/30/2012	0.044	1
LMW-14R	10/22/2012	0.062	1
LMW-14R	8/20/2012	0.21	1
LMW-14R	5/29/2012	0.033	1
LMW-15	11/28/2012	0.049	1
LMW-15	10/22/2012	0.062	1
LMW-15	8/20/2012	0.2	1
LMW-15	5/29/2012	0.04	1
LMW-16	11/28/2012	0.02	0
LMW-16	10/22/2012	0.064	1
LMW-16	8/20/2012	0.18	1
LMW-16	5/29/2012	0.034	1

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Silica_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Silica, Dissolved

Raw Statistics	
Number of Valid Observations	26
Number of Distinct Observations	15
Minimum	42
Maximum	64
Mean of Raw Data	55
Standard Deviation of Raw Data	5.913
Kstar	74.56
Mean of Log Transformed Data	4.001
Standard Deviation of Log Transformed Data	0.113

Normal Distribution Test Results	
Correlation Coefficient R	0.964
Shapiro Wilk Test Statistic	0.922
Shapiro Wilk Critical (0.95) Value	0.92
Approximate Shapiro Wilk P Value	0.0518
Lilliefors Test Statistic	0.202
Lilliefors Critical (0.95) Value	0.174

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.953
A-D Test Statistic	0.972
A-D Critical (0.95) Value	0.742
K-S Test Statistic	0.217
K-S Critical(0.95) Value	0.171

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.95
Shapiro Wilk Test Statistic	0.897
Shapiro Wilk Critical (0.95) Value	0.92
Approximate Shapiro Wilk P Value	0.0129
Lilliefors Test Statistic	0.226
Lilliefors Critical (0.95) Value	0.174

Data not Lognormal at (0.05) Significance Level

Muddy Creek Silica, Dissolved

Raw Statistics	
Number of Valid Observations	46

Number of Distinct Observations	11
Minimum	13
Maximum	24
Mean of Raw Data	17.37
Standard Deviation of Raw Data	2.225
Kstar	59.84
Mean of Log Transformed Data	2.847
Standard Deviation of Log Transformed Data	0.126

Normal Distribution Test Results

Correlation Coefficient R	0.975
Shapiro Wilk Test Statistic	0.955
Shapiro Wilk Critical (0.95) Value	0.945
Approximate Shapiro Wilk P Value	0.12
Lilliefors Test Statistic	0.171
Lilliefors Critical (0.95) Value	0.131

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.982
A-D Test Statistic	0.696
A-D Critical (0.95) Value	0.747
K-S Test Statistic	0.154
K-S Critical(0.95) Value	0.13

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.984
Shapiro Wilk Test Statistic	0.97
Shapiro Wilk Critical (0.95) Value	0.945
Approximate Shapiro Wilk P Value	0.415
Lilliefors Test Statistic	0.148
Lilliefors Critical (0.95) Value	0.131

Data appear Lognormal at (0.05) Significance Level

Mesa Silica, Dissolved

Raw Statistics

Number of Valid Observations	28
Number of Distinct Observations	12
Minimum	13
Maximum	38
Mean of Raw Data	19.14
Standard Deviation of Raw Data	7.417
Kstar	8.195
Mean of Log Transformed Data	2.896
Standard Deviation of Log Transformed Data	0.318

Normal Distribution Test Results

Correlation Coefficient R	0.842
Shapiro Wilk Test Statistic	0.705
Shapiro Wilk Critical (0.95) Value	0.924
Approximate Shapiro Wilk P Value	7.6612E-7
Lilliefors Test Statistic	0.276
Lilliefors Critical (0.95) Value	0.167

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.896
A-D Test Statistic	2.529
A-D Critical (0.95) Value	0.746
K-S Test Statistic	0.244
K-S Critical(0.95) Value	0.165

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.898
Shapiro Wilk Test Statistic	0.798
Shapiro Wilk Critical (0.95) Value	0.924
Approximate Shapiro Wilk P Value	5.0831E-5
Lilliefors Test Statistic	0.222
Lilliefors Critical (0.95) Value	0.167

Data not Lognormal at (0.05) Significance Level

Muddy Creek + Mesa Silica, Dissolved

Raw Statistics

Number of Valid Observations	74
Number of Distinct Observations	14
Minimum	13
Maximum	38
Mean of Raw Data	18.04
Standard Deviation of Raw Data	4.914
Kstar	17.91
Mean of Log Transformed Data	2.866
Standard Deviation of Log Transformed Data	0.219

Normal Distribution Test Results

Correlation Coefficient R	0.824
Approximate Shapiro Wilk Test Statistic	0.688
Approximate Shapiro Wilk P Value	0
Lilliefors Test Statistic	0.26
Lilliefors Critical (0.95) Value	0.103

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.867
A-D Test Statistic	4.345

A-D Critical (0.95) Value	0.75
K-S Test Statistic	0.23
K-S Critical(0.95) Value	0.103
Data not Gamma Distributed at (0.05) Significance Level	
Lognormal Distribution Test Results	
Correlation Coefficient R	0.906
Approximate Shapiro Wilk Test Statistic	0.821
Approximate Shapiro Wilk P Value	2.431E-12
Lilliefors Test Statistic	0.212
Lilliefors Critical (0.95) Value	0.103
Data not Lognormal at (0.05) Significance Level	

General Background Statistics for Full Data Sets

User Selected Options	
From File	Silica_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Silica, Dissolved

General Statistics

Total Number of Observations	26	Number of Distinct Observations	15

Raw Statistics		Log-Transformed Statistics	
Minimum	42	Minimum	3.738
Maximum	64	Maximum	4.159
Second Largest	63	Second Largest	4.143
First Quartile	54	First Quartile	3.989
Median	56	Median	4.025
Third Quartile	59	Third Quartile	4.078
Mean	55	Mean	4.001
SD	5.913	SD	0.113
Coefficient of Variation	0.108		
Skewness	-0.797		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.922	Shapiro Wilk Test Statistic	0.897
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	68.45	95% UTL with 95% Coverage	70.73
95% UPL (t)	65.29	95% UPL (t)	66.58
90% Percentile (z)	62.58	90% Percentile (z)	63.21
95% Percentile (z)	64.73	95% Percentile (z)	65.86
99% Percentile (z)	68.75	99% Percentile (z)	71.14

Gamma Distribution Test		Data Distribution Test	
k star	74.56	Data appear Normal at 5% Significance Level	
Theta Star	0.738		
MLE of Mean	55		
MLE of Standard Deviation	6.37		
nu star	3877		
A-D Test Statistic	0.972	Nonparametric Statistics	
5% A-D Critical Value	0.742	90% Percentile	60.5
K-S Test Statistic	0.217	95% Percentile	62.5
5% K-S Critical Value	0.171	99% Percentile	63.75
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	64
90% Percentile	63.3	95% Percentile Bootstrap UTL with 95% Coverage	64
95% Percentile	65.88	95% BCA Bootstrap UTL with 95% Coverage	64
99% Percentile	70.89	95% UPL	63.65
		95% Chebyshev UPL	81.26
95% WH Approx. Gamma UPL	66.09	Upper Threshold Limit Based upon IQR	66.5
95% HW Approx. Gamma UPL	66.21		
95% WH Approx. Gamma UTL with 95% Coverage	69.85		
95% HW Approx. Gamma UTL with 95% Coverage	70.06		

Muddy Creek Silica, Dissolved

General Statistics			
Total Number of Observations	46	Number of Distinct Observations	11
Raw Statistics		Log-Transformed Statistics	
Minimum	13	Minimum	2.565
Maximum	24	Maximum	3.178
Second Largest	22	Second Largest	3.091
First Quartile	16	First Quartile	2.773
Median	17	Median	2.833
Third Quartile	18	Third Quartile	2.89
Mean	17.37	Mean	2.847
SD	2.225	SD	0.126
Coefficient of Variation	0.128		
Skewness	0.611		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.955	Shapiro Wilk Test Statistic	0.97
Shapiro Wilk Critical Value	0.945	Shapiro Wilk Critical Value	0.945
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	22	95% UTL with 95% Coverage	22.4
95% UPL (t)	21.15	95% UPL (t)	21.35
90% Percentile (z)	20.22	90% Percentile (z)	20.26
95% Percentile (z)	21.03	95% Percentile (z)	21.2
99% Percentile (z)	22.54	99% Percentile (z)	23.11
Gamma Distribution Test		Data Distribution Test	
k star	59.84	Data appear Normal at 5% Significance Level	
Theta Star	0.29		
MLE of Mean	17.37		
MLE of Standard Deviation	2.245		
nu star	5506		
A-D Test Statistic	0.696	Nonparametric Statistics	
5% A-D Critical Value	0.747	90% Percentile	20.5
K-S Test Statistic	0.154	95% Percentile	21
5% K-S Critical Value	0.13	99% Percentile	23.1

Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	22
90% Percentile	20.3	95% Percentile Bootstrap UTL with 95% Coverage	23.5
95% Percentile	21.22	95% BCA Bootstrap UTL with 95% Coverage	21
99% Percentile	23.02	95% UPL	21.65
		95% Chebyshev UPL	27.17
95% WH Approx. Gamma UPL	21.26	Upper Threshold Limit Based upon IQR	21
95% HW Approx. Gamma UPL	21.28		
95% WH Approx. Gamma UTL with 95% Coverage	22.24		
95% HW Approx. Gamma UTL with 95% Coverage	22.28		

Mesa Silica, Dissolved

General Statistics			
Total Number of Observations	28	Number of Distinct Observations	12
Raw Statistics		Log-Transformed Statistics	
Minimum	13	Minimum	2.565
Maximum	38	Maximum	3.638
Second Largest	36	Second Largest	3.584
First Quartile	14.75	First Quartile	2.691
Median	16.5	Median	2.803
Third Quartile	20.25	Third Quartile	3.008
Mean	19.14	Mean	2.896
SD	7.417	SD	0.318
Coefficient of Variation	0.387		
Skewness	1.754		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.705	Shapiro Wilk Test Statistic	0.798
Shapiro Wilk Critical Value	0.924	Shapiro Wilk Critical Value	0.924
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	35.8	95% UTL with 95% Coverage	37.01
95% UPL (t)	32	95% UPL (t)	31.44
90% Percentile (z)	28.65	90% Percentile (z)	27.23
95% Percentile (z)	31.34	95% Percentile (z)	30.57
99% Percentile (z)	36.4	99% Percentile (z)	37.97
Gamma Distribution Test		Data Distribution Test	
k star	8.195	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.336		
MLE of Mean	19.14		
MLE of Standard Deviation	6.687		
nu star	458.9		
A-D Test Statistic	2.529	Nonparametric Statistics	
5% A-D Critical Value	0.746	90% Percentile	35

K-S Test Statistic	0.244	95% Percentile	35.65
5% K-S Critical Value	0.165	99% Percentile	37.46
Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	38
90% Percentile	28.06	95% Percentile Bootstrap UTL with 95% Coverage	38
95% Percentile	31.3	95% BCA Bootstrap UTL with 95% Coverage	37.3
99% Percentile	38.02	95% UPL	37.1
		95% Chebyshev UPL	52.05
95% WH Approx. Gamma UPL	31.58	Upper Threshold Limit Based upon IQR	28.5
95% HW Approx. Gamma UPL	31.54		
95% WH Approx. Gamma UTL with 95% Coverage	36.42		
95% HW Approx. Gamma UTL with 95% Coverage	36.55		

Muddy Creek + Mesa Silica, Dissolved

General Statistics

Total Number of Observations	74	Number of Distinct Observations	14

Raw Statistics		Log-Transformed Statistics	
Minimum	13	Minimum	2.565
Maximum	38	Maximum	3.638
Second Largest	36	Second Largest	3.584
First Quartile	15	First Quartile	2.708
Median	17	Median	2.833
Third Quartile	18	Third Quartile	2.89
Mean	18.04	Mean	2.866
SD	4.914	SD	0.219
Coefficient of Variation	0.272		
Skewness	2.696		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.26	Lilliefors Test Statistic	0.212
Lilliefors Critical Value	0.103	Lilliefors Critical Value	0.103
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	27.74	95% UTL with 95% Coverage	27.05
95% UPL (t)	26.28	95% UPL (t)	25.34
90% Percentile (z)	24.34	90% Percentile (z)	23.24
95% Percentile (z)	26.12	95% Percentile (z)	25.16
99% Percentile (z)	29.47	99% Percentile (z)	29.21
Gamma Distribution Test		Data Distribution Test	
k star	17.91	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.007		
MLE of Mean	18.04		
MLE of Standard Deviation	4.263		
nu star	2651		

A-D Test Statistic	4.345	Nonparametric Statistics	
5% A-D Critical Value	0.75	90% Percentile	21
K-S Test Statistic	0.23	95% Percentile	27.85
5% K-S Critical Value	0.103	99% Percentile	36.54
Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	36
90% Percentile	23.67	95% Percentile Bootstrap UTL with 95% Coverage	35.35
95% Percentile	25.58	95% BCA Bootstrap UTL with 95% Coverage	36
99% Percentile	29.41	95% UPL	35
		95% Chebyshev UPL	39.61
95% WH Approx. Gamma UPL	25.61	Upper Threshold Limit Based upon IQR	22.5
95% HW Approx. Gamma UPL	25.53		
95% WH Approx. Gamma UTL with 95% Coverage	27.22		
95% HW Approx. Gamma UTL with 95% Coverage	27.17		

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Silica_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Silica, Dissolved

Background Data: Alluv Silica, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	28	26
Number of Distinct Observations	12	15
Minimum	13	42
Maximum	38	64
Mean	19.14	55
Median	16.5	56
SD	7.417	5.913
SE of Mean	1.402	1.16

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	406
WMW Test U-Stat	6.293
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	2.787E-10

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Silica_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Silica, Dissolved

Background Data: Alluv Silica, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	46	26
Number of Distinct Observations	11	15
Minimum	13	42
Maximum	24	64
Mean	17.37	55
Median	17	56
SD	2.225	5.913
SE of Mean	0.328	1.16

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1081
WMW Test U-Stat	7.005
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	2.273E-12

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Silica_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Silica, Dissolved

Background Data: Muddy Creek Silica, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	28	46
Number of Distinct Observations	12	11
Minimum	13	13
Maximum	38	24
Mean	19.14	17.37
Median	16.5	17
SD	7.417	2.225
SE of Mean	1.402	0.328

Wilcoxon-Mann-Whitney (WMW) Test

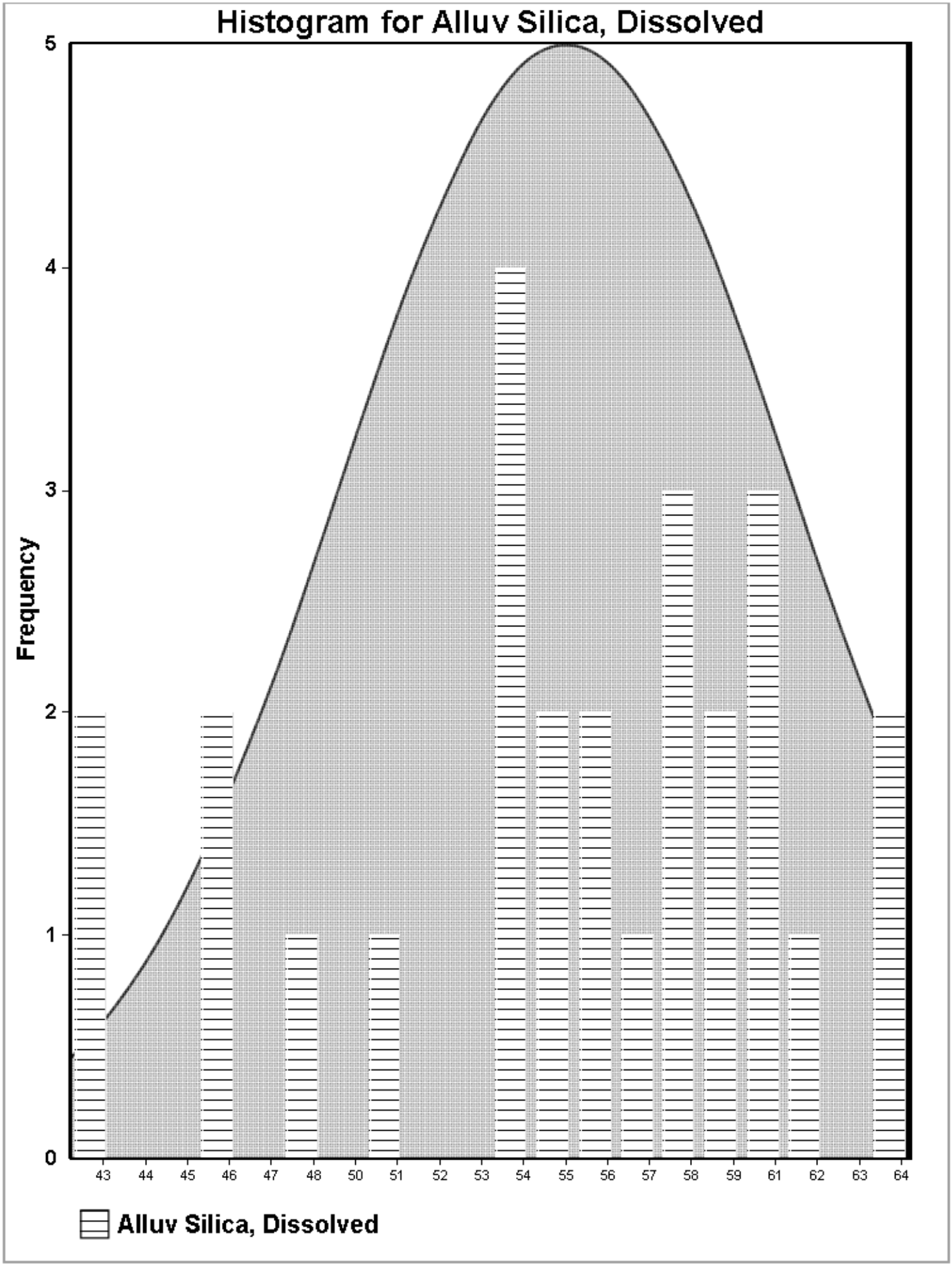
H0: Mean/Median of Site or AOC = Mean/Median of Background

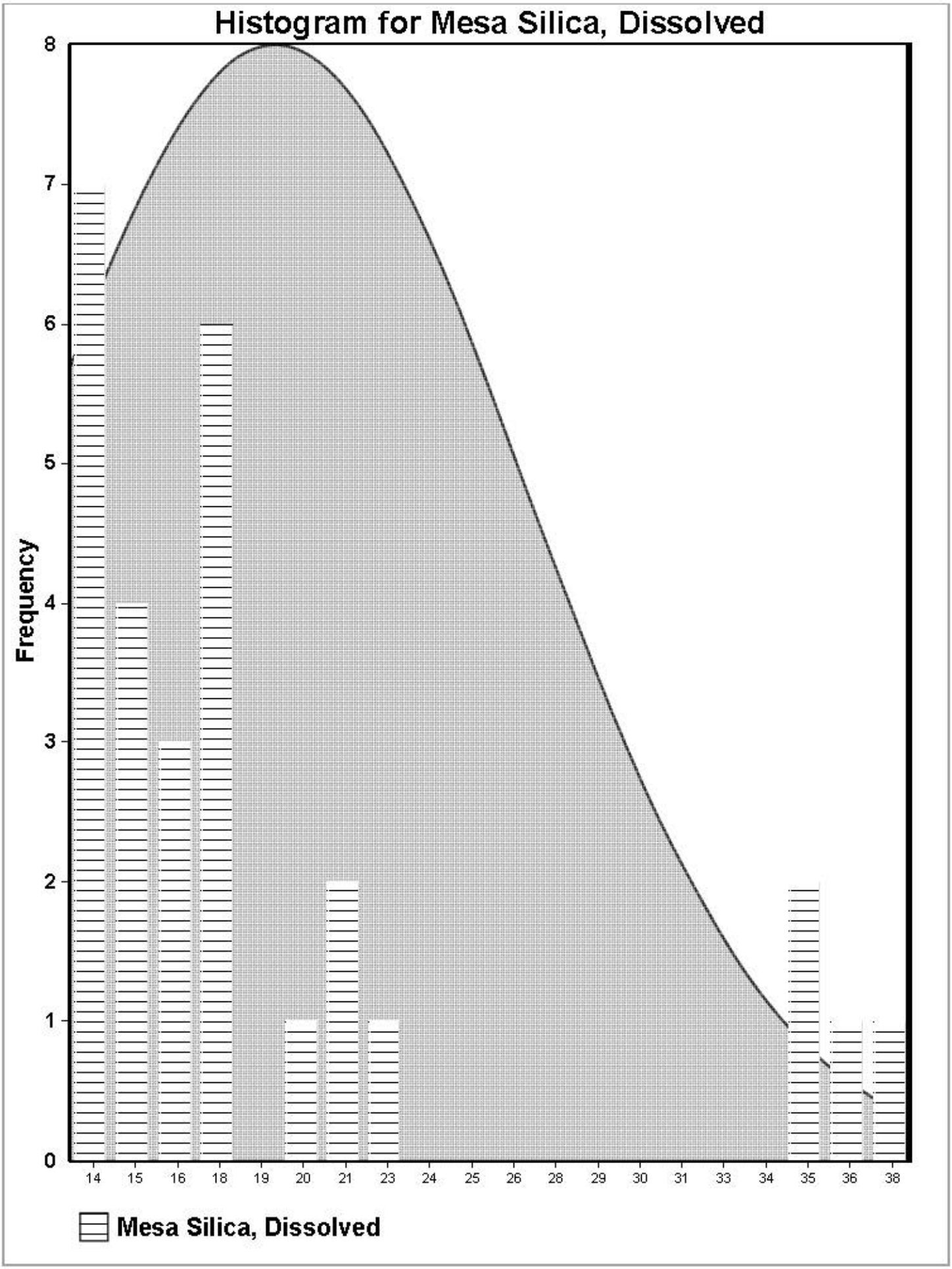
Site Rank Sum W-Stat	977
WMW Test U-Stat	0.808
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0.413

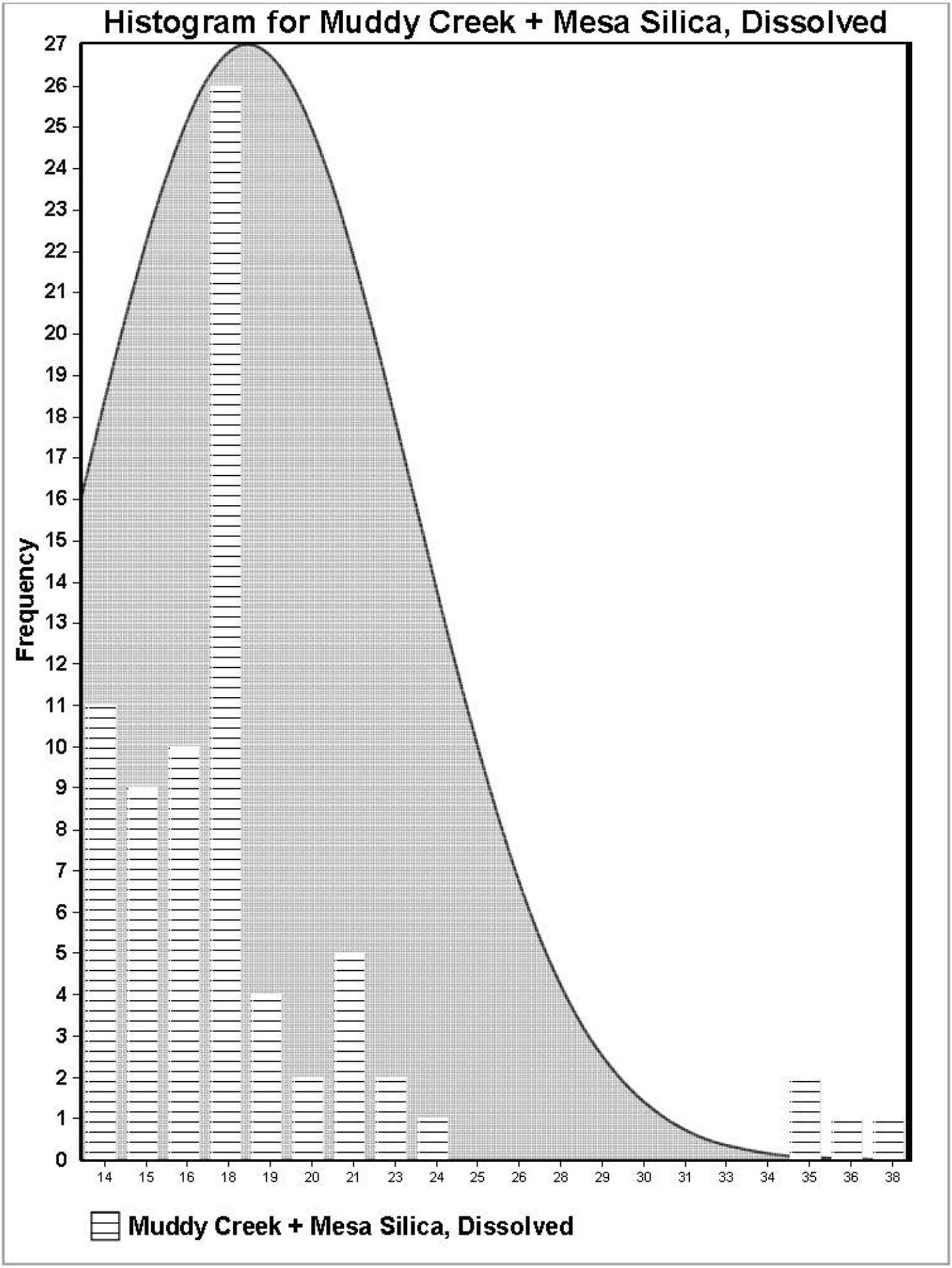
Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv Silica, Dissolved
Frequency
0
1
2
3
4
5
43
44
45
46
47
48
50
51
52
53
54
55
56
57
58
59
61
62
63
64
Alluv Silica, Dissolved


Histogram for Mesa Silica, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
14
15
16
18
19
20
21
23
24
25
26
28
29
30
31
33
34
35
36
38
Mesa Silica, Dissolved


Histogram for Muddy Creek + Mesa Silica, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
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24
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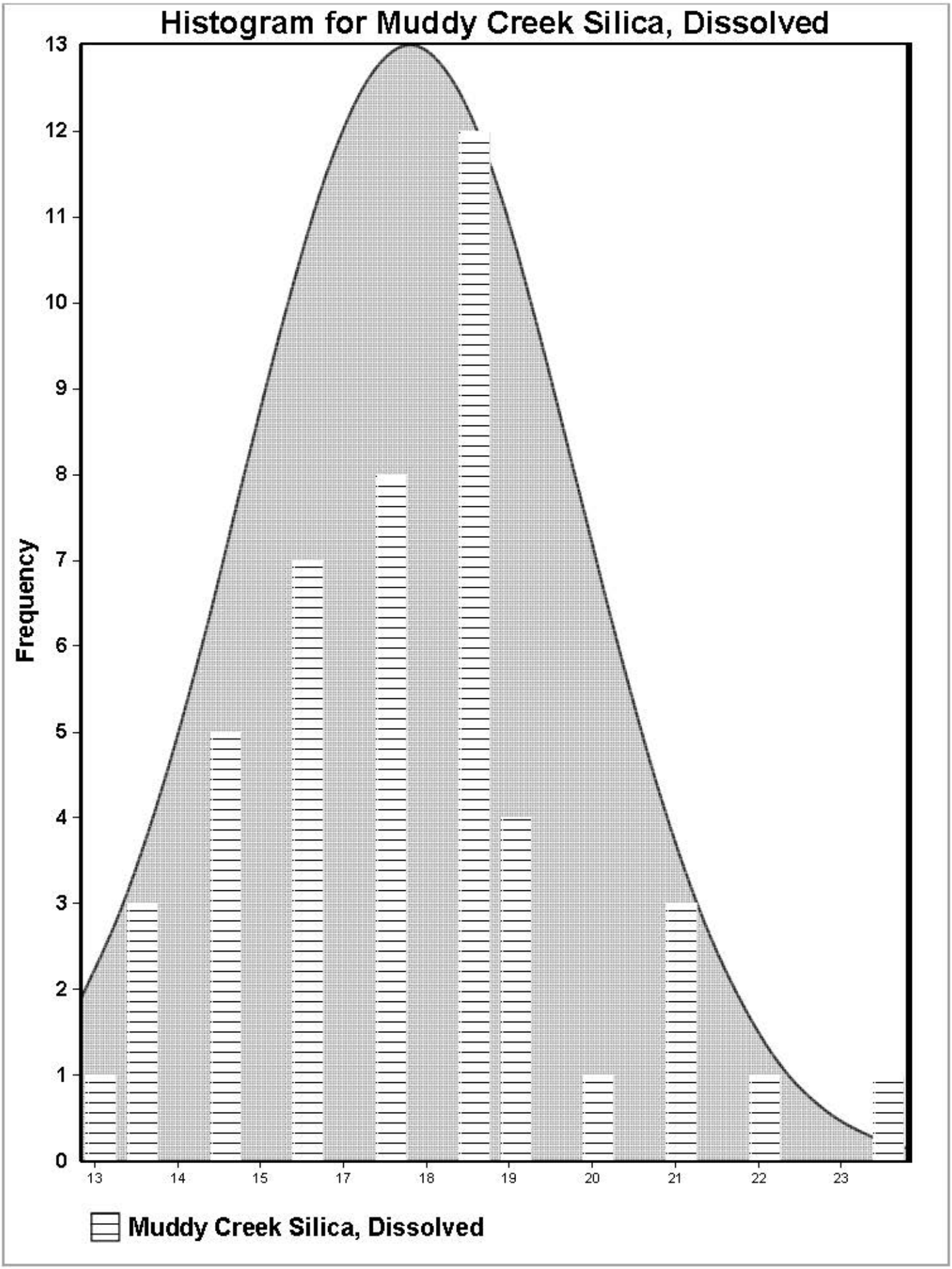
29
30
31
33
34
35
36
38
Muddy Creek + Mesa Silica, Dissolved


Histogram for Muddy Creek Silica, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
13
14
15
17
18
19
20
21
22
23
Muddy Creek Silica, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Silica_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for Alluv Silica, Dissolved

Mean	55
Standard Deviation	5.913
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	55	5.798	42	2	2.242	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Silica, Dissolved

Mean	17.37
Standard Deviation	2.225
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	17.37	2.2	24	43	3.013	3.09	3.45

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Silica, Dissolved

Mean	19.14
Standard Deviation	7.417
Number of data	28
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	19.14	7.284	38	3	2.589	2.88	3.2

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek + Mesa Silica, Dissolved

Mean	18.04
Standard Deviation	4.914
Number of data	74
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	18.04	4.881	38	49	4.089	3.28	3.64

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 38 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 38 is a Potential Statistical Outlier

Location Name	Sample Date	Alluv Silica, Dissolved
BG-1S	11/26/2012	43
BG-1S	8/23/2012	42
BG-1S	5/24/2012	46
BG-1S	3/20/2012	46
IMW-2.5D	11/26/2012	56
IMW-2.5D	8/24/2012	54
IMW-2.5D	5/21/2012	59
IMW-2.5D	3/21/2012	59
IMW-2.5S	11/26/2012	54
IMW-2.5S	8/24/2012	54
IMW-2.5S	5/21/2012	58
IMW-2.5S	3/21/2012	55
IMW-3S	5/21/2012	50
IMW-3S	3/20/2012	48
KMW-2D	11/26/2012	56
KMW-2D	8/24/2012	54
KMW-2D	5/21/2012	60
KMW-2D	3/23/2012	58
KMW-2M	11/26/2012	58
KMW-2M	8/24/2012	55
KMW-2M	5/21/2012	61
KMW-2M	3/23/2012	60
KMW-2S	11/26/2012	60
KMW-2S	8/24/2012	57
KMW-2S	5/21/2012	64
KMW-2S	3/23/2012	63

Location Name	Sample Date	Muddy Creek Silica, Dissolved
BG-3S	11/27/2012	17
BG-3S	8/22/2012	18
BG-3S	5/23/2012	19
BG-3S	3/21/2012	18
BG-4S	11/27/2012	15
BG-4S	8/30/2012	16
BG-4S	5/30/2012	15
BG-4S	3/20/2012	16
BG-6S	11/27/2012	18
BG-6S	8/23/2012	20
BG-6S	5/25/2012	21
BG-6S	3/21/2012	18
BG-1M	11/26/2012	18
BG-1M	8/23/2012	19
BG-1M	5/24/2012	19
BG-1M	3/20/2012	19
BG-3M	11/27/2012	17
BG-3M	8/22/2012	18
BG-3M	5/24/2012	17
BG-3M	3/21/2012	18
BG-4M	11/27/2012	15
BG-4M	8/30/2012	16
BG-4M	5/30/2012	14
BG-4M	3/20/2012	15
BG-6M	11/27/2012	17
BG-6M	8/22/2012	18
BG-6M	5/25/2012	16
BG-6M	3/21/2012	17
BG-1D	11/26/2012	16
BG-1D	8/23/2012	16
BG-1D	5/24/2012	18
BG-1D	3/20/2012	17
BG-3D	11/27/2012	16
BG-3D	8/21/2012	17
BG-3D	5/23/2012	21
BG-3D	3/21/2012	17
BG-4D	11/27/2012	14
BG-4D	8/30/2012	14
BG-4D	5/30/2012	13
BG-4D	3/20/2012	15
BG-6D	11/27/2012	18
BG-6D	8/22/2012	18
BG-6D	5/25/2012	24
BG-6D	3/21/2012	18
IMW-3D	5/25/2012	21
IMW-3D	3/22/2012	22

Location Name	Sample Date	Mesa Silica, Dissolved
BG-2S	11/26/2012	35
BG-2S	8/23/2012	35
BG-2S	5/24/2012	38
BG-2S	3/21/2012	36
BG-2M	11/26/2012	16
BG-2M	8/23/2012	16
BG-2M	5/24/2012	17
BG-2M	3/21/2012	17
BG-2D	11/26/2012	21
BG-2D	8/23/2012	20
BG-2D	5/24/2012	22
BG-2D	3/21/2012	21
LMW-10	11/28/2012	13
LMW-10	8/27/2012	14
LMW-10	5/30/2012	14
LMW-10	3/22/2012	13
LMW-11R	11/26/2012	14
LMW-11R	8/27/2012	16
LMW-11R	5/31/2012	14
LMW-11R	3/23/2012	15
LMW-7	11/28/2012	15
LMW-7	8/27/2012	15
LMW-7	5/31/2012	14
LMW-7	3/23/2012	15
LMW-9	11/28/2012	17
LMW-9	8/27/2012	18
LMW-9	5/31/2012	17
LMW-9	3/23/2012	18

Location Name	Sample Date	Muddy Creek + Mesa Silica, Dissolved
BG-3S	11/27/2012	17
BG-3S	8/22/2012	18
BG-3S	5/23/2012	19
BG-3S	3/21/2012	18
BG-4S	11/27/2012	15
BG-4S	8/30/2012	16
BG-4S	5/30/2012	15
BG-4S	3/20/2012	16
BG-6S	11/27/2012	18
BG-6S	8/23/2012	20
BG-6S	5/25/2012	21
BG-6S	3/21/2012	18
BG-1M	11/26/2012	18
BG-1M	8/23/2012	19
BG-1M	5/24/2012	19
BG-1M	3/20/2012	19
BG-3M	11/27/2012	17
BG-3M	8/22/2012	18
BG-3M	5/24/2012	17
BG-3M	3/21/2012	18
BG-4M	11/27/2012	15
BG-4M	8/30/2012	16
BG-4M	5/30/2012	14
BG-4M	3/20/2012	15
BG-6M	11/27/2012	17
BG-6M	8/22/2012	18
BG-6M	5/25/2012	16
BG-6M	3/21/2012	17
BG-1D	11/26/2012	16
BG-1D	8/23/2012	16
BG-1D	5/24/2012	18
BG-1D	3/20/2012	17
BG-3D	11/27/2012	16
BG-3D	8/21/2012	17
BG-3D	5/23/2012	21
BG-3D	3/21/2012	17
BG-4D	11/27/2012	14
BG-4D	8/30/2012	14
BG-4D	5/30/2012	13
BG-4D	3/20/2012	15
BG-6D	11/27/2012	18
BG-6D	8/22/2012	18
BG-6D	5/25/2012	24
BG-6D	3/21/2012	18
IMW-3D	5/25/2012	21
IMW-3D	3/22/2012	22
BG-2S	11/26/2012	35
BG-2S	8/23/2012	35
BG-2S	5/24/2012	38
BG-2S	3/21/2012	36
BG-2M	11/26/2012	16
BG-2M	8/23/2012	16
BG-2M	5/24/2012	17
BG-2M	3/21/2012	17
BG-2D	11/26/2012	21
BG-2D	8/23/2012	20
BG-2D	5/24/2012	22
BG-2D	3/21/2012	21
LMW-10	11/28/2012	13
LMW-10	8/27/2012	14
LMW-10	5/30/2012	14
LMW-10	3/22/2012	13
LMW-11R	11/26/2012	14

LMW-11R	8/27/2012	16
LMW-11R	5/31/2012	14
LMW-11R	3/23/2012	15
LMW-7	11/28/2012	15
LMW-7	8/27/2012	15
LMW-7	5/31/2012	14
LMW-7	3/23/2012	15
LMW-9	11/28/2012	17
LMW-9	8/27/2012	18
LMW-9	5/31/2012	17
LMW-9	3/23/2012	18

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Silver_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Silver, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	13	13	50.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	13	0.01	0.01	0.01	0.01	1.806E-18
Statistics (Detects Only)	13	0.0047	0.01	0.00737	0.0076	0.00189
Statistics (All: NDs treated as DL value)	26	0.0047	0.01	0.00868	0.01	0.00188
Statistics (All: NDs treated as DL/2 value)	26	0.0047	0.01	0.00618	0.005	0.00178
Statistics (Normal ROS Estimated Data)	26	0.00439	0.01	0.00721	0.00726	0.00169
Statistics (Gamma ROS Estimated Data)	26	0.0047	0.01	0.00744	0.00765	0.00145
Statistics (Lognormal ROS Estimated Data)	26	0.0047	0.01	0.00717	0.00703	0.00167

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	15.84	14.04	4.6527E-4	-4.942	0.266	-0.0539
Statistics (NDs = DL)	18.31	16.22	4.7428E-4	-4.774	0.252	-0.0528
Statistics (NDs = DL/2)	14.6	12.94	4.2363E-4	-5.12	0.259	-0.0505
Statistics (Gamma ROS Estimates)	25.93	22.96	2.8688E-4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.964	0.237	-0.0477

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.976	0.857	0.863	0.989

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.929	0.866	Data Appear Normal
Lilliefors (Detects Only)	0.131	0.246	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.72	0.92	Data Not Normal
Lilliefors (NDs = DL)	0.339	0.174	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.733	0.92	Data Not Normal
Lilliefors (NDs = DL/2)	0.324	0.174	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.961	0.92	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0683	0.174	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.968	0.809	0.902	0.97

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.324	0.734	
Kolmogorov-Smirnov (Detects Only)	0.129	0.236	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	3.31	0.744	
Kolmogorov-Smirnov (NDs = DL)	0.343	0.171	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	2.958	0.744	
Kolmogorov-Smirnov (NDs = DL/2)	0.334	0.171	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.334	0.744	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.121	0.171	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.976	0.849	0.877	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.929	0.866	Data Appear Lognormal
Lilliefors (Detects Only)	0.132	0.246	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.71	0.92	Data Not Lognormal
Lilliefors (NDs = DL)	0.337	0.174	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.754	0.92	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.331	0.174	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.951	0.92	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0863	0.174	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Silver, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	15	31	67.39%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	31	0.01	0.01	0.01	0.01	3.527E-18
Statistics (Detects Only)	15	0.0029	0.011	0.00656	0.0063	0.00243
Statistics (All: NDs treated as DL value)	46	0.0029	0.011	0.00888	0.01	0.00212
Statistics (All: NDs treated as DL/2 value)	46	0.0029	0.011	0.00551	0.005	0.00154
Statistics (Normal ROS Estimated Data)	46	0.0018	0.011	0.00612	0.00605	0.00211
Statistics (Gamma ROS Estimated Data)	46	0.0029	0.011	0.00659	0.00663	0.00136
Statistics (Lognormal ROS Estimated Data)	46	0.0029	0.011	0.00604	0.00567	0.00199

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	7.656	7.171	8.5690E-4	-5.093	0.385	-0.0756
Statistics (NDs = DL)	12.58	11.78	7.0549E-4	-4.764	0.316	-0.0663
Statistics (NDs = DL/2)	16.78	15.7	3.2837E-4	-5.232	0.236	-0.0451
Statistics (Gamma ROS Estimates)	22.96	21.48	2.8685E-4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.163	0.332	-0.0644

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.984	0.795	0.784	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.958	0.881	Data Appear Normal
Lilliefors (Detects Only)	0.136	0.229	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.632	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.424	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.636	0.945	Data Not Normal

Lilliefors (NDs = DL/2)	0.39	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.987	0.945	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0497	0.131	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.987	0.729	0.83	0.949

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.178	0.738	
Kolmogorov-Smirnov (Detects Only)	0.11	0.222	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	8.471	0.749	
Kolmogorov-Smirnov (NDs = DL)	0.426	0.13	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.536	0.748	
Kolmogorov-Smirnov (NDs = DL/2)	0.382	0.13	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.466	0.748	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.27	0.13	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.991	0.778	0.826	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.974	0.881	Data Appear Lognormal
Lilliefors (Detects Only)	0.1	0.229	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.612	0.945	Data Not Lognormal
Lilliefors (NDs = DL)	0.421	0.131	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.708	0.945	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.372	0.131	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.979	0.945	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0539	0.131	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Silver, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	16	12	42.86%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	12	0.01	0.01	0.01	0.01	1.812E-18
Statistics (Detects Only)	16	0.0038	0.027	0.013	0.013	0.00705
Statistics (All: NDs treated as DL value)	28	0.0038	0.027	0.0117	0.01	0.00546
Statistics (All: NDs treated as DL/2 value)	28	0.0038	0.027	0.00954	0.00515	0.00661
Statistics (Normal ROS Estimated Data)	28	-0.00279	0.027	0.00979	0.00852	0.00702
Statistics (Gamma ROS Estimated Data)	28	0.0038	0.027	0.0131	0.013	0.00555
Statistics (Lognormal ROS Estimated Data)	28	0.00262	0.027	0.00998	0.00777	0.00646

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	3.214	2.893	0.00403	-4.51	0.621	-0.138
Statistics (NDs = DL)	5.085	4.564	0.0023	-4.551	0.466	-0.102
Statistics (NDs = DL/2)	2.706	2.44	0.00353	-4.848	0.61	-0.126

Statistics (Gamma ROS Estimates)	5.009	4.496	0.00262	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.798	0.628	-0.131

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.978	0.933	0.879	0.983

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.944	0.887	Data Appear Normal
Lilliefors (Detects Only)	0.122	0.222	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.874	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.264	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.767	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.291	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.966	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.11	0.167	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.978	0.967	0.954	0.888

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.356	0.744	
Kolmogorov-Smirnov (Detects Only)	0.139	0.217	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.136	0.748	
Kolmogorov-Smirnov (NDs = DL)	0.219	0.166	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.601	0.755	
Kolmogorov-Smirnov (NDs = DL/2)	0.287	0.167	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.427	0.749	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.136	0.166	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.975	0.962	0.908	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.936	0.887	Data Appear Lognormal
Lilliefors (Detects Only)	0.169	0.222	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.927	0.924	Data Appear Lognormal
Lilliefors (NDs = DL)	0.239	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.812	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.275	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.97	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.087	0.167	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Alluv + Muddy Creek Silver, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	72	0	72	28	44	61.11%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	44	0.01	0.01	0.01	0.01	5.264E-18
Statistics (Detects Only)	28	0.0029	0.011	0.00694	0.0068	0.00219
Statistics (All: NDs treated as DL value)	72	0.0029	0.011	0.00881	0.01	0.00202
Statistics (All: NDs treated as DL/2 value)	72	0.0029	0.011	0.00575	0.005	0.00165
Statistics (Normal ROS Estimated Data)	72	0.00244	0.011	0.00664	0.00659	0.00196
Statistics (Gamma ROS Estimated Data)	72	0.0029	0.011	0.00701	0.00715	0.00141
Statistics (Lognormal ROS Estimated Data)	72	0.0029	0.011	0.00657	0.00639	0.00191

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	9.734	9.337	7.1255E-4	-5.023	0.338	-0.0673
Statistics (NDs = DL)	14.16	13.58	6.2206E-4	-4.768	0.293	-0.0614
Statistics (NDs = DL/2)	15.18	14.56	3.7898E-4	-5.191	0.248	-0.0478
Statistics (Gamma ROS Estimates)	22.88	21.94	3.0628E-4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.068	0.299	-0.059

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.986	0.821	0.826	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.961	0.924	Data Appear Normal
Lilliefors (Detects Only)	0.118	0.167	Data Appear Normal
Lilliefors (NDs = DL)	0.386	0.104	Data Not Normal
Lilliefors (NDs = DL/2)	0.37	0.104	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0479	0.104	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.978	0.761	0.87	0.956

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.304	0.745	
Kolmogorov-Smirnov (Detects Only)	0.108	0.165	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	11.47	0.75	
Kolmogorov-Smirnov (NDs = DL)	0.385	0.105	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	10.22	0.75	
Kolmogorov-Smirnov (NDs = DL/2)	0.367	0.105	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.469	0.749	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.161	0.105	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.983	0.805	0.856	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.96	0.924	Data Appear Lognormal
Lilliefors (Detects Only)	0.0947	0.167	Data Appear Lognormal
Lilliefors (NDs = DL)	0.381	0.104	Data Not Lognormal

Lilliefors (NDs = DL/2)	0.361	0.104	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0503	0.104	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Silver_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Silver, Dissolved

General Statistics

Number of Valid Data	26	Number of Detected Data	13
Number of Distinct Detected Data	13	Number of Non-Detect Data	13
		Percent Non-Detects	50.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0047	Minimum Detected	-5.36
Maximum Detected	0.01	Maximum Detected	-4.605
Mean of Detected	0.00737	Mean of Detected	-4.942
SD of Detected	0.00189	SD of Detected	0.266
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.929	Shapiro Wilk Test Statistic	0.929
5% Shapiro Wilk Critical Value	0.866	5% Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00618	Mean (Log Scale)	-5.12
SD	0.00178	SD (Log Scale)	0.259
95% UTL 95% Coverage	0.0102	95% UTL 95% Coverage	0.0108
95% UPL (t)	0.00929	95% UPL (t)	0.00937
90% Percentile (z)	0.00847	90% Percentile (z)	0.00832
95% Percentile (z)	0.00912	95% Percentile (z)	0.00914
99% Percentile (z)	0.0103	99% Percentile (z)	0.0109
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00717
		SD in Original Scale	0.00167
		Mean in Log Scale	-4.964
		SD in Log Scale	0.237
		95% UTL 95% Coverage	0.012
		95% UPL (t)	0.0105
		90% Percentile (z)	0.00946
		95% Percentile (z)	0.0103
		99% Percentile (z)	0.0121

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	12.23	Data appear Normal at 5% Significance Level	
Theta Star	6.0231E-4		
nu star	318.1		
A-D Test Statistic	0.324	Nonparametric Statistics	
5% A-D Critical Value	0.734	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.129	Mean	0.00726
5% K-S Critical Value	0.236	SD	0.00177
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	5.0956E-4
		95% KM UTL with 95% Coverage	0.0113
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0151
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0103
Mean	0.00744	90% Percentile (z)	0.00953
Median	0.00765	95% Percentile (z)	0.0102
SD	0.00145	99% Percentile (z)	0.0114
k star	22.96		
Theta star	3.2393E-4	Gamma ROS Limits with Extrapolated Data	
Nu star	1194	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0102
95% Percentile of Chisquare (2k)	62.74	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0103
		95% WH Approx. Gamma UTL with 95% Coverage	0.0112
90% Percentile	0.00948	95% HW Approx. Gamma UTL with 95% Coverage	0.0113
95% Percentile	0.0102		
99% Percentile	0.0115		

Note: DL/2 is not a recommended method.

