APPENDIX D

DATA QUALITY INDICATORS AND MEASUREMENT QUALITY OBJECTIVES

APPENDIX D – DATA QUALITY INDICATORS AND MEASUREMENT QUALITY OBJECTIVES

The State of Nevada certifies laboratories for standard analyses under the Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA), as well as SW-846 under RCRA. Certification of laboratories in Nevada for these standard analyses requires review of the laboratory's QA plan, an initial demonstration of capability (IDC), initial and continuing calibration studies, matrix spikes (MSs), demonstration of method detection limits (MDLs), and analysis of laboratory control samples (LCSs).

The state also approves laboratories for unusual compounds and nonstandard methods, based on reporting limit and MS demonstrations. SOPs, IDCs, CCs, RLs, MSs, and sensitivity analysis are required for approval of any performance-based measurement system (PBMS).

Measurement quality objectives (MQOs) for quantitatitive data quality indicators (precision and accuracy) for standard analyses are presented in Tables D-1 through D-7 of this appendix. Regulatory (or advisory) levels of chemicals and a comparison with program-required quantitation limits are provided in Tables D-8 through D-22. For more information, see also, National Functional Guidelines for Superfund Organic Methods Data Review (June 2008): http://www.epa.gov/superfund/programs/clp/download/somnfg.pdf

EPA's Regional Screening Levels (RSLs) replace the EPA's Preliminary Remediation Goals (PRGs) and are available at: http://www.epa.gov/region9/superfund/prg/ Tables in Appendix D reflect the May, 2012 RSL values.

One important note about the RSLs: The RSL values provided in EPA's RSL table include some values that exceed the physically possible limit of a "pure material" (i.e., one million parts per million, or 1.0E+06 mg/kg). Values of as much as 42 trillion parts per million are listed as the screening level for compounds in an industrial exposure scenario. EPA has intentionally done this so that if one wished to calculate a 1.0E-04 risk level instead of the 1.0E-06 risk level provided in the table, one could multiply the RSL by 100 and obtain the "correct number." For example, if the concentration at a risk level of 1.0E-04 was 5.9E+05 mg/kg, then the RSL value given in the table for a 1.0E-06 risk level would be 5.9E+07 mg/kg, which is clearly not a physically possible concentration (i.e., this represents a "concentration" of greater than one million parts per million; specifically, 59 million parts per million).

The RSL tables therefore provide "scalable" concentrations instead of physically possible concentrations in some cases. The RSLs are chemical concentrations that correspond to fixed levels of risk (i.e., either a one-in-one million [1.0E-06] cancer risk or a noncarcinogenic hazard quotient of 1 in soil, air, and water. In most cases, where a substance causes both cancer and noncancer (systemic) effects, the 1.0E-06 cancer risk will result in a more stringent criterion. If the RSLs are to be used for site screening, the EPA recommends that both cancer and noncancer-based RSLs be used. Both carcinogenic and noncarcinogenic values may be obtained in the supporting tables at http://www.epa.gov/region9/superfund/prg/

TABLE D-1: SEMIVOLATILE ORGANIC COMPOUNDS, EPA METHOD 8270C: METHOD PRECISION AND ACCURACY GOALS

Matrix Spike	Soil		Water	
Compound	% Recovery	RPD	% Recovery	RPD
Phenol	18 – 143	50	18-143	30
2-Chlorophenol	18 – 143	50	18 – 143	30
n-Nitroso-di-n-propylamine	27 – 154	50	27 – 154	30
4-Chloro-3-methylphenol	27 – 143	50	27 – 143	30
Acenaphthene	27 – 154	50	27 – 143	30
4-Nitrophenol	18 – 154	50	18 –165	30
2,4-Dinitrotoluene	27 – 165	50	27 – 165	30
Pentachlorophenol	18 – 165	50	27 – 165	30
Pyrene	27 – 154	50	27 – 154	30

Surrogate Control Limits

Surrogate Compound	Soil % Recovery	Water % Recovery
2,4,6-Tribromophenol	30-140	30-150
2-Fluorobiphenyl	30-130	40-130
2-Fluorophenol	30-130	30-130
Nitrobenzene-d5	30-130	30-130
Phenol-d5	30-130	30-130
Terphenyl-d14	30-140	40-150

Notes:

EPA U.S. Environmental Protection Agency http://www.epa.gov/region9/qa/pdfs/8270.pdf
RPD Relative percent difference

TABLE D-2: VOLATILE ORGANIC COMPOUNDS, EPA METHOD 8260B: METHOD PRECISION AND ACCURACY GOALS

Matrix Spike	Soil		Water	
Compound	% Recovery	RPD	% Recovery	RPD
1,1-Dichloroethene	54– 143	30	63 – 143	20
Trichloroethene	60– 140	30	54 – 154	20
Benzene	63 – 143	30	63 – 143	20
Toluene	63 – 143	30	63 – 143	20
Chlorobenzene	63 – 143	30	63 – 143	20

Surrogate Control Limits

Surrogate Compound	Soil % Recovery	Water % Recovery
1,2-Dichloroethane-d4	70-130	70-130
Bromofluorobenzene	70-130	70-130
Toluene-d8	70-130	70-130

Notes:

EPA U.S. Environmental Protection Agency
RPD Relative percent difference

TABLE D-3: DIOXINS/FURANS, EPA METHOD 8290: METHOD PRECISION AND ACCURACY GOALS

Matrix Spike	Soil		Water	
Compound	% Recovery	RPD	% Recovery	RPD
2378-TCDD	40-135	50	40-135	50
12378-PeCDD	40-135	50	40-135	50
123478-HxCDD	40-135	50	40-135	50
123678-HxCDD	40-135	50	40-135	50
123789-HxCDD	40-135	50	40-135	50
1234678-HpCDD	40-135	50	40-135	50
OCDD	40-135	50	40-135	50
2378-TCDF	40-135	50	40-135	50
12378-PeCDF	40-135	50	40-135	50
23478-PeCDF	40-135	50	40-135	50
123478-HxCDF	40-135	50	40-135	50
123678-HxCDF	40-135	50	40-135	50
123789-HxCDF	40-135	50	40-135	50
234678-HxCDF	40-135	50	40-135	50
1234678-HpCDF	40-135	50	40-135	50
1234789-HpCDF	40-135	50	40-135	50
OCDF	40-135	50	40-135	50

Notes:

EPA U.S. Environmental Protection Agency
RPD Relative percent difference
HxCDD Hexachlorodibenzo-p-dioxin
HxCDF Hexachlorodibenzofuran
HpCDD Heptachlorodibenzo-p-dioxin
HpCDF Heptachlorodibenzofuran
OCDD Octachlorodibenzo-p-dioxin
OCDF Octachlorodibenzofuran
PeCDD Pentachlorodibenzo-p-dioxin
PeCDF Pentachlorodibenzofuran
TCDD Tetrachlorodibenzo-p-dioxin
TCDF Tetrachlorodibenzofuran

