

Technical Memorandum

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From: Lynn Grochala and Allison Geiselbrecht, Floyd|Snider

Date: August 5, 2019

Project No: Cantera-TOC, Time Oil Bulk Terminal PPA Site

Re: Sediment Data Summary Report

This technical memorandum was prepared at the request of Cantera Development Group, LLC (Cantera) to summarize the results of sample collection activities conducted to characterize sediments on the former TOC Holdings Co. (TOC) Seattle Terminal Properties (the Site) and in the vicinity of the Site in Salmon Bay. The Site is located on W. Commodore Way in Seattle and consists of four separate parcels (commonly identified as the Bulk Terminal Property, ASKO Hydraulic Property, East Waterfront Property, and West Waterfront Property). The Site also included one aquatic parcel leased from the Washington State Department of Natural Resources (DNR). W. Commodore Way, a City of Seattle perpetual easement Right-of-Way (ROW), separates the Bulk Terminal and ASKO Hydraulic Properties from the East and West Waterfront Properties, which are located adjacent to Salmon Bay. The geographic location of the Site is shown on Figure 1 and the Site and its surroundings are shown on Figure 2.

Surface sediment data were collected by Floyd|Snider in August 2018 in accordance with the July 2018 Surface Sediment Quality Evaluation Sampling and Analysis Plan and Quality Assurance Project Plan (SAP/QAPP; Floyd|Snider 2018). Additional surface and subsurface sediment data were collected by Floyd|Snider in March 2019 in accordance with an addendum to the SAP/QAPP (SAP/QAPP Addendum; Floyd|Snider 2019). The SAP/QAPP and Addendum were approved by the Washington State Department of Ecology (Ecology). On-property subsurface sediment collection and surface sediment collection outside the property boundary were conducted under the following permits or approvals:

- City of Seattle SEPA Exemption issued February 6, 2019
- City of Seattle Shoreline Exemption issued February 15, 2019
- Washington Department of Fish and Wildlife Hydraulic Project Approval issued March 8, 2019

- U.S. Army Corps of Engineers (USACE) No Action Letter issued March 13, 2019
- DNR Right of Entry issued March 19, 2019

This report summarizes the results of the 2018 and 2019 sediment data collection.

INVESTIGATION OBJECTIVES

The former Site owner, TOC, filed bankruptcy and the Site is currently for sale. Cantera is a prospective purchaser and is currently in a due diligence process to evaluate environmental contamination, and other feasibility issues, with the objective to obtain a Prospective Purchaser Agreement)/Consent Decree from Ecology. Cantera is not a potentially liable person for the Site. Sediment quality was identified as a data gap because current sediment data were not available within or in the vicinity of the Site. As part of the due diligence process, and to address this data gap, sediment samples were collected both adjacent to the Site to evaluate potential Site impacts and to the east of the Site in Salmon Bay to evaluate Salmon Bay ambient conditions. The samples collected to the east of the Site in Salmon Bay are referred to hereafter as ambient samples. Data from samples collected on the Site and adjacent to the Site were compared to the SMS freshwater criteria for the protection of the benthic community in freshwater sediment (WAC 173-204-563).

SUMMARY OF FIELD ACTIVITIES

On August 1, 2018, Floyd|Snider and their subcontractor Research Support Services (RSS) collected six discrete surface sediment grab samples from the 0- to 10-centimeter (cm) biologically active zone using a vessel-based power grab sampler within the limits of the property. Surface sample locations TOC-SS-01 through TOC-SS-06 are shown on Figure 3.

In March 2019, Floyd|Snider and RSS collected an additional eight discrete surface sediment grab samples from the 0-to 10-cm interval. Five samples were collected within the immediate vicinity of the Site, adjacent to the dock used for former TOC loading operations and three samples were collected within Salmon Bay, approximately 1,000 feet to the east of the Site, to evaluate ambient Salmon Bay concentrations. Surface sample locations TOC-SS-07 through TOC-SS-11 and SB-SS-01 through SB-SS-03 are shown on Figure 3. In addition, three sediment cores were advanced by RSS using a vessel-based vibracorer in the immediate vicinity of the Site, two on-property and one north of the dock. Sediment core locations TOC-SC-01 through TOC-SC-03 are shown on Figure 3.

All field activities were performed in accordance with the SAP/QAPP and SAP/QAPP Addendum (Floyd|Snider 2018 and 2019), with the following modification. In March 2019, as requested by Ecology, an additional core was collected near the shoreline of the East Waterfront Property for a total of three cores, rather than the two proposed in the SAP/QAPP Addendum. The sample collection and processing logs are included in Attachment 1.

Sample Collection

The surface sediment samples were collected using a vessel-based power grab sampler. The grab sampler is capable of collecting an undisturbed surface sediment sample. Sediment samples were collected from the 0- to 10-cm biologically active zone and were visually classified and recorded on the surface sediment collection form (Attachment 1).

The sediment cores were advanced using vibracore methodology. The vibracore used aluminum core tubes with polycarbonate liners inside a rigid external tube approximately 4 inches in outer diameter and 3.5 inches in inner diameter. The cores were advanced into native sediment, to a maximum depth of 6.6 feet. Percent recovery for the accepted cores ranged from 69 to 89 percent and averaged 78 percent.

Sample Processing

The surface sediment samples and the core samples were processed on the boat. Sulfide sample collection required a special procedure. Sulfide samples were collected immediately after accepting a grab sample for use, or immediately after opening a sediment core. Sulfides samples were immediately preserved using 5 milliliters (mL) of zinc acetate.

Disposal of Investigation-Derived Waste

Investigation-derived waste included excess sediment from grab sampling and core sample collection, as well as disposable materials used during field work (e.g., disposable personal protective equipment, plastic sheeting, paper towels). Per the USACE, sediment could not be returned to Salmon Bay; therefore, excess sediment was placed in drums and temporarily stored on the Bulk Terminal Property for off-site disposal. A total of one drum is temporarily being stored on the Bulk Terminal Property pending off-site disposal.

FIELD OBSERVATIONS

Surface sediment collected on-site and in the vicinity of the Site generally consisted of gray silt with trace fine sand, or a fine sand with trace silt. Samples collected from Salmon Bay were similar except at location SB-SS-02 which consisted of a fine silty, sand. Field observations of contamination were not apparent, with the exception of what appeared to be sand blast grit in sample TOC-SS-02.

Core samples consisted of silty, fine sand or sandy silt at the surface, which graded to fine sand between 0.5 to 2.1 feet, depending on the core sample. The fine sand, which lacked vegetative material or woody debris, was presumed to be native material. Layers of silty clay were present in core samples from locations TOC-SC-01 and TOC-SC-03 within the 3- to 5-foot range of the cores. Glacial till was observed in core sample TOC-SC-02 from 3.6 feet to the bottom of the core at 4.9 feet. Field observations of contamination were not apparent in the core samples, with the

exception of the observation of a metallic sheen and a mild petroleum-like odor from 0 to 1.5 feet in core sample TOC-SC-02.

ANALYTICAL RESULTS

A summary of the key findings of surface and subsurface analytical results is provided below. A summary of surface sediment analytical data is provided in Table 1, a summary of subsurface sediment analytical data is provided in Table 2, and the laboratory report is included in Attachment 2. Surface sediment sample and sediment core locations are shown on Figure 3.

Surface Sediment

Each surface sediment sample was analyzed for the Sediment Management Standards (SMS) freshwater sediment chemicals and dioxins/furans. Surface sediment data were compared to the SMS freshwater Sediment Cleanup Objective (SCO) and Cleanup Screening Level (CSL) and are presented in Table 1. A brief summary of the key findings follows:

- **Conventionals.** Detected concentrations of ammonia ranged from 2.7 to 43 milligrams per kilogram (mg/kg). Ammonia concentrations in the ambient samples ranged from 6.5 to 14 mg/kg. None of the samples exceeded the SMS criteria.

Sulfides were detected in all Site samples. Concentrations in Site samples ranged from 2.7 to 3,500 mg/kg. Sulfides were detected in two of the three ambient samples, with concentrations of 330 and 940 mg/kg. The sulfide concentrations in 8 of the 11 Site samples exceeded the SCO of 39 mg/kg and CSL of 61 mg/kg. The maximum sulfide concentration was from TOC-SS-11. Two of the ambient samples also exceeded the sulfide SCO and CSL.

- **Metals.** Metals were detected at all Site and ambient locations. Concentrations of arsenic, chromium, copper, and nickel exceeded the SMS criteria in one or more of the Site samples; and concentrations of arsenic, mercury, and nickel exceeded the SMS criteria in one or more of the ambient samples.

Concentrations of arsenic in Site samples ranged from 7.4 to 89 mg/kg, and exceeded the SCO of 14 mg/kg in 8 of the 11 samples. Concentrations of arsenic in the ambient samples ranged from 4.6 to 31 mg/kg and exceeded the SCO at one location. None of the samples exceeded the CSL of 120 mg/kg.

Concentrations of nickel in Site samples ranged from 23 to 240 mg/kg and exceeded the SCO of 26 mg/kg in 9 of the 11 samples, and the CSL of 110 mg/kg in 1 sample. Concentrations of nickel in the ambient samples ranged from 23 to 36 mg/kg and exceeded the SCO in two of the three samples.

Concentrations of chromium in Site samples ranged from 23 to 160 mg/kg and exceeded the SCO of 72 mg/kg and the CSL of 88 mg/kg in two samples.

Concentrations of chromium in the ambient samples ranged from 29 to 49 mg/kg and did not exceed the SMS criteria.

Concentrations of copper in the Site samples ranged from 46 to 680 mg/kg and exceeded the SCO of 400 mg/kg in one sample. Concentrations of copper in the ambient samples ranged from 23 to 230 mg/kg and did not exceed the SMS criteria.

Concentrations of mercury in the Site samples ranged from 0.13 to 0.60 mg/kg and did not exceed the SMS criteria. Mercury was detected in two of the three ambient samples with detected concentrations of 0.54 and 0.83 mg/kg. The greatest ambient sample concentration (0.83 mg/kg) exceeded the SCO of 0.66 mg/kg and the CSL of 0.80 mg/kg.

Concentrations of lead in the Site samples ranged from 40 to 190 mg/kg, and concentrations in the ambient samples ranged from 5.6 to 160 mg/kg. None of the samples exceeded the SMS criteria.

- **Organometallic Compounds.** Concentrations of tributyltin in Site samples and ambient samples were similar. Concentrations in Site samples ranged from 0.024 to 0.14 mg/kg, exceeding the SCO of 0.047 mg/kg in 7 of 11 samples. Ambient concentrations ranged from 0.0014 to 0.17 mg/kg, exceeding the SCO in two of the three samples. None of the other organometallic compounds exceeded the SMS criteria.
- **Polycyclic Aromatic Hydrocarbons.** Polycyclic aromatic hydrocarbons (PAHs) were generally detected at low concentrations in all Site and ambient samples, except for TOC-SS-02. At this location, the Total PAH concentration of 49 mg/kg exceeded the SCO of 17 mg/kg and slightly exceeded the CSL of 30 mg/kg.
- **Semivolatile Organic Compounds.** Semivolatile organic compounds (SVOCs) were detected in all Site samples and in two of the three ambient samples. Concentrations of bis(2-ethylhexyl)phthalate, carbazole, dibenzofuran, and di-n-octyl phthalate exceeded the SCO but not the CSL in one or more of the Site samples. There were no SVOC exceedances in the ambient samples; however, the concentration of bis(2-ethylhexyl)phthalate in SB-SS-01 was 0.5 mg/kg, which was equal to the SCO.
- **Pesticides.** Dichlorodiphenyltrichloroethane (DDT) and/or the DDT metabolites (dichlorodiphenyldichloroethane [DDD] and dichlorodiphenyldichloroethylene [DDE]) were detected at low concentrations in the Site samples and in two of the three ambient samples. None of the concentrations exceeded the SMS criteria. Beta-hexachlorocyclohexane, dieldrin, and endrin ketone were not detected in any samples.
- **Polychlorinated Biphenyls.** Total polychlorinated biphenyl (PCB) Aroclors were detected in the field duplicate of TOC-SS-11 and in the ambient sample SB-SS-01. Both concentrations were less than the SCO of 0.11 mg/kg. PCB Aroclors were not detected in any other surface sediment samples.

- **Total Petroleum Hydrocarbons.** Total petroleum hydrocarbon (TPH; diesel) concentrations were non-detect at all locations, except the ambient location SB-SS 03. TPH (residual) concentrations were detected in 5 of the 11 Site samples, and in two of the three ambient samples. None of the samples exceeded the SMS criteria.
- **Dioxins/Furans.** The dioxin/furan toxic equivalent (TEQ) in the Site samples ranged from 4.88×10^{-06} to 5.72×10^{-05} mg/kg, and averaged 3.88×10^{-05} mg/kg. The dioxin/furan TEQ in the ambient samples ranged from 7.68×10^{-07} to 4.32×10^{-05} mg/kg, and averaged 2.77×10^{-05} . There are no SMS criteria for dioxins/furans; however, dioxin/furan TEQ concentrations in the Site samples are consistent with concentrations in the ambient samples.

Subsurface Sediment

Subsurface sediment samples were analyzed from each core for the SMS freshwater sediment chemicals and dioxins/furans. Subsurface sediment data were compared to the SMS freshwater SCO and CSL and are presented in Table 2. A brief summary of the key findings follows:

- **Conventionals.** Detected concentrations of ammonia ranged from 4.1 to 48 mg/kg. None of the samples exceeded the SCO of 230 mg/kg.

Detected sulfide concentrations ranged from 11 to 710 mg/kg. The sulfide concentrations at two of the three core locations exceeded the SCO of 39 mg/kg and the CSL of 61 mg/kg. The maximum sulfide concentration was from the 0.5- to 1.2-foot interval of TOC-SC-02.

- **Metals.** Metals were detected in all of the core samples. Concentrations of mercury and nickel exceeded the SMS criteria in one or more of the Site samples. All other metals were detected at concentrations less than the SMS criteria. Mercury was detected in two core samples at concentrations of 0.19 and 0.72 mg/kg. The concentration of 0.72 mg/kg from the 0.5- to 1.2-foot interval of TOC-SC-02 exceeded the SCO of 0.66 mg/kg, but did not exceed the CSL of 0.80 mg/kg. The mercury concentration from TOC-SC-02-0.5-1.2 was less than the mercury concentration of the surface sediment ambient sample SB-SS-01 of 0.83 mg/kg. Mercury was not detected in the remaining core samples.

Concentrations of nickel ranged from 25 to 51 mg/kg and exceeded the SCO of 26 mg/kg at all core locations and in five of the six samples.

Concentrations of arsenic ranged from 3.2 to 14 mg/kg. The maximum arsenic concentration was equal to but did not exceed the SCO. Concentrations of lead ranged from 1.9 to 140 mg/kg and did not exceed the SCO.