Muddy Creek Silver, Dissolved

General Statistics

Number of Valid Data	46	Number of Detected Data	15
Number of Distinct Detected Data	15	Number of Non-Detect Data	31
		Percent Non-Detects	67.39%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0029	Minimum Detected	-5.843
Maximum Detected	0.011	Maximum Detected	-4.51
Mean of Detected	0.00656	Mean of Detected	-5.093
SD of Detected	0.00243	SD of Detected	0.385
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Test Statistic	0.974
5% Shapiro Wilk Critical Value	0.881	5% Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00551	Mean (Log Scale)	-5.232

SD	0.00154	SD (Log Scale)	0.236
95% UTL 95% Coverage	0.00871	95% UTL 95% Coverage	0.00873
95% UPL (t)	0.00813	95% UPL (t)	0.00798
90% Percentile (z)	0.00748	90% Percentile (z)	0.00723
95% Percentile (z)	0.00804	95% Percentile (z)	0.00788
99% Percentile (z)	0.0091	99% Percentile (z)	0.00925
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00604
		SD in Original Scale	0.00199
		Mean in Log Scale	-5.163
		SD in Log Scale	0.332
		95% UTL 95% Coverage	0.0114
		95% UPL (t)	0.0101
		90% Percentile (z)	0.00876
		95% Percentile (z)	0.00989
		99% Percentile (z)	0.0124
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	6.169	Data appear Normal at 5% Significance Level	
Theta Star	0.00106		
nu star	185.1		
A-D Test Statistic	0.178	Nonparametric Statistics	
5% A-D Critical Value	0.738	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.11	Mean	0.00615
5% K-S Critical Value	0.222	SD	0.00206
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	5.3599E-4
		95% KM UTL with 95% Coverage	0.0104
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0152
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00965
Mean	0.00659	90% Percentile (z)	0.0088
Median	0.00663	95% Percentile (z)	0.00955
SD	0.00136	99% Percentile (z)	0.011
k star	21.48		
Theta star	3.0665E-4	Gamma ROS Limits with Extrapolated Data	
Nu star	1976	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00912
95% Percentile of Chisquare (2k)	59.26	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00916
		95% WH Approx. Gamma UTL with 95% Coverage	0.00979
90% Percentile	0.00846	95% HW Approx. Gamma UTL with 95% Coverage	0.00987
95% Percentile	0.00909		
99% Percentile	0.0103		

Note: DL/2 is not a recommended method.

Mesa Silver, Dissolved

General Statistics

Number of Valid Data	28	Number of Detected Data	16
Number of Distinct Detected Data	13	Number of Non-Detect Data	12
		Percent Non-Detects	42.86%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0038	Minimum Detected	-5.573
Maximum Detected	0.027	Maximum Detected	-3.612
Mean of Detected	0.013	Mean of Detected	-4.51
SD of Detected	0.00705	SD of Detected	0.621
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.944	Shapiro Wilk Test Statistic	0.936
5% Shapiro Wilk Critical Value	0.887	5% Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00954	Mean (Log Scale)	-4.848
SD	0.00661	SD (Log Scale)	0.61
95% UTL 95% Coverage	0.0244	95% UTL 95% Coverage	0.0309
95% UPL (t)	0.021	95% UPL (t)	0.0226
90% Percentile (z)	0.018	90% Percentile (z)	0.0171
95% Percentile (z)	0.0204	95% Percentile (z)	0.0214
99% Percentile (z)	0.0249	99% Percentile (z)	0.0324
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00656	Mean in Original Scale	0.00998
SD	0.01	SD in Original Scale	0.00646
95% UTL with 95% Coverage	0.0291	95% UTL with 95% Coverage	0.0338
		95% BCA UTL with 95% Coverage	0.027
		95% Bootstrap (%) UTL with 95% Coverage	0.027
95% UPL (t)	0.024	95% UPL (t)	0.0245
90% Percentile (z)	0.0194	90% Percentile (z)	0.0184
95% Percentile (z)	0.0231	95% Percentile (z)	0.0232
99% Percentile (z)	0.0299	99% Percentile (z)	0.0355

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.653	Data appear Normal at 5% Significance Level	
Theta Star	0.00488		
nu star	84.89		
A-D Test Statistic	0.356	Nonparametric Statistics	
5% A-D Critical Value	0.744	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.139	Mean	0.00984
5% K-S Critical Value	0.217	SD	0.00637
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00129
		95% KM UTL with 95% Coverage	0.0241
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0381
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0209
Mean	0.0131	90% Percentile (z)	0.018
Median	0.013	95% Percentile (z)	0.0203
SD	0.00555	99% Percentile (z)	0.0247
k star	4.496		

Theta star	0.00292	Gamma ROS Limits with Extrapolated Data	
Nu star	251.8	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0251
95% Percentile of Chisquare (2k)	16.91	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0256
		95% WH Approx. Gamma UTL with 95% Coverage	0.0301
90% Percentile	0.0214	95% HW Approx. Gamma UTL with 95% Coverage	0.0311
95% Percentile	0.0247		
99% Percentile	0.0316		

Note: DL/2 is not a recommended method.

Alluv + Muddy Creek Silver, Dissolved

General Statistics

Number of Valid Data	72	Number of Detected Data	28
Number of Distinct Detected Data	26	Number of Non-Detect Data	44
		Percent Non-Detects	61.11%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0029	Minimum Detected	-5.843
Maximum Detected	0.011	Maximum Detected	-4.51
Mean of Detected	0.00694	Mean of Detected	-5.023
SD of Detected	0.00219	SD of Detected	0.338
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.961	Shapiro Wilk Test Statistic	0.96
5% Shapiro Wilk Critical Value	0.924	5% Shapiro Wilk Critical Value	0.924
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00575	Mean (Log Scale)	-5.191
SD	0.00165	SD (Log Scale)	0.248
95% UTL 95% Coverage	0.00903	95% UTL 95% Coverage	0.0091
95% UPL (t)	0.00853	95% UPL (t)	0.00844
90% Percentile (z)	0.00787	90% Percentile (z)	0.00765
95% Percentile (z)	0.00847	95% Percentile (z)	0.00837
99% Percentile (z)	0.0096	99% Percentile (z)	0.00992
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.00837	Mean in Original Scale	0.00657
SD	9.3657E-4	SD in Original Scale	0.00191
95% UTL with 95% Coverage	0.0102	95% UTL with 95% Coverage	0.0114
		95% BCA UTL with 95% Coverage	0.0101
		95% Bootstrap (%) UTL with 95% Coverage	0.0101
95% UPL (t)	0.00994	95% UPL (t)	0.0104
90% Percentile (z)	0.00957	90% Percentile (z)	0.00923
95% Percentile (z)	0.00991	95% Percentile (z)	0.0103
99% Percentile (z)	0.0105	99% Percentile (z)	0.0126

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	8.715	Data appear Normal at 5% Significance Level	
Theta Star	7.9587E-4		
nu star	488		
A-D Test Statistic	0.304	Nonparametric Statistics	
5% A-D Critical Value	0.745	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.108	Mean	0.00669
5% K-S Critical Value	0.165	SD	0.00201
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	3.8257E-4
		95% KM UTL with 95% Coverage	0.0107
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0155
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0101
Mean	0.00701	90% Percentile (z)	0.00927
Median	0.00715	95% Percentile (z)	0.01
SD	0.00141	99% Percentile (z)	0.0114
k star	21.94		
Theta star	3.1946E-4	Gamma ROS Limits with Extrapolated Data	
Nu star	3159	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00966
95% Percentile of Chisquare (2k)	60.34	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00971
		95% WH Approx. Gamma UTL with 95% Coverage	0.0102
90% Percentile	0.00898	95% HW Approx. Gamma UTL with 95% Coverage	0.0103
95% Percentile	0.00964		
99% Percentile	0.011		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Silver_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Silver, Dissolved

Background Data: Alluv Silver, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	28	26
Number of Non-Detect Data	12	13
Number of Detect Data	16	13
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.01	0.01
Percent Non detects	42.86%	50.00%
Minimum Detected	0.0038	0.0047
Maximum Detected	0.027	0.01
Mean of Detected Data	0.013	0.00737
Median of Detected Data	0.013	0.0076
SD of Detected Data	0.00705	0.00189

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	2.492
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0127

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Silver_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Silver, Dissolved

Background Data: Alluv Silver, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	31	13
Number of Detect Data	15	13
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.01	0.01
Percent Non detects	67.39%	50.00%
Minimum Detected	0.0029	0.0047
Maximum Detected	0.011	0.01
Mean of Detected Data	0.00656	0.00737
Median of Detected Data	0.0063	0.0076
SD of Detected Data	0.00243	0.00189

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-0.758
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.448

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Silver_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Silver, Dissolved

Background Data: Muddy Creek Silver, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	12	31
Number of Detect Data	16	15
Minimum Non-Detect	0.01	0.01
Maximum Non-Detect	0.01	0.01
Percent Non detects	42.86%	67.39%
Minimum Detected	0.0038	0.0029
Maximum Detected	0.027	0.011
Mean of Detected Data	0.013	0.00656
Median of Detected Data	0.013	0.0063
SD of Detected Data	0.00705	0.00243

Site vs Background Gehan Test

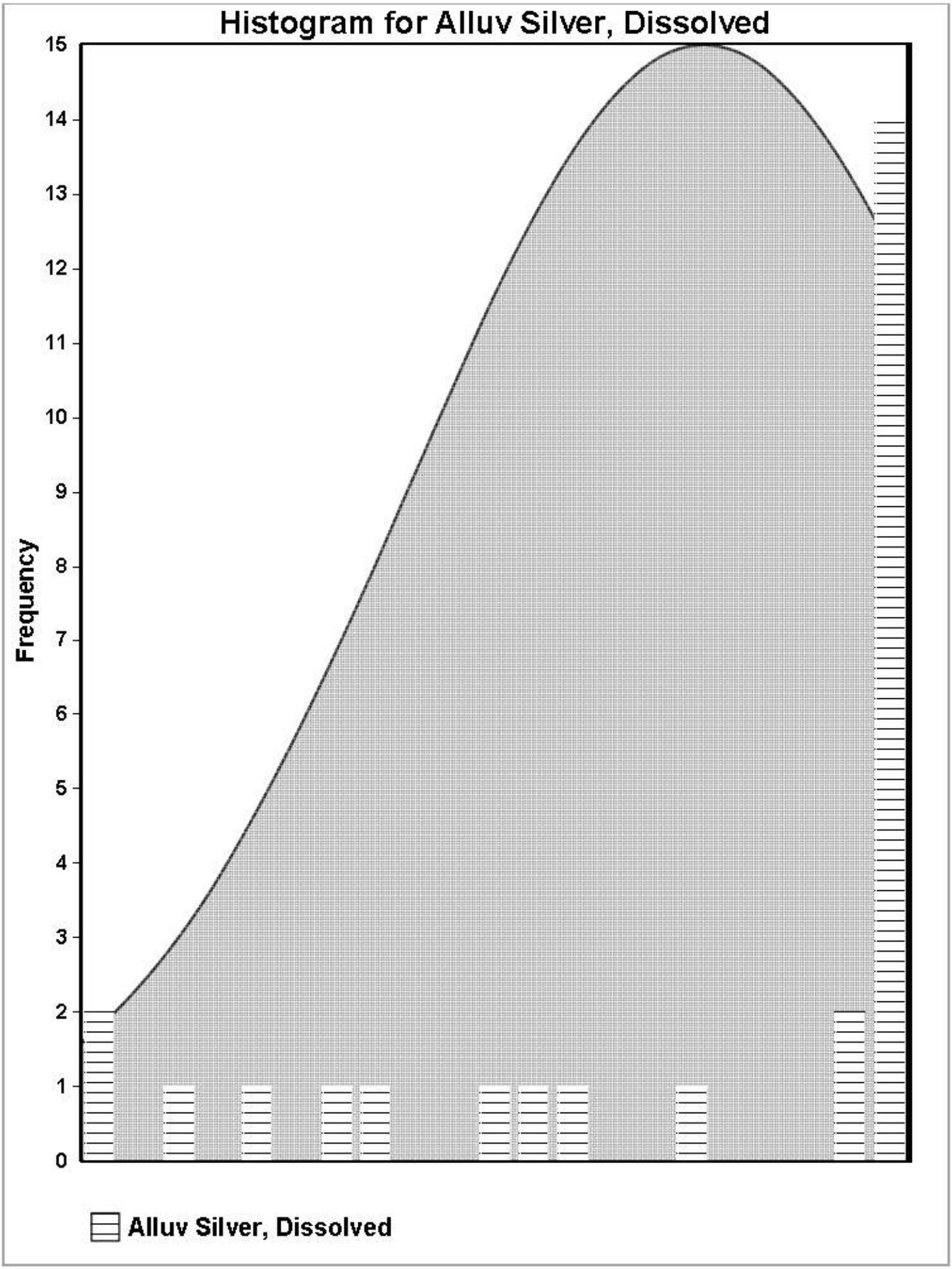
H0: Mu of Site or AOC = Mu of background

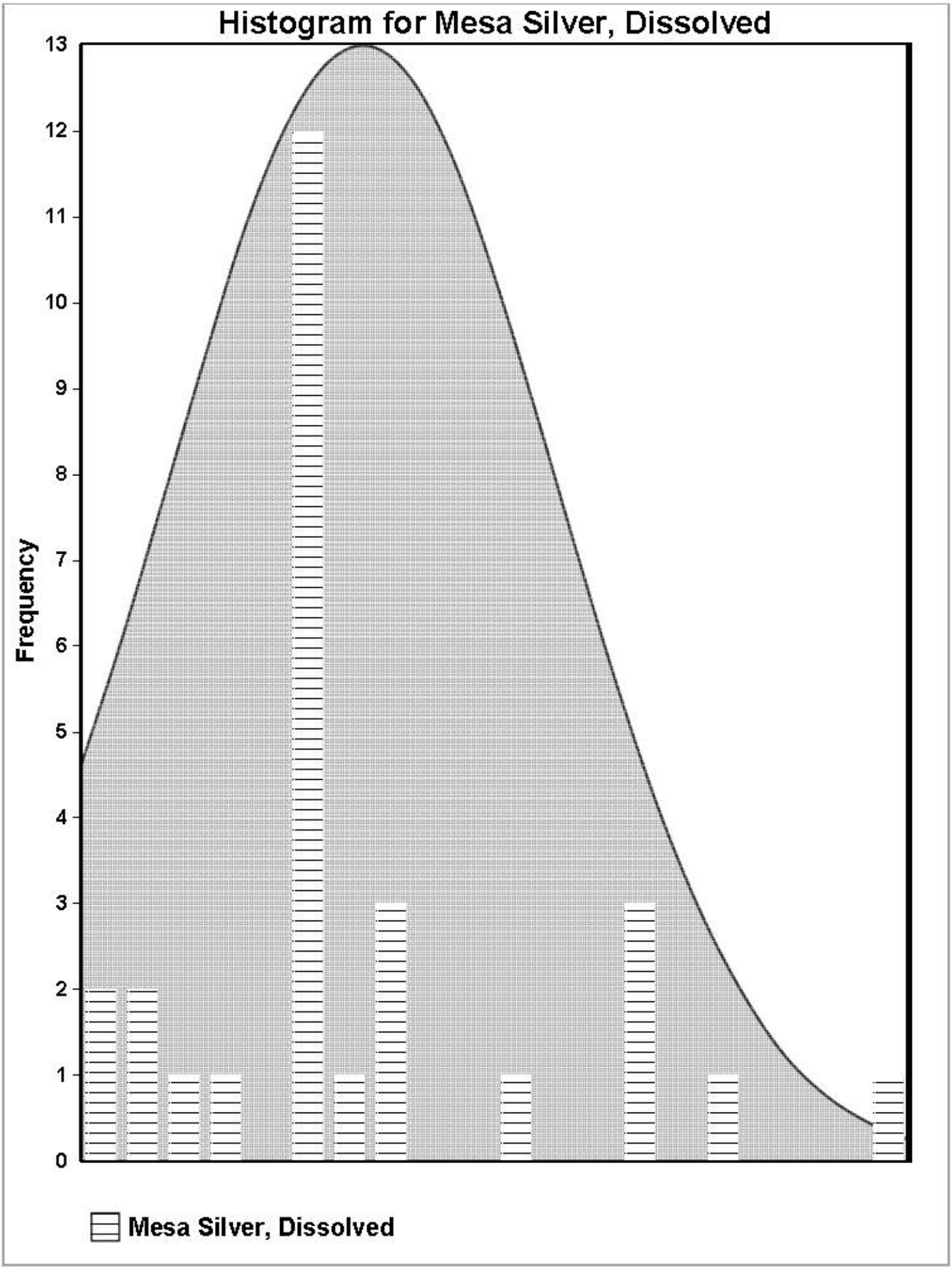
Gehan z Test Value	3.54
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	3.9963E-4

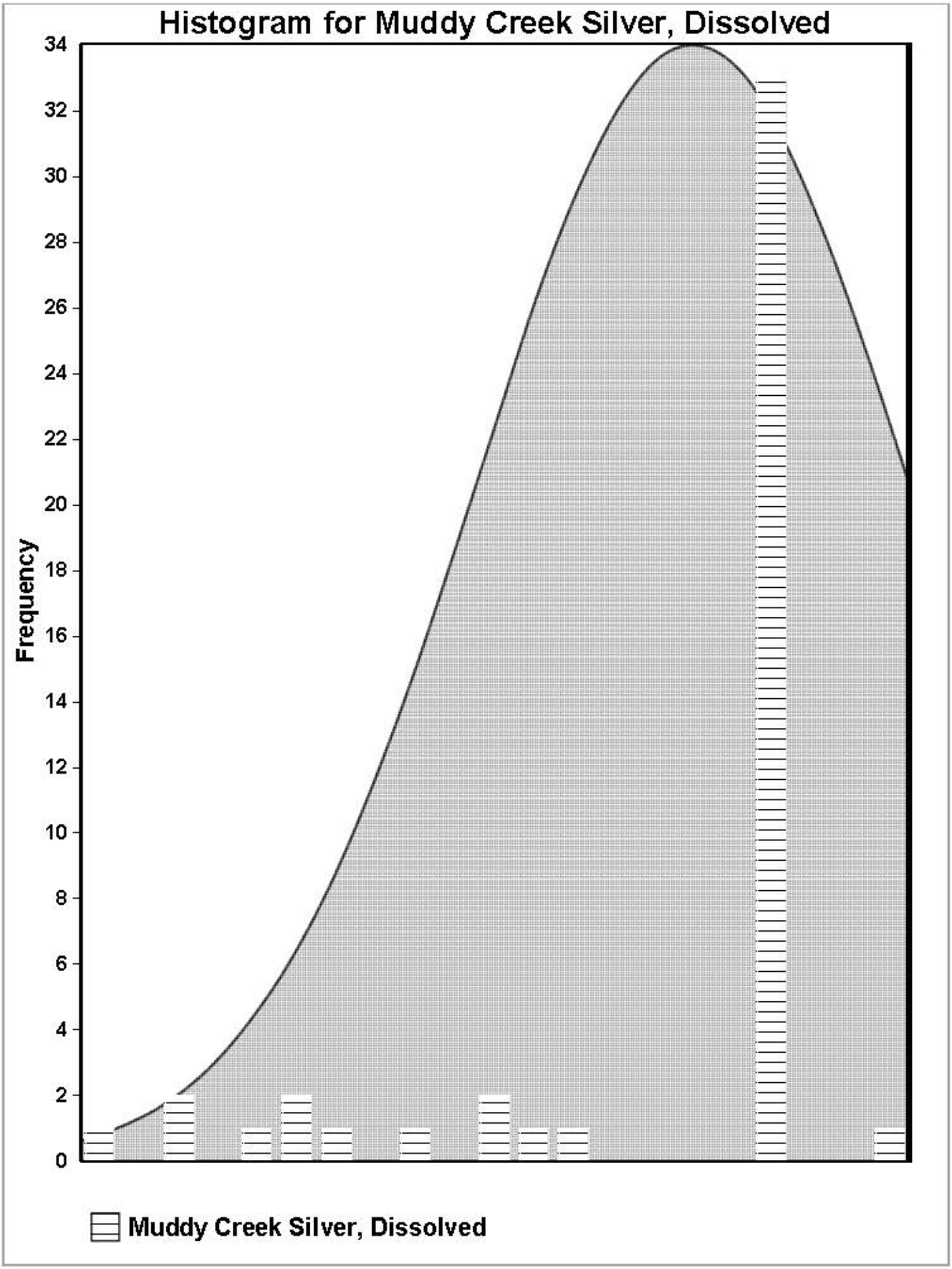
Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Silver, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
Alluv Silver, Dissolved


Histogram for Mesa Silver, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
Mesa Silver, Dissolved


Histogram for Muddy Creek Silver, Dissolved
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
Muddy Creek Silver, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Silver_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Silver, Dissolved

Mean	0.00618
Standard Deviation	0.00178
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00618	0.00175	0.01	23	2.182	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Silver, Dissolved

Mean	0.00551
Standard Deviation	0.00154
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00551	0.00152	0.011	16	3.601	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.011 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.011 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Silver, Dissolved

Mean	0.00954
Standard Deviation	0.00661
Number of data	28
Number of suspected outliers	1

Potential	Obs.	Test	Critical	Critical

#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.00954	0.00649	0.027	17	2.691	2.88	3.2

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Alluv + Muddy Creek Silver, Dissolved

Mean	0.00575
Standard Deviation	0.00165
Number of data	72
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00575	0.00164	0.011	42	3.196	3.27	3.63

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Location Name	Sample Date	Alluv Silver, Dissolved	D_Alluv Silver, Dissolved
BG-1S	11/26/2012	0.0098	1
BG-1S	8/23/2012	0.0088	1
BG-1S	5/24/2012	0.01	0
BG-1S	3/20/2012	0.01	0
IMW-2.5D	11/26/2012	0.0078	1
IMW-2.5D	8/24/2012	0.0047	1
IMW-2.5D	5/21/2012	0.01	0
IMW-2.5D	3/21/2012	0.01	0
IMW-2.5S	11/26/2012	0.0065	1
IMW-2.5S	8/24/2012	0.0059	1
IMW-2.5S	5/21/2012	0.01	0
IMW-2.5S	3/21/2012	0.01	0
IMW-3S	5/21/2012	0.01	0
IMW-3S	3/20/2012	0.0048	1
KMW-2D	11/26/2012	0.0076	1
KMW-2D	8/24/2012	0.0066	1
KMW-2D	5/21/2012	0.01	0
KMW-2D	3/23/2012	0.01	0
KMW-2M	11/26/2012	0.0099	1
KMW-2M	8/24/2012	0.008	1
KMW-2M	5/21/2012	0.01	0
KMW-2M	3/23/2012	0.01	0
KMW-2S	11/26/2012	0.01	1
KMW-2S	8/24/2012	0.0054	1
KMW-2S	5/21/2012	0.01	0
KMW-2S	3/23/2012	0.01	0

Location Name	Sample Date	Muddy Creek Silver, Dissolved	D_Muddy Creek Silver, Dissolved
BG-3S	11/27/2012	0.0041	1
BG-3S	8/22/2012	0.01	0
BG-3S	5/23/2012	0.01	0
BG-3S	3/21/2012	0.01	0
BG-4S	11/27/2012	0.01	0
BG-4S	8/30/2012	0.0055	1
BG-4S	5/30/2012	0.0046	1
BG-4S	3/20/2012	0.0038	1
BG-6S	11/27/2012	0.0029	1
BG-6S	8/23/2012	0.0099	1
BG-6S	5/25/2012	0.01	0
BG-6S	3/21/2012	0.01	0
BG-1M	11/26/2012	0.0073	1
BG-1M	8/23/2012	0.007	1
BG-1M	5/24/2012	0.01	0
BG-1M	3/20/2012	0.011	1
BG-3M	11/27/2012	0.0051	1
BG-3M	8/22/2012	0.01	0
BG-3M	5/24/2012	0.01	0
BG-3M	3/21/2012	0.01	0
BG-4M	11/27/2012	0.01	0
BG-4M	8/30/2012	0.01	0
BG-4M	5/30/2012	0.01	0
BG-4M	3/20/2012	0.01	0
BG-6M	11/27/2012	0.01	0
BG-6M	8/22/2012	0.0077	1
BG-6M	5/25/2012	0.01	0
BG-6M	3/21/2012	0.01	0
BG-1D	11/26/2012	0.0079	1
BG-1D	8/23/2012	0.0063	1
BG-1D	5/24/2012	0.01	0
BG-1D	3/20/2012	0.01	0
BG-3D	11/27/2012	0.01	0
BG-3D	8/21/2012	0.01	0
BG-3D	5/23/2012	0.01	0
BG-3D	3/21/2012	0.01	0
BG-4D	11/27/2012	0.01	0
BG-4D	8/30/2012	0.01	0
BG-4D	5/30/2012	0.0053	1
BG-4D	3/20/2012	0.01	0
BG-6D	11/27/2012	0.01	0
BG-6D	8/22/2012	0.01	1
BG-6D	5/25/2012	0.01	0
BG-6D	3/21/2012	0.01	0
IMW-3D	5/25/2012	0.01	0
IMW-3D	3/22/2012	0.01	0

Location Name	Sample Date	Mesa Silver, Dissolved	D_Mesa Silver, Dissolved
BG-2S	11/26/2012	0.022	1
BG-2S	8/23/2012	0.02	1
BG-2S	5/24/2012	0.01	0
BG-2S	3/21/2012	0.01	0
BG-2M	11/26/2012	0.011	1
BG-2M	8/23/2012	0.013	1
BG-2M	5/24/2012	0.01	0
BG-2M	3/21/2012	0.01	0
BG-2D	11/26/2012	0.013	1
BG-2D	8/23/2012	0.013	1
BG-2D	5/24/2012	0.01	0
BG-2D	3/21/2012	0.01	0
LMW-10	11/28/2012	0.019	1
LMW-10	8/27/2012	0.0084	1
LMW-10	5/30/2012	0.01	0
LMW-10	3/22/2012	0.01	0
LMW-11R	11/26/2012	0.027	1
LMW-11R	8/21/2012	0.0057	1
LMW-11R	5/29/2012	0.01	0
LMW-11R	3/23/2012	0.01	0
LMW-7	11/28/2012	0.016	1
LMW-7	8/27/2012	0.0068	1
LMW-7	5/31/2012	0.0038	1
LMW-7	3/23/2012	0.01	0
LMW-9	11/28/2012	0.019	1
LMW-9	8/27/2012	0.0053	1
LMW-9	5/31/2012	0.0042	1
LMW-9	3/23/2012	0.01	0

Location Name	Sample Date	Alluv + Muddy Creek Silver, Dissolved	D_Alluv + Muddy Creek Silver, Dissolved
BG-1S	11/26/2012	0.0098	1
BG-1S	8/23/2012	0.0088	1
BG-1S	5/24/2012	0.01	0
BG-1S	3/20/2012	0.01	0
IMW-2.5D	11/26/2012	0.0078	1
IMW-2.5D	8/24/2012	0.0047	1
IMW-2.5D	5/21/2012	0.01	0
IMW-2.5D	3/21/2012	0.01	0
IMW-2.5S	11/26/2012	0.0065	1
IMW-2.5S	8/24/2012	0.0059	1
IMW-2.5S	5/21/2012	0.01	0
IMW-2.5S	3/21/2012	0.01	0
IMW-3S	5/21/2012	0.01	0
IMW-3S	3/20/2012	0.0048	1
KMW-2D	11/26/2012	0.0076	1
KMW-2D	8/24/2012	0.0066	1
KMW-2D	5/21/2012	0.01	0
KMW-2D	3/23/2012	0.01	0
KMW-2M	11/26/2012	0.0099	1
KMW-2M	8/24/2012	0.008	1
KMW-2M	5/21/2012	0.01	0
KMW-2M	3/23/2012	0.01	0
KMW-2S	11/26/2012	0.01	1
KMW-2S	8/24/2012	0.0054	1
KMW-2S	5/21/2012	0.01	0
KMW-2S	3/23/2012	0.01	0
BG-3S	11/27/2012	0.0041	1
BG-3S	8/22/2012	0.01	0
BG-3S	5/23/2012	0.01	0
BG-3S	3/21/2012	0.01	0
BG-4S	11/27/2012	0.01	0
BG-4S	8/30/2012	0.0055	1
BG-4S	5/30/2012	0.0046	1
BG-4S	3/20/2012	0.0038	1
BG-6S	11/27/2012	0.0029	1
BG-6S	8/23/2012	0.0099	1
BG-6S	5/25/2012	0.01	0
BG-6S	3/21/2012	0.01	0
BG-1M	11/26/2012	0.0073	1
BG-1M	8/23/2012	0.007	1
BG-1M	5/24/2012	0.01	0
BG-1M	3/20/2012	0.011	1
BG-3M	11/27/2012	0.0051	1
BG-3M	8/22/2012	0.01	0
BG-3M	5/24/2012	0.01	0
BG-3M	3/21/2012	0.01	0
BG-4M	11/27/2012	0.01	0
BG-4M	8/30/2012	0.01	0
BG-4M	5/30/2012	0.01	0
BG-4M	3/20/2012	0.01	0

BG-6M	11/27/2012	0.01	0
BG-6M	8/22/2012	0.0077	1
BG-6M	5/25/2012	0.01	0
BG-6M	3/21/2012	0.01	0
BG-1D	11/26/2012	0.0079	1
BG-1D	8/23/2012	0.0063	1
BG-1D	5/24/2012	0.01	0
BG-1D	3/20/2012	0.01	0
BG-3D	11/27/2012	0.01	0
BG-3D	8/21/2012	0.01	0
BG-3D	5/23/2012	0.01	0
BG-3D	3/21/2012	0.01	0
BG-4D	11/27/2012	0.01	0
BG-4D	8/30/2012	0.01	0
BG-4D	5/30/2012	0.0053	1
BG-4D	3/20/2012	0.01	0
BG-6D	11/27/2012	0.01	0
BG-6D	8/22/2012	0.01	1
BG-6D	5/25/2012	0.01	0
BG-6D	3/21/2012	0.01	0
IMW-3D	5/25/2012	0.01	0
IMW-3D	3/22/2012	0.01	0

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Sodium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Sodium, Dissolved

Raw Statistics	
Number of Valid Observations	87
Number of Distinct Observations	49
Minimum	181
Maximum	840
Mean of Raw Data	472
Standard Deviation of Raw Data	117.9
Kstar	14.14
Mean of Log Transformed Data	6.122
Standard Deviation of Log Transformed Data	0.276

Normal Distribution Test Results	
Correlation Coefficient R	0.986
Approximate Shapiro Wilk Test Statistic	0.974
Approximate Shapiro Wilk P Value	0.298
Lilliefors Test Statistic	0.101
Lilliefors Critical (0.95) Value	0.095

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.984
A-D Test Statistic	1.189
A-D Critical (0.95) Value	0.751
K-S Test Statistic	0.106
K-S Critical(0.95) Value	0.0957

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.958
Approximate Shapiro Wilk Test Statistic	0.922
Approximate Shapiro Wilk P Value	1.7804E-5
Lilliefors Test Statistic	0.125
Lilliefors Critical (0.95) Value	0.095

Data not Lognormal at (0.05) Significance Level

Muddy Creek Sodium, Dissolved

Raw Statistics	
Number of Valid Observations	53
Number of Distinct Observations	22
Minimum	120

Maximum	450
Mean of Raw Data	230.9
Standard Deviation of Raw Data	70.63
Kstar	12.26
Mean of Log Transformed Data	5.403
Standard Deviation of Log Transformed Data	0.274

Normal Distribution Test Results

Correlation Coefficient R	0.909
Approximate Shapiro Wilk Test Statistic	0.829
Approximate Shapiro Wilk P Value	5.5593E-8
Lilliefors Test Statistic	0.171
Lilliefors Critical (0.95) Value	0.122

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.941
A-D Test Statistic	1.691
A-D Critical (0.95) Value	0.75
K-S Test Statistic	0.147
K-S Critical(0.95) Value	0.122

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.964
Approximate Shapiro Wilk Test Statistic	0.929
Approximate Shapiro Wilk P Value	0.00459
Lilliefors Test Statistic	0.152
Lilliefors Critical (0.95) Value	0.122

Data not Lognormal at (0.05) Significance Level

Mesa Sodium, Dissolved

Raw Statistics

Number of Valid Observations	100
Number of Distinct Observations	56
Minimum	100
Maximum	810
Mean of Raw Data	411.4
Standard Deviation of Raw Data	166.5
Kstar	5.584
Mean of Log Transformed Data	5.93
Standard Deviation of Log Transformed Data	0.448

Normal Distribution Test Results

Correlation Coefficient R	0.978
Approximate Shapiro Wilk Test Statistic	0.938
Approximate Shapiro Wilk P Value	1.4300E-4
Lilliefors Test Statistic	0.149

Lilliefors Critical (0.95) Value	0.0886
Data not Normal at (0.05) Significance Level	
Gamma Distribution Test Results	
Correlation Coefficient R	0.985
A-D Test Statistic	0.985
A-D Critical (0.95) Value	0.754
K-S Test Statistic	0.0949
K-S Critical(0.95) Value	0.0896
Data not Gamma Distributed at (0.05) Significance Level	
Lognormal Distribution Test Results	
Correlation Coefficient R	0.971
Approximate Shapiro Wilk Test Statistic	0.93
Approximate Shapiro Wilk P Value	2.2378E-5
Lilliefors Test Statistic	0.105
Lilliefors Critical (0.95) Value	0.0886
Data not Lognormal at (0.05) Significance Level	

General Background Statistics for Full Data Sets

User Selected Options	
From File	Sodium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Sodium, Dissolved

General Statistics

Total Number of Observations	87	Number of Distinct Observations	49

Raw Statistics		Log-Transformed Statistics	
Minimum	181	Minimum	5.198
Maximum	840	Maximum	6.733
Second Largest	740	Second Largest	6.607
First Quartile	399.5	First Quartile	5.99
Median	480	Median	6.174
Third Quartile	520	Third Quartile	6.254
Mean	472	Mean	6.122
SD	117.9	SD	0.276
Coefficient of Variation	0.25		
Skewness	0.132		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.101	Lilliefors Test Statistic	0.125
Lilliefors Critical Value	0.095	Lilliefors Critical Value	0.095
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	701.5	95% UTL with 95% Coverage	780.5
95% UPL (t)	669.3	95% UPL (t)	723.6
90% Percentile (z)	623.2	90% Percentile (z)	649.6
95% Percentile (z)	666	95% Percentile (z)	718.2
99% Percentile (z)	746.4	99% Percentile (z)	866.9

Gamma Distribution Test		Data Distribution Test	
k star	14.14	Data do not follow a Discernable Distribution (0.05)	
Theta Star	33.38		
MLE of Mean	472		
MLE of Standard Deviation	125.5		
nu star	2461		
A-D Test Statistic	1.189	Nonparametric Statistics	
5% A-D Critical Value	0.751	90% Percentile	614
K-S Test Statistic	0.106	95% Percentile	664.2
5% K-S Critical Value	0.0957	99% Percentile	754
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	720
90% Percentile	638.3	95% Percentile Bootstrap UTL with 95% Coverage	720
95% Percentile	695.6	95% BCA Bootstrap UTL with 95% Coverage	720
99% Percentile	811.9	95% UPL	692.4
		95% Chebyshev UPL	989.1
95% WH Approx. Gamma UPL	697.3	Upper Threshold Limit Based upon IQR	700.8
95% HW Approx. Gamma UPL	702.8		
95% WH Approx. Gamma UTL with 95% Coverage	742.2		
95% HW Approx. Gamma UTL with 95% Coverage	750.2		

Muddy Creek Sodium, Dissolved

General Statistics			
Total Number of Observations	53	Number of Distinct Observations	22
Raw Statistics		**Log-Transformed Statistics**	
Minimum	120	Minimum	4.787
Maximum	450	Maximum	6.109
Second Largest	450	Second Largest	6.109
First Quartile	190	First Quartile	5.247
Median	210	Median	5.347
Third Quartile	250	Third Quartile	5.521
Mean	230.9	Mean	5.403
SD	70.63	SD	0.274
Coefficient of Variation	0.306		
Skewness	1.649		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.171	Lilliefors Test Statistic	0.152
Lilliefors Critical Value	0.122	Lilliefors Critical Value	0.122
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	375.4	95% UTL with 95% Coverage	389
95% UPL (t)	350.3	95% UPL (t)	353
90% Percentile (z)	321.5	90% Percentile (z)	315.6
95% Percentile (z)	347.1	95% Percentile (z)	348.6
99% Percentile (z)	395.3	99% Percentile (z)	420.2
Gamma Distribution Test		**Data Distribution Test**	
k star	12.26	Data do not follow a Discernable Distribution (0.05)	
Theta Star	18.84		
MLE of Mean	230.9		
MLE of Standard Deviation	65.96		
nu star	1300		
A-D Test Statistic	1.691	**Nonparametric Statistics**	
5% A-D Critical Value	0.75	90% Percentile	280
K-S Test Statistic	0.147	95% Percentile	414
5% K-S Critical Value	0.122	99% Percentile	450

Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	450
90% Percentile	318.5	95% Percentile Bootstrap UTL with 95% Coverage	450
95% Percentile	349	95% BCA Bootstrap UTL with 95% Coverage	450
99% Percentile	411.3	95% UPL	429
		95% Chebyshev UPL	541.7
95% WH Approx. Gamma UPL	350.3	Upper Threshold Limit Based upon IQR	340
95% HW Approx. Gamma UPL	350.7		
95% WH Approx. Gamma UTL with 95% Coverage	381.4		
95% HW Approx. Gamma UTL with 95% Coverage	382.9		

Mesa Sodium, Dissolved

General Statistics			
Total Number of Observations	100	Number of Distinct Observations	56
Raw Statistics		Log-Transformed Statistics	
Minimum	100	Minimum	4.605
Maximum	810	Maximum	6.697
Second Largest	810	Second Largest	6.697
First Quartile	310	First Quartile	5.737
Median	385	Median	5.953
Third Quartile	480	Third Quartile	6.174
Mean	411.4	Mean	5.93
SD	166.5	SD	0.448
Coefficient of Variation	0.405		
Skewness	0.581		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.149	Lilliefors Test Statistic	0.105
Lilliefors Critical Value	0.0886	Lilliefors Critical Value	0.0886
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	731.6	95% UTL with 95% Coverage	890.5
95% UPL (t)	689.2	95% UPL (t)	794.4
90% Percentile (z)	624.7	90% Percentile (z)	667.9
95% Percentile (z)	685.2	95% Percentile (z)	786
99% Percentile (z)	798.7	99% Percentile (z)	1067
Gamma Distribution Test		Data Distribution Test	
k star	5.584	Data do not follow a Discernable Distribution (0.05)	
Theta Star	73.67		
MLE of Mean	411.4		
MLE of Standard Deviation	174.1		
nu star	1117		
A-D Test Statistic	0.985	Nonparametric Statistics	
5% A-D Critical Value	0.754	90% Percentile	650.1

K-S Test Statistic	0.0949	95% Percentile	760.5
5% K-S Critical Value	0.0896	99% Percentile	810
Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	790
90% Percentile	644.2	95% Percentile Bootstrap UTL with 95% Coverage	790
95% Percentile	733.1	95% BCA Bootstrap UTL with 95% Coverage	790
99% Percentile	920	95% UPL	769.5
		95% Chebyshev UPL	1141
95% WH Approx. Gamma UPL	735.4	Upper Threshold Limit Based upon IQR	735
95% HW Approx. Gamma UPL	746.6		
95% WH Approx. Gamma UTL with 95% Coverage	801.9		
95% HW Approx. Gamma UTL with 95% Coverage	818.5		

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Sodium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Sodium, Dissolved

Background Data: Alluv Sodium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	53	87
Number of Distinct Observations	22	49
Minimum	120	181
Maximum	450	840
Mean	230.9	472
Median	210	480
SD	70.63	117.9
SE of Mean	9.702	12.65

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1677
WMW Test U-Stat	8.846
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Sodium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Sodium, Dissolved

Background Data: Alluv Sodium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	100	87
Number of Distinct Observations	56	49
Minimum	100	181
Maximum	810	840
Mean	411.4	472
Median	385	480
SD	166.5	117.9
SE of Mean	16.65	12.65

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	8066
WMW Test U-Stat	3.612
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	3.0071E-4

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Sodium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Sodium, Dissolved

Background Data: Muddy Creek Sodium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Observations	100	53
Number of Distinct Observations	56	22
Minimum	100	120
Maximum	810	450
Mean	411.4	230.9
Median	385	210
SD	166.5	70.63
SE of Mean	16.65	9.702

Wilcoxon-Mann-Whitney (WMW) Test

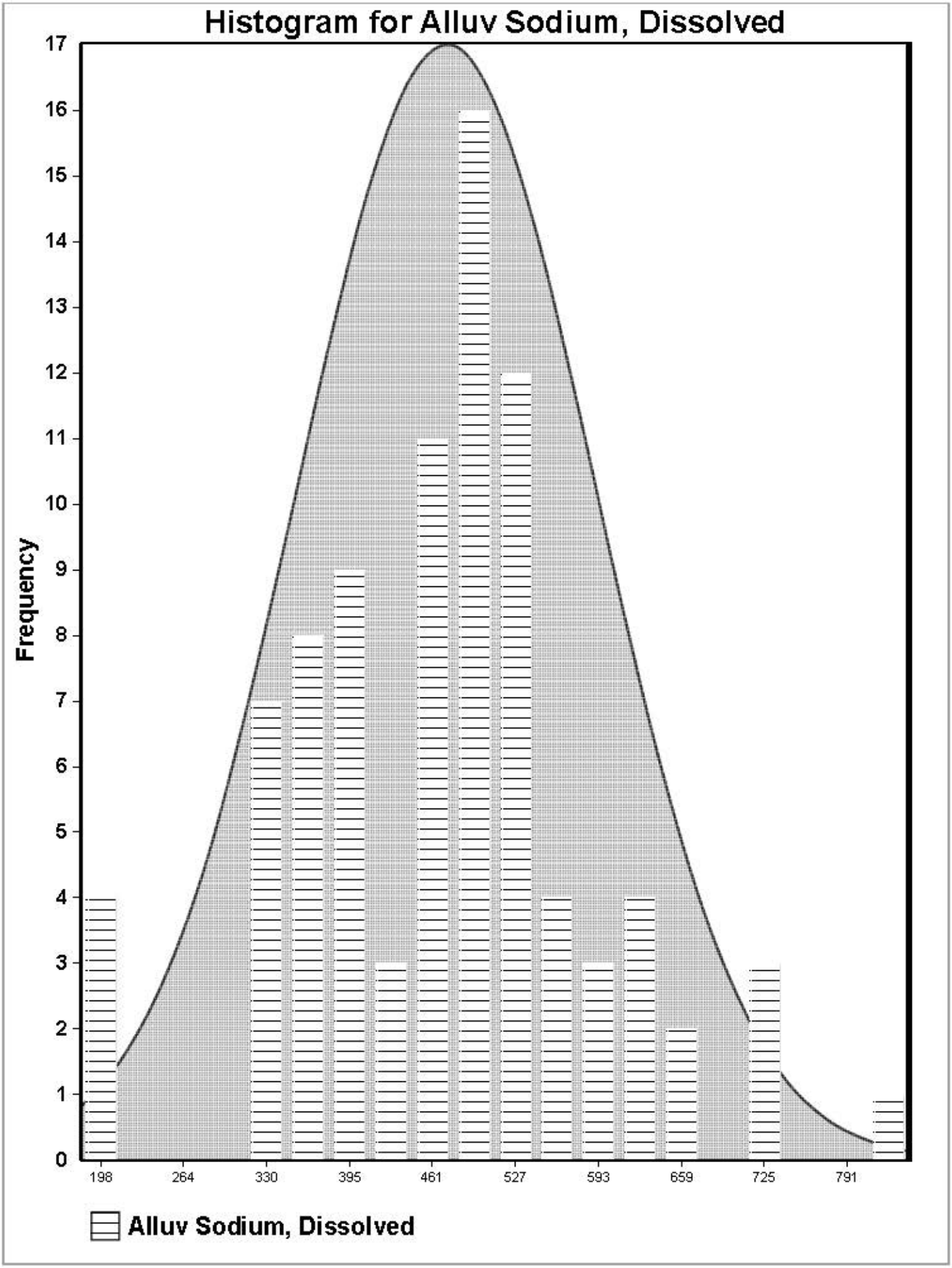
H0: Mean/Median of Site or AOC = Mean/Median of Background

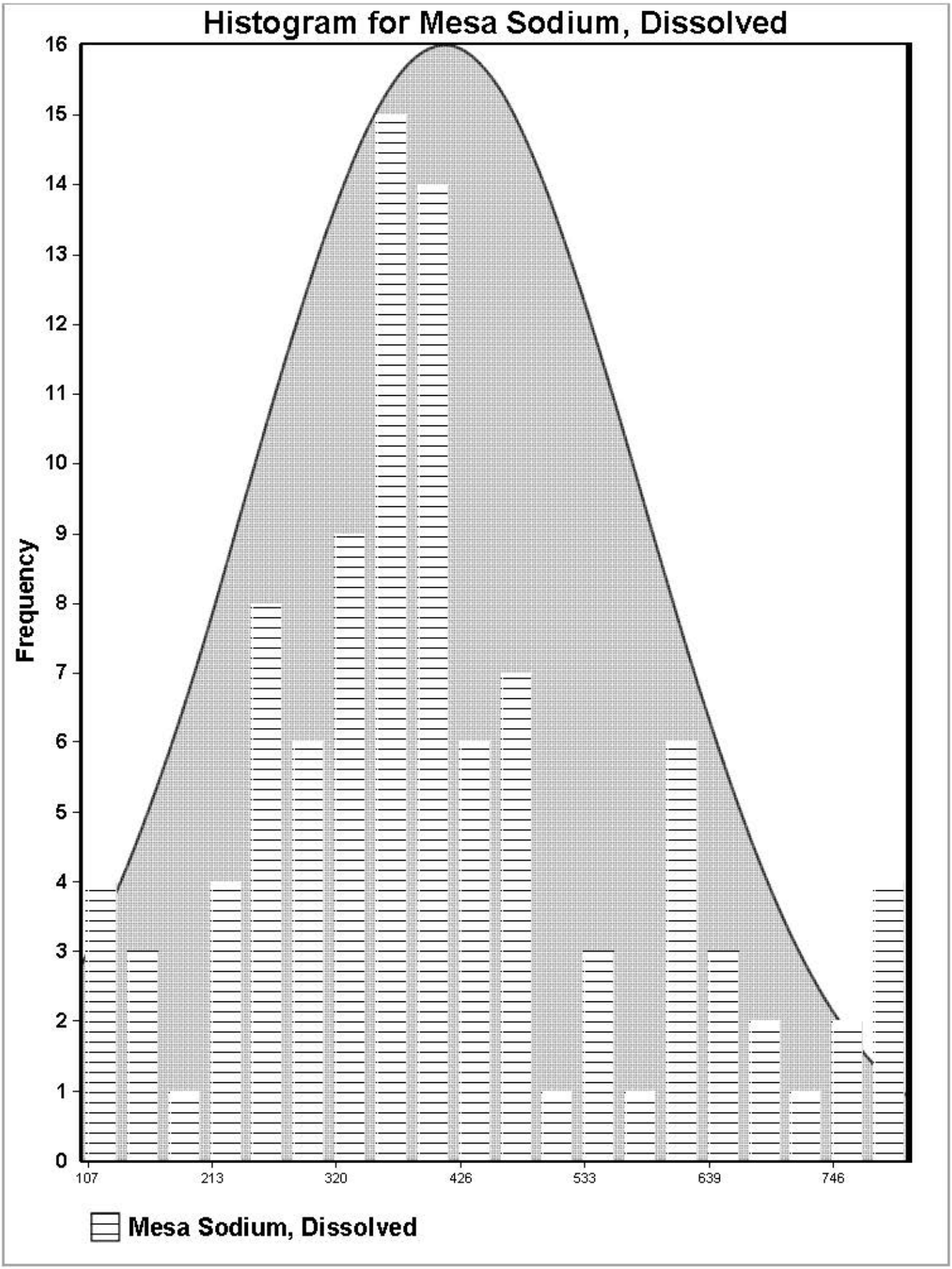
Site Rank Sum W-Stat	9596
WMW Test U-Stat	7.266
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	3.699E-13

