

**REQUIRED ANALYTICAL METHODS, CONTAINERS, PRESERVATION TECHNIQUES,
AND HOLDING TIMES FOR SEDIMENT SAMPLES^(a)**

Parameter (Method)	Volume Required ^(b)	Container ^(c)	Preservative	Holding Time
Physical Characteristics				
Grain Size (ASTM D422) Atterberg Limits (ASTM D423/D424) Specific Gravity (ASTM D854) Total Solids / Moisture Content (ASTM D2216)	32 oz.	P,G	4° C	Not Applicable
Inorganics/General Chemistry				
Metals (SW846 6010A/6020A)	8 oz.	P,G	4° C	6 months
Mercury (SW846 7471B)	(d)	P,G	4° C	28 days
Cyanide (SW846 9012A)	(d)	G	4° C	14 days
Total Organic Carbon (Lloyd Kahn)	(d)	G	4° C	14 days
Total Sulfide (SW846 9030B/9034)	(d)	G	4° C Zinc acetate ^(e)	7 days
Nitrogen, Ammonia (EPA 350.1)	(d)	G	4° C	28 days
Nitrogen, Nitrate + Nitrite (EPA 353.2)	(d)	G	4° C	28 days
Nitrogen, Total Kjeldahl, (EPA 351.3)	4 oz.	G	4° C	28 days
Total Phosphorus (EPA 365.4 or SM 4500 P E)	4 oz.	G	4° C	28 days
pH (EPA 9045D)	(d)	G	4° C	Immediate
Organics				
Oil and Grease (SW846 9071B)	4 oz.	G	4° C	28 days
Total Petroleum Hydrocarbons (TPH) Gas Range Organics (GRO) (SW846 8015)	4 oz.	G	4° C (no headspace)	14 days
TPH Diesel Range Organics/Oil Range Organics (DRO/ORO) (SW846 8015)	4 oz.	G	4° C	14 days
Priority Pollutant Volatiles (SW846 8260C)	4 oz	G	4°C (no headspace)	14 days
Priority Pollutant SVOCs / PAHs (SW846 8270D LL) Priority Pollutant Pesticides (SW846 8081B LL) /PCB Congeners (SW846 8082A)	8 oz.	G	4° C	14 days until extraction, 40 days after extraction

Other				
Tributyltin (Unger or Krone Method SOP)	8 oz.	G	4° C	14 days until extraction, 40 days after extraction
Toxicity Characteristic Leaching Procedure (TCLP) (Includes VOCs, SVOCs, Pesticides, Herbicides, Metals, Mercury [SW846 8260C, 8270D, 8081B, 8151A, 6010C, 7470A, 1311])	32 oz. + 4 oz. (no headspace)	G	4° C	14 days from collection to leach (28 for mercury, 180 for metals), 7 days from leach to SVOCs, Pesticides, Herbicides extraction, 14 from leach for VOC analysis, 40 days from leach to SVOC, Pesticides, Herbicides analysis.

QA/QC Requirements = 1 Field Duplicate (FD) per 10 samples; 1 Matrix Spike (MS) / 1 Matrix Spike Duplicate (MSD) per 20 samples.

- (a) From time of sample collection.
 - (b) Additional volume will need to be provided for samples designated as FDs and MS/MSDs.
 - (c) P=plastic; G=glass
 - (d) Can be taken from the 8 oz. used for Metals analysis.
 - (e) Zinc acetate should be added to the sediment jar in the field covering the top of the sediment surface.
- oz. = ounces