- **Organometallic Compounds.** Concentrations of tributyltin ranged from 0.0021 to 0.26 mg/kg. Two of the three samples from TOC-SC-02 exceeded the SCO of 0.047 mg/kg. None of the other organometallic compounds exceeded the SMS criteria.

- **Polycyclic Aromatic Hydrocarbons.** PAHs were detected at low concentrations in the two upper sample intervals from TOC-SS-02. PAHs were not detected at TOC-SC-01 or TOC-SC-03. There were no exceedances of the SMS criteria for Total PAHs.
- **Semivolatile Organic Compounds.** SVOCs were non-detect in all samples except TOC-SC-02-0.5-1.2. Bis(2-ethylhexyl)phthalate was detected at a concentration of 0.17 mg/kg, but was less than the SCO of 0.5 mg/kg. Di-n-octyl phthalate was detected at a concentration of 0.04 mg/kg, which slightly exceeded the SCO of 0.039 mg/kg, but not the CSL of 1.1 mg/kg.
- **Pesticides.** Pesticides were not detected in the core samples.
- **Polychlorinated Biphenyls.** Total PCB Aroclors were only detected in sample TOC-SC-02-0.5-1.2. The detected concentration of 0.0053 mg/kg was less than the SCO of 0.11 mg/kg.
- **Total Petroleum Hydrocarbons.** TPH (diesel) concentrations were non-detect in all samples, except TOC-SC-02-0.5-1.2. At this location, the TPH (diesel) concentration of 870 mg/kg exceeded the SCO of 340 mg/kg and the CSL of 510 mg/kg. TPH (residual) concentrations were detected at concentrations of 900 and 410 mg/kg in two of the samples from TOC-SC-02. None of the TPH (residual) results exceeded the SMS criteria.
- **Dioxins/Furans.** Concentrations of dioxins/furans in the Site samples ranged from 2.94×10^{-07} to 5.31×10^{-05} mg/kg, and averaged 1.25×10^{-05} . The dioxin/furan TEQ in the ambient surface sediment samples ranged from 7.68×10^{-07} to 4.32×10^{-05} mg/kg, and averaged 2.77×10^{-05} . There are no SMS criteria for dioxins/furans, however, dioxin/furan TEQ concentrations in the Site subsurface sediment samples are consistent with concentrations in the ambient samples.

DATA VALIDATION

A Compliance Screening (Stages 1 & 2A) data quality review was performed on metals, TPH, PCBs, SVOCs, ammonia, butyl tins, and pesticide data resulting from laboratory analysis. The analytical data were validated in accordance with the *National Functional Guidelines for Inorganic Superfund Methods Data Review* (USEPA 2017a) and *National Functional Guidelines for Organic Superfund Data Review* (USEPA 2017b). Dioxins/furans were also analyzed and were validated by EcoChem under a separate data validation report. The Data Validation Summary describing the Compliance Screening and the Data Validation Report prepared by EcoChem are included in Attachment 3. All sample delivery groups met U.S. Environmental Protection Agency requirements. Based on the data quality review, data were determined to be of acceptable quality for use as qualified in the data tables.

REFERENCES

- Floyd|Snider. 2018. *Surface Sediment Quality Evaluation Sampling and Analysis Plan/Quality Assurance Project Plan*. Prepared for Cantera Development Group, LLC. July.
- Floyd|Snider. 2019. *Addendum to the Surface Sediment Quality Evaluation Sampling and Analysis Plan/Quality Assurance Project Plan*. Prepared for Cantera Development Group, LLC. February.
- U.S. Environmental Protection Agency (USEPA). 2017a. National Functional Guidelines for Inorganic Superfund Methods Data Review. Prepared by the Office of Superfund Remediation and Technology Innovation. EPA-540-R-2017-001/OLEM 9355.0-135. January.
- _____. 2017b. National Functional Guidelines for Organic Superfund Methods Data Review. Prepared by the Office of Superfund Remediation and Technology Innovation. EPA-540-R-2017-002/OLEM 9355.0-136. January.

LIST OF ATTACHMENTS

- Table 1 Surface Sediment Data Summary
- Table 2 Subsurface Sediment Data Summary
- Figure 1 Site Location Map
- Figure 2 Site Vicinity Map
- Figure 3 Sediment Sample Locations
- Attachment 1 Field Forms
- Attachment 2 Laboratory Reports
- Attachment 3 Data Validation Reports

Tables

Table 1
Surface Sediment Data Summary

Location					TOC-SS-01	TOC-SS-02	TOC-SS-03		TOC-SS-04	TOC-SS-05	TOC-SS-06	TOC-SS-07	TOC-SS-08	TOC-SS-09
Sample ID					TOC-SS-01-0-10	TOC-SS-02-0-10	TOC-SS-03-0-10	TOC-SS-03D-0-10	TOC-SS-04-0-10	TOC-SS-05-0-10	TOC-SS-06-0-10	TOC-SS-07-0-10	TOC-SS-08-0-10	TOC-SS-09-0-10
Sample Date					08/01/2018	08/01/2018	08/01/2018	08/01/2018	08/01/2018	08/01/2018	08/01/2018	03/20/2019	03/20/2019	03/20/2019
Sample Depth					0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm
Sample Type					N	N	N	FD	N	N	N	N	N	N
Easting ⁽¹⁾					1255802.255	1255913.851	1256015.792	1256015.792	1255740.367	1255883.729	1256015.382	1255676.602	1255774.357	1255928.224
Northing ⁽¹⁾					245910.667	245930.755	245944.616	245944.616	246066.554	246048.212	246042.938	246116.012	246238.462	246146.428
Chemical	CAS Number	SMS Freshwater Sediment - SCO	SMS Freshwater Sediment - CSL	Units										
Conventionals														
Ammonia	7664-41-7	230	300	mg/kg	24	19 J	39	43	9.3	28	27	3.3 U	5.1	2.9
Sulfides	18496-25-8	39	61	mg/kg	2,200	870	2,800	2,800	1,800	1,300	1,500	1,900	23	2.7
Metals														
Arsenic	7440-38-2	14	120	mg/kg	89	70 J	20	21	20	17	16	15 J	14	8.1
Cadmium	7440-43-9	2.1	5.4	mg/kg	1.3	1.6 J	1	1.2	0.98	0.86	0.71	0.66 J	0.29	0.21 U
Chromium	7440-47-3	72	88	mg/kg	100	160 J	53	59	57	50	47	41	39	23
Copper	7440-50-8	400	1200	mg/kg	680	310 J	340	380	350	290	270	210	120	46
Lead	7439-92-1	360	1300	mg/kg	180	120 J	140	150	140	120	110	120 J	71	43
Mercury	7439-97-6	0.66	0.8	mg/kg	0.49	0.49	0.52	0.59	0.54	0.52	0.49	0.55	0.26	0.13
Nickel	7440-02-0	26	110	mg/kg	47	240 J	45	50	47	40	34	35	33	23
Selenium	7782-49-2	11	20	mg/kg	1.5 U	1.1 UJ	2.3 U	2.1	2.2 U	2.1 U	1.8 U	1.4 J	0.97	0.8
Silver	7440-22-4	0.57	1.7	mg/kg	0.44	0.35 J	0.46 U	0.42 U	0.44 U	0.43 U	0.35 U	0.34 J	0.24	0.11 U
Zinc	7440-66-6	3200	4200	mg/kg	1,900	1,100 J	640	730	570	490	410	340	190	100
Organometallic Compounds														
Monobutyltin	78763-54-9	0.54	4.8	mg/kg	0.0074	0.011	0.0072	0.0072	0.0089	0.009	0.0074	0.0077	0.011	0.011
Dibutyltin	1002-53-5	0.91	130	mg/kg	0.024	0.032	0.024	0.022	0.03	0.028	0.021	0.029	0.075	0.057
Tributyltin	36643-28-4	0.047	0.32	mg/kg	0.069	0.034	0.051	0.045	0.07	0.046	0.053	0.081	0.14	0.097
Tetrabutyltin	1461-25-2	0.097	0.097	mg/kg	0.0049 U	0.005 U	0.0049 U	0.005 U	0.005 U	0.0049 U	0.005 U	0.0049 U	0.0049 U	0.0049 U
Polycyclic Aromatic Hydrocarbons (PAHs)														
2-Methylnaphthalene	91-57-6	NA	NA	mg/kg	0.05 U	0.078	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.041 U	0.041 U	0.037 U
Acenaphthene	83-32-9	NA	NA	mg/kg	0.1	0.35 J	0.05 U	0.05 U	0.053	0.05 U	0.092	0.041 U	0.041 U	0.037 U
Acenaphthylene	208-96-8	NA	NA	mg/kg	0.091	0.079	0.05 U	0.05 U	0.092	0.085	0.093	0.05	0.041 U	0.037 U
Anthracene	120-12-7	NA	NA	mg/kg	0.24	0.72 J	0.18	0.05 U	0.13	0.43	0.2	0.067	0.11	0.13
Benz(a)anthracene	56-55-3	NA	NA	mg/kg	1.1	3.7 J	0.24	0.14	0.42	0.8	0.62	0.39	0.43	0.61
Benzo(a)pyrene	50-32-8	NA	NA	mg/kg	0.92	3.5 J	0.25	0.18	0.41	0.49	0.49	0.43	0.62	0.58
Benzo(b)fluoranthene	205-99-2	NA	NA	mg/kg	2.4	4.1 J	0.68	0.55	1.1	1.3	1.4	0.35 J	0.48 J	0.6 J
Benzo(g,h,i)perylene	191-24-2	NA	NA	mg/kg	0.41 J	1.7 J	0.16 J	0.065 J	0.24 J	0.3 J	0.23 J	0.34	0.37	0.29
Benzo(k)fluoranthene	207-08-9	NA	NA	mg/kg	0.95	3.3 J	0.25	0.14	0.86	0.51	0.48	0.38	0.41	0.49
Chrysene	218-01-9	NA	NA	mg/kg	1.4	4.9 J	0.39	0.25	0.66	1.5	0.94	0.37	0.54	0.83
Dibenz(a,h)anthracene	53-70-3	NA	NA	mg/kg	0.24	0.96 J	0.06	0.05 U	0.082	0.15	0.096	0.08	0.13	0.095
Fluoranthene	206-44-0	NA	NA	mg/kg	2.2	10 J	0.62	0.37	0.93	1.1	1.8	0.57	1	1.4
Fluorene	86-73-7	NA	NA	mg/kg	0.12	0.55 J	0.05 U	0.05 U	0.063	0.12	0.13	0.041 U	0.041 U	0.037 U
Indeno(1,2,3-cd)pyrene	193-39-5	NA	NA	mg/kg	0.43	1.7 J	0.15	0.064	0.24	0.27	0.23	0.28	0.33	0.22
Naphthalene	91-20-3	NA	NA	mg/kg	0.13	0.12	0.05 U	0.05 U	0.068	0.079	0.091	0.052	0.041 U	0.037 U
Phenanthrene	85-01-8	NA	NA	mg/kg	0.83	5.9 J	0.19	0.099	0.29	0.63	0.7	0.18	0.32	0.2
Pyrene	129-00-0	NA	NA	mg/kg	1.9	7.6 J	0.54	0.34	0.89	0.99	1.5	0.54	0.93	1.2
Total cPAH TEQ	CPAHTEQ	NA	NA	mg/kg	1.4	4.9 J	0.39	0.27	0.69	0.81	0.78	0.58 J	0.8 J	0.79 J
Total PAHs	tPAH_U0	17	30	mg/kg	13 J	49 J	3.8 J	2.3 J	6.5 J	8.8 J	9.1 J	4.1 J	5.7 J	6.5 J
Semivolatile Organic Compounds														
Benzoic Acid	65-85-0	2.9	3.8	mg/kg	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.51 U	0.52 U	0.46 U
Bis(2-ethylhexyl)phthalate	117-81-7	0.5	22	mg/kg	0.85	0.63	0.51	0.32	0.91	0.91	0.76	0.29	3.3	1.2
Carbazole	86-74-8	0.9	1.1	mg/kg	0.089	0.95 J	0.075 U	0.075 U	0.075 U	0.074 U	0.075 U	0.077 U	0.077 U	0.069 U

