Appendix C

Recent Analytical Test Results

Terracon

Filter Cake Material

Terracon

Kennametal Inc., Filter Cake Material

Meteoric Water Mobility Procedure (MWMP) Testing / Profile II

Sample Location:		FCUW*	FCUE*	FCM*	FCL*	FC-(2/04)**	FC-(5/04)**
	Standards (mg/L)						
Lab Reference #		56965	56965	56965	56965	58437	58437
Sampling Date	-	11/4/2003	11/4/2003	11/4/2003	11/4/2003	1/20/2004	4/26/2004
Lab Test Date	-	11/13/2003	11/13/2003	11/13/2003	11/13/2003	1/28/2004	5/25/2004
Depth to Water, feet	-	N/A	N/A	N/A	N/A	N/A	N/A
pH, S.U.	6.5 - 8.5	7.48	7.53	7.02	7.22	7.10	7.63
Alkalinity, Total	-	27	33	8	8	6	22
Alkalinity/Bicarbonate	-	27	33	8	8	6	-
Alkalinity/Carbonate	-	<1	<1	<1	<1	<2	<1
Alkalinity/Hydroxide	-	<1	<1	<1	<1	<2	-
Chloride	250	260	3,400	1,800	250	230	540
Fluoride	2.0 - 4.0	<0.1	<1	<1	<0.1	<1	<.10
Nitrate as N, Total	10	0.62	6.7	11	0.87	0.95	5.60
Nitrite as N, Total	-	-	-	-	-	-	0.40
Sulfate	500	1,600	1,700	2,600	1,800	1,300	2,400
Total Dissolved Solids	500 - 1,000	2,600	8,200	6,600	2,900	2,900	5,200
Aluminum	0.05 - 0.2	<0.05	<0.5	<0.5	<0.25	0.2	0.064
Antimony	0.006	<0.005	<0.01	<0.01	<0.005	0.006	<0.0025
Arsenic	0.01	0.008	0.089	0.024	0.015	0.014	0.021
Barium	2.00	0.014	0.018	0.04	0.034	0.030	0.026
Beryllium	0.004	<0.005	<0.01	<0.01	<0.005	<0.002	<0.001
Bismuth	-	<0.5	<1	<1	<0.5	<0.2	<0.10
Boron	-	0.44	1.0	1.3	0.7	0.5	1.6
Cadmium	0.005	<0.005	<0.01	<0.01	<0.005	<0.002	<0.0010
Calcium	-	680	1,400	700	540	560	500
Chromium	0.10	0.048	<0.01	<0.01	<0.005	<0.002	0.0086
Cobalt	-	<0.005	0.011	0.014	<0.005	<0.002	<0.010
Copper	1.00	0.008	0.18	0.017	0.01	0.01	<0.050
Cyanide, WAD	-	-	-	-	-	-	0.12
Gallium	-	<0.5	<1	<1	<1	<0.2	<0.10
Iron	0.30	<0.05	<0.5	<0.5	<0.25	<0.1	<0.010
Lead	0.015	<0.005	<0.01	<0.01	<0.005	<0.002	<0.010
Lithium	-	<0.5	<1	<1	<0.5	<0.2	<0.10
Magnesium	125	18	330	440	29	19	150
Manganese	0.05	0.028	25	210	15	6.8	27
Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00010
Molybdenum	-	0.70	0.12	0.011	0.14	0.07	0.059
Nickel	0.1	0.061	0.13	0.078	0.050	0.011	0.014
Phosphorus	-	0.03	<0.02	<0.02	<0.02	0	<0.50
Potassium	-	7	64	55	11	11	19
Scandium	-	<0.25	<0.5	<0.5	<0.25	<0.1	<0.10
Selenium	0.05	0.006	0.01	<0.01	<0.005	<0.01	<0.0050
Silver	0.1	<0.005	<0.01	<0.01	<0.005	<0.002	<0.0050
Sodium	-	41	540	420	260	230	740
Strontium	-	0.6	1.5	1.2	0.4	0.6	0.75
Thallium	0.002	<0.0025	<0.005	<0.005	<0.0025	0.002	<0.0010
Tin	-	<0.5	<1	<1	<0.5	0.40	<0.10
Titanium	-	<0.25	<0.5	<0.5	<0.25	<0.1	<0.10
Tungsten	-	0.58	0.14	0.026	0.91	0.60	0.05
Uranium	-	-	-	-	-	<0.002	-
Vanadium	-	<0.005	<0.01	<0.01	<0.005	0.002	0.083
Zinc	5.0	<0.025	<0.05	<0.05	<0.025	0.02	<0.010
Gross Alpha	-	-	-	-	-	-	ND
Gross Beta	-	-	-	-	-	-	57.5

ND = non detect

*Sampled by: Steve Morrow (Terracon)

**Sampled by: Ken Mallory (SPB/Shaw Engineering)

Kennametal Inc., Filter Cake Material, Sample Date 11/14/2003

Meteoric Water Mobility Procedure (MWMP) Testing / Profile II, **Constituents That Exceed the MCL's**

mg/L	FCUW	FCUE	FCM	FCL	Drinking Water MCL's	Toxicity Characteristic (TC) Levels[1]
Arsenic	-	0.089	0.024	0.015	0.01	5.0
Chloride	260	3400	1800	250	250	-
Magnesium	-	330	440	-	125	-
Manganese	-	25	210	15	0.05	-
Nitrate-N	-	-	11	-	10	-
Sulfate	1600	1700	2600	1800	500	-
Total Dissolved Solids	2600	8200	6600	2900	500-1000	-

Meteoric Water Mobility Procedure (MWMP) Testing / Profile II, **Non-Detectable Constituents**

mg/L	FCUW	FCUE	FCM	FCL	Drinking Water MCL's	Toxicity Characteristic (TC) Levels[1]
Aluminum	-	<0.5	<0.5	<0.25	0.05-0.2	-
Antimony	-	<0.01	<0.01	-	0.006	-
Beryllium	<0.005	<0.01	<0.01	<0.005	0.004	-
Cadmium	-	<0.01	-	-	0.005	1.0
Iron	-	<0.5	<0.5	-	0.3	-
Thallium	<0.0025	<0.005	<0.005	-	0.002	-

1) TC levels were set to be protective of the 85th percentile receptors, 55 Federal Register 11804, March 29,1990.

References

EPA 1996. Hazardous Waste Characteristics Scoping Study. U.S. Environmental Protection Agency, Office of Solid Waste. November 15, 1996.

Groundwater Data

Terracon

Kennametal, Groundwater Recent Data

Groundwater Monitoring Well Data, MW-1 through MW-4, Sampled 2/12/2004

CollectDate	Material	Parameter	Reported Result	MCL
2/12/2004	Kennametal Monitoring Well MW-1	Antimony	<0.005	0.006
2/12/2004	Kennametal Monitoring Well MW-1	Barium	0.015	2
2/12/2004	Kennametal Monitoring Well MW-1	Beryllium	<0.005	0.004
2/12/2004	Kennametal Monitoring Well MW-1	Cadmium	<0.005	0.005
2/12/2004	Kennametal Monitoring Well MW-1	Chloride	2100	250
2/12/2004	Kennametal Monitoring Well MW-1	Lead	<0.005	0.015
2/12/2004	Kennametal Monitoring Well MW-1	Manganese	0.59	0.05
2/12/2004	Kennametal Monitoring Well MW-1	Molybdenum	0.041	
2/12/2004	Kennametal Monitoring Well MW-1	Sulfate	3400	500
2/12/2004	Kennametal Monitoring Well MW-1	Total Dissolved Solids	8100	500-1000
2/12/2004	Kennametal Monitoring Well MW-1	Tungsten	0.04	
2/12/2004	Kennametal Monitoring Well MW-2	Antimony	<0.005	0.006
2/12/2004	Kennametal Monitoring Well MW-2	Barium	0.017	2
2/12/2004	Kennametal Monitoring Well MW-2	Beryllium	<0.005	0.004
2/12/2004	Kennametal Monitoring Well MW-2	Cadmium	<0.005	0.005
2/12/2004	Kennametal Monitoring Well MW-2	Chloride	1900	250
2/12/2004	Kennametal Monitoring Well MW-2	Lead	<0.005	0.015
2/12/2004	Kennametal Monitoring Well MW-2	Manganese	3.5	0.05
2/12/2004	Kennametal Monitoring Well MW-2	Molybdenum	0.081	
2/12/2004	Kennametal Monitoring Well MW-2	Sulfate	3400	500
2/12/2004	Kennametal Monitoring Well MW-2	Total Dissolved Solids	8900	500-1000
2/12/2004	Kennametal Monitoring Well MW-2	Tungsten	<0.01	
2/12/2004	Kennametal Monitoring Well MW-3	Antimony	<0.005	0.006
2/12/2004	Kennametal Monitoring Well MW-3	Barium	0.015	2
2/12/2004	Kennametal Monitoring Well MW-3	Beryllium	<0.005	0.004
2/12/2004	Kennametal Monitoring Well MW-3	Cadmium	<0.005	0.005
2/12/2004	Kennametal Monitoring Well MW-3	Chloride	2000	250
2/12/2004	Kennametal Monitoring Well MW-3	Lead	<0.005	0.015
2/12/2004	Kennametal Monitoring Well MW-3	Manganese	0.012	0.05
2/12/2004	Kennametal Monitoring Well MW-3	Molybdenum	0.33	
2/12/2004	Kennametal Monitoring Well MW-3	Sulfate	2000	500
2/12/2004	Kennametal Monitoring Well MW-3	Total Dissolved Solids	6400	500-1000
2/12/2004	Kennametal Monitoring Well MW-3	Tungsten	0.69	
2/12/2004	Kennametal Monitoring Well MW-4	Antimony	<0.005	0.006
2/12/2004	Kennametal Monitoring Well MW-4	Barium	0.28	2
2/12/2004	Kennametal Monitoring Well MW-4	Beryllium	<0.005	0.004
2/12/2004	Kennametal Monitoring Well MW-4	Cadmium	<0.005	0.005
2/12/2004	Kennametal Monitoring Well MW-4	Chloride	2700	250
2/12/2004	Kennametal Monitoring Well MW-4	Lead	<0.005	0.015
2/12/2004	Kennametal Monitoring Well MW-4	Manganese	0.11	0.05
2/12/2004	Kennametal Monitoring Well MW-4	Molybdenum	0.28	
2/12/2004	Kennametal Monitoring Well MW-4	Sulfate	3200	500
2/12/2004	Kennametal Monitoring Well MW-4	Total Dissolved Solids	8900	500-1000
2/12/2004	Kennametal Monitoring Well MW-4	Tungsten	0.04	
2/12/2004	Kennametal Monitoring Well MW-4	Nitrogen	0.9	
2/12/2004	Kennametal Monitoring Well MW-4	Nitrate	<0.5	
2/12/2004	Kennametal Monitoring Well MW-4	Total Nitrogen (By Sum)	<1.4	

Kennametal, Groundwater Recent Data

Groundwater Monitoring Well Data, MW-5 through MW-8, Sampled 2/12/2004

CollectDate	Material	Parameter	Reported Result	MCL
2/12/2004	Kennametal Monitoring Well MW-5	Antimony	<0.01	0.006
2/12/2004	Kennametal Monitoring Well MW-5	Barium	0.05	2
2/12/2004	Kennametal Monitoring Well MW-5	Beryllium	<0.01	0.004
2/12/2004	Kennametal Monitoring Well MW-5	Cadmium	<0.01	0.005
2/12/2004	Kennametal Monitoring Well MW-5	Chloride	2300	250
2/12/2004	Kennametal Monitoring Well MW-5	Lead	<0.01	0.015
2/12/2004	Kennametal Monitoring Well MW-5	Manganese	1.2	0.05
2/12/2004	Kennametal Monitoring Well MW-5	Molybdenum	0.08	
2/12/2004	Kennametal Monitoring Well MW-5	Sulfate	3300	500
2/12/2004	Kennametal Monitoring Well MW-5	Total Dissolved Solids	8000	500-1000
2/12/2004	Kennametal Monitoring Well MW-5	Tungsten	0.02	
2/12/2004	Kennametal Monitoring Well MW-6	Antimony	<0.01	0.006
2/12/2004	Kennametal Monitoring Well MW-6	Barium	0.02	2
2/12/2004	Kennametal Monitoring Well MW-6	Beryllium	<0.01	0.004
2/12/2004	Kennametal Monitoring Well MW-6	Cadmium	<0.01	0.005
2/12/2004	Kennametal Monitoring Well MW-6	Chloride	3200	250
2/12/2004	Kennametal Monitoring Well MW-6	Lead	<0.01	0.015
2/12/2004	Kennametal Monitoring Well MW-6	Manganese	<0.01	0.05
2/12/2004	Kennametal Monitoring Well MW-6	Molybdenum	0.67	
2/12/2004	Kennametal Monitoring Well MW-6	Sulfate	1400	500
2/12/2004	Kennametal Monitoring Well MW-6	Total Dissolved Solids	6600	500-1000
2/12/2004	Kennametal Monitoring Well MW-6	Tungsten	0.08	
2/12/2004	Kennametal Monitoring Well MW-7	Antimony	<0.01	0.006
2/12/2004	Kennametal Monitoring Well MW-7	Barium	0.03	2
2/12/2004	Kennametal Monitoring Well MW-7	Beryllium	<0.01	0.004
2/12/2004	Kennametal Monitoring Well MW-7	Cadmium	<0.01	0.005
2/12/2004	Kennametal Monitoring Well MW-7	Chloride	3900	250
2/12/2004	Kennametal Monitoring Well MW-7	Lead	<0.01	0.015
2/12/2004	Kennametal Monitoring Well MW-7	Manganese	<0.01	0.05
2/12/2004	Kennametal Monitoring Well MW-7	Molybdenum	0.63	
2/12/2004	Kennametal Monitoring Well MW-7	Sulfate	1600	500
2/12/2004	Kennametal Monitoring Well MW-7	Total Dissolved Solids	8900	500-1000
2/12/2004	Kennametal Monitoring Well MW-7	Tungsten	0.05	
2/12/2004	Kennametal Monitoring Well MW-8	Antimony	<0.005	0.006
2/12/2004	Kennametal Monitoring Well MW-8	Barium	0.043	2
2/12/2004	Kennametal Monitoring Well MW-8	Beryllium	<0.005	0.004
2/12/2004	Kennametal Monitoring Well MW-8	Cadmium	<0.005	0.005
2/12/2004	Kennametal Monitoring Well MW-8	Chloride	1800	250
2/12/2004	Kennametal Monitoring Well MW-8	Lead	<0.005	0.015
2/12/2004	Kennametal Monitoring Well MW-8	Manganese	<0.005	0.05
2/12/2004	Kennametal Monitoring Well MW-8	Molybdenum	0.11	
2/12/2004	Kennametal Monitoring Well MW-8	Sulfate	220	500
2/12/2004	Kennametal Monitoring Well MW-8	Total Dissolved Solids	3100	500-1000
2/12/2004	Kennametal Monitoring Well MW-8	Tungsten	0.2	

