R-009-205.4

3284

SOIL AND RUBBLE SAMPLING AND ANALYSIS PLAN FOR THE SOUTH GROUNDWATER CONTAMINATION PLUME REMOVAL ACTION PART 2 - PUMP AND DISCHARGE SYSTEM AND PART 3 - INTERIM

05/01/92

DOE-FN/EPA
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S&A PLAN
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Enclosure 3

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Attachment 1

SOIL AND RUBBLE SAMPLING AND ANALYSIS PLAN

for the

SOUTH GROUNDWATER CONTAMINATION PLUME REMOVAL ACTION

PART 2 - PUMP AND DISCHARGE SYSTEM

and

PART 3 - INTERIM ADVANCED WASTEWATER TREATMENT SYSTEM

REVISION 2
MAY, 1992

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

1.0 Sampling and Analysis

~~Additional~~ Sampling is proposed to be conducted to support the South Groundwater Contamination Plume Removal Action to achieve the following objectives:

- Characterize the concentration of HSL and radiological constituents in the soils to be excavated in order to facilitate worker health and safety~~the removal action~~. Qualitative characterization will be performed in non-suspect areas.
- Complete a Hazardous Waste Determination on Containerized Waste Materials generated incidental to completing the construction activities associated with the removal action.
- Monitor fugitive dust emissions during excavation and stockpiling operations.

To achieve sampling objectives, samples are proposed to be collected prior to, during, and after the construction phase of the Removal Action.

2.0 Pre-Excavation Field Screening & Soil Sampling and Analysis

2.1 Background

Based on historical records, there are five suspect areas of contamination identified within the area to be affected by Part 2 and Part 3 of the removal action (see Figure I-1). The first is the area between the Inactive Fly Ash Pile/South Field Area and the Inactive Fly Ash Pile at the location of the South Construction Road from the West Perimeter Road extending south to and including the Storm Sewer Outfall Ditch (SSOD). This area is considered suspect as a result of its location adjacent to the Fly Ash Piles/South Field Area which are currently being investigated under Operable Unit 2 of the Remedial Investigation/Feasibility Study (RI/FS), and the crossing of the SSOD, which is being investigated as part of Operable Unit 5. The second suspect area is comprised of the monitoring and recovery well locations. This location is suspect as a result of the elevated concentrations of hazardous substances in the regional aquifer which will be disturbed during drilling operations. The third suspect area is the groundwater discharge pipeline crossing at the SSOD just west of the South Access Road to the FEMP. This location is considered suspect due to a portion of the former FEMP Production Area that drains to the SSOD. The fourth suspect area is the new outfall pipeline from the proposed diversion manhole, Manhole 176A, at the existing outfall pipeline downstream of Manhole 175, to proposed Manhole 176B. This area is considered suspect due to its close proximity to the existing outfall pipeline. Finally, the fifth suspect area is at the new outfall pipelines outlet to the Great Miami River. This area is considered suspect due to downstream location to the existing outfall pipeline's outlet.

Pre-excavation field screening, soil sampling and analysis is proposed to~~: 1)~~ identify contaminants in areas where personnel may be exposed to hazardous substances during construction activities, so that appropriate health and safety measures can be taken to protect the workers.~~; and 2) provide data to determine if additional investigations, under FEMP Remedial Investigation/Feasibility Study (RI/FS) activities, are warranted.~~ The data may also later be used to aid in the characterization of soils in the South Plume area and excess excavated soils.

2.2 Sample Extraction and Analysis

Sample point locations will be established along the pipeline easement centerline as follows: 1) at 500-feet intervals within the non-suspect areas, 2) at 100-feet intervals within the suspect areas, and 3) discrete locations as shown and described in Figure I-1. The centerline of the pipeline easement is assumed to represent the centerline for the pipeline trench excavation.

Soil samples will be collected, using a stainless steel hand auger, at one-foot intervals from the ground surface to an approximate total depth of six feet below surface grade (the approximate depth at which the pipeline will be installed) at each sample point location described previously. Each soil sample will be field-screened for qualitative determinations of volatile organic and radiological contaminant concentrations.