Table 1
Surface Sediment Data Summary

Location					TOC-SS-10	TOC-SS-11		SB-SS-01	SB-SS-02	SB-SS-03
Sample ID					TOC-SS-10-0-10	TOC-SS-11-0-10	TOC-SS-11-1-0-10	SB-SS-01-0-10	SB-SS-02-0-10	SB-SS-03-0-10
Sample Date					03/20/2019	03/20/2019	03/20/2019	03/20/2019	03/20/2019	03/20/2019
Sample Depth					0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm
Sample Type					N	N	FD	N	N	N
Easting ⁽¹⁾					1256069.713	1256100.05	1256100.05	1256822.509	1257101.989	1257373.15
Northing ⁽¹⁾					246111.352	245951.879	245951.879	246211.786	246195.919	246035.413
Chemical	CAS Number	SMS Freshwater Sediment - SCO	SMS Freshwater Sediment - CSL	Units						
Conventionals										
Ammonia	7664-41-7	230	300	mg/kg	2.7	18	34	14	8.8	6.5
Sulfides	18496-25-8	39	61	mg/kg	3.2	3,300	3,500	330	1.3 U	940
Metals										
Arsenic	7440-38-2	14	120	mg/kg	7.4	17	17	31	4.6	12
Cadmium	7440-43-9	2.1	5.4	mg/kg	0.21 U	0.93	0.88	0.65	0.22 U	0.38 U
Chromium	7440-47-3	72	88	mg/kg	26	50	49	49	35	29
Copper	7440-50-8	400	1200	mg/kg	54	330	300	230	23	150
Lead	7439-92-1	360	1300	mg/kg	40	190	140	160	5.6	65
Mercury	7439-97-6	0.66	0.8	mg/kg	0.16	0.53	0.6	0.83	0.091 U	0.54
Nickel	7440-02-0	26	110	mg/kg	24	42	38	35	36	23
Selenium	7782-49-2	11	20	mg/kg	0.94	2 U	2.1 U	1.6	1.2	0.97
Silver	7440-22-4	0.57	1.7	mg/kg	0.1 U	0.4 U	0.43 U	0.33	0.11 U	0.2
Zinc	7440-66-6	3200	4200	mg/kg	110	600	630	370	50	170
Organometallic Compounds										
Monobutyltin	78763-54-9	0.54	4.8	mg/kg	0.0047	0.0044	0.0036 JQ	0.0071	0.0041 U	0.016
Dibutyltin	1002-53-5	0.91	130	mg/kg	0.014	0.016	0.017	0.085	0.0058 U	0.052
Tributyltin	36643-28-4	0.047	0.32	mg/kg	0.024	0.037	0.03	0.17	0.0014 JQ	0.09
Tetrabutyltin	1461-25-2	0.097	0.097	mg/kg	0.0049 U	0.005 U	0.005 U	0.0052	0.005 U	0.005 U
Polycyclic Aromatic Hydrocarbons (PAHs)										
2-Methylnaphthalene	91-57-6	NA	NA	mg/kg	0.04 U	0.039 U	0.04 U	0.11	0.04 U	0.04 U
Acenaphthene	83-32-9	NA	NA	mg/kg	0.04 U	0.039 U	0.04 U	0.093	0.04 U	0.052
Acenaphthylene	208-96-8	NA	NA	mg/kg	0.04 U	0.039 U	0.04 U	0.097	0.04 U	0.052
Anthracene	120-12-7	NA	NA	mg/kg	0.1	0.039 U	0.058	0.2	0.04 U	0.18
Benz(a)anthracene	56-55-3	NA	NA	mg/kg	0.48	0.11	0.2	0.58	0.04 U	0.88
Benzo(a)pyrene	50-32-8	NA	NA	mg/kg	0.45	0.13	0.24	0.77	0.04 U	1.8
Benzo(b)fluoranthene	205-99-2	NA	NA	mg/kg	0.41 J	0.13 J	0.23 J	0.65 J	0.04 U	1.2 J
Benzo(g,h,i)perylene	191-24-2	NA	NA	mg/kg	0.26	0.12	0.16	0.52	0.04 U	1.2
Benzo(k)fluoranthene	207-08-9	NA	NA	mg/kg	0.36	0.14	0.16	0.59	0.04 U	1.3
Chrysene	218-01-9	NA	NA	mg/kg	0.63	0.16	0.34	0.82	0.04 U	1
Dibenz(a,h)anthracene	53-70-3	NA	NA	mg/kg	0.12	0.039 U	0.052	0.21	0.04 U	0.55
Fluoranthene	206-44-0	NA	NA	mg/kg	1.2	0.28	0.45	1.4	0.04 U	1
Fluorene	86-73-7	NA	NA	mg/kg	0.04 U	0.039 U	0.04 U	0.17	0.04 U	0.066
Indeno(1,2,3-cd)pyrene	193-39-5	NA	NA	mg/kg	0.25	0.11	0.15	0.4	0.04 U	1.1
Naphthalene	91-20-3	NA	NA	mg/kg	0.04 U	0.039 U	0.04 U	0.36	0.04 U	0.045
Phenanthrene	85-01-8	NA	NA	mg/kg	0.28	0.11	0.17	0.64	0.04 U	0.47
Pyrene	129-00-0	NA	NA	mg/kg	1	0.23	0.39	1.4	0.04 U	0.95
Total cPAH TEQ	CPAHTEQ	NA	NA	mg/kg	0.62 J	0.19 J	0.32 J	1 J	0.03 U	2.3 J
Total PAHs	tPAH_UO	17	30	mg/kg	5.6 J	1.5 J	2.6 J	8.9 J	0.04 U	12 J
Semivolatile Organic Compounds										
Benzoic Acid	65-85-0	2.9	3.8	mg/kg	0.5 U	0.49 U	0.5 U	0.5 U	0.5 U	0.5 U
Bis(2-ethylhexyl)phthalate	117-81-7	0.5	22	mg/kg	1.4	0.15	0.16	0.5	0.1 U	0.23
Carbazole	86-74-8	0.9	1.1	mg/kg	0.074 U	0.074 U	0.075 U	0.074	0.075 U	0.22

Table 1
Surface Sediment Data Summary

Location					TOC-SS-01	TOC-SS-02	TOC-SS-03		TOC-SS-04	TOC-SS-05	TOC-SS-06	TOC-SS-07	TOC-SS-08	TOC-SS-09
Sample ID					TOC-SS-01-0-10	TOC-SS-02-0-10	TOC-SS-03-0-10	TOC-SS-03D-0-10	TOC-SS-04-0-10	TOC-SS-05-0-10	TOC-SS-06-0-10	TOC-SS-07-0-10	TOC-SS-08-0-10	TOC-SS-09-0-10
Sample Date					08/01/2018	08/01/2018	08/01/2018	08/01/2018	08/01/2018	08/01/2018	08/01/2018	03/20/2019	03/20/2019	03/20/2019
Sample Depth					0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm
Sample Type					N	N	N	FD	N	N	N	N	N	N
Easting ⁽¹⁾					1255802.255	1255913.851	1256015.792	1256015.792	1255740.367	1255883.729	1256015.382	1255676.602	1255774.357	1255928.224
Northing ⁽¹⁾					245910.667	245930.755	245944.616	245944.616	246066.554	246048.212	246042.938	246116.012	246238.462	246146.428
Chemical	CAS Number	SMS Freshwater Sediment - SCO	SMS Freshwater Sediment - CSL	Units										
Semivolatile Organic Compounds (cont.)														
Dibenzofuran	132-64-9	0.2	0.68	mg/kg	0.075 U	0.23 J	0.075 U	0.075 U	0.075 U	0.074 U	0.075 U	0.077 U	0.077 U	0.069 U
Di-n-butyl phthalate	84-74-2	0.38	1	mg/kg	0.1 U	0.1 U	0.099 U	0.1 U	0.1 U	0.099 U	0.1 U	0.1 U	0.1 U	0.092 U
Di-n-octyl phthalate	117-84-0	0.039	1.1	mg/kg	0.12	0.12 J	0.076	0.052	0.11	0.1	0.071	0.041 J	0.021 J	0.01 U
Pentachlorophenol	87-86-5	1.2	1.2	mg/kg	0.13 J	0.1 U	0.099 U	0.1 U	0.1 U	0.099 U	0.1 U	0.1 U	0.1 U	0.092 U
Phenol	108-95-2	0.12	0.21	mg/kg	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.1 U	0.1 U	0.092 U
Pesticides ⁽²⁾														
Beta-Hexachlorocyclohexane	319-85-7	0.0072	0.011	mg/kg	0.00063 U	0.00063 U	0.0021 U	0.002 U	0.002 U	0.0019 U	0.0017 U	0.0033 U	0.0017 U	0.0016 U
Dieldrin	60-57-1	0.0049	0.0093	mg/kg	0.0011 U	0.0011 U	0.0037 U	0.0036 U	0.0035 U	0.0034 U	0.0031 U	<i>0.0063 U</i>	0.0032 U	0.0031 U
Total DDDs	tDDD_U0	0.31	0.86	mg/kg	0.0011 U	0.0023 JQ	0.0048 JQ	0.0061 JQ	0.0056 JQ	0.0053 JQ	0.0042 JQ	0.0063 U	0.0038	0.0031 U
Total DDEs	tDDE_U0	0.021	0.033	mg/kg	0.0038 JQ	0.0011 U	0.0037 U	0.0036 U	0.0035 U	0.0035 U	0.0031 U	0.0062 JQ	0.0032 U	0.0031 U
Total DDTs	tDDT_U0	0.1	8.1	mg/kg	0.0011 U	0.0011 U	0.0038 U	0.0037 U	0.0035 U	0.0035 U	0.0031 U	0.0063 U	0.0032 U	0.0031 U
Endrin ketone	53494-70-5	0.0085	na	mg/kg	0.0013 U	0.0013 U	0.0044 U	0.0043 U	0.0041 U	0.004 U	0.0036 U	0.0063 U	0.0032 U	0.0031 U
Polychlorinated Biphenyls (PCBs)														
Total PCB Aroclors	tPCBAr_U0	0.11	2.5	mg/kg	0.099 U	0.1 UJ	0.1 U	0.099 U	0.1 U	0.1 U	0.097 U	0.0069 U	0.0038 U	0.0035 U
Total Petroleum Hydrocarbons (TPHs)														
TPH (diesel)	TPHD	340	510	mg/kg	74 U	56 U	100 U	110 U	100 U	98 U	82 U	65 U	31 U	26 U
TPH (residual)	TPHO	3600	4400	mg/kg	190 U	140 U	260 U	270 U	260 U	250 U	200 U	1,000	490	220
Dioxins/furans														
Dioxin/furan TEQ	DFTEQ	NA	NA	mg/kg	4.13E-05 J	2.40E-05 J	5.64E-05	5.72E-05	5.33E-05	4.94E-05 J	4.65E-05 J	5.37E-05	1.79E-05	6.89E-06 J

Notes:
RED/BOLD The detected concentration exceeds the SMS SCO or CSL.
italics The non-detect concentration is greater than the SMS SCO or CSL.
 1 Coordinates are presented in Washington State Plane North NAD 83 Ft.
 2 Non-detect results are reported to the method detection limit because the reporting limits for several of the pesticides were greater than the SMS criteria.

Abbreviations:
 CAS Chemical Abstracts Service
 cPAH Carcinogenic polycyclic aromatic hydrocarbon
 CSL Cleanup Screening Level
 DDD Dichlorodiphenyldichloroethane
 DDE Dichlorodiphenyldichloroethylene
 DDT Dichlorodiphenyltrichloroethane
 FD Field duplicate
 mg/kg Milligrams per kilogram
 N Normal
 NA Not applicable
 NAD 83 North American Datum of 1983
 SCO Sediment Cleanup Objective
 SMS Sediment Management Standards
 TEQ Toxic equivalent

Qualifiers:
 J Analyte was detected, given result should be considered an estimate.
 JQ Analyte was detected between the method detection limit and reporting limit, concentration is considered an estimate.
 U Analyte was not detected at the given reporting limit.
 UJ Analyte was not detected, concentration given is reporting limit, which is considered to be an estimate.

Table 1
Surface Sediment Data Summary

Location					TOC-SS-10	TOC-SS-11			SB-SS-01	SB-SS-02	SB-SS-03
Sample ID					TOC-SS-10-0-10	TOC-SS-11-0-10	TOC-SS-111-0-10	SB-SS-01-0-10	SB-SS-02-0-10	SB-SS-03-0-10	
Sample Date					03/20/2019	03/20/2019	03/20/2019	03/20/2019	03/20/2019	03/20/2019	
Sample Depth					0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	0-10 cm	
Sample Type					N	N	FD	N	N	N	
Easting ⁽¹⁾					1256069.713	1256100.05	1256100.05	1256822.509	1257101.989	1257373.15	
Northing ⁽¹⁾					246111.352	245951.879	245951.879	246211.786	246195.919	246035.413	
Chemical	CAS Number	SMS Freshwater Sediment - SCO	SMS Freshwater Sediment - CSL	Units							
Semivolatile Organic Compounds (cont.)											
Dibenzofuran	132-64-9	0.2	0.68	mg/kg	0.074 U	0.074 U	0.075 U	0.13 J	0.075 U	0.075 U	
Di-n-butyl phthalate	84-74-2	0.38	1	mg/kg	0.099 U	0.098 U	0.1 U	0.099 U	0.1 U	0.1 U	
Di-n-octyl phthalate	117-84-0	0.039	1.1	mg/kg	0.011 U	0.011 U	0.011 U	0.06 J	0.011 U	0.011 U	
Pentachlorophenol	87-86-5	1.2	1.2	mg/kg	0.099 U	0.098 U	0.1 U	0.099 U	0.1 U	0.1 U	
Phenol	108-95-2	0.12	0.21	mg/kg	0.099 U	0.098 U	0.1 U	0.099 U	0.1 U	0.1 U	
Pesticides ⁽²⁾											
Beta-Hexachlorocyclohexane	319-85-7	0.0072	0.011	mg/kg	0.0017 U	0.0033 U	0.0017 U	0.0033 U	0.0016 U	0.0016 U	
Dieldrin	60-57-1	0.0049	0.0093	mg/kg	0.0032 U	<i>0.0065 U</i>	0.0033 U	<i>0.0065 U</i>	0.0032 U	0.0032 U	
Total DDDs	tDDD_U0	0.31	0.86	mg/kg	0.0032 U	0.0073	0.0084	0.0086	0.0032 U	0.0049	
Total DDEs	tDDE_U0	0.021	0.033	mg/kg	0.0032 U	0.0059 JQ	0.0029 JQ	0.0081	0.0032 U	0.003 JQ	
Total DDTs	tDDT_U0	0.1	8.1	mg/kg	0.0032 U	0.0065 U	0.051	0.0065 U	0.0032 U	0.0032 U	
Endrin ketone	53494-70-5	0.0085	na	mg/kg	0.0032 U	0.0065 U	0.0033 U	0.0065 U	0.0032 U	0.0032 U	
Polychlorinated Biphenyls (PCBs)											
Total PCB Aroclors	tPCBAr_U0	0.11	2.5	mg/kg	0.0038 U	0.012 U	0.0088 J	0.023 J	0.0038 U	0.0054 U	
Total Petroleum Hydrocarbons (TPHs)											
TPH (diesel)	TPHD	340	510	mg/kg	29 U	110 U	98 U	42 U	28 U	51	
TPH (residual)	TPHO	3600	4400	mg/kg	330	960	1,600	820	71 U	450	
Dioxins/furans											
Dioxin/furan TEQ	DFTEQ	NA	NA	mg/kg	4.88E-06 J	4.71E-05	4.60E-05	3.91E-05	7.68E-07 J	4.32E-05	

Notes:

RED/BOLD The detected concentration exceeds the SMS SCO or CSL.

italics The non-detect concentration is greater than the SMS SCO or CSL.

1 Coordinates are presented in Washington State Plane North NAD83 Ft.

2 Non-detect results are reported to the method detection limit because the reporting limits for several of the pesticides were greater than the SMS criteria.

Abbreviations:

- | | |
|---|-------------------------------------|
| CAS Chemical Abstracts Service | N Normal |
| cPAH Carcinogenic polycyclic aromatic hydrocarbon | NA Not applicable |
| CSL Cleanup Screening Level | NAD 83 North American Datum of 1983 |
| DDD Dichlorodiphenyldichloroethane | SCO Sediment Cleanup Objective |
| DDE Dichlorodiphenyldichloroethylene | SMS Sediment Management Standards |
| DDT Dichlorodiphenyltrichloroethane | TEQ Toxic equivalent |
| FD Field duplicate | |
| mg/kg Milligrams per kilogram | |

Qualifiers:

- J Analyte was detected, given result should be considered an estimate.
- JQ Analyte was detected between the method detection limit and reporting limit, concentration is considered an estimate.
- U Analyte was not detected at the given reporting limit.
- UJ Analyte was not detected, concentration given is reporting limit, which is considered to be an estimate.