Kennametal, Groundwater Recent Data

Groundwater Monitoring Well Data, MW-1 through MW-5, Sampled 5/18/2004

CollectDate	Material	Parameter	Reported Result	MCL
5/18/2004	Kennametal Monitoring Well MW-1	Antimony	<0.01	0.006
5/18/2004	Kennametal Monitoring Well MW-1	Barium	0.01	2
5/18/2004	Kennametal Monitoring Well MW-1	Beryllium	<0.01	0.004
5/18/2004	Kennametal Monitoring Well MW-1	Cadmium	<0.01	0.005
5/18/2004	Kennametal Monitoring Well MW-1	Chloride	2,200	250
5/18/2004	Kennametal Monitoring Well MW-1	Lead	<0.01	0.015
5/18/2004	Kennametal Monitoring Well MW-1	Manganese	0.55	0.1
5/18/2004	Kennametal Monitoring Well MW-1	Molybdenum	0.04	
5/18/2004	Kennametal Monitoring Well MW-1	Sulfate	3,700	500
5/18/2004	Kennametal Monitoring Well MW-1	Total Dissolved Solids	8,800	500-1000
5/18/2004	Kennametal Monitoring Well MW-1	Tungsten	0.03	
5/18/2004	Kennametal Monitoring Well MW-2	Antimony	<0.01	0.006
5/18/2004	Kennametal Monitoring Well MW-2	Barium	0.01	2
5/18/2004	Kennametal Monitoring Well MW-2	Beryllium	<0.01	0.004
5/18/2004	Kennametal Monitoring Well MW-2	Cadmium	<0.01	0.005
5/18/2004	Kennametal Monitoring Well MW-2	Chloride	2,300	250
5/18/2004	Kennametal Monitoring Well MW-2	Lead	<0.01	0.015
5/18/2004	Kennametal Monitoring Well MW-2	Manganese	3.2	0.1
5/18/2004	Kennametal Monitoring Well MW-2	Molybdenum	0.1	
5/18/2004	Kennametal Monitoring Well MW-2	Sulfate	4,200	500
5/18/2004	Kennametal Monitoring Well MW-2	Total Dissolved Solids	8,800	500-1000
5/18/2004	Kennametal Monitoring Well MW-2	Tungsten	<0.01	
5/18/2004	Kennametal Monitoring Well MW-4	Antimony	<0.01	0.006
5/18/2004	Kennametal Monitoring Well MW-4	Barium	0.02	2
5/18/2004	Kennametal Monitoring Well MW-4	Beryllium	<0.01	0.004
5/18/2004	Kennametal Monitoring Well MW-4	Cadmium	<0.01	0.005
5/18/2004	Kennametal Monitoring Well MW-4	Chloride	2,900	250
5/18/2004	Kennametal Monitoring Well MW-4	Lead	<0.01	0.015
5/18/2004	Kennametal Monitoring Well MW-4	Manganese	0.09	0.1
5/18/2004	Kennametal Monitoring Well MW-4	Molybdenum	0.27	
5/18/2004	Kennametal Monitoring Well MW-4	Sulfate	3,600	500
5/18/2004	Kennametal Monitoring Well MW-4	Total Dissolved Solids	9,000	500-1000
5/18/2004	Kennametal Monitoring Well MW-4	Tungsten	0.04	
5/18/2004	Kennametal Monitoring Well MW-5	Antimony	<0.01	0.006
5/18/2004	Kennametal Monitoring Well MW-5	Barium	0.07	2
5/18/2004	Kennametal Monitoring Well MW-5	Beryllium	<0.01	0.004
5/18/2004	Kennametal Monitoring Well MW-5	Cadmium	<0.01	0.005
5/18/2004	Kennametal Monitoring Well MW-5	Chloride	2,900	250
5/18/2004	Kennametal Monitoring Well MW-5	Lead	<0.01	0.015
5/18/2004	Kennametal Monitoring Well MW-5	Manganese	0.32	0.1
5/18/2004	Kennametal Monitoring Well MW-5	Molybdenum	0.1	
5/18/2004	Kennametal Monitoring Well MW-5	Sulfate	3,900	500
5/18/2004	Kennametal Monitoring Well MW-5	Total Dissolved Solids	9,000	500-1000
5/18/2004	Kennametal Monitoring Well MW-5	Tungsten	0.02	

Kennametal, Groundwater Recent Data

Groundwater Monitoring Well Data, MW-6 through MW-8, Sampled 5/18/2004

CollectDate	Material	Parameter	Reported Result	MCL
5/18/2004	Kennametal Monitoring Well MW-6	Antimony	<0.01	**0.006**
5/18/2004	Kennametal Monitoring Well MW-6	Barium	0.04	**2**
5/18/2004	Kennametal Monitoring Well MW-6	Beryllium	<0.01	**0.004**
5/18/2004	Kennametal Monitoring Well MW-6	Cadmium	<0.01	**0.005**
5/18/2004	Kennametal Monitoring Well MW-6	Chloride	3,900	**250**
5/18/2004	Kennametal Monitoring Well MW-6	Lead	<0.01	**0.015**
5/18/2004	Kennametal Monitoring Well MW-6	Manganese	<0.01	**0.1**
5/18/2004	Kennametal Monitoring Well MW-6	Molybdenum	0.67	
5/18/2004	Kennametal Monitoring Well MW-6	Sulfate	1,500	**500**
5/18/2004	Kennametal Monitoring Well MW-6	Total Dissolved Solids	6,700	**500-1000**
5/18/2004	Kennametal Monitoring Well MW-6	Tungsten	0.08	
5/18/2004	Kennametal Monitoring Well MW-7	Antimony	<0.01	**0.006**
5/18/2004	Kennametal Monitoring Well MW-7	Barium	0.04	**2**
5/18/2004	Kennametal Monitoring Well MW-7	Beryllium	<0.01	**0.004**
5/18/2004	Kennametal Monitoring Well MW-7	Cadmium	<0.01	**0.005**
5/18/2004	Kennametal Monitoring Well MW-7	Chloride	5,000	**250**
5/18/2004	Kennametal Monitoring Well MW-7	Lead	<0.01	**0.015**
5/18/2004	Kennametal Monitoring Well MW-7	Manganese	<0.01	**0.1**
5/18/2004	Kennametal Monitoring Well MW-7	Molybdenum	0.59	
5/18/2004	Kennametal Monitoring Well MW-7	Sulfate	2,200	**500**
5/18/2004	Kennametal Monitoring Well MW-7	Total Dissolved Solids	10,000	**500-1000**
5/18/2004	Kennametal Monitoring Well MW-7	Tungsten	0.05	
5/18/2004	Kennametal Monitoring Well MW-8	Antimony	<0.004	**0.006**
5/18/2004	Kennametal Monitoring Well MW-8	Barium	0.037	**2**
5/18/2004	Kennametal Monitoring Well MW-8	Beryllium	<0.004	**0.004**
5/18/2004	Kennametal Monitoring Well MW-8	Cadmium	<0.004	**0.005**
5/18/2004	Kennametal Monitoring Well MW-8	Chloride	2,000	**250**
5/18/2004	Kennametal Monitoring Well MW-8	Lead	<0.004	**0.015**
5/18/2004	Kennametal Monitoring Well MW-8	Manganese	<0.004	**0.1**
5/18/2004	Kennametal Monitoring Well MW-8	Molybdenum	0.097	
5/18/2004	Kennametal Monitoring Well MW-8	Sulfate	250	**500**
5/18/2004	Kennametal Monitoring Well MW-8	Total Dissolved Solids	6,300	**500-1000**
5/18/2004	Kennametal Monitoring Well MW-8	Tungsten	0.19	

Appendix D

Monitoring Wells

Terracon

Boring Logs

Terracon

LOG OF WELL NO. MW-5

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf	
	Approx. Surface Elev.: 3946.38 ft										
	POORLY GRADED SAND, dark gray / brown, slightly moist, loose, no cementation, fine to medium grained sand, non-plastic.		SP		SPT	1.5	3				
		5	SP	-	SPT	1.5	7				moist
		10	SP		SPT	1.5	27				interbedded silt moist
	15 3931.5										
	POORLY GRADED SAND WITH SILT, occasional interbedded silts, dark brown, moist, medium dense, no cementation, fine to medium grained sand, non-plastic.	15	SP SM		MC	1.5	20				
	20 3926.5	20									

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽ 33.29	▼
WL	▽	▼
WL		

Terracon

BORING STARTED	2-10-04		
BORING COMPLETED	2-10-04		
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-5

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf	
	SANDY SILT, poorly graded sand, brown, moist, very stiff, no cementation, fine to medium grained sand, non-plastic.		SP SM		MC	1.5	65				interbedded silts and poorly graded sand moist
		25	SM		SPT	1.5	59				predominantly silt
	30 3916.5										
	SILTY SAND, brown, very moist, dense, no cementation, fine to medium grained sand, non-plastic. ▽	30	SP SM		SPT	1.5	42				predominantly sand (increased drill resistance at 36 ft)
		35									
	38 3908.5										
	SILTY SAND WITH CLAY, brown, moist to very moist, very dense, fine to medium grained sand, low plasticity.		SP SM		SPT	1.5	59				
	Continued Next Page	40									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽ 33.29	▽
WL	▽	▽
WL		

Terracon

BORING STARTED			2-10-04
BORING COMPLETED			2-10-04
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-5

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf	
	SILTY SAND WITH CLAY, brown, moist to very moist, very dense, fine to medium grained sand, low plasticity.										
	45 3901.5	45	SM		SPT	1.5	14				
	SANDY SILT, brown, moist to very moist, medium stiff, low plasticity.										
	48 3898.5	50	SM		SPT	1.5	1				slight drilling resistance at 52 ft
	POORLY GRADED SAND WITH SILT, brown, very moist, very loose, fine to medium grained sand, non-plastic.	55	SM		SPT	1.5	2				slight drilling resistance at 57 ft
		60									

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽ 33.29	▼
WL	▽	▼
WL		

Terracon

BORING STARTED			2-10-04
BORING COMPLETED			2-10-04
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-5

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf	
	POORLY GRADED SAND WITH SILT, brown, very moist, very loose, fine to medium grained sand, non-plastic.	65	SM		SPT	1.5	7				slight drilling resistance at 65 ft
		70									
		75	SW		SPT	1.5	4				
		80									

73.5 — 3873

WELL GRADED SAND, brown/yellow, very moist (wet), loose, fine to coarse sand, non-plastic.

76.25 — 3870

ELASTIC SILT, light brown, moist, soft, high plasticity.

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽ 33.29	▼
WL	▽	▼
WL		

Terracon

BORING STARTED	2-10-04		
BORING COMPLETED	2-10-04		
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-5

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf	
	ELASTIC SILT, light brown, moist, soft, high plasticity.		MH		SPT	1.5	3				Drilled to 80.0 ft Sampled to 81.5 ft
	81.5 3865										

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽ 33.29	▼
WL	▽	▼
WL		

Terracon

BORING STARTED			2-10-04
BORING COMPLETED			2-10-04
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINTLOGS.GPJ TERRACON.GDT 3/31/04

WHITE—DIVISION OF WATER RESOURCES
CANARY—CLIENT'S COPY
PINK—WELL DRILLER'S COPY

MW-5

PRINT OR TYPE ONLY
DO NOT WRITE ON BACK

STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLER'S REPORT

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No.
Permit No.
Basin

NOTICE OF INTENT NO. 52776

1. OWNER Kennametal Pelican
MAILING ADDRESS 347 N. Taylor St. Fallon NV 89406
ADDRESS AT WELL LOCATION Kennametal Pelican 347 N. Taylor St. Fallon Nv 89406

2. LOCATION NE 1/4 NW 1/4 Sec. 1 T. 20 N/S R. 24 E. Churchill County
PERMIT NO. MW-92006 NDEP (Issued by Water Resources) | 29-37-101 (Parcel No.) | N/A (Subdivision Name)

3. WORK PERFORMED
☒ New Well ☐ Replace ☐ Recondition
☐ Deepen ☐ Abandon ☐ Other

4. PROPOSED USE
☐ Domestic ☐ Irrigation ☐ Test
☐ Municipal/Industrial ☒ Monitor ☐ Stock

5. WELL TYPE
☐ Cable ☐ Rotary ☐ RVC
☐ Air ☒ Other DCA

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Sand Dark brn fine-med.		0	15'	15'
Sandstone rock fragments		15'	25'	10'
Cl. Med. brn		25'	30'	5'
Mostly Sand Mint.	33 gpm	30'	35'	5'
Cl. Sand Seam Dry		35'	40'	5'
Cl. Sandy brown	Wet	40	45'	5'
Sand + Sl. Sand		45'	52'	7'
Inc. Cl. Mixed Sand Cl.		52'	65'	13'
Cl. Sand w. moist.		65'	71'	6'
Mixed Sand Brn Yellow		71'	Water	5½'
Brown Cl. Sandy Clay		76'	80'	4'

MW-5

Date started 2-10-04, 2004
Date completed 2-20-04, 2004

8. WELL CONSTRUCTION
Depth Drilled 80 Feet Depth Cased 80 Feet

HOLE DIAMETER (BIT SIZE)

	From	To
10¼" Inches	0 Feet	80 Feet
Inches	Feet	Feet
Inches	Feet	Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
4"		SCH 40	+2'	45'

Perforations:
Type perforation Hand Slot Factory Cut
Size perforation .020
From 15' feet to 70' feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