A portion of each soil sample will be retained in clean glass jars sealed with aluminum foil lids for field screening of volatile organic compounds using a photoionization detector (PID) or a flame-ionization detector (FID). This will be accomplished by placing the soil material in the jar at a capacity of approximately one-half of the bottle volume. A piece of aluminum foil is placed over the mouth of the bottle. The bottle lid is gently emplaced over the aluminum foil to ensure that the aluminum foil is not punctured. The soil samples will be retained at ~~approximately~~ 60-80 degrees Fahrenheit for a period of ~~at least~~ 15 minutes for volatilization of the organic compounds prior to PID or FID measurement. ~~Soil samples exhibiting PID or FID readings of greater than 5 meter units above background, or the soil sample exhibiting the greatest PID/FID reading per sample point location (if multiple samples at a given sample point location exceed 5 meter units above background) will be retained in glass jars sealed with Teflon lined Closures (TLC), and analyzed for the following contaminants:~~ Subsequent to equilibrium of the volatile compounds in the bottle headspace, the bottle lid is removed and the probe of the PID device is inserted through the aluminum sheet to evacuate the headspace contents. This procedure will remain consistent for all samples.

~~Each soil sample will also be field screened for radiological contaminants using portable radiation detection devices. Soil samples exhibiting detectable alpha readings or beta/gamma readings exceeding 100 counts per minute above background, or the soil sample exhibiting the greatest radiation detection reading per sample point location (if multiple samples at a given sample point location exceed the previous mentioned criteria) will be retained in glass or plastic jars for total/isotopic uranium, and total/isotopic thorium analyses.~~

The organic criteria for sampling and analysis is based on the PID/FID readings. If the PID/FID readings are greater than five meter units above background, then