Table 2
Subsurface Sediment Data Summary

Location					TOC-SC-01		TOC-SC-02			TOC-SC-03
Sample ID					TOC-SC-01-0.5-2.0	TOC-SC-01-2.5-4.0	TOC-SC-02-0.5-1.2	TOC-SC-02-1.2-2.2	TOC-SC-02-2.6-4.0	TOC-SC-03-0-0.5
Sample Date					03/21/2019	03/21/2019	03/21/2019	03/21/2019	03/21/2019	03/21/2019
Sample Depth					0.5-2 ft	2.5-4 ft	0.5-1.2 ft	1.2-2.2 ft	2.6-4 ft	0-0.5 ft
Sample Type					N	N	N	N	N	N
Easting ⁽¹⁾					1255950.583	1255950.583	1255990.07	1255990.07	1255990.07	1255988.46
Northing ⁽¹⁾					246149.59	246149.59	245934.228	245934.228	245934.228	245884.43
Chemical	CAS Number	SMS Freshwater Sediment - SCO	SMS Freshwater Sediment - CSL	Units						
Conventionals										
Ammonia	7664-41-7	230	300	mg/kg	6.9	17	48	30	20	4.1
Sulfides	18496-25-8	39	61	mg/kg	1.3 U	11	710	130	0.85 U	90
Metals										
Arsenic	7440-38-2	14	120	mg/kg	4.6	3.2	14	5.5	3.5	5.3
Cadmium	7440-43-9	2.1	5.4	mg/kg	0.22 U	0.19 U	0.86	0.36	0.17 U	0.19 U
Chromium	7440-47-3	72	88	mg/kg	24	35	33	25	29	34
Copper	7440-50-8	400	1200	mg/kg	9.4	13	93	32	14	15
Lead	7439-92-1	360	1300	mg/kg	2.7	1.9	140	39	2.4	4.1
Mercury	7439-97-6	0.66	0.8	mg/kg	0.092 U	0.073 U	0.72	0.19	0.067 U	0.075 U
Nickel	7440-02-0	26	110	mg/kg	30	51	30	25	39	38
Selenium	7782-49-2	11	20	mg/kg	0.93	0.91	1.3	0.92	1.2	1.2
Silver	7440-22-4	0.57	1.7	mg/kg	0.11 U	0.094 U	0.21	0.12 U	0.085 U	0.095 U
Zinc	7440-66-6	3200	4200	mg/kg	31	38	300	140	35	48
Organometallic Compounds										
Monobutyltin	78763-54-9	0.54	4.8	mg/kg	0.0041 U	0.0041 U	0.021	0.006	0.0041 U	0.0041 U
Dibutyltin	1002-53-5	0.91	130	mg/kg	0.0057 U	0.0058 U	0.12 J	0.044 J	0.0057 U	0.0033 JQ
Tributyltin	36643-28-4	0.047	0.32	mg/kg	0.0038 U	0.0038 U	0.26	0.063	0.0038 U	0.0021
Tetrabutyltin	1461-25-2	0.097	0.097	mg/kg	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Polycyclic Aromatic Hydrocarbons (PAHs)										
2-Methylnaphthalene	91-57-6	NA	NA	mg/kg	0.038 U	0.038 U	0.044	0.035 U	0.038 U	0.038 U
Acenaphthene	83-32-9	NA	NA	mg/kg	0.038 U	0.038 U	0.079	0.038	0.038 U	0.038 U
Acenaphthylene	208-96-8	NA	NA	mg/kg	0.038 U	0.038 U	0.08	0.045	0.038 U	0.038 U
Anthracene	120-12-7	NA	NA	mg/kg	0.038 U	0.038 U	0.093	0.035 U	0.038 U	0.038 U
Benz(a)anthracene	56-55-3	NA	NA	mg/kg	0.038 U	0.038 U	0.32	0.1	0.038 U	0.038 U
Benzo(a)pyrene	50-32-8	NA	NA	mg/kg	0.038 U	0.038 U	0.39	0.12	0.038 U	0.038 U
Benzo(b)fluoranthene	205-99-2	NA	NA	mg/kg	0.038 U	0.038 U	0.3 J	0.13 J	0.038 U	0.038 U
Benzo(g,h,i)perylene	191-24-2	NA	NA	mg/kg	0.038 U	0.038 U	0.28	0.13	0.038 U	0.038 U
Benzo(k)fluoranthene	207-08-9	NA	NA	mg/kg	0.038 U	0.038 U	0.31	0.08	0.038 U	0.038 U
Chrysene	218-01-9	NA	NA	mg/kg	0.038 U	0.038 U	0.4	0.13	0.038 U	0.038 U
Dibenz(a,h)anthracene	53-70-3	NA	NA	mg/kg	0.038 U	0.038 U	0.088	0.035 U	0.038 U	0.038 U
Fluoranthene	206-44-0	NA	NA	mg/kg	0.038 U	0.038 U	0.7	0.3	0.038 U	0.038 U
Fluorene	86-73-7	NA	NA	mg/kg	0.038 U	0.038 U	0.07	0.035 U	0.038 U	0.038 U
Indeno(1,2,3-cd)pyrene	193-39-5	NA	NA	mg/kg	0.038 U	0.038 U	0.23	0.069	0.038 U	0.038 U
Naphthalene	91-20-3	NA	NA	mg/kg	0.038 U	0.038 U	0.13	0.085	0.038 U	0.038 U
Phenanthrene	85-01-8	NA	NA	mg/kg	0.038 U	0.038 U	0.3	0.15	0.038 U	0.038 U
Pyrene	129-00-0	NA	NA	mg/kg	0.038 U	0.038 U	0.71	0.3	0.038 U	0.038 U
Total cPAH TEQ	CPAHTEQ	NA	NA	mg/kg	0.029 U	0.029 U	0.51 J	0.16 J	0.029 U	0.029 U
Total PAHs	tPAH_U0	17	30	mg/kg	0.038 U	0.038 U	4.5 J	1.7 J	0.038 U	0.038 U

Table 2
Subsurface Sediment Data Summary

Location					TOC-SC-01		TOC-SC-02			TOC-SC-03
Sample ID					TOC-SC-01-0.5-2.0	TOC-SC-01-2.5-4.0	TOC-SC-02-0.5-1.2	TOC-SC-02-1.2-2.2	TOC-SC-02-2.6-4.0	TOC-SC-03-0-0.5
Sample Date					03/21/2019	03/21/2019	03/21/2019	03/21/2019	03/21/2019	03/21/2019
Sample Depth					0.5-2 ft	2.5-4 ft	0.5-1.2 ft	1.2-2.2 ft	2.6-4 ft	0-0.5 ft
Sample Type					N	N	N	N	N	N
Easting ⁽¹⁾					1255950.583	1255950.583	1255990.07	1255990.07	1255990.07	1255988.46
Northing ⁽¹⁾					246149.59	246149.59	245934.228	245934.228	245934.228	245884.43
Chemical	CAS Number	SMS Freshwater Sediment - SCO	SMS Freshwater Sediment - CSL	Units						
Semivolatile Organic Compounds										
Benzoic Acid	65-85-0	2.9	3.8	mg/kg	0.47 U	0.48 U	0.46 U	0.44 U	0.47 U	0.48 U
Bis(2-ethylhexyl)phthalate	117-81-7	0.5	22	mg/kg	0.095 U	0.095 U	0.17	0.088 U	0.095 U	0.096 U
Carbazole	86-74-8	0.9	1.1	mg/kg	0.071 U	0.071 U	0.069 U	0.066 U	0.071 U	0.072 U
Dibenzofuran	132-64-9	0.2	0.68	mg/kg	0.071 U	0.071 U	0.069 U	0.066 U	0.071 U	0.072 U
Di-n-butyl phthalate	84-74-2	0.38	1	mg/kg	0.095 U	0.095 U	0.092 U	0.088 U	0.095 U	0.096 U
Di-n-octyl phthalate	117-84-0	0.039	1.1	mg/kg	0.011 U	0.011 U	0.04 J	0.0099 U	0.011 U	0.011 U
Pentachlorophenol	87-86-5	1.2	1.2	mg/kg	0.095 U	0.095 U	0.092 U	0.088 U	0.095 U	0.096 U
Phenol	108-95-2	0.12	0.21	mg/kg	0.095 U	0.095 U	0.092 U	0.088 U	0.095 U	0.096 U
Pesticides ⁽²⁾										
Beta-Hexachlorocyclohexane	319-85-7	0.0072	0.011	mg/kg	0.0017 U	0.0017 U	0.0034 U	0.0017 U	0.0017 U	0.0017 U
Dieldrin	60-57-1	0.0049	0.0093	mg/kg	0.0033 U	0.0033 U	<i>0.0066 U</i>	0.0033 U	0.0033 U	0.0033 U
Total DDDs	tDDD_U0	0.31	0.86	mg/kg	0.0033 U	0.0033 U	0.0066 U	0.0033 U	0.0033 U	0.0033 U
Total DDEs	tDDE_U0	0.021	0.033	mg/kg	0.0033 U	0.0033 U	0.0066 U	0.0033 U	0.0033 U	0.0033 U
Total DDTs	tDDT_U0	0.1	8.1	mg/kg	0.0033 U	0.0033 U	0.0066 U	0.0033 U	0.0033 U	0.0033 U
Endrin ketone	53494-70-5	0.0085	NA	mg/kg	0.0033 U	0.0033 U	0.0066 U	0.0033 U	0.0033 U	0.0033 U
Polychlorinated Biphenyls (PCBs)										
Total PCB Aroclors	tPCBAr_U0	0.11	2.5	mg/kg	0.0034 U	0.003 U	0.0053 J	0.0038 U	0.0027 U	0.0031 U
Total Petroleum Hydrocarbons (TPHs)										
TPH (diesel)	TPHD	340	510	mg/kg	26 U	22 U	870	31 U	20 U	23 U
TPH (residual)	TPHO	3,600	4,400	mg/kg	64 U	55 U	900	410	49 U	57 U
Dioxins/furans										
Dioxin/furan TEQ	DFTEQ	NA	NA	mg/kg	3.90E-07 J	3.13E-07 J	5.31E-05 J	8.25E-06 J	2.94E-07 J	NA

Notes:

RED/BOLD The detected concentration exceeds the SMS SCO or CSL.

italics The non-detect concentration is greater than the SMS SCO or CSL.

1 Coordinates are presented in Washington State Plane North NAD 83 Ft.

2 Non-detect results are reported to the method detection limit because the reporting limits for several of the pesticides were greater than the SMS criteria.

Abbreviations:

CAS Chemical Abstracts Service

cPAH Carcinogenic polycyclic aromatic hydrocarbon

CSL Cleanup Screening Level

DDD Dichlorodiphenyldichloroethane

DDE Dichlorodiphenyldichloroethylene

DDT Dichlorodiphenyltrichloroethane

mg/kg Milligrams per kilogram

N Normal

NA Not applicable

NAD 83 North American Datum of 1983

SCO Sediment Cleanup Objective

SMS Sediment Management Standards

TEQ Toxic equivalent

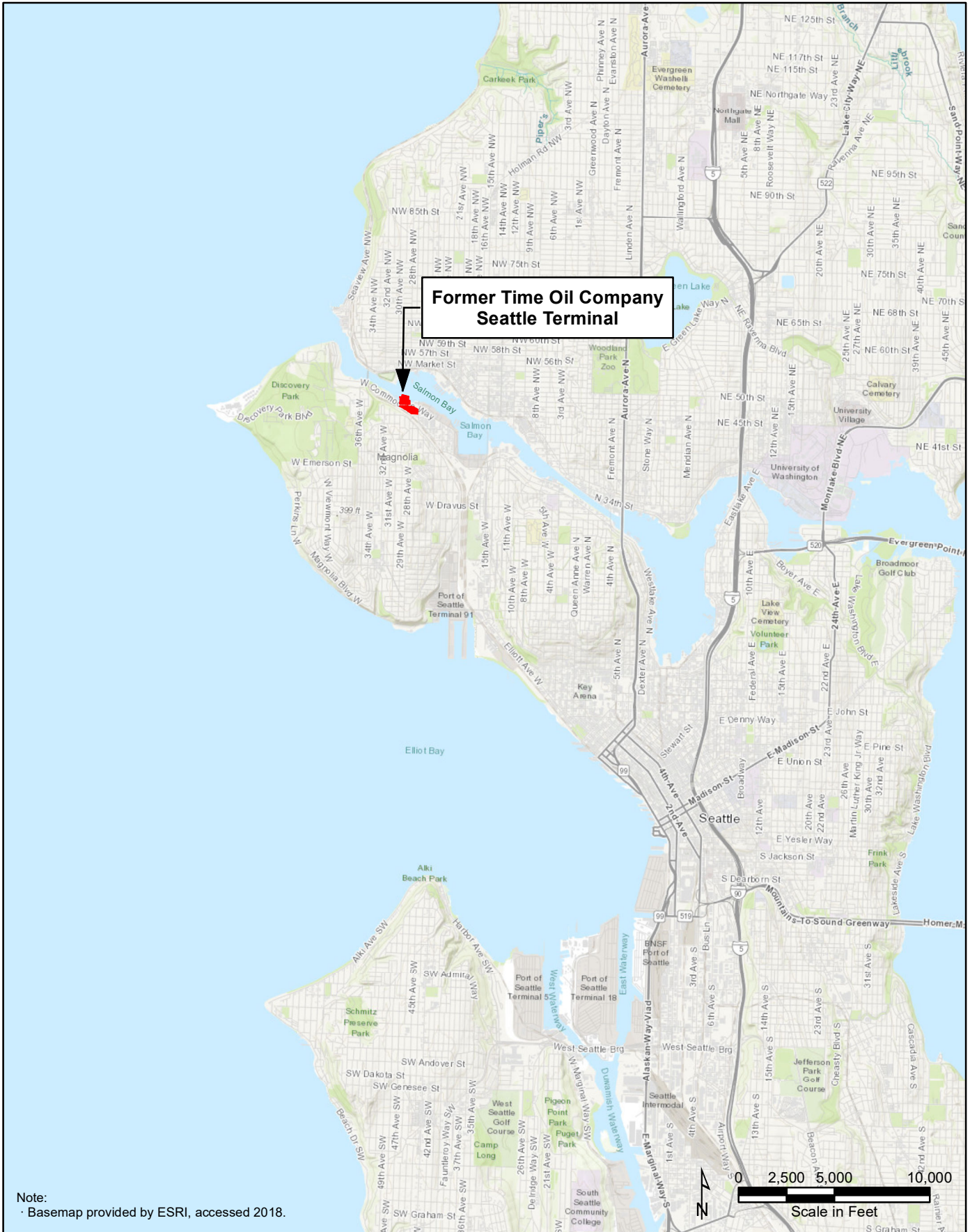
Qualifiers:

J Analyte was detected, given result should be considered an estimate.

JQ Analyte was detected between the method detection limit and reporting limit, concentration is considered an estimate.

U Analyte was not detected at the given reporting limit.

Figures



Note:
 • Basemap provided by ESRI, accessed 2018.

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 strategy ■ science ■ engineering

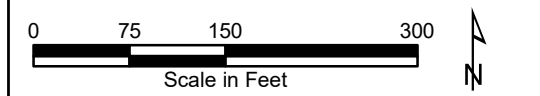
**Sediment Data
 Summary Report
 Time Oil Bulk Terminal PPA
 Seattle, Washington**

**Figure 1
 Site Location Map**



Notes:
 · Parcel boundaries obtained from King County Geographic Information Systems Center, 2011.
 · Orthoimagery obtained from Nearmap, 2018.