Surface Seal: ☒ Yes ☐ No
Depth of Seal 10'
Placement Method: ☒ Pumped ☐ Poured Bentonite From 13' - 10'
Seal Type: ☒ Neat Cement ☐ Cement Grout ☐ Concrete Grout
Gravel Packed: ☒ Yes ☐ No
From 80' feet to 13' feet

9. WATER LEVEL
Static water level 33.29 feet below land surface
Artesian flow G.P.M. P.S.I.
Water temperature 65° °F Quality

7. WELL TEST DATA
TEST METHOD: ☐ Bailer ☐ Pump ☐ Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)

10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.
Name Haz-Tech Drilling Inc (Contractor)
Address P.O. Box 940 (Contractor)
Meridian ID 83680
Nevada contractor's license number issued by the State Contractor's Board 0035018
Nevada driller's license number issued by the Division of Water Resources, the on-site driller M-2169
Signed (By driller performing actual drilling on site or contractor)
Date 2-29-04

LOG OF WELL NO. MW-6

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

Approx. Surface Elev.: 3969.26 ft

GRAPHIC LOG	DESCRIPTION		DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	TESTS SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	0.5	SILTY CLAYEY SAND with trace gravel, yellow brown, dry, medium dense, moderately cemented, medium plasticity.	3969	SP		SPT		7			
		SILTY SAND, yellow brown dry, medium dense, moderately cemented, fine grained sand, non-plastic.		SM SM		SPT		21			
	3		3966.5	SM		SPT		9			
	3.5	SILTY SAND, yellow brown dry, medium dense, moderately cemented, fine grained sand, non-plastic. (trace gravel 3.0 - 3.5 ft.)	3966	ML		SPT		8			
	4.5	SANDY SILT, yellow brown, dry, medium dense, moderately cemented, non-plastic.	3965	SM		SPT		5			
	5.5	SILTY SAND, yellow brown, slightly moist, loose, fine to medium grained sand, poorly graded sand, non-plastic.	3964	CL		SPT		1			
	6.5	SILTY CLAY, yellow brown, slightly moist, soft, low to medium plasticity.	3963	ML CL ML		MC		4			
	8	SILTY CLAY with sand, yelllow brown, slightly moist, soft, medium plasticity. (blocky structure)	3961.5								
		SANDY CLAYEY SILT, brown, moist, weakly cemented, soft, low plasticity. (blocky structure)		ML		SPT		3			
	14.75		3954.5								
	15.75	SILTY SAND, brown, moist, weakly cemented, medium dense, non-plastic.	3953.5	ML SM		MC MC		21			
	16	SANDY CLAYEY SILT, brown, moist, weakly cemented, soft, non-plastic. (blocky structure)	3953.5	ML		MC					
		SILTY SAND, brown, slightly moist, weakly cemented, dense, fine to coarse sand, non-plastic.		SM		SPT		54			

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽ 57.61	▼
WL	▽	▼
WL		

Terracon

BORING STARTED	2-13-04		
BORING COMPLETED	2-18-04		
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-6

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	SILTY SAND, brown, slightly moist, weakly cemented, dense, fine to coarse sand, non-plastic.									
	24.5 3945									
	moist, fine to medium grained sand	25	SM		SPT		79			
		30	SM		SPT		82			
		35	SM		SPT		44			
		40	SM		SPT		36			

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽ 57.61	▼
WL	▽	▼
WL		

Terracon

BORING STARTED			2-13-04
BORING COMPLETED			2-18-04
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-6

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	moist, fine to medium grained sand	45	SM		SPT		75			
	46.5 3923 SILTY SAND with gravel, brown, moist, weakly cemented, dense, fine to coarse sand, non-plastic.	50	SM		SPT		50			
		55								
		60								

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽ 57.61	▽
WL	▽	▽
WL		

Terracon

BORING STARTED			2-13-04
BORING COMPLETED			2-18-04
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-6

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: SPT - N BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, psf
	SILTY SAND with gravel, brown, moist, weakly cemented, dense, fine to coarse sand, non-plastic.	65								
	69 / 3900.5									
	SILTSTONE, Dark gray to black, fresh, no visible fracturing, strong.	70	SM		CORE					
	72.25 / 3897									
	SILT, black, wet, soft, low plasticity to non-plastic		ML		CORE					
	74.5 / 3895	75								
	SILTY SAND, black, wet, medium dense, no cementation, fine to medium grained sand, poorly graded sand, non-plastic.		SM		SPT		12			
	Boring drilled to 85.0 feet Sampled to 86.5 feet	80								

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 57.61	▼	
WL	▽	▼	
WL			

Terracon

BORING STARTED			2-13-04
BORING COMPLETED			2-18-04
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-6

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	SILTY SAND, black, wet, medium dense, no cementation, fine to medium grained sand, poorly graded sand, non-plastic. Boring drilled to 85.0 feet Sampled to 86.5 feet	85	SM		SPT		9			
	86.5 3883									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 57.61	▼	
WL	▽	▼	
WL			

Terracon

BORING STARTED			2-13-04
BORING COMPLETED			2-18-04
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

WHITE—DIVISION OF WATER RESOURCES
CANARY—CLIENT'S COPY
PINK—WELL DRILLER'S COPY

PRINT OR TYPE ONLY
DO NOT WRITE ON BACK

STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLER'S REPORT

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No.
Permit No.
Basin

NOTICE OF INTENT NO. 52776

1. OWNER Kennametal Refinery
MAILING ADDRESS 747 N Taylor St Fallon NV 89406
ADDRESS AT WELL LOCATION Kennametal Refinery 747 N. Taylor St. Fallon NV 89406

2. LOCATION NE ¼ NW ¼ Sec. 1 T 20 N/S R 28 E Churchill County
PERMIT NO. NEV 97006 NDEP (Issued by Water Resources) | 09-27-101 (Parcel No.) | N/A (Subdivision Name)

3. WORK PERFORMED
☒ New Well ☐ Replace ☐ Recondition
☐ Deepen ☐ Abandon ☐ Other

4. PROPOSED USE
☐ Domestic ☐ Irrigation ☐ Test
☐ Municipal/Industrial ☒ Monitor ☐ Stock

5. WELL TYPE
☐ Cable ☐ Rotary ☐ RVC
☐ Air ☒ Other NSA

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Silty Sand Trace Gravel-yellow		0	2'	2'
Sand yellow with mud [illegible]		[illegible]	[illegible]	2'
Sandy silt		12'	4½'	½'
Silty Sand loose		4½'	5½'	1'
Silty Clay		5½'	8'	2½'
Brn Sandy clayey silt		8'	14½'	1½'
Silty Sand		14½'	16'	1½'
Silty Sand Fine C.		16'	25'	9'
Fine - med sand		25'	30'	5'
Silty Sand Brn moist		30'	46'	[illegible]
[illegible] silty sand [illegible]	55'	46'	60'	4'
Silty Sand [illegible]	[illegible]	60'	69½'	9½'
[illegible] silt [illegible]	[illegible]	69½'	74'	4½'
Silt [illegible]	[illegible]	74'	85'	[illegible]
Silty Sand loose Fine-Med	[illegible]	80'	85'	5'
MW-6				

Date started 2-13-04, 20
Date complated 2-13-04, 20

7. WELL TEST DATA

TEST METHOD: ☐ Bailer ☐ Pump ☐ Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)

8. WELL CONSTRUCTION
Depth Drilled 85 Feet Depth Cased 85 Feet

HOLE DIAMETER (BIT SIZE)

	From	To
10½" Inches	0 Feet	85' Feet
Inches	Feet	Feet
Inches	Feet	Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
4"		5.40	43'	20'
4"		0.40	15	85

Perforations:
Type perforation Long Year Factory Slot
Size perforation .020
From 20' feet to 75' feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

Surface Seal: ☒ Yes ☐ No
Depth of Seal 12
Placement Method: ☒ Pumped ☐ Poured Bentonite From 15'-12'
Gravel Packed: ☒ Yes ☐ No
From 85' feet to 15' feet

Seal Type: ☒ Neat Cement ☐ Cement Grout ☐ Concrete Grout

9. WATER LEVEL
Static water level 56.99 feet below land surface
Artesian flow G.P.M. P.S.I.
Water temperature <85° °F Quality

10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.
Name Haz-Tech Drilling Inc. (Contractor)
Address ~~[illegible]~~ P.O. Box 940 (Contractor)
Meridian ID 83680
Nevada contractor's license number issued by the State Contractor's Board 0038618
Nevada driller's license number issued by the Division of Water Resources, the on-site driller M-2198
Signed [signature] (By driller performing actual drilling on site or contractor)
Date 2-29-04

LOG OF WELL NO. MW-7

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

Approx. Surface Elev.: 3976.03 ft

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: SPT - N BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, psf
	POORLY GRADED SAND with silt, brown / black, slightly moist to moist, loose, no cementation, fine to medium grained sand, occasional coarser grained lenses, non-plastic.	5	SP SM		SPT		7			
		10	SP		SPT		1			
	10.5 3965.5		SM SC		SPT		5			
	SILTY CLAYEY SAND, light brown, slightly moist, loose, weak cementation, fine grained sand, non-plastic. (blocky structure) 12 3964		SM							
	WELL GRADED SAND with gravel, dark brown, moist, medium dense, no cementation, fine to coarse sand, gravel up to 1/2 in., non-plastic.	15	SW SM		SPT		27			
	18 3958 coarser sand, increased drilling resistance	20								

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 58.09	▼	
WL	▽	▼	
WL			

Terracon

BORING STARTED	2-21-04		
BORING COMPLETED	2-23-04		
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-7

CLIENT Kennametal, Inc. Nevada Refinery

SITE Fallon, Nevada

PROJECT Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	20.25 3956 SANDY SILT, light brown, slightly moist, stiff, weak cementation, laminar structure, low plasticity. 21 3955		SW		SPT					
			SM		SPT		14			
			ML		SPT		17			
	SILTY SAND, light brown to brown, slightly moist to moist, medium dense, no cementation, non-plastic.	25	SM							
	27.5 3948.5 occasional finer gravel									
	29 3947 increased gravel and coarser sand									
	30.5 3945.5 SILTY SAND, pooly graded, brown, slightly moist, very dense, no cemetation, fine grained sand, non-plastic	30	SM		SPT		21			
			SM		SPT		88			
	36 3940 fine to coarse sand and gravel	35								
	40 3936	40								

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽ 58.09	▼
WL	▽	▼
WL		

Terracon

BORING STARTED	2-21-04		
BORING COMPLETED	2-23-04		
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-7

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	SILTY SAND, poorly graded, brown, slightly moist to moist, dense, no cementation, fine to coarse sand, occasional gravel, non-plastic.		SM		SPT		52			
	46 3930 coarser sand and gravel 50 3926	45								
	SILTY SAND, poorly graded, brown, moist, very dense, weak cementation, fine to coarse sand and fine gravel, non-plastic. (laminar structure)	50	SM		SPT		50			
	56 3920 increased drill resistance, coarser gravel ▽	55								
	Continued Next Page	60								

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽ 58.09	▽
WL	▽	▽
WL		

Terracon

BORING STARTED	2-21-04		
BORING COMPLETED	2-23-04		
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-7

CLIENT
Kennametal, Inc. Nevada Refinery

SITE
Fallon, Nevada

PROJECT
Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	60.5 3915.5									
	61 SANDSTONE, yellow / orange, highly weathered / possible alteration, very close fracture spacing, weak to friable. 3915		SM		SPT		50			
	breaks down to clayey sand, wet, low plasticity.									
	TUFA Deposit, calcium carbonate precipitate, light brown, fresh to slightly weathered, no fracturing, very strong to extremely strong.	65								
	(Tufa samples taken from auger cuttings)									
	68 3908									
	SILTSTONE, gray / green / black, highly weathered.	70								
	moderate drilling resistance, auger cuttings sandy silt, wet, low plasticity to non-plastic.	75								
	79.5 3896.5	80								

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 58.09	▼	
WL	▽	▼	
WL			

Terracon

BORING STARTED	2-21-04		
BORING COMPLETED	2-23-04		
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-7

CLIENT
Kennametal, Inc. Nevada Refinery

SITE
Fallon, Nevada

PROJECT
Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	SANDY SILT, green/black, wet, soft, non-plastic. (no drilling resistance)		ML		SPT		1			
	83 3893									
	SILTY SAND, dark green, wet, fine grained sand, non-plastic. note: sampled loose due to flowing sand in auger (moderate drilling resistance) Boring drilled to 100 feet Sampled to 101.5 feet.	85								
		90								
		95								
	100 3876	100								

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽ 58.09	▼
WL	▽	▼
WL		

Terracon

BORING STARTED			2-21-04
BORING COMPLETED			2-23-04
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-7

CLIENT: Kennametal, Inc.. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: SPT - N BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, psf
			SM		SPT		1			

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽ 58.09	▼
WL	▽	▼
WL		

Terracon

BORING STARTED			2-21-04
BORING COMPLETED			2-23-04
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

WHITE—DIVISION OF WATER RESOURCES
CANARY—CLIENT'S COPY
PINK—WELL DRILLER'S COPY

PRINT OR TYPE ONLY
DO NOT WRITE ON BACK

STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLER'S REPORT

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No.
Permit No.
Basin

NOTICE OF INTENT NO. 52716

1. OWNER Kennametal Refinery
MAILING ADDRESS 347 N. Taylor St. Fallon, NV 89406
ADDRESS AT WELL LOCATION Kennametal Refinery 347 N. Taylor St. Fallon NV 89406

2. LOCATION NE ¼ NW ¼ Sec. 1 T 20 N/S R 28 E Churchill County
PERMIT NO. NEV 92006 NDEP (Issued by Water Resources) | 09-37-101 (Parcel No.) | Subdivision Name