SEDIMENT TARGET DETECTION LIMITS (TDLs) FOR DREDGED MATERIAL PLACEMENT RIGHT OF ENTRY APPLICATION

Analyte Group	Analyte	CAS Number	TDL	Units
Butyltins	Tributyltins	688-73-3	10	ug/kg
General Chemistry	Cyanide (SW846 9012A)	57-12-5	2	mg/kg
General Chemistry	Nitrogen, ammonia (EPA 350.1M)	NH3	5.45	mg/kg
General Chemistry	Nitrogen, nitrate + nitrite (EPA 353.2M)	NO3+NO2	1	mg/kg
General Chemistry	Nitrogen, total Kjeldahl (EPA 351.3M)	TKN	15	mg/kg
General Chemistry	pH	pH	0.1	pH Units
General Chemistry	Sulfide (SW846 9030B/9034)	SULFIDE	10	mg/kg
General Chemistry	Total Organic Carbon (Lloyd Kahn)	TOC	1000	mg/kg
General Chemistry	Total Phosphorus (SM 4500 P E)	TPHOS	0.35	mg/kg
Metals	Aluminum	7429-90-5	50	mg/kg
Metals	Antimony	7440-36-0	2.5	mg/kg
Metals	Arsenic	7440-38-2	5	mg/kg
Metals	Beryllium	7440-41-7	2.5	mg/kg
Metals	Cadmium	7440-43-9	0.3	mg/kg
Metals	Chromium	7440-47-3	5	mg/kg
Metals	Cobalt	7440-48-4	0.1	mg/kg
Metals	Copper	7440-50-8	5	mg/kg
Metals	Iron	7439-89-6	50	mg/kg
Metals	Lead	7439-92-1	5	mg/kg
Metals	Manganese	7439-96-5	5	mg/kg
Metals	Mercury	7439-97-6	0.2	mg/kg
Metals	Nickel	7440-02-0	5	mg/kg
Metals	Selenium	7782-49-2	1	mg/kg
Metals	Silver	7440-22-4	0.2	mg/kg
Metals	Thallium	7440-28-0	0.2	mg/kg
Metals	Tin	7440-31-5	0.5	mg/kg
Metals	Zinc	7440-66-6	15	mg/kg
Organics	Oil and Grease	OG	50	mg/kg
Organics	TPH – Diesel Range Organics	DRO	50	mg/kg
Organics	TPH – Gas Range Organics	GRO	50	mg/kg
Organics	TPH – Oil Range Organics	ORO	50	mg/kg
Organochlorine Pesticides	2,4'-DDD	53-19-0	10	ug/kg
Organochlorine Pesticides	2,4'-DDE	3424-82-6	10	ug/kg
Organochlorine Pesticides	2,4'-DDT	789-02-6	10	ug/kg
Organochlorine Pesticides	4,4'-DDD	72-54-8	10	ug/kg
Organochlorine Pesticides	4,4'-DDE	72-55-9	10	ug/kg
Organochlorine Pesticides	4,4'-DDT	50-29-3	10	ug/kg
Organochlorine Pesticides	Aldrin	309-00-2	10	ug/kg
Organochlorine Pesticides	alpha-BHC	319-84-6	10	ug/kg
Organochlorine Pesticides	Azinphos Methyl	86-50-0	10	ug/kg
Organochlorine Pesticides	beta-BHC	319-85-7	10	ug/kg
Organochlorine Pesticides	Chlorbenside	103-17-3	2	ug/kg
Organochlorine Pesticides	Chlordane (Technical)	57-74-9	10	ug/kg
Organochlorine Pesticides	Dacthal	1861-32-1	2	ug/kg
Organochlorine Pesticides	delta-BHC	319-86-8	10	ug/kg
Organochlorine Pesticides	Demeton, Total	8065-48-3	10	ug/kg
Organochlorine Pesticides	Dieldrin	60-57-1	10	ug/kg
Organochlorine Pesticides	Endosulfan I	959-98-8	10	ug/kg
Organochlorine Pesticides	Endosulfan II	33213-65-9	10	ug/kg
Organochlorine Pesticides	Endosulfan sulfate	1031-07-8	10	ug/kg
Organochlorine Pesticides	Endrin	72-20-8	5	ug/kg