Abbreviation:
 DNR = Washington State Department of Natural Resources



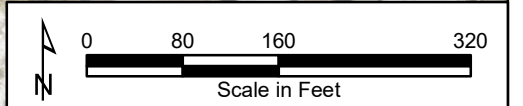
Legend

- ▲ March 2019 Surface Sediment Sample
- March 2019 Sediment Core Location
- △ August 2018 Surface Sediment Sample
- ▲ Historical Surface Sediment Sample
- ▭ Property Boundary for the Seattle Terminal Properties



Notes:
 · Parcel boundaries obtained from King County Geographic Information Systems Center, 2011.
 · Orthoimagery obtained from Nearmap, 2017.

Abbreviation:
 DNR = Washington State Department of Natural Resources



Attachment 1
Field Forms

SURFACE SEDIMENT SAMPLE COLLECTION FORM

Date/Time Collected: 8/1/18

Weather: overcast, drizzling

Field Personnel: AM, KH

Sample Type:

1. Surface Sample (0-10 cm)

Sample ID/Design. TOC-SS-01

Sample Method (Van Veen Surface Grab/Diver Core-Cookie Cutter)

Datum (Horizontal/Vertical) WGS

Leadline Water Dept: 10.4 (A)
 Predicted Tide Elevation NA (B)
 Mudline Elevation NA (B-A)
 Actual Tide Elevation NA

Run # or Composite Pt	Time	Latitude (Northing)	Longitude (Easting)	Sample Criteria (Surface Grab Only)					Accept Sample Y/N	Comments (Include depth of sample)
				1	2	3	4	5		
<u>1</u>	<u>9:52</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>Y</u>	<u>22 cm</u>

Acceptance criteria: 1 Overlying water is present, 2 Water has low turbidity, 3 Sampler is not over filled, 4 Sample surface is flat, 5 Desired sample depth is reached

Decon Procedure (Alconox Wash, DI water rinse, other): _____

Sediment Sample Description

Sediment Sample Description (density, moisture, color, minor constituents, major constituents, other observations - *see field ref cards):

vegetative matter and clams at surface

0-10: SILT: very soft, wet, olive gray SILT w/ trace f-sand, trace rainbow sheen

Sample containers filled (number and type): biob. @ 10 cm gravelly SILT w/ sand (30%)

TOC-SS-01-0-10 @ 9:50

2 x 32oz, 1 x 8 oz amber, 1 x 4oz = 4 jars total

Laboratory analysis:

Grain size, total solids, TOC, ammonia, sulfides, metals, butyltins, SVOCs, pesticides, PCB Aroclors, D/Fs, TPH, archive

Diver Comments (if applicable) etc:

NA

SURFACE SEDIMENT SAMPLE COLLECTION FORM

Date/Time Collected: 8/1/18

Weather: overcast, drizzle

Field Personnel: AM, KH

Sample Type:

1. Surface Sample (0-10 cm)

Sample ID/Design. TOC-SS-02

Sample Method (Van Veen Surface Grab/Diver Core-Cookie Cutter)

Datum (Horizontal/Vertical)

Leadline Water Dept: 10.9 (A)
 Predicted Tide Elevation - (B)
 Mudline Elevation - (B-A)
 Actual Tide Elevation -

Run # or Composite Pt	Time	Latitude (Northing)	Longitude (Easting)	Sample Criteria (Surface Grab Only)					Accept Sample Y/N	Comments (Include depth of sample recovery)
				1	2	3	4	5		
1	10:25			✓	✓	✓	X	X	N	Grab landed on wood or rocks
2	10:29			✓	✓	X	X	✓	N	Over penetrated
3	10:35			X	X	✓	X	X	N	Debris in jaws
4	10:40			✓	✓	✓	✓	✓	Y	Surface is slightly sloped but is flat (25 cm)

Acceptance criteria: 1 Overlying water is present, 2 Water has low turbidity, 3 Sampler is not over filled, 4 Sample surface is flat, 5 Desired sample depth is reached

Decon Procedure (Alconox Wash, DI water rinse, other): _____

Sediment Sample Description

Sediment Sample Description (density, moisture, color, minor constituents, major constituents, other observations - *see field ref cards): vegetative matter and clams at surface

at 0-10 cm: SILT: very soft, wet, gray SILT w/ trace metallic sheen blebs

@ 9-10 cm white and gray SAND: loose, damp, SAND (medium grain, well sorted)

Sample containers filled (number and type):

TOC-SS-02-0-10 @ 10:40 ; 6 jars total MS/MSD

1 x 32 oz, 1 x 8 oz amber, 1 x 4 oz, 3 x 16 oz

Laboratory analysis:

Grain size, total solids, TOC, ammonia, sulfides, metals, butyltins, SVOCs, pesticides, PCB Aroclors, D/Fs, TPH, archive, MS/MSD

Diver Comments (if applicable) etc:

SURFACE SEDIMENT SAMPLE COLLECTION FORM

Date/Time Collected: 8/1/18

Weather: overcast

Field Personnel: AM, KH

Sample Type:

1. Surface Sample (0-10 cm)

Sample ID/Design. TOC-SS-03 *#collected field duplicate*

Sample Method (Van Veen Surface Grab/Diver Core-Cookie Cutter)

Datum (Horizontal/Vertical)

Leadline Water Dept: 12.2 (A) depth meter

Predicted Tide Elevation _____ (B)

Mudline Elevation _____ (B-A)

Actual Tide Elevation _____

Run # or Composite Pt	Time	Latitude (Northing)	Longitude (Easting)	Sample Criteria (Surface Grab Only)					Accept Sample Y/N	Comments (Include depth of sample)
				1	2	3	4	5		
1	11:10			✓	✓	X	✓	✓	N	0.125 penetrated - very soft sed
2	11:15			✓	✓	✓	✓	✓	Y	26 cm

Acceptance criteria: 1 Overlying water is present, 2 Water has low turbidity, 3 Sampler is not over filled, 4 Sample surface is flat, 5 Desired sample depth is reached

Decon Procedure (Alconox Wash, DI water rinse, other): _____

Sediment Sample Description

Sediment Sample Description (density, moisture, color, minor constituents, major constituents, other observations - *see field ref cards): vegetative matter at the surface, 1cm of olive gray flocc
0-10: SILT: very soft, wet, gray SILT, moderate sulfide-like odor, trace metallic sheen bits
10-26: same as above

Sample containers filled (number and type): 11:15
TOC-SS-03-0-10 @ H#20; TOC-SS-03D-0-10 @ 11:20
5 jars for TOC-SS-03, 4 jars for TOC-SS-03D

Laboratory analysis:
Grain size, total solids, TOC, ammonia, sulfides, metals, butyltins, SVOCs,
pesticides, PCB Aroclors, D/Es, TPH, archive

Diver Comments (if applicable) etc:
NA

SURFACE SEDIMENT SAMPLE COLLECTION FORM

Date/Time Collected: 8/1/18

Weather: overcast

Field Personnel: AM, KH

Sample Type:

1. Surface Sample (0-10 cm)

Sample ID/Design. TOC-SS-04

Sample Method (Van Veen Surface Grab/Diver Core-Cookie Cutter)

Datum (Horizontal/Vertical)

Leadline Water Dept: 17.0 (A) depth meter
 Predicted Tide Elevation _____ (B)
 Mudline Elevation _____ (B-A)
 Actual Tide Elevation _____

Run # or Composite Pt	Time	Latitude (Northing)	Longitude (Easting)	Sample Criteria (Surface Grab Only)					Accept Sample Y/N	Comments (Include depth of sample, recovery)
				1	2	3	4	5		
1	11:45			✓	✓	✓	✓	✓	Y	26

Acceptance criteria: 1 Overlying water is present, 2 Water has low turbidity, 3 Sampler is not over filled, 4 Sample surface is flat, 5 Desired sample depth is reached

Decon Procedure (Alconox Wash, DI water rinse, other): _____

Sediment Sample Description

Sediment Sample Description (density, moisture, color, minor constituents, major constituents, other observations - *see field ref cards): vegetative matter at surface, 1cm of olive gray fluke
0-10 cm: SILT - very soft, very wet, gray SILT, slight sulfide-like color, trace metallic sheen, bubbles
10-26 cm: same as above

Sample containers filled (number and type):

TOC-SS-04-0-10 @ 11:45

6 jars - 1x16oz, 1x8oz, 1x8oz amber, 1x4oz

Laboratory analysis:

Grain size, total solids, TOC, ammonia, sulfides, metals, butyltins, SVOCs, pesticides, PCB Aroclors, D/Es, TPH, archive

Diver Comments (if applicable) etc:

NA

SURFACE SEDIMENT SAMPLE COLLECTION FORM

Date/Time Collected: 8/1/18

Weather: overcast

Field Personnel: AM, KH

Sample Type:

1. Surface Sample (0-10 cm)

Sample ID/Design. TOC-SS-05

Sample Method (Van Veen Surface Grab/Diver Core-Cookie Cutter)

Datum (Horizontal/Vertical)

Leadline Water Dept: 17.1 (A) depth meter
 Predicted Tide Elevation — (B)
 Mudline Elevation — (B-A)
 Actual Tide Elevation —

Run # or Composite Pt	Time	Latitude (Northing)	Longitude (Easting)	Sample Criteria (Surface Grab Only)					Accept Sample Y/N	Comments (Include depth of sample) recovery
				1	2	3	4	5		
1	12:35			✓	✓	X	✓	✓	N	Grab cover popped off and sample over-penetrated
2	12:53			✓	✓	✓	✓	✓	Y	30cm

Acceptance criteria: 1 Overlying water is present, 2 Water has low turbidity, 3 Sampler is not over filled, 4 Sample surface is flat, 5 Desired sample depth is reached

Decon Procedure (Alconox Wash, DI water rinse, other): _____

Sediment Sample Description

Sediment Sample Description (density, moisture, color, minor constituents, major constituents, other observations - *see field ref cards): vegetative matter, clam, 1cm olive gray flake at surface

0-10 cm: SILT: very soft, wet, SILT, trace metallic sheen blebs

10-30 cm: same as above

Sample containers filled (number and type):

TOC-SS-05-0-10 @ 12:53

6 jars

Laboratory analysis:

Grain size, total solids, TOC, ammonia, sulfides, metals, butyltins, SVOCs, pesticides, PCB Aroclors, D/Es, TPH, archive

Diver Comments (if applicable) etc:

NA

SURFACE SEDIMENT SAMPLE COLLECTION FORM

Date/Time Collected: 8/1/18

Weather: overcast

Field Personnel: AM, KH

Sample Type:

1. Surface Sample (0-10 cm)

Sample ID/Design. TOC-SS-06

Sample Method (Van Veen Surface Grab/Diver Core-Cookie Cutter)

Datum (Horizontal/Vertical)

Leadline Water Dept: 14.5 (A) depth meter
 Predicted Tide Elevation - (B)
 Mudline Elevation - (B-A)
 Actual Tide Elevation -

Run # or Composite Pt	Time	Latitude (Northing)	Longitude (Easting)	Sample Criteria (Surface Grab Only)					Accept Sample Y/N	Comments (Include depth of sample)
				1	2	3	4	5		
<u>1</u>	<u>13:10</u>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<u>Y</u>	<u>27 cm</u>

Acceptance criteria: 1 Overlying water is present, 2 Water has low turbidity, 3 Sampler is not over filled, 4 Sample surface is flat, 5 Desired sample depth is reached

Decon Procedure (Alconox Wash, DI water rinse, other): _____

Sediment Sample Description

Sediment Sample Description (density, moisture, color, minor constituents, major constituents, other observations - *see field ref cards): vegetative matter, 0.5 cm layer of olive gray flack

0-10: SILT: very soft, wet, SILT w/ f-sand (5-10%), trace rainbow sheen blebs, trace metallic sheen blebs, 10-27 cm - same as above

Sample containers filled (number and type):

TOC-SS-06-0-10 - 5 jars @ 13:10
1x32 oz, 2x16 oz, 1x8 oz amber, 1-4oz

Laboratory analysis:

Grain size, total solids, TOC, ammonia, sulfides, metals, butyltins, SVOCs, pesticides, PCB Aroclors, D/Es, TPH, archive

Diver Comments (if applicable) etc:

NA

SURFACE SEDIMENT SAMPLE COLLECTION FORM

Project: Cantera-TOC	Station ID: TOC-SS-07
Field Staff: Kara Hitchko & Pamela Osterhout	Date: 3/20/19
Contractor: RSS	Weather: sunny, 55°F 70°F
Sampling Method: Power grab	Horizontal/Vertical Datum: NAD83(2011)
Water Depth:	Water Level Measurements
Leadline Water Depth:	Tide Elevation: NA Pred. / Actual
Depth Sounder Water Depth: 18.5'	Time: 12:24
Mudline elevation: calculated after sampling	

Sample Type: Surface Sample (0 - 10 cm)

Grab #	Time	Latitude (Northing)	Longitude (Easting)	Accept Sample Y/N	Recovery Depth (in.)	Comments: jaws close, winnowing, overlying water, surface intact, etc
1	12:24			Y	21 cm	Elodea in jaws, overlying water present, good grab

Acceptance criteria: 1) Overlying water is present, 2) Water has low turbidity, 3) Sampler is not over filled, 4) Sample surface is flat, 5) Desired sample depth is reached

Sediment Sample Description (surface material, density, moisture, color, minor constituents, major constituents, odor, sheen, plant matter, shells, biota):

At surface - Entirely covered in elodea, thin film of olive brown and green floc.
 1cm - 5cm/8cm: very soft, wet, dark gray SILT (colloidal), trace sheen in overlying water
 5/8cm - 10 cm: gray, fine silty ~~fine~~ SAND to sandy SILT, soft
 Trace ~~stain~~ metallic sheen blebs after homogenizing

Sample containers: 32 oz, ~~3x16oz~~ 4x16oz, 2x8oz, 1x4oz w/ Zn Ac

Analysis: Grain size, Ammonia, TS, TOC, Metals, SVOCs, PCBs, TPH, D/Fs, sulfides, butyltins + MS/MSD

Notes: TOC-SS-07-0-10 @ 12:33
~~Collected field duplicate: TOC-SS-107-0-10 @ 12:45~~

SURFACE SEDIMENT SAMPLE COLLECTION FORM

Project: Cantera-TOC	Station ID: TOC-SS-08
Field Staff: Kara Hitchko & Pamela Osterhout	Date: 3/20/19
Contractor: RSS	Weather: sunny, 70°F
Sampling Method: Power grab	Horizontal/Vertical Datum:
Water Depth:	Water Level Measurements
Leadline Water Depth:	Tide Elevation: Pred. / Actual
Depth Sounder Water Depth: 39.7	Time: 13:04
Mudline elevation: calculated after sampling	

Sample Type: Surface Sample (0 - 10 cm)

Grab #	Time	Latitude (Northing)	Longitude (Easting)	Accept Sample Y/N	Recovery Depth (in.)	Comments: jaws close, winnowing, overlying water, surface intact, etc
1	13:04			Y	26 cm	overlying water clear surface intact, but slightly convex. winnowing on one side - sample collected from opposite side

Acceptance criteria: 1) Overlying water is present, 2) Water has low turbidity, 3) Sampler is not over filled, 4) Sample surface is flat, 5) Desired sample depth is reached

Sediment Sample Description (surface material, density, moisture, color, minor constituents, major constituents, odor, sheen, plant matter, shells, biota):

0-1 cm: olive brown, fine SAND, clams, worm tubes, macroinvertebrate
 1-10 cm: olive gray, silty, fine SAND (60% sand, 40% silt), no odor trace vegetative matter. Loose and moderately soft, moist.