3. WORK PERFORMED
☒ New Well ☐ Replace ☐ Recondition
☐ Deepen ☒ Abandon ☐ Other

4. PROPOSED USE
☐ Domestic ☐ Irrigation ☐ Test
☐ Municipal/Industrial ☒ Monitor ☐ Stock

5. WELL TYPE
☐ Cable ☐ Rotary ☐ RVC
☐ Air ☒ Other HSA

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Poorly graded Sand w/ silt Brn gray		0	6½'	6½'
Lt. Brn. silty clay sand		6½'	11½'	5'
Well graded sand w/ gravel		11½'	21'	9½'
Lt. Brn. silty sand moist		21'	27½'	6½'
Fine gravel coarse sand		27½'	30½'	3'
Fine gravel very dense silty sand		30½'	36'	5½'
Fine gravel very dense silty sand		36'	46'	10'
Coarse sand fine gravel		46'	50'	4'
Silty sand w/ dense		50'	56'	6'
Silty sand		56'	60½'	4½'
Altered weathered sandstone	69	60½'	69'	8½'
Silt stone weathered gray	70	69'	79½'	10½'
Same less weathered gray		79½'	83'	3½'
Silty sand lime Mt. gray		83'	100'	14'

MW-7

Date started 2-21-04, 20
Date completed 2-23-04, 20

7. WELL TEST DATA

TEST METHOD: ☐ Bailer ☐ Pump ☐ Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)

8. WELL CONSTRUCTION
Depth Drilled 100' Feet Depth Cased 100' Feet

HOLE DIAMETER (BIT SIZE)

	From	To
10½" Inches	0 Feet	100' Feet
Inches	Feet	Feet
Inches	Feet	Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
4"		5.40	+3'	40'
4"		5.40	90'	100'

Perforations:
Type perforation Long Year Factory Slot
Size perforation .020
From 40' feet to 90' feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

Surface Seal: ☒ Yes ☐ No
Depth of Seal 25'
Placement Method: ☒ Pumped ☐ Poured
Seal Type: ☒ Neat Cement ☐ Cement Grout ☐ Concrete Grout
Bentonite From 35', 25'
Gravel Packed: ☒ Yes ☐ No
From 100' feet to 35' feet

9. WATER LEVEL
Static water level 58.9 feet below land surface
Artesian flow G.P.M. P.S.I.
Water temperature <85° °F Quality

10. DRILLER'S CERTIFICATION
This well was drilled under my supervision and the report is true to the best of my knowledge.
Name Haz-Tech Drilling Inc. (Contractor)
Address P.O. Box 940 Meridian ID 83680 (Contractor)
Nevada contractor's license number issued by the State Contractor's Board 0038018
Nevada driller's license number issued by the Division of Water Resources, the on-site driller M-2188
Signed [signature] (By driller performing actual drilling on site or contractor)
Date 2-29-04

LOG OF WELL NO. MW-8

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

Approx. Surface Elev.: 3985.12 ft

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	SILTY SAND, brown / yellow, dry, loose, no cementation, fine to medium grained sand, poorly graded, non-plastic.									
	4.5 3980.5		SM		SPT		6			
	slightly moist	5								
	7 3978									
	increased drill resistance possible gravels									
	9.5 3975.5		SM		SPT		9			
	POORLY GRADED SAND with silt, brown, slightly moist, medium dense, fine to coarse grained sand, non-plastic.	10	SP SM		SPT		23			
	15 3970		SP SM		SPT		15			
	SILTY SAND, brown, slightly moist, weak cementation, medium dense, fine grained sand, poorly graded, non-plastic.	15	SM		SPT		11			
			SM		SPT		30			
		20								

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽ 74.18	▼
WL	▽	▼
WL		

Terracon

BORING STARTED	2-23-04		
BORING COMPLETED	2-24-04		
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-8

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	SILTY SAND, brown, slightly moist, weak cementation, medium dense, fine grained sand, poorly graded, non-plastic.									
	24 3961 coarser sand		SM		SPT		28			
	25 3960 finer sand	25								
			SM		SPT		50			
	30 3955 occasional gravel	30								
	34 3951 SILTY SAND, light brown, slightly moist to moist, medium dense, no cementation, fine to medium grained sand, non-plastic.		SM		SPT		50			
		35								
			SM		SPT		57			
		40								

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 74.18	▼	
WL	▽	▼	
WL			

Terracon

BORING STARTED	2-23-04		
BORING COMPLETED	2-24-04		
RIG	BK-81	FOREMAN	SAM
SAM	JOB #	64035510	

BOREHOLE 99 GINTLOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-8

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	SILTY SAND, light brown, slightly moist to moist, medium dense, no cementation, fine to medium grained sand, non-plastic.	45								
		50	SM		SPT		61			
		55								
		60	SM		SPT		92			

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽ 74.18	▼
WL	▽	▼
WL		

Terracon

BORING STARTED	2-23-04		
BORING COMPLETED	2-24-04		
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-8

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	SILTY SAND, light brown, slightly moist to moist, medium dense, no cementation, fine to medium grained sand, non-plastic.	65								
	67.5 3917.5									
	SILTY SAND with gravel, light brown / yellow / orange, moist, cemented silty sands, very dense, fine to coarse sand, well rounded gravels up to 1.5 in., non-plastic. (Possible conglomerate sandstone) (Increased drill resistance)	70			SPT		50			
	72 3913									
	Siltstone, dark gray / green, wet, highly weathered, close fracturing, weak and platey. (auger cuttings, SANDY SILT, wet, moderately cemented) ▽	75								
			ML		SPT		50			
		80								

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 74.18	▽	
WL	▽	▽	
WL			

Terracon

BORING STARTED			2-23-04
BORING COMPLETED			2-24-04
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-8

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	Siltstone, dark gray / green, wet, highly weathered, close fracturing, weak and platey. (auger cuttings, SANDY SILT, wet, moderately cemented)	85								
87		3898								
	SILTY SAND, dark green, wet, loose, fine to coarse sand, non-plastic. (little to no drill resistance)		SM		SPT		1			
90		3895								
	SANDY SILT, dark green, wet, soft, non-plastic	90	ML		SPT		4			
94		3891								
	SILTY SAND, dark green, wet, dense, no cementation, medium to coarse grained sand, poorly graded, non-plastic. Boring drilled to 100 feet Sampled to 101.5 feet	95								
		100								

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 74.18	▼	
WL	▽	▼	
WL			

Terracon

BORING STARTED	2-23-04		
BORING COMPLETED	2-24-04		
RIG	BK-81	FOREMAN	SAM
SAM	JOB #	64035510	

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

LOG OF WELL NO. MW-8

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	101.5 3883.5		SM		SPT		44			

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽ 74.18	▼
WL	▽	▼
WL		

Terracon

BORING STARTED	2-23-04		
BORING COMPLETED	2-24-04		
RIG	BK-81	FOREMAN	SAM
	SAM	JOB #	64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 3/31/04

WHITE—DIVISION OF WATER RESOURCES
CANARY—CLIENT'S COPY
PINK—WELL DRILLER'S COPY

PRINT OR TYPE ONLY
DO NOT WRITE ON BACK

STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLER'S REPORT

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No.
Permit No.
Basin

NOTICE OF INTENT NO. 52776

1. OWNER Kennametal Refinery
MAILING ADDRESS 347 N. Taylor St. Fallon NV 89406
ADDRESS AT WELL LOCATION Kennametal Refinery 347 N. Taylor Street Fallon NV 89406

2. LOCATION NE ¼ NW ¼ Sec. 1 T. 20 N/S R. 28 E. Churchill County
PERMIT NO. NEV 97606 NDED (Issued by Water Resources) | PA-37-101 (Parcel No.) | NA (Subdivision Name)

3. WORK PERFORMED
☒ New Well ☐ Replace ☐ Recondition
☐ Deepen ☐ Abandon ☐ Other

4. PROPOSED USE
☐ Domestic ☐ Irrigation ☐ Test
☐ Municipal/Industrial ☒ Monitor ☐ Stock

5. WELL TYPE
☐ Cable ☐ Rotary ☐ RVC
☐ Air ☒ Other HSA

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Silt sand Brn yellow D/D		0'	9½'	9½'
Sand w/ trace of silt F. coarse		9½'	15'	5½'
Silty sand F. med sand		15'	24'	9'
Sand		24'	25'	1'
Fine sand		25'	30'	5'
Silt sand w/some gravel		30'	67'	37'
Mud - cemented silty sands		67'	72'	5'
Highly weathered siltstone	74'	72'	87'	15'
Silty sand OK green		87'	90'	3'
Sandy silt OK green wet		90'	94'	4'
Silty sand OK green		94'	100'	6'

MW-4

Date started 2-23-04, 20
Date completed 2-24-04, 20

7. WELL TEST DATA

TEST METHOD: ☐ Bailer ☐ Pump ☐ Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)

8. WELL CONSTRUCTION

Depth Drilled Feet Depth Cased Feet

HOLE DIAMETER (BIT SIZE)

	From	To
10½" Inches	[illegible] Feet	100' Feet
Inches	Feet	Feet
Inches	Feet	Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
4"		S. 40	+3'	45'
4"		S. 40'	90'	100'

Perforations:
Type perforation Factory Slot Long Year
Size perforation .020
From 45' feet to 90' feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

Surface Seal: ☒ Yes ☐ No
Depth of Seal 30'
Placement Method: ☒ Pumped ☐ Poured
Seal Type: ☒ Neat Cement ☐ Cement Grout ☐ Concrete Grout

Gravel Packed: ☒ Yes ☐ No
From 100' feet to 40' feet

9. WATER LEVEL

Static water level 74.18 feet below land surface
Artesian flow G.P.M. P.S.I.
Water temperature <55° °F Quality

10. DRILLER'S CERTIFICATION

This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Haz-Tech Drilling Inc. (Contractor)
Address P.O. Box 940 (Contractor)
Meridian Tx 83680

Nevada contractor's license number issued by the State Contractor's Board 0038018

Nevada driller's license number issued by the Division of Water Resources, the on-site driller M-2188

Signed [signature] (By driller performing actual drilling on site or contractor)

Date 2-29-04

USE ADDITIONAL SHEETS IF NECESSARY

(O)-627

Abandoned Well

MW-3

WHITE—DIVISION OF WATER RESOURCES
CANARY—CLIENT'S COPY
PINK—WELL DRILLER'S COPY

PRINT OR TYPE ONLY
DO NOT WRITE ON BACK

STATE OF NEVADA
DIVISION OF WATER RESOURCES

WELL DRILLER'S REPORT

Please complete this form in its entirety in accordance with NRS 534.170 and NAC 534.340

OFFICE USE ONLY
Log No.
Permit No.
Basin

NOTICE OF INTENT NO. 52776

1. OWNER Kennecott Refinery — ADDRESS AT WELL LOCATION Kennecott Refinery
MAILING ADDRESS 347 N. Taylor St — 347 N. Taylor Street Ellen W.
Ellen. NV 89411

2. LOCATION NE ¼ NW ¼ Sec. 1 T 20 N/S R 65 E White Pine County
PERMIT NO. NEV97006 (NDEP) — Issued by Water Resources — 08-RT-101 — Parcel No. — Subdivision Name

3. WORK PERFORMED
☐ New Well ☐ Replace ☐ Recondition
☐ Deepen ☒ Abandon ☐ Other

4. PROPOSED USE
☐ Domestic ☐ Irrigation ☐ Test
☐ Municipal/Industrial ☒ Monitor ☐ Stock

5. WELL TYPE
☐ Cable ☐ Rotary ☐ RVC
☐ Air ☒ Other

6. LITHOLOGIC LOG

Material	Water Strata	From	To	Thickness
Piezometer well at the Kennecott Refinery				
Water level is at	RAS	RAS	The well	
Consists of 6" PVC Sch. 80 casing.				
Setting on well, run rods down to				
Rather than through - reamed				
Ends out drilling (+4 mud) down with				
Rod down with tapered pilot bit				
with cement grout surface				

Date started 2-16-04
Date completed 2-16-04

7. WELL TEST DATA

TEST METHOD: ☐ Bailer ☐ Pump ☐ Air Lift

G.P.M.	Draw Down (Feet Below Static)	Time (Hours)

8. WELL CONSTRUCTION

Depth Drilled — Feet — Depth Cased — Feet

HOLE DIAMETER (BIT SIZE)

	From	To
Inches	Feet	Feet
Inches	Feet	Feet
Inches	Feet	Feet

CASING SCHEDULE

Size O.D. (Inches)	Weight/Ft. (Pounds)	Wall Thickness (Inches)	From (Feet)	To (Feet)
6"	5	Sch 80	+1'	171½

Perforations:
Type perforation
Size perforation
From feet to feet
From feet to feet
From feet to feet
From feet to feet
From feet to feet

Surface Seal: ☒ Yes ☐ No
Depth of Seal 171½
Placement Method: ☒ Pumped ☐ Poured

Seal Type:
☒ Neat Cement
☐ Cement Grout
☐ Concrete Grout

Gravel Packed: ☐ Yes ☒ No
From feet to feet

9. WATER LEVEL

Static water level N/A feet below land surface
Artesian flow G.P.M. P.S.I.
Water temperature 65 °F Quality

10. DRILLER'S CERTIFICATION

This well was drilled under my supervision and the report is true to the best of my knowledge.