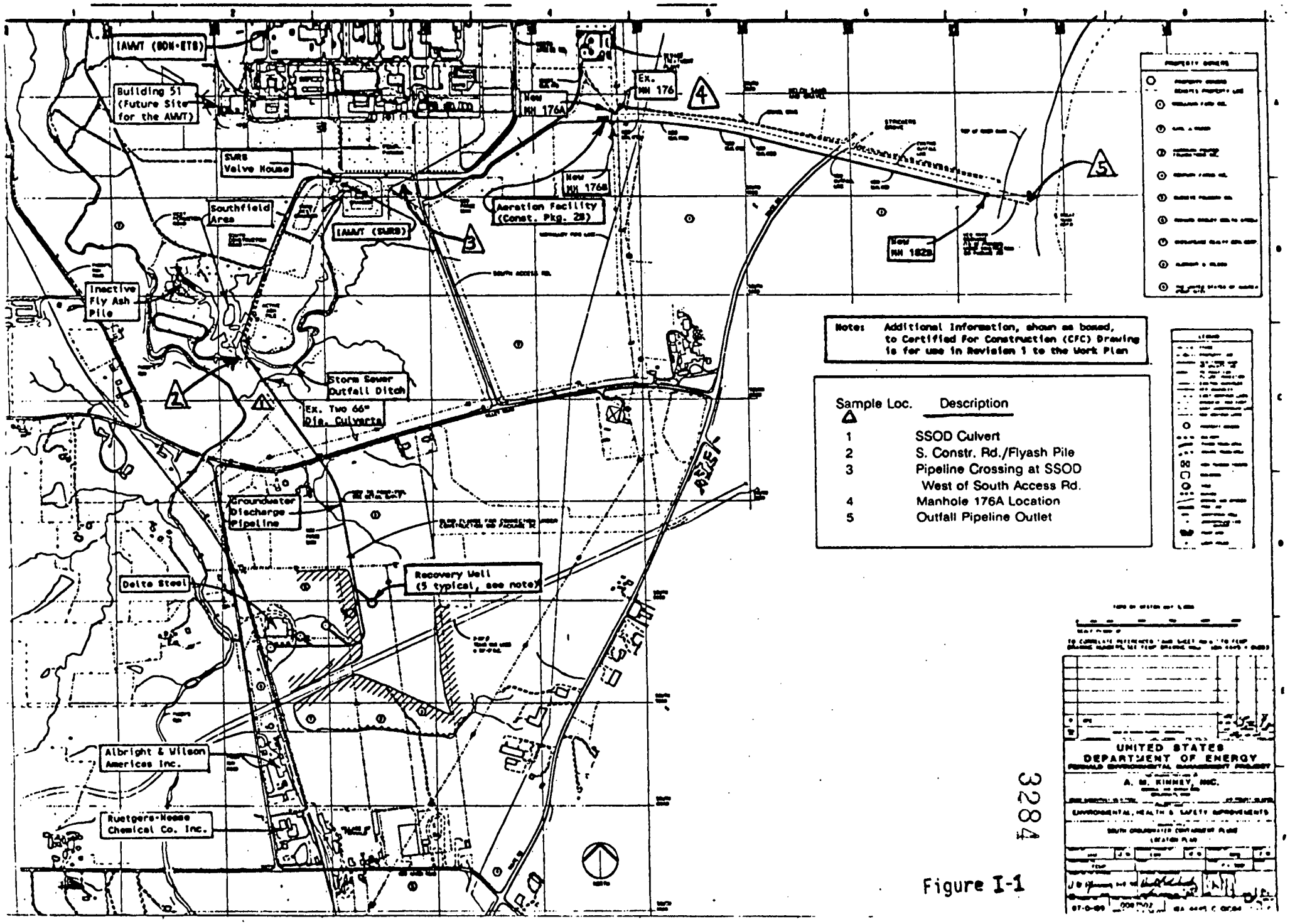

Figure I-1

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a separate sample will be sent to the laboratory for analysis. Also, if physical evidence such as odor, color, or oily sheen show that contamination may exist, a sample will be collected and analyzed.

The radiological screen for sampling and analysis is based on alpha, beta, and gamma readings. If there are detectable alpha readings or beta/gamma readings of greater than 100 counts per minute above background, then a sample will be collected and sent to the laboratory for analysis.

If warranted based on field screening data as described above, selected soil samples will be retained for laboratory analyses to quantify volatile organic and radiological contaminant concentrations for selection of the appropriate personal protective equipment (PPE) during construction activities. A maximum of one sample per location will be sent to the laboratory for analysis. If screening levels of organic or radiological parameters exceed the above criteria at several depths at one location, a separate sample will be collected at the depth that exhibits the highest readings.

In suspect areas, one or more samples will be analyzed for HSLs and Total Radiological Parameters, regardless of field screening results. Also, a few samples from non-suspect areas will be analyzed for potential pesticide/herbicide contamination.

Following is a list of parameters for laboratory analyses, if warranted by field screening. The list was derived from process knowledge of FEMP and the surrounding agricultural and industrial activities. Attached is a complete list of constituents in each category and the SW 846 test methods that will be followed.

Non-Suspect Areas

Total Volatiles - all analytes for this category.
Total Semi-Volatiles - all analytes for this category.
Total Pesticides/Herbicides - all analytes for this category.
Total Metals - all TC listed metals.
Total Radiological Parameters - all analytes listed for this category.
Suspect Areas

HSL Volatiles - all analytes listed for this category.
HSL Semi-Volatiles - all analytes listed for this category.
HSL Inorganics - all analytes listed for this category.
HSL Pesticides/PCBs - all analytes listed for this category.
Total Radiological Parameters - all analytes listed for this category.

Analytical data to be used for evaluation of worker health and safety ~~should~~ will be obtained in the most expedient manner possible (i.e., would not require full CLP sampling/analytical protocols).