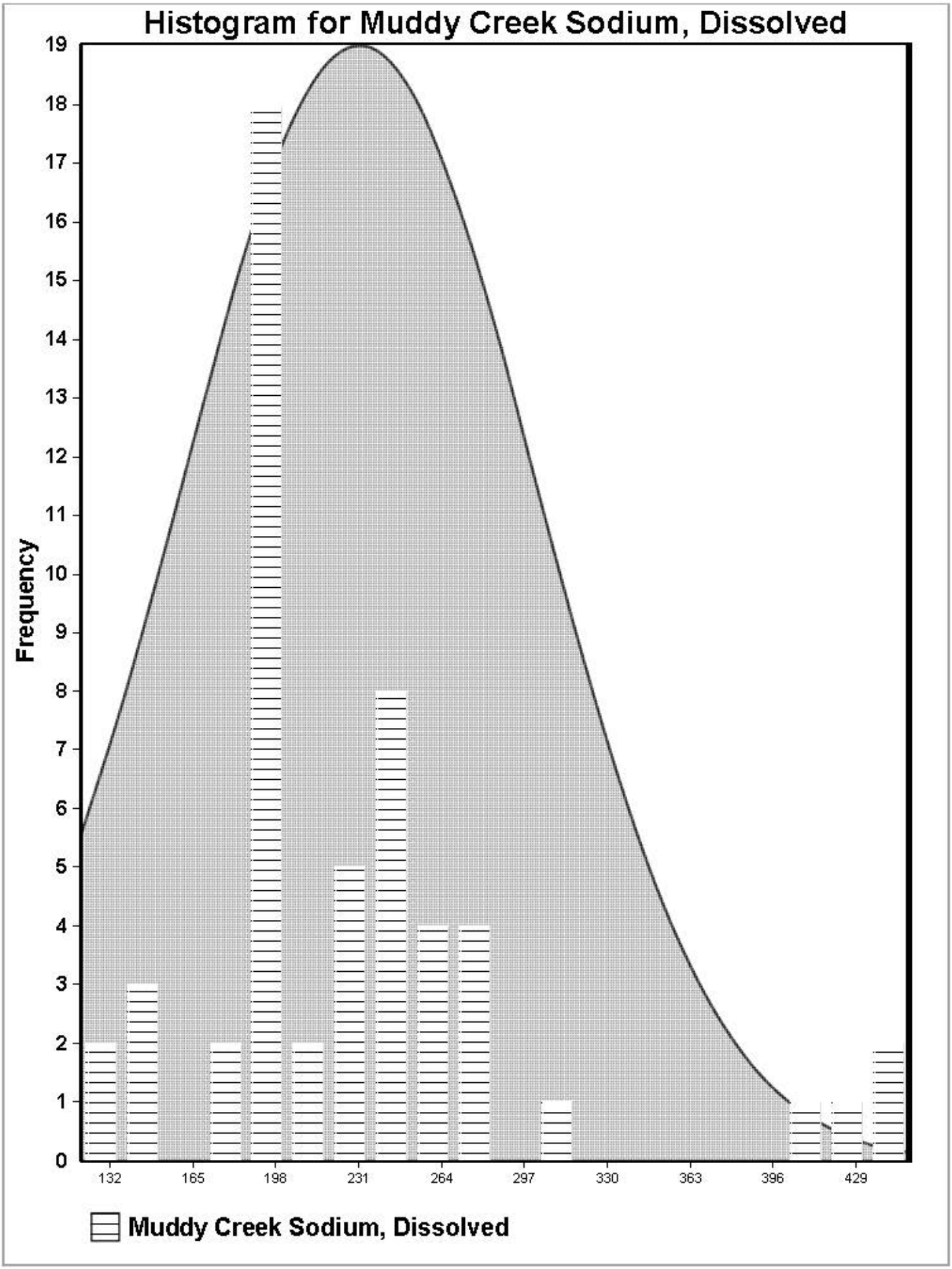
Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Sodium, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
198
264
330
395
461
527
593
659
725
791
Alluv Sodium, Dissolved


Histogram for Mesa Sodium, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
107
213
320
426
533
639
746
Mesa Sodium, Dissolved


Histogram for Muddy Creek Sodium, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
132
165
198
231
264
297
330
363
396
429
Muddy Creek Sodium, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Sodium_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for Alluv Sodium, Dissolved

Mean	472
Standard Deviation	117.9
Number of data	87
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	472	117.3	840	26	3.138	3.338	3.705

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Sodium, Dissolved

Mean	230.9
Standard Deviation	70.63
Number of data	53
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	230.9	69.96	450	9	3.131	3.151	3.504

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Sodium, Dissolved

Mean	411.4
Standard Deviation	166.5
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	411.4	165.6	810	17	2.407	3.38	3.75

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Location Name	Sample Date	Alluv Sodium, Dissolved
BG-1S	11/26/2012	410
BG-1S	8/23/2012	340
BG-1S	5/24/2012	360
BG-1S	3/20/2012	330
IMW-2.5D	11/26/2012	540
IMW-2.5D	8/24/2012	470
IMW-2.5D	5/21/2012	470
IMW-2.5D	3/21/2012	510
IMW-2.5D	12/8/2011	510
IMW-2.5D	6/6/2011	388
IMW-2.5D	12/15/2010	203
IMW-2.5D	6/9/2010	210
IMW-2.5D	12/12/2009	190
IMW-2.5S	11/26/2012	640
IMW-2.5S	8/24/2012	540
IMW-2.5S	5/21/2012	570
IMW-2.5S	3/21/2012	660
IMW-2.5S	12/8/2011	610
IMW-2.5S	9/9/2011	580
IMW-2.5S	6/6/2011	486
IMW-2.5S	3/7/2011	620
IMW-2.5S	12/15/2010	626
IMW-2.5S	9/20/2010	666
IMW-2.5S	6/9/2010	710
IMW-2.5S	3/9/2010	740
IMW-2.5S	12/12/2009	840
IMW-2.5S	9/21/2009	720
IMW-3S	5/21/2012	330
IMW-3S	3/20/2012	330
IMW-3S	12/9/2011	340
IMW-3S	9/9/2011	360
IMW-3S	6/7/2011	181
IMW-3S	3/7/2011	343
IMW-3S	12/10/2010	335
IMW-3S	9/16/2010	355
IMW-3S	6/8/2010	360
IMW-3S	3/9/2010	370
IMW-3S	12/10/2009	370
IMW-3S	9/14/2009	350
IMW-3S	6/9/2009	370
IMW-3S	3/3/2009	400
IMW-3S	12/9/2008	400
IMW-3S	9/9/2008	410
IMW-3S	6/3/2008	460
IMW-3S	3/4/2008	410
KMW-2D	11/26/2012	580
KMW-2D	8/24/2012	480
KMW-2D	5/21/2012	510
KMW-2D	3/23/2012	520
KMW-2D	12/8/2011	520
KMW-2D	6/6/2011	379
KMW-2D	12/13/2010	477
KMW-2D	6/8/2010	520
KMW-2D	12/8/2009	420
KMW-2D	12/10/2008	500
KMW-2D	6/3/2008	500
KMW-2M	11/26/2012	560
KMW-2M	8/24/2012	470
KMW-2M	5/21/2012	500
KMW-2M	3/23/2012	520
KMW-2M	12/8/2011	520
KMW-2M	6/6/2011	433
KMW-2M	12/13/2010	483
KMW-2M	6/8/2010	500
KMW-2M	12/8/2009	450
KMW-2M	12/10/2008	530
KMW-2M	6/3/2008	520
KMW-2S	11/26/2012	570
KMW-2S	8/24/2012	450
KMW-2S	5/21/2012	450
KMW-2S	3/23/2012	480
KMW-2S	12/8/2011	490
KMW-2S	9/9/2011	500
KMW-2S	6/6/2011	399
KMW-2S	3/8/2011	453
KMW-2S	12/13/2010	459
KMW-2S	9/15/2010	479
KMW-2S	6/8/2010	490
KMW-2S	3/9/2010	470
KMW-2S	12/8/2009	400
KMW-2S	9/16/2009	440
KMW-2S	6/10/2009	510
KMW-2S	3/3/2009	540
KMW-2S	12/10/2008	560
KMW-2S	9/8/2008	520
KMW-2S	6/3/2008	580
KMW-2S	3/4/2008	520

Location Name	Sample Date	Muddy Creek Sodium, Dissolved
BG-3S	11/27/2012	190
BG-3S	8/22/2012	190
BG-3S	5/23/2012	180
BG-3S	3/21/2012	190
BG-4S	11/27/2012	220
BG-4S	8/30/2012	230
BG-4S	5/30/2012	230
BG-4S	3/20/2012	220
BG-6S	11/27/2012	450
BG-6S	8/23/2012	420
BG-6S	5/25/2012	410
BG-6S	3/21/2012	450
BG-1M	11/26/2012	280
BG-1M	8/23/2012	240
BG-1M	5/24/2012	250
BG-1M	3/20/2012	240
BG-3M	11/27/2012	260
BG-3M	8/22/2012	200
BG-3M	5/24/2012	240
BG-3M	3/21/2012	170
BG-4M	11/27/2012	190
BG-4M	8/30/2012	200
BG-4M	5/30/2012	190
BG-4M	3/20/2012	200
BG-6M	11/27/2012	190
BG-6M	8/22/2012	200
BG-6M	5/25/2012	150
BG-6M	3/21/2012	200
BG-1D	11/26/2012	270
BG-1D	8/23/2012	220
BG-1D	5/24/2012	200
BG-1D	3/20/2012	210
BG-3D	11/27/2012	250
BG-3D	8/21/2012	250
BG-3D	5/23/2012	150
BG-3D	3/21/2012	140
BG-4D	11/27/2012	200
BG-4D	8/30/2012	190
BG-4D	5/30/2012	190
BG-4D	3/20/2012	190
BG-6D	11/27/2012	200
BG-6D	8/22/2012	200
BG-6D	5/25/2012	130
BG-6D	3/21/2012	120
IMW-3D	5/25/2012	260
IMW-3D	3/22/2012	250
IMW-3D	12/9/2011	260
IMW-3D	6/7/2011	204
IMW-3D	12/10/2010	256
IMW-3D	6/8/2010	280
IMW-3D	12/10/2009	250
IMW-3D	12/9/2008	280
IMW-3D	6/3/2008	310

Location Name	Sample Date	Mesa Sodium, Dissolved
BG-2S	11/26/2012	400
BG-2S	8/23/2012	400
BG-2S	5/24/2012	400
BG-2S	3/21/2012	420
BG-2M	11/26/2012	200
BG-2M	8/23/2012	140
BG-2M	5/24/2012	170
BG-2M	3/21/2012	160
BG-2D	11/26/2012	120
BG-2D	8/23/2012	100
BG-2D	5/24/2012	100
BG-2D	3/21/2012	100
LMW-10	11/28/2012	720
LMW-10	8/27/2012	770
LMW-10	5/30/2012	790
LMW-10	3/22/2012	780
LMW-10	12/6/2011	810
LMW-10	9/8/2011	680
LMW-10	6/8/2011	651
LMW-10	3/2/2011	615
LMW-10	12/9/2010	684
LMW-10	9/21/2010	601
LMW-10	6/9/2010	610
LMW-10	3/11/2010	550
LMW-10	12/11/2009	810
LMW-10	9/18/2009	630
LMW-10	6/10/2009	620
LMW-10	3/5/2009	760
LMW-10	12/12/2008	620
LMW-10	9/10/2008	590
LMW-10	6/4/2008	650
LMW-10	3/5/2008	650
LMW-11R	11/26/2012	560
LMW-11R	8/21/2012	480
LMW-11R	5/29/2012	480
LMW-11R	3/23/2012	480
LMW-7	11/28/2012	340
LMW-7	8/27/2012	340
LMW-7	5/31/2012	330
LMW-7	3/23/2012	330
LMW-7	12/5/2011	330
LMW-7	9/6/2011	310
LMW-7	6/9/2011	271
LMW-7	3/9/2011	282
LMW-7	12/10/2010	304
LMW-7	9/21/2010	403
LMW-7	6/9/2010	310
LMW-7	3/11/2010	290
LMW-7	12/11/2009	320
LMW-7	9/18/2009	490
LMW-7	6/10/2009	340
LMW-7	3/5/2009	380
LMW-7	12/12/2008	320
LMW-7	9/10/2008	350
LMW-7	6/4/2008	360
LMW-7	3/5/2008	360
LMW-9	11/28/2012	390
LMW-9	8/27/2012	400
LMW-9	5/31/2012	370
LMW-9	3/23/2012	390
LMW-9	12/5/2011	410
LMW-9	9/8/2011	360
LMW-9	6/8/2011	367
LMW-9	3/9/2011	355
LMW-9	12/10/2010	360
LMW-9	9/21/2010	379
LMW-9	6/9/2010	380
LMW-9	3/11/2010	370
LMW-9	12/11/2009	400
LMW-9	9/18/2009	410
LMW-9	6/10/2009	440
LMW-9	3/5/2009	460
LMW-9	12/12/2008	420
LMW-9	9/10/2008	440
LMW-9	6/4/2008	460
LMW-9	3/5/2008	420
LMW-11	2/22/2012	520
LMW-11	12/6/2011	560
LMW-11	9/8/2011	480
LMW-11	3/2/2011	444
LMW-12R	11/30/2012	410
LMW-12R	10/22/2012	390
LMW-12R	8/21/2012	380
LMW-12R	5/30/2012	360
LMW-13R	11/28/2012	270
LMW-13R	10/22/2012	260
LMW-13R	8/20/2012	230
LMW-13R	5/29/2012	230
LMW-14R	11/30/2012	260
LMW-14R	10/22/2012	260
LMW-14R	8/20/2012	240
LMW-14R	5/29/2012	240
LMW-15	11/28/2012	280
LMW-15	10/22/2012	270
LMW-15	8/20/2012	250
LMW-15	5/29/2012	250
LMW-16	11/28/2012	390
LMW-16	10/22/2012	370
LMW-16	8/20/2012	340
LMW-16	5/29/2012	410

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Sulfate

Raw Statistics	
Number of Valid Observations	87
Number of Distinct Observations	35
Minimum	310
Maximum	1600
Mean of Raw Data	1068
Standard Deviation of Raw Data	254.7
Kstar	13.29
Mean of Log Transformed Data	6.937
Standard Deviation of Log Transformed Data	0.297

Normal Distribution Test Results	
Correlation Coefficient R	0.959
Approximate Shapiro Wilk Test Statistic	0.917
Approximate Shapiro Wilk P Value	5.7326E-6
Lilliefors Test Statistic	0.192
Lilliefors Critical (0.95) Value	0.095

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.931
A-D Test Statistic	3.972
A-D Critical (0.95) Value	0.751
K-S Test Statistic	0.211
K-S Critical(0.95) Value	0.0957

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.896
Approximate Shapiro Wilk Test Statistic	0.811
Approximate Shapiro Wilk P Value	3.331E-16
Lilliefors Test Statistic	0.221
Lilliefors Critical (0.95) Value	0.095

Data not Lognormal at (0.05) Significance Level

Muddy Cree Sulfate

Raw Statistics	
Number of Valid Observations	53
Number of Distinct Observations	31
Minimum	390

Maximum	1300
Mean of Raw Data	730.1
Standard Deviation of Raw Data	197.1
Kstar	13.86
Mean of Log Transformed Data	6.559
Standard Deviation of Log Transformed Data	0.265

Normal Distribution Test Results

Correlation Coefficient R	0.963
Approximate Shapiro Wilk Test Statistic	0.924
Approximate Shapiro Wilk P Value	0.0026
Lilliefors Test Statistic	0.143
Lilliefors Critical (0.95) Value	0.122

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.977
A-D Test Statistic	0.759
A-D Critical (0.95) Value	0.749
K-S Test Statistic	0.109
K-S Critical(0.95) Value	0.122

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.983
Approximate Shapiro Wilk Test Statistic	0.961
Approximate Shapiro Wilk P Value	0.15
Lilliefors Test Statistic	0.118
Lilliefors Critical (0.95) Value	0.122

Data appear Lognormal at (0.05) Significance Level

Mesa Sulfate

Raw Statistics

Number of Valid Observations	100
Number of Distinct Observations	27
Minimum	990
Maximum	2900
Mean of Raw Data	1759
Standard Deviation of Raw Data	459.8
Kstar	14.44
Mean of Log Transformed Data	7.439
Standard Deviation of Log Transformed Data	0.263

Normal Distribution Test Results

Correlation Coefficient R	0.98
Approximate Shapiro Wilk Test Statistic	0.941
Approximate Shapiro Wilk P Value	3.2619E-4
Lilliefors Test Statistic	0.136

Lilliefors Critical (0.95) Value	0.0886
Data not Normal at (0.05) Significance Level	
Gamma Distribution Test Results	
Correlation Coefficient R	0.987
A-D Test Statistic	1.2
A-D Critical (0.95) Value	0.751
K-S Test Statistic	0.129
K-S Critical(0.95) Value	0.0893
Data not Gamma Distributed at (0.05) Significance Level	
Lognormal Distribution Test Results	
Correlation Coefficient R	0.986
Approximate Shapiro Wilk Test Statistic	0.95
Approximate Shapiro Wilk P Value	0.00256
Lilliefors Test Statistic	0.121
Lilliefors Critical (0.95) Value	0.0886
Data not Lognormal at (0.05) Significance Level	

General Background Statistics for Full Data Sets

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Sulfate

General Statistics

Total Number of Observations	87	Number of Distinct Observations	35

Raw Statistics		Log-Transformed Statistics	
Minimum	310	Minimum	5.737
Maximum	1600	Maximum	7.378
Second Largest	1600	Second Largest	7.378
First Quartile	855	First Quartile	6.751
Median	1120	Median	7.021
Third Quartile	1200	Third Quartile	7.09
Mean	1068	Mean	6.937
SD	254.7	SD	0.297
Coefficient of Variation	0.239		
Skewness	-0.767		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.192	Lilliefors Test Statistic	0.221
Lilliefors Critical Value	0.095	Lilliefors Critical Value	0.095
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	1564	95% UTL with 95% Coverage	1833
95% UPL (t)	1494	95% UPL (t)	1690
90% Percentile (z)	1394	90% Percentile (z)	1505
95% Percentile (z)	1487	95% Percentile (z)	1677
99% Percentile (z)	1661	99% Percentile (z)	2052

Gamma Distribution Test		Data Distribution Test
k star	13.29	Data do not follow a Discernable Distribution (0.05)
Theta Star	80.37	
MLE of Mean	1068	
MLE of Standard Deviation	293	
nu star	2312	
A-D Test Statistic	3.972	Nonparametric Statistics
5% A-D Critical Value	0.751	90% Percentile 1300
K-S Test Statistic	0.211	95% Percentile 1400
5% K-S Critical Value	0.0957	99% Percentile 1600
Data not Gamma Distributed at 5% Significance Level		

Assuming Gamma Distribution		95% UTL with 95% Coverage	1400
90% Percentile	1456	95% Percentile Bootstrap UTL with 95% Coverage	1540
95% Percentile	1591	95% BCA Bootstrap UTL with 95% Coverage	1400
99% Percentile	1865	95% UPL	1400
		95% Chebyshev UPL	2185
95% WH Approx. Gamma UPL	1595	Upper Threshold Limit Based upon IQR	1718
95% HW Approx. Gamma UPL	1615		
95% WH Approx. Gamma UTL with 95% Coverage	1700		
95% HW Approx. Gamma UTL with 95% Coverage	1727		

Muddy Cree Sulfate

General Statistics			
Total Number of Observations	53	Number of Distinct Observations	31
Raw Statistics		Log-Transformed Statistics	
Minimum	390	Minimum	5.966
Maximum	1300	Maximum	7.17
Second Largest	1200	Second Largest	7.09
First Quartile	630	First Quartile	6.446
Median	710	Median	6.565
Third Quartile	820	Third Quartile	6.709
Mean	730.1	Mean	6.559
SD	197.1	SD	0.265
Coefficient of Variation	0.27		
Skewness	0.879		

Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.143	Lilliefors Test Statistic	0.118
Lilliefors Critical Value	0.122	Lilliefors Critical Value	0.122
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	1133	95% UTL with 95% Coverage	1213
95% UPL (t)	1063	95% UPL (t)	1104
90% Percentile (z)	982.7	90% Percentile (z)	990.8
95% Percentile (z)	1054	95% Percentile (z)	1091
99% Percentile (z)	1189	99% Percentile (z)	1307
Gamma Distribution Test		Data Distribution Test	
k star	13.86	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	52.68		
MLE of Mean	730.1		
MLE of Standard Deviation	196.1		
nu star	1469		
A-D Test Statistic	0.759	Nonparametric Statistics	
5% A-D Critical Value	0.749	90% Percentile	920
K-S Test Statistic	0.109	95% Percentile	1200
5% K-S Critical Value	0.122	99% Percentile	1248

Data follow Appx. Gamma Distribution at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	1200
90% Percentile	990	95% Percentile Bootstrap UTL with 95% Coverage	1240
95% Percentile	1080	95% BCA Bootstrap UTL with 95% Coverage	1200
99% Percentile	1262	95% UPL	1200
		95% Chebyshev UPL	1597
95% WH Approx. Gamma UPL	1084	Upper Threshold Limit Based upon IQR	1105
95% HW Approx. Gamma UPL	1088		
95% WH Approx. Gamma UTL with 95% Coverage	1175		
95% HW Approx. Gamma UTL with 95% Coverage	1183		

Mesa Sulfate

General Statistics			
Total Number of Observations	100	Number of Distinct Observations	27
Raw Statistics		Log-Transformed Statistics	
Minimum	990	Minimum	6.898
Maximum	2900	Maximum	7.972
Second Largest	2800	Second Largest	7.937
First Quartile	1338	First Quartile	7.198
Median	1800	Median	7.496
Third Quartile	2000	Third Quartile	7.601
Mean	1759	Mean	7.439
SD	459.8	SD	0.263
Coefficient of Variation	0.261		
Skewness	0.428		
Background Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.136	Lilliefors Test Statistic	0.121
Lilliefors Critical Value	0.0886	Lilliefors Critical Value	0.0886
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	2644	95% UTL with 95% Coverage	2823
95% UPL (t)	2526	95% UPL (t)	2639
90% Percentile (z)	2348	90% Percentile (z)	2383
95% Percentile (z)	2515	95% Percentile (z)	2623
99% Percentile (z)	2829	99% Percentile (z)	3139
Gamma Distribution Test		Data Distribution Test	
k star	14.44	Data do not follow a Discernable Distribution (0.05)	
Theta Star	121.8		
MLE of Mean	1759		
MLE of Standard Deviation	462.9		
nu star	2888		
A-D Test Statistic	1.2	Nonparametric Statistics	
5% A-D Critical Value	0.751	90% Percentile	2410

K-S Test Statistic	0.129	95% Percentile	2600
5% K-S Critical Value	0.0893	99% Percentile	2801
Data not Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	2800
90% Percentile	2372	95% Percentile Bootstrap UTL with 95% Coverage	2800
95% Percentile	2583	95% BCA Bootstrap UTL with 95% Coverage	2600
99% Percentile	3011	95% UPL	2600
		95% Chebyshev UPL	3773
95% WH Approx. Gamma UPL	2589	Upper Threshold Limit Based upon IQR	2994
95% HW Approx. Gamma UPL	2600		
95% WH Approx. Gamma UTL with 95% Coverage	2743		
95% HW Approx. Gamma UTL with 95% Coverage	2761		

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Sulfate

Background Data: Muddy Cree Sulfate

Raw Statistics

	Site	Background
Number of Valid Observations	100	53
Number of Distinct Observations	27	31
Minimum	990	390
Maximum	2900	1300
Mean	1759	730.1
Median	1800	710
SD	459.8	197.1
SE of Mean	45.98	27.07

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	10308
WMW Test U-Stat	9.996
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Cree Sulfate

Background Data: Alluv Sulfate

Raw Statistics

	Site	Background
Number of Valid Observations	53	87
Number of Distinct Observations	31	35
Minimum	390	310
Maximum	1300	1600
Mean	730.1	1068
Median	710	1120
SD	197.1	254.7
SE of Mean	27.07	27.31

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	2116
WMW Test U-Stat	6.962
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	3.255E-12

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Sulfate

Background Data: Alluv Sulfate

Raw Statistics

	Site	Background
Number of Valid Observations	100	87
Number of Distinct Observations	27	35
Minimum	990	310
Maximum	2900	1600
Mean	1759	1068
Median	1800	1120
SD	459.8	254.7
SE of Mean	45.98	27.31

Wilcoxon-Mann-Whitney (WMW) Test

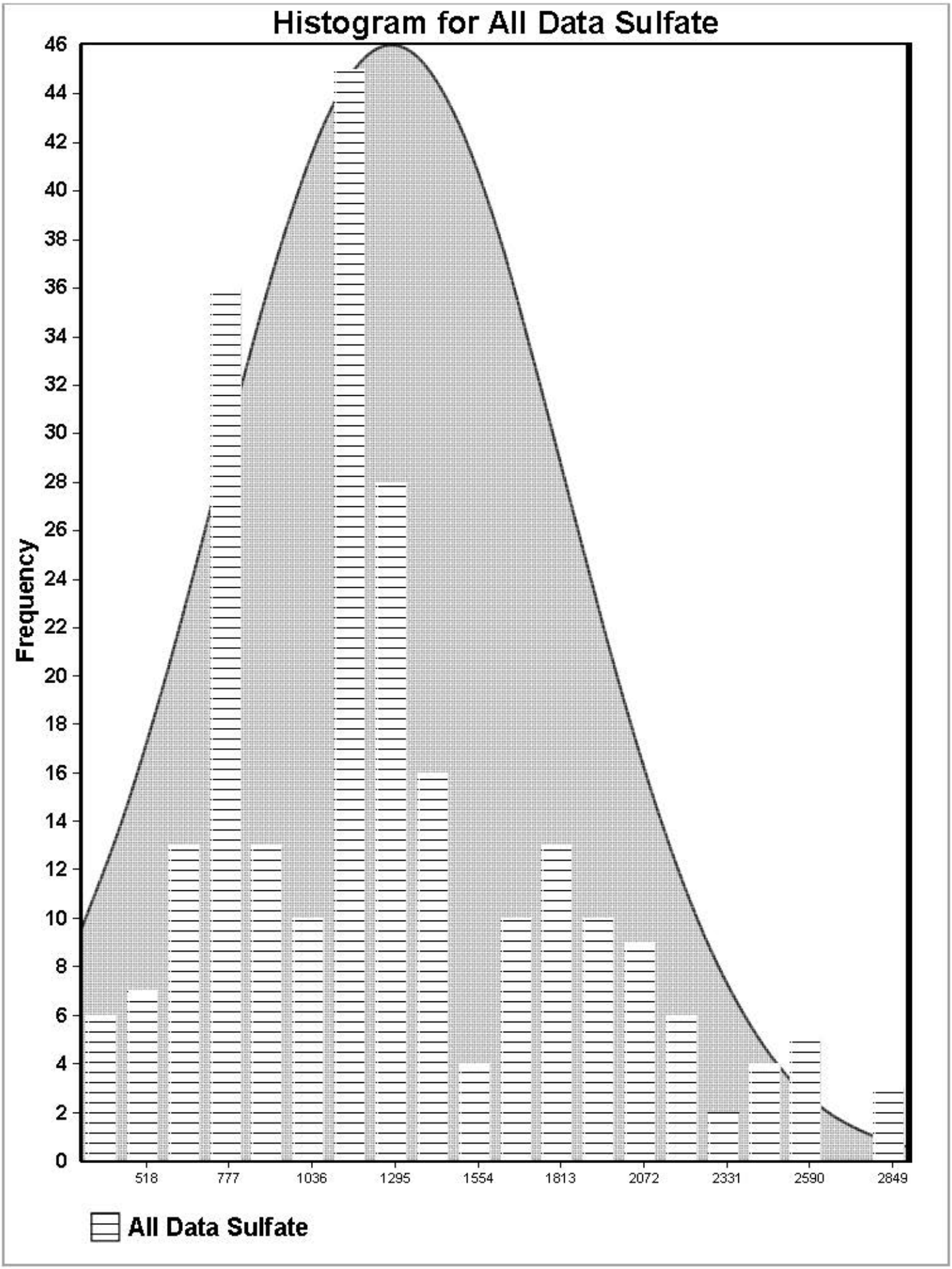
H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	13060
WMW Test U-Stat	9.911
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for All Data Sulfate
Frequency
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
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46
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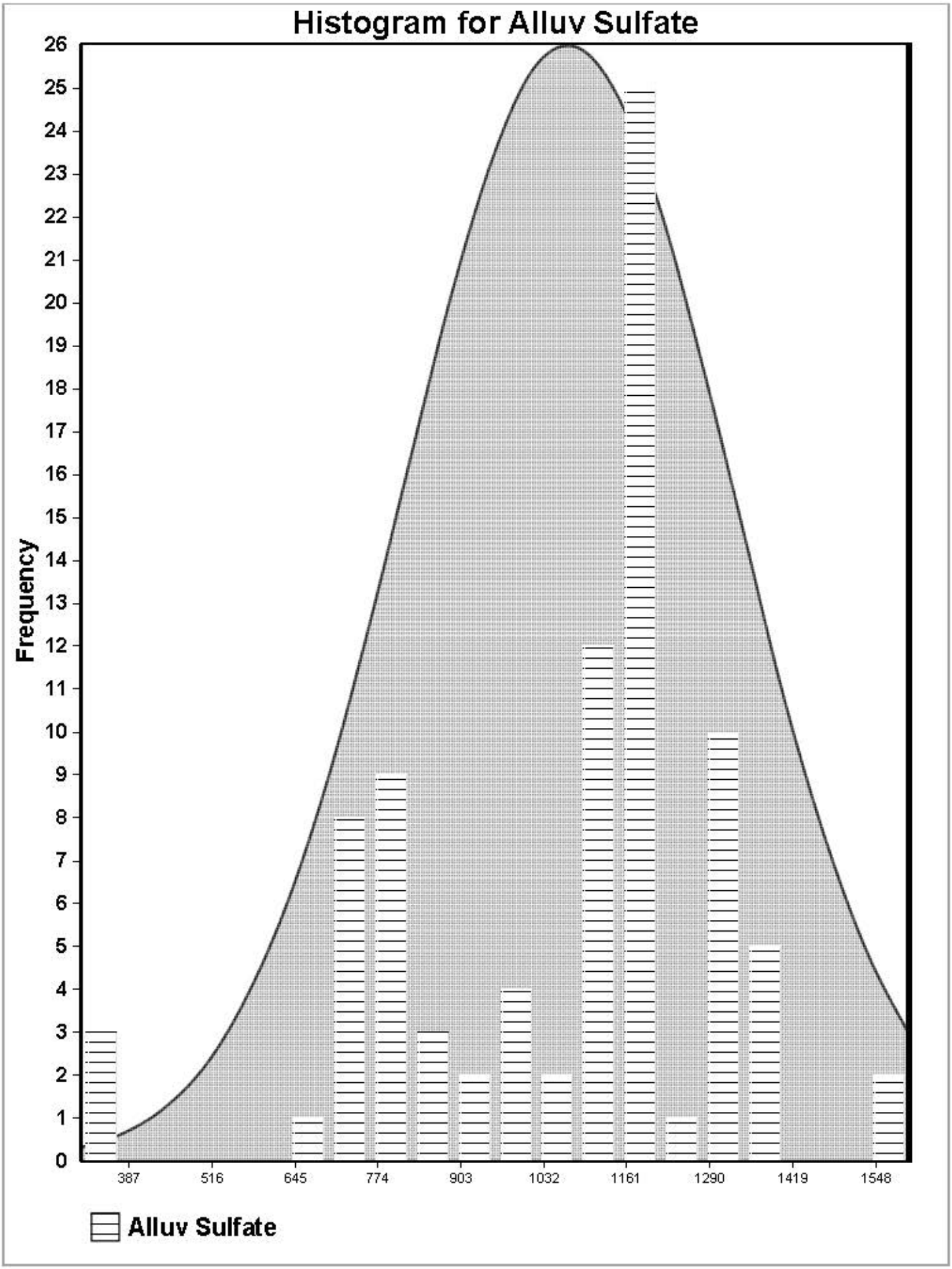
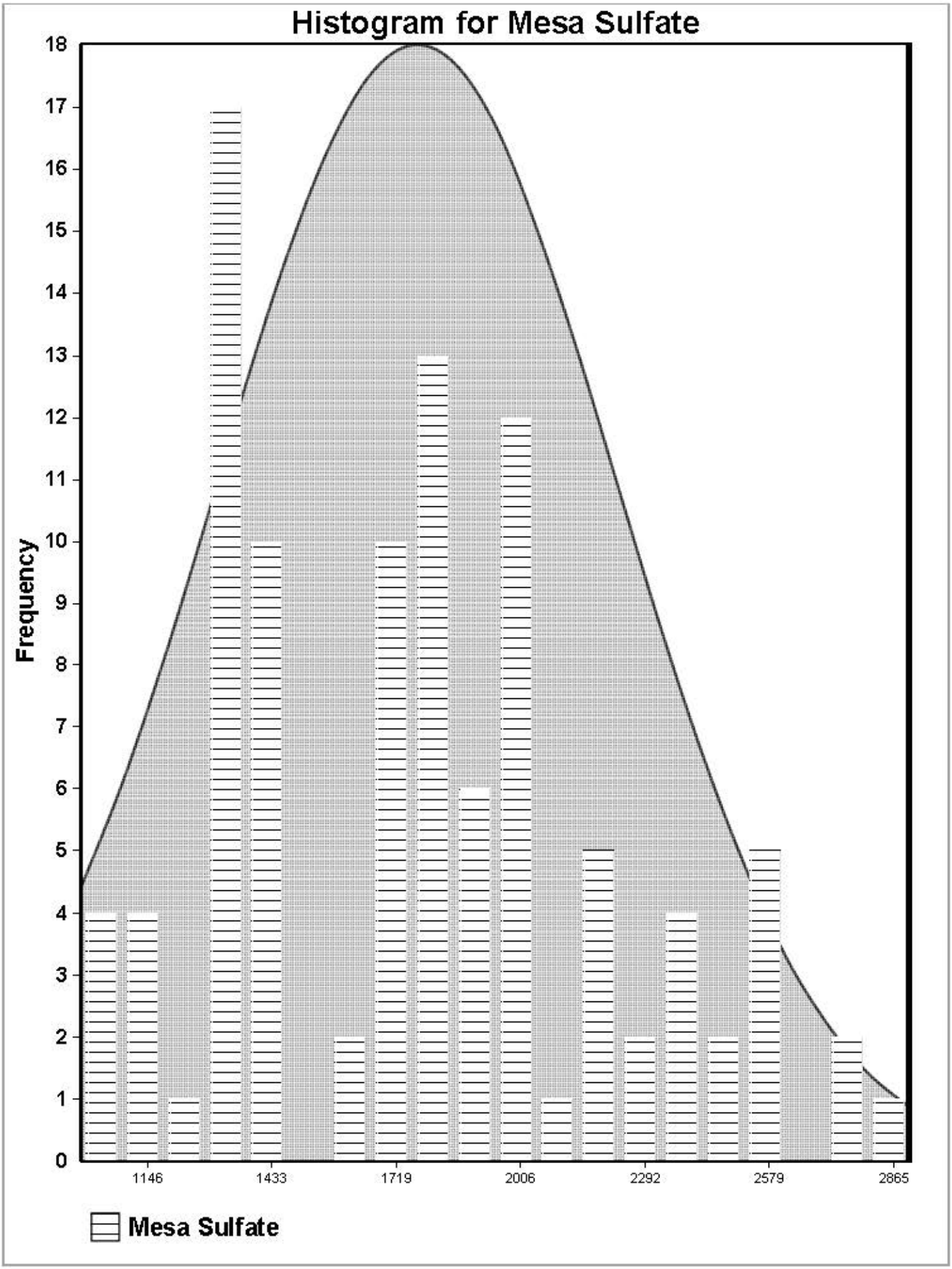
1036
1295
1554
1813
2072
2331
2590
2849
All Data Sulfate


Histogram for Alluv Sulfate
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
387
516
645
774
903
1032
1161
1290
1419
1548
Alluv Sulfate


Histogram for Mesa Sulfate
Frequency
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1
2
3
4
5
6
7
8
9
10
11
12
13
14
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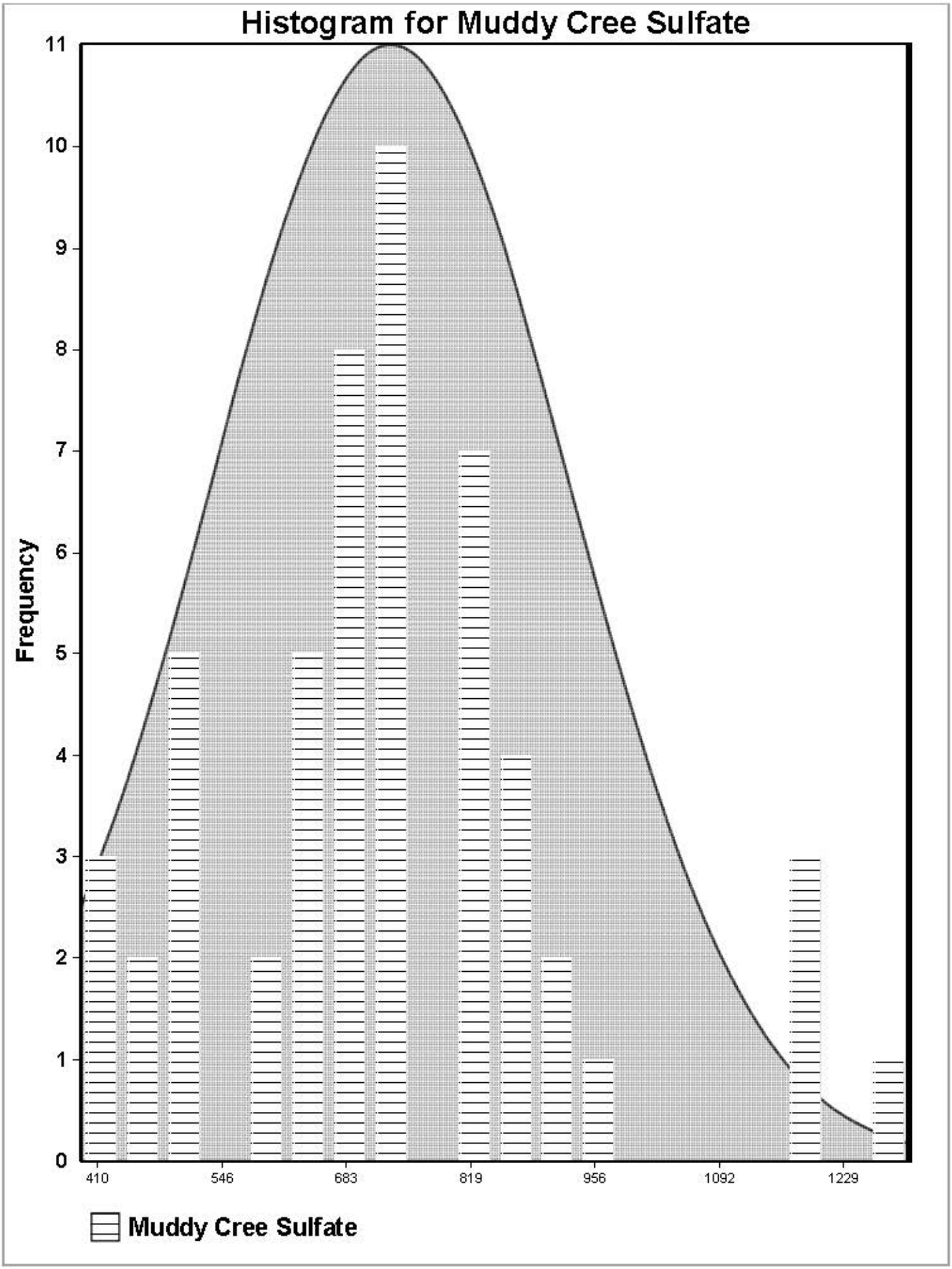
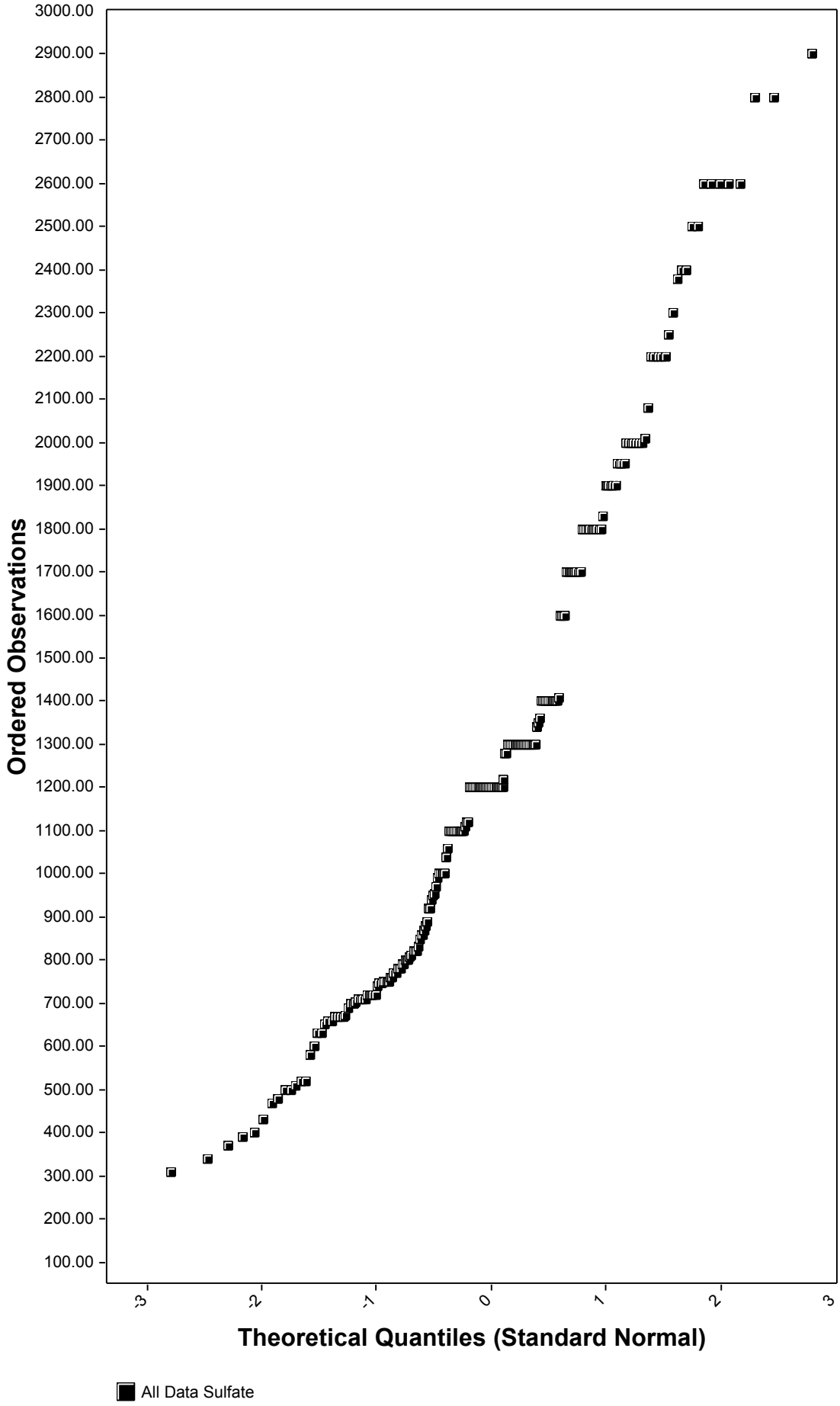
1719
2006
2292
2579
2865
Mesa Sulfate


Histogram for Muddy Cree Sulfate
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
410
546
683
819
956
1092
1229
Muddy Cree Sulfate

Q-Q Plot for All Data Sulfate



All Data Sulfate

N = 240

Mean = 1281.3458

Sd = 546.7025

Slope = 536.4302

Intercept = 1281.3458

Correlation, R = 0.9760

Outlier Tests for Selected Variables

User Selected Options	
From File	Sulfate.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for Alluv Sulfate

Mean	1068
Standard Deviation	254.7
Number of data	87
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1068	253.3	310	13	2.993	3.338	3.705

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Cree Sulfate

Mean	730.1
Standard Deviation	197.1
Number of data	53
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	730.1	195.2	1300	9	2.919	3.151	3.504

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Sulfate

Mean	1759
Standard Deviation	459.8
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1759	457.5	2900	4	2.494	3.38	3.75

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Location Name	Sample Date	Alluv Sulfate
BG-1S	11/26/2012	850
BG-1S	8/23/2012	790
BG-1S	5/24/2012	880
BG-1S	3/20/2012	950
IMW-2.5D	11/26/2012	1100
IMW-2.5D	8/24/2012	1000
IMW-2.5D	5/21/2012	1100
IMW-2.5D	3/21/2012	1000
IMW-2.5D	12/8/2011	1100
IMW-2.5D	6/6/2011	972
IMW-2.5D	12/15/2010	369
IMW-2.5D	6/9/2010	340
IMW-2.5D	12/12/2009	310
IMW-2.5S	11/26/2012	1200
IMW-2.5S	8/24/2012	1200
IMW-2.5S	5/21/2012	1200
IMW-2.5S	3/21/2012	1200
IMW-2.5S	12/8/2011	1100
IMW-2.5S	9/9/2011	1200
IMW-2.5S	6/6/2011	1040
IMW-2.5S	3/7/2011	1280
IMW-2.5S	12/15/2010	1280
IMW-2.5S	9/20/2010	1200
IMW-2.5S	6/9/2010	1400
IMW-2.5S	3/9/2010	1400
IMW-2.5S	12/12/2009	1600
IMW-2.5S	9/21/2009	1600
IMW-3S	5/21/2012	740
IMW-3S	3/20/2012	800
IMW-3S	12/9/2011	750
IMW-3S	9/9/2011	760
IMW-3S	6/7/2011	673
IMW-3S	3/7/2011	808
IMW-3S	12/10/2010	748
IMW-3S	9/16/2010	745
IMW-3S	6/8/2010	780
IMW-3S	3/9/2010	750
IMW-3S	12/10/2009	770
IMW-3S	9/14/2009	790
IMW-3S	6/9/2009	760
IMW-3S	3/3/2009	770
IMW-3S	12/9/2008	780
IMW-3S	9/9/2008	780
IMW-3S	6/3/2008	860
IMW-3S	3/4/2008	720
KMW-2D	11/26/2012	1200
KMW-2D	8/24/2012	1200
KMW-2D	5/21/2012	1200
KMW-2D	3/23/2012	1200
KMW-2D	12/8/2011	1200
KMW-2D	6/6/2011	954
KMW-2D	12/13/2010	1110
KMW-2D	6/8/2010	1100
KMW-2D	12/8/2009	1100
KMW-2D	12/10/2008	1100
KMW-2D	6/3/2008	1000
KMW-2M	11/26/2012	1300
KMW-2M	8/24/2012	1200
KMW-2M	5/21/2012	1300
KMW-2M	3/23/2012	1400
KMW-2M	12/8/2011	1200
KMW-2M	6/6/2011	1120
KMW-2M	12/13/2010	1400
KMW-2M	6/8/2010	1200
KMW-2M	12/8/2009	1200
KMW-2M	12/10/2008	1100
KMW-2M	6/3/2008	1100
KMW-2S	11/26/2012	1300
KMW-2S	8/24/2012	1200
KMW-2S	5/21/2012	1300
KMW-2S	3/23/2012	1300
KMW-2S	12/8/2011	1200
KMW-2S	9/9/2011	1300
KMW-2S	6/6/2011	1060
KMW-2S	3/8/2011	1340
KMW-2S	12/13/2010	1360
KMW-2S	9/15/2010	1220
KMW-2S	6/8/2010	1200
KMW-2S	3/9/2010	1200