Name Hot Tech Drilling Inc. (Contractor)
Address P.O. Box 940 (Contractor)
Meridian ID 83680

Nevada contractor's license number issued by the State Contractor's Board 0058018
Nevada driller's license number issued by the Division of Water Resources, the on-site driller

Signed (By driller performing actual drilling on site or contractor)
Date 2-27-04

Appendix E

Temporary Hydraulic Conductivity Wells and Exploration Boring

Terracon

Boring Logs

Terracon

LOG OF BORING NO. HC-1A

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

Approx. Surface Elev.: 3966 ft

DEPTH, ft.	USCS SYMBOL	DESCRIPTION	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	SM	SILTY SAND, light brown/yellow brown ,dry, loose, no cementation, fine sand, non-plastic, occassional rootlets near surface.				13			
						6			
3.5		3962.5				4			
4		slightly moist 3962							
	CL	SILTY CLAY, with sand , yellow brown, slightly moist, very soft, fine to medium grained sand, medium plasticity.				1			
5	ML					2			
5.5		3960.5							
		increasing fine sand (occassional lenses of medium to coarse sand)				2			
		Field Ksat (4.5'-6.5') = 8.2×10^{-5} cm/sec							
8		3958				2			
	ML	SANDY SILT, with trace clay, yellow brown, slightly moist, soft, fine grained sand, low to medium plasticity.				3			
9.67		3956.5				2			
10	SP SM	POORLY GRADED SAND, with Silt, light brown, slightly moist to dry, loose, fine to medium sand, non-plastic.				15			
11.33		3954.5				10			
	SM	SILTY SAND, light brown, dry, medium				7			
12		dense, fine grained sand, non-plastic. 3954							
		(breaks in laminardisks)				28			
		occassional coarser grained sand							
13.5		slightly moist 3952.5							
		slightly moist, trace gravel, fine grained, dense				46			
15									
15.5		3950.5				58	8.8	96	
		slightly moist, very dense							
		Field hydraulic conductivity testing performed				57			
		testing interval (15ft to 17ft)							
18		Ksat = 1.9×10^{-2} cm/sec 3948				45			
		slightly moist, dense, trace to occassional fine gravel, fine to coarse grained poorly graded sand.							
20		3946				40			

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▽
WL	▽	▽
WL		

Terracon

BORING STARTED	
BORING COMPLETED	
RIG	FOREMAN
	JOB # 64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 5/5/04

LOG OF BORING NO. HC-1A

CLIENT Kennametal, Inc. Nevada Refinery

SITE Fallon, Nevada

PROJECT Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	slightly moist, very dense, fine to coarse poorly graded sand.		SM				61			
	23 3943						46			
	slightly moist, dense									
	24 3942						59			
	slightly moist, very dense	25								
	25.5 3940.5						35			
	slightly moist, dense									
	26.5 3939.5						34			
	moist, dense, medium to coarse grained sand, occassional trace gravel.									
	28 3938						52			
	moist, dense, fine grained sand	30					56			
	30 3936						44			
	SILTY SAND, poorly graded sand, brown, moist, very dense, weakly cemented, fine to medium grained sand, non-plastic.						44			
		35					52			
							48			
							41			
		40					42			

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▽
WL	▽	▽
WL		

Terracon

BORING STARTED	
BORING COMPLETED	
RIG	FOREMAN
	JOB # 64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 4/14/04

LOG OF BORING NO. HC-1A

CLIENT Kennametal, Inc. Nevada Refinery

SITE Fallon, Nevada

PROJECT Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	SILTY SAND, poorly graded sand, brown, moist, very dense, weakly cemented, fine to medium grained sand, non-plastic.	42	SM				49			
		3924								

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▼
WL	▽	▽
WL		

Terracon

BORING STARTED	
BORING COMPLETED	
RIG	FOREMAN
	JOB # 64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 4/14/04

LOG OF BORING NO. HC-2A

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

Approx. Surface Elev.: 3966 ft

DEPTH, ft	GRAPHIC LOG	DESCRIPTION	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
		SILTY SAND with trace clay, yellow brown, slightly moist, very loose, no cementation, non-plastic.								
3.5			SM		SPT		4			
		3962.5								
4		SILTY SANDY CLAY, yellow brown, moist, soft, medium plasticity. 3962	CL				1			
		SILTY SAND with trace clay, yellowish brown, slightly moist to moist, very soft, weakly cemented, low plasticity.	ML							
5			SM				1			
6		3960								
		SILTY CLAY with sand, yellowish brown, slightly moist to moist, soft, low plasticity. (blocky structure)	CL ML				1			
8		3958					2			
		SANDY SILT, slightly moist, soft becoming stiff with depth, weakly cemented, low plasticity to non-plastic.	ML				4	38.2	66	
		Field Ksat (8.5'-10.0') = 1.2×10^{-2} cm/sec								
10							4			
10.5		3955.5	SM				21			
		Lab Ksat (9.0' to 9.3') = 4.7×10^{-5} cm/sec SILTY SAND, poorly graded, brown, moist, medium dense, fine to medium grained sand, non-plastic.								
		Field Ksat (11'-14') = 3.3×10^{-3} cm/sec					26			
15							45			
20										

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▼
WL	▽	▼
WL		

Terracon

BORING STARTED	
BORING COMPLETED	
RIG	FOREMAN
	JOB # 64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 5/5/04

LOG OF BORING NO. HC-2A

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: SPT - N BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, psf
	SILTY SAND, poorly graded, brown, moist, medium dense, fine to medium grained sand, non-plastic.		SM				88			
		25					52			
	26.5 3939.5									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▼
WL	▽	▼
WL		

Terracon

BORING STARTED	
BORING COMPLETED	
RIG	FOREMAN
	JOB # 64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 4/14/04

LOG OF BORING NO. HC-3

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

Approx. Surface Elev.: 3966 ft

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: SPT - N BLOWS / ft.	TESTS: WATER CONTENT, %	TESTS: DRY UNIT WT pcf	TESTS: UNCONFINED STRENGTH, psf	
	0.5 SILTY CLAYEY SAND with trace gravel, yellowish brown, dry, medium dense, moderately cemented, medium plasticity. 3965.5		SC		SPT		4				
			SM		SPT		15				
			SM								
	SILTY SAND, yellowish brown, dry, medium dense, no cementation, fine grained sand, non-plastic. (trace gravel from 3.0ft - 3.5ft)										
	3.5 3962.5				SPT		11				
	SANDY SILT, yellowish brown, dry, medium dense, no cementation, fine grained sand, non-plastic. 3961.5		ML		SPT		6				
	4.5										
	SILTY SAND, poorly graded sand, yellowish brown, slightly moist, loose, fine to medium grained sand, non-plastic. 3960.5	5	SM		SPT		4				Shelby tube 5.5 ft - 7.5ft
	5.5										
	SILTY CLAY, yellowish brown, slightly moist, soft, low to medium plasticity. (blocky structure), increasing sand and silt with depth. 3958		CL ML		MC		4				Shelby tube 7.5ft - 9.5ft
	8										
	SANDY SILT with clay, brown, moist, soft, weakly cemented, low plasticity to non-plastic, (blocky structure)	10	ML		SPT		6	38.2	73		Shelby tube 9.5ft - 11.5ft
	Lab Ksat (10.5'-11.0') = 6.7×10^{-4} cm/sec										
	14.75 3951.5										
	SILTY SAND, poorly graded sand, yellowish brown, slightly moist, loose, fine to medium grained sand, non-plastic. 3950.5	15	SM		MC		2				Shelby tube 11.5ft - 13.5ft
	15.75				MC		8				

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▼
WL	▽	▼
WL		

Terracon

BORING STARTED	
BORING COMPLETED	
RIG	FOREMAN
	JOB # 64035510

BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 5/5/04

LOG OF BORING NO. HC-4

CLIENT: Kennametal, Inc. Nevada Refinery

SITE: Fallon, Nevada

PROJECT: Kennametal, Inc. Nevada Refinery

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf	
	Approx. Surface Elev.: 3966 ft										
	0.75 SILTY SAND, brown yellow, slightly moist, medium dense, occassional weak cementation, fine to medium sand, non-plastic. 3965.5		SM		SPT		15				
	1.25 slightly moist, weak cementation, fine to coarse sand, non-plastic. 3965										
	3 slightly moist, medium dense, weak cementation, fine to medium sand, non-plastic. 3963				SPT		15				
	3.75 slightly moist, medium dense, fine to coarse sand, non-plastic. 3962.5										
	5.75 slightly moist, fine grained sand, non-plastic. 3960.5	5			SPT		4				
	SILTY CLAYEY SAND, brown yellow, slightly moist, soft, low plasticity.		SC SM		SPT		4				
	7.5 3958.5				SPT		1				Shelby tube 7.5ft - 9.0ft
	8.25 moist, weak cementation, soft, medium plasticity. 3958		CL ML		SPT		1				Shelby tube 9.0ft - 11.0ft
	SILTY CLAY with sand, light brown, moist, soft, medium plasticity. (blocky structure)										Shelby tube 11.0ft - 13.0ft
	10 Field Ksat (8.5'-10.5') = 3.3×10^{-3} cm/sec 3956	10	ML		SPT		8				
	Lab Ksat (9.75'-10.25') = 2.8×10^{-4} cm/sec										
	SANDY SILT, brown, moist, soft to medium stiff, low plasticity.										
	12.5 Field Ksat (10.0'-11.5') = 1.1×10^{-3} cm/sec 3953.5		SM		SPT		23				
	SILTY SAND, poorly graded, light brown, slightly moist, medium dense, no cementation, non-plastic.										
	15 (fine to medium grained sand) 3951	15			SPT		37				
	slightly moist, fine to coarse sand.										
	16.5 3949.5	20									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▼
WL	▽	▼
WL		

Terracon

BORING STARTED	
BORING COMPLETED	
RIG	FOREMAN
	JOB # 64035510

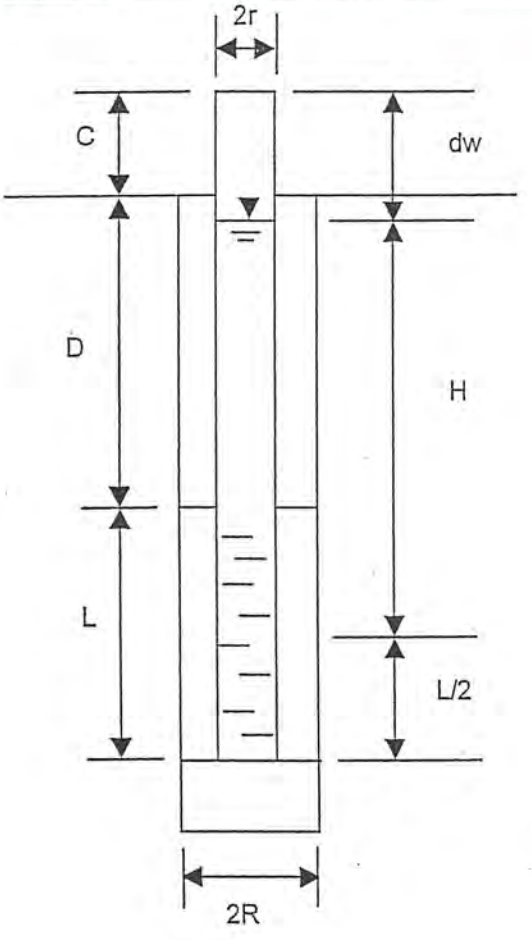
BOREHOLE 99 GINT LOGS.GPJ TERRACON.GDT 5/5/04

Well As-Built Drawings and Testing Results

Terracon

Field Falling Head Hydraulic Conductivity Test

Client:	Kennametal, Inc.
Project:	Class III Landfill Permit Support
Project No.:	6403551.0
Date:	Feb-04
Test Boring No.:	HC - 1A
Constant:	4895.077



L =	2	feet
r =	0.0417	feet
R=	0.3438	feet
C=	2.21	feet
D=	15	feet

Hydraulic Conductivity, Ksat (cm/sec)	1.90E-02

Field Falling Head Hydraulic Conductivity Test
HC - 1A

Trial 1

Remarks	Date	Time Hrs.	Time Min.	Elapsed Time, Hrs	dw, ft.	Drop, ft.	H1, Beginning Head, ft.	H2, Ending Head, ft.	k, ft/yr	k, cm/sec
	2/12/2004	10	0.000							
		10	0.033	0.00055	0.075	0.075	18.21	18.135	18365.953	1.78E-02
		10	0.065	0.00055	0.093	0.018	18.135	18.117	4419.136	4.27E-03
		10	0.149	0.00138	0.25	0.157	18.117	17.96	15399.335	1.49E-02
		10	0.232	0.00138	0.4583	0.2083	17.96	17.7517	20640.084	1.99E-02
		10	0.315	0.00138	0.74	0.2817	17.7517	17.47	28301.487	2.74E-02
		10	0.398	0.00138	0.98	0.24	17.47	17.23	24474.537	2.37E-02
		10	0.481	0.00138	1.2	0.22	17.23	17.01	22736.397	2.20E-02
		10	0.564	0.00138	1.43	0.23	17.01	16.78	24086.426	2.33E-02
		10	0.647	0.00138	1.63	0.2	16.78	16.58	21214.689	2.05E-02
		10	0.730	0.00138	1.85	0.22	16.58	16.36	23633.705	2.28E-02
		10	0.813	0.00138	1.78	-0.07	16.36	16.43	-7554.215	-7.30E-03
		10	0.896	0.00138	2.23	0.45	16.43	15.98	49132.199	4.75E-02
		10	0.979	0.00138	2.47	0.24	15.98	15.74	26773.847	2.59E-02
		10	1.062	0.00138	2.67	0.2	15.74	15.54	22625.385	2.19E-02
		10	1.145	0.00138	2.87	0.2	15.54	15.34	22918.460	2.22E-02
		10	1.228	0.00138	3.07	0.2	15.34	15.14	23219.227	2.24E-02
		10	1.311	0.00138	3.25	0.18	15.14	14.96	21161.124	2.05E-02
		10	1.394	0.00138	3.43	0.18	14.96	14.78	21417.277	2.07E-02
		10	1.477	0.00138	3.66	0.23	14.78	14.55	27749.074	2.68E-02
		10	1.560	0.00138	3.79	0.13	14.55	14.42	15879.152	1.53E-02
		10	1.643	0.00138	3.98	0.19	14.42	14.23	23467.223	2.27E-02
		10	1.726	0.00138	4.15	0.17	14.23	14.06	21264.183	2.06E-02
		10	1.809	0.00138	4.3	0.15	14.06	13.91	18977.173	1.83E-02
		10	1.892	0.00138	4.45	0.15	13.91	13.76	19182.925	1.85E-02
		10	1.975	0.00138	4.63	0.18	13.76	13.58	23297.360	2.25E-02
		10	2.058	0.00138	4.8	0.17	13.58	13.41	22288.393	2.15E-02
		10	2.141	0.00138	4.98	0.18	13.41	13.23	23909.528	2.31E-02
		10	2.224	0.00138	5.1	0.12	13.23	13.11	16121.231	1.56E-02
		10	2.307	0.00138	5.27	0.17	13.11	12.94	23092.658	2.23E-02
		10	2.390	0.00138	5.43	0.16	12.94	12.78	22013.127	2.13E-02
		10	2.473	0.00138	5.57	0.14	12.78	12.64	19488.805	1.88E-02
		10	2.556	0.00138	5.72	0.15	12.64	12.49	21121.828	2.04E-02
		10	2.639	0.00138	5.84	0.12	12.49	12.37	17060.982	1.65E-02
		10	2.722	0.00138	6.01	0.17	12.37	12.2	24483.668	2.37E-02
		10	2.805	0.00138	6.15	0.14	12.2	12.06	20420.669	1.97E-02
		10	2.888	0.00138	6.3	0.15	12.06	11.91	22143.994	2.14E-02
		10	2.971	0.00138	6.41	0.11	11.91	11.8	16417.002	1.59E-02
		10	3.054	0.00138	6.54	0.13	11.8	11.67	19600.312	1.89E-02
		10	3.137	0.00138	6.64	0.1	11.67	11.57	15226.378	1.47E-02
		10	3.220	0.00138	6.8	0.16	11.57	11.41	24637.843	2.38E-02
		10	3.303	0.00138	6.93	0.13	11.41	11.28	20274.100	1.96E-02
		10	3.386	0.00138	7.07	0.14	11.28	11.14	22096.584	2.14E-02
		10	3.469	0.00138	7.2	0.13	11.14	11.01	20768.367	2.01E-02
		10	3.552	0.00138	7.4	0.2	11.01	10.81	32434.557	3.13E-02
		10	3.635	0.00138	7.56	0.16	10.81	10.65	26382.928	2.55E-02
		10	3.718	0.00138	7.71	0.15	10.65	10.5	25096.526	2.43E-02
		10	3.801	0.00138	7.8	0.09	10.5	10.41	15230.747	1.47E-02
		10	3.884	0.00138	7.9	0.1	10.41	10.31	17078.234	1.65E-02
		10	3.967	0.00138	8.01	0.11	10.31	10.2	18978.407	1.83E-02
		10	4.050	0.00138	8.13	0.12	10.2	10.08	20938.522	2.02E-02
		10	4.133	0.00138	8.25	0.12	10.08	9.96	21189.282	2.05E-02
		10	4.216	0.00138	8.35	0.1	9.96	9.86	17853.734	1.73E-02
		10	4.299	0.00138	8.45	0.1	9.86	9.76	18035.730	1.74E-02
		10	4.382	0.00138	8.55	0.1	9.76	9.66	18221.474	1.76E-02
		10	4.465	0.00138	8.56	0.01	9.66	9.65	1832.527	1.77E-03
		10	4.548	0.00138	8.75	0.2	9.65	9.45	37053.510	3.58E-02
		10	4.631	0.00138	8.9	0.14	9.45	9.31	26407.539	2.55E-02
		10	4.714	0.00138	8.99	0.09	9.31	9.22	17186.990	1.66E-02
		10	4.797	0.00138	9.08	0.09	9.22	9.13	17355.581	1.68E-02
		10	4.880	0.00138	9.18	0.1	9.13	9.03	19485.739	1.88E-02
		10	4.963	0.00138	9.28	0.1	9.03	8.93	19702.729	1.90E-02
		10	5.046	0.00138	9.36	0.08	8.93	8.85	15921.756	1.54E-02
		10	5.129	0.00138	9.45	0.09	8.85	8.76	18084.890	1.75E-02
		10	5.212	0.00138	9.55	0.1	8.76	8.66	20313.491	1.96E-02
		10	5.295	0.00138	9.65	0.1	8.66	8.56	20549.420	1.99E-02
		10	5.378	0.00138	9.74	0.09	8.56	8.47	18700.817	1.81E-02
		10	5.461	0.00138	9.85	0.11	8.47	8.36	23128.171	2.24E-02
		10	5.544	0.00138	9.95	0.1	8.36	8.26	21291.277	2.06E-02