TABLE D-4: TOTAL PETROLEUM HYDROCARBONS, EPA METHOD 8015B: METHOD PRECISION AND ACCURACY GOALS

	Matrix Spike[a]		Surrogates[a]
Analysis	**% Recovery**	**RPD**	**% Recovery**
TPH-purgeable	70 – 130	30	-
Bromofluorobenzene	-	-	70-140
TPH-extractable	60 – 140	20	-
Bromobenzene	-	-	50-150
Hexacosane	-	-	40-160

Notes:

[a] Listed criteria will apply to all water and soil matrices.
EPA U.S. Environmental Protection Agency
RPD Relative percent difference
TPH Total petroleum hydrocarbons

TABLE D-5: EXPLOSIVES, EPA METHOD 8330: METHOD PRECISION AND ACCURACY GOALS

Matrix Spike	Soil		Water	
Compound	% Recovery	RPD	% Recovery	RPD
2-Amino-4,6-Dinitrotoluene	63-143	50	54-143	30
4-Amino-2,6-Dinitrotoluene	54-176	50	36-154	30
1,3-Dinitrobenzene	63-154	50	45-143	30
2,4-Dinitrotoluene	63-143	50	54-143	30
HMX	54-143	50	45-143	30
Nitrobenzene	63-154	50	36-143	30
RDX	54-154	50	27-143	30
2-Nitrotoluene	54-143	50	45-143	30
3-Nitrotoluene	54-154	50	45-165	30
4-Nitrotoluene	54-154	50	45-143	30
Tetryl	18-165	50	45-154	30
1,3,5-Trinitrobenzene	63-143	50	54-143	30
TNT	27-176	50	45-154	30

Surrogate Control Limits

Surrogate Compound	Soil % Recovery	Water % Recovery
3,4-Dinitrotoluene	60-140	70-130

Notes:

EPA U.S. Environmental Protection Agency
HMX octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
RDX hexahydro-1,3,5-trinitro-1,3,5-triazine
RPD Relative percent difference
TNT 2,4,6-Trinitrotoluene

TABLE D-6: RADIONUCLIDES[a]: METHOD PRECISION AND ACCURACY GOALS

Laboratory Control Sample Limits

Analysis	Water % Recovery
Americium-241	81-115
Cadmium-109	81-115
Cesium-137	81-115
Cobalt-60	81-115
Radium-226	80-120
Total alpha emitting Radium	75-125
Radium-228	70-130

Isotopic Tracer Control Limits

Surrogate Compound	Soil % Recovery
Isotropic Thorium	30-110
Isotopic Uranium	30-110
Carrier	40-110

Notes:

a Methods EPA 901.1, EPA 903.1, SW-846 9315, SW-846 9320, ASTM D3972-90M
ASTM American Society for Testing and Materials
EPA U.S. Environmental Protection Agency

TABLE D-7: MISCELLANEOUS ANALYSES: METHOD PRECISION AND ACCURACY GOALS

		Soil		Water	
Analyses	**Method**	**% Recovery**	**RPD**	**% Recovery**	**RPD**
Metals	EPA 6010B	75-125	20	75-125	20
Cyanide	EPA 9010B	75-125	20	75-125	20
Perchlorate	EPA 314.0	75-125	20	75-125	20
Alkalinity	EPA 310.1	NA	NA	75-125	20
Anions[a]	EPA 300.0	NA	NA	75-125	20
Sulfide	EPA 376.1	NA	NA	75-125	20
Total dissolved solids	EPA 160.1	NA	NA	75-125	20
Total suspended solids	EPA 160.2	NA	NA	75-125	20
Hydrazine	ASTM D1385	NA	NA	75-125	20

Notes:

[a] Anions to include bromide, chloride, fluoride, nitrate, nitrite, orthophosphate, sulfate
ASTM American Society for Testing and Materials
EPA U.S. Environmental Protection Agency
RPD Relative percent difference
NA Not applicable

TABLE D-8: VOLATILE ORGANIC COMPOUNDS IN WATER: COMPARISON OF PROJECT-REQUIRED QUANTITATION LIMITS AND DRINKING WATER CRITERIA

Volatiles	Analytical Method[a]	Water PRQL (µg/L)	Regulatory Level[b] (µg/L)
Chloromethane	EPA 8260B	2.0	NA
Bromomethane	EPA 8260B	2.0	NA
Vinyl chloride	**EPA 8260B**	**1.0**	**2**
Chloroethane	EPA 8260B	2.0	NA
Methylene chloride	EPA 8260B	2.0	5
Acetone	EPA 8260B	10.0	NA
Carbon disulfide	EPA 8260B	1.0	NA
1,1-Dichloroethene	EPA 8260B	1.0	7
1,1-Dichloroethane	EPA 8260B	1.0	NA
cis-1,2-Dichloroethene	EPA 8260B	1.0	7
trans-1,2-Dichloroethene	EPA 8260B	1.0	100
Chloroform	EPA 8260B	1.0	80
1,2-Dichloroethane	**EPA 8260B**	**1.0**	**5**
2-Butanone	EPA 8260B	10.0	NA
1,1,1-Trichloroethane	EPA 8260B	1.0	200
Carbon tetrachloride	**EPA 8260B**	**1.0**	**5**
Bromodichloromethane	EPA 8260B	1.0	NA
1,2-Dichloropropane	EPA 8260B	1.0	5
cis-1,3-Dichloropropene	**EPA 8260B**	**1.0**	**NA**
Trichloroethene	EPA 8260B	1.0	5
Dibromochloromethane	EPA 8260B	1.0	80
1,1,2-Trichloroethane	EPA 8260B	1.0	5
Benzene	**EPA 8260B**	**1.0**	**5**
trans-1,3-Dichloropropene	**EPA 8260B**	**1.0**	**NA**
Bromoform	EPA 8260B	1.0	80
4-Methyl-2-pentanone	EPA 8260B	10.0	NA
2-Hexanone	EPA 8260B	10.0	NA
Tetrachloroethene	EPA 8260B	1.0	5
Toluene	EPA 8260B	1.0	1000
1,1,2,2-Tetrachloroethane	**EPA 8260B**	**1.0**	**NA**
Chlorobenzene	EPA 8260B	1.0	100
Ethylbenzene	EPA 8260B	1.0	700
Styrene	EPA 8260B	1.0	100
Total xylenes	EPA 8260B	3.0	10000

Notes:

[a] 25 milliliter (mL) purge

b MCLs from May 2012 RSL table and from http://water.epa.gov/drink/contaminants/index.cfm#Organic

[c] The listed PRQL reflects the maximum sensitivity of current, routinely used analytical methods. The listed PRQL will be used as the project screening criteria unless reasonable grounds are established for pursuing non-routine methods.