Location Name	Sample Date	Muddy Creek Sulfate
BG-3S	11/27/2012	580
BG-3S	8/22/2012	510
BG-3S	5/23/2012	520
BG-3S	3/21/2012	500
BG-4S	11/27/2012	920
BG-4S	8/30/2012	800
BG-4S	5/30/2012	820
BG-4S	3/20/2012	870
BG-6S	11/27/2012	1300
BG-6S	8/23/2012	1200
BG-6S	5/25/2012	1200
BG-6S	3/21/2012	1200
BG-1M	11/26/2012	630
BG-1M	8/23/2012	700
BG-1M	5/24/2012	630
BG-1M	3/20/2012	670
BG-3M	11/27/2012	600
BG-3M	8/22/2012	470
BG-3M	5/24/2012	500
BG-3M	3/21/2012	520
BG-4M	11/27/2012	870
BG-4M	8/30/2012	750
BG-4M	5/30/2012	800
BG-4M	3/20/2012	820
BG-6M	11/27/2012	920
BG-6M	8/22/2012	750
BG-6M	5/25/2012	810
BG-6M	3/21/2012	820
BG-1D	11/26/2012	670
BG-1D	8/23/2012	650
BG-1D	5/24/2012	660
BG-1D	3/20/2012	710
BG-3D	11/27/2012	480
BG-3D	8/21/2012	390
BG-3D	5/23/2012	400
BG-3D	3/21/2012	430
BG-4D	11/27/2012	720
BG-4D	8/30/2012	670
BG-4D	5/30/2012	670
BG-4D	3/20/2012	720
BG-6D	11/27/2012	940
BG-6D	8/22/2012	830
BG-6D	5/25/2012	860
BG-6D	3/21/2012	890
IMW-3D	5/25/2012	720
IMW-3D	3/22/2012	720
IMW-3D	12/9/2011	710
IMW-3D	6/7/2011	660
IMW-3D	12/10/2010	704
IMW-3D	6/8/2010	710
IMW-3D	12/10/2009	710
IMW-3D	12/9/2008	700
IMW-3D	6/3/2008	690

Location Name	Sample Date	Mesa Sulfate
BG-2S	11/26/2012	2600
BG-2S	8/23/2012	2600
BG-2S	5/24/2012	2600
BG-2S	3/21/2012	2900
BG-2M	11/26/2012	1200
BG-2M	8/23/2012	1000
BG-2M	5/24/2012	1100
BG-2M	3/21/2012	1100
BG-2D	11/26/2012	1000
BG-2D	8/23/2012	990
BG-2D	5/24/2012	1000
BG-2D	3/21/2012	1100
LMW-10	11/28/2012	2200
LMW-10	8/27/2012	2200
LMW-10	5/30/2012	2300
LMW-10	3/22/2012	2200
LMW-10	12/6/2011	2200
LMW-10	9/8/2011	2400
LMW-10	6/8/2011	2010
LMW-10	3/2/2011	2080
LMW-10	12/9/2010	2380
LMW-10	9/21/2010	1950
LMW-10	6/9/2010	2000
LMW-10	3/11/2010	1800
LMW-10	12/11/2009	2200
LMW-10	9/18/2009	1900
LMW-10	6/10/2009	2000
LMW-10	3/5/2009	2000
LMW-10	12/12/2008	2000
LMW-10	9/10/2008	2000
LMW-10	6/4/2008	1900
LMW-10	3/5/2008	1800
LMW-11R	11/26/2012	2600
LMW-11R	8/21/2012	2600
LMW-11R	5/29/2012	2800
LMW-11R	3/23/2012	2800
LMW-7	11/28/2012	1300
LMW-7	8/27/2012	1300
LMW-7	5/31/2012	1300
LMW-7	3/23/2012	1300
LMW-7	12/5/2011	1300
LMW-7	9/6/2011	1300
LMW-7	6/9/2011	1350
LMW-7	3/9/2011	1410
LMW-7	12/10/2010	1400
LMW-7	9/21/2010	1120
LMW-7	6/9/2010	1300
LMW-7	3/11/2010	1300
LMW-7	12/11/2009	1400
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LMW-7	9/10/2008	1400
LMW-7	6/4/2008	1400
LMW-7	3/5/2008	1300
LMW-9	11/28/2012	1800
LMW-9	8/27/2012	1800
LMW-9	5/31/2012	1900
LMW-9	3/23/2012	1900
LMW-9	12/5/2011	1800
LMW-9	9/8/2011	1900
LMW-9	6/8/2011	1950
LMW-9	3/9/2011	1950
LMW-9	12/10/2010	1950
LMW-9	9/21/2010	1830
LMW-9	6/9/2010	1800
LMW-9	3/11/2010	1700
LMW-9	12/11/2009	2000
LMW-9	9/18/2009	1800
LMW-9	6/10/2009	1800
LMW-9	3/5/2009	1800
LMW-9	12/12/2008	1800
LMW-9	9/10/2008	2000
LMW-9	6/4/2008	1800
LMW-9	3/5/2008	1700
LMW-11	2/22/2012	2500
LMW-11	12/6/2011	2400
LMW-11	9/8/2011	2500

Location Name	Sample Date	All Data Sulfate
BG-1S	11/26/2012	850
BG-1S	8/23/2012	790
BG-1S	5/24/2012	880
BG-1S	3/20/2012	950
IMW-2.5D	11/26/2012	1100
IMW-2.5D	8/24/2012	1000
IMW-2.5D	5/21/2012	1100
IMW-2.5D	3/21/2012	1000
IMW-2.5D	12/8/2011	1100
IMW-2.5D	6/6/2011	972
IMW-2.5D	12/15/2010	369
IMW-2.5D	6/9/2010	340
IMW-2.5D	12/12/2009	310
IMW-2.5S	11/26/2012	1200
IMW-2.5S	8/24/2012	1200
IMW-2.5S	5/21/2012	1200
IMW-2.5S	3/21/2012	1200
IMW-2.5S	12/8/2011	1100
IMW-2.5S	9/9/2011	1200
IMW-2.5S	6/6/2011	1040
IMW-2.5S	3/7/2011	1280
IMW-2.5S	12/15/2010	1280
IMW-2.5S	9/20/2010	1200
IMW-2.5S	6/9/2010	1400
IMW-2.5S	3/9/2010	1400
IMW-2.5S	12/12/2009	1600
IMW-2.5S	9/21/2009	1600
IMW-3S	5/21/2012	740
IMW-3S	3/20/2012	800
IMW-3S	12/9/2011	750
IMW-3S	9/9/2011	760
IMW-3S	6/7/2011	673
IMW-3S	3/7/2011	808
IMW-3S	12/10/2010	748
IMW-3S	9/16/2010	745
IMW-3S	6/8/2010	780
IMW-3S	3/9/2010	750
IMW-3S	12/10/2009	770
IMW-3S	9/14/2009	790
IMW-3S	6/9/2009	760
IMW-3S	3/3/2009	770
IMW-3S	12/9/2008	780
IMW-3S	9/9/2008	780
IMW-3S	6/3/2008	860
IMW-3S	3/4/2008	720
KMW-2D	11/26/2012	1200
KMW-2D	8/24/2012	1200
KMW-2D	5/21/2012	1200
KMW-2D	3/23/2012	1200
KMW-2D	12/8/2011	1200
KMW-2D	6/6/2011	954
KMW-2D	12/13/2010	1110
KMW-2D	6/8/2010	1100
KMW-2D	12/8/2009	1100
KMW-2D	12/10/2008	1100
KMW-2D	6/3/2008	1000
KMW-2M	11/26/2012	1300
KMW-2M	8/24/2012	1200
KMW-2M	5/21/2012	1300
KMW-2M	3/23/2012	1400
KMW-2M	12/8/2011	1200
KMW-2M	6/6/2011	1120
KMW-2M	12/13/2010	1400
KMW-2M	6/8/2010	1200
KMW-2M	12/8/2009	1200
KMW-2M	12/10/2008	1100
KMW-2M	6/3/2008	1100
KMW-2S	11/26/2012	1300
KMW-2S	8/24/2012	1200
KMW-2S	5/21/2012	1300
KMW-2S	3/23/2012	1300
KMW-2S	12/8/2011	1200
KMW-2S	9/9/2011	1300
KMW-2S	6/6/2011	1060
KMW-2S	3/8/2011	1340
KMW-2S	12/13/2010	1360
KMW-2S	9/15/2010	1220
KMW-2S	6/8/2010	1200
KMW-2S	3/9/2010	1200

KMW-2S	12/8/2009	1200
KMW-2S	9/16/2009	1300
KMW-2S	6/10/2009	1200
KMW-2S	3/3/2009	1200
KMW-2S	12/10/2008	1200
KMW-2S	9/8/2008	1200
KMW-2S	6/3/2008	1200
KMW-2S	3/4/2008	1100

LMW-11	3/2/2011	2250
LMW-12R	11/30/2012	1300
LMW-12R	10/22/2012	1400
LMW-12R	8/21/2012	1400
LMW-12R	5/30/2012	1300
LMW-13R	11/28/2012	1600
LMW-13R	10/22/2012	1700
LMW-13R	8/20/2012	1600
LMW-13R	5/29/2012	1700
LMW-14R	11/30/2012	1700
LMW-14R	10/22/2012	1800
LMW-14R	8/20/2012	1700
LMW-14R	5/29/2012	1700
LMW-15	11/28/2012	1700
LMW-15	10/22/2012	1700
LMW-15	8/20/2012	1700
LMW-15	5/29/2012	1900
LMW-16	11/28/2012	1300
LMW-16	10/22/2012	1400
LMW-16	8/20/2012	1300
LMW-16	5/29/2012	1400

KMW-2S	12/8/2009	1200
KMW-2S	9/16/2009	1300
KMW-2S	6/10/2009	1200
KMW-2S	3/3/2009	1200
KMW-2S	12/10/2008	1200
KMW-2S	9/8/2008	1200
KMW-2S	6/3/2008	1200
KMW-2S	3/4/2008	1100
BG-3S	11/27/2012	580
BG-3S	8/22/2012	510
BG-3S	5/23/2012	520
BG-3S	3/21/2012	500
BG-4S	11/27/2012	920
BG-4S	8/30/2012	800
BG-4S	5/30/2012	820
BG-4S	3/20/2012	870
BG-6S	11/27/2012	1300
BG-6S	8/23/2012	1200
BG-6S	5/25/2012	1200
BG-6S	3/21/2012	1200
BG-1M	11/26/2012	630
BG-1M	8/23/2012	700
BG-1M	5/24/2012	630
BG-1M	3/20/2012	670
BG-3M	11/27/2012	600
BG-3M	8/22/2012	470
BG-3M	5/24/2012	500
BG-3M	3/21/2012	520
BG-4M	11/27/2012	870
BG-4M	8/30/2012	750
BG-4M	5/30/2012	800
BG-4M	3/20/2012	820
BG-6M	11/27/2012	920
BG-6M	8/22/2012	750
BG-6M	5/25/2012	810
BG-6M	3/21/2012	820
BG-1D	11/26/2012	670
BG-1D	8/23/2012	650
BG-1D	5/24/2012	660
BG-1D	3/20/2012	710
BG-3D	11/27/2012	480
BG-3D	8/21/2012	390
BG-3D	5/23/2012	400
BG-3D	3/21/2012	430
BG-4D	11/27/2012	720
BG-4D	8/30/2012	670
BG-4D	5/30/2012	670
BG-4D	3/20/2012	720
BG-6D	11/27/2012	940
BG-6D	8/22/2012	830
BG-6D	5/25/2012	860
BG-6D	3/21/2012	890
IMW-3D	5/25/2012	720
IMW-3D	3/22/2012	720
IMW-3D	12/9/2011	710
IMW-3D	6/7/2011	660
IMW-3D	12/10/2010	704
IMW-3D	6/8/2010	710
IMW-3D	12/10/2009	710
IMW-3D	12/9/2008	700
IMW-3D	6/3/2008	690
BG-2S	11/26/2012	2600
BG-2S	8/23/2012	2600
BG-2S	5/24/2012	2600
BG-2S	3/21/2012	2900
BG-2M	11/26/2012	1200
BG-2M	8/23/2012	1000
BG-2M	5/24/2012	1100
BG-2M	3/21/2012	1100
BG-2D	11/26/2012	1000
BG-2D	8/23/2012	990
BG-2D	5/24/2012	1000
BG-2D	3/21/2012	1100
LMW-10	11/28/2012	2200
LMW-10	8/27/2012	2200
LMW-10	5/30/2012	2300
LMW-10	3/22/2012	2200
LMW-10	12/6/2011	2200
LMW-10	9/8/2011	2400
LMW-10	6/8/2011	2010
LMW-10	3/2/2011	2080

LMW-10	12/9/2010	2380
LMW-10	9/21/2010	1950
LMW-10	6/9/2010	2000
LMW-10	3/11/2010	1800
LMW-10	12/11/2009	2200
LMW-10	9/18/2009	1900
LMW-10	6/10/2009	2000
LMW-10	3/5/2009	2000
LMW-10	12/12/2008	2000
LMW-10	9/10/2008	2000
LMW-10	6/4/2008	1900
LMW-10	3/5/2008	1800
LMW-11R	11/26/2012	2600
LMW-11R	8/21/2012	2600
LMW-11R	5/29/2012	2800
LMW-11R	3/23/2012	2800
LMW-7	11/28/2012	1300
LMW-7	8/27/2012	1300
LMW-7	5/31/2012	1300
LMW-7	3/23/2012	1300
LMW-7	12/5/2011	1300
LMW-7	9/6/2011	1300
LMW-7	6/9/2011	1350
LMW-7	3/9/2011	1410
LMW-7	12/10/2010	1400
LMW-7	9/21/2010	1120
LMW-7	6/9/2010	1300
LMW-7	3/11/2010	1300
LMW-7	12/11/2009	1400
LMW-7	9/18/2009	1400
LMW-7	6/10/2009	1300
LMW-7	3/5/2009	1300
LMW-7	12/12/2008	1300
LMW-7	9/10/2008	1400
LMW-7	6/4/2008	1400
LMW-7	3/5/2008	1300
LMW-9	11/28/2012	1800
LMW-9	8/27/2012	1800
LMW-9	5/31/2012	1900
LMW-9	3/23/2012	1900
LMW-9	12/5/2011	1800
LMW-9	9/8/2011	1900
LMW-9	6/8/2011	1950
LMW-9	3/9/2011	1950
LMW-9	12/10/2010	1950
LMW-9	9/21/2010	1830
LMW-9	6/9/2010	1800
LMW-9	3/11/2010	1700
LMW-9	12/11/2009	2000
LMW-9	9/18/2009	1800
LMW-9	6/10/2009	1800
LMW-9	3/5/2009	1800
LMW-9	12/12/2008	1800
LMW-9	9/10/2008	2000
LMW-9	6/4/2008	1800
LMW-9	3/5/2008	1700
LMW-11	2/22/2012	2500
LMW-11	12/6/2011	2400
LMW-11	9/8/2011	2500
LMW-11	3/2/2011	2250
LMW-12R	11/30/2012	1300
LMW-12R	10/22/2012	1400
LMW-12R	8/21/2012	1400
LMW-12R	5/30/2012	1300
LMW-13R	11/28/2012	1600
LMW-13R	10/22/2012	1700
LMW-13R	8/20/2012	1600
LMW-13R	5/29/2012	1700
LMW-14R	11/30/2012	1700
LMW-14R	10/22/2012	1800
LMW-14R	8/20/2012	1700
LMW-14R	5/29/2012	1700
LMW-15	11/28/2012	1700
LMW-15	10/22/2012	1700
LMW-15	8/20/2012	1700
LMW-15	5/29/2012	1900
LMW-16	11/28/2012	1300
LMW-16	10/22/2012	1400
LMW-16	8/20/2012	1300
LMW-16	5/29/2012	1400

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Thallium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Thallium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	0	26	12	14	53.85%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	14	0.02	0.02	0.02	0.02	3.600E-18
Statistics (Detects Only)	12	0.031	0.072	0.0523	0.0495	0.0125
Statistics (All: NDs treated as DL value)	26	0.02	0.072	0.0349	0.02	0.0184
Statistics (All: NDs treated as DL/2 value)	26	0.01	0.072	0.0295	0.01	0.0231
Statistics (Normal ROS Estimated Data)	26	-0.0111	0.072	0.0325	0.0307	0.0226
Statistics (Gamma ROS Estimated Data)	26	0.0277	0.072	0.0536	0.055	0.0123
Statistics (Lognormal ROS Estimated Data)	26	0.0149	0.072	0.0379	0.0326	0.0165

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	18.31	16.22	0.00286	-2.978	0.25	-0.0838
Statistics (NDs = DL)	4.122	3.672	0.00847	-3.481	0.503	-0.145
Statistics (NDs = DL/2)	1.653	1.488	0.0179	-3.854	0.844	-0.219
Statistics (Gamma ROS Estimates)	17.54	15.54	0.00306	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.363	0.44	-0.131

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.987	0.89	0.889	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.967	0.859	Data Appear Normal
Lilliefors (Detects Only)	0.158	0.256	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.775	0.92	Data Not Normal
Lilliefors (NDs = DL)	0.33	0.174	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.771	0.92	Data Not Normal
Lilliefors (NDs = DL/2)	0.34	0.174	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.978	0.92	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0811	0.174	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.981	0.933	0.918	0.617

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.249	0.732	
Kolmogorov-Smirnov (Detects Only)	0.167	0.245	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.734	0.748	
Kolmogorov-Smirnov (NDs = DL)	0.345	0.172	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	3.097	0.76	
Kolmogorov-Smirnov (NDs = DL/2)	0.355	0.174	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.52	0.744	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.141	0.171	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.981	0.883	0.865	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.959	0.859	Data Appear Lognormal
Lilliefors (Detects Only)	0.161	0.256	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.758	0.92	Data Not Lognormal
Lilliefors (NDs = DL)	0.343	0.174	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.726	0.92	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.352	0.174	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.97	0.92	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0916	0.174	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Thallium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	14	32	69.57%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	32	0.02	0.02	0.02	0.02	7.050E-18
Statistics (Detects Only)	14	0.0091	0.07	0.0353	0.0395	0.0216
Statistics (All: NDs treated as DL value)	46	0.0091	0.07	0.0247	0.02	0.0136
Statistics (All: NDs treated as DL/2 value)	46	0.0091	0.07	0.0177	0.01	0.0165
Statistics (Normal ROS Estimated Data)	46	-0.0192	0.07	0.0211	0.0177	0.0195
Statistics (Gamma ROS Estimated Data)	46	0.0091	0.07	0.0291	0.0259	0.0156
Statistics (Lognormal ROS Estimated Data)	46	0.00424	0.07	0.0216	0.0158	0.016

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.415	2.272	0.0146	-3.565	0.73	-0.205
Statistics (NDs = DL)	4.985	4.674	0.00495	-3.806	0.424	-0.111
Statistics (NDs = DL/2)	2.118	1.994	0.00836	-4.289	0.623	-0.145
Statistics (Gamma ROS Estimates)	3.638	3.416	0.00801	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.06	0.672	-0.166

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.95	0.779	0.729	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.882	0.874	Data Appear Normal
Lilliefors (Detects Only)	0.242	0.237	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.618	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.46	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.534	0.945	Data Not Normal

Lilliefors (NDs = DL/2)	0.397	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.979	0.945	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0823	0.131	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.936	0.859	0.87	0.804

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.865	0.745	
Kolmogorov-Smirnov (Detects Only)	0.233	0.231	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	7.606	0.753	
Kolmogorov-Smirnov (NDs = DL)	0.444	0.131	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	10.07	0.76	
Kolmogorov-Smirnov (NDs = DL/2)	0.415	0.132	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.567	0.754	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.1	0.131	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.941	0.845	0.757	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.865	0.874	Data Not Lognormal
Lilliefors (Detects Only)	0.227	0.237	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.726	0.945	Data Not Lognormal
Lilliefors (NDs = DL)	0.424	0.131	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.568	0.945	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.412	0.131	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.975	0.945	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0737	0.131	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Thallium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	31	0	31	16	15	48.39%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	15	0.02	0.03	0.022	0.02	0.00414
Statistics (Detects Only)	16	0.0077	0.1	0.0532	0.06	0.034
Statistics (All: NDs treated as DL value)	31	0.0077	0.1	0.0381	0.02	0.0289
Statistics (All: NDs treated as DL/2 value)	31	0.0077	0.1	0.0328	0.015	0.0322
Statistics (Normal ROS Estimated Data)	31	-0.0273	0.1	0.0343	0.0236	0.0341
Statistics (Gamma ROS Estimated Data)	31	0.0077	0.1	0.054	0.0572	0.026
Statistics (Lognormal ROS Estimated Data)	31	0.00428	0.1	0.0348	0.0197	0.0312

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.76	1.612	0.0302	-3.245	0.918	-0.283
Statistics (NDs = DL)	2.072	1.893	0.0184	-3.528	0.723	-0.205
Statistics (NDs = DL/2)	1.264	1.163	0.0259	-3.864	0.926	-0.24

Statistics (Gamma ROS Estimates)	2.965	2.699	0.0182	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.763	0.928	-0.247

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.949	0.891	0.853	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.877	0.887	Data Not Normal
Lilliefors (Detects Only)	0.195	0.222	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.781	0.929	Data Not Normal
Lilliefors (NDs = DL)	0.292	0.159	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.713	0.929	Data Not Normal
Lilliefors (NDs = DL/2)	0.333	0.159	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.943	0.929	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.139	0.159	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.884	0.942	0.923	0.764

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.037	0.752	
Kolmogorov-Smirnov (Detects Only)	0.208	0.218	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	2.223	0.758	
Kolmogorov-Smirnov (NDs = DL)	0.272	0.16	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.548	0.769	
Kolmogorov-Smirnov (NDs = DL/2)	0.291	0.161	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.176	0.753	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.164	0.159	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.927	0.945	0.886	0.972

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.84	0.887	Data Not Lognormal
Lilliefors (Detects Only)	0.232	0.222	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.881	0.929	Data Not Lognormal
Lilliefors (NDs = DL)	0.251	0.159	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.764	0.929	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.255	0.159	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.927	0.929	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.128	0.159	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Alluv + Mesa Thallium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	57	0	57	28	29	50.88%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	29	0.02	0.03	0.021	0.02	0.0031
Statistics (Detects Only)	28	0.0077	0.1	0.0528	0.052	0.0265
Statistics (All: NDs treated as DL value)	57	0.0077	0.1	0.0366	0.02	0.0245
Statistics (All: NDs treated as DL/2 value)	57	0.0077	0.1	0.0313	0.012	0.0282
Statistics (Normal ROS Estimated Data)	57	-0.036	0.1	0.0311	0.0275	0.0313
Statistics (Gamma ROS Estimated Data)	57	0.0077	0.1	0.054	0.0568	0.0216
Statistics (Lognormal ROS Estimated Data)	57	0.00407	0.1	0.0339	0.0222	0.0267

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.8	2.664	0.0189	-3.13	0.715	-0.228
Statistics (NDs = DL)	2.654	2.526	0.0138	-3.507	0.627	-0.179
Statistics (NDs = DL/2)	1.41	1.347	0.0222	-3.859	0.881	-0.228
Statistics (Gamma ROS Estimates)	4.353	4.136	0.0124	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.71	0.84	-0.227

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.988	0.901	0.878	0.993

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.96	0.924	Data Appear Normal
Lilliefors (Detects Only)	0.0913	0.167	Data Appear Normal
Lilliefors (NDs = DL)	0.295	0.117	Data Not Normal
Lilliefors (NDs = DL/2)	0.297	0.117	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0762	0.117	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.944	0.958	0.946	0.756

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.975	0.755	
Kolmogorov-Smirnov (Detects Only)	0.177	0.167	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.019	0.759	
Kolmogorov-Smirnov (NDs = DL)	0.296	0.119	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.736	0.77	
Kolmogorov-Smirnov (NDs = DL/2)	0.29	0.12	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.862	0.754	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.145	0.118	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.932	0.939	0.888	0.985

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.86	0.924	Data Not Lognormal
Lilliefors (Detects Only)	0.218	0.167	Data Not Lognormal
Lilliefors (NDs = DL)	0.285	0.117	Data Not Lognormal

			Lilliefors (NDs = DL/2)	0.293	0.117	Data Not Lognormal					
			Lilliefors (Lognormal ROS Estimates)	0.108	0.117	Data Appear Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.											

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Thallium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Thallium, Dissolved

General Statistics

Number of Valid Data	26	Number of Detected Data	12
Number of Distinct Detected Data	12	Number of Non-Detect Data	14
		Percent Non-Detects	53.85%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.031	Minimum Detected	-3.474
Maximum Detected	0.072	Maximum Detected	-2.631
Mean of Detected	0.0523	Mean of Detected	-2.978
SD of Detected	0.0125	SD of Detected	0.25
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.967	Shapiro Wilk Test Statistic	0.959
5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0295	Mean (Log Scale)	-3.854
SD	0.0231	SD (Log Scale)	0.844
95% UTL 95% Coverage	0.082	95% UTL 95% Coverage	0.145
95% UPL (t)	0.0697	95% UPL (t)	0.0921
90% Percentile (z)	0.0591	90% Percentile (z)	0.0625
95% Percentile (z)	0.0675	95% Percentile (z)	0.0849
99% Percentile (z)	0.0832	99% Percentile (z)	0.151
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0525	Mean in Original Scale	0.0379
SD	0.0119	SD in Original Scale	0.0165
95% UTL with 95% Coverage	0.0796	95% UTL with 95% Coverage	0.0942
		95% BCA UTL with 95% Coverage	0.072
		95% Bootstrap (%) UTL with 95% Coverage	0.072
95% UPL (t)	0.0732	95% UPL (t)	0.0744
90% Percentile (z)	0.0677	90% Percentile (z)	0.0608
95% Percentile (z)	0.0721	95% Percentile (z)	0.0714
99% Percentile (z)	0.0802	99% Percentile (z)	0.0963

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	13.79	Data appear Normal at 5% Significance Level	
Theta Star	0.0038		
nu star	330.9		
A-D Test Statistic	0.249	Nonparametric Statistics	
5% A-D Critical Value	0.732	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.167	Mean	0.0408
5% K-S Critical Value	0.245	SD	0.0134
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.00274
		95% KM UTL with 95% Coverage	0.0713
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.1
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0641
Mean	0.0536	90% Percentile (z)	0.058
Median	0.055	95% Percentile (z)	0.0628
SD	0.0123	99% Percentile (z)	0.072
k star	15.54		
Theta star	0.00345	Gamma ROS Limits with Extrapolated Data	
Nu star	808	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0784
95% Percentile of Chisquare (2k)	45.08	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.079
		95% WH Approx. Gamma UTL with 95% Coverage	0.0877
90% Percentile	0.0716	95% HW Approx. Gamma UTL with 95% Coverage	0.0888
95% Percentile	0.0778		
99% Percentile	0.0902		

Note: DL/2 is not a recommended method.

Muddy Creek Thallium, Dissolved

General Statistics			
Number of Valid Data	46	Number of Detected Data	14
Number of Distinct Detected Data	14	Number of Non-Detect Data	32
		Percent Non-Detects	69.57%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0091	Minimum Detected	-4.699
Maximum Detected	0.07	Maximum Detected	-2.659
Mean of Detected	0.0353	Mean of Detected	-3.565
SD of Detected	0.0216	SD of Detected	0.73
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.882	Shapiro Wilk Test Statistic	0.865
5% Shapiro Wilk Critical Value	0.874	5% Shapiro Wilk Critical Value	0.874
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0177	Mean (Log Scale)	-4.289

SD	0.0165	SD (Log Scale)	0.623
95% UTL 95% Coverage	0.0521	95% UTL 95% Coverage	0.0501
95% UPL (t)	0.0458	95% UPL (t)	0.0395
90% Percentile (z)	0.0389	90% Percentile (z)	0.0305
95% Percentile (z)	0.0449	95% Percentile (z)	0.0382
99% Percentile (z)	0.0562	99% Percentile (z)	0.0585
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.0264	Mean in Original Scale	0.0216
SD	0.0511	SD in Original Scale	0.016
95% UTL with 95% Coverage	0.0798	95% UTL with 95% Coverage	0.0698
		95% BCA UTL with 95% Coverage	0.0668
		95% Bootstrap (%) UTL with 95% Coverage	0.0688
95% UPL (t)	0.0603	95% UPL (t)	0.054
90% Percentile (z)	0.0391	90% Percentile (z)	0.0408
95% Percentile (z)	0.0576	95% Percentile (z)	0.0521
99% Percentile (z)	0.0924	99% Percentile (z)	0.0824
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.945	Data appear Normal at 5% Significance Level	
Theta Star	0.0181		
nu star	54.47		
A-D Test Statistic	0.865	Nonparametric Statistics	
5% A-D Critical Value	0.745	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.233	Mean	0.0199
5% K-S Critical Value	0.231	SD	0.0155
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00247
		95% KM UTL with 95% Coverage	0.0521
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0881
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0462
Mean	0.0291	90% Percentile (z)	0.0397
Median	0.0259	95% Percentile (z)	0.0454
SD	0.0156	99% Percentile (z)	0.0559
k star	3.416		
Theta star	0.00853	Gamma ROS Limits with Extrapolated Data	
Nu star	314.2	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0596
95% Percentile of Chisquare (2k)	13.82	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0605
		95% WH Approx. Gamma UTL with 95% Coverage	0.0696
90% Percentile	0.0503	95% HW Approx. Gamma UTL with 95% Coverage	0.0715
95% Percentile	0.059		
99% Percentile	0.0776		

Note: DL/2 is not a recommended method.

Mesa Thallium, Dissolved

General Statistics

Number of Valid Data	31	Number of Detected Data	16
Number of Distinct Detected Data	16	Number of Non-Detect Data	15
		Percent Non-Detects	48.39%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0077	Minimum Detected	-4.867
Maximum Detected	0.1	Maximum Detected	-2.303
Mean of Detected	0.0532	Mean of Detected	-3.245
SD of Detected	0.034	SD of Detected	0.918
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.03	Maximum Non-Detect	-3.507

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	21
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	10
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	67.74%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.877	Shapiro Wilk Test Statistic	0.84
5% Shapiro Wilk Critical Value	0.887	5% Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0328	Mean (Log Scale)	-3.864
SD	0.0322	SD (Log Scale)	0.926
95% UTL 95% Coverage	0.104	95% UTL 95% Coverage	0.16
95% UPL (t)	0.0883	95% UPL (t)	0.104
90% Percentile (z)	0.074	90% Percentile (z)	0.0687
95% Percentile (z)	0.0857	95% Percentile (z)	0.0962
99% Percentile (z)	0.108	99% Percentile (z)	0.181
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0768	Mean in Original Scale	0.0348
SD	0.0154	SD in Original Scale	0.0312
95% UTL with 95% Coverage	0.111	95% UTL with 95% Coverage	0.178
		95% BCA UTL with 95% Coverage	0.1
		95% Bootstrap (%) UTL with 95% Coverage	0.1
95% UPL (t)	0.103	95% UPL (t)	0.115
90% Percentile (z)	0.0966	90% Percentile (z)	0.0762
95% Percentile (z)	0.102	95% Percentile (z)	0.107
99% Percentile (z)	0.113	99% Percentile (z)	0.201

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.472	Data follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.0361		
nu star	47.1		
A-D Test Statistic	1.037	Nonparametric Statistics	
5% A-D Critical Value	0.752	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.208	Mean	0.0334
5% K-S Critical Value	0.218	SD	0.0313
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	0.00587
		95% KM UTL with 95% Coverage	0.102
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.172
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0874

Mean	0.054	90% Percentile (z)	0.0735
Median	0.0572	95% Percentile (z)	0.0849
SD	0.026	99% Percentile (z)	0.106
k star	2.699		
Theta star	0.02	Gamma ROS Limits with Extrapolated Data	
Nu star	167.4	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.119
95% Percentile of Chisquare (2k)	11.68	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.125
		95% WH Approx. Gamma UTL with 95% Coverage	0.147
90% Percentile	0.098	95% HW Approx. Gamma UTL with 95% Coverage	0.156
95% Percentile	0.117		
99% Percentile	0.158		

Note: DL/2 is not a recommended method.

Alluv + Mesa Thallium, Dissolved

General Statistics

Number of Valid Data	57	Number of Detected Data	28
Number of Distinct Detected Data	27	Number of Non-Detect Data	29
		Percent Non-Detects	50.88%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0077	Minimum Detected	-4.867
Maximum Detected	0.1	Maximum Detected	-2.303
Mean of Detected	0.0528	Mean of Detected	-3.13
SD of Detected	0.0265	SD of Detected	0.715
Minimum Non-Detect	0.02	Minimum Non-Detect	-3.912
Maximum Non-Detect	0.03	Maximum Non-Detect	-3.507

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	35
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	22
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	61.40%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.96	Shapiro Wilk Test Statistic	0.86
5% Shapiro Wilk Critical Value	0.924	5% Shapiro Wilk Critical Value	0.924
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0313	Mean (Log Scale)	-3.859
SD	0.0282	SD (Log Scale)	0.881
95% UTL 95% Coverage	0.0885	95% UTL 95% Coverage	0.126
95% UPL (t)	0.0789	95% UPL (t)	0.0933
90% Percentile (z)	0.0674	90% Percentile (z)	0.0652
95% Percentile (z)	0.0777	95% Percentile (z)	0.0898
99% Percentile (z)	0.0969	99% Percentile (z)	0.164
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0197	Mean in Original Scale	0.0339

SD	0.0424	SD in Original Scale	0.0267
95% UTL with 95% Coverage	0.106	95% UTL with 95% Coverage	0.135
		95% BCA UTL with 95% Coverage	0.094
		95% Bootstrap (%) UTL with 95% Coverage	0.0952
95% UPL (t)	0.0911	95% UPL (t)	0.101
90% Percentile (z)	0.074	90% Percentile (z)	0.0719
95% Percentile (z)	0.0893	95% Percentile (z)	0.0976
99% Percentile (z)	0.118	99% Percentile (z)	0.173
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.524	Data appear Normal at 5% Significance Level	
Theta Star	0.0209		
nu star	141.3		
A-D Test Statistic	0.975	Nonparametric Statistics	
5% A-D Critical Value	0.755	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.177	Mean	0.0322
5% K-S Critical Value	0.167	SD	0.0274
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00379
		95% KM UTL with 95% Coverage	0.0877
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.153
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0784
Mean	0.054	90% Percentile (z)	0.0673
Median	0.0568	95% Percentile (z)	0.0772
SD	0.0216	99% Percentile (z)	0.0959
k star	4.136		
Theta star	0.013	Gamma ROS Limits with Extrapolated Data	
Nu star	471.5	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.105
95% Percentile of Chisquare (2k)	15.89	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.108
		95% WH Approx. Gamma UTL with 95% Coverage	0.119
90% Percentile	0.0895	95% HW Approx. Gamma UTL with 95% Coverage	0.124
95% Percentile	0.104		
99% Percentile	0.134		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Thallium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Thallium, Dissolved

Background Data: Alluv Thallium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	31	26
Number of Non-Detect Data	15	14
Number of Detect Data	16	12
Minimum Non-Detect	0.02	0.02
Maximum Non-Detect	0.03	0.02
Percent Non detects	48.39%	53.85%
Minimum Detected	0.0077	0.031
Maximum Detected	0.1	0.072
Mean of Detected Data	0.0532	0.0523
Median of Detected Data	0.06	0.0495
SD of Detected Data	0.034	0.0125

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-0.0362
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.971

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Thallium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Thallium, Dissolved

Background Data: Alluv Thallium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	46	26
Number of Non-Detect Data	32	14
Number of Detect Data	14	12
Minimum Non-Detect	0.02	0.02
Maximum Non-Detect	0.02	0.02
Percent Non detects	69.57%	53.85%
Minimum Detected	0.0091	0.031
Maximum Detected	0.07	0.072
Mean of Detected Data	0.0353	0.0523
Median of Detected Data	0.0395	0.0495
SD of Detected Data	0.0216	0.0125

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-2.597
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.00939

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Thallium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Thallium, Dissolved

Background Data: Muddy Creek Thallium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	31	46
Number of Non-Detect Data	15	32
Number of Detect Data	16	14
Minimum Non-Detect	0.02	0.02
Maximum Non-Detect	0.03	0.02
Percent Non detects	48.39%	69.57%
Minimum Detected	0.0077	0.0091
Maximum Detected	0.1	0.07
Mean of Detected Data	0.0532	0.0353
Median of Detected Data	0.06	0.0395
SD of Detected Data	0.034	0.0216

Site vs Background Gehan Test

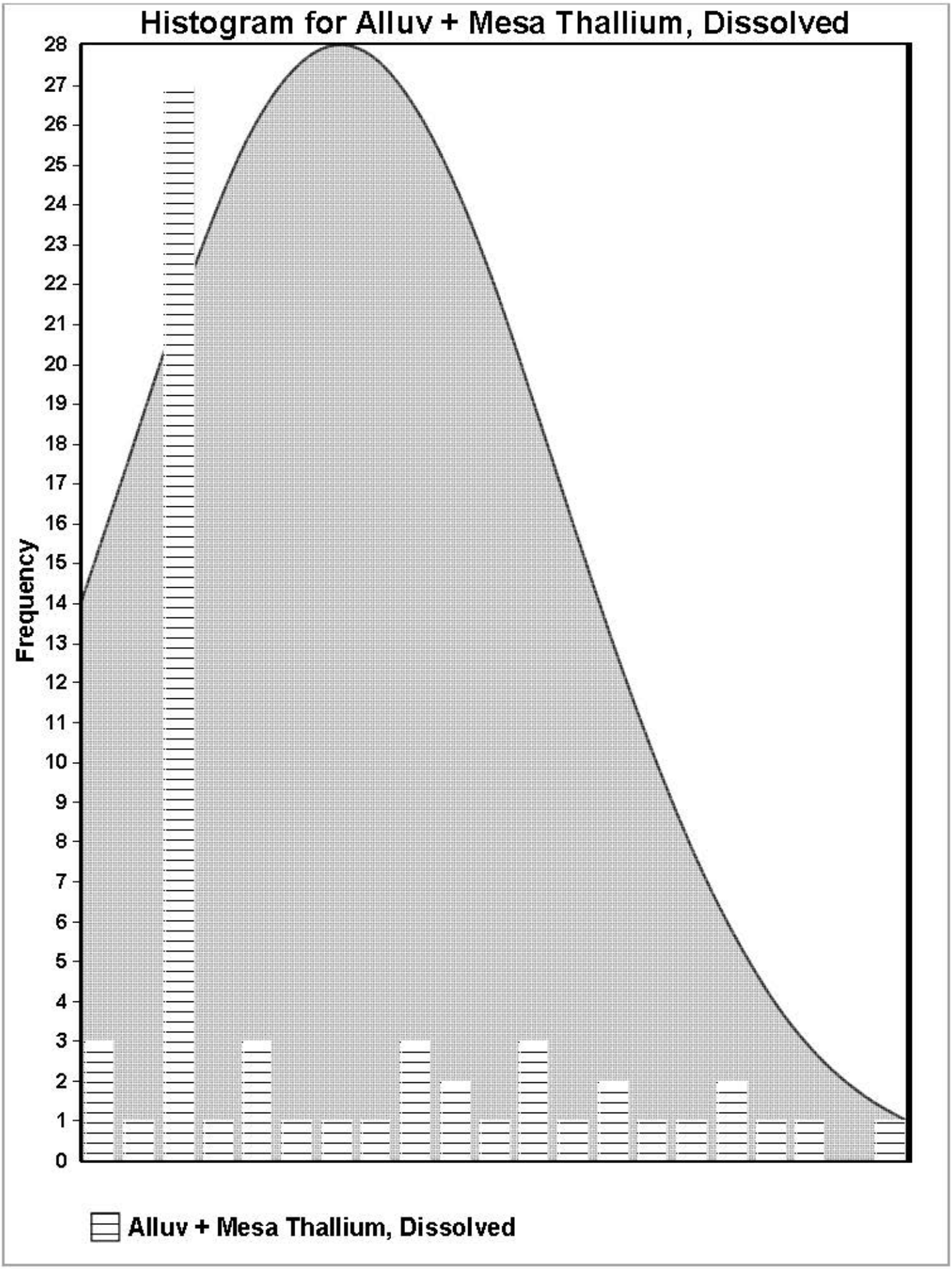
H0: Mu of Site or AOC = Mu of background

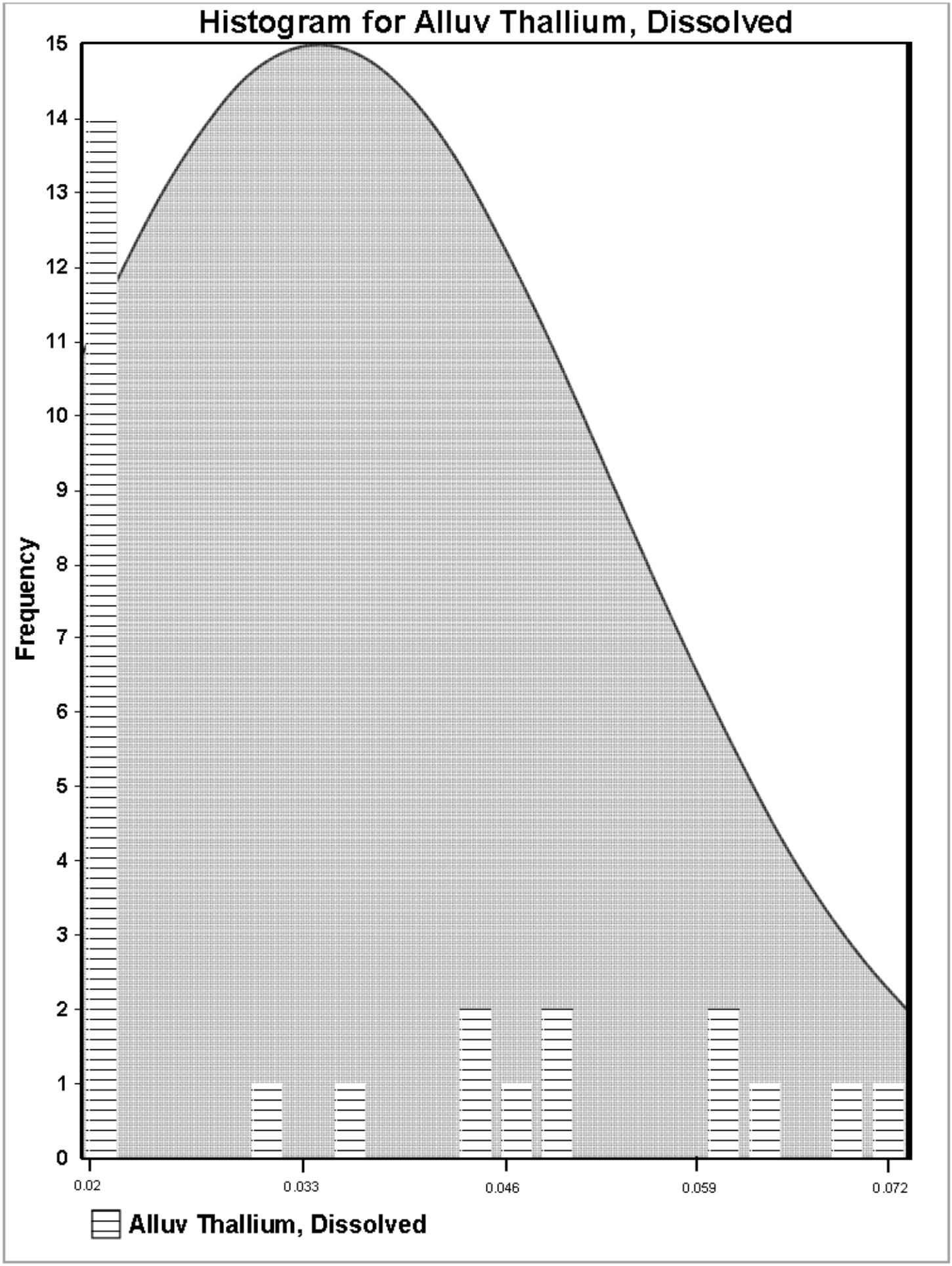
Gehan z Test Value	2.126
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.0335