Analyte Group	Analyte	CAS Number	TDL	Units
Organochlorine Pesticides	Endrin aldehyde	7421-93-4	5	ug/kg
Organochlorine Pesticides	gamma-BHC (Lindane)	58-89-9	10	ug/kg
Organochlorine Pesticides	Heptachlor	76-44-8	10	ug/kg
Organochlorine Pesticides	Heptachlor epoxide	1024-57-3	10	ug/kg
Organochlorine Pesticides	Malathion	121-75-5	10	ug/kg
Organochlorine Pesticides	Methoxychlor	72-43-5	10	ug/kg
Organochlorine Pesticides	Methyl Parathion	298-00-0	10	ug/kg
Organochlorine Pesticides	Mirex	2385-85-5	5	ug/kg
Organochlorine Pesticides	Parathion	56-38-2	10	ug/kg
Organochlorine Pesticides	Toxaphene	8001-35-2	20	ug/kg
PAHs	1-Methylnaphthalene	90-12-0	20	ug/kg
PAHs	2-Methylnaphthalene	91-57-6	20	ug/kg
PAHs	Acenaphthene	83-32-9	20	ug/kg
PAHs	Acenaphthylene	208-96-8	20	ug/kg
PAHs	Anthracene	120-12-7	20	ug/kg
PAHs	Benzo[a]anthracene	56-55-3	20	ug/kg
PAHs	Benzo[a]pyrene	50-32-8	20	ug/kg
PAHs	Benzo[b]fluoranthene	205-99-2	20	ug/kg
PAHs	Benzo[ghi]perylene	191-24-2	20	ug/kg
PAHs	Benzo[k]fluoranthene	207-08-9	20	ug/kg
PAHs	Chrysene	218-01-9	20	ug/kg
PAHs	Dibenzo[a,h]anthracene	53-70-3	20	ug/kg
PAHs	Fluoranthene	206-44-0	20	ug/kg
PAHs	Fluorene	86-73-7	20	ug/kg
PAHs	Indeno[1,2,3-cd] pyrene	193-39-5	20	ug/kg
PAHs	Naphthalene	91-20-3	20	ug/kg
PAHs	Phenanthrene	85-01-8	20	ug/kg
PAHs	Pyrene	129-00-0	20	ug/kg
PCB Congeners	2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (BZ # 209)	2051-24-3	1	ug/kg
PCB Congeners	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ # 206)	40186-72-9	1	ug/kg
PCB Congeners	2,2',3,3',4,4',5,6-Octachlorobiphenyl (BZ # 195)	52663-78-2	1	ug/kg
PCB Congeners	2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ # 170)	35065-30-6	1	ug/kg
PCB Congeners	2,2',3,3',4,4'-Hexachlorobiphenyl (BZ # 128)	38380-07-3	1	ug/kg
PCB Congeners	2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ # 180)	35065-29-3	1	ug/kg
PCB Congeners	2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ # 183)	52663-69-1	1	ug/kg
PCB Congeners	2,2',3,4,4',5'-Hexachlorobiphenyl (BZ # 138)	35065-28-2	1	ug/kg
PCB Congeners	2,2',3,4,4',6,6'-Heptachlorobiphenyl (BZ # 184)	74472-48-3	1	ug/kg
PCB Congeners	2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ # 187)	52663-68-0	1	ug/kg
PCB Congeners	2,2',3,4,5'-Pentachlorobiphenyl (BZ # 87)	38380-02-8	1	ug/kg
PCB Congeners	2,2',3,4',5-Pentachlorobiphenyl (BZ # 90)	68194-07-0	1	ug/kg
PCB Congeners	2,2',3,5'-Tetrachlorobiphenyl (BZ # 44)	41464-39-5	1	ug/kg
PCB Congeners	2,2',4,4',5,5'-Hexachlorobiphenyl (BZ # 153)	35065-27-1	1	ug/kg
PCB Congeners	2,2',4,5,5'-Pentachlorobiphenyl (BZ # 101)	37680-73-2	1	ug/kg
PCB Congeners	2,2',4,5'-Tetrachlorobiphenyl (BZ # 49)	41464-40-8	1	ug/kg
PCB Congeners	2,2',5,5'-Tetrachlorobiphenyl (BZ # 52)	35693-99-3	1	ug/kg
PCB Congeners	2,2',5-Trichlorobiphenyl (BZ # 18)	37680-65-2	1	ug/kg
PCB Congeners	2,3,3',4,4',5-Hexachlorobiphenyl (BZ # 156)	38380-08-4	1	ug/kg
PCB Congeners	2,3,3',4,4'-Pentachlorobiphenyl (BZ # 105)	32598-14-4	1	ug/kg
PCB Congeners	2,3',4,4',5-Pentachlorobiphenyl (BZ # 118)	31508-00-6	1	ug/kg
PCB Congeners	2,3',4,4'-Tetrachlorobiphenyl (BZ # 66)	32598-10-0	1	ug/kg
PCB Congeners	2,4,4'-Trichlorobiphenyl (BZ # 28)	7012-37-5	1	ug/kg
PCB Congeners	2,4'-Dichlorobiphenyl (BZ # 8)	34883-43-7	1	ug/kg
PCB Congeners	3,3',4,4',5,5'-Hexachlorobiphenyl (BZ # 169)	32774-16-6	1	ug/kg