If soil analyses are warranted, trip and rinsate blanks will be collected for Quality Assurance/Quality Control (QA/QC) purposes. Trip and rinsate blanks will accompany each set of samples shipped to the appropriate designated laboratory. Duplicate soil samples, rinsate, and trip blanks will be taken at a frequency of

one for every ten samples, or for each sampling event, whichever is more frequent. The QA/QC and duplicate samples will be analyzed for the respective analytes previously mentioned. Sampling and analyses for characterization not associated with worker health and safety will be done in accordance with the RI/FS QAPP.

Excess soil boring cuttings will be returned to their respective sample point location borehole in non-suspect areas. The remainder of the borehole annulus will be backfilled with bentonite slurry ~~pellets as the annular seal~~ with the use of a tremie pipe. Boreholes in suspect areas will be backfilled with bentonite slurry only. The location of the borehole will be noted.

The work to be performed, as described in this ~~and outlined in the pre-excavation soil sampling, field screening, and analysis~~ plan, will be accomplished in accordance with the Health and Safety Plan for the South Groundwater Contamination Plume Removal Action, Part 2 and Part 3.

3.0 Construction-Related Sampling

3.1 Construction Measurements

During excavation, portable instrument measurements will be taken for organic vapors and for radiological contaminants. Any soils depicting measurable organic vapor readings will be containerized and managed as potentially hazardous waste. Any indications of activities, as measured on a 2x2 inch NaI scintillation detector, greater than 15 percent above background with no measurable organic vapor readings will be excavated and transferred to the former FEMP Production Area stockpile north of the Plant 1 Pad. Soils placed here will be stabilized, seeded and covered with erosion control fabric. Erosion control fabric will be maintained until a good vegetative cover is developed.

Excess soils depicting no measurable organic vapor or above background radiological reading will be transferred to a designated soil stockpile area south of the Stormwater Retention Basin.

3.2 Buildover Criteria

An objective of the FEMP is to restrict, to the extent practical, the construction buildover of soils depicting significant concentrations of hazardous substances or radiological constituents. The intent of this policy is to reduce the risk of locating permanent structures over soils containing concentrations of hazardous substances or radiological constituents exceeding possible final cleanup levels. This policy was initiated to minimize the impact that current facility construction actions (i.e. removal actions, etc.) may have on the implementation of final actions. Parts 2 and 3 of the South Groundwater Contamination Plume Removal Action involves the installation of approximately 2 miles of pipeline and associated appurtenances. Approximately 1 mile of pipeline will be located off the FEMP reservation. With the exception of the identified suspect areas, there is no reason to expect that hazardous substances or elevated concentrations of radionuclides will be encountered during the construction phase of the removal action. As previously identified, pre-excavation sampling and real time excavation monitoring and controls are being

used to confirm this expectation.

Specific buildover criteria are not proposed to be applied to construction activities associated with this removal action. The FEMP considers that the pipeline and associated appurtenances do not provide a significant impediment to future remedial activities. The FEMP recognizes that actions may be required during final remediation to address elevated concentrations of HSLs or radionuclides identified during the course of the Remedial Investigation. These actions may include focused excavations under or adjacent to the pipeline.~~ or temporary relocation of the line.~~

3.3 Post-Excavation Soil Management and Disposition

3.3.1 Excess Soil Management

Excess soil materials will be stockpiled at a site located in proximity to the groundwater pipeline excavation until a RCRA and/or radiological determination has been made in accordance with Section 3.3.2.

In order to allow for drainage of runoff away from the soil stockpiles, areas with the greatest relative elevation will be selected for soil stockpile sites.

Each soil stockpile will be managed by placing a heavy, non-permeable tarpaulin on the ground in the area where the soil will be stockpiled. The perimeter of the tarpaulin will be fastened to the ground by stakes or other appropriate means. Soil will be piled radially from the center of the tarpaulin, with a maximum lateral extent to no less than 3 feet from the edge of the tarpaulin. Each soil stockpile will be completely covered, on a daily basis, using a heavy, non-permeable tarpaulin. The tarpaulin cover will be weighted at its perimeter and intermittently over its surface area to avoid disturbance by wind.