Field Falling Head Hydraulic Conductivity Test
HC - 1A

Trial 2

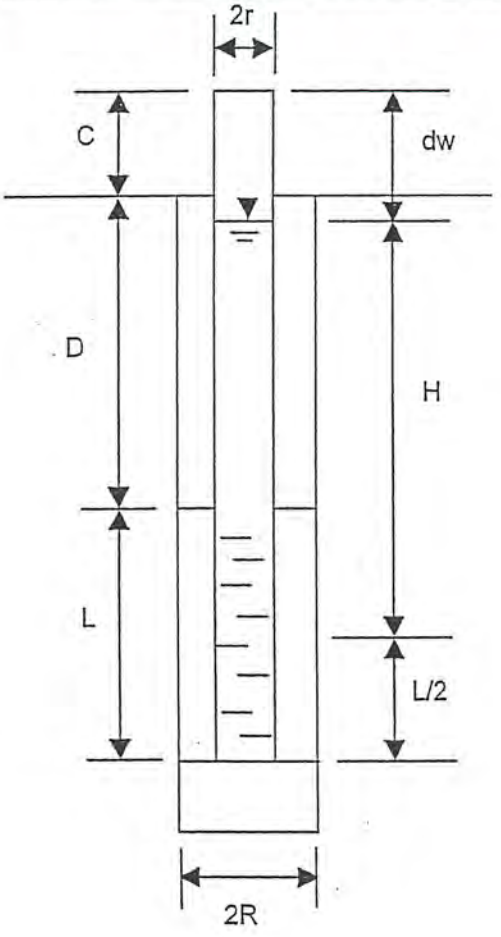
Remarks	Date	Time Hrs.	Time Min.	Elapsed Time, Hrs	dw, ft.	Drop, ft.	H1, Beginning Head, ft.	H2, Ending Head, ft.	k, ft/yr	k, cm/sec
	2/12/2004	10	0.000							
		10	0.083	0.00138	0.3	0.3	18.21	17.91	29390.450	2.84E-02
		10	0.166	0.00138	0.6	0.3	17.91	17.61	29886.910	2.89E-02
		10	0.249	0.00138	0.75	0.15	17.61	17.46	15135.202	1.46E-02
		10	0.332	0.00138	0.96	0.21	17.46	17.25	21409.050	2.07E-02
		10	0.415	0.00138	1.28	0.32	17.25	16.93	33129.177	3.20E-02
		10	0.498	0.00138	1.51	0.23	16.93	16.7	24201.021	2.34E-02
		10	0.581	0.00138	1.64	0.13	16.7	16.57	13826.851	1.34E-02
		10	0.664	0.00138	1.85	0.21	16.57	16.36	22566.296	2.18E-02
		10	0.747	0.00138	2.04	0.19	16.36	16.17	20668.181	2.00E-02
		10	0.830	0.00138	2.25	0.21	16.17	15.96	23128.171	2.24E-02
		10	0.913	0.00138	2.46	0.21	15.96	15.75	23434.504	2.26E-02
		10	0.996	0.00138	2.66	0.2	15.75	15.55	22610.928	2.19E-02
		10	1.079	0.00138	2.89	0.23	15.55	15.32	26364.766	2.55E-02
		10	1.162	0.00138	3.07	0.18	15.32	15.14	20911.025	2.02E-02
		10	1.245	0.00138	3.25	0.18	15.14	14.96	21161.124	2.05E-02
		10	1.328	0.00138	3.44	0.19	14.96	14.77	22614.730	2.19E-02
		10	1.411	0.00138	3.59	0.15	14.77	14.62	18060.276	1.75E-02
		10	1.494	0.00138	3.8	0.21	14.62	14.41	25597.938	2.47E-02
		10	1.577	0.00138	3.95	0.15	14.41	14.26	18513.831	1.79E-02
		10	1.660	0.00138	4.15	0.2	14.26	14.06	24990.185	2.42E-02
		10	1.743	0.00138	4.34	0.19	14.06	13.87	24072.178	2.33E-02
		10	1.826	0.00138	4.48	0.14	13.87	13.73	17949.472	1.73E-02
		10	1.909	0.00138	4.66	0.18	13.73	13.55	23348.601	2.26E-02
		10	1.992	0.00138	4.79	0.13	13.55	13.42	17056.705	1.65E-02
		10	2.075	0.00138	4.98	0.19	13.42	13.23	25228.365	2.44E-02
		10	2.158	0.00138	5.12	0.14	13.23	13.09	18822.395	1.82E-02
		10	2.241	0.00138	5.29	0.17	13.09	12.92	23128.171	2.24E-02
		10	2.324	0.00138	5.48	0.19	12.92	12.73	26211.927	2.53E-02
		10	2.407	0.00138	5.61	0.13	12.73	12.6	18161.047	1.76E-02
		10	2.490	0.00138	5.74	0.13	12.6	12.47	18349.395	1.77E-02
		10	2.573	0.00138	5.9	0.16	12.47	12.31	22848.169	2.21E-02
		10	2.656	0.00138	6.04	0.14	12.31	12.17	20237.150	1.96E-02
		10	2.739	0.00138	6.18	0.14	12.17	12.03	20471.299	1.98E-02
		10	2.822	0.00138	6.32	0.14	12.03	11.89	20710.929	2.00E-02
		10	2.905	0.00138	6.46	0.14	11.89	11.75	20956.236	2.03E-02
		10	2.988	0.00138	6.61	0.15	11.75	11.6	22731.971	2.20E-02
		10	3.071	0.00138	6.72	0.11	11.6	11.49	16857.822	1.63E-02
		10	3.154	0.00138	6.86	0.14	11.49	11.35	21690.255	2.10E-02
		10	3.237	0.00138	7	0.14	11.35	11.21	21959.460	2.12E-02
		10	3.320	0.00138	7.15	0.15	11.21	11.06	23834.375	2.30E-02
		10	3.403	0.00138	7.24	0.09	11.06	10.97	14456.419	1.40E-02
		10	3.486	0.00138	7.35	0.11	10.97	10.86	17830.835	1.72E-02
		10	3.569	0.00138	7.5	0.15	10.86	10.71	24607.859	2.38E-02
		10	3.652	0.00138	7.61	0.11	10.71	10.6	18265.937	1.77E-02
		10	3.735	0.00138	7.73	0.12	10.6	10.48	20143.891	1.95E-02
		10	3.818	0.00138	7.85	0.12	10.48	10.36	20375.874	1.97E-02
		10	3.901	0.00138	7.96	0.11	10.36	10.25	18885.323	1.83E-02
		10	3.984	0.00138	8.08	0.12	10.25	10.13	20835.781	2.01E-02
		10	4.067	0.00138	8.18	0.1	10.13	10.03	17552.630	1.70E-02
		10	4.150	0.00138	8.29	0.11	10.03	9.92	19511.134	1.89E-02
		10	4.233	0.00138	8.42	0.13	9.92	9.79	23339.387	2.26E-02
		10	4.316	0.00138	8.51	0.09	9.79	9.7	16340.427	1.58E-02
		10	4.399	0.00138	8.61	0.1	9.7	9.6	18334.768	1.77E-02
		10	4.482	0.00138	8.72	0.11	9.6	9.49	20390.106	1.97E-02
		10	4.565	0.00138	8.82	0.1	9.49	9.39	18742.639	1.81E-02
		10	4.648	0.00138	9.3	0.48	9.39	8.91	92816.005	8.97E-02
		10	4.731	0.00138	9.42	0.12	8.91	8.79	23990.577	2.32E-02
		10	4.814	0.00138	9.52	0.1	8.79	8.69	20243.765	1.96E-02
		10	4.897	0.00138	9.61	0.09	8.69	8.6	18419.602	1.78E-02
		10	4.980	0.00138	9.71	0.1	8.6	8.5	20693.627	2.00E-02
		10	5.063	0.00138	9.8	0.09	8.5	8.41	18833.525	1.82E-02
		10	5.146	0.00138	9.9	0.1	8.41	8.31	21163.936	2.05E-02
		10	5.229	0.00138	9.99	0.09	8.31	8.22	19266.480	1.86E-02
		10	5.312	0.00138	10.07	0.08	8.22	8.14	17303.717	1.67E-02
		10	5.395	0.00138	10.17	0.1	8.14	8.04	21870.273	2.11E-02
		10	5.478	0.00138	10.24	0.07	8.04	7.97	15471.750	1.50E-02
		10	5.561	0.00138	10.33	0.09	7.97	7.88	20093.055	1.94E-02
		10	5.644	0.00138	10.4	0.07	7.88	7.81	15787.298	1.53E-02
		10	5.727	0.00138	10.48	0.08	7.81	7.73	18215.783	1.76E-02
		10	5.810	0.00138	10.57	0.09	7.73	7.64	20720.554	2.00E-02
		10	5.893	0.00138	10.66	0.09	7.64	7.55	20966.091	2.03E-02
		10	5.976	0.00138	10.74	0.08	7.55	7.47	18847.458	1.82E-02
		10	6.059	0.00138	10.81	0.07	7.47	7.4	16657.882	1.61E-02
		10	6.142	0.00138	10.9	0.09	7.4	7.31	21650.232	2.09E-02
		10	6.225	0.00138	10.96	0.06	7.31	7.25	14582.185	1.41E-02
		10	6.308	0.00138	11.04	0.08	7.25	7.17	19631.679	1.90E-02
		10	6.391	0.00138	11.12	0.08	7.17	7.09	19851.950	1.92E-02
		10	6.474	0.00138	11.2	0.08	7.09	7.01	20077.221	1.94E-02
		10	6.557	0.00138	11.27	0.07	7.01	6.94	17756.467	1.72E-02
		10	6.640	0.00138	11.35	0.08	6.94	6.86	20513.682	1.98E-02
		10	6.723	0.00138	11.41	0.06	6.86	6.8	15542.944	1.50E-02
		10	6.806	0.00138	11.5	0.09	6.8	6.71	23573.273	2.28E-02