µg/L	Micrograms per liter	NA	Not available
AL	Action level	PRQL	Project-required quantitation limit
SOW	Statement of work	SOW	Statement of work
MCL	Maximum contaminant level	VOC	Volatile organic compounds

TABLE D-9: SEMIVOLATILE ORGANIC COMPOUNDS IN WATER: COMPARISON OF PROJECT-REQUIRED QUANTITATION LIMITS AND DRINKING WATER CRITERIA

Semivolatiles	Analytical Method	Water PRQL (µg/L)	Regulatory Level [a] (µg/L)
Phenol	EPA 8270C	10	NA
bis(2-Chloroethyl)ether	EPA 8270C SIM[c]	2	NA
2-Chlorophenol	EPA 8270C	10	NA
1,3-Dichlorobenzene	EPA 8270C	10	NA
1,4-Dichlorobenzene	**EPA 8270C**	**10**	**75**
1,2-Dichlorobenzene	EPA 8270C	10	600
2-Methylphenol	EPA 8270C	10	NA
2,2'-oxybis(1-Chloropropane)	EPA 8270C	10	NA
4-Methylphenol	EPA 8270C	10	NA
n-Nitroso-di-n-propylamine	EPA 8270C SIM[c]	2	NA
Hexachloroethane	EPA 8270C	10	NA
Nitrobenzene	EPA 8270C	10	NA
Isophorone	EPA 8270C	10	NA
2-Nitrophenol	EPA 8270C	10	NA
2,4-Dimethylphenol	EPA 8270C	10	NA
bis(2-Chloroethoxy)methane	EPA 8270C	10	NA
2,4-Dichlorophenol	EPA 8270C	10	NA
1,2,4-Trichlorobenzene	EPA 8270C	10	70
Naphthalene	EPA 8270C SIM[c]	1	NA
4-Chloroaniline	EPA 8270C	10	NA
Hexachlorobutadiene	EPA 8270C	10	NA
4-Chloro-3-methylphenol	EPA 8270C	10	NA
2-Methylnaphthalene	EPA 8270C SIM[c]	1	NA
Hexachlorocyclopentadiene	EPA 8270C	10	50
2,4,6-Trichlorophenol	EPA 8270C	10	NA
2,4,5-Trichlorophenol	EPA 8270C	10	NA
2-Chloronaphthalene	EPA 8270C	10	NA
2-Nitroaniline	EPA 8270C	20	NA
Dimethylphthalate	EPA 8270C	10	NA
2,6-Dinitrotoluene	EPA 8270C	20	NA
Acenaphthene	EPA 8270C SIM[c]	1	NA
2,4-Dinitrophenol	EPA 8270C	20	NA
4-Nitrophenol	EPA 8270C	20	NA
Dibenzofuran	EPA 8270C	10	NA
2,4-Dinitrotoluene	EPA 8270C	20	NA
Diethylphthalate	EPA 8270C	20	NA
4-Chlorophenyl phenyl ether	EPA 8270C	10	NA
Fluorene	EPA 8270C SIM[c]	2	NA

TABLE D-9: SEMIVOLATILE ORGANIC COMPOUNDS IN WATER: COMPARISON OF PROJECT-REQUIRED QUANTITATION LIMITS AND DRINKING WATER CRITERIA (Continued)

Semivolatiles	Analytical Method	Water PRQL (µg/L)	Regulatory Level [a] (µg/L)
3-Nitroaniline	EPA 8270C	10	NA
4-Nitroaniline	EPA 8270C	10	NA
4,6-Dinitro-2-methylphenol	EPA 8270C	20	NA
n-Nitrosodiphenylamine	EPA 8270C	10	NA
n-Nitrosodimethylamine	EPA 8270C	10	NA
4-Bromophenyl phenyl ether	EPA 8270C	20	NA
Hexachlorobenzene	**EPA 8270C SIM[c]**	**1**	**1**
Pentachlorophenol	**EPA 8270C**	**20**	**1**
Phenanthrene	EPA 8270C SIM[c]	2	NA
Anthracene	EPA 8270C SIM[c]	1	NA
Carbazole	EPA 8270C	10	NA
Di-n-butylphthalate	EPA 8270C	10	NA
Fluoranthene	EPA 8270C SIM[c]	2	NA
Pyrene	EPA 8270C SIM[c]	2	NA
Butylbenzylphthalate	EPA 8270C	10	NA
3,3'-Dichlorobenzidine	EPA 8270C	10	NA
Benzo(a)anthracene	EPA 8270C SIM[c]	2	NA
Chrysene	EPA 8270C SIM[c]	2	NA
bis(2-Ethylhexyl)phthalate	**EPA 8270C**	**20**	**6**
Di-n-octylphthalate	EPA 8270C	10	NA
Benzo(b)fluoranthene	EPA 8270C SIM[c]	1	NA
Benzo(k)fluoranthene	EPA 8270C SIM[c]	2	NA
Benzo(a)pyrene	**EPA 8270C SIM[c]**	**1**	**0.2**
Indeno(1,2,3-cd)pyrene	EPA 8270C SIM[c]	1	NA
Dibenzo(a,h)anthracene	EPA 8270C SIM[c]	1	NA
Benzo(g,h,i)perylene	EPA 8270C SIM[c]	1	NA
Acenaphthylene	EPA 8270C SIM[c]	1	NA

Notes:

[b] The listed PRQL reflects the maximum sensitivity of current, routinely used analytical methods. The listed PRQL will be used as the project screening criteria unless reasonable grounds are established for pursuing non-routine methods.

[c] SIM methodology will be used to lower the PRQL for this analyte.

µg/kg Micrograms per kilogram
µg/L Micrograms per liter
AL Action level
MCL Maximum contaminant level
NA Not available
PRQL Project-required quantitation limit
SIM Selective ion monitoring
SOW Statement of work