Analyte Group	Analyte	CAS Number	TDL	Units
PCB Congeners	3,3',4,4',5-Pentachlorobiphenyl (BZ # 126)	57465-28-8	1	ug/kg
PCB Congeners	3,3',4,4'-Tetrachlorobiphenyl (BZ # 77)	32598-13-3	1	ug/kg
Semi-volatiles	1,2,4-Trichlorobenzene	120-82-1	10	ug/kg
Semi-volatiles	1,2-Dichlorobenzene	95-50-1	20	ug/kg
Semi-volatiles	1,2-Diphenylhydrazine	122-66-7	110	ug/kg
Semi-volatiles	1,3-Dichlorobenzene	541-73-1	20	ug/kg
Semi-volatiles	1,4-Dichlorobenzene	106-46-7	20	ug/kg
Semi-volatiles	2,4,6-Trichlorophenol	88-06-2	90	ug/kg
Semi-volatiles	2,4-Dichlorophenol	120-83-2	130	ug/kg
Semi-volatiles	2,4-Dimethylphenol	105-67-9	20	ug/kg
Semi-volatiles	2,4-Dinitrophenol	51-28-5	10000	ug/kg
Semi-volatiles	2,4-Dinitrotoluene	121-14-2	84	ug/kg
Semi-volatiles	2,6-Dinitrotoluene	606-20-2	100	ug/kg
Semi-volatiles	2-Chloronaphthalene	91-58-7	89	ug/kg
Semi-volatiles	2-Chlorophenol	95-57-8	160	ug/kg
Semi-volatiles	2-Methylphenol	95-48-7	50	ug/kg
Semi-volatiles	2-Nitrophenol	88-75-5	130	ug/kg
Semi-volatiles	3,3'-Dichlorobenzidine	91-94-1	1500	ug/kg
Semi-volatiles	4,6-Dinitro-2-Methylphenol	534-52-1	10000	ug/kg
Semi-volatiles	4-Bromophenyl phenyl ether	101-55-3	210	ug/kg
Semi-volatiles	4-Chloro-3-methylphenol	59-50-7	91	ug/kg
Semi-volatiles	4-Chlorophenyl phenyl ether	7005-72-3	100	ug/kg
Semi-volatiles	4-Methylphenol	106-44-5	100	ug/kg
Semi-volatiles	4-Nitrophenol	100-02-7	1200	ug/kg
Semi-volatiles	Benzidine	92-87-5	12000	ug/kg
Semi-volatiles	Benzoic acid	65-85-0	100	ug/kg
Semi-volatiles	Benzyl alcohol	100-51-6	50	ug/kg
Semi-volatiles	Bis(2-Chloroethoxy) methane	111-91-1	110	ug/kg
Semi-volatiles	Bis(2-chloroethyl) ether	111-44-4	110	ug/kg
Semi-volatiles	Bis(2-Chloroisopropyl) ether	108-60-1	150	ug/kg
Semi-volatiles	Bis(2-ethylhexyl) phthalate	117-81-7	50	ug/kg
Semi-volatiles	Butylbenzylphthalate	85-68-7	50	ug/kg
Semi-volatiles	Dibenzofuran	132-64-9	50	ug/kg
Semi-volatiles	Diethyl phthalate	84-66-2	50	ug/kg
Semi-volatiles	Dimethyl phthalate	131-11-3	50	ug/kg
Semi-volatiles	Di-n-butyl phthalate	84-74-2	50	ug/kg
Semi-volatiles	Di-n-octyl phthalate	117-84-0	50	ug/kg
Semi-volatiles	Hexachlorobenzene	118-74-1	10	ug/kg
Semi-volatiles	Hexachlorobutadiene	87-68-3	20	ug/kg
Semi-volatiles	Hexachlorocyclopentadiene	77-47-4	330	ug/kg
Semi-volatiles	Hexachloroethane	67-72-1	100	ug/kg
Semi-volatiles	Isophorone	78-59-1	120	ug/kg
Semi-volatiles	Nitrobenzene	98-95-3	600	ug/kg
Semi-volatiles	N-Nitrosodimethylamine	62-75-9	1000	ug/kg
Semi-volatiles	N-Nitroso-di-n-propylamine	621-64-7	110	ug/kg
Semi-volatiles	N-Nitrosodiphenylamine	86-30-6	20	ug/kg
Semi-volatiles	Pentachlorophenol	87-86-5	100	ug/kg
Semi-volatiles	Phenol	108-95-2	100	ug/kg
Volatiles	1,1,1-Trichloroethane	71-55-6	13	ug/kg
Volatiles	1,1,2,2-Tetrachloroethane	79-34-5	5.5	ug/kg
Volatiles	1,1,2-Trichloroethane	79-00-5	6.5	ug/kg
Volatiles	1,1-Dichloroethane	75-34-3	8.5	ug/kg
Volatiles	1,1-Dichloroethene	75-35-4	11	ug/kg