Sample containers:

Analysis: Grain size, ammonia, TS, TOC, metals, SVOCs, PCBs, TPH, D/Fs, sulfides, butyltins

Notes: TOC-SS-08-0-10 @ 13:10

SURFACE SEDIMENT SAMPLE COLLECTION FORM

Project: Cantera-TOC	Station ID: TOC-SS-09
Field Staff: Kara Hitchko & Pamela Osterhout	Date: 3/20/19
Contractor: RSS	Weather: sunny, 70°F
Sampling Method: Power grab	Horizontal/Vertical Datum:
Water Depth:	Water Level Measurements
Leadline Water Depth:	Tide Elevation: Pred. / Actual
Depth Sounder Water Depth: 36.9	Time: 13:44
Mudline elevation: calculated after sampling	

Sample Type: Surface Sample (0 - 10 cm)

Grab #	Time	Latitude (Northing)	Longitude (Easting)	Accept Sample Y/N	Recovery Depth (in. ^{cm})	Comments: jaws close, winnowing, overlying water, surface intact, etc
1	13:46			Y	20.5	overlying water clear, surface intact

Acceptance criteria: 1) Overlying water is present, 2) Water has low turbidity, 3) Sampler is not over filled, 4) Sample surface is flat, 5) Desired sample depth is reached

Sediment Sample Description (surface material, density, moisture, color, minor constituents, major constituents, odor, sheen, plant matter, shells, biota):

1cm: olive brown ~~flock~~ SAND, worm tubes -below 10 cm
 0-10 cm: Olive gray, poorly-graded fine SAND trace silt, ~~pockets of silt~~
 trace fine wood debris, no odor.

Sample containers: 32 oz, 2x 16 oz, 2x 8 oz, 1x 4 oz w/ Zn Ac.

Analysis: Grain size, ammonia, sulfides, TS, TDC, metals, SVCCs, PCBs, D/Fs, TPH, butyltins

Notes: TOC-SS-09-0-10 @ 13:50

SURFACE SEDIMENT SAMPLE COLLECTION FORM

Project: Cantera-TOC	Station ID: TOC-SS-10
Field Staff: Kara Hitchko & Pamela Osterhout	Date: 3/20/2019
Contractor: RSS	Weather: sunny, 72°F
Sampling Method: Power grab	Horizontal/Vertical Datum: NAD83 (2011)
Water Depth:	Water Level Measurements
Leadline Water Depth:	Tide Elevation: Pred. / Actual
Depth Sounder Water Depth: 36.7	Time: 14:39
Mudline elevation: calculated after sampling	

Sample Type: Surface Sample (0 - 10 cm)

Grab #	Time	Latitude (Northing)	Longitude (Easting)	Accept Sample Y/N	Recovery Depth (in.)	Comments: jaws close, winnowing, overlying water, surface intact, etc
1	14:41			Y	14 cm	overlying water clear, surface intact.

Acceptance criteria: 1) Overlying water is present, 2) Water has low turbidity, 3) Sampler is not over filled, 4) Sample surface is flat, 5) Desired sample depth is reached

Sediment Sample Description (surface material, density, moisture, color, minor constituents, major constituents, odor, sheen, plant matter, shells, biota):
 Surface: olive brown, ~~f-sand~~ f-SAND, worm tubes, macroinvertebrates, bark, trace silt, trace shells
 0-10 cm: gray, moderate, dense, moist, f-sand, w/ trace silt (5%), trace fine vegetative matter
 Rainbow sheen blob

Sample containers: 32 oz, 2x 16oz, 2x 8oz, 1x 4oz w/ ZnAc

Analysis: gran size, ammonia, TS, TOC, metals, TPH, PCBs, DF, silts, bioturbins

Notes: TOC-SS-10-0-10 @ 14:47

SURFACE SEDIMENT SAMPLE COLLECTION FORM

Project: Cantera-TOC	Station ID: TOC-SS-11
Field Staff: Kara Hitchko & Pamela Osterhout	Date: 3/20/2019
Contractor: RSS	Weather: Sunny, 70°F
Sampling Method: Power grab	Horizontal/Vertical Datum:
Water Depth:	Water Level Measurements
Leadline Water Depth:	Tide Elevation: N/A Pred. / Actual
Depth Sounder Water Depth: 14.1	Time: 15:24
Mudline elevation: calculated after sampling	

Sample Type: Surface Sample (0 - 10 cm)

Grab #	Time	Latitude (Northing)	Longitude (Easting)	Accept Sample Y/N	Recovery Depth (in.)	Comments: jaws close, winnowing, overlying water, surface intact, etc
1	14:20			N	NM	over-penetrated
2	15:24			Y	27 cm	Flat surface, full recovery

Acceptance criteria: 1) Overlying water is present, 2) Water has low turbidity, 3) Sampler is not over filled, 4) Sample surface is flat, 5) Desired sample depth is reached

Sediment Sample Description (surface material, density, moisture, color, minor constituents, major constituents, odor, sheen, plant matter, shells, biota):

0-1 cm: olive brown flock, elodea, vegetative material
 1-10 cm: very soft and wet very dark gray SILT; trace (~1%) sand
 trace metallic sheen blebs.

Sample containers: 32 oz, 2x 16oz, 2x 8oz, 1x 4oz w/ Zn Ac. x2 for duplicate.

Analysis: grain size, Ammonia, TS, TOC, metals, TPH, PCBs, D/F, sulfides, butyltins

Notes: TDC-SS-11-0-10 @ 15:27
 collected field duplicate: TDC-SS-111-0-10 @ 15:35

SURFACE SEDIMENT SAMPLE COLLECTION FORM

Project: Cantera-TOC	Station ID: SB-SS-01
Field Staff: Kara Hitchko & Pamela Osterhout	Date: 3/20/19
Contractor: RSS	Weather: sunny 53°F
Sampling Method: Power grab	Horizontal/Vertical Datum: NAD83 (2011)
Water Depth:	Water Level Measurements
Leadline Water Depth: 43.9'	Tide Elevation: NA Pred. / Actual
Depth Sounder Water Depth:	Time: 10:20 am
Mudline elevation: calculated after sampling	

Sample Type: Surface Sample (0 - 10 cm)

Grab #	Time	Latitude (Northing)	Longitude (Easting)	Accept Sample Y/N	Recovery Depth (in.)	Comments: jaws close, winnowing, overlying water, surface intact, etc
1	10:20			Y	24 cm	overlying water clear. Surface intact. good grab

Acceptance criteria: 1) Overlying water is present, 2) Water has low turbidity, 3) Sampler is not over filled, 4) Sample surface is flat, 5) Desired sample depth is reached

Sediment Sample Description (surface material, density, moisture, color, minor constituents, major constituents, odor, sheen, plant matter, shells, biota):
 At surface, 1 cm: olive brown floc, woody debris, small sticks up to 10"
 0-10: Dark gray SILT, soft, moist, trace fine sand, trace vegetative matter.

Sample containers: 32 oz, 2x 16 oz, 2x 8 oz, 1x 4oz w/ Zn. Ac.

Analysis: GS, ammonia, TS, TOC, metals, SVOCs, PCBs, TPH, D/Fs, sulfides, butyltins

Notes: SB-SS-01-0-10 @ 10:30

SURFACE SEDIMENT SAMPLE COLLECTION FORM

Project: Cantera-TOC	Station ID: SB-SS-02
Field Staff: Kara Hitchko & Pamela Osterhout	Date: 3/20/19
Contractor: RSS	Weather: sunny, 53°F
Sampling Method: Power grab	Horizontal/Vertical Datum: NAD83 (2011)
Water Depth:	Water Level Measurements
Leadline Water Depth: 32.1'	Tide Elevation: NA Pred. / Actual
Depth Sounder Water Depth: -	Time: 11:03
Mudline elevation: calculated after sampling	

Sample Type: Surface Sample (0 - 10 cm)

Grab #	Time	Latitude (Northing)	Longitude (Easting)	Accept Sample Y/N	Recovery Depth (in.)	Comments: jaws close, winnowing, overlying water, surface intact, etc
1	11:10			Y	23 cm	overlying water, surface intact, but slanted due to angled grab. good grab

Acceptance criteria: 1) Overlying water is present, 2) Water has low turbidity, 3) Sampler is not over filled, 4) Sample surface is flat, 5) Desired sample depth is reached

Sediment Sample Description (surface material, density, moisture, color, minor constituents, major constituents, odor, sheen, plant matter, shells, biota):

1/2 cm @ surface: Olive brown floc, worm(?) casings and woody debris (<1")
 0-10 cm: ^{light (100%)} gray, fine silty SAND (55% sand, pockets of clay) to sandy SILT, trace sheen kelp, wet, very loose grading to loose

Sample containers: 32 oz, 2 x 16 oz, 2 x 8 oz, 1 x 4 oz w/ Zn AC.

Analysis: GS, ammonia, TS, TOC, metals, SVOCs, PCBs, TPH, D/Fs, sulfides, butyltin

Notes: SB-SS-02-0-10 @ 11:10

SURFACE SEDIMENT SAMPLE COLLECTION FORM

Project: Cantera-TOC	Station ID: SB-SS-03
Field Staff: Kara Hitchko & Pamela Osterhout	Date: 3/20/19
Contractor: RSS	Weather: Sunny, 55°F
Sampling Method: Power grab	Horizontal/Vertical Datum:
Water Depth:	Water Level Measurements
Leadline Water Depth:	Tide Elevation: Pred. / Actual
Depth Sounder Water Depth: 32.5'	Time: 11:38
Mudline elevation: calculated after sampling	

Sample Type: Surface Sample (0 - 10 cm)

Grab #	Time	Latitude (Northing)	Longitude (Easting)	Accept Sample Y/N	Recovery Depth (in.)	Comments: jaws close, winnowing, overlying water, surface intact, etc
1	11:40			N	NM	4' log chunk stuck in jaws
2	11:46			Y	27 cm	overlying water clear, surface intact, some woody debris in jaws

Acceptance criteria: 1) Overlying water is present, 2) Water has low turbidity, 3) Sampler is not over filled, 4) Sample surface is flat, 5) Desired sample depth is reached

Sediment Sample Description (surface material, density, moisture, color, minor constituents, major constituents, odor, sheen, plant matter, shells, biota):

surface: 1/2 cm olive brown Ploek, clams, wood debris
 0-10 cm: v. dark gray, ^{very} soft, ^{wet} SILT w/ trace metallic sheen blebs, ~10% woody debris (up to 6") sticks and bark, trace sand

Sample containers: 32oz, 2x 16oz, 2x 8oz, 1x 4oz w/ Zn Ac.

Analysis: grain size, TPH, DIFs, sulfides, PCBs, pesticides, butyltins, ammonia, TS, TOC, metals, SVOCs

Notes: SB-SS-03-0-10 @ 11:52

SUBSURFACE SEDIMENT CORE COLLECTION FORM

Project: Cantera Sediment Sampling
 Project No: _____
 Field Staff: KH, PO
 Contractor: RSS
 Sampling Method: Vibracore / Mud Mole
 Field Coordinates:
 Lat/Northing: _____

Station ID: TOC-SC-01
 Date: 3/21/19
 Attempt No: 1
 Vertical Datum: -
 Horizontal Datum: NAD83 (2011)
 Long/Easting: _____

(A) Water Depth
 Leadline Water Depth: 37.8
 Depth Sounder Water Depth: 37.8

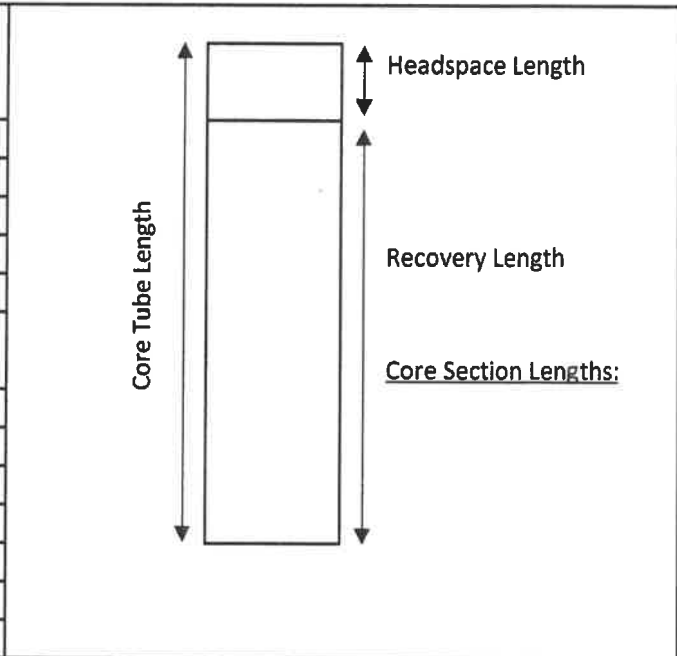
(B) Water Level Measurements
 Tide Elevation: NA Pred. / Actual
 Time: 9:06

(C) Mudline Elevation (B-A): NA

Core Collection Information

Core Accepted: Yes / No
 Drive Penetration (D): 7.1
 Core Tube Length: -
 Headspace Length: -
 Recovery Length (E): 5.3
 Percent Recovery (E/D*100): 75%

Drive Notes:
Drove slowly with slack line for a few feet



Sediment Description:
 Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents
 (color, layering, sheen, debris, plant matter, shells, biota)
Olive gray silty SAND from ~0-3 feet, light gray sand and clayey silt layer from ~3 feet to core bottom

Notes:

KH

none

SUBSURFACE SEDIMENT CORE COLLECTION FORM

FLOYD | SNIDER

Project: Cantera Sediment Sampling
 Project No: _____
 Field Staff: KW, PO
 Contractor: RSS
 Sampling Method: Vibracore
 Field Coordinates:
 Lat/Northing: _____

Station ID: TOC-SC-02
 Date: 3/21/19
 Attempt No: 1
 Vertical Datum: _____
 Horizontal Datum: NAD83 (Zerl)
 Long/Easting: _____

(A) Water Depth
 Leadline Water Depth: 13.1
 Depth Sounder Water Depth: _____

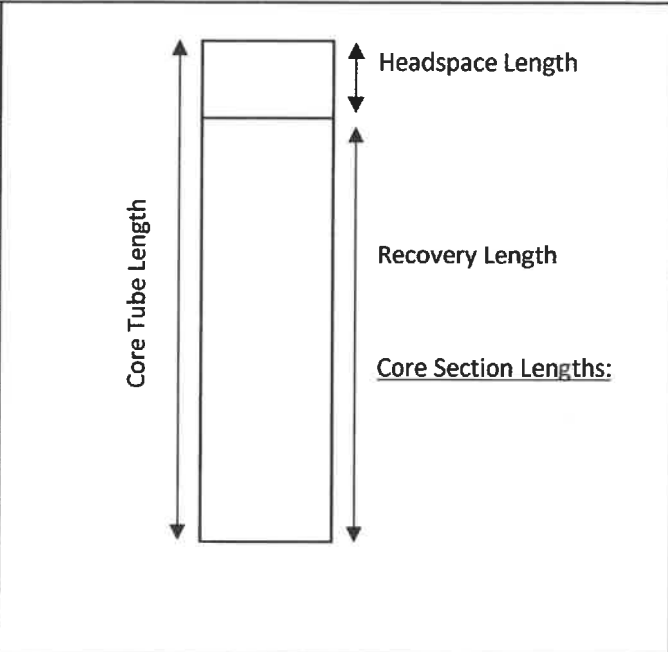
(B) Water Level Measurements
 Tide Elevation: NA Pred. / Actual
 Time: 9:51

(C) Mudline Elevation (B-A): NA

Core Collection Information

Core Accepted: Yes / No _____
 Drive Penetration (D): 7.1
 Core Tube Length: NA
 Headspace Length: NA
 Recovery Length (E): 5.1
 Percent Recovery (E/D*100): 72%

Drive Notes:
Slow driving down to 7.1.