TABLE D-10: METALS IN WATER: COMPARISON OF PROJECT-REQUIRED QUANTITATION LIMITS AND DRINKING WATER CRITERIA

Analyte	Analytical Method	Water PRQL (mg/L)	Primary [b] (mg/L)	Secondary [a,c] (mg/L)
Aluminum	EPA 3010A/6010B	0.2	NA	0.2
Antimony	EPA 3005A/7041	0.005	0.006	NA
Arsenic	EPA 3010A/6010B-trace	0.01	0.01	0.01
Barium	EPA 3010A/6010B	0.01	2	NA
Beryllium	**EPA 3010A/6010B**	**0.01**	**0.004**	**NA**
Cadmium	**EPA 3010A/6010B**	**0.01**	**0.005**	**NA**
Calcium	EPA 3010A/6010B	1	NA	NA
Chromium	EPA 3010A/6010B	0.02	0.1	NA
Cobalt	EPA 3010A/6010B	0.02	NA	NA
Copper	EPA 3010A/6010B	0.01	1.3	1
Iron	**EPA 3010A/6010B**	**1**	**NA**	**0.3**
Lead	EPA 3010A/6010B- trace	0.01	0.015	NA
Magnesium	EPA 3010A/6010B	1	NA	NA
Manganese	**EPA 3010A/6010B**	**0.1**	**NA**	**0.05**
Mercury	EPA 7470A	0.0005	0.002	NA
Nickel	EPA 3010A/6010B	0.02	NA	NA
Potassium	EPA 3010A/6010B	5	NA	NA
Selenium	EPA 3010A/6010B-trace	0.01	0.05	NA
Silver	EPA 3010A/6010B	0.02	NA	0.1
Sodium	EPA 3010A/6010B	1	NA	NA
Thallium	**EPA 3020A/7841**	**0.005**	**0.002**	**NA**
Vanadium	EPA 3010A/6010B	0.01	NA	NA
Zinc	EPA 3010A/6010B	0.02	NA	5

Notes:

[b] Primary MCLs are mandatory, enforceable water quality standards for drinking water contaminants. The MCLs are established to protect the public against consumption of drinking water contaminants that present a risk to human health.

[c] Secondary MCLs are non-mandatory water quality standards for drinking water contaminants. They are established only as guidelines for managing aesthetic properties in drinking water, such as taste, color and odor.

[d] The listed PRQL reflects the maximum sensitivity of current, routinely used analytical methods. The listed PRQL will be used as the project screening criteria unless reasonable grounds are established for pursuing non-routine methods.

µg/L Microgram per liter
AL Action level
EPA U.S. Environmental Protection Agency
MCL Maximum contaminant level
NA Not available or not applicable
PRQL Project-required quantitation limit
SOW Statement of work

Primary Drinking Water Standards, http://water.epa.gov/drink/contaminants/index.cfm#List
Secondary Drinking Water Standards, http://water.epa.gov/drink/contaminants/index.cfm#SecondaryList

TABLE D-11: TOTAL PETROLEUM HYDROCARBONS IN WATER: PROJECT-REQUIRED QUANTITATION LIMITS

Analyte	Analytical Method	Water PRQL (mg/L)
TPH-purgeable[a]	EPA 8015B	0.1
TPH-extractable[a]	EPA 8015B	0.5

Notes:

[a] No CA levels are available for TPH.

CA California
EPA U.S. Environmental Protection Agency
mg/L Milligrams per liter
PRQL Project-required quantitation limit
TPH Total petroleum hydrocarbons

TABLE D-12: MISCELLANEOUS ANALYSES IN WATER: PROJECT-REQUIRED QUANTITATION LIMITS

Compound	Analytical Method	Water PRQL (mg/L)	Regulatory Level (mg/L)
Alkalinity	EPA 310.1	5	NA
Anions			
Bromide	EPA 300.0	0.5	NA
Chloride	EPA 300.0	0.2	250
Fluoride	EPA 300.0	0.1	4
Nitrate (as N)	EPA 300.0	0.1	10
Nitrite (as N)	EPA 300.0	0.1	1
Orthophosphate	EPA 300.0	0.5	NA
Sulfate	EPA 300.0	0.5	250
Cyanide	EPA 9014A	0.01	0.2
Sulfide	EPA 376.1	1	NA
Perchlorate	EPA 314.0	2 µg/L	18 µg/L
Total Dissolved Solids	EPA 160.1	10	500
Total Suspended Solids	EPA 160.2	10	NA
Hydrazine	ASTM D1385	5 µg/L	NA

Notes:

µg/L Micrograms per liter
ASTM American Society for Testing and Materials
mg/L Milligrams per liter
PRQL Project-required quantitation limit
EPA U.S. Environmental Protection Agency

TABLE D-13: EXPLOSIVES IN WATER: PROJECT-REQUIRED QUANTITATION LIMITS

Compound	Analytical Method	Water PRQL (µg/L)
Explosives		
2-Amino-4,6-Dinitrotoluene	EPA 8330	1
4-Amino-2,6-Dinitrotoluene	EPA 8330	1
1,3-Dinitrobenzene	EPA 8330	1
2,4-Dinitrotoluene	EPA 8330	1
HMX	EPA 8330	1
2,6-Dinitrotoluene	EPA 8330	1
Nitroguanidine	EPA 8330	1
Nitroglycerin	EPA 8330	1
Nitrobenzene	EPA 8330	1
RDX	EPA 8330	1
2-Nitrotoluene	EPA 8330	1
3-Nitrotoluene	EPA 8330	1
4-Nitrotoluene	EPA 8330	1
Tetryl	EPA 8330	1
1,3,5-Trinitrobenzene	EPA 8330	1
TNT	EPA 8330	1
Pentaerythritol tetranitrate	EPA 8330	1

Notes:

µg/L Micrograms per liter
EPA U.S. Environmental Protection Agency
HMX octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
NA Not available
PRQL Project-required quantitation limit
RDX hexahydro-1,3,5-trinitro-1,3,5-triazine
TNT 2,4,6-Trinitrotoluene

TABLE D-14: DIOXINS AND FURANS IN WATER: COMPARISON OF METHOD DETECTION LIMITS AND DRINKING WATER CRITERIA

Compound	Analytical Method	MDL (pg/l)	Regulatory Level[a] (pg/l)
2,3,7,8-TCDD	EPA 8290	2.16	30
1,2,3,7,8-PeCDD	EPA 8290	2.75	NA
1,2,3,4,7,8-HxCDD	EPA 8290	3.56	NA
1,2,3,6,7,8-HxCDD	EPA 8290	2.70	NA
1,2,3,7,8,9-HxCDD	EPA 8290	6.66	NA
1,2,3,4,6,7,8-HpCDD	EPA 8290	5.62	NA
OCDD	EPA 8290	52.54	NA
2,3,7,8-TCDF	EPA 8290	2.36	NA
1,2,3,7,8-PeCDF	EPA 8290	2.88	NA
2,3,4,7,8-PeCDF	EPA 8290	7.41	NA
1,2,3,4,7,8-HxCDF	EPA 8290	3.52	NA
1,2,3,6,7,8-HxCDF	EPA 8290	2.58	NA
1,2,3,7,8,9-HxCDF	EPA 8290	4.30	NA
2,3,4,6,7,8-HxCDF	EPA 8290	6.97	NA
1,2,3,4,6,7,8-HpCDF	EPA 8290	2.36	NA
1,2,3,4,7,8,9-HpCDF	EPA 8290	10.10	NA
OCDF	EPA 8290	5.87	NA

Notes:

[a] These promulgated levels will be used as groundwater screening criteria for this investigation.