3.3.2 Disposition of Soil Stockpiles

The disposal requirements for each soil stockpile will be evaluated separately. The RCRA and radiological determination will be based on analytical results of the soils obtained from the procedure outlined in Section 2.2. All radioactive, RCRA, and mixed waste soils will be managed in accordance with the Removal Action #17 Work Plan when finalized. Until Removal Action #17 work plan is finalized, control of contaminated soils will be directed by FEMP Site Standard Operating Procedure, SSOP-00441, "Controlling the Generation of Construction/Maintenance Waste".~~Stockpiled soil will be dispositioned as follows:~~

~~Category I - A stockpile exhibiting average concentrations of depleted uranium of < 35 pCi/g or natural thorium of < 10 pCi/g, and determined to be non RCRA shall be returned to an uncontrolled state and made available for unrestricted use within the FEMP Controlled Area. In order to prevent wind and runoff erosion, the entire stockpile will be covered with sod or other suitable ground cover vegetation.~~

~~Category II - A stockpile exhibiting average concentrations of depleted uranium of < 100 pCi/g or natural thorium of < 50 pCi/g, and determined to be non RCRA shall be returned to an uncontrolled state and made available for unrestricted~~

~~use within the FEMP Controlled Area. In order to prevent wind and runoff erosion, the entire stockpile will be covered with sod or other suitable ground cover vegetation.~~

~~Low Level Waste A stockpile exhibiting average concentrations of depleted uranium of > 100 pCi/g or natural thorium of > 50 pCi/g, and determined to be non RCRA shall be containerized and dispositioned as low level radioactive waste.~~

~~Mixed Hazardous Waste A stockpile exhibiting average concentrations of depleted uranium of > 100 pCi/g or natural thorium of > 50 pCi/g, and determined to be RCRA hazardous waste shall be containerized, stored, and managed as mixed waste.~~

3.4 Monitoring for Fugitive Dust Emissions

Portable air samplers will be placed at the perimeter of the open excavation and the soil stockpile to measure airborne particulate concentrations. Samples will be collected weekly and analyzed for gross alpha and gross beta concentrations at the FEMP laboratory. Engineering controls and additional health and safety measures will be instituted if elevated concentrations are detected.

Attachment I-1

Categories of Analytical Constituents

SOIL AND RUBBLE SAMPLING AND ANALYSIS PLAN
for the
SOUTH GROUNDWATER CONTAMINATION PLUME REMOVAL ACTION

PART 2 - PUMP AND DISCHARGE SYSTEM
and
PART 3 - INTERIM ADVANCED WASTEWATER TREATMENT SYSTEM

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

HSL Volatiles

Volatile	CAS Number	Detection Limits Low Water[a] ug/L	Detection Limits Low Soil/Sediment[b] ug/L
1. Chloromethane	74-87-3	10	10
2. Bromomethane	74-83-9	10	10
3. Vinyl Chloride	75-01-4	10	10
4. Chloroethane	75-00-3	10	10
5. Methylene Chloride	75-09-2	5	5
6. Acetone	67-64-1	10	10
7. Carbon Disulfide	75-15-0	5	5
8. 1,1-Dichloroethene	75-35-4	5	5
9. 1,1-Dichloroethane	75-35-3	5	5
10. trans-1,2-Dichloroethene	156-60-5	5	5
11. Chloroform	67-66-3	5	5
12. 1,2-Dichloroethane	107-06-2	5	5
13. 2-Butanone	78-93-3	10	10
14. 1,1,1-Trichloroethane	71-55-6	5	5
15. Carbon Tetrachloride	56-23-5	5	5
16. Vinyl Acetate	108-05-4	10	10
17. Bromodichloromethane	75-27-4	5	5
18. 1,1,2,2-Trichloroethane	79-34-5	5	5
19. 1,2-Dichloropropane	78-87-5	5	5
20. trans-1,3-Dichloropropene	10061-02-6	5	5
21. Trichloroethene	79-01-6	5	5
22. Dibromochloromethane	124-48-1	5	5
23. 1,1,2-Trichloroethane	79-00-5	5	5
24. Benzene	71-43-2	5	5
25. cis-1,3-Dichloropropene	10061-01-5	5	5
26. 2-Chloroethyl Vinyl Ether	110-75-8	10	10
27. Bromoform	75-25-2	5	5
28. 2-Hexanone	591-78-6	10	10
29. 4-Methyl-2-pentanone	108-10-1	10	10
30. Tetrachloroethene	127-18-4	5	5
31. Toluene	108-88-3	5	5
32. Chlorobenzene	108-90-7	5	5
33. Ethyl Benzene	100-41-4	5	5
34. Styrene	100-42-5	5	5
35. Total Xylenes		5	5