Analyte Group	Analyte	CAS Number	TDL	Units
Volatiles	1,2,4-Trichlorobenzene	120-82-1	10	ug/kg
Volatiles	1,2-Dichlorobenzene	95-50-1	20	ug/kg
Volatiles	1,2-Dichloroethane	107-06-2	8.1	ug/kg
Volatiles	1,2-Dichloropropane	78-87-5	7.4	ug/kg
Volatiles	1,3-Dichlorobenzene	541-73-1	20	ug/kg
Volatiles	1,4-Dichlorobenzene	106-46-7	20	ug/kg
Volatiles	2-Butanone (MEK)	78-93-3	29	ug/kg
Volatiles	Benzene	71-43-2	10	ug/kg
Volatiles	Benzoic Acid	65-85-0	3500	ug/kg
Volatiles	Benzyl Alcohol	100-51-6	470	ug/kg
Volatiles	Bromoform	75-25-2	6.8	ug/kg
Volatiles	Bromomethane	74-83-9	24	ug/kg
Volatiles	Carbon tetrachloride	56-23-5	14	ug/kg
Volatiles	Chlorodibromomethane	124-48-1	7.6	ug/kg
Volatiles	Chloroethane	75-00-3	11	ug/kg
Volatiles	Chloroform	67-66-3	10	ug/kg
Volatiles	Chloromethane	74-87-3	7.3	ug/kg
Volatiles	cis-1,3-Dichloropropene	10061-01-5	6.7	ug/kg
Volatiles	Dibenzofuran	132-64-9	430	ug/kg
Volatiles	Dichlorobromomethane	75-27-4	7.3	ug/kg
Volatiles	Dichlorodifluoromethane	75-71-8	12	ug/kg
Volatiles	Ethylbenzene	100-41-4	10	ug/kg
Volatiles	Hexachlorobutadiene	87-68-3	20	ug/kg
Volatiles	Hexachloroethane	67-72-1	130	ug/kg
Volatiles	Methylene Chloride	75-09-2	23	ug/kg
Volatiles	Methylethyl ketone	78-93-3	20	ug/kg
Volatiles	N-Nitrosodiphenylamine	86-30-6	870	ug/kg
Volatiles	Tetrachloroethene	127-18-4	10	ug/kg
Volatiles	Toluene	108-88-3	10	ug/kg
Volatiles	Total Xylenes	128686-03-3	10	ug/kg
Volatiles	trans-1,2-Dichloroethene	156-60-5	11	ug/kg
Volatiles	trans-1,3-Dichloropropene	10061-02-6	6.5	ug/kg
Volatiles	Trichloroethene	79-01-6	10	ug/kg
Volatiles	Trichlorofluoromethane	75-69-4	9.2	ug/kg
Volatiles	Vinyl chloride	75-01-4	11	ug/kg