AL	Action level
EPA	U.S Environmental Protection Agency
HpCDD	Heptachlorodibenzo-p-dioxin
HpCDF	Heptachlorodibenzofuran
HxCDD	Hexachlorodibenzo-p-dioxin
HxCDF	Hexachlorodibenzofuran
MCL	Maximum contaminant level
MDL	Method detection limit
NA	Not available
OCDD	Octachlorodibenzo-p-dioxin
OCDF	Octachlorodibenzofuran
PeCDD	Pentachlorodibenzo-p-dioxin
PeCDF	Pentachlorodibenzofuran
pg/L	Picograms per liter
SOW	Statement of Work
TCDD	Tetrachlorodibenzo-p-dioxin
TCDF	Tetrachlorodibenzofuran

TABLE D-15: RADIONUCLIDES IN WATER: COMPARISON OF PROJECT-REQUIRED QUANTITATION LIMITS AND DRINKING WATER CRITERIA

Compound	Analytical Method	(pCi/Liter)	Regulatory level
Cesium-137	Gamma spectroscopy-EPA 901.1	10	NA
Cobalt-60	Gamma spectroscopy-EPA 901.1	10	NA
Potassium-40	Gamma spectroscopy-EPA 901.1	250	NA
Radium-226	Gas Flow Proportional Counting-EPA 903.1	1	5[a]
Radium-228	Gas Flow Proportional Counting- EPA 9320	1	5[a]
Thorium-228	Alpha spectroscopy-ASTM D3972-90M	0.2	NA
Thorium-230	Alpha spectroscopy-ASTM D3972-90M	0.2	NA
Thorium-232	Alpha spectroscopy-ASTM D3972-90M	0.2	NA
Uranium-233/234	Alpha spectroscopy-ASTM D3972-90M	0.2	NA
Uranium-235	Alpha spectroscopy-ASTM D3972-90M	0.2	NA
Uranium-238	Alpha spectroscopy-ASTM D3972-90M	0.2	NA
Uranium, total			30 µg/L

Notes:

[a] The maximum contaminant level for combined Radium-226 and Radium-228 is 20 pCi/L.

ASTM American Society for Testing and Materials
EPA U.S. Environmental Protection Agency
NA Not applicable
pCi/L Picocuries per liter
PRQL Project-required quantitation limit

REGIONAL SCREENING LEVELS; FORMERLY PROVIDED AS PRELIMINARY REMEDIATION GOALS

The concentrations listed in the following tables in Appendix D are the values listed in the tables of Regional Screening Levels (RSLs), which replace the Preliminary Remediation Goals (PRGs) that were included in the 2007 version of the NBP QA Program Plan.

NOTE: Some of the RSL Values Provided in the EPA's RSL Table Exceed the Physically Possible Concentration Limit of "One Million Parts per Million" at the 1.0E-06 Risk Level

The RSL values provided in EPA's RSL table at http://www.epa.gov/region9/superfund/prg/ include some values that exceed the physically possible limit of a "pure material" (i.e., one million parts per million, or 1.0E+06 mg/kg). Values of as much as 42 trillion parts per million are listed as the screening level for compounds in an industrial exposure scenario. EPA has intentionally done this so that if one wished to calculate a 1.0E-04 risk level instead of the 1.0E-06 risk level provided in the table, one could multiply the RSL by 100 and obtain the "correct number." For example, if the concentration at a risk level of 1.0E-04 was 5.9E+05 mg/kg, then the RSL value given in the table for a 1.0E-06 risk level would be 5.9E+07 mg/kg, which is clearly not a physically possible concentration (i.e., this represents a "concentration" of greater than one million parts per million; specifically, 59 million parts per million).

The RSL tables therefore provide "scalable" concentrations instead of physically possible concentrations in some cases. Rather, the RSLs are chemical concentrations that correspond to fixed levels of risk (i.e., either a one-in-one million [1.0E-06] cancer risk or a noncarcinogenic hazard quotient of 1) in soil, air, and water. In most cases where a substance causes both cancer and noncancer (systemic) effects, the 1.0E-06 cancer risk will result in a more stringent criterion. If the RSLs are to be used for site screening, EPA recommends that both cancer and noncancer-based RSLs be used. Both carcinogenic and noncarcinogenic values may be obtained in the Supporting Tables at http://www.epa.gov/region9/superfund/prg/

EPA notes that the RSL table applies a 'max' soil concentration to the tables for the following reasons:

1. Risk-based RSLs for some chemicals in soil exceed unity (>1,000,000 mg/kg), which is not possible.

2. RSLs currently do not address short-term exposures (e.g., pica children and construction workers). Although extremely high soil SLs are likely to represent relatively non-toxic chemicals, such high values may not be justified if in fact more toxicological data were available for evaluating short-term and/or acute exposures.

TABLE D-16: VOLATILE ORGANIC COMPOUNDS IN SOIL: COMPARISON OF PROJECT-REQUIRED QUANTITATION LIMITS AND REGIONAL SCREENING LEVELS (formerly Preliminary Remediation Goals)

Volatile Organic Compound	CAS No.	Analytical Method	Soil PRQL (µg/kg)	Industrial Soil RSL[a] (µg/kg)	Residential Soil RSL[a] (µg/kg)	Below RSLs?
1,1,1-Trichloroethane	71-55-6	EPA 8260B	5	38,000,000	8,700,000	YES
1,1,2,2-Tetrachloroethane	79-34-5	EPA 8260B	5	2,800	560	YES
1,1,2-Trichloroethane	79-00-5	EPA 8260B	5	5,300	1,100	YES
1,1-Dichloroethane	75-34-3	EPA 8260B	5	17,000	3,300	YES
1,1-Dichloroethene	75-35-4	EPA 8260B	5	11,000,000	240,000	YES
1,2-Dichloroethane	107-06-2	EPA 8260B	5	2,200	430	YES
1,2-Dichloropropane	78-87-5	EPA 8260B	5	4,700	940	YES
2-Butanone (methyl ethyl ketone)	78-93-3	EPA 8260B	20	200,000,000	28,000,000	YES
2-Hexanone	591-78-6	EPA 8260B	20	NA	NA	NA
4-Methyl-2-pentanone (methyl isobutyl ketone)	108-10-1	EPA 8260B	20	53,000,000	5,300,000	YES
Acetone	67-64-1	EPA 8260B	20	63,000,000	61,000,000	YES
Benzene	71-43-2	EPA 8260B	5	5,400	1,100	YES
Bromodichloromethane	75-27-4	EPA 8260B	5	1,400	270	YES
Bromoform	75-25-2	EPA 8260B	5	220,000	62,000	YES
Bromomethane	74-83-9	EPA 8260B	10	32,000	7,300	YES
Carbon disulfide	75-15-0	EPA 8260B	5	37,000,000	820,000	YES
Carbon tetrachloride	56-23-5	EPA 8260B	5	3,000	610	YES
Chlorobenzene	108-90-7	EPA 8260B	5	1,400,000	290,000	YES
Chloroethane (Ethyl chloride)	75-00-3	EPA 8260B	10	6,500	3,000	YES
Chloroform	67-66-3	EPA 8260B	5	1,500	290	YES
Chloromethane	74-87-3	EPA 8260B	10	500,000	120,000	YES
cis-1,2-Dichloroethene	156-59-2	EPA 8260B	5	2,000,000	160,000	YES
cis-1,3-Dichloropropene (total)	542-75-6	EPA 8260B	5	8,300 (total)	1,700 (total)	YES
Dibromochloromethane	124-48-1	EPA 8260B	5	3,300	680	YES
Ethylbenzene	100-41-4	EPA 8260B	5	27,000	5,400	YES
Methylene chloride	75-09-2	EPA 8260B	5	960,000	56,000	YES
Styrene	100-42-5	EPA 8260B	5	36,000,000	6,700,000	YES
Tetrachloroethene	127-18-4	EPA 8260B	5	110,000	22,000	YES
Toluene	108-88-3	EPA 8260B	5	45,000,000	5,000,000	YES
Total xylenes	1330-20-7	EPA 8260B	15	2,700,000	630,000	YES
trans-1,2-Dichloroethene	156-60-5	EPA 8260B	5	690,000	150,000	YES
trans-1,3-Dichloropropene	10061-02-6	EPA 8260B	5	8,300 (total)	1,700 (total)	YES
Trichloroethene	79-01-6	EPA 8260B	5	6,400	910	YES
Vinyl chloride	75-01-4	EPA 8260B	5	1,700	60	YES