Field Falling Head Hydraulic Conductivity Test
HC - 1A

Trial 3		Time					H1, Beginning	H2, Ending		
Remarks	Date	Hrs.	Min.	Elapsed Time, Hrs	dw, ft.	Drop, ft.	Head, ft.	Head, ft.	k, ft/yr	k, cm/sec
	2/12/2004	10	0.000							
		10	0.083	0.00138	0.25	0.25	18.21	17.96	24458.185	2.36E-02
		10	0.166	0.00138	0.5	0.25	17.96	17.71	24801.024	2.40E-02
		10	0.249	0.00138	0.73	0.23	17.71	17.48	23128.171	2.24E-02
		10	0.332	0.00138	0.96	0.23	17.48	17.25	23434.504	2.26E-02
		10	0.415	0.00138	1.21	0.25	17.25	17	25829.271	2.50E-02
		10	0.498	0.00138	1.44	0.23	17	16.77	24100.691	2.33E-02
		10	0.581	0.00138	1.65	0.21	16.77	16.56	22295.474	2.15E-02
		10	0.664	0.00138	1.86	0.21	16.56	16.35	22580.010	2.18E-02
		10	0.747	0.00138	2.11	0.25	16.35	16.1	27262.020	2.63E-02
		10	0.830	0.00138	2.36	0.25	16.1	15.85	27688.556	2.68E-02
		10	0.913	0.00138	2.54	0.18	15.85	15.67	20207.799	1.95E-02
		10	0.996	0.00138	2.75	0.21	15.67	15.46	23871.125	2.31E-02
		10	1.079	0.00138	2.96	0.21	15.46	15.25	24197.595	2.34E-02
		10	1.162	0.00138	3.15	0.19	15.25	15.06	22181.984	2.14E-02
		10	1.245	0.00138	3.36	0.21	15.06	14.85	24844.806	2.40E-02
		10	1.328	0.00138	3.56	0.2	14.85	14.65	23990.577	2.32E-02
		10	1.411	0.00138	3.76	0.2	14.65	14.45	24320.345	2.35E-02
		10	1.494	0.00138	3.97	0.21	14.45	14.24	25901.294	2.50E-02
		10	1.577	0.00138	4.15	0.18	14.24	14.06	22507.061	2.18E-02
		10	1.660	0.00138	4.35	0.2	14.06	13.86	25348.210	2.45E-02
		10	1.743	0.00138	4.51	0.16	13.86	13.7	20543.455	1.99E-02
		10	1.826	0.00138	4.69	0.18	13.7	13.52	23400.067	2.26E-02
		10	1.909	0.00138	4.88	0.19	13.52	13.33	25040.444	2.42E-02
		10	1.992	0.00138	5.02	0.14	13.33	13.19	18680.446	1.81E-02
		10	2.075	0.00138	5.19	0.17	13.19	13.02	22951.688	2.22E-02
		10	2.158	0.00138	5.36	0.17	13.02	12.85	23253.333	2.25E-02
		10	2.241	0.00138	5.51	0.15	12.85	12.7	20774.619	2.01E-02
		10	2.324	0.00138	5.66	0.15	12.7	12.55	21021.447	2.03E-02
		10	2.407	0.00138	5.85	0.19	12.55	12.36	26990.603	2.61E-02
		10	2.490	0.00138	8.98	3.13	12.36	9.23	513008.330	4.96E-01
		10	2.573	0.00138	6.14	-2.84	9.23	12.07	-471814.690	-4.56E-01
		10	2.656	0.00138	6.29	0.15	12.07	11.92	22125.533	2.14E-02
		10	2.739	0.00138	6.45	0.16	11.92	11.76	23909.528	2.31E-02
		10	2.822	0.00138	6.6	0.15	11.76	11.61	22712.517	2.20E-02
		10	2.905	0.00138	6.74	0.14	11.61	11.47	21464.706	2.07E-02
		10	2.988	0.00138	6.85	0.11	11.47	11.36	17049.808	1.65E-02
		10	3.071	0.00138	7	0.15	11.36	11.21	23517.569	2.27E-02
		10	3.154	0.00138	7.11	0.11	11.21	11.1	17447.204	1.69E-02
		10	3.237	0.00138	7.26	0.15	11.1	10.95	24072.178	2.33E-02
		10	3.320	0.00138	7.4	0.14	10.95	10.81	22766.793	2.20E-02
		10	3.403	0.00138	7.52	0.12	10.81	10.69	19750.382	1.91E-02
		10	3.486	0.00138	7.66	0.14	10.69	10.55	23324.173	2.25E-02
		10	3.569	0.00138	7.8	0.14	10.55	10.41	23635.755	2.28E-02
		10	3.652	0.00138	7.99	0.19	10.41	10.22	32590.205	3.15E-02
		10	3.735	0.00138	8.02	0.03	10.22	10.19	5201.289	5.03E-03
		10	3.818	0.00138	8.14	0.12	10.19	10.07	20959.192	2.03E-02
		10	3.901	0.00138	8.26	0.12	10.07	9.95	21210.451	2.05E-02
		10	3.984	0.00138	8.38	0.12	9.95	9.83	21467.807	2.07E-02
		10	4.067	0.00138	8.5	0.12	9.83	9.71	21731.485	2.10E-02
		10	4.150	0.00138	8.6	0.1	9.71	9.61	18315.788	1.77E-02
		10	4.233	0.00138	8.71	0.11	9.61	9.5	20368.766	1.97E-02
		10	4.316	0.00138	8.81	0.1	9.5	9.4	18722.805	1.81E-02
		10	4.399	0.00138	8.91	0.1	9.4	9.3	18923.049	1.83E-02
		10	4.482	0.00138	9.02	0.11	9.3	9.19	21051.764	2.03E-02
		10	4.565	0.00138	9.12	0.1	9.19	9.09	19357.824	1.87E-02
		10	4.648	0.00138	9.23	0.11	9.09	8.98	21541.069	2.08E-02
		10	4.731	0.00138	9.34	0.11	8.98	8.87	21806.561	2.11E-02
		10	4.814	0.00138	9.43	0.09	8.87	8.78	18043.905	1.74E-02
		10	4.897	0.00138	9.53	0.1	8.78	8.68	20266.954	1.96E-02
		10	4.980	0.00138	9.63	0.1	8.68	8.58	20501.797	1.98E-02
		10	5.063	0.00138	9.73	0.1	8.58	8.48	20742.146	2.00E-02
		10	5.146	0.00138	9.83	0.1	8.48	8.38	20988.198	2.03E-02
		10	5.229	0.00138	9.93	0.1	8.38	8.28	21240.157	2.05E-02
		10	5.312	0.00138	10.03	0.1	8.28	8.18	21498.239	2.08E-02
		10	5.395	0.00138	10.12	0.09	8.18	8.09	19574.365	1.89E-02
		10	5.478	0.00138	10.21	0.09	8.09	8	19793.345	1.91E-02
		10	5.561	0.00138	10.29	0.08	8	7.92	17781.961	1.72E-02
		10	5.644	0.00138	10.38	0.09	7.92	7.83	20220.630	1.95E-02
		10	5.727	0.00138	10.47	0.09	7.83	7.74	20454.394	1.98E-02
		10	5.810	0.00138	10.56	0.09	7.74	7.65	20693.627	2.00E-02
		10	5.893	0.00138	10.64	0.08	7.65	7.57	18559.791	1.80E-02
		10	5.976	0.00138	10.73	0.09	7.57	7.48	21161.124	2.05E-02
		10	6.059	0.00138	10.81	0.08	7.48	7.4	19024.786	1.84E-02
		10	6.142	0.00138	10.89	0.08	7.4	7.32	19231.577	1.86E-02
		10	6.225	0.00138	10.97	0.08	7.32	7.24	19442.913	1.88E-02
		10	6.308	0.00138	11.05	0.08	7.24	7.16	19658.945	1.90E-02

Field Falling Head Hydraulic Conductivity Test

Client:	Kennametal, Inc.
Project:	Class III Landfill Permit Support
Project No.:	64035510
Date:	Feb-04
Test Boring No.:	HC -1B
Constant:	4895.077



L =	2	feet
r =	0.0417	feet
R=	0.3438	feet
C=	2.9	feet
D=	4.5	feet

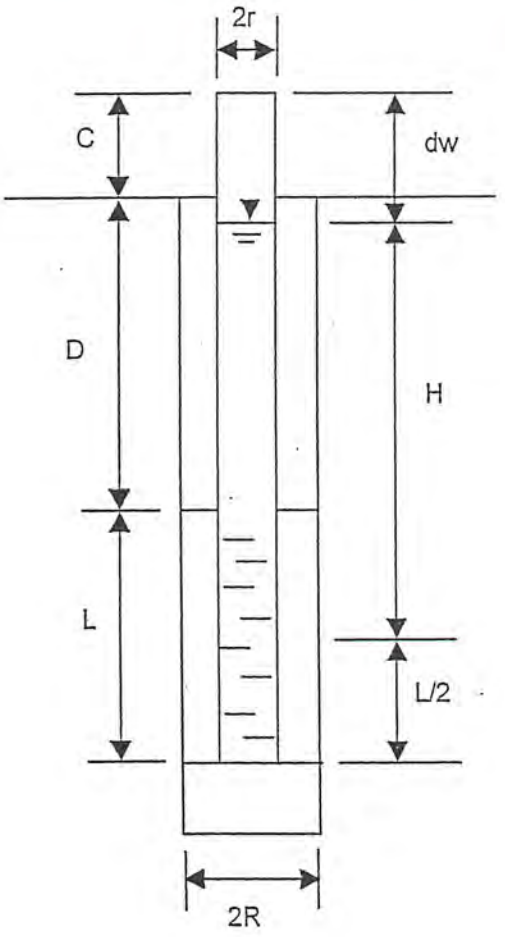
Hydraulic Conductivity, Ksat (cm/sec)		8.21E-05

Field Falling Head Hydraulic Conductivity Test
HC - 1B

Remarks	Date	Time Hrs.	Time Min.	Elapsed Time, Hrs	dw, ft.	Drop, ft.	H1, Beginning Head, ft.	H2, Ending Head, ft.	k, ft/yr	k, cm/sec
	2/12/2004	9	48		0					
		10	8	0.33	0.161	0.161	8.4	8.239	142.095	1.37E-04
		10	38	0.50	0.333	0.172	8.239	8.067	103.269	9.98E-05
		11	8	0.50	0.505	0.172	8.067	7.895	105.495	1.02E-04
		14	8	3.00	1.26	0.755	7.895	7.14	81.937	7.92E-05
		16	8	2.00	1.66	0.4	7.14	6.74	70.534	6.82E-05
	2/14/2004	9	50		0					
		11	20	1.50	0.69	0.69	8.4	7.71	139.773	1.35E-04
		13	20	2.00	1.32	0.63	7.71	7.08	104.256	1.01E-04
		15	20	2.00	1.79	0.47	7.08	6.61	84.028	8.12E-05
		19	50	4.50	2.8	1.01	6.61	5.6	89.981	8.70E-05
	2/15/2004	31	15	11.42	4.66	1.86	5.6	3.74	85.386	8.25E-05
	2/16/2004	7	15		2.8					
		10	15	3.00	3.35	0.55	5.6	5.05	84.266	8.14E-05
		12	15	2.00	3.67	0.32	5.05	4.73	80.083	7.74E-05
		18	45	6.50	4.63	0.96	4.73	3.77	85.055	8.22E-05

Field Constant Head Hydraulic Conductivity Test

Client:	Kennametal, Inc
Project:	Class III Landfill Permit Support
Project No.:	6403551.0
Date:	12-Feb-04
Test Boring No.:	HC - 2A



L =	3	feet
r =	0.0417	feet
R=	0.3438	feet
C=	2.91	feet
D=	11	feet

Hydraulic Conductivity, Ksat (cm/sec)	3.26E-03

Field Constant Head Hydraulic Conductivity Test

HC - 2A

Remarks	Date	Time Hrs	Time Min	Elapsed Time, Hrs	dw, ft	Cumulative Volume gal	Flow, Q (gpm)	k, cm/sec
	2/12/2004		0		0.271			
			1	0.017	0.271	7.25	7.25	3.74E-03
			2	0.017	0.271	14.5	7.25	3.74E-03
			3	0.017	0.271	21.8	7.25	3.74E-03
			4	0.017	0.271	29.0	7.25	3.74E-03
			5	0.017	0.271	36.3	7.25	3.74E-03
			6	0.017	0.271	43.5	7.25	3.74E-03
			7	0.017	0.271	50.8	7.25	3.74E-03
			8	0.017	0.271	58.0	7.25	3.74E-03
			9	0.017	0.271	65.3	7.25	3.74E-03
			10	0.017	0.271	72.5	7.25	3.74E-03
			11	0.017	0.271	79.8	7.25	3.74E-03
			12	0.017	0.271	87.0	7.25	3.74E-03
			13	0.017	0.271	94.3	7.25	3.74E-03
			14	0.017	0.271	101.5	7.25	3.74E-03
			15	0.017	0.271	108.8	7.25	3.74E-03
			16	0.017	0.271	116.0	7.25	3.74E-03
			17	0.017	0.271	123.3	7.25	3.74E-03
			18	0.017	0.271	130.5	7.25	3.74E-03
			19	0.017	0.271	137.8	7.25	3.74E-03
change in flow rate			20	0.017	0.104	143.2	5.45	2.78E-03
			21	0.017	0.104	148.7	5.45	2.78E-03
			22	0.017	0.104	154.1	5.45	2.78E-03
			23	0.017	0.104	159.6	5.45	2.78E-03
			24	0.017	0.104	165.0	5.45	2.78E-03

Shaded boxes indicate test data.