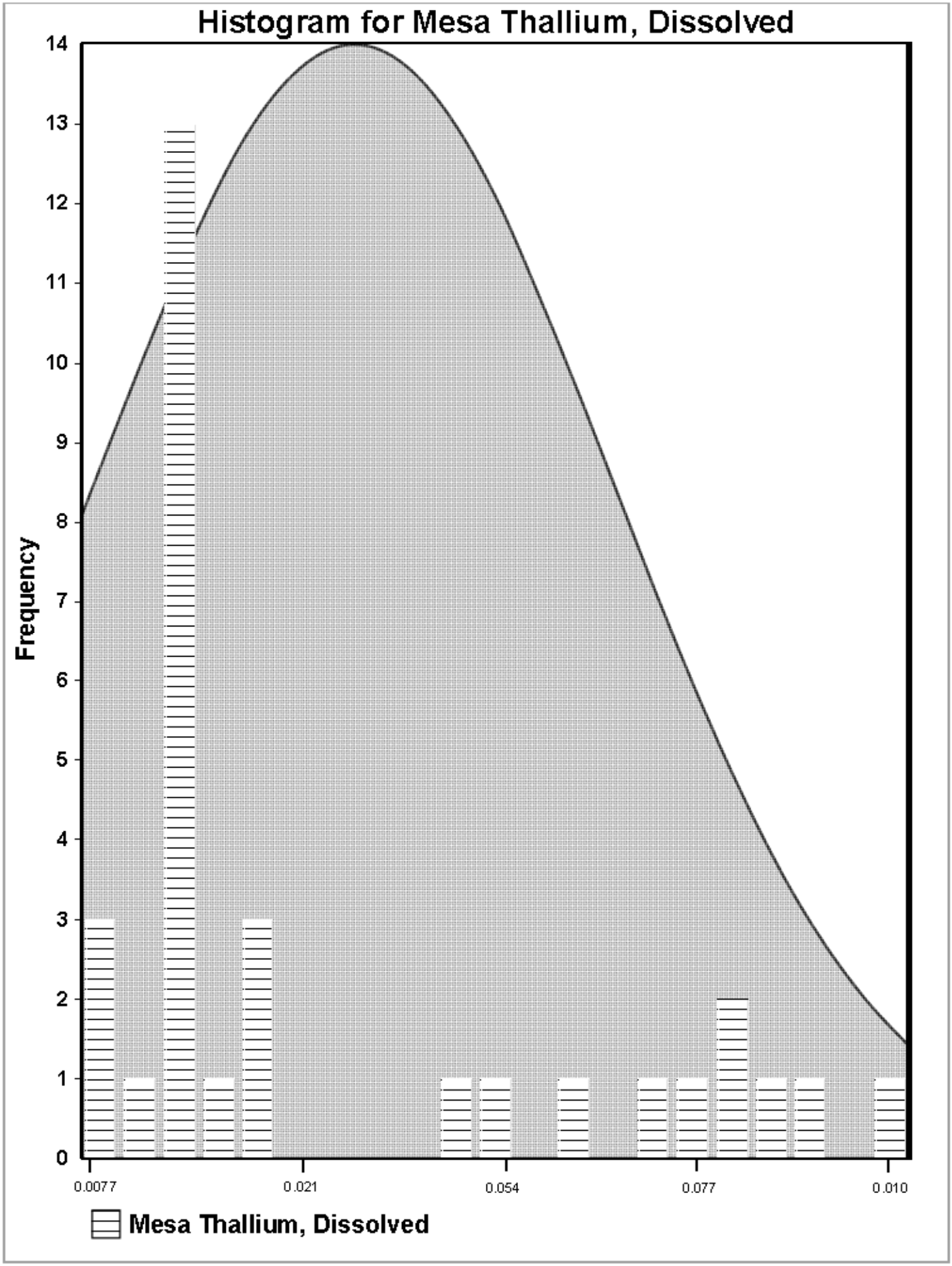
Conclusion with Alpha = 0.05

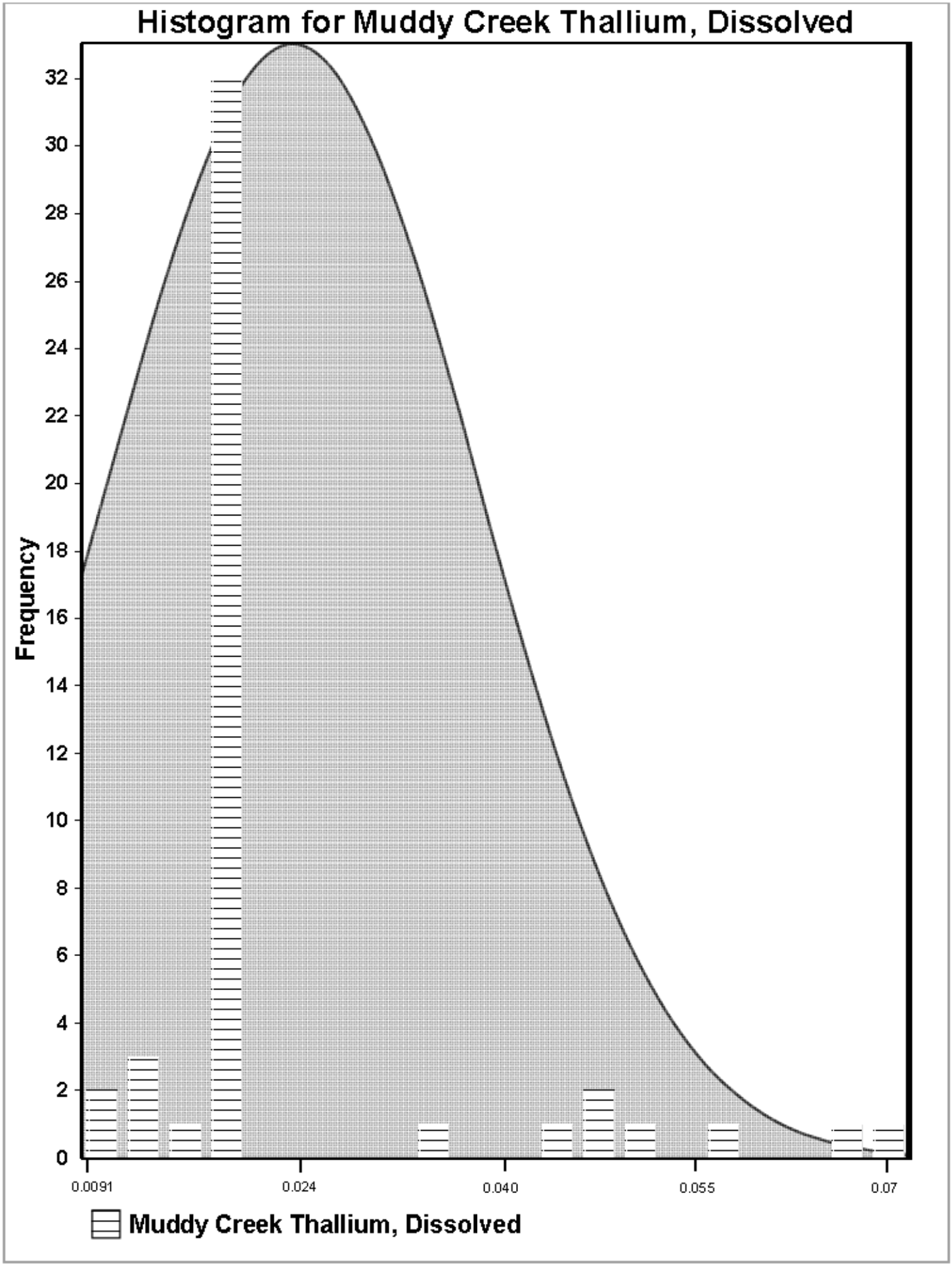
Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv + Mesa Thallium, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
Alluv + Mesa Thallium, Dissolved


Histogram for Alluv Thallium, Dissolved
Frequency
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
0.02
0.033
0.046
0.059
0.072
Alluv Thallium, Dissolved


Histogram for Mesa Thallium, Dissolved
Frequency
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0
0.0077
0.021
0.054
0.077
0.010
Mesa Thallium, Dissolved


Histogram for Muddy Creek Thallium, Dissolved
Frequency
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
0.0091
0.024
0.040
0.055
0.07
Muddy Creek Thallium, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Thallium_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Thallium, Dissolved

Mean	0.0295
Standard Deviation	0.0231
Number of data	26
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0295	0.0226	0.072	1	1.878	2.84	3.16

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Thallium, Dissolved

Mean	0.0177
Standard Deviation	0.0165
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0177	0.0164	0.07	29	3.197	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.07 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Thallium, Dissolved

Mean	0.0328
Standard Deviation	0.0322
Number of data	31
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

1	0.0328	0.0317	0.1	18	2.122	2.92	3.25

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Alluv + Mesa Thallium, Dissolved

Mean	0.0313
Standard Deviation	0.0282
Number of data	57
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0313	0.028	0.1	44	2.458	3.179	3.536

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Location Name	Sample Date	Alluv Thallium, Dissolved	D_Alluv Thallium, Dissolved
BG-1S	11/26/2012	0.072	1
BG-1S	8/23/2012	0.05	1
BG-1S	5/24/2012	0.02	0
BG-1S	3/20/2012	0.02	0
IMW-2.5D	11/26/2012	0.061	1
IMW-2.5D	8/24/2012	0.038	1
IMW-2.5D	5/21/2012	0.02	0
IMW-2.5D	3/21/2012	0.02	0
IMW-2.5S	11/26/2012	0.049	1
IMW-2.5S	8/24/2012	0.031	1
IMW-2.5S	5/21/2012	0.02	0
IMW-2.5S	3/21/2012	0.02	0
IMW-3S	5/21/2012	0.02	0
IMW-3S	3/20/2012	0.02	0
KMW-2D	11/26/2012	0.068	1
KMW-2D	8/24/2012	0.044	1
KMW-2D	5/21/2012	0.02	0
KMW-2D	3/23/2012	0.02	0
KMW-2M	11/26/2012	0.063	1
KMW-2M	8/24/2012	0.047	1
KMW-2M	5/21/2012	0.02	0
KMW-2M	3/23/2012	0.02	0
KMW-2S	11/26/2012	0.06	1
KMW-2S	8/24/2012	0.045	1
KMW-2S	5/21/2012	0.02	0
KMW-2S	3/23/2012	0.02	0

Location Name	Sample Date	Muddy Creek Thallium, Dissolved	D_Muddy Creek Thallium, Dissolved
BG-3S	11/27/2012	0.02	0
BG-3S	8/22/2012	0.02	0
BG-3S	5/23/2012	0.02	0
BG-3S	3/21/2012	0.02	0
BG-4S	11/27/2012	0.02	0
BG-4S	8/30/2012	0.014	1
BG-4S	5/30/2012	0.0091	1
BG-4S	3/20/2012	0.02	0
BG-6S	11/27/2012	0.02	0
BG-6S	8/23/2012	0.057	1
BG-6S	5/25/2012	0.02	0
BG-6S	3/21/2012	0.02	0
BG-1M	11/26/2012	0.065	0
BG-1M	8/23/2012	0.047	0
BG-1M	5/24/2012	0.02	0
BG-1M	3/20/2012	0.02	0
BG-3M	11/27/2012	0.02	0
BG-3M	8/22/2012	0.035	0
BG-3M	5/24/2012	0.02	0
BG-3M	3/21/2012	0.02	0
BG-4M	11/27/2012	0.02	0
BG-4M	8/30/2012	0.012	0
BG-4M	5/30/2012	0.016	1
BG-4M	3/20/2012	0.02	0
BG-6M	11/27/2012	0.02	0
BG-6M	8/22/2012	0.049	0
BG-6M	5/25/2012	0.02	0
BG-6M	3/21/2012	0.02	0
BG-1D	11/26/2012	0.07	0
BG-1D	8/23/2012	0.044	0
BG-1D	5/24/2012	0.02	0
BG-1D	3/20/2012	0.02	0
BG-3D	11/27/2012	0.02	0
BG-3D	8/21/2012	0.02	0
BG-3D	5/23/2012	0.02	0
BG-3D	3/21/2012	0.02	0
BG-4D	11/27/2012	0.02	0
BG-4D	8/30/2012	0.015	1
BG-4D	5/30/2012	0.013	1
BG-4D	3/20/2012	0.02	0
BG-6D	11/27/2012	0.02	0
BG-6D	8/22/2012	0.048	1
BG-6D	5/25/2012	0.02	0
BG-6D	3/21/2012	0.02	0
IMW-3D	5/25/2012	0.02	0
IMW-3D	3/22/2012	0.02	0

Location Name	Sample Date	Mesa Thallium, Dissolved	D_Mesa Thallium, Dissolved
BG-2S	11/26/2012	0.084	0
BG-2S	8/23/2012	0.066	0
BG-2S	5/24/2012	0.02	0
BG-2S	3/21/2012	0.0097	0
BG-2M	11/26/2012	0.077	0
BG-2M	8/23/2012	0.054	1
BG-2M	5/24/2012	0.02	1
BG-2M	3/21/2012	0.02	0
BG-2D	11/26/2012	0.073	0
BG-2D	8/23/2012	0.05	1
BG-2D	5/24/2012	0.02	0
BG-2D	3/21/2012	0.02	0
LMW-10	11/28/2012	0.094	1
LMW-10	8/27/2012	0.017	1
LMW-10	5/30/2012	0.02	0
LMW-10	3/22/2012	0.02	0
LMW-10	12/6/2011	0.03	0
LMW-11R	11/26/2012	0.1	1
LMW-11R	8/21/2012	0.015	0
LMW-11R	5/29/2012	0.022	0
LMW-11R	3/23/2012	0.02	0
LMW-7	11/28/2012	0.087	1
LMW-7	8/27/2012	0.0077	1
LMW-7	5/31/2012	0.02	0
LMW-7	3/23/2012	0.02	0
LMW-7	12/5/2011	0.03	1
LMW-9	11/28/2012	0.082	0
LMW-9	8/27/2012	0.012	0
LMW-9	5/31/2012	0.02	1
LMW-9	3/23/2012	0.02	1
LMW-9	12/5/2011	0.03	0

Location Name	Sample Date	Alluv + Mesa Thallium, Dissolved	D_Alluv + Mesa Thallium, Dissolved
BG-1S	11/26/2012	0.072	1
BG-1S	8/23/2012	0.05	1
BG-1S	5/24/2012	0.02	0
BG-1S	3/20/2012	0.02	0
IMW-2.5D	11/26/2012	0.061	1
IMW-2.5D	8/24/2012	0.038	1
IMW-2.5D	5/21/2012	0.02	0
IMW-2.5D	3/21/2012	0.02	0
IMW-2.5S	11/26/2012	0.049	1
IMW-2.5S	8/24/2012	0.031	1
IMW-2.5S	5/21/2012	0.02	0
IMW-2.5S	3/21/2012	0.02	0
IMW-3S	5/21/2012	0.02	0
IMW-3S	3/20/2012	0.02	0
KMW-2D	11/26/2012	0.068	1
KMW-2D	8/24/2012	0.044	1
KMW-2D	5/21/2012	0.02	0
KMW-2D	3/23/2012	0.02	0
KMW-2M	11/26/2012	0.063	1
KMW-2M	8/24/2012	0.047	1
KMW-2M	5/21/2012	0.02	0
KMW-2M	3/23/2012	0.02	0
KMW-2S	11/26/2012	0.06	1
KMW-2S	8/24/2012	0.045	1
KMW-2S	5/21/2012	0.02	0
KMW-2S	3/23/2012	0.02	0
BG-2S	11/26/2012	0.084	1
BG-2S	8/23/2012	0.066	1
BG-2S	5/24/2012	0.02	0
BG-2S	3/21/2012	0.0097	1
BG-2M	11/26/2012	0.077	1
BG-2M	8/23/2012	0.054	1
BG-2M	5/24/2012	0.02	0
BG-2M	3/21/2012	0.02	0
BG-2D	11/26/2012	0.073	1
BG-2D	8/23/2012	0.05	1
BG-2D	5/24/2012	0.02	0
BG-2D	3/21/2012	0.02	0
LMW-10	11/28/2012	0.094	1
LMW-10	8/27/2012	0.017	1
LMW-10	5/30/2012	0.02	0
LMW-10	3/22/2012	0.02	0
LMW-10	12/6/2011	0.03	0
LMW-11R	11/26/2012	0.1	1
LMW-11R	8/21/2012	0.015	1
LMW-11R	5/29/2012	0.022	1
LMW-11R	3/23/2012	0.02	0
LMW-7	11/28/2012	0.087	1
LMW-7	8/27/2012	0.0077	1
LMW-7	5/31/2012	0.02	0
LMW-7	3/23/2012	0.02	0
LMW-7	12/5/2011	0.03	0
LMW-9	11/28/2012	0.082	1
LMW-9	8/27/2012	0.012	1
LMW-9	5/31/2012	0.02	0
LMW-9	3/23/2012	0.02	0
LMW-9	12/5/2011	0.03	0

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Titanium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Titanium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	86	0	86	1	85	98.84%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Alluv Titanium, Dissolved was not processed!

Muddy Creek Titanium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	53	0	53	0	53	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Muddy Creek Titanium, Dissolved was not processed!

Mesa Titanium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	4	96	96.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	96	0.005	0.02	0.00859	0.01	0.00259
Statistics (Detects Only)	4	0.014	0.033	0.026	0.0285	0.00837
Statistics (All: NDs treated as DL value)	100	0.005	0.033	0.00929	0.01	0.0045
Statistics (All: NDs treated as DL/2 value)	100	0.0025	0.033	0.00517	0.005	0.00469
Statistics (Normal ROS Estimated Data)	100	-0.0975	0.033	-0.0344	-0.035	0.0273
Statistics (Gamma ROS Estimated Data)	100	0.0088	0.089	0.06	0.0643	0.0211
Statistics (Lognormal ROS Estimated Data)	100	1.0290E-4	0.033	0.00353	0.00165	0.00553

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	10.17	9.876	0.00256	-3.7	0.388	-0.105
Statistics (NDs = DL)	6.099	5.923	0.00152	-4.763	0.398	-0.0835
Statistics (NDs = DL/2)	3.232	3.142	0.0016	-5.428	0.486	-0.0896
Statistics (Gamma ROS Estimates)	5.863	5.694	0.0102	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-6.379	1.214	-0.19

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.932	0.742	0.6	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.876	0.748	Data Appear Normal
Lilliefors (Detects Only)	0.298	0.443	Data Appear Normal
Lilliefors (NDs = DL)	0.387	0.0886	Data Not Normal
Lilliefors (NDs = DL/2)	0.464	0.0886	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0176	0.0886	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.87	0.792	0.709	0.925

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.502	0.657	
Kolmogorov-Smirnov (Detects Only)	0.339	0.395	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	13.61	0.754	
Kolmogorov-Smirnov (NDs = DL)	0.335	0.0896	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	14.86	0.758	
Kolmogorov-Smirnov (NDs = DL/2)	0.399	0.09	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.348	0.754	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.131	0.0896	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.898	0.836	0.805	0.999

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.815	0.748	Data Appear Lognormal
Lilliefors (Detects Only)	0.339	0.443	Data Appear Lognormal
Lilliefors (NDs = DL)	0.364	0.0886	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.344	0.0886	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0187	0.0886	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

All Titanium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	239	0	239	5	234	97.91%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	234	0.005	0.1	0.00959	0.01	0.00626
Statistics (Detects Only)	5	0.014	0.033	0.026	0.027	0.00725
Statistics (All: NDs treated as DL value)	239	0.005	0.1	0.00994	0.01	0.00669
Statistics (All: NDs treated as DL/2 value)	239	0.0025	0.05	0.00524	0.005	0.00444
Statistics (Normal ROS Estimated Data)	239	-0.104	0.033	-0.0359	-0.036	0.0255
Statistics (Gamma ROS Estimated Data)	239	0.00377	0.0697	0.0515	0.0553	0.0145
Statistics (Lognormal ROS Estimated Data)	239	8.7521E-5	0.033	0.00311	0.00167	0.00444

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	12.68	12.52	0.00205	-3.69	0.337	-0.0913
Statistics (NDs = DL)	6.818	6.735	0.00146	-4.687	0.34	-0.0726
Statistics (NDs = DL/2)	4.549	4.495	0.00115	-5.365	0.393	-0.0733
Statistics (Gamma ROS Estimates)	8.53	8.426	0.00604	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-6.391	1.115	-0.174

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.93	0.47	0.492	1

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.88	0.762	Data Appear Normal
Lilliefors (Detects Only)	0.3	0.396	Data Appear Normal
Lilliefors (NDs = DL)	0.467	0.0573	Data Not Normal
Lilliefors (NDs = DL/2)	0.492	0.0573	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.00904	0.0573	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.888	0.528	0.582	0.915

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.545	0.679	
Kolmogorov-Smirnov (Detects Only)	0.337	0.357	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	4.184E+28	0.755	
Kolmogorov-Smirnov (NDs = DL)	0.413	0.0592	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	51.11	0.757	
Kolmogorov-Smirnov (NDs = DL/2)	0.448	0.0593	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.51	0.754	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.149	0.0591	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.888	0.728	0.711	1

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.805	0.762	Data Appear Lognormal
Lilliefors (Detects Only)	0.347	0.396	Data Appear Lognormal
Lilliefors (NDs = DL)	0.431	0.0573	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.404	0.0573	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.00976	0.0573	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Titanium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Titanium, Dissolved

General Statistics

Number of Valid Data	86	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	85

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, B

The data set for variable Alluv Titanium, Dissolved was not processed!

Muddy Creek Titanium, Dissolved

General Statistics

Number of Valid Data	53	Number of Detected Data	0
Number of Distinct Detected Data	0	Number of Non-Detect Data	53

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Muddy Creek Titanium, Dissolved was not processed!

Mesa Titanium, Dissolved

General Statistics

Number of Valid Data	100	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	96
		Percent Non-Detects	96.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.014	Minimum Detected	-4.269
Maximum Detected	0.033	Maximum Detected	-3.411
Mean of Detected	0.026	Mean of Detected	-3.7
SD of Detected	0.00837	SD of Detected	0.388
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Data with Multiple Detection Limits	Single Detection Limit Scenario

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	97
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	3
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	97.00%

Warning: There are only 4 Distinct Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.876	Shapiro Wilk Test Statistic	0.815
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00517	Mean (Log Scale)	-5.428
SD	0.00469	SD (Log Scale)	0.486
95% UTL 95% Coverage	0.0142	95% UTL 95% Coverage	0.0112
95% UPL (t)	0.013	95% UPL (t)	0.00988
90% Percentile (z)	0.0112	90% Percentile (z)	0.00818
95% Percentile (z)	0.0129	95% Percentile (z)	0.00977
99% Percentile (z)	0.0161	99% Percentile (z)	0.0136
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.0236	Mean in Original Scale	0.00353
SD	0.0233	SD in Original Scale	0.00553
95% UTL with 95% Coverage	0.0212	95% UTL with 95% Coverage	0.0175
		95% BCA UTL with 95% Coverage	0.027
		95% Bootstrap (%) UTL with 95% Coverage	0.027
95% UPL (t)	0.0152	95% UPL (t)	0.0129
90% Percentile (z)	0.00623	90% Percentile (z)	0.00804
95% Percentile (z)	0.0147	95% Percentile (z)	0.0125
99% Percentile (z)	0.0306	99% Percentile (z)	0.0286
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.71	Data appear Normal at 5% Significance Level	
Theta Star	0.00959		
nu star	21.68		
A-D Test Statistic	0.502	Nonparametric Statistics	
5% A-D Critical Value	0.657	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.339	Mean	0.0145
5% K-S Critical Value	0.395	SD	0.00276
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	3.1895E-4
		95% KM UTL with 95% Coverage	0.0198
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0266
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0191
Mean	0.06	90% Percentile (z)	0.018
Median	0.0643	95% Percentile (z)	0.019

SD	0.0211	99% Percentile (z)	0.0209
k star	5.694		
Theta star	0.0105	Gamma ROS Limits with Extrapolated Data	
Nu star	1139	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.107
95% Percentile of Chisquare (2k)	20.2	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.109
		95% WH Approx. Gamma UTL with 95% Coverage	0.116
90% Percentile	0.0936	95% HW Approx. Gamma UTL with 95% Coverage	0.12
95% Percentile	0.106		
99% Percentile	0.133		

Note: DL/2 is not a recommended method.

All Titanium, Dissolved

General Statistics

Number of Valid Data	239	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	234
		Percent Non-Detects	97.91%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.014	Minimum Detected	-4.269
Maximum Detected	0.033	Maximum Detected	-3.411
Mean of Detected	0.026	Mean of Detected	-3.69
SD of Detected	0.00725	SD of Detected	0.337
Minimum Non-Detect	0.005	Minimum Non-Detect	-5.298
Maximum Non-Detect	0.1	Maximum Non-Detect	-2.303

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	239
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Warning: There are only 5 Detected Values in this data

Note: It should be noted that even though bootstrap may be performed on this data set

the resulting calculations may not be reliable enough to draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.88	Shapiro Wilk Test Statistic	0.805
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00524	Mean (Log Scale)	-5.365
SD	0.00444	SD (Log Scale)	0.393
95% UTL 95% Coverage	0.0133	95% UTL 95% Coverage	0.00956
95% UPL (t)	0.0126	95% UPL (t)	0.00897
90% Percentile (z)	0.0109	90% Percentile (z)	0.00774

95% Percentile (z)	0.0125	95% Percentile (z)	0.00893
99% Percentile (z)	0.0156	99% Percentile (z)	0.0117
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00311
		SD in Original Scale	0.00444
		Mean in Log Scale	-6.391
		SD in Log Scale	1.115
		95% UTL 95% Coverage	0.0127
		95% UPL (t)	0.0106
		90% Percentile (z)	0.007
		95% Percentile (z)	0.0105
		99% Percentile (z)	0.0224
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	5.204	Data appear Normal at 5% Significance Level	
Theta Star	0.005		
nu star	52.04		
A-D Test Statistic	0.545	Nonparametric Statistics	
5% A-D Critical Value	0.679	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.337	Mean	0.0143
5% K-S Critical Value	0.357	SD	0.00196
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.4209E-4
		95% KM UTL with 95% Coverage	0.0178
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0228
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0175
Mean	0.0515	90% Percentile (z)	0.0168
Median	0.0553	95% Percentile (z)	0.0175
SD	0.0145	99% Percentile (z)	0.0188
k star	8.426		
Theta star	0.00611	Gamma ROS Limits with Extrapolated Data	
Nu star	4028	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0837
95% Percentile of Chisquare (2k)	27.4	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0855
		95% WH Approx. Gamma UTL with 95% Coverage	0.0877
90% Percentile	0.0751	95% HW Approx. Gamma UTL with 95% Coverage	0.0899
95% Percentile	0.0837		
99% Percentile	0.101		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Titanium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Titanium, Dissolved

Background Data: Alluv Titanium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	86
Number of Non-Detect Data	96	85
Number of Detect Data	4	1
Minimum Non-Detect	0.005	0.005
Maximum Non-Detect	0.02	0.1
Percent Non detects	96.00%	98.84%
Minimum Detected	0.014	0.026
Maximum Detected	0.033	0.026
Mean of Detected Data	0.026	0.026
Median of Detected Data	0.0285	0.026
SD of Detected Data	0.00837	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	1.187
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.235

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Titanium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Titanium, Dissolved

Background Data: Alluv Titanium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	53	86
Number of Non-Detect Data	53	85
Number of Detect Data	0	1
Minimum Non-Detect	0.005	0.005
Maximum Non-Detect	0.01	0.1
Percent Non detects	100.00%	98.84%
Minimum Detected	N/A	0.026
Maximum Detected	N/A	0.026
Mean of Detected Data	N/A	0.026
Median of Detected Data	N/A	0.026
SD of Detected Data	N/A	N/A

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-0.791
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.429

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Titanium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Titanium, Dissolved

Background Data: Muddy Creek Titanium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	53
Number of Non-Detect Data	96	53
Number of Detect Data	4	0
Minimum Non-Detect	0.005	0.005
Maximum Non-Detect	0.02	0.01
Percent Non detects	96.00%	100.00%
Minimum Detected	0.014	N/A
Maximum Detected	0.033	N/A
Mean of Detected Data	0.026	N/A
Median of Detected Data	0.0285	N/A
SD of Detected Data	0.00837	N/A

Site vs Background Gehan Test

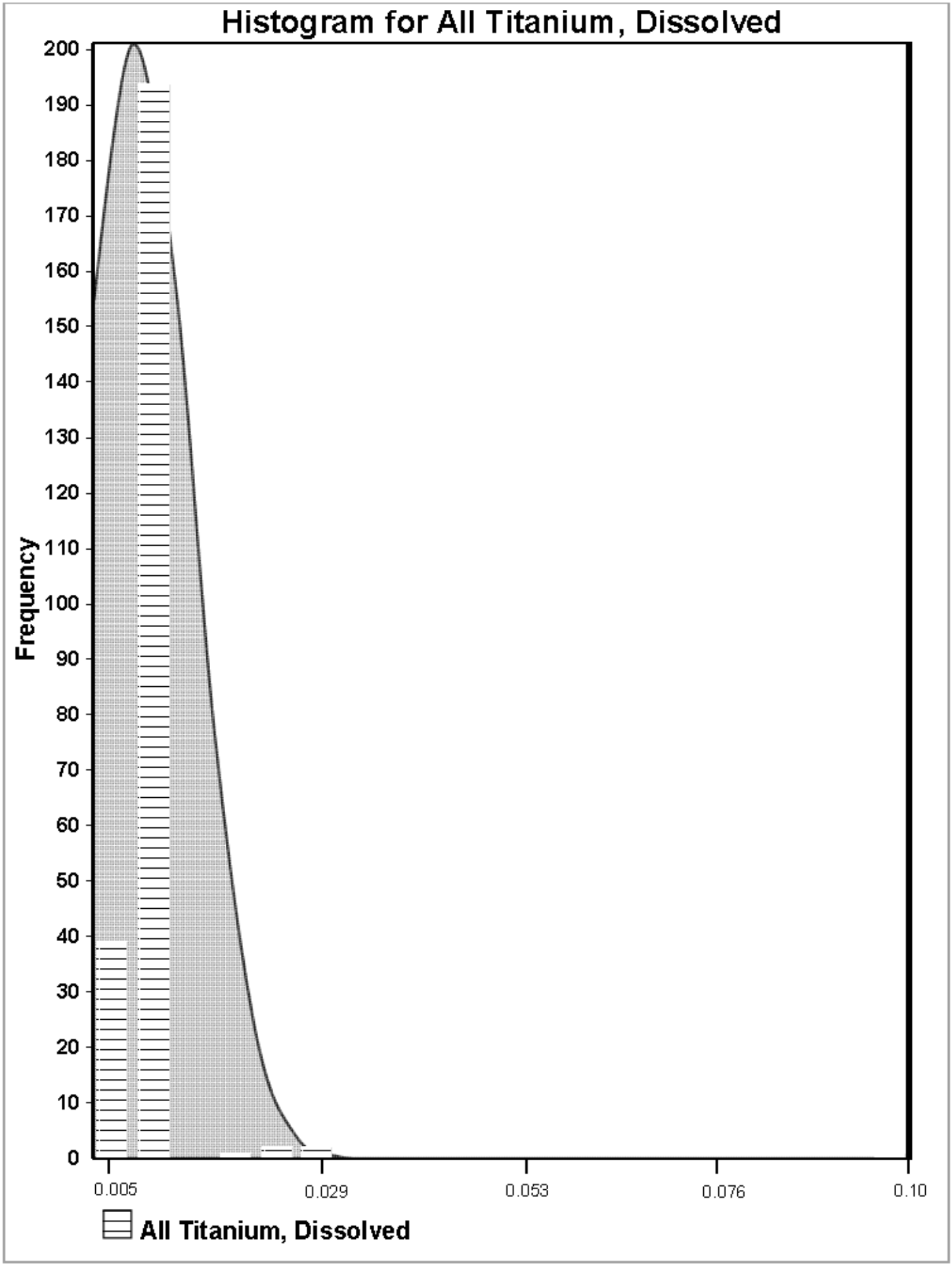
H0: Mu of Site or AOC = Mu of background

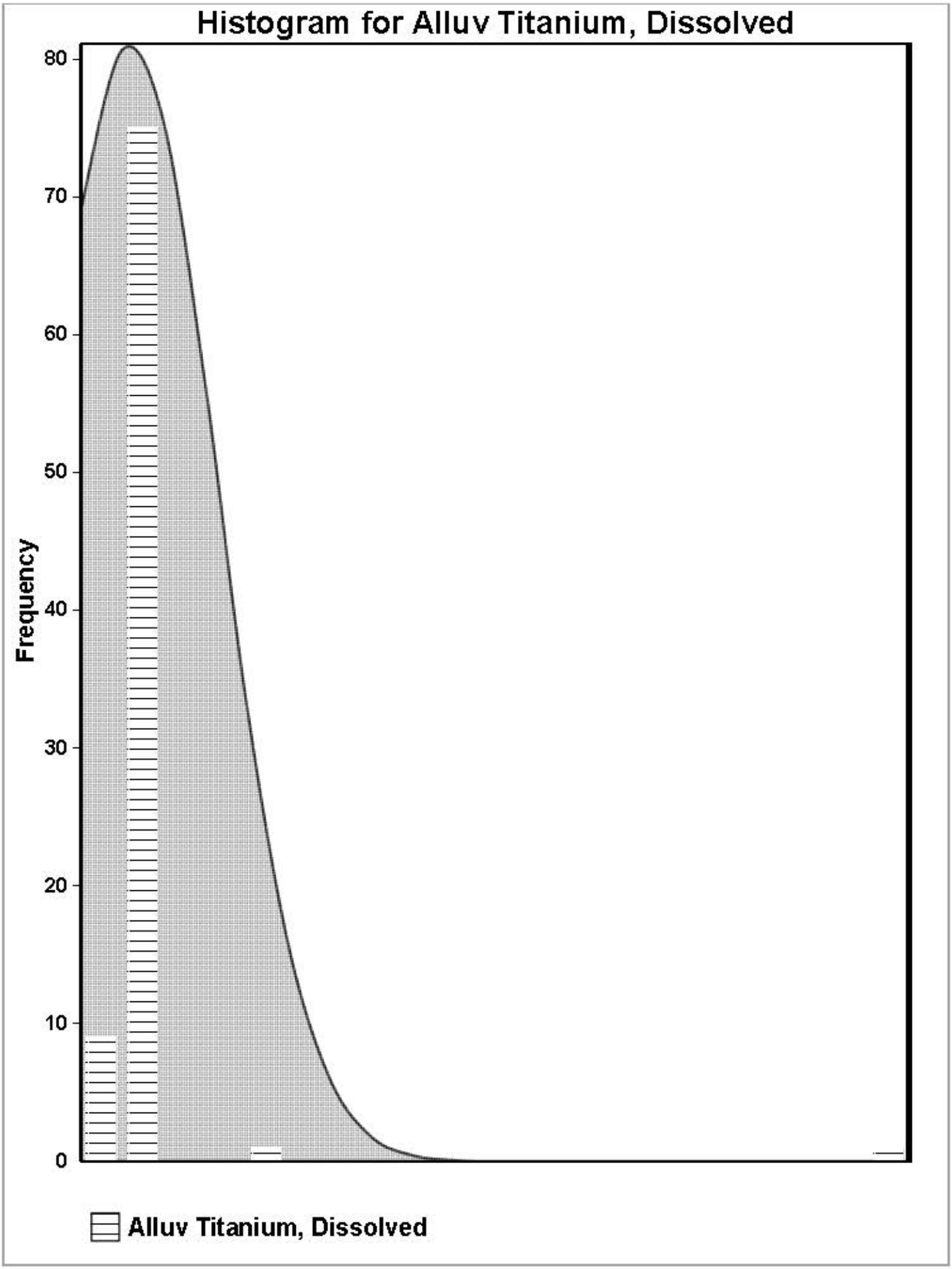
Gehan z Test Value	1.473
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.141

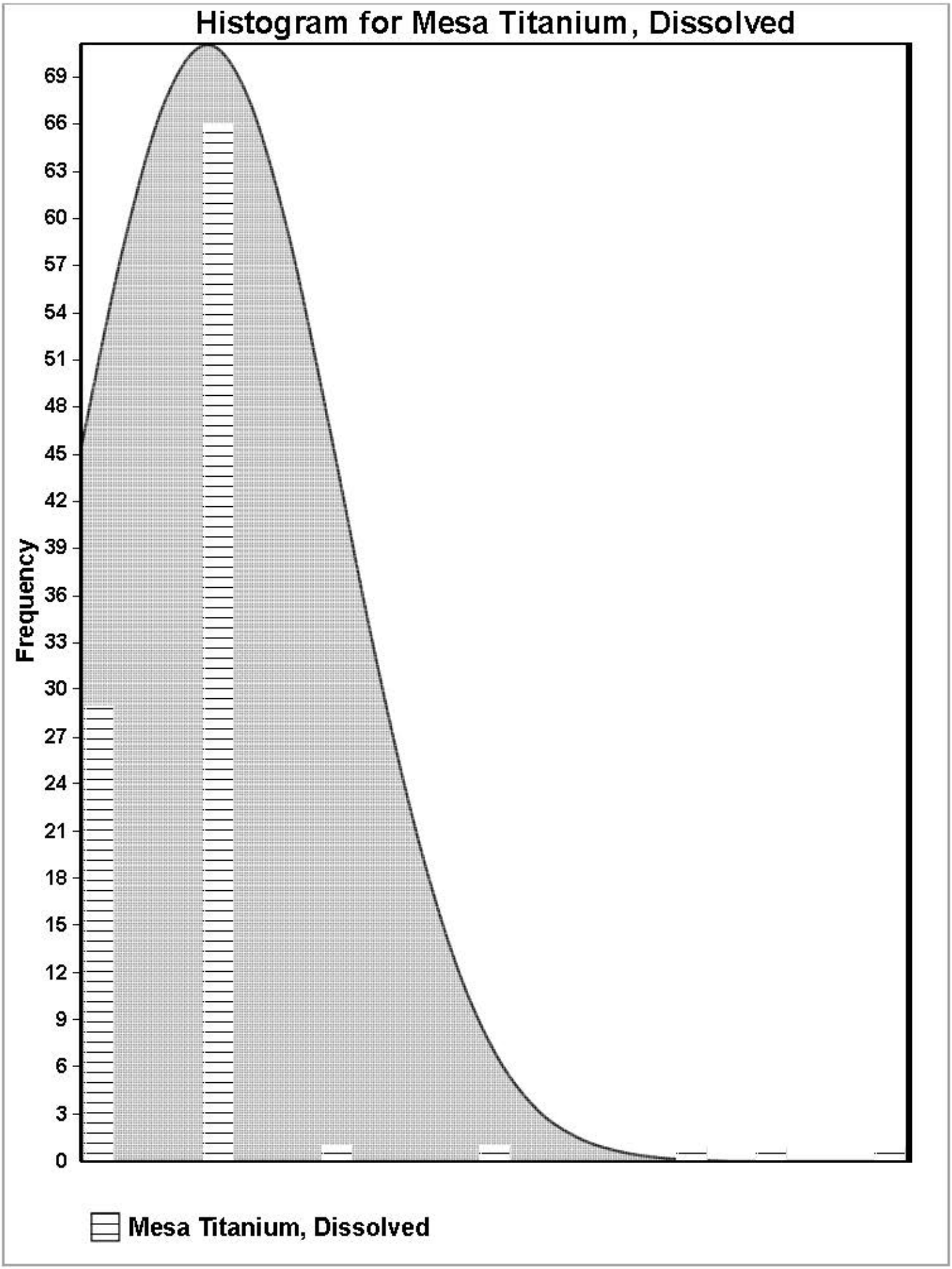
Conclusion with Alpha = 0.05

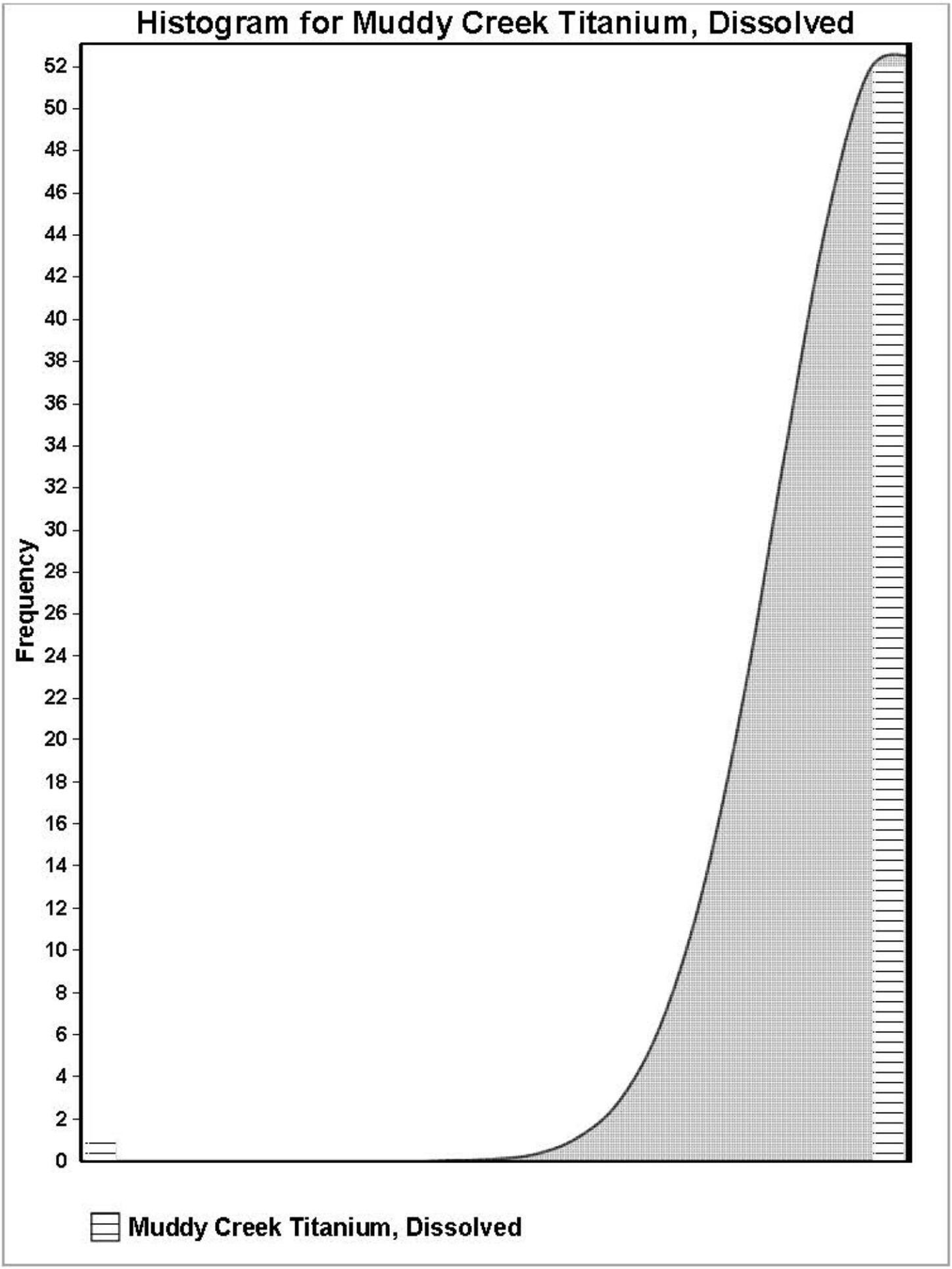
Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for All Titanium, Dissolved
Frequency
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0.005
0.029
0.053
0.076
0.10
All Titanium, Dissolved


Histogram for Alluv Titanium, Dissolved
Frequency
80
70
60
50
40
30
20
10
0
Alluv Titanium, Dissolved


Histogram for Mesa Titanium, Dissolved
Frequency
69
66
63
60
57
54
51
48
45
42
39
36
33
30
27
24
21
18
15
12
9
6
3
0
Mesa Titanium, Dissolved


Histogram for Muddy Creek Titanium, Dissolved
Frequency
52
50
48
46
44
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
Muddy Creek Titanium, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Titanium_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Titanium, Dissolved

Mean	0.00551
Standard Deviation	0.00542
Number of data	86
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00551	0.00539	0.05	43	8.252	3.334	3.7

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.05 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.05 is a Potential Statistical Outlier

Rosner's Outlier Test for Muddy Creek Titanium, Dissolved

Mean	0.00495
Standard Deviation	3.4340E-4
Number of data	53
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00495	3.4015E-4	0.0025	47	7.211	3.151	3.504

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.0025 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.0025 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Titanium, Dissolved

Mean	0.00517
Standard Deviation	0.00469
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00517	0.00467	0.033	30	5.965	3.38	3.75

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.033 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.033 is a Potential Statistical Outlier

Rosner's Outlier Test for All Titanium, Dissolved

Mean	0.00524
Standard Deviation	0.00444
Number of data	239
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00524	0.00443	0.05	43	10.1	3.656	4.027

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.05 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.05 is a Potential Statistical Outlier

Location Name	Sample Date	Alluv Titanium, Dissolved	D_Alluv Titanium, Dissolved
BG-1S	11/26/2012	0.01	0
BG-1S	8/23/2012	0.01	0
BG-1S	5/24/2012	0.01	0
BG-1S	3/20/2012	0.01	0
IMW-2.5D	11/26/2012	0.01	0
IMW-2.5D	8/24/2012	0.01	0
IMW-2.5D	5/21/2012	0.01	0
IMW-2.5D	3/21/2012	0.01	0
IMW-2.5D	12/8/2011	0.005	0
IMW-2.5D	6/6/2011	0.01	0
IMW-2.5D	12/15/2010	0.01	0
IMW-2.5D	6/9/2010	0.01	0
IMW-2.5D	12/12/2009	0.01	0
IMW-2.5S	11/26/2012	0.01	0
IMW-2.5S	8/24/2012	0.01	0
IMW-2.5S	5/21/2012	0.01	0
IMW-2.5S	3/21/2012	0.01	0
IMW-2.5S	12/8/2011	0.005	0
IMW-2.5S	9/9/2011	0.005	0
IMW-2.5S	6/6/2011	0.01	0
IMW-2.5S	3/7/2011	0.01	0
IMW-2.5S	12/15/2010	0.01	0
IMW-2.5S	9/20/2010	0.01	0
IMW-2.5S	6/9/2010	0.01	0
IMW-2.5S	3/9/2010	0.01	0
IMW-2.5S	12/12/2009	0.01	0
IMW-2.5S	9/21/2009	0.01	0
IMW-3S	5/21/2012	0.01	0
IMW-3S	3/20/2012	0.01	0
IMW-3S	12/9/2011	0.005	0
IMW-3S	9/9/2011	0.005	0
IMW-3S	6/7/2011	0.01	0
IMW-3S	3/7/2011	0.01	0
IMW-3S	12/10/2010	0.01	0
IMW-3S	9/16/2010	0.01	0
IMW-3S	6/8/2010	0.01	0
IMW-3S	3/9/2010	0.01	0
IMW-3S	12/10/2009	0.01	0
IMW-3S	9/14/2009	0.01	0
IMW-3S	6/9/2009	0.01	0
IMW-3S	3/3/2009	0.01	0
IMW-3S	12/9/2008	0.01	0
IMW-3S	9/9/2008	0.1	0
IMW-3S	6/3/2008	0.01	0
IMW-3S	3/4/2008	0.01	0
KMW-2D	11/26/2012	0.01	0
KMW-2D	8/24/2012	0.01	0
KMW-2D	5/21/2012	0.01	0
KMW-2D	3/23/2012	0.01	0
KMW-2D	12/8/2011	0.005	0
KMW-2D	6/6/2011	0.01	0
KMW-2D	12/13/2010	0.01	0
KMW-2D	6/8/2010	0.01	0
KMW-2D	12/8/2009	0.01	0
KMW-2D	12/10/2008	0.01	0
KMW-2M	11/26/2012	0.01	0
KMW-2M	8/24/2012	0.01	0
KMW-2M	5/21/2012	0.01	0
KMW-2M	3/23/2012	0.01	0
KMW-2M	12/8/2011	0.005	0
KMW-2M	6/6/2011	0.01	0
KMW-2M	12/13/2010	0.01	0
KMW-2M	6/8/2010	0.01	0
KMW-2M	12/8/2009	0.01	0
KMW-2M	12/10/2008	0.01	0
KMW-2M	6/3/2008	0.01	0
KMW-2S	11/26/2012	0.01	0
KMW-2S	8/24/2012	0.01	0
KMW-2S	5/21/2012	0.01	0
KMW-2S	3/23/2012	0.01	0
KMW-2S	12/8/2011	0.005	0
KMW-2S	9/9/2011	0.005	0
KMW-2S	6/6/2011	0.01	0
KMW-2S	3/8/2011	0.01	0
KMW-2S	12/13/2010	0.01	0
KMW-2S	9/15/2010	0.01	0
KMW-2S	6/8/2010	0.01	0
KMW-2S	3/9/2010	0.01	0
KMW-2S	12/8/2009	0.01	0
KMW-2S	9/16/2009	0.01	0
KMW-2S	6/10/2009	0.01	0
KMW-2S	3/3/2009	0.01	0
KMW-2S	12/10/2008	0.01	0
KMW-2S	9/8/2008	0.026	1
KMW-2S	6/3/2008	0.01	0
KMW-2S	3/4/2008	0.01	0