Notes:

[a] Residential and industrial RSLs are presented for initial risk screening of analytical results at 1.0E-06 risk level.

µg/kg Micrograms per kilogram
EPA U.S Environmental Protection Agency
NA Not available
PRG Preliminary remediation goal (EPA 2002)
PRQL Project-required quantitation limit
RSL Regional Screening Level (EPA 2012)

TABLE D-17: SEMIVOLATILE ORGANIC COMPOUNDS IN SOIL: COMPARISON OF PROJECT-REQUIRED QUANTITATION LIMITS AND REGIONAL SCREENING LEVELS (formerly Preliminary Remediation Goals)

Semivolatile Organic Compound	CAS No.	Analytical Method	Soil PRQL (µg/kg)	Industrial Soil RSL[a] (µg/kg)	Residential Soil RSL (µg/kg)	Below RSLs?
1,3-Dichlorobenzene	541-73-1	EPA 8270C	330	NA	NA	YES
1,4-Dichlorobenzene	106-46-7	EPA 8270C	330	12,000	2,400	YES
2,2'-oxybis (1-Chloropropane) Syn: Bis(2-chloro-1-methlethylo)ether	108-60-1	EPA 8270C	330	22,000	4,600	NA
2,4,5-Trichlorophenol	95-95-4	EPA 8270C	330	62,000,000	6,100,000	YES
2,4,6-Trichlorophenol	88-06-2	EPA 8270C	330	160,000	44,000	YES
2,4-Dichlorophenol	120-83-2	EPA 8270C	330	1,800,000	180,000	YES
2,4-Dimethylphenol	105-67-9	EPA 8270C	330	12,000,000	1,200,000	YES
2,4-Dinitrophenol	51-28-5	EPA 8270C	660	1,200,000	120,000	YES
2,4-Dinitrotoluene	121-14-2	EPA 8270C	330	5,500	1,600	YES
2,6-Dinitrotoluene	606-20-2	EPA 8270C	330	620,000	61,000	YES
2-Chloronaphthalene (beta-chloronaphthalene)	91-58-7	EPA 8270C	330	82,000,000	6,300,000	YES
2-Chlorophenol	95-57-8	EPA 8270C	330	5,100,000	390,000	YES
2-Methylnaphthalene	91-57-6	EPA 8270C	330	NA	NA	NA
2-Methylphenol (o-cresol)	95-48-7	EPA 8270C	330	31,000,000	3,100,000	YES
2-Nitroaniline	88-74-4	EPA 8270C	660	6,000,000	610,000	YES
2-Nitrophenol	88-75-5	EPA 8270C	330	NA	NA	NA
3,3'-Dichlorobenzidine	91-94-1	EPA 8270C	330	3,800	1,100	YES
3-Nitroaniline	99-09-2	EPA 8270C	660	NA	NA	NA
4,6-Dinitro-2-methylphenol Syn: 4,6-dinitro-o-cresol	534-52-1	EPA 8270C	660	NA	NA	NA
4-Bromophenyl phenyl ether	101-55-3	EPA 8270C	330	NA	NA	NA
4-Chloro-3-methylphenol	59-50-7	EPA 8270C	330	NA	NA	NA
4-Chloroaniline (p-chloroaniline)	106-47-8	EPA 8270C	330	8,600	2,400	YES
4-Chlorophenyl phenyl ether Syn: 4-Chlorodiphenyl ether	7005-72-3	EPA 8270C	330	NA	NA	NA
4-Methylphenol (p-cresol)	106-44-5	EPA 8270C	330	62,000,000	6,100,000	YES
4-Nitroaniline	100-01-6	EPA 8270C	330	NA	NA	NA
4-Nitrophenol Syn: p-nitrophenol	100-02-7	EPA 8270C	660	NA	NA	NA
Acenaphthene	83-32-9	EPA 8270C	330	33,000,000	3,400,000	YES
Anthracene	120-12-7	EPA 8270C	330	330,000,000	17,000,000	YES
Benzo(a)anthracene	56-55-3	EPA 8270C	330	2,100	150	YES
Benzo(a)pyrene	**50-32-8**	**EPA 8270C**	**330**	**210**	**15**	**NO[b]**
Benzo(b)fluoranthene	205-99-2	EPA 8270C	330	2,100	150	YES

TABLE D-17: SEMIVOLATILE ORGANIC COMPOUNDS IN SOIL: COMPARISON OF PROJECT-REQUIRED QUANTITATION LIMITS AND REGIONAL SCREENING LEVELS (formerly Preliminary Remediation Goals)