[a]Medium Water Contract Required Detection Limits (CRDL) for Volatile HSL Compounds are 100 times the individual Low Water CRDL.

[b]Medium Soil/Sediments Contract Required Detection Limits (CRDL) for Volatile HSL Compounds are 100 times the individual Low Soil/Sediment CRDL

HSL Semi-Volatiles

Semi-Volatile	CAS Number	Detection Limits Low Water[c] ug/L	Detection Limits Low Soil/Sediment[d] ug/Kg
36. Phenol	104-95-2	10	330
37. bis(2-Chloroethyl) ether	111-44-4	10	330
38. 2-Chlorophenol	95-57-6	10	330
39. 1,3-Dichlorobenzane	541-73-1	10	330
40. 1,4-Dichlorobenzene	104-44-7	10	330
41. Benzyl Alcohol	100-51-6	10	330
42. 1,2-Dichlorobenzene	95-50-1	10	330
43. 2-Methylphenol	95-48-7	10	330
44. bis(2-Chloroisopropyl) ether	39638-32-9	10	330
45. 4-Nethylphenol	104-44-5	10	330
46. H-Kitroso-Dipropylamine	621-64-7	10	330
47. Hexachloroethane	67-72-1	10	330
48. Nirtobenzene	98-95-3	10	330
49. Isophorone	78-59-1	10	330
50. 2-Kitrophenol	88-75-5	10	330
51. 2,4-Dimethylphenol	105-67-9	10	330
52. Benzoic Acid	65-85-0	50	1600
53. bis(2-Chloroethoxyl) methane	111-91-1	10	330
54. 2,4-Dichlorophenol	120-63-2	10	330
55. 1,2,4-Trichlorobenzene	120-62-1	10	330
56. Naphthalene	91-20-3	10	330
57. 4-Chloroaniline	106-47-8	10	330
58. Hexachlorobutadiene	87-68-3	10	330
59. 4-Chloro-3-methyphenol (para-chloro-meta-cresel)	59-50-7	10	330
60. 2-Methylnaphthalene	91-57-6	10	330
61. Hexachlorocyclopentadiene	77-47-4	10	330
62. 2,4,6-Trichlorophenol	88-06-2	10	330
63. 2,4,5-Trichlorophenol	95-95-4	50	1600
64. 2-Chloronaphthalene	91-58-7	10	330
65. 2-Nitaniline	88-74-4	50	1600
66. Dimethyl Phthalate	131-11-3	10	330
67. Acenaphthylene	208-96-8	10	330
68. 3-Nitroaniline	99-09-2	50	1600
69. Acenapthene	83-32-8	10	330
70. 2,4-Disitrophenol	51-28-5	50	1600
71. 4-Nitrophenol	100-02-7	50	1600
72. Dibenzofuras	132-64-9	10	330