Location Name	Sample Date	Muddy Creek Titanium, Dissolved	D_Muddy Creek Titanium, Dissolved
BG-3S	11/27/2012	0.01	0
BG-3S	8/22/2012	0.01	0
BG-3S	5/23/2012	0.01	0
BG-3S	3/21/2012	0.01	0
BG-4S	11/27/2012	0.01	0
BG-4S	8/30/2012	0.01	0
BG-4S	5/30/2012	0.01	0
BG-4S	3/20/2012	0.01	0
BG-6S	11/27/2012	0.01	0
BG-6S	8/23/2012	0.01	0
BG-6S	5/25/2012	0.01	0
BG-6S	3/21/2012	0.01	0
BG-1M	11/26/2012	0.01	0
BG-1M	8/23/2012	0.01	0
BG-1M	5/24/2012	0.01	0
BG-1M	3/20/2012	0.01	0
BG-3M	11/27/2012	0.01	0
BG-3M	8/22/2012	0.01	0
BG-3M	5/24/2012	0.01	0
BG-3M	3/21/2012	0.01	0
BG-4M	11/27/2012	0.01	0
BG-4M	8/30/2012	0.01	0
BG-4M	5/30/2012	0.01	0
BG-4M	3/20/2012	0.01	0
BG-6M	11/27/2012	0.01	0
BG-6M	8/22/2012	0.01	0
BG-6M	5/25/2012	0.01	0
BG-6M	3/21/2012	0.01	0
BG-1D	11/26/2012	0.01	0
BG-1D	8/23/2012	0.01	0
BG-1D	5/24/2012	0.01	0
BG-1D	3/20/2012	0.01	0
BG-3D	11/27/2012	0.01	0
BG-3D	8/21/2012	0.01	0
BG-3D	5/23/2012	0.01	0
BG-3D	3/21/2012	0.01	0
BG-4D	11/27/2012	0.01	0
BG-4D	8/30/2012	0.01	0
BG-4D	5/30/2012	0.01	0
BG-4D	3/20/2012	0.01	0
BG-6D	11/27/2012	0.01	0
BG-6D	8/22/2012	0.01	0
BG-6D	5/25/2012	0.01	0
BG-6D	3/21/2012	0.01	0
IMW-3D	5/25/2012	0.01	0
IMW-3D	3/22/2012	0.01	0
IMW-3D	12/9/2011	0.005	0
IMW-3D	6/7/2011	0.01	0
IMW-3D	12/10/2010	0.01	0
IMW-3D	6/8/2010	0.01	0
IMW-3D	12/10/2009	0.01	0
IMW-3D	12/9/2008	0.01	0
IMW-3D	6/3/2008	0.01	0
BG-2S	11/26/2012	0.01	0
BG-2S	8/23/2012	0.01	0
BG-2S	5/24/2012	0.01	0
BG-2S	3/21/2012	0.01	0
BG-2M	11/26/2012	0.01	0
BG-2M	8/23/2012	0.01	0
BG-2M	5/24/2012	0.01	0
BG-2M	3/21/2012	0.01	0
BG-2D	11/26/2012	0.01	0
BG-2D	8/23/2012	0.01	0
BG-2D	5/24/2012	0.01	0
BG-2D	3/21/2012	0.01	0
LMW-10	11/28/2012	0.01	0
LMW-10	8/27/2012	0.01	0
LMW-10	5/30/2012	0.01	0
LMW-10	3/22/2012	0.01	0
LMW-10	12/6/2011	0.005	0
LMW-10	9/8/2011	0.005	0
LMW-10	6/8/2011	0.01	0
LMW-10	3/2/2011	0.01	0
LMW-10	12/9/2010	0.02	0
LMW-10	9/21/2010	0.01	0
LMW-10	6/9/2010	0.01	0
LMW-10	3/11/2010	0.01	0
LMW-10	12/11/2009	0.01	0
LMW-10	9/18/2009	0.01	0
LMW-10	6/10/2009	0.01	0
LMW-10	3/5/2009	0.01	0
LMW-10	12/12/2008	0.01	0

Location Name	Sample Date	Mesa Titanium, Dissolved	D_Mesa Titanium, Dissolved
BG-2S	11/26/2012	0.01	0
BG-2S	8/23/2012	0.01	0
BG-2S	5/24/2012	0.01	0
BG-2S	3/21/2012	0.01	0
BG-2M	11/26/2012	0.01	0
BG-2M	8/23/2012	0.01	0
BG-2M	5/24/2012	0.01	0
BG-2M	3/21/2012	0.01	0
BG-2D	11/26/2012	0.01	0
BG-2D	8/23/2012	0.01	0
BG-2D	5/24/2012	0.01	0
BG-2D	3/21/2012	0.01	0
LMW-10	11/28/2012	0.01	0
LMW-10	8/27/2012	0.01	0
LMW-10	5/30/2012	0.01	0
LMW-10	3/22/2012	0.01	0
LMW-10	12/6/2011	0.005	0
LMW-10	9/8/2011	0.005	0
LMW-10	6/8/2011	0.01	0
LMW-10	3/2/2011	0.01	0
LMW-10	12/9/2010	0.02	0
LMW-10	9/21/2010	0.01	0
LMW-10	6/9/2010	0.01	0
LMW-10	3/11/2010	0.01	0
LMW-10	12/11/2009	0.01	0
LMW-10	9/18/2009	0.01	0
LMW-10	6/10/2009	0.01	0
LMW-10	3/5/2009	0.01	0
LMW-10	12/12/2008	0.01	0
LMW-10	9/10/2008	0.01	0
LMW-10	6/4/2008	0.01	0
LMW-10	3/5/2008	0.01	0
LMW-11R	11/26/2012	0.01	0
LMW-11R	8/21/2012	0.01	0
LMW-11R	5/29/2012	0.01	0
LMW-11R	3/23/2012	0.01	0
LMW-7	11/28/2012	0.01	0
LMW-7	8/27/2012	0.01	0
LMW-7	5/31/2012	0.01	0
LMW-7	3/23/2012	0.01	0
LMW-7	12/5/2011	0.005	0
LMW-7	9/6/2011	0.005	0
LMW-7	6/9/2011	0.01	0
LMW-7	3/9/2011	0.01	0
LMW-7	12/10/2010	0.01	0
LMW-7	9/21/2010	0.01	0
LMW-7	6/9/2010	0.01	0
LMW-7	3/11/2010	0.01	0
LMW-7	12/11/2009	0.014	1
LMW-7	9/18/2009	0.01	0
LMW-7	6/10/2009	0.03	1
LMW-7	3/5/2009	0.01	0
LMW-7	12/12/2008	0.01	0
LMW-7	9/10/2008	0.027	1
LMW-7	6/4/2008	0.01	0
LMW-7	3/5/2008	0.01	0
LMW-9	11/28/2012	0.01	0
LMW-9	8/27/2012	0.01	0
LMW-9	5/31/2012	0.01	0
LMW-9	3/23/2012	0.01	0
LMW-9	12/5/2011	0.005	0
LMW-9	9/8/2011	0.005	0
LMW-9	6/8/2011	0.01	0
LMW-9	3/9/2011	0.01	0
LMW-9	12/10/2010	0.01	0
LMW-9	9/21/2010	0.01	0
LMW-9	6/9/2010	0.01	0
LMW-9	3/11/2010	0.01	0
LMW-9	12/11/2009	0.01	0
LMW-9	9/18/2009	0.01	0
LMW-9	6/10/2009	0.01	0
LMW-9	3/5/2009	0.01	0
LMW-9	12/12/2008	0.01	0
LMW-9	9/10/2008	0.01	0
LMW-9	6/4/2008	0.01	0
LMW-9	3/5/2008	0.01	0
LMW-11	2/22/2012	0.005	0
LMW-11	12/6/2011	0.005	0
LMW-11	9/8/2011	0.005	0
LMW-11	3/2/2011	0.01	0
LMW-12R	11/30/2012	0.005	0
LMW-12R	10/22/2012	0.005	0
LMW-12R	8/21/2012	0.005	0
LMW-12R	5/30/2012	0.005	0
LMW-13R	11/28/2012	0.005	0
LMW-13R	10/22/2012	0.005	0
LMW-13R	8/20/2012	0.005	0
LMW-13R	5/29/2012	0.005	0
LMW-14R	11/30/2012	0.005	0
LMW-14R	10/22/2012	0.005	0
LMW-14R	8/20/2012	0.005	0
LMW-14R	5/29/2012	0.005	0
LMW-15	11/28/2012	0.005	0
LMW-15	10/22/2012	0.005	0
LMW-15	8/20/2012	0.005	0
LMW-15	5/29/2012	0.005	0
LMW-16	11/28/2012	0.005	0
LMW-16	10/22/2012	0.005	0
LMW-16	8/20/2012	0.005	0
LMW-16	5/29/2012	0.005	0

Location Name	Sample Date	All Titanium, Dissolved	D_All Titanium, Dissolved
BG-1S	11/26/2012	0.01	0
BG-1S	8/23/2012	0.01	0
BG-1S	5/24/2012	0.01	0
BG-1S	3/20/2012	0.01	0
IMW-2.5D	11/26/2012	0.01	0
IMW-2.5D	8/24/2012	0.01	0
IMW-2.5D	5/21/2012	0.01	0
IMW-2.5D	3/21/2012	0.01	0
IMW-2.5D	12/8/2011	0.005	0
IMW-2.5D	6/6/2011	0.01	0
IMW-2.5D	12/15/2010	0.01	0
IMW-2.5D	6/9/2010	0.01	0
IMW-2.5D	12/12/2009	0.01	0
IMW-2.5S	11/26/2012	0.01	0
IMW-2.5S	8/24/2012	0.01	0
IMW-2.5S	5/21/2012	0.01	0
IMW-2.5S	3/21/2012	0.01	0
IMW-2.5S	12/8/2011	0.005	0
IMW-2.5S	9/9/2011	0.005	0
IMW-2.5S	6/6/2011	0.01	0
IMW-2.5S	3/7/2011	0.01	0
IMW-2.5S	12/15/2010	0.01	0
IMW-2.5S	9/20/2010	0.01	0
IMW-2.5S	6/9/2010	0.01	0
IMW-2.5S	3/9/2010	0.01	0
IMW-2.5S	12/12/2009	0.01	0
IMW-2.5S	9/21/2009	0.01	0
IMW-3S	5/21/2012	0.01	0
IMW-3S	3/20/2012	0.01	0
IMW-3S	12/9/2011	0.005	0
IMW-3S	9/9/2011	0.005	0
IMW-3S	6/7/2011	0.01	0
IMW-3S	3/7/2011	0.01	0
IMW-3S	12/10/2010	0.01	0
IMW-3S	9/16/2010	0.01	0
IMW-3S	6/8/2010	0.01	0
IMW-3S	3/9/2010	0.01	0
IMW-3S	12/10/2009	0.01	0
IMW-3S	9/14/2009	0.01	0
IMW-3S	6/9/2009	0.01	0
IMW-3S	3/3/2009	0.01	0
IMW-3S	12/9/2008	0.01	0
IMW-3S	9/9/2008	0.1	0
IMW-3S	6/3/2008	0.01	0
IMW-3S	3/4/2008	0.01	0
KMW-2D	11/26/2012	0.01	0
KMW-2D	8/24/2012	0.01	0
KMW-2D	5/21/2012	0.01	0
KMW-2D	3/23/2012	0.01	0
KMW-2D	12/8/2011	0.005	0
KMW-2D	6/6/2011	0.01	0
KMW-2D	12/13/2010	0.01	0
KMW-2D	6/8/2010	0.01	0
KMW-2D	12/8/2009	0.01	0
KMW-2D	12/10/2008	0.01	0
KMW-2M	11/26/2012	0.01	0
KMW-2M	8/24/2012	0.01	0
KMW-2M	5/21/2012	0.01	0
KMW-2M	3/23/2012	0.01	0
KMW-2M	12/8/2011	0.005	0
KMW-2M	6/6/2011	0.01	0
KMW-2M	12/13/2010	0.01	0
KMW-2M	6/8/2010	0.01	0
KMW-2M	12/8/2009	0.01	0
KMW-2M	12/10/2008	0.01	0
KMW-2M	6/3/2008	0.01	0
KMW-2S	11/26/2012	0.01	0
KMW-2S	8/24/2012	0.01	0
KMW-2S	5/21/2012	0.01	0
KMW-2S	3/23/2012	0.01	0
KMW-2S	12/8/2011	0.005	0
KMW-2S	9/9/2011	0.005	0
KMW-2S	6/6/2011	0.01	0
KMW-2S	3/8/2011	0.01	0
KMW-2S	12/13/2010	0.01	0
KMW-2S	9/15/2010	0.01	0
KMW-2S	6/8/2010	0.01	0
KMW-2S	3/9/2010	0.01	0
KMW-2S	12/8/2009	0.01	0
KMW-2S	9/16/2009	0.01	0
KMW-2S	6/10/2009	0.01	0
KMW-2S	3/3/2009	0.01	0
KMW-2S	12/10/2008	0.01	0
KMW-2S	9/8/2008	0.026	1
KMW-2S	6/3/2008	0.01	0
KMW-2S	3/4/2008	0.01	0
BG-3S	11/27/2012	0.01	0
BG-3S	8/22/2012	0.01	0
BG-3S	5/23/2012	0.01	0
BG-3S	3/21/2012	0.01	0
BG-4S	11/27/2012	0.01	0
BG-4S	8/30/2012	0.01	0
BG-4S	5/30/2012	0.01	0
BG-4S	3/20/2012	0.01	0
BG-6S	11/27/2012	0.01	0
BG-6S	8/23/2012	0.01	0
BG-6S	5/25/2012	0.01	0
BG-6S	3/21/2012	0.01	0
BG-1M	11/26/2012	0.01	0
BG-1M	8/23/2012	0.01	0
BG-1M	5/24/2012	0.01	0
BG-1M	3/20/2012	0.01	0
BG-3M	11/27/2012	0.01	0
BG-3M	8/22/2012	0.01	0
BG-3M	5/24/2012	0.01	0
BG-3M	3/21/2012	0.01	0
BG-4M	11/27/2012	0.01	0
BG-4M	8/30/2012	0.01	0
BG-4M	5/30/2012	0.01	0
BG-4M	3/20/2012	0.01	0
BG-6M	11/27/2012	0.01	0
BG-6M	8/22/2012	0.01	0
BG-6M	5/25/2012	0.01	0
BG-6M	3/21/2012	0.01	0
BG-1D	11/26/2012	0.01	0
BG-1D	8/23/2012	0.01	0
BG-1D	5/24/2012	0.01	0
BG-1D	3/20/2012	0.01	0
BG-3D	11/27/2012	0.01	0
BG-3D	8/21/2012	0.01	0
BG-3D	5/23/2012	0.01	0
BG-3D	3/21/2012	0.01	0
BG-4D	11/27/2012	0.01	0
BG-4D	8/30/2012	0.01	0
BG-4D	5/30/2012	0.01	0
BG-4D	3/20/2012	0.01	0
BG-6D	11/27/2012	0.01	0
BG-6D	8/22/2012	0.01	0
BG-6D	5/25/2012	0.01	0
BG-6D	3/21/2012	0.01	0
IMW-3D	5/25/2012	0.01	0
IMW-3D	3/22/2012	0.01	0
IMW-3D	12/9/2011	0.005	0
IMW-3D	6/7/2011	0.01	0
IMW-3D	12/10/2010	0.01	0
IMW-3D	6/8/2010	0.01	0
IMW-3D	12/10/2009	0.01	0
IMW-3D	12/9/2008	0.01	0
IMW-3D	6/3/2008	0.01	0
BG-2S	11/26/2012	0.01	0
BG-2S	8/23/2012	0.01	0
BG-2S	5/24/2012	0.01	0
BG-2S	3/21/2012	0.01	0
BG-2M	11/26/2012	0.01	0
BG-2M	8/23/2012	0.01	0
BG-2M	5/24/2012	0.01	0
BG-2M	3/21/2012	0.01	0
BG-2D	11/26/2012	0.01	0
BG-2D	8/23/2012	0.01	0
BG-2D	5/24/2012	0.01	0
BG-2D	3/21/2012	0.01	0
LMW-10	11/28/2012	0.01	0
LMW-10	8/27/2012	0.01	0
LMW-10	5/30/2012	0.01	0
LMW-10	3/22/2012	0.01	0
LMW-10	12/6/2011	0.005	0
LMW-10	9/8/2011	0.005	0
LMW-10	6/8/2011	0.01	0
LMW-10	3/2/2011	0.01	0
LMW-10	12/9/2010	0.02	0
LMW-10	9/21/2010	0.01	0
LMW-10	6/9/2010	0.01	0
LMW-10	3/11/2010	0.01	0
LMW-10	12/11/2009	0.01	0
LMW-10	9/18/2009	0.01	0
LMW-10	6/10/2009	0.01	0
LMW-10	3/5/2009	0.01	0
LMW-10	12/12/2008	0.01	0

LMW-10	9/10/2008	0.033	1
LMW-10	6/4/2008	0.01	0
LMW-10	3/5/2008	0.01	0
LMW-11R	11/26/2012	0.01	0
LMW-11R	8/21/2012	0.01	0
LMW-11R	5/29/2012	0.01	0
LMW-11R	3/23/2012	0.01	0
LMW-7	11/28/2012	0.01	0
LMW-7	8/27/2012	0.01	0
LMW-7	5/31/2012	0.01	0
LMW-7	3/23/2012	0.01	0
LMW-7	12/5/2011	0.005	0
LMW-7	9/6/2011	0.005	0
LMW-7	6/9/2011	0.01	0
LMW-7	3/9/2011	0.01	0
LMW-7	12/10/2010	0.01	0
LMW-7	9/21/2010	0.01	0
LMW-7	6/9/2010	0.01	0
LMW-7	3/11/2010	0.01	0
LMW-7	12/11/2009	0.014	1
LMW-7	9/18/2009	0.01	0
LMW-7	6/10/2009	0.03	1
LMW-7	3/5/2009	0.01	0
LMW-7	12/12/2008	0.01	0
LMW-7	9/10/2008	0.027	1
LMW-7	6/4/2008	0.01	0
LMW-7	3/5/2008	0.01	0
LMW-9	11/28/2012	0.01	0
LMW-9	8/27/2012	0.01	0
LMW-9	5/31/2012	0.01	0
LMW-9	3/23/2012	0.01	0
LMW-9	12/5/2011	0.005	0
LMW-9	9/8/2011	0.005	0
LMW-9	6/8/2011	0.01	0
LMW-9	3/9/2011	0.01	0
LMW-9	12/10/2010	0.01	0
LMW-9	9/21/2010	0.01	0
LMW-9	6/9/2010	0.01	0
LMW-9	3/11/2010	0.01	0
LMW-9	12/11/2009	0.01	0
LMW-9	9/18/2009	0.01	0
LMW-9	6/10/2009	0.01	0
LMW-9	3/5/2009	0.01	0
LMW-9	12/12/2008	0.01	0
LMW-9	9/10/2008	0.01	0
LMW-9	6/4/2008	0.01	0
LMW-9	3/5/2008	0.01	0
LMW-11	2/22/2012	0.005	0
LMW-11	12/6/2011	0.005	0
LMW-11	9/8/2011	0.005	0
LMW-11	3/2/2011	0.01	0
LMW-12R	11/30/2012	0.005	0
LMW-12R	10/22/2012	0.005	0
LMW-12R	8/21/2012	0.005	0
LMW-12R	5/30/2012	0.005	0
LMW-13R	11/28/2012	0.005	0
LMW-13R	10/22/2012	0.005	0
LMW-13R	8/20/2012	0.005	0
LMW-13R	5/29/2012	0.005	0
LMW-14R	11/30/2012	0.005	0
LMW-14R	10/22/2012	0.005	0
LMW-14R	8/20/2012	0.005	0
LMW-14R	5/29/2012	0.005	0
LMW-15	11/28/2012	0.005	0
LMW-15	10/22/2012	0.005	0
LMW-15	8/20/2012	0.005	0
LMW-15	5/29/2012	0.005	0
LMW-16	11/28/2012	0.005	0
LMW-16	10/22/2012	0.005	0
LMW-16	8/20/2012	0.005	0
LMW-16	5/29/2012	0.005	0

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options	
From File	Total Dissolved Solids.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Total Dissolved Solids

Raw Statistics	
Number of Valid Observations	87
Number of Distinct Observations	40
Minimum	1200
Maximum	3400
Mean of Raw Data	2467
Standard Deviation of Raw Data	497.4
Kstar	20.28
Mean of Log Transformed Data	7.787
Standard Deviation of Log Transformed Data	0.231

Normal Distribution Test Results	
Correlation Coefficient R	0.958
Approximate Shapiro Wilk Test Statistic	0.904
Approximate Shapiro Wilk P Value	4.0189E-7
Lilliefors Test Statistic	0.17
Lilliefors Critical (0.95) Value	0.095

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results	
Correlation Coefficient R	0.932
A-D Test Statistic	4.083
A-D Critical (0.95) Value	0.75
K-S Test Statistic	0.197
K-S Critical(0.95) Value	0.0956

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results	
Correlation Coefficient R	0.926
Approximate Shapiro Wilk Test Statistic	0.849
Approximate Shapiro Wilk P Value	1.517E-12
Lilliefors Test Statistic	0.208
Lilliefors Critical (0.95) Value	0.095

Data not Lognormal at (0.05) Significance Level

Muddy Creek Total Dissolved Solids

Raw Statistics	
Number of Valid Observations	53
Number of Distinct Observations	16
Minimum	1000

Maximum	2600
Mean of Raw Data	1596
Standard Deviation of Raw Data	358.8
Kstar	19.8
Mean of Log Transformed Data	7.351
Standard Deviation of Log Transformed Data	0.221

Normal Distribution Test Results

Correlation Coefficient R	0.96
Approximate Shapiro Wilk Test Statistic	0.916
Approximate Shapiro Wilk P Value	9.9142E-4
Lilliefors Test Statistic	0.153
Lilliefors Critical (0.95) Value	0.122

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.97
A-D Test Statistic	1.091
A-D Critical (0.95) Value	0.748
K-S Test Statistic	0.131
K-S Critical(0.95) Value	0.122

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.975
Approximate Shapiro Wilk Test Statistic	0.941
Approximate Shapiro Wilk P Value	0.0182
Lilliefors Test Statistic	0.125
Lilliefors Critical (0.95) Value	0.122

Data not Lognormal at (0.05) Significance Level

Mesa Total Dissolved Solids

Raw Statistics

Number of Valid Observations	100
Number of Distinct Observations	60
Minimum	1600
Maximum	4800
Mean of Raw Data	3185
Standard Deviation of Raw Data	761.8
Kstar	16.04
Mean of Log Transformed Data	8.036
Standard Deviation of Log Transformed Data	0.255

Normal Distribution Test Results

Correlation Coefficient R	0.992
Approximate Shapiro Wilk Test Statistic	0.962
Approximate Shapiro Wilk P Value	0.0364
Lilliefors Test Statistic	0.0748

Lilliefors Critical (0.95) Value	0.0886
Data appear Normal at (0.05) Significance Level	
Gamma Distribution Test Results	
Correlation Coefficient R	0.983
A-D Test Statistic	0.662
A-D Critical (0.95) Value	0.75
K-S Test Statistic	0.0707
K-S Critical(0.95) Value	0.0893
Data appear Gamma Distributed at (0.05) Significance Level	
Lognormal Distribution Test Results	
Correlation Coefficient R	0.982
Approximate Shapiro Wilk Test Statistic	0.946
Approximate Shapiro Wilk P Value	9.9191E-4
Lilliefors Test Statistic	0.0691
Lilliefors Critical (0.95) Value	0.0886
Data appear Lognormal at (0.05) Significance Level	

General Background Statistics for Full Data Sets

User Selected Options	
From File	Total Dissolved Solids.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Total Dissolved Solids

General Statistics

Total Number of Observations	87	Number of Distinct Observations	40

Raw Statistics		Log-Transformed Statistics	
Minimum	1200	Minimum	7.09
Maximum	3400	Maximum	8.132
Second Largest	3280	Second Largest	8.096
First Quartile	2000	First Quartile	7.601
Median	2600	Median	7.863
Third Quartile	2800	Third Quartile	7.937
Mean	2467	Mean	7.787
SD	497.4	SD	0.231
Coefficient of Variation	0.202		
Skewness	-0.822		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.17	Lilliefors Test Statistic	0.208
Lilliefors Critical Value	0.095	Lilliefors Critical Value	0.095
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	3435	95% UTL with 95% Coverage	3778
95% UPL (t)	3299	95% UPL (t)	3546
90% Percentile (z)	3104	90% Percentile (z)	3240
95% Percentile (z)	3285	95% Percentile (z)	3524
99% Percentile (z)	3624	99% Percentile (z)	4125
Gamma Distribution Test		Data Distribution Test	
k star	20.28	Data do not follow a Discernable Distribution (0.05)	
Theta Star	121.6		
MLE of Mean	2467		
MLE of Standard Deviation	547.8		
nu star	3529		
A-D Test Statistic	4.083	Nonparametric Statistics	
5% A-D Critical Value	0.75	90% Percentile	2920
K-S Test Statistic	0.197	95% Percentile	3000
5% K-S Critical Value	0.0956	99% Percentile	3297
Data not Gamma Distributed at 5% Significance Level			

Assuming Gamma Distribution		95% UTL with 95% Coverage	3200
90% Percentile	3190	95% Percentile Bootstrap UTL with 95% Coverage	3200
95% Percentile	3431	95% BCA Bootstrap UTL with 95% Coverage	3000
99% Percentile	3916	95% UPL	3060
		95% Chebyshev UPL	4647
95% WH Approx. Gamma UPL	3439	Upper Threshold Limit Based upon IQR	4000
95% HW Approx. Gamma UPL	3463		
95% WH Approx. Gamma UTL with 95% Coverage	3627		
95% HW Approx. Gamma UTL with 95% Coverage	3660		

Muddy Creek Total Dissolved Solids

General Statistics			
Total Number of Observations	53	Number of Distinct Observations	16
Raw Statistics		**Log-Transformed Statistics**	
Minimum	1000	Minimum	6.908
Maximum	2600	Maximum	7.863
Second Largest	2500	Second Largest	7.824
First Quartile	1400	First Quartile	7.244
Median	1640	Median	7.402
Third Quartile	1800	Third Quartile	7.496
Mean	1596	Mean	7.351
SD	358.8	SD	0.221
Coefficient of Variation	0.225		
Skewness	0.731		

Background Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.153	Lilliefors Test Statistic	0.125
Lilliefors Critical Value	0.122	Lilliefors Critical Value	0.122
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% UTL with 95% Coverage	2330	95% UTL with 95% Coverage	2448
95% UPL (t)	2203	95% UPL (t)	2263
90% Percentile (z)	2056	90% Percentile (z)	2068
95% Percentile (z)	2186	95% Percentile (z)	2241
99% Percentile (z)	2431	99% Percentile (z)	2605
Gamma Distribution Test		**Data Distribution Test**	
k star	19.8	Data do not follow a Discernable Distribution (0.05)	
Theta Star	80.63		
MLE of Mean	1596		
MLE of Standard Deviation	358.7		
nu star	2098		
A-D Test Statistic	1.091	**Nonparametric Statistics**	
5% A-D Critical Value	0.748	90% Percentile	1900
K-S Test Statistic	0.131	95% Percentile	2400
5% K-S Critical Value	0.122	99% Percentile	2548

Data not Gamma Distributed at 5% Significance Level

Assuming Gamma Distribution		95% UTL with 95% Coverage	2500
90% Percentile	2070	95% Percentile Bootstrap UTL with 95% Coverage	2500
95% Percentile	2228	95% BCA Bootstrap UTL with 95% Coverage	2500
99% Percentile	2547	95% UPL	2430
		95% Chebyshev UPL	3175
95% WH Approx. Gamma UPL	2236	Upper Threshold Limit Based upon IQR	2400
95% HW Approx. Gamma UPL	2242		
95% WH Approx. Gamma UTL with 95% Coverage	2395		
95% HW Approx. Gamma UTL with 95% Coverage	2407		

Mesa Total Dissolved Solids

General Statistics

Total Number of Observations	100	Number of Distinct Observations	60

Raw Statistics		Log-Transformed Statistics	
Minimum	1600	Minimum	7.378
Maximum	4800	Maximum	8.476
Second Largest	4500	Second Largest	8.412
First Quartile	2600	First Quartile	7.863
Median	3169	Median	8.061
Third Quartile	3800	Third Quartile	8.243
Mean	3185	Mean	8.036
SD	761.8	SD	0.255
Coefficient of Variation	0.239		
Skewness	-0.0221		

Background Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.0748	Lilliefors Test Statistic	0.0691
Lilliefors Critical Value	0.0886	Lilliefors Critical Value	0.0886
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% UTL with 95% Coverage	4650	95% UTL with 95% Coverage	5041
95% UPL (t)	4456	95% UPL (t)	4724
90% Percentile (z)	4161	90% Percentile (z)	4281
95% Percentile (z)	4438	95% Percentile (z)	4696
99% Percentile (z)	4957	99% Percentile (z)	5585

Gamma Distribution Test		Data Distribution Test
k star	16.04	Data appear Normal at 5% Significance Level
Theta Star	198.6	
MLE of Mean	3185	
MLE of Standard Deviation	795.3	
nu star	3208	
A-D Test Statistic	0.662	Nonparametric Statistics
5% A-D Critical Value	0.75	90% Percentile 4264

K-S Test Statistic	0.0707	95% Percentile	4396
5% K-S Critical Value	0.0893	99% Percentile	4503
Data appear Gamma Distributed at 5% Significance Level			
Assuming Gamma Distribution		95% UTL with 95% Coverage	4500
90% Percentile	4237	95% Percentile Bootstrap UTL with 95% Coverage	4500
95% Percentile	4596	95% BCA Bootstrap UTL with 95% Coverage	4500
99% Percentile	5321	95% UPL	4400
		95% Chebyshev UPL	6522
95% WH Approx. Gamma UPL	4606	Upper Threshold Limit Based upon IQR	5600
95% HW Approx. Gamma UPL	4632		
95% WH Approx. Gamma UTL with 95% Coverage	4868		
95% HW Approx. Gamma UTL with 95% Coverage	4905		

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Total Dissolved Solids.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Total Dissolved Solids

Background Data: Alluv Total Dissolved Solids

Raw Statistics

	Site	Background
Number of Valid Observations	100	87
Number of Distinct Observations	60	40
Minimum	1600	1200
Maximum	4800	3400
Mean	3185	2467
Median	3169	2600
SD	761.8	497.4
SE of Mean	76.18	53.33

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	11697
WMW Test U-Stat	6.22
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	4.959E-10

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Total Dissolved Solids.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Total Dissolved Solids

Background Data: Alluv Total Dissolved Solids

Raw Statistics

	Site	Background
Number of Valid Observations	53	87
Number of Distinct Observations	16	40
Minimum	1000	1200
Maximum	2600	3400
Mean	1596	2467
Median	1640	2600
SD	358.8	497.4
SE of Mean	49.28	53.33

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC = Mean/Median of Background

Site Rank Sum W-Stat	1815
WMW Test U-Stat	8.255
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	1.517E-16

Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options	
From File	Total Dissolved Solids.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Total Dissolved Solids

Background Data: Muddy Creek Total Dissolved Solids

Raw Statistics

	Site	Background
Number of Valid Observations	100	53
Number of Distinct Observations	60	16
Minimum	1600	1000
Maximum	4800	2600
Mean	3185	1596
Median	3169	1640
SD	761.8	358.8
SE of Mean	76.18	49.28

Wilcoxon-Mann-Whitney (WMW) Test

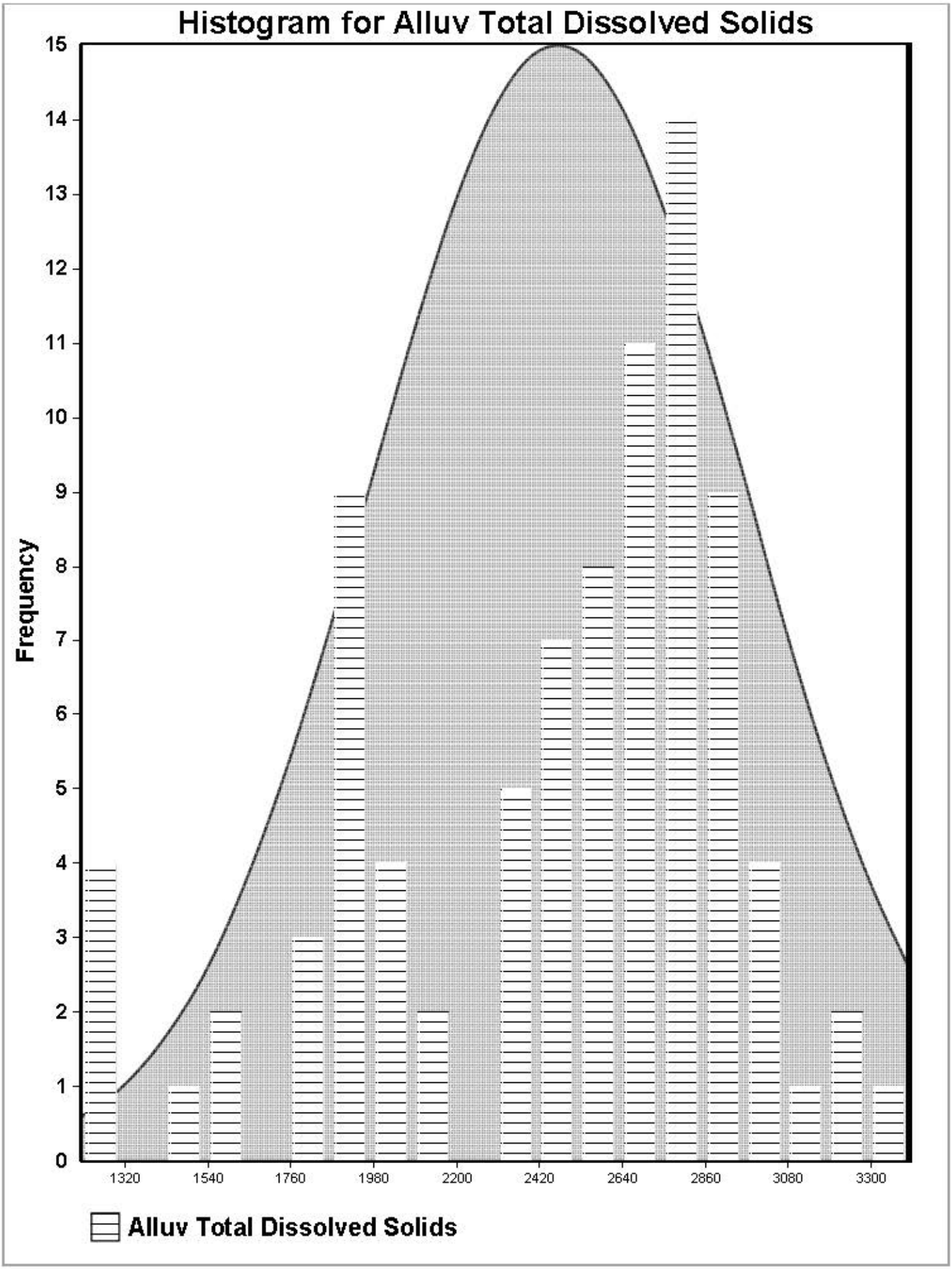
H0: Mean/Median of Site or AOC = Mean/Median of Background

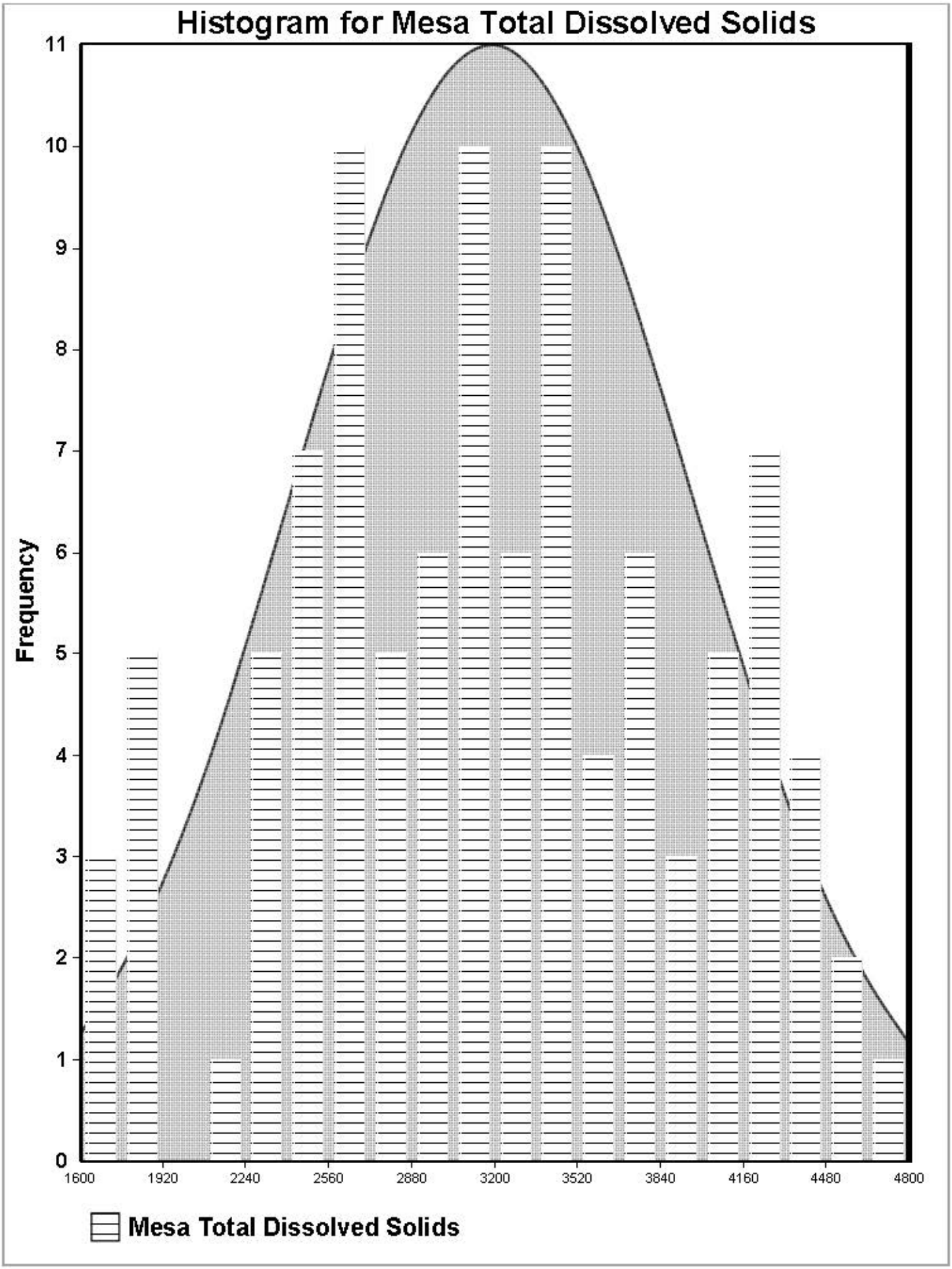
Site Rank Sum W-Stat	10199
WMW Test U-Stat	9.578
Lower Critical Value (0.025)	-1.96
Upper Critical Value (0.975)	1.96
P-Value	0

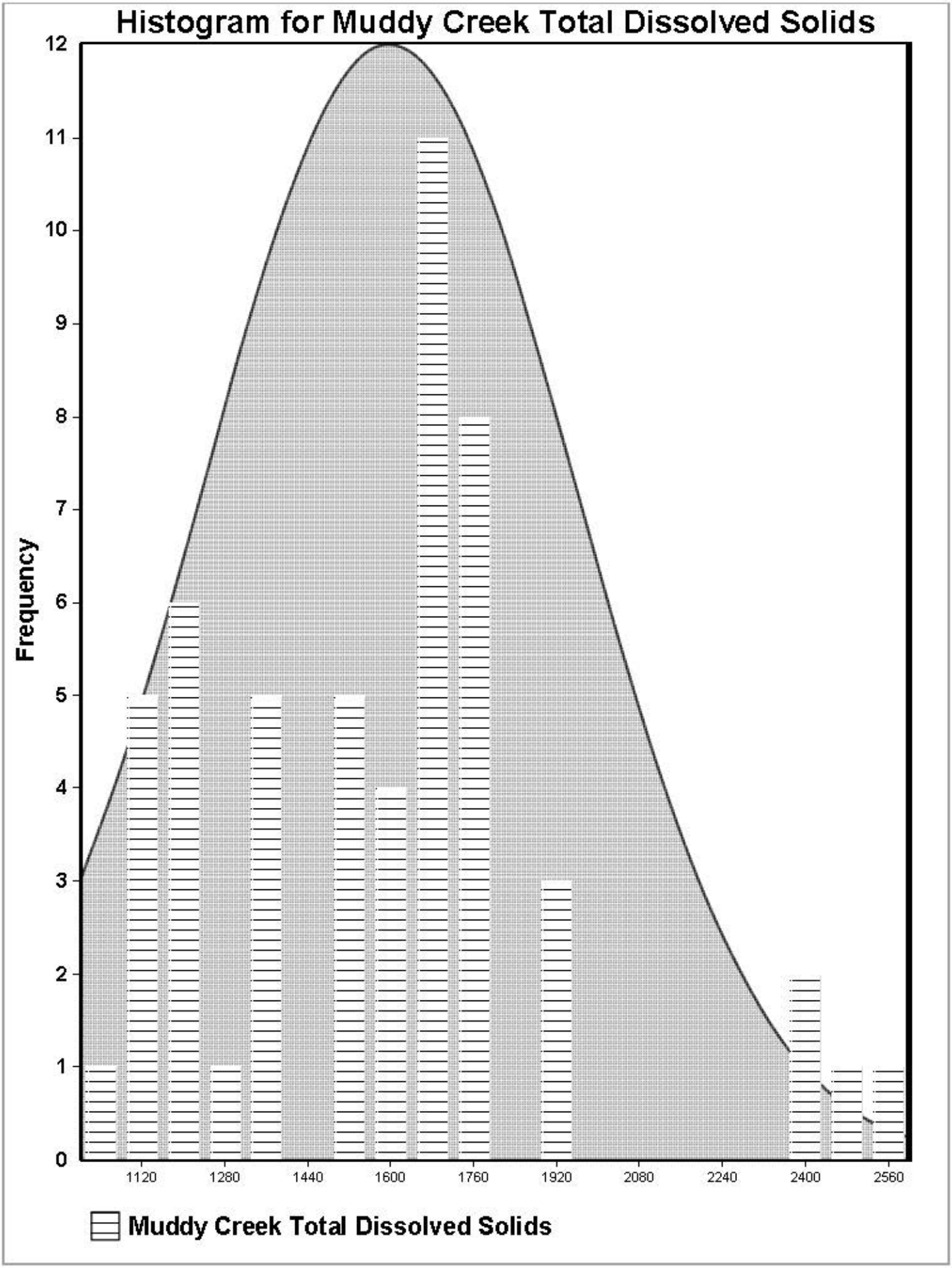
Conclusion with Alpha = 0.05

Reject H0, Conclude Site <> Background

P-Value < alpha (0.05)


Histogram for Alluv Total Dissolved Solids
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1320
1540
1760
1980
2200
2420
2640
2860
3080
3300
Alluv Total Dissolved Solids


Histogram for Mesa Total Dissolved Solids
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
1600
1920
2240
2560
2880
3200
3520
3840
4160
4480
4800
Mesa Total Dissolved Solids


Histogram for Muddy Creek Total Dissolved Solids
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
1120
1280
1440
1600
1760
1920
2080
2240
2400
2560
Muddy Creek Total Dissolved Solids

Outlier Tests for Selected Variables

User Selected Options	
From File	Total Dissolved Solids.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers with Rosner test	1

Rosner's Outlier Test for Alluv Total Dissolved Solids

Mean	2467
Standard Deviation	497.4
Number of data	87
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2467	494.6	1200	13	2.561	3.338	3.705

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Total Dissolved Solids

Mean	1596
Standard Deviation	358.8
Number of data	53
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1596	355.4	2600	10	2.825	3.151	3.504

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Total Dissolved Solids

Mean	3185
Standard Deviation	761.8
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3185	758	4800	13	2.131	3.38	3.75