Semivolatile Organic Compounds	CAS No.	Analytical Method	Soil PRQL (µg/kg)	Industrial Soil RSL[a] (µg/kg)	Residential Soil RSL (µg/kg)	Below RSLs?
Benzo(g,h,i)perylene	191-24-2	EPA 8270C	330	NA	NA	NA
Benzo(k)fluoranthene	207-08-9	EPA 8270C	330	21,000	1,500	YES
bis(2-Chloroethoxy)methane	111-91-1	EPA 8270C	330	1,800,000	180,000	YES
bis(2-Chloroethyl)ether (Dichloroethyl ether)	**111-44-4**	**EPA 8270C**	**330**	**1,000**	**210**	**NO[b]**
bis(2-Ethylhexyl)phthalate (Dioctyl phthalate)	117-81-7	EPA 8270C	330	120,000	35,000	YES
Butylbenzylphthalate	85-68-7	EPA 8270C	330	NA	NA	NA
Carbazole (Diphenylenimine or Dibenzopyrrole)	86-74-8	EPA 8270C	330	86,000	24,000	YES
Chrysene	218-01-9	EPA 8270C	330	210,000	15,000	YES
Dibenzo(a,h)anthracene	**53-70-3**	**EPA 8270C**	**330**	**210**	**15**	**NO[b]**
Dibenzofuran	132-64-9	EPA 8270C	330	1,000,000	78,000	YES
Diethylphthalate	84-66-2	EPA 8270C	330	490,000,000	49,000,000	YES
Dimethylphthalate	120-61-6	EPA 8270C	330	100,000,000	7,800,000	YES
Di-n-butylphthalate	84-74-2	EPA 8270C	330	62,000,000	6,100,000	YES
Di-n-octylphthalate	117-84-0	EPA 8270C	330			YES
Fluoranthene	206-44-0	EPA 8270C	330	22,000,000	2,300,000	YES
Fluorene	86-73-7	EPA 8270C	330	22,000,000	2,300,000	YES
Hexachlorobenzene	**118-74-1**	**EPA 8270C**	**330**	**1,100**	**300**	**NO[b]**
Hexachlorobutadiene	87-68-3	EPA 8270C	330	22,000	6,200	YES
Hexachlorocyclopentadiene	77-47-4	EPA 8270C	330	3,700,000	370,000	YES
Hexachloroethane	67-72-1	EPA 8270C	330	120,000	35,000	YES
Indeno(1,2,3-cd)pyrene	193-39-5	EPA 8270C	330	2,100	150	YES
Isophorone	78-59-1	EPA 8270C	330	1,800,000	510,000	YES
Naphthalene	91-20-3	EPA 8270C	330	18,000	3,600	YES
Nitrobenzene	98-95-3	EPA 8270C	330	24,000	4,800	YES
n-Nitrosodimethylamine	**62-75-9**	**EPA 8270C**	**330**	**34**	**2.3**	**NO[b]**
n-Nitroso-di-n-propylamine	**621-64-7**	**EPA 8270C**	**330**	**250**	**69**	**NO[b]**
n-Nitrosodiphenylamine	86-30-6	EPA 8270C	330	350,000	99,000	YES
Pentachlorophenol	87-86-5	EPA 8270C	660	2,700	890	YES
Phenanthrene	85-01-8	EPA 8270C	330	NA	NA	NA
Phenol	108-95-2	EPA 8270C	330	180,000,000	18,000,000	YES
Pyrene	129-00-0	EPA 8270C	330	17,000,000	1,700,000	YES

TABLE D-17: SEMIVOLATILE ORGANIC COMPOUNDS IN SOIL: COMPARISON OF PROJECT-REQUIRED QUANTITATION LIMITS AND REGIONAL SCREENING LEVELS (formerly Preliminary Remediation Goals)

Semivolatile Organic Compounds	CAS No.	Analytical Method	Soil PRQL (µg/kg)	Industrial Soil RSL[a] (µg/kg)	Residential Soil RSL (µg/kg)	Below RSLs?

Notes:

[a] Residential and industrial RSLs are presented for initial risk screening of analytical results.

[b] The listed PRQL reflects the maximum sensitivity of current, routinely used analytical methods. The listed PRQL will be used as the project screening criteria unless reasonable grounds are established for pursuing non-routine methods.

Shaded entries indicate no RSL value provided.

µg/kg	Microgram per kilogram
EPA	U.S Environmental Protection Agency
NA	Not available
PRG	Preliminary remediation goal (EPA 2002)
PRQL	Project-required quantitation limit
RSL	Regional screening level (EPA, May, 2012)
SOW	Statement of work

TABLE D-18: METALS ANALYSES IN SOIL: COMPARISON OF PROJECT-REQUIRED QUANTITATION LIMITS AND REGIONAL SCREENING LEVELS (formerly Preliminary Remediation Goals)

Analyte	Method	Soil PRQL (mg/kg)	Industrial Soil RSL[a] (mg/kg)	Residential Soil RSL[a] (mg/kg)	Hazard Index (mg/kg)	Below RSL?
Aluminum	EPA 3050B/6010B	20	990,000	77,000	77,000	YES
Antimony (metallic)	EPA 3050B/6010B	10	410	31	31	YES
Arsenic	EPA 3050B/6010B	10	1.6	0.39	22	NO
Barium	EPA 3050B/6010B	1	190,000	15,000	15,000	YES
Beryllium	EPA 3050B/6010B	1	2,000	160	160	YES
Cadmium	EPA 3050B/6010B	1	800	70	70	YES
Calcium	EPA 3050B/6010B	100	NA	NA		NA
Chromium (III)	EPA 3050B/6010B	2	1,000,000	120,000	120,000	YES
Chromium (VI)			5.6	0.29	230	
Cobalt	EPA 3050B/6010B	2	300	23	23	YES
Copper	EPA 3050B/6010B	2	41,000	3,100	3,100	YES
Iron	EPA 3050B/6010B	20	720,000	55,000	55,000	YES
Lead	EPA 3050B/6010B	10	800	400	400	YES
Magnesium	EPA 3050B/6010B	100	NA	NA		NA
Manganese	EPA 3050B/6010B	1	23,000	1,800	1,800	YES
Mercury	EPA 7471A	0.1	43	10	10	YES
Nickel	EPA 3050B/6010B	2	20,000	1,500	1,500	YES
Potassium	EPA 3050B/6010B	500	NA	NA		NA
Selenium	EPA 3050B/6010B	10	5,100	390	390	YES
Silver	EPA 3050B/6010B	1	5,100	390	390	YES
Sodium	EPA 3050B/6010B	100	NA	NA		NA
Thallium	EPA 3050B/6010B	5	10	0.78	0.78	YES
Vanadium	EPA 3050B/6010B	1	5,200	390	390	YES
Zinc	EPA 3050B/6010B	2	310,000	23,000	23,000	YES

Notes:

[a] Residential and industrial RSLs are presented for initial risk screening of analytical results. The RSLs replace the PRGs formerly cited.