Toxicity Characteristic Leaching Procedure (TCLP)

Analyte	CAS Number	Threshold Levels	Units
1, 1-Dichloroethylene	75-35-4	0.7	mg/L
1, 2-Dichloroethane	107-06-2	0.5	mg/L
1, 4-Dichlorobenzene	106-46-7	7.5	mg/L
2, 4, 5-TP (Silvex)	93-72-1	1	mg/L
2, 4, 5-Trichlorophenol	95-95-4	400	mg/L
2, 4, 6-Trichlorophenol	88-06-2	2	mg/L
2, 4-D	94-75-7	10	mg/L
2,4-Dinitrotoluene	121-14-2	0.13	mg/L
Arsenic	7440-38-2	5	mg/L
Barium	7440-39-3	100	mg/L
Benzene	71-43-2	0.5	mg/L
Cadmium	7440-43-9	1	mg/L
Carbon tetrachloride	56-23-5	0.5	mg/L
Chlordane	57-74-9	0.03	mg/L
Chlorobenzene	108-90-7	100	mg/L
Chloroform	67-66-3	6	mg/L
Chromium III	16055-83-1	5	mg/L
Chromium, Hexavalent	18540-29-9	5	mg/L
Chromium, total	7440-47-3	5	mg/L
Endrin	72-20-8	0.02	mg/L
Heptachlor	76-44-8	0.008	mg/L
Heptachlor epoxide	1024-57-3	0.008	mg/L
Hexachlorobenzene	118-74-1	0.13	mg/L
Hexachlorobutadiene	87-68-3	0.5	mg/L
Hexachlorocyclohexane (Lindane)	58-89-9	0.4	mg/L
Hexachloroethane	67-72-1	3	mg/L
Lead	7439-92-1	5	mg/L
m-Cresol	108-39-4	200	mg/L
Mercury	7439-97-6	0.2	mg/L
Methoxychlor	72-43-5	10	mg/L
Methyl Ethyl Ketone (MEK)	78-93-3	200	mg/L
Nitrobenzene	98-95-3	2	mg/L
o-Cresol	95-48-7	200	mg/L
p-Cresol	106-44-5	200	mg/L
Pentachlorophenol	87-86-5	100	mg/L
Pyridine	110-86-1	5	mg/L
Selenium	7782-49-2	1	mg/L
Silver	7440-22-4	5	mg/L
Tetrachloroethylene	127-18-4	0.7	mg/L
Toxaphene	8001-35-2	0.5	mg/L
Trichloroethylene	79-01-6	0.5	mg/L
Vinyl Chloride	75-01-4	0.2	mg/L