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Total Dissolved Solids

Location Name	Sample Date	Alluvial Total Dissolved Solids	Location Name	Sample Date	Alluvial Total Dissolved Solids	Location Name	Sample Date	Muddy Creek Total Dissolved Solids	Location Name	Sample Date	Mesa Total Dissolved Solids	Location Name	Sample Date	Mesa Total Dissolved Solids
BG-1S	11/26/2012	1500	KMW-2D	12/8/2009	2400	BG-3S	11/27/2012	1200	BG-2S	11/26/2012	4000	LMW-7	9/10/2008	2700
BG-1S	8/23/2012	1900	KMW-2D	12/10/2008	2500	BG-3S	8/22/2012	1200	BG-2S	8/23/2012	4500	LMW-7	6/4/2008	2600
BG-1S	5/24/2012	2100	KMW-2D	6/3/2008	2400	BG-3S	5/23/2012	1200	BG-2S	5/24/2012	3800	LMW-7	3/5/2008	2600
BG-1S	3/20/2012	2100	KMW-2M	11/26/2012	2900	BG-3S	3/21/2012	1100	BG-2S	3/21/2012	4300	LMW-9	11/28/2012	3100
IMW-2.5D	11/26/2012	2500	KMW-2M	8/24/2012	3000	BG-4S	11/27/2012	1800	BG-2M	11/26/2012	1900	LMW-9	8/27/2012	3300
IMW-2.5D	8/24/2012	2600	KMW-2M	5/21/2012	3100	BG-4S	8/30/2012	1700	BG-2M	8/23/2012	1900	LMW-9	5/31/2012	3300
IMW-2.5D	5/21/2012	2500	KMW-2M	3/23/2012	2800	BG-4S	5/30/2012	1700	BG-2M	5/24/2012	1900	LMW-9	3/23/2012	3200
IMW-2.5D	3/21/2012	2400	KMW-2M	12/8/2011	2784	BG-4S	3/20/2012	1800	BG-2M	3/21/2012	1800	LMW-9	12/5/2011	3224
IMW-2.5D	12/8/2011	2508	KMW-2M	6/6/2011	2710	BG-6S	11/27/2012	2500	BG-2D	11/26/2012	1600	LMW-9	9/8/2011	3300
IMW-2.5D	6/6/2011	2380	KMW-2M	12/13/2010	2630	BG-6S	8/23/2012	2600	BG-2D	8/23/2012	1800	LMW-9	6/8/2011	3440
IMW-2.5D	12/15/2010	1210	KMW-2M	6/8/2010	2600	BG-6S	5/25/2012	2400	BG-2D	5/24/2012	1700	LMW-9	3/9/2011	3250
IMW-2.5D	6/9/2010	1300	KMW-2M	12/8/2009	2600	BG-6S	3/21/2012	2400	BG-2D	3/21/2012	1600	LMW-9	12/10/2010	3420
IMW-2.5D	12/12/2009	1200	KMW-2M	12/10/2008	2500	BG-1M	11/26/2012	1400	LMW-10	11/28/2012	4800	LMW-9	9/21/2010	3500
IMW-2.5S	11/26/2012	2700	KMW-2M	6/3/2008	2600	BG-1M	8/23/2012	1800	LMW-10	8/27/2012	4200	LMW-9	6/9/2010	3200
IMW-2.5S	8/24/2012	2700	KMW-2S	11/26/2012	3000	BG-1M	5/24/2012	1400	LMW-10	5/30/2012	4400	LMW-9	3/11/2010	3400
IMW-2.5S	5/21/2012	2700	KMW-2S	8/24/2012	2900	BG-1M	3/20/2012	1500	LMW-10	3/22/2012	4200	LMW-9	12/11/2009	3400
IMW-2.5S	3/21/2012	2700	KMW-2S	5/21/2012	3000	BG-3M	11/27/2012	1200	LMW-10	12/6/2011	4020	LMW-9	9/18/2009	2900
IMW-2.5S	12/8/2011	2708	KMW-2S	3/23/2012	2800	BG-3M	8/22/2012	1200	LMW-10	9/8/2011	4224	LMW-9	6/10/2009	3400
IMW-2.5S	9/9/2011	2708	KMW-2S	12/8/2011	2864	BG-3M	5/24/2012	1100	LMW-10	6/8/2011	4300	LMW-9	3/5/2009	3300
IMW-2.5S	6/6/2011	2760	KMW-2S	9/9/2011	2800	BG-3M	3/21/2012	1200	LMW-10	3/2/2011	4010	LMW-9	12/12/2008	3400
IMW-2.5S	3/7/2011	2910	KMW-2S	6/6/2011	2920	BG-4M	11/27/2012	1700	LMW-10	12/9/2010	4100	LMW-9	9/10/2008	3400
IMW-2.5S	12/15/2010	2910	KMW-2S	3/8/2011	2830	BG-4M	8/30/2012	1600	LMW-10	9/21/2010	3790	LMW-9	6/4/2008	3400
IMW-2.5S	9/20/2010	2920	KMW-2S	12/13/2010	2760	BG-4M	5/30/2012	1700	LMW-10	6/9/2010	3600	LMW-9	3/5/2008	3400
IMW-2.5S	6/9/2010	3000	KMW-2S	9/15/2010	3280	BG-4M	3/20/2012	1700	LMW-10	3/11/2010	3800	LMW-11	2/22/2012	4336
IMW-2.5S	3/9/2010	3200	KMW-2S	6/8/2010	2700	BG-6M	11/27/2012	1900	LMW-10	12/11/2009	3900	LMW-11	12/6/2011	4396
IMW-2.5S	12/12/2009	3400	KMW-2S	3/9/2010	2800	BG-6M	8/22/2012	1800	LMW-10	9/18/2009	3600	LMW-11	9/8/2011	4260
IMW-2.5S	9/21/2009	2800	KMW-2S	12/8/2009	2900	BG-6M	5/25/2012	1800	LMW-10	6/10/2009	3800	LMW-11	3/2/2011	4080
IMW-3S	5/21/2012	1800	KMW-2S	9/16/2009	2500	BG-6M	3/21/2012	1800	LMW-10	3/5/2009	3800	LMW-12R	11/30/2012	2746
IMW-3S	3/20/2012	1600	KMW-2S	6/10/2009	2800	BG-1D	11/26/2012	1300	LMW-10	12/12/2008	3900	LMW-12R	10/22/2012	2778
IMW-3S	12/9/2011	1856	KMW-2S	3/3/2009	2800	BG-1D	8/23/2012	1600	LMW-10	9/10/2008	3600	LMW-12R	8/21/2012	2786
IMW-3S	9/9/2011	1902	KMW-2S	12/10/2008	2800	BG-1D	5/24/2012	1400	LMW-10	6/4/2008	3600	LMW-12R	5/30/2012	2784
IMW-3S	6/7/2011	1840	KMW-2S	9/8/2008	2900	BG-1D	3/20/2012	1400	LMW-10	3/5/2008	3800	LMW-13R	11/28/2012	2968
IMW-3S	3/7/2011	1880	KMW-2S	6/3/2008	2700	BG-3D	11/27/2012	1100	LMW-11R	11/26/2012	4500	LMW-13R	10/22/2012	2930
IMW-3S	12/10/2010	1940	KMW-2S	3/4/2008	2700	BG-3D	8/21/2012	1100	LMW-11R	8/21/2012	4400	LMW-13R	8/20/2012	2950
IMW-3S	9/16/2010	1250				BG-3D	5/23/2012	1000	LMW-11R	5/29/2012	4300	LMW-13R	5/29/2012	2862
IMW-3S	6/8/2010	1900				BG-3D	3/21/2012	1100	LMW-11R	3/23/2012	4100	LMW-14R	11/30/2012	3066
IMW-3S	3/9/2010	2000				BG-4D	11/27/2012	1400	LMW-7	11/28/2012	2100	LMW-14R	10/22/2012	3082
IMW-3S	12/10/2009	1900				BG-4D	8/30/2012	1500	LMW-7	8/27/2012	2600	LMW-14R	8/20/2012	3138
IMW-3S	9/14/2009	1600				BG-4D	5/30/2012	1500	LMW-7	5/31/2012	2500	LMW-14R	5/29/2012	3052
IMW-3S	6/9/2009	1900				BG-4D	3/20/2012	1500	LMW-7	3/23/2012	2400	LMW-15	11/28/2012	3070
IMW-3S	3/3/2009	2000				BG-6D	11/27/2012	1900	LMW-7	12/5/2011	2408	LMW-15	10/22/2012	3070
IMW-3S	12/9/2008	1900				BG-6D	8/22/2012	1900	LMW-7	9/6/2011	2378	LMW-15	8/20/2012	3070
IMW-3S	9/9/2008	2000				BG-6D	5/25/2012	1800	LMW-7	6/9/2011	2540	LMW-15	5/29/2012	2946
IMW-3S	6/3/2008	2000				BG-6D	3/21/2012	1800	LMW-7	3/9/2011	2260	LMW-16	11/28/2012	2562
IMW-3S	3/4/2008	1900				IMW-3D	5/25/2012	1700	LMW-7	12/10/2010	2600	LMW-16	10/22/2012	2598
KMW-2D	11/26/2012	2600				IMW-3D	3/22/2012	1700	LMW-7	9/21/2010	2520	LMW-16	8/20/2012	2610
KMW-2D	8/24/2012	2800				IMW-3D	12/9/2011	1674	LMW-7	6/9/2010	2400	LMW-16	5/29/2012	2582
KMW-2D	5/21/2012	2800				IMW-3D	6/7/2011	1680	LMW-7	3/11/2010	2400			
KMW-2D	3/23/2012	2600				IMW-3D	12/10/2010	1640	LMW-7	12/11/2009	2500			
KMW-2D	12/8/2011	2640				IMW-3D	6/8/2010	1500	LMW-7	9/18/2009	2900			
KMW-2D	6/6/2011	2450				IMW-3D	12/10/2009	1600	LMW-7	6/10/2009	2500			
KMW-2D	12/13/2010	2560				IMW-3D	12/9/2008	1700	LMW-7	3/5/2009	2500			
KMW-2D	6/8/2010	2400				IMW-3D	6/3/2008	1700	LMW-7	12/12/2008	2600			

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Vanadium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Vanadium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	87	0	87	19	68	78.16%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	68	0.003	0.01	0.00691	0.01	0.0035
Statistics (Detects Only)	19	0.0046	0.0085	0.00689	0.007	0.00111
Statistics (All: NDs treated as DL value)	87	0.003	0.01	0.00691	0.0076	0.00313
Statistics (All: NDs treated as DL/2 value)	87	0.0015	0.0085	0.00421	0.005	0.00216
Statistics (Normal ROS Estimated Data)	87	7.6687E-4	0.00889	0.00494	0.00488	0.00191
Statistics (Gamma ROS Estimated Data)	87	0.00424	0.00983	0.00772	0.0079	0.00135
Statistics (Lognormal ROS Estimated Data)	87	0.00269	0.0092	0.00528	0.005	0.00154

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	36.37	35.12	1.8945E-4	-4.992	0.176	-0.0352
Statistics (NDs = DL)	4.021	3.89	0.00172	-5.105	0.541	-0.106
Statistics (NDs = DL/2)	3.01	2.914	0.0014	-5.646	0.641	-0.113
Statistics (Gamma ROS Estimates)	29.57	28.56	2.6093E-4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.286	0.29	-0.0549

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.962	0.871	0.909	0.995

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.918	0.901	Data Appear Normal
Lilliefors (Detects Only)	0.182	0.203	Data Appear Normal
Lilliefors (NDs = DL)	0.275	0.095	Data Not Normal
Lilliefors (NDs = DL/2)	0.287	0.095	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0594	0.095	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.944	0.821	0.891	0.548

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.815	0.74	
Kolmogorov-Smirnov (Detects Only)	0.191	0.198	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	9.722	0.756	
Kolmogorov-Smirnov (NDs = DL)	0.266	0.0962	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	9.754	0.759	
Kolmogorov-Smirnov (NDs = DL/2)	0.335	0.0966	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.542	0.75	

Kolmogorov-Smirnov (Gamma ROS Est.)	0.107	0.0956	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.942	0.859	0.867	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.882	0.901	Data Not Lognormal
Lilliefors (Detects Only)	0.187	0.203	Data Appear Lognormal
Lilliefors (NDs = DL)	0.259	0.095	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.35	0.095	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0607	0.095	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Vanadium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	53	0	53	15	38	71.70%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	38	0.0039	0.01	0.00984	0.01	9.8955E-4
Statistics (Detects Only)	15	0.0025	0.005	0.00335	0.0032	6.5560E-4
Statistics (All: NDs treated as DL value)	53	0.0025	0.01	0.008	0.01	0.00308
Statistics (All: NDs treated as DL/2 value)	53	0.00195	0.005	0.00448	0.005	8.9295E-4
Statistics (Normal ROS Estimated Data)	53	0.002	0.005	0.00333	0.00324	6.3077E-4
Statistics (Gamma ROS Estimated Data)	53	0.0017	0.005	0.00337	0.00344	6.0295E-4
Statistics (Lognormal ROS Estimated Data)	53	0.00223	0.005	0.00333	0.0032	6.1522E-4

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	30.44	28.73	1.1018E-4	-5.714	0.185	-0.0324
Statistics (NDs = DL)	4.747	4.491	0.00169	-4.937	0.519	-0.105
Statistics (NDs = DL/2)	20.26	19.12	2.2099E-4	-5.434	0.24	-0.0441
Statistics (Gamma ROS Estimates)	28.87	27.25	1.1659E-4	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-5.72	0.181	-0.0316

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.958	0.788	0.796	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.924	0.881	Data Appear Normal
Lilliefors (Detects Only)	0.192	0.229	Data Appear Normal
Lilliefors (NDs = DL)	0.439	0.122	Data Not Normal
Lilliefors (NDs = DL/2)	0.438	0.122	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0746	0.122	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.976	0.697	0.744	0.972

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.278	0.735	
Kolmogorov-Smirnov (Detects Only)	0.178	0.221	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	10.18	0.754	
Kolmogorov-Smirnov (NDs = DL)	0.442	0.122	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	9.52	0.748	
Kolmogorov-Smirnov (NDs = DL/2)	0.436	0.122	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.786	0.748	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.105	0.122	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.982	0.8	0.792	0.998

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.966	0.881	Data Appear Lognormal
Lilliefors (Detects Only)	0.165	0.229	Data Appear Lognormal
Lilliefors (NDs = DL)	0.437	0.122	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.431	0.122	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0636	0.122	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Vanadium, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	100	0	100	21	79	79.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	79	0.003	0.02	0.00676	0.01	0.00381
Statistics (Detects Only)	21	0.003	0.025	0.00668	0.0037	0.00631
Statistics (All: NDs treated as DL value)	100	0.003	0.025	0.00674	0.0044	0.00441
Statistics (All: NDs treated as DL/2 value)	100	0.0015	0.025	0.00407	0.0044	0.00357
Statistics (Normal ROS Estimated Data)	100	-0.0258	0.025	-0.0047	-0.00496	0.00953
Statistics (Gamma ROS Estimated Data)	100	1.000E-12	0.026	0.0118	0.012	0.00736
Statistics (Lognormal ROS Estimated Data)	100	1.3264E-4	0.025	0.00256	0.00138	0.00376

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.011	1.958	0.00332	-5.278	0.665	-0.126
Statistics (NDs = DL)	2.685	2.611	0.00251	-5.197	0.627	-0.121
Statistics (NDs = DL/2)	2.227	2.167	0.00183	-5.745	0.671	-0.117
Statistics (Gamma ROS Estimates)	0.671	0.657	0.0177	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-6.558	1.066	-0.163

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.786	0.855	0.755	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.622	0.908	Data Not Normal
Lilliefors (Detects Only)	0.377	0.193	Data Not Normal
Lilliefors (NDs = DL)	0.245	0.0886	Data Not Normal

Lilliefors (NDs = DL/2)	0.307	0.0886	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0704	0.0886	Data Appear Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.918	0.91	0.86	0.92

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.652	0.754	
Kolmogorov-Smirnov (Detects Only)	0.31	0.192	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	11.02	0.761	
Kolmogorov-Smirnov (NDs = DL)	0.263	0.0902	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	7.958	0.764	
Kolmogorov-Smirnov (NDs = DL/2)	0.231	0.0905	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.54	0.802	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.235	0.0935	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.871	0.875	0.894	0.996

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.754	0.908	Data Not Lognormal
Lilliefors (Detects Only)	0.254	0.193	Data Not Lognormal
Lilliefors (NDs = DL)	0.277	0.0886	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.251	0.0886	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0561	0.0886	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Vanadium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Vanadium, Dissolved

General Statistics

Number of Valid Data	87	Number of Detected Data	19
Number of Distinct Detected Data	14	Number of Non-Detect Data	68
		Percent Non-Detects	78.16%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0046	Minimum Detected	-5.382
Maximum Detected	0.0085	Maximum Detected	-4.768
Mean of Detected	0.00689	Mean of Detected	-4.992
SD of Detected	0.00111	SD of Detected	0.176
Minimum Non-Detect	0.003	Minimum Non-Detect	-5.809
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	87
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	100.00%

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.918	Shapiro Wilk Test Statistic	0.882
5% Shapiro Wilk Critical Value	0.901	5% Shapiro Wilk Critical Value	0.901
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00421	Mean (Log Scale)	-5.646
SD	0.00216	SD (Log Scale)	0.641
95% UTL 95% Coverage	0.00842	95% UTL 95% Coverage	0.0123
95% UPL (t)	0.00782	95% UPL (t)	0.0103
90% Percentile (z)	0.00698	90% Percentile (z)	0.00802
95% Percentile (z)	0.00777	95% Percentile (z)	0.0101
99% Percentile (z)	0.00924	99% Percentile (z)	0.0157
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00528
		SD in Original Scale	0.00154
		Mean in Log Scale	-5.286
		SD in Log Scale	0.29
		95% UTL 95% Coverage	0.00891
		95% UPL (t)	0.00823

		90% Percentile (z)	0.00735
		95% Percentile (z)	0.00816
		99% Percentile (z)	0.00995
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	30.66	Data appear Normal at 5% Significance Level	
Theta Star	2.2471E-4		
nu star	1165		
A-D Test Statistic	0.815	Nonparametric Statistics	
5% A-D Critical Value	0.74	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.191	Mean	0.00549
5% K-S Critical Value	0.198	SD	0.0013
Data follow Appx. Gamma Distribution at 5% Significance Level		SE of Mean	1.9140E-4
		95% KM UTL with 95% Coverage	0.00803
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0112
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00767
Mean	0.00772	90% Percentile (z)	0.00716
Median	0.0079	95% Percentile (z)	0.00763
SD	0.00135	99% Percentile (z)	0.00852
k star	28.56		
Theta star	2.7018E-4	Gamma ROS Limits with Extrapolated Data	
Nu star	4970	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0103
95% Percentile of Chisquare (2k)	75.77	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0103
		95% WH Approx. Gamma UTL with 95% Coverage	0.0107
90% Percentile	0.00962	95% HW Approx. Gamma UTL with 95% Coverage	0.0108
95% Percentile	0.0102		
99% Percentile	0.0115		

Note: DL/2 is not a recommended method.

Muddy Creek Vanadium, Dissolved

General Statistics			
Number of Valid Data	53	Number of Detected Data	15
Number of Distinct Detected Data	12	Number of Non-Detect Data	38
		Percent Non-Detects	71.70%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0025	Minimum Detected	-5.991
Maximum Detected	0.005	Maximum Detected	-5.298
Mean of Detected	0.00335	Mean of Detected	-5.714
SD of Detected	6.5560E-4	SD of Detected	0.185
Minimum Non-Detect	0.0039	Minimum Non-Detect	-5.547
Maximum Non-Detect	0.01	Maximum Non-Detect	-4.605
Data with Multiple Detection Limits		Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect with Single DL	53
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected with Single DL	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
Background Statistics			

Normal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.924
5% Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level	

Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.966
5% Shapiro Wilk Critical Value	0.881
Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution	
DL/2 Substitution Method	
Mean	0.00448
SD	8.9295E-4
95% UTL 95% Coverage	0.0063
95% UPL (t)	0.00599
90% Percentile (z)	0.00562
95% Percentile (z)	0.00595
99% Percentile (z)	0.00655
Maximum Likelihood Estimate(MLE) Method	N/A

Assuming Lognormal Distribution	
DL/2 Substitution Method	
Mean (Log Scale)	-5.434
SD (Log Scale)	0.24
95% UTL 95% Coverage	0.00713
95% UPL (t)	0.00655
90% Percentile (z)	0.00594
95% Percentile (z)	0.00648
99% Percentile (z)	0.00763
Log ROS Method	
Mean in Original Scale	0.00333
SD in Original Scale	6.1522E-4
Mean in Log Scale	-5.72
SD in Log Scale	0.181
95% UTL 95% Coverage	0.00475
95% UPL (t)	0.00445
90% Percentile (z)	0.00414
95% Percentile (z)	0.00442
99% Percentile (z)	0.005

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	24.39
Theta Star	1.3747E-4
nu star	731.8
A-D Test Statistic	0.278
5% A-D Critical Value	0.735
K-S Test Statistic	0.178
5% K-S Critical Value	0.221
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics with Extrapolated Data	
Mean	0.00337
Median	0.00344
SD	6.0295E-4
k star	27.25
Theta star	1.2353E-4
Nu star	2889
95% Percentile of Chisquare (2k)	72.74
90% Percentile	0.00421
95% Percentile	0.00449
99% Percentile	0.00505

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.00334
SD	6.2287E-4
SE of Mean	1.6300E-4
95% KM UTL with 95% Coverage	0.00461
95% KM Chebyshev UPL	0.00608
95% KM UPL (t)	0.00439
90% Percentile (z)	0.00414
95% Percentile (z)	0.00436
99% Percentile (z)	0.00479
Gamma ROS Limits with Extrapolated Data	
95% Wilson Hilferty (WH) Approx. Gamma UPL	0.00451
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.00453
95% WH Approx. Gamma UTL with 95% Coverage	0.00478
95% HW Approx. Gamma UTL with 95% Coverage	0.00481

Note: DL/2 is not a recommended method.

Mesa Vanadium, Dissolved

General Statistics			
Number of Valid Data	100	Number of Detected Data	21
Number of Distinct Detected Data	15	Number of Non-Detect Data	79
		Percent Non-Detects	79.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.003	Minimum Detected	-5.809
Maximum Detected	0.025	Maximum Detected	-3.689
Mean of Detected	0.00668	Mean of Detected	-5.278
SD of Detected	0.00631	SD of Detected	0.665
Minimum Non-Detect	0.003	Minimum Non-Detect	-5.809
Maximum Non-Detect	0.02	Maximum Non-Detect	-3.912

Data with Multiple Detection Limits	Single Detection Limit Scenario	
Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect with Single DL	98
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected with Single DL	2
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	98.00%

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.622	Shapiro Wilk Test Statistic	0.754
5% Shapiro Wilk Critical Value	0.908	5% Shapiro Wilk Critical Value	0.908
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.00407	Mean (Log Scale)	-5.745
SD	0.00357	SD (Log Scale)	0.671
95% UTL 95% Coverage	0.0109	95% UTL 95% Coverage	0.0116
95% UPL (t)	0.01	95% UPL (t)	0.0098
90% Percentile (z)	0.00864	90% Percentile (z)	0.00756
95% Percentile (z)	0.00994	95% Percentile (z)	0.00964
99% Percentile (z)	0.0124	99% Percentile (z)	0.0152
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
		Mean in Original Scale	0.00256
		SD in Original Scale	0.00376
		Mean in Log Scale	-6.558
		SD in Log Scale	1.066
		95% UTL 95% Coverage	0.011
		95% UPL (t)	0.00841
		90% Percentile (z)	0.00557
		95% Percentile (z)	0.0082
		99% Percentile (z)	0.017
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.756	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0038		
nu star	73.74		

A-D Test Statistic	2.652	Nonparametric Statistics	
5% A-D Critical Value	0.754	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.31	Mean	0.00389
5% K-S Critical Value	0.192	SD	0.0032
Data not Gamma Distributed at 5% Significance Level		SE of Mean	3.3298E-4
		95% KM UTL with 95% Coverage	0.01
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.0179
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.00923
Mean	0.0118	90% Percentile (z)	0.00799
Median	0.012	95% Percentile (z)	0.00915
SD	0.00736	99% Percentile (z)	0.0113
k star	0.657		
Theta star	0.018	Gamma ROS Limits with Extrapolated Data	
Nu star	131.5	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0323
95% Percentile of Chisquare (2k)	4.577	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0378
		95% WH Approx. Gamma UTL with 95% Coverage	0.0375
90% Percentile	0.0302	95% HW Approx. Gamma UTL with 95% Coverage	0.0452
95% Percentile	0.0412		
99% Percentile	0.0678		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Vanadium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Vanadium, Dissolved

Background Data: Alluv Vanadium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	53	87
Number of Non-Detect Data	38	68
Number of Detect Data	15	19
Minimum Non-Detect	0.0039	0.003
Maximum Non-Detect	0.01	0.01
Percent Non detects	71.70%	78.16%
Minimum Detected	0.0025	0.0046
Maximum Detected	0.005	0.0085
Mean of Detected Data	0.00335	0.00689
Median of Detected Data	0.0032	0.007
SD of Detected Data	6.5560E-4	0.00111

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0.208
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.835

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Vanadium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Vanadium, Dissolved

Background Data: Alluv Vanadium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	87
Number of Non-Detect Data	79	68
Number of Detect Data	21	19
Minimum Non-Detect	0.003	0.003
Maximum Non-Detect	0.02	0.01
Percent Non detects	79.00%	78.16%
Minimum Detected	0.003	0.0046
Maximum Detected	0.025	0.0085
Mean of Detected Data	0.00668	0.00689
Median of Detected Data	0.0037	0.007
SD of Detected Data	0.00631	0.00111

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-0.505
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.614

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Vanadium_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Vanadium, Dissolved

Background Data: Muddy Creek Vanadium, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	100	53
Number of Non-Detect Data	79	38
Number of Detect Data	21	15
Minimum Non-Detect	0.003	0.0039
Maximum Non-Detect	0.02	0.01
Percent Non detects	79.00%	71.70%
Minimum Detected	0.003	0.0025
Maximum Detected	0.025	0.005
Mean of Detected Data	0.00668	0.00335
Median of Detected Data	0.0037	0.0032
SD of Detected Data	0.00631	6.5560E-4

Site vs Background Gehan Test

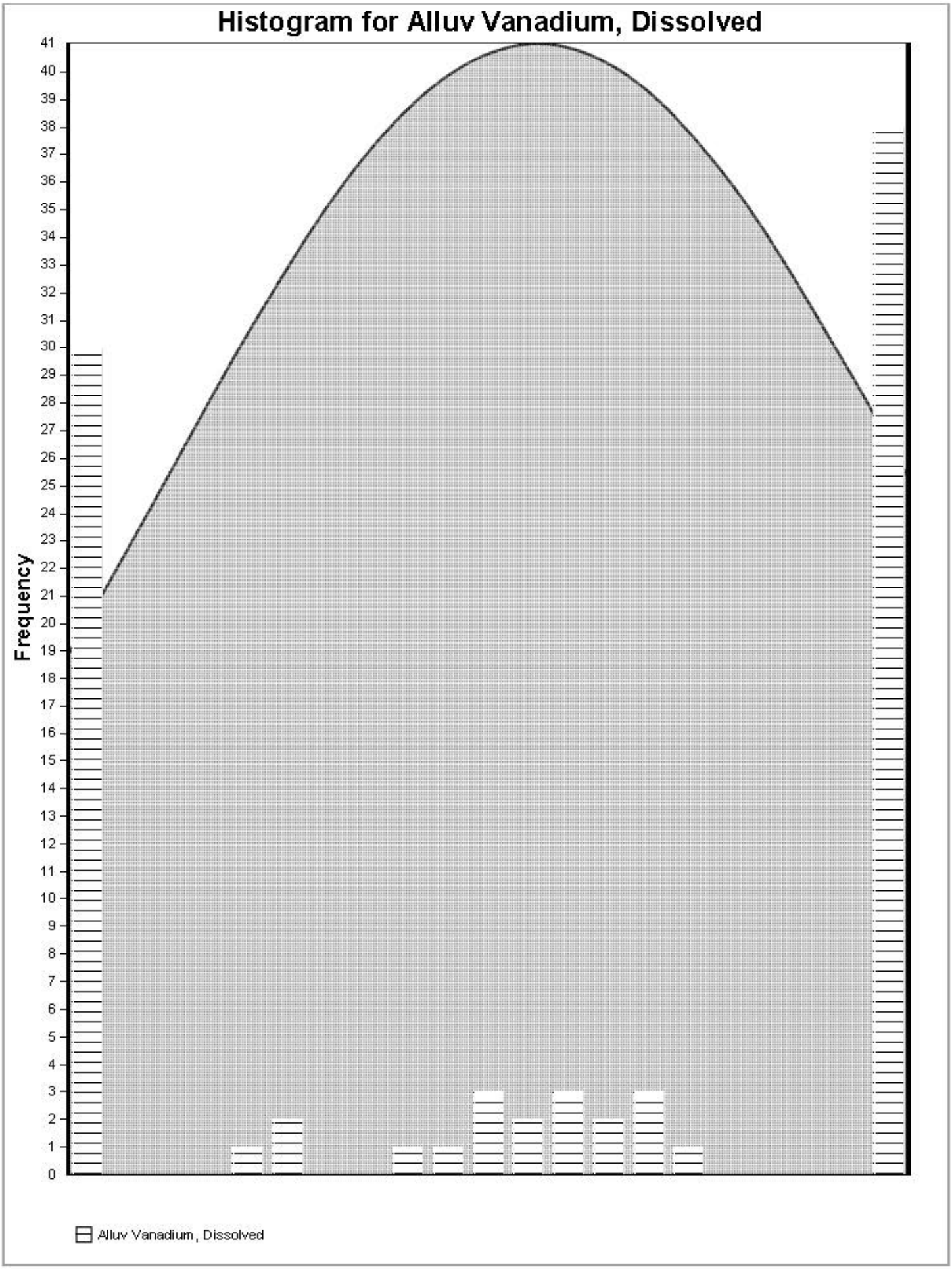
H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	-0.595
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.552

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for Alluv Vanadium, Dissolved
Frequency
0
1
2
3
4
5
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7
8
9
10
11
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13
14
15
16
17
18
19
20
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24
25
26
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32
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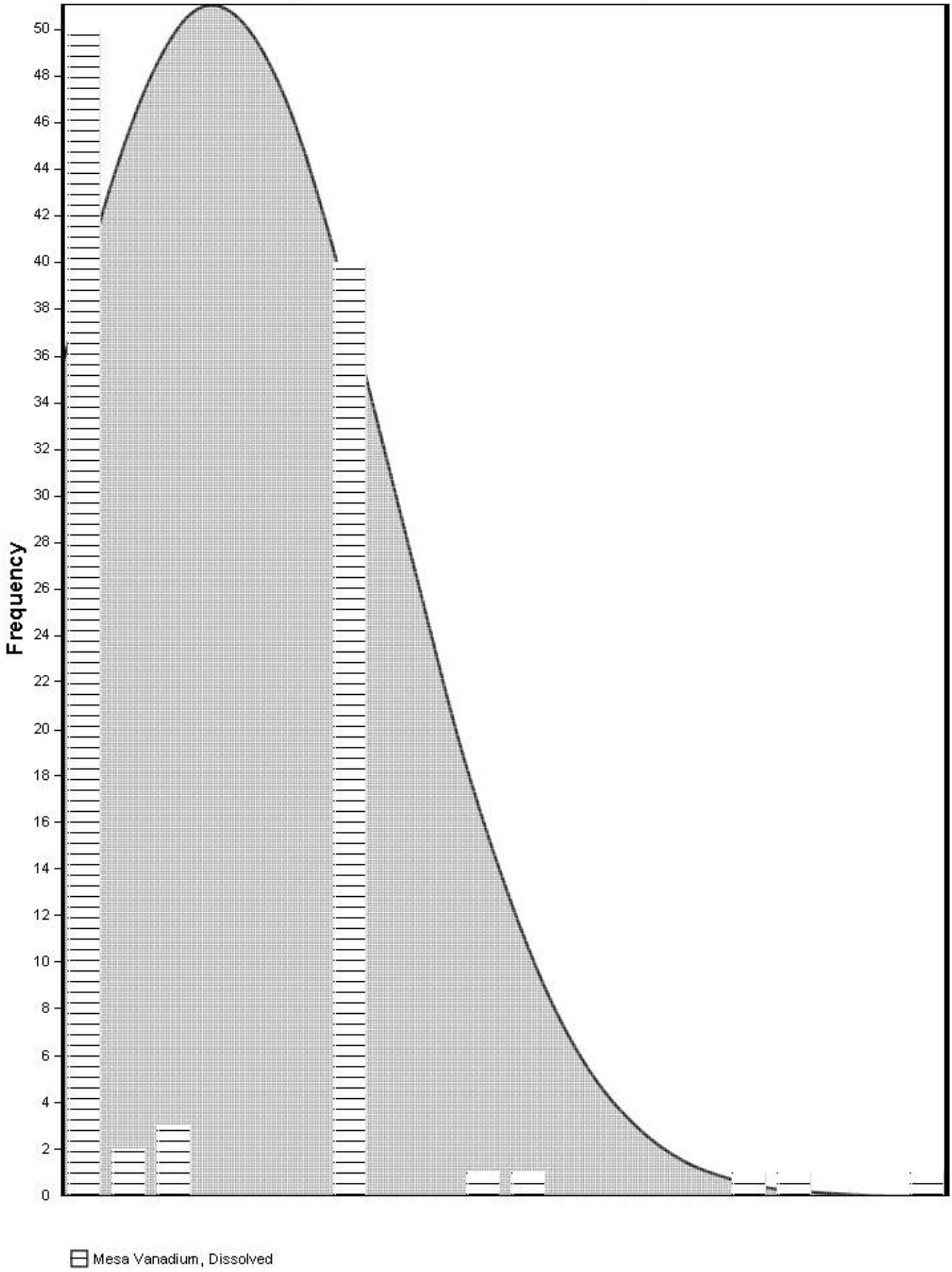
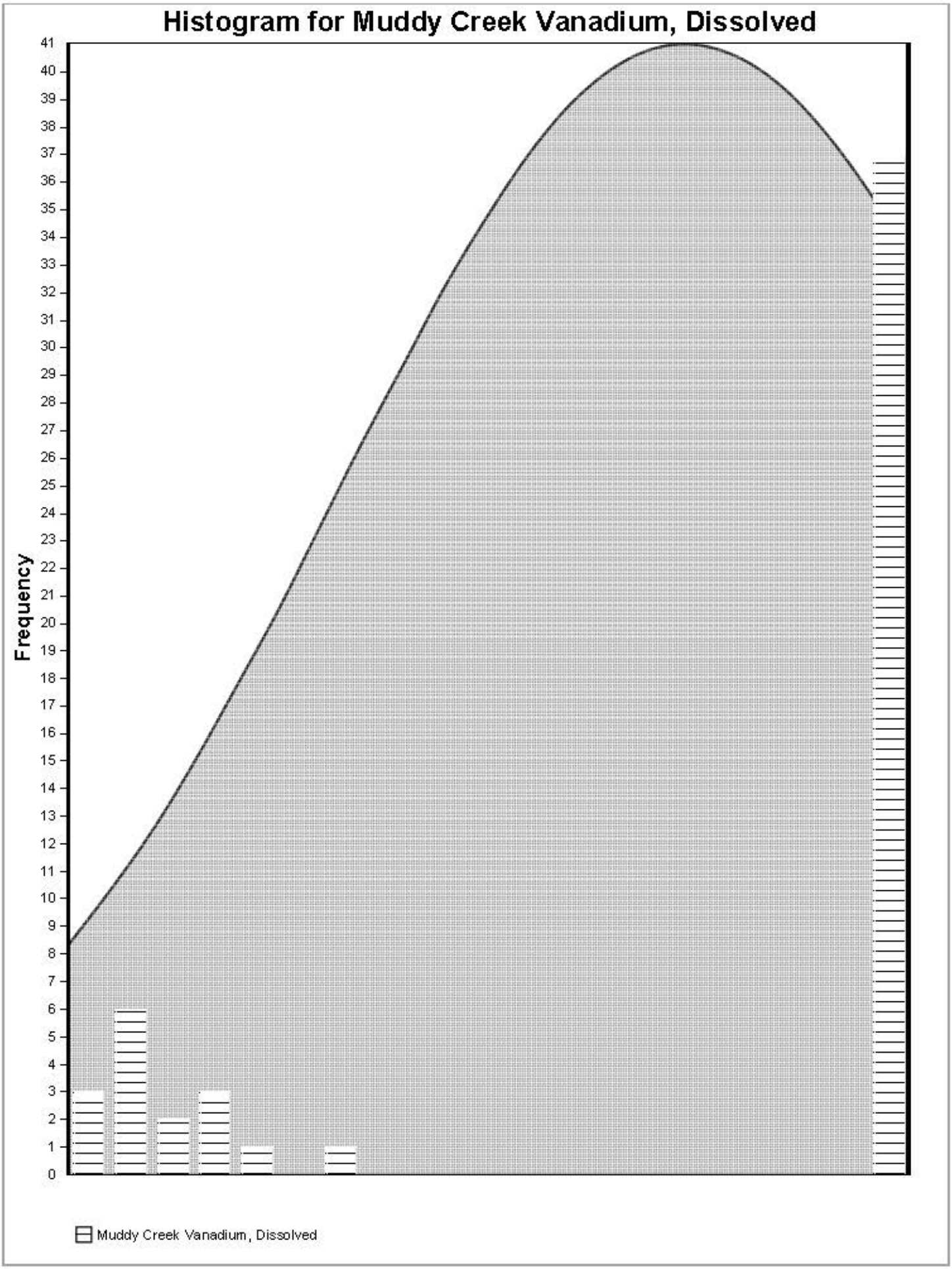
34
35
36
37
38
39
40
41
Alluv Vanadium, Dissolved

Histogram for Mesa Vanadium, Dissolved




Histogram for Muddy Creek Vanadium, Dissolved
Frequency
0
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13
14
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41
Muddy Creek Vanadium, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Vanadium_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Vanadium, Dissolved

Mean	0.00421
Standard Deviation	0.00216
Number of data	87
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00421	0.00215	0.0085	45	1.996	3.338	3.705

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Vanadium, Dissolved

Mean	0.00448
Standard Deviation	8.9295E-4
Number of data	53
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00448	8.8449E-4	0.00195	50	2.856	3.151	3.504

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Mesa Vanadium, Dissolved

Mean	0.00407
Standard Deviation	0.00357
Number of data	100
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.00407	0.00355	0.025	81	5.898	3.38	3.75

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.025 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.025 is a Potential Statistical Outlier

Vandium

Location Name	Sample Date	Alluv Vanadium, Dissolved	Location Name	Sample Date	Alluv Vanadium, Dissolved	Location Name	Sample Date	Muddy Creek Vanadium, Dissolved	Location Name	Sample Date	Mesa Vanadium, Dissolved			Mesa Vanadium, Dissolved
BG-1S	11/26/2012	0.0066	KMW-2D	12/8/2009	0.003 *	BG-3S	11/27/2012	0.01 *	BG-2S	11/26/2012	0.01 *	LMW-7	9/10/2008	0.0031 *
BG-1S	8/23/2012	0.0079	KMW-2D	12/10/2008	0.003 *	BG-3S	8/22/2012	0.01 *	BG-2S	8/23/2012	0.01 *	LMW-7	6/4/2008	0.0035 *
BG-1S	5/24/2012	0.0068	KMW-2D	6/3/2008	0.003 *	BG-3S	5/23/2012	0.01 *	BG-2S	5/24/2012	0.01 *	LMW-7	3/5/2008	0.0031 *
BG-1S	3/20/2012	0.0064	KMW-2M	11/26/2012	0.01 *	BG-3S	3/21/2012	0.01 *	BG-2S	3/21/2012	0.01 *	LMW-9	11/28/2012	0.01 *
IMW-2.5D	11/26/2012	0.01 *	KMW-2M	8/24/2012	0.01 *	BG-4S	11/27/2012	0.01 *	BG-2M	11/26/2012	0.01 *	LMW-9	8/27/2012	0.01 *
IMW-2.5D	8/24/2012	0.01 *	KMW-2M	5/21/2012	0.01	BG-4S	8/30/2012	0.0026 *	BG-2M	8/23/2012	0.01 *	LMW-9	5/31/2012	0.01 *
IMW-2.5D	5/21/2012	0.01 *	KMW-2M	3/23/2012	0.01 *	BG-4S	5/30/2012	0.01 *	BG-2M	5/24/2012	0.01 *	LMW-9	3/23/2012	0.01 *
IMW-2.5D	3/21/2012	0.01 *	KMW-2M	12/8/2011	0.003 *	BG-4S	3/20/2012	0.01 *	BG-2M	3/21/2012	0.01 *	LMW-9	12/5/2011	0.003 *
IMW-2.5D	12/8/2011	0.003 *	KMW-2M	6/6/2011	0.01 *	BG-6S	11/27/2012	0.01 *	BG-2D	11/26/2012	0.01 *	LMW-9	9/8/2011	0.003 *
IMW-2.5D	6/6/2011	0.01 *	KMW-2M	12/13/2010	0.01	BG-6S	8/23/2012	0.0035 *	BG-2D	8/23/2012	0.01 *	LMW-9	6/8/2011	0.01 *
IMW-2.5D	12/15/2010	0.01 *	KMW-2M	6/8/2010	0.003 *	BG-6S	5/25/2012	0.01 *	BG-2D	5/24/2012	0.01 *	LMW-9	3/9/2011	0.01 *
IMW-2.5D	6/9/2010	0.003 *	KMW-2M	12/8/2009	0.003	BG-6S	3/21/2012	0.0029 *	BG-2D	3/21/2012	0.01 *	LMW-9	12/10/2010	0.01 *
IMW-2.5D	12/12/2009	0.003 *	KMW-2M	12/10/2008	0.003 *	BG-1M	11/26/2012	0.01 *	LMW-10	11/28/2012	0.01 *	LMW-9	9/21/2010	0.01 *
IMW-2.5S	11/26/2012	0.01 *	KMW-2M	6/3/2008	0.003 *	BG-1M	8/23/2012	0.01 *	LMW-10	8/27/2012	0.01 *	LMW-9	6/9/2010	0.003 *
IMW-2.5S	8/24/2012	0.01 *	KMW-2S	11/26/2012	0.01 *	BG-1M	5/24/2012	0.01 *	LMW-10	5/30/2012	0.01 *	LMW-9	3/11/2010	0.003 *
IMW-2.5S	5/21/2012	0.01 *	KMW-2S	8/24/2012	0.01 *	BG-1M	3/20/2012	0.01 *	LMW-10	3/22/2012	0.01 *	LMW-9	12/11/2009	0.003 *
IMW-2.5S	3/21/2012	0.01 *	KMW-2S	5/21/2012	0.01 *	BG-3M	11/27/2012	0.01 *	LMW-10	12/6/2011	0.003 *	LMW-9	9/18/2009	0.003 *
IMW-2.5S	12/8/2011	0.003 *	KMW-2S	3/23/2012	0.01 *	BG-3M	8/22/2012	0.01 *	LMW-10	9/8/2011	0.003 *	LMW-9	6/10/2009	0.003 *
IMW-2.5S	9/9/2011	0.003 *	KMW-2S	12/8/2011	0.003 *	BG-3M	5/24/2012	0.01 *	LMW-10	6/8/2011	0.01 *	LMW-9	3/5/2009	0.003 *
IMW-2.5S	6/6/2011	0.01 *	KMW-2S	9/9/2011	0.0046 *	BG-3M	3/21/2012	0.01 *	LMW-10	3/2/2011	0.01 *	LMW-9	12/12/2008	0.003 *
IMW-2.5S	3/7/2011	0.01 *	KMW-2S	6/6/2011	0.01	BG-4M	11/27/2012	0.0028 *	LMW-10	12/9/2010	0.02 *	LMW-9	9/10/2008	0.003 *
IMW-2.5S	12/15/2010	0.01 *	KMW-2S	3/8/2011	0.01	BG-4M	8/30/2012	0.0041 *	LMW-10	9/21/2010	0.01 *	LMW-9	6/4/2008	0.0051 *
IMW-2.5S	9/20/2010	0.01 *	KMW-2S	12/13/2010	0.01	BG-4M	5/30/2012	0.003 *	LMW-10	6/9/2010	0.003 *	LMW-9	3/5/2008	0.0053 *
IMW-2.5S	6/9/2010	0.003 *	KMW-2S	9/15/2010	0.01 *	BG-4M	3/20/2012	0.01 *	LMW-10	3/11/2010	0.003 *	LMW-11	2/22/2012	0.0056 *
IMW-2.5S	3/9/2010	0.003 *	KMW-2S	6/8/2010	0.003 *	BG-6M	11/27/2012	0.01 *	LMW-10	12/11/2009	0.003 *	LMW-11	12/6/2011	0.003 *
IMW-2.5S	12/12/2009	0.003 *	KMW-2S	3/9/2010	0.003 *	BG-6M	8/22/2012	0.01 *	LMW-10	9/18/2009	0.003 *	LMW-11	9/8/2011	0.003 *
IMW-2.5S	9/21/2009	0.003 *	KMW-2S	12/8/2009	0.003 *	BG-6M	5/25/2012	0.01 *	LMW-10	6/10/2009	0.003 *	LMW-11	3/2/2011	0.01 *
IMW-3S	5/21/2012	0.0066	KMW-2S	9/16/2009	0.003 *	BG-6M	3/21/2012	0.01 *	LMW-10	3/5/2009	0.003 *	LMW-12R	11/30/2012	0.025 *
IMW-3S	3/20/2012	0.0058	KMW-2S	6/10/2009	0.003 *	BG-1D	11/26/2012	0.01 *	LMW-10	12/12/2008	0.003 *	LMW-12R	10/22/2012	0.013 *
IMW-3S	12/9/2011	0.005	KMW-2S	3/3/2009	0.003 *	BG-1D	8/23/2012	0.01 *	LMW-10	9/10/2008	0.003 *	LMW-12R	8/21/2012	0.003 *
IMW-3S	9/9/2011	0.005	KMW-2S	12/10/2008	0.003 *	BG-1D	5/24/2012	0.01	LMW-10	6/4/2008	0.0037	LMW-12R	5/30/2012	0.0041 *
IMW-3S	6/7/2011	0.01 *	KMW-2S	9/8/2008	0.003 *	BG-1D	3/20/2012	0.01	LMW-10	3/5/2008	0.0034	LMW-13R	11/28/2012	0.0037 *
IMW-3S	3/7/2011	0.01 *	KMW-2S	6/3/2008	0.003 *	BG-3D	11/27/2012	0.01 *	LMW-11R	11/26/2012	0.01 *	LMW-13R	10/22/2012	0.0053 *
IMW-3S	12/10/2010	0.01 *	KMW-2S	3/4/2008	0.003 *	BG-3D	8/21/2012	0.01 *	LMW-11R	8/21/2012	0.01 *	LMW-13R	8/20/2012	0.003 *
IMW-3S	9/16/2010	0.01 *				BG-3D	5/23/2012	0.01 *	LMW-11R	5/29/2012	0.01 *	LMW-13R	5/29/2012	0.003 *
IMW-3S	6/8/2010	0.0076				BG-3D	3/21/2012	0.01 *	LMW-11R	3/23/2012	0.01 *	LMW-14R	11/30/2012	0.015 *
IMW-3S	3/9/2010	0.0075				BG-4D	11/27/2012	0.0025 *	LMW-7	11/28/2012	0.01 *	LMW-14R	10/22/2012	0.0047 *
IMW-3S	12/10/2009	0.008				BG-4D	8/30/2012	0.0037 *	LMW-7	8/27/2012	0.01 *	LMW-14R	8/20/2012	0.003 *
IMW-3S	9/14/2009	0.007				BG-4D	5/30/2012	0.01 *	LMW-7	5/31/2012	0.01 *	LMW-14R	5/29/2012	0.003 *
IMW-3S	6/9/2009	0.0075				BG-4D	3/20/2012	0.01 *	LMW-7	3/23/2012	0.01 *	LMW-15	11/28/2012	0.003 *
IMW-3S	3/3/2009	0.0069				BG-6D	11/27/2012	0.0036 *	LMW-7	12/5/2011	0.003 *	LMW-15	10/22/2012	0.0031 *
IMW-3S	12/9/2008	0.0075				BG-6D	8/22/2012	0.01 *	LMW-7	9/6/2011	0.003 *	LMW-15	8/20/2012	0.003 *
IMW-3S	9/9/2008	0.0077				BG-6D	5/25/2012	0.01 *	LMW-7	6/9/2011	0.01 *	LMW-15	5/29/2012	0.003 *
IMW-3S	6/3/2008	0.008				BG-6D	3/21/2012	0.01 *	LMW-7	3/9/2011	0.01 *	LMW-16	11/28/2012	0.0031 *
IMW-3S	3/4/2008	0.0085				IMW-3D	5/25/2012	0.0032 *	LMW-7	12/10/2010	0.01 *	LMW-16	10/22/2012	0.003 *
KMW-2D	11/26/2012	0.01 *				IMW-3D	3/22/2012	0.0032 *	LMW-7	9/21/2010	0.01 *	LMW-16	8/20/2012	0.021 *
KMW-2D	8/24/2012	0.01 *				IMW-3D	12/9/2011	0.003 *	LMW-7	6/9/2010	0.003 *	LMW-16	5/29/2012	0.003 *
KMW-2D	5/21/2012	0.01 *				IMW-3D	6/7/2011	0.01 *	LMW-7	3/11/2010	0.003 *			
KMW-2D	3/23/2012	0.01 *				IMW-3D	12/10/2010	0.01	LMW-7	12/11/2009	0.0032			
KMW-2D	12/8/2011	0.003 *				IMW-3D	6/8/2010	0.0039 *	LMW-7	9/18/2009	0.003 *			
KMW-2D	6/6/2011	0.01 *				IMW-3D	12/10/2009	0.004	LMW-7	6/10/2009	0.0032			
KMW-2D	12/13/2010	0.01 *				IMW-3D	12/9/2008	0.0032	LMW-7	3/5/2009	0.003			
KMW-2D	6/8/2010	0.003 *				IMW-3D	6/3/2008	0.005 *	LMW-7	12/12/2008	0.003 *			* non-detect

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Zinc_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	0.95

Alluv Zinc, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	17	11	39.29%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	11	0.03	0.03	0.03	0.03	7.278E-18
Statistics (Detects Only)	17	0.011	0.065	0.0325	0.019	0.0218
Statistics (All: NDs treated as DL value)	28	0.011	0.065	0.0315	0.03	0.0168
Statistics (All: NDs treated as DL/2 value)	28	0.011	0.065	0.0256	0.016	0.0189
Statistics (Normal ROS Estimated Data)	28	-0.00226	0.065	0.028	0.0195	0.0194
Statistics (Gamma ROS Estimated Data)	28	0.011	0.065	0.0319	0.0268	0.0172
Statistics (Lognormal ROS Estimated Data)	28	0.00892	0.065	0.0275	0.0191	0.0185

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.56	2.309	0.0127	-3.635	0.653	-0.18
Statistics (NDs = DL)	4.098	3.683	0.00769	-3.585	0.507	-0.141
Statistics (NDs = DL/2)	2.758	2.486	0.00929	-3.857	0.576	-0.149
Statistics (Gamma ROS Estimates)	3.944	3.545	0.00809	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.776	0.588	-0.156

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.868	0.907	0.787	0.932

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.733	0.892	Data Not Normal
Lilliefors (Detects Only)	0.331	0.215	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.809	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.321	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.611	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.367	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.858	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.223	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.887	0.936	0.869	0.9

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.875	0.747	
Kolmogorov-Smirnov (Detects Only)	0.291	0.211	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	1.442	0.75	
Kolmogorov-Smirnov (NDs = DL)	0.259	0.166	Data Not Gamma Distributed

Anderson-Darling (NDs = DL/2)	4.67	0.755	
Kolmogorov-Smirnov (NDs = DL/2)	0.325	0.167	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.758	0.75	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.119	0.166	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.905	0.957	0.834	0.948

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.8	0.892	Data Not Lognormal
Lilliefors (Detects Only)	0.256	0.215	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.904	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.224	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.688	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.293	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.886	0.924	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.171	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Muddy Creek Zinc, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	46	0	46	28	18	39.13%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	18	0.03	0.03	0.03	0.03	1.428E-17
Statistics (Detects Only)	28	0.01	0.39	0.0385	0.0215	0.0702
Statistics (All: NDs treated as DL value)	46	0.01	0.39	0.0352	0.03	0.0546
Statistics (All: NDs treated as DL/2 value)	46	0.01	0.39	0.0293	0.015	0.0556
Statistics (Normal ROS Estimated Data)	46	-0.0337	0.39	0.0301	0.0203	0.0575
Statistics (Gamma ROS Estimated Data)	46	0.01	0.39	0.0392	0.0326	0.0546
Statistics (Lognormal ROS Estimated Data)	46	0.00656	0.39	0.0306	0.0185	0.0555

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.259	1.192	0.0306	-3.703	0.75	-0.202
Statistics (NDs = DL)	1.94	1.828	0.0181	-3.626	0.589	-0.162
Statistics (NDs = DL/2)	1.503	1.419	0.0195	-3.897	0.63	-0.162
Statistics (Gamma ROS Estimates)	1.953	1.84	0.0201	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.858	0.674	-0.175

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.565	0.507	0.498	0.628

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.353	0.924	Data Not Normal
Lilliefors (Detects Only)	0.355	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.301	0.945	Data Not Normal
Lilliefors (NDs = DL)	0.364	0.131	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.29	0.945	Data Not Normal

Lilliefors (NDs = DL/2)	0.364	0.131	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.446	0.945	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.292	0.131	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.751	0.651	0.679	0.832

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.566	0.768	
Kolmogorov-Smirnov (Detects Only)	0.198	0.169	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.731	0.762	
Kolmogorov-Smirnov (NDs = DL)	0.287	0.132	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	6.358	0.768	
Kolmogorov-Smirnov (NDs = DL/2)	0.28	0.133	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.505	0.762	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.208	0.132	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.91	0.881	0.836	0.929

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.845	0.924	Data Not Lognormal
Lilliefors (Detects Only)	0.136	0.167	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.808	0.945	Data Not Lognormal
Lilliefors (NDs = DL)	0.208	0.131	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.727	0.945	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.271	0.131	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.89	0.945	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.101	0.131	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Mesa Zinc, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	28	0	28	23	5	17.86%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	5	0.03	0.03	0.03	0.03	0
Statistics (Detects Only)	23	0.011	0.088	0.0342	0.016	0.0274
Statistics (All: NDs treated as DL value)	28	0.011	0.088	0.0334	0.022	0.0248
Statistics (All: NDs treated as DL/2 value)	28	0.011	0.088	0.0308	0.015	0.0259
Statistics (Normal ROS Estimated Data)	28	0.00143	0.088	0.0318	0.0175	0.0259
Statistics (Gamma ROS Estimated Data)	28	0.011	0.088	0.0337	0.0195	0.0252
Statistics (Lognormal ROS Estimated Data)	28	0.00994	0.088	0.0314	0.017	0.0257

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.866	1.69	0.0183	-3.668	0.758	-0.207
Statistics (NDs = DL)	2.232	2.017	0.015	-3.639	0.687	-0.189
Statistics (NDs = DL/2)	1.931	1.748	0.0159	-3.763	0.715	-0.19

Statistics (Gamma ROS Estimates)	2.137	1.932	0.0158	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.736	0.717	-0.192

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.871	0.893	0.835	0.892

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.745	0.914	Data Not Normal
Lilliefors (Detects Only)	0.306	0.185	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.783	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.269	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.686	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.34	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.787	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.261	0.167	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.922	0.948	0.914	0.945

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	2.368	0.756	
Kolmogorov-Smirnov (Detects Only)	0.27	0.184	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	1.749	0.757	
Kolmogorov-Smirnov (NDs = DL)	0.2	0.167	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.689	0.759	
Kolmogorov-Smirnov (NDs = DL/2)	0.322	0.168	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.93	0.757	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.231	0.167	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.904	0.943	0.875	0.919

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.8	0.914	Data Not Lognormal
Lilliefors (Detects Only)	0.253	0.185	Data Not Lognormal
Shapiro-Wilks (NDs = DL)	0.87	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.194	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.75	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.306	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.827	0.924	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.211	0.167	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

All Zinc, Dissolved

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	102	0	102	68	34	33.33%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	34	0.03	0.03	0.03	0.03	2.113E-17
Statistics (Detects Only)	68	0.01	0.39	0.0355	0.019	0.0485
Statistics (All: NDs treated as DL value)	102	0.01	0.39	0.0337	0.03	0.0396
Statistics (All: NDs treated as DL/2 value)	102	0.01	0.39	0.0287	0.015	0.0407
Statistics (Normal ROS Estimated Data)	102	-0.0288	0.39	0.0299	0.019	0.042
Statistics (Gamma ROS Estimated Data)	102	0.01	0.39	0.0359	0.03	0.0397
Statistics (Lognormal ROS Estimated Data)	102	0.00588	0.39	0.03	0.019	0.0406

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.63	1.588	0.0218	-3.674	0.72	-0.196
Statistics (NDs = DL)	2.347	2.285	0.0144	-3.618	0.591	-0.163
Statistics (NDs = DL/2)	1.825	1.778	0.0157	-3.849	0.637	-0.165
Statistics (Gamma ROS Estimates)	2.313	2.252	0.0155	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.803	0.667	-0.175

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.637	0.609	0.584	0.695

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.299	0.107	Data Not Normal
Lilliefors (NDs = DL)	0.302	0.0877	Data Not Normal
Lilliefors (NDs = DL/2)	0.323	0.0877	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.213	0.0877	Data Not Normal

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.788	0.733	0.745	0.848

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	3.91	0.767	
Kolmogorov-Smirnov (Detects Only)	0.213	0.11	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	4.589	0.763	
Kolmogorov-Smirnov (NDs = DL)	0.246	0.0899	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	12.1	0.767	
Kolmogorov-Smirnov (NDs = DL/2)	0.291	0.0903	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	1.912	0.763	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.101	0.0899	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.936	0.95	0.867	0.958

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.188	0.107	Data Not Lognormal
Lilliefors (NDs = DL)	0.19	0.0877	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.281	0.0877	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.133	0.0877	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.											