EPA U.S. Environmental Protection Agency
HI Hazard index, where value is equivalent to an HI = 1
mg/kg Milligrams per kilogram
NA Not available or not applicable
PRQL Project-required quantitation limit
PRG Preliminary remediation goal (EPA 2002)
RSL Regional screening level (EPA, May, 2012)
SOW Statement of work

TABLE D-19: TOTAL PETROLEUM HYDROCARBONS IN SOIL: PROJECT-REQUIRED QUANTITATION LIMITS

Analyte	Analytical Method	Soil PRQL (mg/kg)
TPH-purgeable[a]	CA LUFT and EPA 8015B/5035	0.1
TPH-extractable[a]	CA LUFT and EPA 8015B	10

Notes:

[a] No PRGs are available for TPH.

CA California
EPA U.S. Environmental Protection Agency
LUFT Leaking underground fuel tank
mg/kg Milligrams per kilogram
PRQL Project-required quantitation limit
TPH Total petroleum hydrocarbons

TABLE D-20: DIOXINS AND FURANS IN SOIL: COMPARISON OF METHOD DETECTION LIMITS AND REGIONAL SCREENING LEVELS (formerly Preliminary Remediation Goals)

Compound[a]	Analytical Method	MDL (µg/kg)	Industrial RSL (µg/kg)[b]	Residential RSL (µg/kg)[b]	HI (µg/kg)	PRQL Below RSLs?
2,3,7,8-TCDD	EPA 8290	0.00013	0.018	0.0045	0.051	Yes
1,2,3,7,8-PeCDD	EPA 8290	0.00019	NA	NA		NA
1,2,3,4,7,8-HxCDD	EPA 8290	0.00053	NA	NA		NA
1,2,3,6,7,8-HxCDD	EPA 8290	0.00057	NA	NA		NA
1,2,3,7,8,9-HxCDD	EPA 8290	0.00068	NA	NA		NA
1,2,3,4,6,7,8-HpCDD	EPA 8290	0.00063	NA	NA		NA
OCDD	EPA 8290	0.00686	NA	NA		NA
2,3,7,8-TCDF	EPA 8290	0.00019	NA	NA		NA
1,2,3,7,8-PeCDF	EPA 8290	0.00028	NA	NA		NA
2,3,4,7,8-PeCDF	EPA 8290	0.00056	NA	NA		NA
1,2,3,4,7,8-HxCDF	EPA 8290	0.00034	NA	NA		NA
1,2,3,6,7,8,-HxCDF	EPA 8290	0.00049	NA	NA		NA
1,2,3,7,8,9-HxCDF	EPA 8290	0.00025	NA	NA		NA
2,3,4,6,7,8-HxCDF	EPA 8290	0.00047	NA	NA		NA
1,2,3,4,6,7,8-HpCDF	EPA 8290	0.00033	NA	NA		NA
1,2,3,4,7,8,9-HpCDF	EPA 8290	0.00050	NA	NA		NA
OCDF	EPA 8290	0.00079	NA	NA		NA

Notes:

[a] Dioxin and furan congeners will be converted to TCDD equivalents using the toxicity equivalency factor (TEF) for each compound.

[b] Residential and industrial RSLs are presented for initial risk screening of analytical results.

µg/kg Micrograms per kilogram
EPA U.S. Environmental Protection Agency
HI Hazard index, where value is equivalent to an HI = 1
HpCDD Heptachlorodibenzo-p-dioxin
HpCDF Heptachlorodibenzofuran
HxCDD Hexachlorodibenzo-p-dioxin
HxCDF Hexachlorodibenzofuran
OCDD Octachlorodibenzo-p-dioxin
OCDF Octachlorodibenzofuran
PeCDD Pentachlorodibenzo-p-dioxin
PeCDF Pentachlorodibenzofuran
PRG Preliminary remediation goal
TCDD Tetrachlorodibenzo-p-dioxin
TCDF Tetrachlorodibenzofuran

TABLE D-21: EXPLOSIVES IN SOIL: COMPARISON OF PROJECT-REQUIRED QUANTITATION LIMITS AND REGIONAL SCREENING LEVELS (formerly Preliminary Remediation Goals)

Analyte	Analytical Method	CAS No.	Soil PRQL (mg/kg)	Industrial Soil RSL[a] (mg/kg)	Residential Soil RSL[a] (mg/kg)	PRQL Below RSLs?
Explosives						
2-Amino-4,6-Dinitrotoluene	EPA 8330	35572-78-2	0.4	2,000	150	NA
4-Amino-2,6-Dinitrotoluene	EPA 8330	19406-51-0	0.4	1,900	150	NA
1,3-Dinitrobenzene	EPA 8330	99-65-0	0.4	62	6.1	YES
2,4-Dinitrotoluene	EPA 8330	121-14-2	0.4	5.5	1.6	YES
HMX	EPA 8330	2691-41-0	0.4	49,000	3,800	YES
2,6-Dinitro toluene	EPA 8330	606-20-2	0.4	620	61	YES
Nitrobenzene	EPA 8330	98-95-3	0.4	24	4.8	YES
RDX	EPA 8330	121-82-4	0.4	24	5.6	YES
2-Nitrotoluene	EPA 8330	88-72-2	0.4	13	2.9	YES
3-Nitrotoluene	EPA 8330	99-08-1	0.4	62	6.1	YES
4-Nitrotoluene	EPA 8330	99-99-0	0.4	110	30	YES
Tetryl (Methyl-2,4,6-trinitrophenylnitramine)	EPA 8330	479-45-8	0.4	NA	NA	NA
1,3,5-Trinitrobenzene	EPA 8330	99-35-4	0.4	27,000	2,200	YES
TNT	EPA 8330	118-96-7	0.4	79	19	YES

Notes:

[a] Residential and industrial RSLs are presented for initial risk screening of analytical results.

EPA U.S. Environmental Protection Agency
HMX octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine
mg/kg Milligrams per kilogram
PRQL Project-required quantitation limit
PRG Preliminary remediation goal
RDX hexahydro-1,3,5-trinitro-1,3,5 –triazine
RSL Regional screening level (EPA, May, 2012)
TNT 2,4,6-Trinitrotoluene

TABLE D-22: CYANIDE AND PERCHLORATE IN SOIL: COMPARISON OF PROJECT-REQUIRED QUANTITATION LIMITS AND REGIONAL SCREENING LEVELS (formerly Preliminary Remediation Goals)

Analyte	Analytical Method	CAS No.	Soil PRQL (mg/kg)	Industrial Soil RSL[a] (mg/kg)	Residential Soil RSL[a] (mg/kg)	HI Soil RSL (mg/kg)	PRQL Below RSLs?
Cyanide	EPA 9010B	57-12-5	1	35	11	47	YES
Perchlorate	EPA 314.0	14797-73-0	0.05	720	55	55	YES

Notes:

[a] Residential and industrial PRGs are presented for initial risk screening of analytical results.

EPA U.S. Environmental Protection Agency
mg/kg Milligrams per kilogram
PRQL Project-required quantitation limit
PRG Preliminary remediation goal
RSL Regional screening level