73. 2,4-Dimitrotoluene	121-14-2	10	330
74. 2,6-Dinitrotoluene	606-20-2	10	330
75. Diethylphthalate	84-66-2	10	330
76. 4-Chlorophenyl Phenyl ether	7005-72-3	10	330
77. Fluorene	86-73-7	10	330
78. 4-Nitroaniline	100-01-6	50	1600
79. 4,6-Dinitro-2-methylphenol	534-52-1	50	1600
80. H-nitrosodiphenylamine	86-30-6	10	330
81. 4-Bromophenyl Phenyl ether	101-55-3	10	330
82. Hexachlorobenzene	118-74-1	10	330
83. Pentachlorophenol	87-86-5	60	1600
84. Phenanthrene	85-01-6	10	330
85. Anthracene	120-12-7	10	330
86. Di-n-butylphthalate	84-74-2	10	330
87. Fluoranthene	206-44-0	10	330
88. Pyrene	129-00-0	10	330
89. Butyl Benzyl Phthalate	85-68-7	10	330
90. 3,3-Dichlorobenzidine	91-94-1	20	660
91. Benzo(a)anthracene	56-55-3	10	330
92. bis(2-ethylheyl)phthalate	117-81-7	10	330
93. Chrysene	218-01-9	10	330
94. Di-n-cotyl Phthalate	117-84-0	10	330
95. Benzo(b)fluoranthene	205-99-2	10	330
96. Benzo(k)fluoranthene	207-08-9	10	330
97. Benzo(a)pyrene	50-32-8	10	330
98. Indeno(1,2,3-cd)pyrene	193-39-5	10	330
99. Dibenz(a,h)anthracene	53-70-3	10	330
100. Benzo(g,h,i)perylene	191-24-2	10	330

[c]Medium Water Contract Required Detection Limits (CRDL) for Volatile HSL Compounds are 100 times the individual Low Water CRDL.

[d]Medium Soil/Sediments Contract Required Detection Limits (CRDL) for Volatile HSL Compounds are 100 times the individual Low Soil/Sediment CRDL

HSL Pesticides

Pesticides	CAS Number	Detection Limits Low Water* ug/L	Low Soil/Sediment' ug/Kg
101. alpha-BHC	319-84-6	0.05	8.0
102. beta-BHC	319-85-7	0.05	8.0
103. delta-BHC	319-86-8	0.05	8.0
104. gamma-BHC (Lindane)	58-89-9	0.05	8.0
105. Heptachlor	76-44-8	0.05	8.0
106. Aldrin	309-00-2	0.05	8.0
107. Heptachlor Epoxide	1024-57-3	0.05	8.0
108. Endosulfan I	959-98-8	0.05	8.0
109. Dieldrin	60-57-1	0.10	16.0
110. 4,4'-DDE	72-55-9	0.10	16.0
111. Endrin	72-20-8	0.10	16.0
112. Endosulfan II	33213-65-9	0.10	16.0
113. 4,4'-DDD	72-54-8	0.10	16.0
114. Endosulfan Sulfate	1031-07-8	0.10	16.0
115. 4,4'-DDT	50-29-3	0.10	16.0
116. Endrin Ketone	53494-70-5	0.10	16.0
117. Methoxychlor	72-43-5	0.5	80.0
118. Chlordane	57-74-9	0.5	80.0
119. Toxaphene	8001-35-2	1.0	160.0
120. AROCLOR-1016	12674-11-2	0.5	80.0
121. AROCLOR-1221	11104-28-2	0.5	80.0
122. AROCLOR-1232	11141-16-5	0.5	80.0
123. AROCLOR-1242	53469-21-9	0.5	80.0
124. AROCLOR-1248	12672-29-6	0.5	80.0
125. AROCLOR-1254	11097-69-1	1.0	160.0
126. AROCLOR-1260	11096-82-5	1.0	160.0

*Medium Water Contract Required Detection Limits (CRDL) for Pesticide HSL Compounds are 100 times the individual Low Water CRDL.

'Medium Soil/Sediment Contract Required Detection Limits (CRDL) for Pesticide HSL compounds are 15 times the individual Low Soil/Sediment CRDL.

*Detection limits listed for soil/sediment are based on wet weight. The detection limits calculated by the laboratory for soil/sediment, calculated on dry weight basis, as required by the contract, will be higher.