General Background Statistics for Data Sets with Non-Detects

User Selected Options	
From File	Zinc_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Values	1
Number of Bootstrap Operations	2000

Alluv Zinc, Dissolved

General Statistics

Number of Valid Data	28	Number of Detected Data	17
Number of Distinct Detected Data	13	Number of Non-Detect Data	11
		Percent Non-Detects	39.29%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.011	Minimum Detected	-4.51
Maximum Detected	0.065	Maximum Detected	-2.733
Mean of Detected	0.0325	Mean of Detected	-3.635
SD of Detected	0.0218	SD of Detected	0.653
Minimum Non-Detect	0.03	Minimum Non-Detect	-3.507
Maximum Non-Detect	0.03	Maximum Non-Detect	-3.507

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.733	Shapiro Wilk Test Statistic	0.8
5% Shapiro Wilk Critical Value	0.892	5% Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0256	Mean (Log Scale)	-3.857
SD	0.0189	SD (Log Scale)	0.576
95% UTL 95% Coverage	0.0681	95% UTL 95% Coverage	0.077
95% UPL (t)	0.0584	95% UPL (t)	0.0574
90% Percentile (z)	0.0498	90% Percentile (z)	0.0442
95% Percentile (z)	0.0567	95% Percentile (z)	0.0545
99% Percentile (z)	0.0696	99% Percentile (z)	0.0807
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0332	Mean in Original Scale	0.0275
SD	0.0294	SD in Original Scale	0.0185
95% UTL with 95% Coverage	0.0992	95% UTL with 95% Coverage	0.0858
		95% BCA UTL with 95% Coverage	0.065
		95% Bootstrap (%) UTL with 95% Coverage	0.065
95% UPL (t)	0.0841	95% UPL (t)	0.0635
90% Percentile (z)	0.0709	90% Percentile (z)	0.0487
95% Percentile (z)	0.0815	95% Percentile (z)	0.0602
99% Percentile (z)	0.102	99% Percentile (z)	0.0899

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.147	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0151		
nu star	73.01		
A-D Test Statistic	1.875	Nonparametric Statistics	
5% A-D Critical Value	0.747	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.291	Mean	0.0264
5% K-S Critical Value	0.211	SD	0.0182
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00359
		95% KM UTL with 95% Coverage	0.0674
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.107
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.058
Mean	0.0319	90% Percentile (z)	0.0498
Median	0.0268	95% Percentile (z)	0.0564
SD	0.0172	99% Percentile (z)	0.0688
k star	3.545		
Theta star	0.009	Gamma ROS Limits with Extrapolated Data	
Nu star	198.5	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.065
95% Percentile of Chisquare (2k)	14.2	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0658
		95% WH Approx. Gamma UTL with 95% Coverage	0.0795
90% Percentile	0.0546	95% HW Approx. Gamma UTL with 95% Coverage	0.0815
95% Percentile	0.0639		
99% Percentile	0.0838		

Note: DL/2 is not a recommended method.

Muddy Creek Zinc, Dissolved

General Statistics			
Number of Valid Data	46	Number of Detected Data	28
Number of Distinct Detected Data	21	Number of Non-Detect Data	18
		Percent Non-Detects	39.13%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.01	Minimum Detected	-4.605
Maximum Detected	0.39	Maximum Detected	-0.942
Mean of Detected	0.0385	Mean of Detected	-3.703
SD of Detected	0.0702	SD of Detected	0.75
Minimum Non-Detect	0.03	Minimum Non-Detect	-3.507
Maximum Non-Detect	0.03	Maximum Non-Detect	-3.507

Background Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.353	Shapiro Wilk Test Statistic	0.845
5% Shapiro Wilk Critical Value	0.924	5% Shapiro Wilk Critical Value	0.924
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0293	Mean (Log Scale)	-3.897

SD	0.0556	SD (Log Scale)	0.63
95% UTL 95% Coverage	0.145	95% UTL 95% Coverage	0.0753
95% UPL (t)	0.124	95% UPL (t)	0.0592
90% Percentile (z)	0.101	90% Percentile (z)	0.0455
95% Percentile (z)	0.121	95% Percentile (z)	0.0572
99% Percentile (z)	0.159	99% Percentile (z)	0.0879
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.0895	Mean in Original Scale	0.0306
SD	0.137	SD in Original Scale	0.0555
95% UTL with 95% Coverage	0.195	95% UTL with 95% Coverage	0.0856
		95% BCA UTL with 95% Coverage	0.307
		95% Bootstrap (%) UTL with 95% Coverage	0.307
95% UPL (t)	0.143	95% UPL (t)	0.0662
90% Percentile (z)	0.086	90% Percentile (z)	0.05
95% Percentile (z)	0.136	95% Percentile (z)	0.0639
99% Percentile (z)	0.229	99% Percentile (z)	0.101
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.148	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0336		
nu star	64.29		
A-D Test Statistic	2.566	Nonparametric Statistics	
5% A-D Critical Value	0.768	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.198	Mean	0.0302
5% K-S Critical Value	0.169	SD	0.0549
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00828
		95% KM UTL with 95% Coverage	0.144
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.272
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.123
Mean	0.0392	90% Percentile (z)	0.101
Median	0.0326	95% Percentile (z)	0.121
SD	0.0546	99% Percentile (z)	0.158
k star	1.84		
Theta star	0.0213	Gamma ROS Limits with Extrapolated Data	
Nu star	169.3	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0923
95% Percentile of Chisquare (2k)	8.963	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.09
		95% WH Approx. Gamma UTL with 95% Coverage	0.112
90% Percentile	0.0778	95% HW Approx. Gamma UTL with 95% Coverage	0.11
95% Percentile	0.0955		
99% Percentile	0.135		

Note: DL/2 is not a recommended method.

Mesa Zinc, Dissolved

General Statistics			
Number of Valid Data	28	Number of Detected Data	23
Number of Distinct Detected Data	17	Number of Non-Detect Data	5
		Percent Non-Detects	17.86%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.011	Minimum Detected	-4.51
Maximum Detected	0.088	Maximum Detected	-2.43
Mean of Detected	0.0342	Mean of Detected	-3.668
SD of Detected	0.0274	SD of Detected	0.758
Minimum Non-Detect	0.03	Minimum Non-Detect	-3.507
Maximum Non-Detect	0.03	Maximum Non-Detect	-3.507

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.745	Shapiro Wilk Test Statistic	0.8
5% Shapiro Wilk Critical Value	0.914	5% Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0308	Mean (Log Scale)	-3.763
SD	0.0259	SD (Log Scale)	0.715
95% UTL 95% Coverage	0.0889	95% UTL 95% Coverage	0.116
95% UPL (t)	0.0756	95% UPL (t)	0.0802
90% Percentile (z)	0.0639	90% Percentile (z)	0.058
95% Percentile (z)	0.0733	95% Percentile (z)	0.0753
99% Percentile (z)	0.0909	99% Percentile (z)	0.123
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0694	Mean in Original Scale	0.0314
SD	0.0128	SD in Original Scale	0.0257
95% UTL with 95% Coverage	0.0982	95% UTL with 95% Coverage	0.119
		95% BCA UTL with 95% Coverage	0.088
		95% Bootstrap (%) UTL with 95% Coverage	0.088
95% UPL (t)	0.0916	95% UPL (t)	0.0827
90% Percentile (z)	0.0858	90% Percentile (z)	0.0598
95% Percentile (z)	0.0904	95% Percentile (z)	0.0776
99% Percentile (z)	0.0992	99% Percentile (z)	0.127
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.652	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0207		
nu star	75.98		
A-D Test Statistic	2.368	Nonparametric Statistics	
5% A-D Critical Value	0.756	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.27	Mean	0.0308
5% K-S Critical Value	0.184	SD	0.0254
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00492
		95% KM UTL with 95% Coverage	0.0879
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.143
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0748
Mean	0.0337	90% Percentile (z)	0.0634
Median	0.0195	95% Percentile (z)	0.0726
SD	0.0252	99% Percentile (z)	0.0899
k star	1.932		

Theta star	0.0174	Gamma ROS Limits with Extrapolated Data	
Nu star	108.2	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0826
95% Percentile of Chisquare (2k)	9.266	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0839
		95% WH Approx. Gamma UTL with 95% Coverage	0.107
90% Percentile	0.0661	95% HW Approx. Gamma UTL with 95% Coverage	0.11
95% Percentile	0.0808		
99% Percentile	0.114		

Note: DL/2 is not a recommended method.

All Zinc, Dissolved

General Statistics

Number of Valid Data	102	Number of Detected Data	68
Number of Distinct Detected Data	38	Number of Non-Detect Data	34
		Percent Non-Detects	33.33%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.01	Minimum Detected	-4.605
Maximum Detected	0.39	Maximum Detected	-0.942
Mean of Detected	0.0355	Mean of Detected	-3.674
SD of Detected	0.0485	SD of Detected	0.72
Minimum Non-Detect	0.03	Minimum Non-Detect	-3.507
Maximum Non-Detect	0.03	Maximum Non-Detect	-3.507

Background Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.299	Lilliefors Test Statistic	0.188
5% Lilliefors Critical Value	0.107	5% Lilliefors Critical Value	0.107
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.0287	Mean (Log Scale)	-3.849
SD	0.0407	SD (Log Scale)	0.637
95% UTL 95% Coverage	0.107	95% UTL 95% Coverage	0.0723
95% UPL (t)	0.0966	95% UPL (t)	0.0616
90% Percentile (z)	0.0809	90% Percentile (z)	0.0482
95% Percentile (z)	0.0957	95% Percentile (z)	0.0607
99% Percentile (z)	0.123	99% Percentile (z)	0.0937
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	-0.0467	Mean in Original Scale	0.03
SD	0.0969	SD in Original Scale	0.0406
95% UTL with 95% Coverage	0.139	95% UTL with 95% Coverage	0.0803
		95% BCA UTL with 95% Coverage	0.0805
		95% Bootstrap (%) UTL with 95% Coverage	0.0805
95% UPL (t)	0.115	95% UPL (t)	0.0679
90% Percentile (z)	0.0775	90% Percentile (z)	0.0525
95% Percentile (z)	0.113	95% Percentile (z)	0.0669
99% Percentile (z)	0.179	99% Percentile (z)	0.105

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.568	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0227		
nu star	213.2		
A-D Test Statistic	3.91	Nonparametric Statistics	
5% A-D Critical Value	0.767	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.213	Mean	0.0292
5% K-S Critical Value	0.11	SD	0.0404
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.00405
		95% KM UTL with 95% Coverage	0.107
Assuming Gamma Distribution		95% KM Chebyshev UPL	0.206
Gamma ROS Statistics with Extrapolated Data		95% KM UPL (t)	0.0967
Mean	0.0359	90% Percentile (z)	0.081
Median	0.03	95% Percentile (z)	0.0957
SD	0.0397	99% Percentile (z)	0.123
k star	2.252		
Theta star	0.016	Gamma ROS Limits with Extrapolated Data	
Nu star	459.3	95% Wilson Hilferty (WH) Approx. Gamma UPL	0.0803
95% Percentile of Chisquare (2k)	10.29	95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0796
		95% WH Approx. Gamma UTL with 95% Coverage	0.0908
90% Percentile	0.068	95% HW Approx. Gamma UTL with 95% Coverage	0.0906
95% Percentile	0.0821		
99% Percentile	0.113		

Note: DL/2 is not a recommended method.

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Zinc_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Zinc, Dissolved

Background Data: Muddy Creek Zinc, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	28	46
Number of Non-Detect Data	5	18
Number of Detect Data	23	28
Minimum Non-Detect	0.03	0.03
Maximum Non-Detect	0.03	0.03
Percent Non detects	17.86%	39.13%
Minimum Detected	0.011	0.01
Maximum Detected	0.088	0.39
Mean of Detected Data	0.0342	0.0385
Median of Detected Data	0.016	0.0215
SD of Detected Data	0.0274	0.0702

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0.661
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.509

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Zinc_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Mesa Zinc, Dissolved

Background Data: Alluv Zinc, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	28	28
Number of Non-Detect Data	5	11
Number of Detect Data	23	17
Minimum Non-Detect	0.03	0.03
Maximum Non-Detect	0.03	0.03
Percent Non detects	17.86%	39.29%
Minimum Detected	0.011	0.011
Maximum Detected	0.088	0.065
Mean of Detected Data	0.0342	0.0325
Median of Detected Data	0.016	0.019
SD of Detected Data	0.0274	0.0218

Site vs Background Gehan Test

H0: Mu of Site or AOC = Mu of background

Gehan z Test Value	0.149
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.881

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)

Gehan Site vs Background Comparison Hypothesis Test for Data Sets with Non-Detects

User Selected Options	
From File	Zinc_Dissolved.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0.000
Selected Null Hypothesis	Site or AOC Mean/Median Equal to Background Mean/Median (Two Sided Alternative)
Alternative Hypothesis	Site or AOC Mean/Median Not Equal to Background Mean/Median

Area of Concern Data: Muddy Creek Zinc, Dissolved

Background Data: Alluv Zinc, Dissolved

Raw Statistics

	Site	Background
Number of Valid Data	46	28
Number of Non-Detect Data	18	11
Number of Detect Data	28	17
Minimum Non-Detect	0.03	0.03
Maximum Non-Detect	0.03	0.03
Percent Non detects	39.13%	39.29%
Minimum Detected	0.01	0.011
Maximum Detected	0.39	0.065
Mean of Detected Data	0.0385	0.0325
Median of Detected Data	0.0215	0.019
SD of Detected Data	0.0702	0.0218

Site vs Background Gehan Test

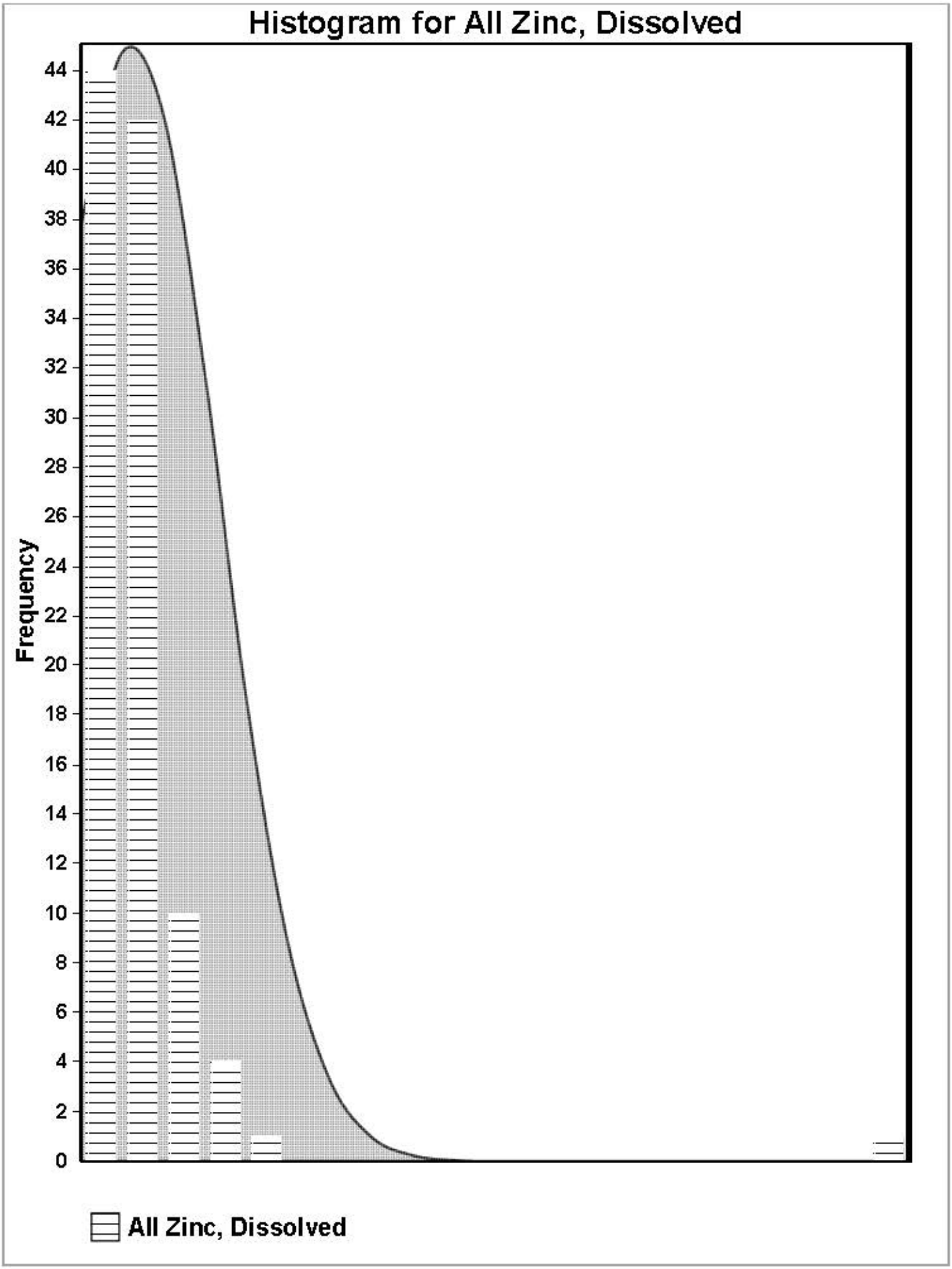
H0: Mu of Site or AOC = Mu of background

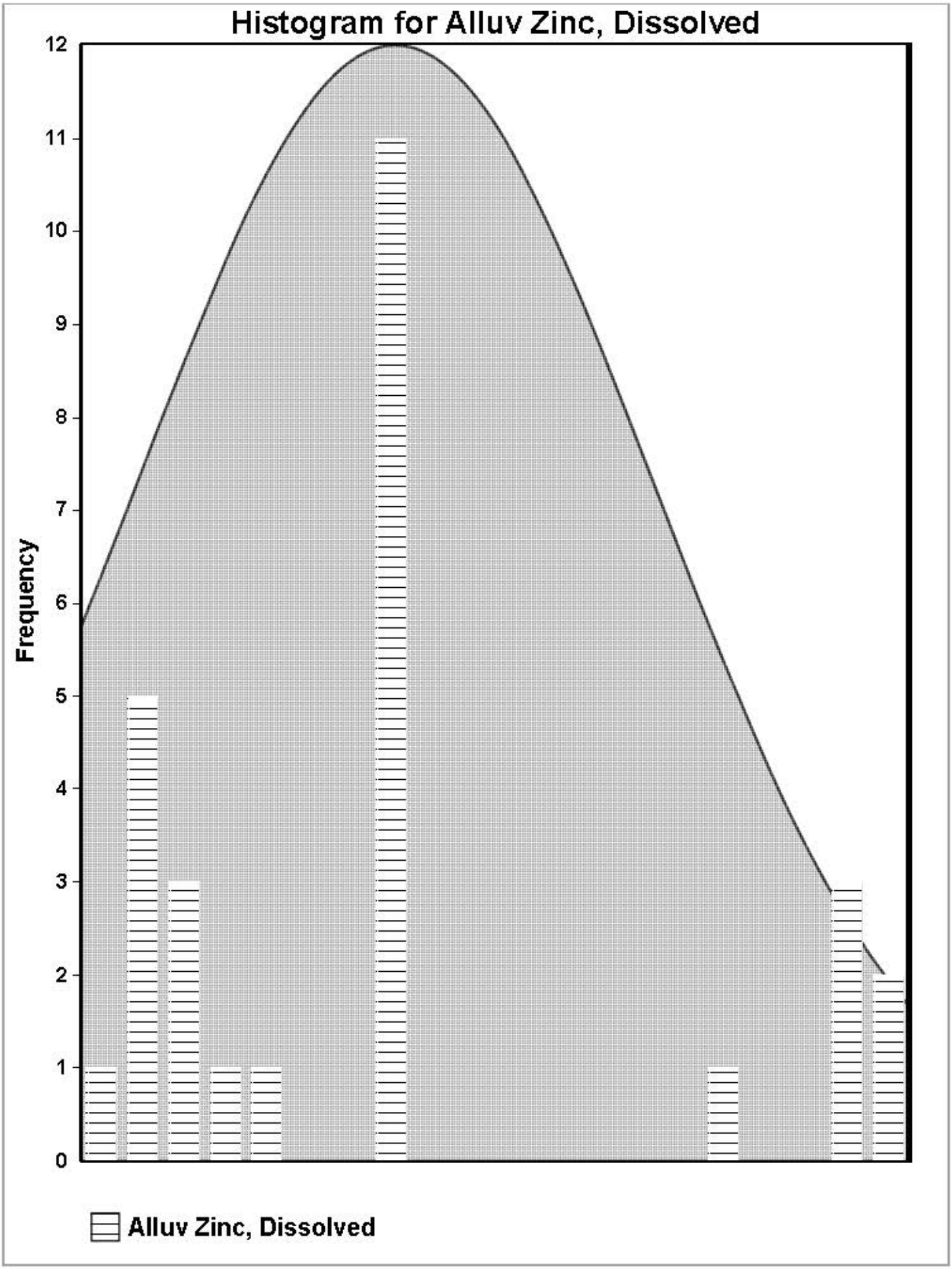
Gehan z Test Value	-0.601
Lower Critical z (0.025)	-1.96
Upper Critical z (0.975)	1.96
P-Value	0.548

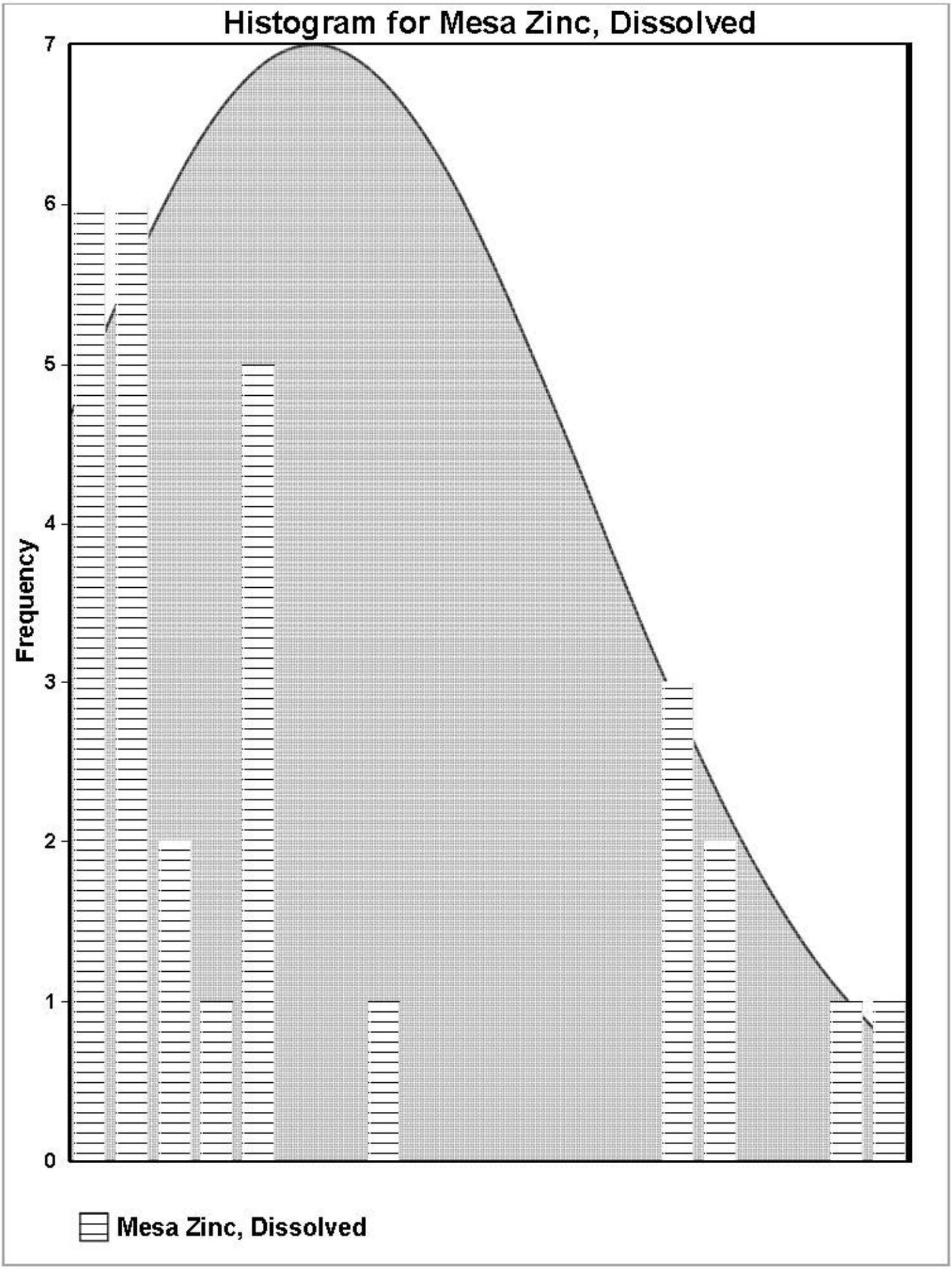
Conclusion with Alpha = 0.05

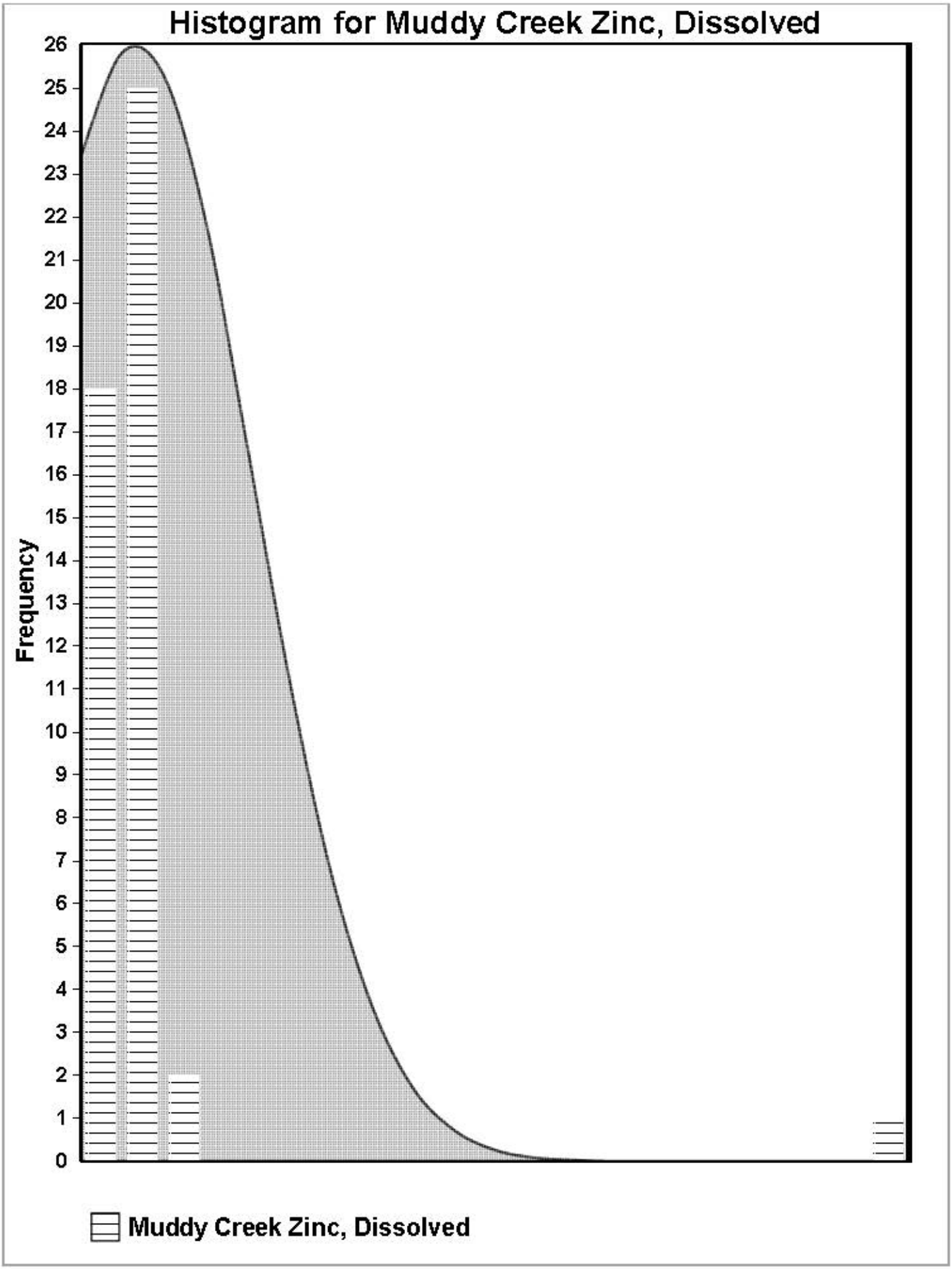
Do Not Reject H0, Conclude Site = Background

P-Value >= alpha (0.05)


Histogram for All Zinc, Dissolved
Frequency
44
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
All Zinc, Dissolved


Histogram for Alluv Zinc, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
12
Alluv Zinc, Dissolved


Histogram for Mesa Zinc, Dissolved
Frequency
0
1
2
3
4
5
6
7
Mesa Zinc, Dissolved


Histogram for Muddy Creek Zinc, Dissolved
Frequency
0
1
2
3
4
5
6
7
8
9
10
11
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13
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16
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21
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24
25
26
Muddy Creek Zinc, Dissolved

Outlier Tests for Selected Variables

User Selected Options	
From File	Zinc_Dissolved.wst
Full Precision	OFF
Test for Suspected Outliers with Dixon test	1
Test for Suspected Outliers for Rosner test	1

Rosner's Outlier Test for Alluv Zinc, Dissolved

Mean	0.0256
Standard Deviation	0.0189
Number of data	28
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0256	0.0186	0.065	1	2.121	2.88	3.2

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for Muddy Creek Zinc, Dissolved

Mean	0.0293
Standard Deviation	0.0556
Number of data	46
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0293	0.055	0.39	30	6.554	3.09	3.45

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.39 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.39 is a Potential Statistical Outlier

Rosner's Outlier Test for Mesa Zinc, Dissolved

Mean	0.0308
Standard Deviation	0.0259
Number of data	28
Number of suspected outliers	1

			Potential	Obs.	Test	Critical	Critical

#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	0.0308	0.0254	0.088	17	2.253	2.88	3.2

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for All Zinc, Dissolved

Mean	0.0287
Standard Deviation	0.0407
Number of data	102
Number of suspected outliers	1

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0287	0.0405	0.39	58	8.918	3.386	3.756

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.39 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Therefore, Observation 0.39 is a Potential Statistical Outlier

Location Name	Sample Date	Alluv Zinc, Dissolved	D_Alluv Zinc, Dissolved
BG-1S	11/26/2012	0.065	1
BG-1S	8/23/2012	0.014	1
BG-1S	5/24/2012	0.03	0
BG-1S	3/20/2012	0.03	0
IMW-2.5D	11/26/2012	0.06	1
IMW-2.5D	8/24/2012	0.018	1
IMW-2.5D	5/21/2012	0.03	0
IMW-2.5D	3/21/2012	0.016	1
IMW-2.5S	11/26/2012	0.054	1
IMW-2.5S	8/24/2012	0.02	1
IMW-2.5S	5/21/2012	0.03	0
IMW-2.5S	3/21/2012	0.011	1
IMW-3S	5/21/2012	0.03	0
IMW-3S	3/20/2012	0.03	0
IMW-3S	3/3/2009	0.016	1
KMW-2D	11/26/2012	0.061	1
KMW-2D	8/24/2012	0.019	1
KMW-2D	5/21/2012	0.016	1
KMW-2D	3/23/2012	0.03	0
KMW-2M	11/26/2012	0.063	1
KMW-2M	8/24/2012	0.019	1
KMW-2M	5/21/2012	0.03	0
KMW-2M	3/23/2012	0.03	0
KMW-2S	11/26/2012	0.062	1
KMW-2S	8/24/2012	0.022	1
KMW-2S	5/21/2012	0.03	0
KMW-2S	3/23/2012	0.03	0
KMW-2S	3/3/2009	0.016	1

Location Name	Sample Date	Muddy Creek Zinc, Dissolved	D_Muddy Creek Zinc, Dissolved
BG-3S	11/27/2012	0.028	1
BG-3S	8/22/2012	0.013	1
BG-3S	5/23/2012	0.03	0
BG-3S	3/21/2012	0.011	1
BG-4S	11/27/2012	0.036	1
BG-4S	8/30/2012	0.03	0
BG-4S	5/30/2012	0.013	1
BG-4S	3/20/2012	0.01	1
BG-6S	11/27/2012	0.047	1
BG-6S	8/23/2012	0.015	1
BG-6S	5/25/2012	0.03	0
BG-6S	3/21/2012	0.014	1
BG-1M	11/26/2012	0.058	1
BG-1M	8/23/2012	0.031	1
BG-1M	5/24/2012	0.03	0
BG-1M	3/20/2012	0.03	0
BG-3M	11/27/2012	0.024	1
BG-3M	8/22/2012	0.014	1
BG-3M	5/24/2012	0.03	0
BG-3M	3/21/2012	0.032	1
BG-4M	11/27/2012	0.033	1
BG-4M	8/30/2012	0.03	0
BG-4M	5/30/2012	0.011	1
BG-4M	3/20/2012	0.03	0
BG-6M	11/27/2012	0.039	1
BG-6M	8/22/2012	0.018	1
BG-6M	5/25/2012	0.03	0
BG-6M	3/21/2012	0.014	1
BG-1D	11/26/2012	0.057	1
BG-1D	8/23/2012	0.39	1
BG-1D	5/24/2012	0.03	0
BG-1D	3/20/2012	0.019	1
BG-3D	11/27/2012	0.017	1
BG-3D	8/21/2012	0.03	0
BG-3D	5/23/2012	0.03	0
BG-3D	3/21/2012	0.03	0
BG-4D	11/27/2012	0.028	1
BG-4D	8/30/2012	0.03	0
BG-4D	5/30/2012	0.03	0
BG-4D	3/20/2012	0.03	0
BG-6D	11/27/2012	0.045	1
BG-6D	8/22/2012	0.018	1
BG-6D	5/25/2012	0.016	1
BG-6D	3/21/2012	0.028	1
IMW-3D	5/25/2012	0.03	0
IMW-3D	3/22/2012	0.03	0

Location Name	Sample Date	Mesa Zinc, Dissolved	D_Mesa Zinc, Dissolved
BG-2S	11/26/2012	0.081	1
BG-2S	8/23/2012	0.024	1
BG-2S	5/24/2012	0.03	0
BG-2S	3/21/2012	0.03	0
BG-2M	11/26/2012	0.066	1
BG-2M	8/23/2012	0.014	1
BG-2M	5/24/2012	0.011	1
BG-2M	3/21/2012	0.015	1
BG-2D	11/26/2012	0.068	1
BG-2D	8/23/2012	0.015	1
BG-2D	5/24/2012	0.03	0
BG-2D	3/21/2012	0.014	1
LMW-10	11/28/2012	0.071	1
LMW-10	8/27/2012	0.016	1
LMW-10	5/30/2012	0.015	1
LMW-10	3/22/2012	0.03	0
LMW-11R	11/26/2012	0.088	1
LMW-11R	8/21/2012	0.019	1
LMW-11R	5/29/2012	0.015	1
LMW-11R	3/23/2012	0.041	1
LMW-7	11/28/2012	0.067	1
LMW-7	8/27/2012	0.013	1
LMW-7	5/31/2012	0.03	0
LMW-7	3/23/2012	0.012	1
LMW-9	11/28/2012	0.072	1
LMW-9	8/27/2012	0.016	1
LMW-9	5/31/2012	0.013	1
LMW-9	3/23/2012	0.02	1

Location Name	Sample Date	All Zinc, Dissolved	D_All Zinc, Dissolved
BG-1S	11/26/2012	0.065	1
BG-1S	8/23/2012	0.014	1
BG-1S	5/24/2012	0.03	0
BG-1S	3/20/2012	0.03	0
IMW-2.5D	11/26/2012	0.06	1
IMW-2.5D	8/24/2012	0.018	1
IMW-2.5D	5/21/2012	0.03	0
IMW-2.5D	3/21/2012	0.016	1
IMW-2.5S	11/26/2012	0.054	1
IMW-2.5S	8/24/2012	0.02	1
IMW-2.5S	5/21/2012	0.03	0
IMW-2.5S	3/21/2012	0.011	1
IMW-3S	5/21/2012	0.03	0
IMW-3S	3/20/2012	0.03	0
IMW-3S	3/3/2009	0.016	1
KMW-2D	11/26/2012	0.061	1
KMW-2D	8/24/2012	0.019	1
KMW-2D	5/21/2012	0.016	1
KMW-2D	3/23/2012	0.03	0
KMW-2M	11/26/2012	0.063	1
KMW-2M	8/24/2012	0.019	1
KMW-2M	5/21/2012	0.03	0
KMW-2M	3/23/2012	0.03	0
KMW-2S	11/26/2012	0.062	1
KMW-2S	8/24/2012	0.022	1
KMW-2S	5/21/2012	0.03	0
KMW-2S	3/23/2012	0.03	0
KMW-2S	3/3/2009	0.016	1
BG-3S	11/27/2012	0.028	1
BG-3S	8/22/2012	0.013	1
BG-3S	5/23/2012	0.03	0
BG-3S	3/21/2012	0.011	1
BG-4S	11/27/2012	0.036	1
BG-4S	8/30/2012	0.03	0
BG-4S	5/30/2012	0.013	1
BG-4S	3/20/2012	0.01	1
BG-6S	11/27/2012	0.047	1
BG-6S	8/23/2012	0.015	1
BG-6S	5/25/2012	0.03	0
BG-6S	3/21/2012	0.014	1
BG-1M	11/26/2012	0.058	1
BG-1M	8/23/2012	0.031	1
BG-1M	5/24/2012	0.03	0
BG-1M	3/20/2012	0.03	0
BG-3M	11/27/2012	0.024	1
BG-3M	8/22/2012	0.014	1
BG-3M	5/24/2012	0.03	0
BG-3M	3/21/2012	0.032	1
BG-4M	11/27/2012	0.033	1
BG-4M	8/30/2012	0.03	0

BG-4M	5/30/2012	0.011	1
BG-4M	3/20/2012	0.03	0
BG-6M	11/27/2012	0.039	1
BG-6M	8/22/2012	0.018	1
BG-6M	5/25/2012	0.03	0
BG-6M	3/21/2012	0.014	1
BG-1D	11/26/2012	0.057	1
BG-1D	8/23/2012	0.39	1
BG-1D	5/24/2012	0.03	0
BG-1D	3/20/2012	0.019	1
BG-3D	11/27/2012	0.017	1
BG-3D	8/21/2012	0.03	0
BG-3D	5/23/2012	0.03	0
BG-3D	3/21/2012	0.03	0
BG-4D	11/27/2012	0.028	1
BG-4D	8/30/2012	0.03	0
BG-4D	5/30/2012	0.03	0
BG-4D	3/20/2012	0.03	0
BG-6D	11/27/2012	0.045	1
BG-6D	8/22/2012	0.018	1
BG-6D	5/25/2012	0.016	1
BG-6D	3/21/2012	0.028	1
IMW-3D	5/25/2012	0.03	0
IMW-3D	3/22/2012	0.03	0
BG-2S	11/26/2012	0.081	1
BG-2S	8/23/2012	0.024	1
BG-2S	5/24/2012	0.03	0
BG-2S	3/21/2012	0.03	0
BG-2M	11/26/2012	0.066	1
BG-2M	8/23/2012	0.014	1
BG-2M	5/24/2012	0.011	1
BG-2M	3/21/2012	0.015	1
BG-2D	11/26/2012	0.068	1
BG-2D	8/23/2012	0.015	1
BG-2D	5/24/2012	0.03	0
BG-2D	3/21/2012	0.014	1
LMW-10	11/28/2012	0.071	1
LMW-10	8/27/2012	0.016	1
LMW-10	5/30/2012	0.015	1
LMW-10	3/22/2012	0.03	0
LMW-11R	11/26/2012	0.088	1
LMW-11R	8/21/2012	0.019	1
LMW-11R	5/29/2012	0.015	1
LMW-11R	3/23/2012	0.041	1
LMW-7	11/28/2012	0.067	1
LMW-7	8/27/2012	0.013	1
LMW-7	5/31/2012	0.03	0
LMW-7	3/23/2012	0.012	1
LMW-9	11/28/2012	0.072	1
LMW-9	8/27/2012	0.016	1
LMW-9	5/31/2012	0.013	1
LMW-9	3/23/2012	0.02	1