Sediment Description:
 Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents
 (color, layering, sheen, debris, plant matter, shells, biota)
Very dark gray-black from 0 to 1 foot, light gray silt and sand layers from approx 2.5 to bottom of core

Notes:
~~None~~
 KW

SUBSURFACE SEDIMENT CORE COLLECTION FORM

FLOYD | SNIDER

Project: Contera Sediment Sampling
 Project No: _____
 Field Staff: PO, KH
 Contractor: _____
 Sampling Method: Vibracore
 Field Coordinates:
 Lat/Northing: 245885.61
245884.43

Station ID: TOC-SC-03
 Date: 3/21/19
 Attempt No: 1
 Vertical Datum: _____
 Horizontal Datum: NAD83 (2011)
 Long/Easting: 1255989.37
1255988.46

(A) Water Depth
 Leadline Water Depth: 6.0 5.7
 Depth Sounder Water Depth: _____

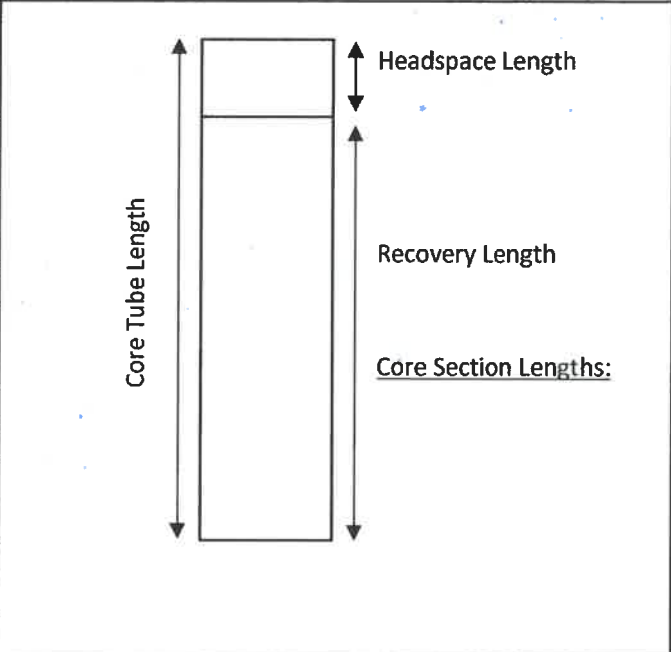
(B) Water Level Measurements
 Tide Elevation: _____ Pred. / Actual
 Time: 14:36

(C) Mudline Elevation (B-A):

Core Collection Information

Core Accepted: Yes / No
Drive Penetration (D): <u>7.4</u>
Core Tube Length: <u>NA</u>
Headspace Length: <u>NA</u>
Recovery Length (E): <u>6.6</u>
Percent Recovery (E/D*100): <u>89%</u>

Drive Notes:
Slow, steady driving to 5', very slow down to 6.6.



Sediment Description:
 Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents
 (color, layering, sheen, debris, plant matter, shells, biota)
light brown grey f-sand and silt

Notes:

None

KH

SUBSURFACE SEDIMENT CORE SAMPLING FORM

FLOYD | SNIDER

Project: Cantera Sediment Sampling	Station ID: TOC-SC-01
Date/Time: 3/21/19	Attempt No.: 1
Logged by: KH	No. of Sections: 1
Sampling Method: Vibracore	Core Quality: <u>Good</u> Fair Poor Disturbed
Mudline elevation: 37.8 (leadline) @ 9:06 AM	Diameter of Core (inches):
(A) Drive Length (ft): 7.1	(C) Percent Recovery (B/A*100): 77%
(B) Recovered Length (ft): 5.5	
Notes: TOC-SC-01-0.5-2.0 @ 11:11 ; TOC-SC-01-2.5-4.0 @ 11:07	

Elevation (ft)	Recovered Length (ft)	% Gravel	% Sand	% Fines	Sediment Description (Density, Moisture, Minor Constituents, MAJOR Constituents, Organics, Sheen, Odor, etc.)	Recovered Length (ft)	Sample ID and Analyses	Summary Sketch
1		0	65	10	0 to 2.1: silty f-SAND - loose, moist, olive gray-brown, silty SAND, pockets of decomposed woody debris (15%), trace shells, trace slight sulfide odor fragments		No sample TOC-SC-01-0.5-2.0 @ 11:11 All analytes	
2						2	No sample	
3		0	95	5	@ 2.1: grades to f-SAND - moderately dense, moist, f-SAND, trace silt, light gray		TOC-SC-01-2.5-4.0 @ 11:07 All analytes	
4				100	@ 3 to 3.2: silty CLAY - stiff, damp, light gray, silty CLAY @ 3.2 - dense, damp, light gray, f-SAND, trace silt		No sample	
5					@ 5.0 - stiff, damp, light gray, silty CLAY			
6					Bottom of core @ 5.5			

SUBSURFACE SEDIMENT CORE SAMPLING FORM

FLOYD | SNIDER

Project: Cantera Sediment Sampling	Sation ID: TOC-SC-02
Date/Time: 3/21/19	Attempt No.: 1
Logged by: KH	No. of Sections: 1
Sampling Method: Vibracore	Core Quality: (Good) Fair Poor Disturbed
Mudline elevation: 13.1 (leadline) @ 9:51	Diameter of Core (inches):
(A) Drive Length (ft): 7.1	(C) Percent Recovery (B/A*100): 69%
(B) Recovered Length (ft): 4.9	(72% on boat)
Notes: TOC-SC-02-0.5-1.2 @ 12:50; TOC-SC-02-1.2-2.2 @ 13:00 TOC-SC-02-2.6-4.0 @ 12:55	

Elevation (CRD)	Recovered Length (ft)	% Gravel	% Sand	% Fines	Sediment Description (Density, Moisture, Minor Constituents, MAJOR Constituents, Organics, Sheen, Odor, etc.)	Recovered Length (ft)	Sample ID and Analyses	Summary Sketch
1		-	10	60	0 to 1.5: sandy SILT - soft, very wet, Sandy SILT, woody debris (30%) up to 2", moderate metallic sheen/oily appearance, mild petroleum-like odor, very dark olive gray.		No sample	
2		-	60	40	@ 1.5: grades to silty f-SAND, - loose, wet, olive gray and brown, silty f-SAND, trace fine wood debris, trace shell fragments.		TOC-SC-02-0.5-1.2 All analytes	
		-	60	40			TOC-SC-02-1.2-2.2 All analytes	
3		x trace	30	70	@ 2.2 same as above except grades to olive gray, no woody debris.		No sample	
4		20	-	80	@ 2.6 grades to stiff to very stiff, damp, light gray, sandy SILT w/ clay, trace grayed.		TOC-SC-02-2.6-4.0 @ 12:55 All analytes	
5					@ 3.6 grades to gravelly CLAY w/ silt, hard (glacial till)		No sample	
6					↑ Bottom of core @ 4.9			

SUBSURFACE SEDIMENT CORE SAMPLING FORM

FLOYD | SNIDER

Project: Cantera Sediment Sampling	Sation ID: TOC-SC-03
Date/Time: 3/21/19	Attempt No.: 1
Logged by: KH	No. of Sections: 1
Sampling Method: Vibracore	Core Quality: <u>Good</u> Fair Poor Disturbed
Mudline elevation: 5.7 (headline) @ 14:36	Diameter of Core (inches):
(A) Drive Length (ft): 7.4	(C) Percent Recovery (B/A*100): 89%
(B) Recovered Length (ft): 6.6	
Notes: TOC-SC-03-0-0.5 @ 15:30; TOC-SC-03-1.0-2.5 @ 15:40	

↳ All analyses except grain size

↳ Archive only

Elevation (CRD)	Recovered Length (ft)	% Gravel	% Sand	% Fines	Sediment Description (Density, Moisture, Minor Constituents, MAJOR Constituents, Organics, Sheen, Odor, etc.)	Recovered Length (ft)	Sample ID and Analyses	Summary Sketch
		-	30	60	0 to 0.5: f-sandy SILT - ^{wet} olive gray brown, soft, f-sandy SILT w/ woody debris (10%) (sticks and twigs up to 3")		TOC-SC-03-0-0.5	
1							No sample	
		-	90	10	0.5 to 2.6: silty f-SAND - moderately dense/loose, wet, light gray, silty f-SAND		TOC-SC-03-1-2.5	
2							2 Archive	
		-	85	15	@ 2.6 grades to moderately dense, moist, light yellow-brown and light gray f-SAND, trace silt, pockets of highly consolidated oxidized silt			
3							No sample	
4								
5								
		-	-	100	@ 5.5: very dense, damp, light gray-brown, silty CLAY			
6		-	100	trace	@ 6.0: very dense, damp, light gray, f-SAND, trace silt			
					↑ Core bottom @ 6.6			
7								

sand

silt

Page 1 of 1

clay

woody debris

SUBSURFACE SEDIMENT CORE COLLECTION FORM

Project: Cantera Sediment Sampling
 Project No: _____
 Field Staff: KH, PO
 Contractor: RSS
 Sampling Method: Vibracore / Mud Mole
 Field Coordinates:
 Lat/Northing: _____

Station ID: TOC-SC-01
 Date: 3/21/19
 Attempt No: 1
 Vertical Datum: -
 Horizontal Datum: NAD83 (2011)
 Long/Easting: _____

(A) Water Depth
 Leadline Water Depth: 37.8
 Depth Sounder Water Depth: 37.8

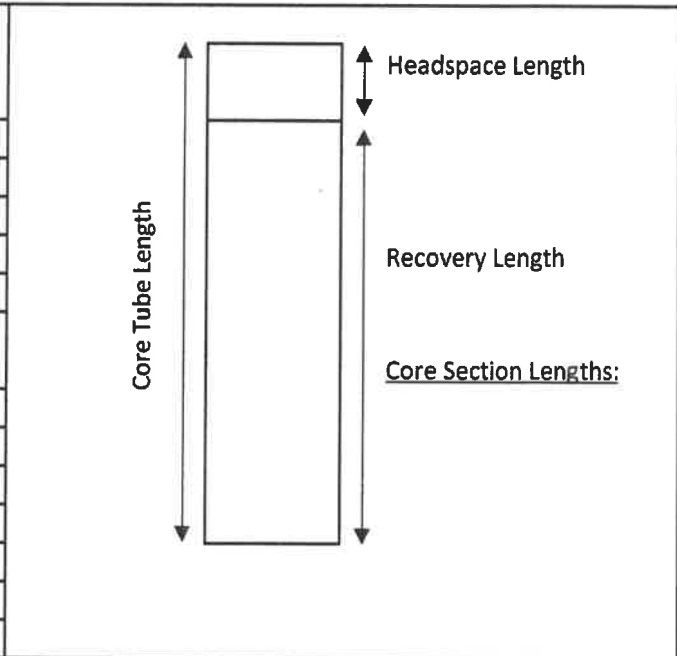
(B) Water Level Measurements
 Tide Elevation: NA Pred. / Actual
 Time: 9:06

(C) Mudline Elevation (B-A): NA

Core Collection Information

Core Accepted: Yes / No
 Drive Penetration (D): 7.1
 Core Tube Length: -
 Headspace Length: -
 Recovery Length (E): 5.3
 Percent Recovery (E/D*100): 75%

Drive Notes:
Drove slowly with slack line for a few feet



Sediment Description:
 Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents
 (color, layering, sheen, debris, plant matter, shells, biota)
Olive gray silty SAND from ~0-3 feet, light gray sand and clayey silt layer from ~3 feet to core bottom

Notes:

KH

none

SUBSURFACE SEDIMENT CORE COLLECTION FORM

FLOYD | SNIDER

Project: Cantera Sediment Sampling
 Project No: _____
 Field Staff: KW, PO
 Contractor: RSS
 Sampling Method: Vibracore
 Field Coordinates:
 Lat/Northing: _____

Station ID: TOC-SC-02
 Date: 3/21/19
 Attempt No: 1
 Vertical Datum: _____
 Horizontal Datum: NAD83 (Zerl)
 Long/Easting: _____

(A) Water Depth
 Leadline Water Depth: 13.1
 Depth Sounder Water Depth: _____

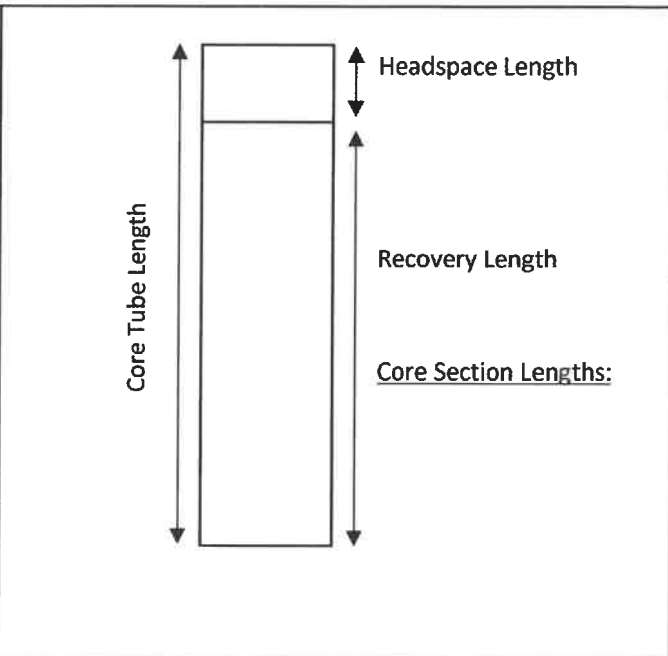
(B) Water Level Measurements
 Tide Elevation: NA Pred. / Actual
 Time: 9:51

(C) Mudline Elevation (B-A): NA

Core Collection Information

Core Accepted: Yes / No _____
 Drive Penetration (D): 7.1
 Core Tube Length: NA
 Headspace Length: NA
 Recovery Length (E): 5.1
 Percent Recovery (E/D*100): 72%

Drive Notes:
Slow driving down to 7.1.