HSL INORGANICS

Analyte	Contract Required Detection Limit (ug/L)
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Cyanide	10
Iron	100
Lead	5
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5000
Selenium	5
Silver	10
Sodium	5000
Thallium	10
Vanadium	50
Zinc	20

ANALYSIS REQUESTS

NOTE: THE METHOD NUMBERS THAT ARE LISTED ARE ONLY SUGGESTED METHODS FOR SW-846 ANALYSES.

Full TCLP (1311)

Metals
Arsenic (7060)
Barium (6010)
Cadmium (6010)
Chromium (6010)
Lead (6010)
Mercury (7470)
Selenium (7740)
Silver (6010)

Semi-Volatiles (8270)
1,4-Dichlorobenzene
2,4-Dinitroluene
Hexachlorobenzene Chlordane
Hexachloroethane Endrin
Hexachloro-1,3-butadiene
Nitrobenzene
Pentachlorophenol Lindane
Pyridine
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
O-Cresol
m-Cresol
p-Cresol

Volatiles (8240)
Benzene
Carbon Tetrachloride
Chlorobenzene
Chloroform
2-Butane
1,2-Dichloroethane
1,1-Dichloroethylene
Tetrachloroethylene
Trichlotoethylene
Vinyl Chloride

Pesticides (8080)
Heptachlor
Heptachlor Epoxide
Methoxychlor
Toxaphene

Herbicides (8150)
2,4-D
2,4,5-TP (Silvex)

TCLP Metals (1311)

Arsenic (6010)
Barium (6010)
Cadmium (6010)
Chromium (6010)
Lead (6010)
Mercury (7470)
Selenium (6010)
Silver (6010)

Total Metals

Arsenic (6010)
Barium (6010)
Cadmium (6010)
Chromium (6010)
Lead (6010)
Mercury (7470)
Selenium (6010)
Silver (6010)

TCLP Volatile Organic Analysis (1311, 8240)

1,1-Dichloroethylene
1,2-Dichloroethane
2-Butane
Benzene
Carbon Tetrachloride
Chlorobenzene
Chloroform
Tetrachloeothylene
Trichloroethylene
Vinyl Chloride

Total Volatile Organic Analysis (8240)

1,1,1-Trichloroethane
1,1,2-Trichloro-
  1,2,2-trifluoroethane
1,1,2-Trichloroethane
Acetone
Benzene
Carbon Tetrachloride
Carbon Disulfide
Chlorobenzene
Cyclohexanone
Ethyl Acetate
Ethyl Benzene
Ethyl Ether
Methyl Ethyl Ketone
Methyl Isobutyl Ketone
Methylene Chloride
Tetrachloroethylene
Toluene
Total Xylenes
Trichloeothylene
Trichlorofluoro-
  methane

Total Alcohols (8015)

2-Ethoxy ethanol
Isobutanol
Methanol
n-Butyl alcohol

TCLP Semi-Volatiles (1311, 8270)

1,4-Dichlorobenzene
2,4-Dinitrotoluene
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
Hexachloro-1,3-butadiene
Hexachlorobenzene
Hexachloroethane
m-Cresol
Nitrobenzene
O-Cresol
p-Cresol
Pentachlorophenol
Pyridine

Total Semi-Volatiles (8270)

1,4-Dichlorobenzene
2,4-Dinitrotoluene
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
Hexachloro-1,3-butadiene
Hexachlorobenzene
Hexachloroethane
m-Cresol
Nitrobenzene
O-Cresol
p-Cresol
Pentachlorophenol
Pydidine

TCLP Pestidides (1311,8080)

Chlordane
Endrin
Heptachlor
Heptachlor Epoxide
Lindane
Methoxychlor
Toxaphene

Total Pesticides (8080)

Chlordane
Endrin
Heptachlor
Heptachlor Epoxide
Lindane
Methoxychlor
Toxaphene

Total Herbicides (8150)

2,4-D 2,4,5-TP (Silvex)

RADIONUCLIDES

U-233,234,235,236,238

Ra-226,228

Th-228,230,232

Th-234

Pu-238,239,Total Pu

Np-237

Tc-99

Cs-137

Potassium-40

Alpha, beta, gamma
Semi-quant, ID