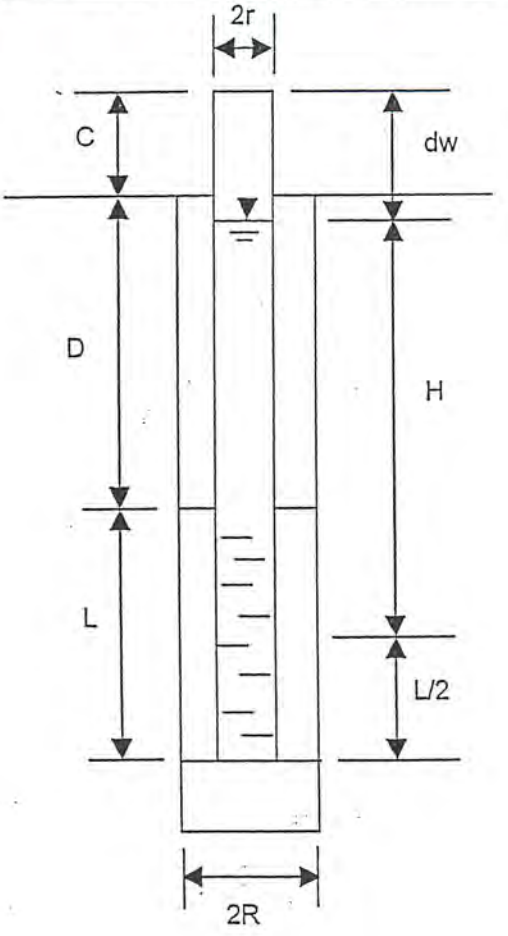
L =	3	feet
r =	0.0417	feet
R=	0.3438	feet
C=	2.91	feet
D=	11	feet

K=((Q/(2pi()LH))loge(L/R))/7.48*12*2.54/60= cm/sec

H=D+(L/2)+collar-dw

Field Falling Head Hydraulic Conductivity Test

Client:	Kennametal, Inc.
Project:	Class III Landfill Permit Support
Project No.:	64035510
Date:	Feb-04
Test Boring No.:	HC - 2B
Constant:	5460.442



L =	1.5	feet
r =	0.0417	feet
R=	0.3438	feet
C=	2.91	feet
D=	8.5	feet

Hydraulic Conductivity, Ksat (cm/sec)	1.19E-02

Field Falling Head Hydraulic Conductivity Test
HC - 2B

Trial 1

Remarks	Date	Time Hrs.	Time Min.	Elapsed Time, Hrs	dw, ft.	Drop, ft.	H1, Beginning Head, ft.	H2, Ending Head, ft.	k, ft/yr	k, cm/sec
	2/26/2004	0	0.000							
		0	0.167	0.00278	0.292	0.292	12.16	11.868	23841.185	2.30E-02
		0	0.334	0.00278	0.396	0.104	11.868	11.764	8633.670	8.34E-03
		0	0.501	0.00278	0.492	0.096	11.764	11.668	8037.565	7.77E-03
		0	0.668	0.00278	0.76	0.268	11.668	11.4	22792.263	2.20E-02
		0	0.835	0.00278	0.94	0.18	11.4	11.22	15611.424	1.51E-02
		0	1.002	0.00278	1.09	0.15	11.22	11.07	13202.124	1.28E-02
		0	1.169	0.00278	1.28	0.19	11.07	10.88	16981.720	1.64E-02
		0	1.336	0.00278	1.45	0.17	10.88	10.71	15447.524	1.49E-02
		0	1.503	0.00278	1.61	0.16	10.71	10.55	14764.520	1.43E-02
		0	1.836	0.00555	1.91	0.3	10.55	10.25	14190.339	1.37E-02
		0	2.169	0.00555	2.22	0.31	10.25	9.94	15106.373	1.46E-02
		0	2.502	0.00555	2.54	0.32	9.94	9.62	16095.926	1.56E-02
		0	2.835	0.00555	2.79	0.25	9.62	9.37	12952.389	1.25E-02
		0	3.168	0.00555	3.08	0.29	9.37	9.08	15464.521	1.49E-02
		0	3.501	0.00555	3.33	0.25	9.08	8.83	13733.438	1.33E-02
		0	4.001	0.00833	3.69	0.36	8.83	8.47	13635.324	1.32E-02
		0	4.501	0.00833	4.04	0.35	8.47	8.12	13823.905	1.34E-02
		0	5.001	0.00833	4.37	0.33	8.12	7.79	13591.044	1.31E-02
		0	5.501	0.00833	4.69	0.32	7.79	7.47	13740.563	1.33E-02
		0	6.001	0.00833	4.98	0.29	7.47	7.18	12970.880	1.25E-02
		0	7.001	0.01667	5.52	0.54	7.18	6.64	12801.616	1.24E-02
		0	8.001	0.01667	6.01	0.49	6.64	6.15	12551.760	1.21E-02
		0	9.001	0.01667	6.45	0.44	6.15	5.71	12154.779	1.17E-02
		0	10.001	0.01667	6.85	0.4	5.71	5.31	11892.070	1.15E-02
		0	11.001	0.01667	7.22	0.37	5.31	4.94	11826.519	1.14E-02
		0	12.001	0.01667	7.57	0.35	4.94	4.59	12032.454	1.16E-02
		0	13.001	0.01667	7.89	0.32	4.59	4.27	11833.013	1.14E-02
		0	14.001	0.01667	8.19	0.3	4.27	3.97	11928.151	1.15E-02

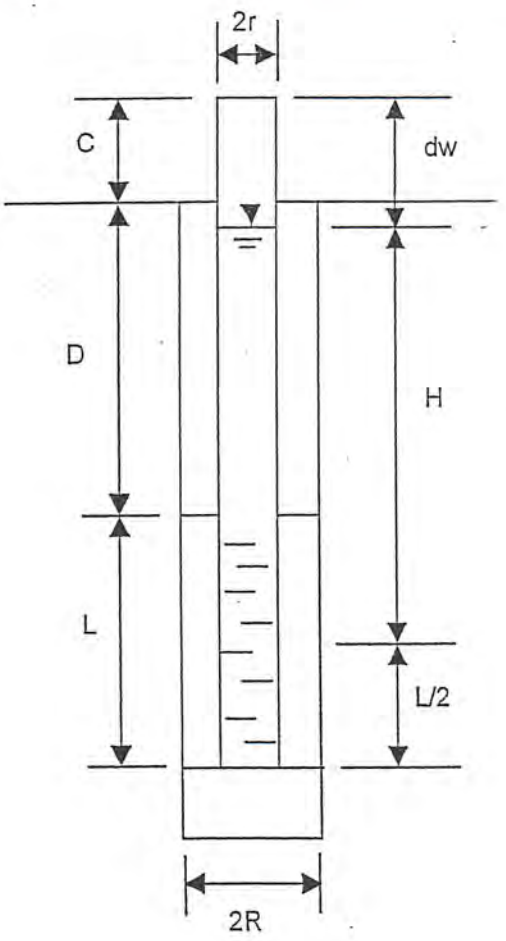
Field Falling Head Hydraulic Conductivity Test
HC - 2B

Trial 2

Remarks	Date	Time Hrs.	Time Min.	Elapsed Time, Hrs	dw, ft.	Drop, ft.	H1, Beginning Head, ft.	H2, Ending Head, ft.	k, ft/yr	k, cm/sec
	2/26/2004	0	0.000							
		0	0.333	0.00555	0.45	0.45	12.16	11.71	18547.908	1.79E-02
		0	0.666	0.00555	0.8	0.35	11.71	11.36	14926.407	1.44E-02
		0	0.999	0.00555	1.15	0.35	11.36	11.01	15393.483	1.49E-02
		0	1.332	0.00555	1.51	0.36	11.01	10.65	16352.302	1.58E-02
		0	1.665	0.00555	1.83	0.32	10.65	10.33	15006.497	1.45E-02
		0	1.998	0.00555	2.14	0.31	10.33	10.02	14987.601	1.45E-02
		0	2.331	0.00555	2.45	0.31	10.02	9.71	15458.575	1.49E-02
		0	2.664	0.00555	2.74	0.29	9.71	9.42	14914.815	1.44E-02
		0	2.997	0.00555	3.02	0.28	9.42	9.14	14842.768	1.43E-02
		0	3.497	0.00833	3.42	0.4	9.14	8.74	14658.906	1.42E-02
		0	3.997	0.00833	3.78	0.36	8.74	8.38	13778.686	1.33E-02
		0	4.497	0.00833	4.14	0.36	8.38	8.02	14383.604	1.39E-02
		0	4.997	0.00833	4.47	0.33	8.02	7.69	13764.069	1.33E-02
		0	5.997	0.01667	5.08	0.61	7.69	7.08	13530.954	1.31E-02
		0	6.997	0.01667	5.64	0.56	7.08	6.52	13490.505	1.30E-02
		0	7.997	0.01667	6.14	0.5	6.52	6.02	13063.259	1.26E-02
		0	8.997	0.01667	6.59	0.45	6.02	5.57	12720.616	1.23E-02
		0	9.997	0.01667	7.01	0.42	5.57	5.15	12836.114	1.24E-02
		0	10.997	0.01667	7.38	0.37	5.15	4.78	12207.635	1.18E-02
		0	11.997	0.01667	7.74	0.36	4.78	4.42	12820.169	1.24E-02
		0	12.997	0.01667	8.04	0.3	4.42	4.12	11509.129	1.11E-02
		0	13.997	0.01667	8.34	0.3	4.12	3.82	12378.837	1.20E-02
		0	14.997	0.01667	8.62	0.28	3.82	3.54	12464.053	1.20E-02

Field Constant Head Hydraulic Conductivity Test

Client:	Kennametal Inc.
Project:	Class III Landfill Permit Support
Project No.:	64035510
Date:	12-Feb-04
Test Boring No.:	HC -4A



L =	2	feet
r =	0.0417	feet
R=	0.3438	feet
C=	3.73	feet
D=	8.5	feet

Hydraulic Conductivity, Ksat (cm/sec)	3.28E-03

Field Constant Head Hydraulic Conductivity Test

HC - 4A

Remarks	Date	Time Hrs	Time Min	Elapsed Time, Hrs	dw, ft	Cumulative Volume gal	Flow, Q (gpm)	k, cm/sec
	2/24/2004		0		5.97			
			1	0.017	5.97	2.5	2.5	3.28E-03
			2	0.017	5.97	5.0	2.5	3.28E-03
			3	0.017	5.97	7.5	2.5	3.28E-03
			4	0.017	5.97	10.0	2.5	3.28E-03
			5	0.017	5.97	12.5	2.5	3.28E-03
			6	0.017	5.97	15.0	2.5	3.28E-03
			7	0.017	5.97	17.5	2.5	3.28E-03
			8	0.017	5.97	20.0	2.5	3.28E-03
			9	0.017	5.97	22.5	2.5	3.28E-03
			10	0.017	5.97	25.0	2.5	3.28E-03
			11	0.017	5.97	27.5	2.5	3.28E-03
			12	0.017	5.97	30.0	2.5	3.28E-03
			13	0.017	5.97	32.5	2.5	3.28E-03
			14	0.017	5.97	35.0	2.5	3.28E-03
			15	0.017	5.97	37.5	2.5	3.28E-03
			16	0.017	5.97	40.0	2.5	3.28E-03
			17	0.017	5.97	42.5	2.5	3.28E-03
			18	0.017	5.97	45.0	2.5	3.28E-03
			19	0.017	5.97	47.5	2.5	3.28E-03
			20	0.017	5.97	50.0	2.5	3.28E-03

Shaded boxes indicate test data.

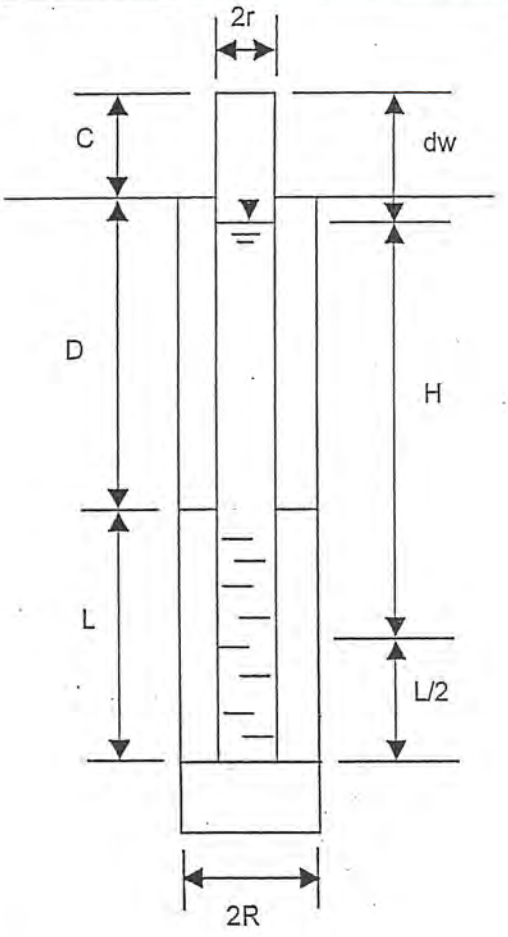
L =	2	feet
r =	0.0417	feet
R=	0.3438	feet
C=	3.73	feet
D=	8.5	feet

K=((Q/(2pi()LH))loge(L/R))/7.48*12*2.54/60= cm/sec

H=D+(L/2)+collar-dw

Field Falling Head Hydraulic Conductivity Test

Client:	Kennametal, Inc.
Project:	Class III Landfill Permit Support
Project No.:	64035510
Date:	23-Feb-04
Test Boring No.:	HC - 4B
Constant:	5460.442



L =	1.5	feet
r =	0.0417	feet
R=	0.3438	feet
C=	2.88	feet
D=	10	feet

Hydraulic Conductivity, Ksat (cm/sec)	1.09E-03

Field Falling Head Hydraulic Conductivity Test

HC - 4B

Remarks	Date	Time		Elapsed Time, Hrs	dw, ft.	Drop, ft.	H1, Beginning Head, ft.	H2, Ending Head, ft.	k, ft/yr	k, cm/sec
		Hrs.	Min.							
	2/12/2004		0		0					
			1	0.017	0.104	0.104	13.63	13.526	1254.719	1.21E-03
			2	0.017	0.271	0.167	13.526	13.359	2035.099	1.97E-03
			3	0.017	0.433	0.162	13.359	13.197	1998.626	1.93E-03
			4	0.017	0.458	0.025	13.197	13.172	310.617	3.00E-04
			6	0.033	0.675	0.217	13.172	12.955	1360.565	1.31E-03
			8	0.033	1.08	0.405	12.955	12.55	2601.230	2.51E-03
			10	0.033	1.34	0.26	12.55	12.29	1714.632	1.66E-03
			12	0.033	1.58	0.24	12.29	12.05	1615.250	1.56E-03
			16	0.067	2.06	0.48	12.05	11.57	1664.487	1.61E-03
			20	0.067	2.5	0.44	11.57	11.13	1587.618	1.53E-03
			24	0.067	2.91	0.41	11.13	10.72	1536.921	1.49E-03
			30	0.100	3.49	0.58	10.72	10.14	1518.244	1.47E-03
			36	0.100	4.02	0.53	10.14	9.61	1465.334	1.42E-03
			42	0.100	4.49	0.47	9.61	9.14	1368.751	1.32E-03
			48	0.100	4.94	0.45	9.14	8.69	1378.126	1.33E-03
			56	0.133	5.48	0.54	8.69	8.15	1313.230	1.27E-03
		1	6	0.167	6.05	0.57	8.15	7.58	1187.204	1.15E-03
		1	16	0.167	6.56	0.51	7.58	7.07	1140.543	1.10E-03
		1	26	0.167	7	0.44	7.07	6.63	1052.231	1.02E-03
		1	48	0.367	7.8	0.8	6.63	5.83	956.155	9.24E-04

Shaded boxes indicate test data.