Sediment Description:
 Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents
 (color, layering, sheen, debris, plant matter, shells, biota)
Very dark gray-black from 0 to 1 foot, light gray silt and sand layers from approx 2.5 to bottom of core

Notes:
~~None~~
 KW

SUBSURFACE SEDIMENT CORE COLLECTION FORM

FLOYD | SNIDER

Project: Contera Sediment Sampling
 Project No: _____
 Field Staff: PO, KH
 Contractor: _____
 Sampling Method: Vibracore
 Field Coordinates:
 Lat/Northing: 245885.61
245884.43

Station ID: TOC-SC-03
 Date: 3/21/19
 Attempt No: 1
 Vertical Datum: _____
 Horizontal Datum: NAD83 (2011)
 Long/Easting: 1255989.37
1255988.46

(A) Water Depth
 Leadline Water Depth: 6.0 5.7
 Depth Sounder Water Depth: _____

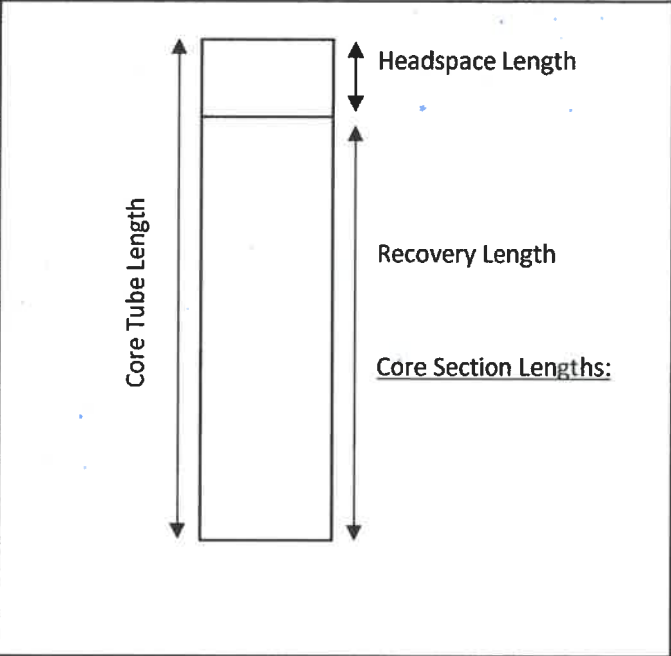
(B) Water Level Measurements
 Tide Elevation: _____ Pred. / Actual
 Time: 14:36

(C) Mudline Elevation (B-A):

Core Collection Information

Core Accepted: Yes / No
Drive Penetration (D): <u>7.4</u>
Core Tube Length: <u>NA</u>
Headspace Length: <u>NA</u>
Recovery Length (E): <u>6.6</u>
Percent Recovery (E/D*100): <u>89%</u>

Drive Notes:
Slow, steady driving to 5', very slow down to 6.6.



Sediment Description:
 Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents
 (color, layering, sheen, debris, plant matter, shells, biota)
light brown grey f-sand and silt

Notes:

None

KH

SUBSURFACE SEDIMENT CORE SAMPLING FORM

FLOYD | SNIDER

Project: Cantera Sediment Sampling	Station ID: TOC-SC-01
Date/Time: 3/21/19	Attempt No.: 1
Logged by: KH	No. of Sections: 1
Sampling Method: Vibracore	Core Quality: <u>Good</u> Fair Poor Disturbed
Mudline elevation: 37.8 (leadline) @ 9:06 AM	Diameter of Core (inches):
(A) Drive Length (ft): 7.1	(C) Percent Recovery (B/A*100): 77%
(B) Recovered Length (ft): 5.5	
Notes: TOC-SC-01-0.5-2.0 @ 11:11 ; TOC-SC-01-2.5-4.0 @ 11:07	

Elevation (ft)	Recovered Length (ft)	% Gravel	% Sand	% Fines	Sediment Description (Density, Moisture, Minor Constituents, MAJOR Constituents, Organics, Sheen, Odor, etc.)	Recovered Length (ft)	Sample ID and Analyses	Summary Sketch
1		0	65	10	0 to 2.1: silty f-SAND - loose, moist, olive gray-brown, silty SAND, pockets of decomposed woody debris (15%), trace shells, trace slight sulfide odor fragments		No sample TOC-SC-01-0.5-2.0 @ 11:11 All analytes	
2							No sample	
3		0	95	5	@ 2.1: grades to f-SAND - moderately dense, moist, f-SAND, trace silt, light gray		TOC-SC-01-2.5-4.0 @ 11:07 All analytes	
4				100	@ 3 to 3.2: silty CLAY - stiff, damp, light gray, silty CLAY @ 3.2 - dense, damp, light gray, f-SAND, trace silt		No sample	
5					@ 5.0 - stiff, damp, light gray, silty CLAY			
6					Bottom of core @ 5.5			

SUBSURFACE SEDIMENT CORE SAMPLING FORM

FLOYD | SNIDER

Project: Cantera Sediment Sampling	Sation ID: TOC-SC-02
Date/Time: 3/21/19	Attempt No.: 1
Logged by: KH	No. of Sections: 1
Sampling Method: Vibracore	Core Quality: (Good) Fair Poor Disturbed
Mudline elevation: 13.1 (leadline) @ 9:51	Diameter of Core (inches):
(A) Drive Length (ft): 7.1	(C) Percent Recovery (B/A*100): 69%
(B) Recovered Length (ft): 4.9	(72% on boat)
Notes: TOC-SC-02-0.5-1.2 @ 12:50; TOC-SC-02-1.2-2.2 @ 13:00 TOC-SC-02-2.6-4.0 @ 12:55	

Elevation (CRD)	Recovered Length (ft)	% Gravel	% Sand	% Fines	Sediment Description (Density, Moisture, Minor Constituents, MAJOR Constituents, Organics, Sheen, Odor, etc.)	Recovered Length (ft)	Sample ID and Analyses	Summary Sketch
1		-	10	60	0 to 1.5: sandy SILT - soft, very wet, Sandy SILT, woody debris (30%) up to 2", moderate metallic sheen/oily appearance, mild petroleum-like odor, very dark olive gray.		No sample	
2		-	60	40	@ 1.5: grades to silty f-SAND, - loose, wet, olive gray and brown, silty f-SAND, trace fine wood debris, trace shell fragments.		TOC-SC-02-0.5-1.2 All analytes	
		-	60	40			TOC-SC-02-1.2-2.2 All analytes	
3		x trace	30	70	@ 2.2 same as above except grades to olive gray, no woody debris.		No sample	
4		20	-	80	@ 2.6 grades to stiff to very stiff, damp, light gray, sandy SILT w/ clay, trace grayed.		TOC-SC-02-2.6-4.0 @ 12:55 All analytes	
5					@ 3.6 grades to gravelly CLAY w/ silt, hard (glacial till)		No sample	
6					↑ Bottom of core @ 4.9			

SUBSURFACE SEDIMENT CORE SAMPLING FORM

FLOYD | SNIDER

Project: Cantera Sediment Sampling	Sation ID: TOC-SC-03
Date/Time: 3/21/19	Attempt No.: 1
Logged by: KH	No. of Sections: 1
Sampling Method: Vibracore	Core Quality: <u>Good</u> Fair Poor Disturbed
Mudline elevation: 5.7 (headline) @ 14:36	Diameter of Core (inches):
(A) Drive Length (ft): 7.4	(C) Percent Recovery (B/A*100): 89%
(B) Recovered Length (ft): 6.6	
Notes: TOC-SC-03-0-0.5 @ 15:30; TOC-SC-03-1.0-2.5 @ 15:40	

↳ All analyses except grain size

↳ Archive only

Elevation (CRD)	Recovered Length (ft)	% Gravel	% Sand	% Fines	Sediment Description (Density, Moisture, Minor Constituents, MAJOR Constituents, Organics, Sheen, Odor, etc.)	Recovered Length (ft)	Sample ID and Analyses	Summary Sketch
		-	30	60	0 to 0.5: f-sandy SILT - ^{wet} olive gray brown, soft, f-sandy SILT w/ woody debris (10%) (sticks and twigs up to 3")		TOC-SC-03-0-0.5	
1							No sample	
		-	90	10	0.5 to 2.6: silty f-SAND - moderately dense/loose, wet, light gray, silty f-SAND		TOC-SC-03-1-2.5	
2							2 Archive	
		-	85	15	@ 2.6 grades to moderately dense, moist, light yellow-brown and light gray f-SAND, trace silt, pockets of highly consolidated oxidized silt			
3							No sample	
4								
5								
		-	-	100	@ 5.5: very ^{hard} dense, damp, light gray-brown, silty CLAY			
6		-	100	trace	@ 6.0: very dense, damp, light gray, f-SAND, trace silt			
7					Core bottom @ 6.6			

sand

silt

clay

woody debris

Attachment 2
Laboratory Reports



3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Floyd | Snider
Amanda Mckay
601 Union St., Suite 600
Seattle, WA 98101

RE: Surface Sediment Quality Evaluation
Work Order Number: 1808013

September 11, 2018

Attention Amanda Mckay:

Fremont Analytical, Inc. received 7 sample(s) on 8/1/2018 for the analyses presented in the following report.

Ammonia by SM 4500 NH3 E
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.
Dioxins by EPA Method 1613
Grain Size by ASTM D422
Mercury by EPA Method 7471
Organochlorine Pesticides by EPA Method 8081
Polychlorinated Biphenyls (PCB) by EPA 8082
Salinity by SM 2520B
Sample Moisture (Percent Moisture)
Semi-Volatile Organic Compounds by EPA Method 8270
Total Metals by EPA Method 6020
Total Organic Carbon by EPA 9060

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

DoD/ELAP Certification #L17-135, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)



Mike Ridgeway
Laboratory Director

CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation
Work Order: 1808013

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1808013-001	TOC-SS-01-0-10	08/01/2018 9:50 AM	08/01/2018 3:00 PM
1808013-002	TOC-SS-02-0-10	08/01/2018 10:40 AM	08/01/2018 3:00 PM
1808013-003	TOC-SS-03-0-10	08/01/2018 11:15 AM	08/01/2018 3:00 PM
1808013-004	TOC-SS-04-0-10	08/01/2018 11:45 AM	08/01/2018 3:00 PM
1808013-005	TOC-SS-05-0-10	08/01/2018 12:53 PM	08/01/2018 3:00 PM
1808013-006	TOC-SS-06-0-10	08/01/2018 1:10 PM	08/01/2018 3:00 PM
1808013-007	TOC-SS-03D-0-10	08/01/2018 11:20 AM	08/01/2018 3:00 PM

CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

WorkOrder Narrative:

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Prep Sample Cleanup Comments:

1808013-001A 283216 Acid: Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1808013-001A) required Acid Cleanup Procedure (Using Method No 3665A).

1808013-002A 283218 Acid: Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1808013-002A) required Acid Cleanup Procedure (Using Method No 3665A).

1808013-007A 283225 Acid: Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1808013-007A) required Acid Cleanup Procedure (Using Method No 3665A).

1808013-006A 283224 Acid: Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1808013-006A) required Acid Cleanup Procedure (Using Method No 3665A).

1808013-005A 283223 Acid: Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1808013-005A) required Acid Cleanup Procedure (Using Method No 3665A).

1808013-004A 283222 Acid: Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1808013-004A) required Acid Cleanup Procedure (Using Method No 3665A).

1808013-003A 283221 Acid: Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1808013-003A) required Acid Cleanup Procedure (Using Method No 3665A).

1808013-001A 283216 Florisil: Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1808013-001A) required Florisil Cleanup Procedure (Using Method No 3620C).

1808013-002A 283218 Florisil: Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1808013-002A) required Florisil Cleanup Procedure (Using Method No 3620C).

1808013-003A 283221 Florisil: Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1808013-003A) required Florisil Cleanup Procedure (Using Method No 3620C).

1808013-005A 283223 Florisil: Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1808013-005A) required Florisil Cleanup Procedure (Using Method No 3620C).

1808013-006A 283224 Florisil: Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1808013-006A) required Florisil Cleanup Procedure (Using Method No 3620C).

1808013-007A 283225 Florisil: Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1808013-007A) required Florisil Cleanup Procedure (Using Method No 3620C).

1808013-004A 283222 Florisil: Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1808013-004A) required Florisil Cleanup Procedure (Using Method No 3620C).

1808013-007A 283600 Acid: Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1808013-007A)

CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

required Acid Cleanup Procedure (Using Method No 3665A).
1808013-007A 283600 Florisil: Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1808013-007A)
required Florisil Cleanup Procedure (Using Method No 3620C).

Qualifiers:

- * - Flagged value is not within established control limits
- B - Analyte detected in the associated Method Blank
- D - Dilution was required
- E - Value above quantitation range
- H - Holding times for preparation or analysis exceeded
- I - Analyte with an internal standard that does not meet established acceptance criteria
- J - Analyte detected below Reporting Limit
- N - Tentatively Identified Compound (TIC)
- Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
- S - Spike recovery outside accepted recovery limits
- ND - Not detected at the Reporting Limit
- R - High relative percent difference observed

Acronyms:

- %Rec - Percent Recovery
- CCB - Continued Calibration Blank
- CCV - Continued Calibration Verification
- DF - Dilution Factor
- HEM - Hexane Extractable Material
- ICV - Initial Calibration Verification
- LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
- MB or MBLANK - Method Blank
- MDL - Method Detection Limit
- MS/MSD - Matrix Spike / Matrix Spike Duplicate
- PDS - Post Digestion Spike
- Ref Val - Reference Value
- RL - Reporting Limit
- RPD - Relative Percent Difference
- SD - Serial Dilution
- SGT - Silica Gel Treatment
- SPK - Spike
- Surr - Surrogate



Client: Floyd | Snider

Collection Date: 8/1/2018 9:50:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-001

Matrix: Sediment

Client Sample ID: TOC-SS-01-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 21498

Analyst: SB

Aroclor 1016	ND	0.0992		mg/Kg-dry	1	8/6/2018 9:35:36 PM
Aroclor 1221	ND	0.0992		mg/Kg-dry	1	8/6/2018 9:35:36 PM
Aroclor 1232	ND	0.0992		mg/Kg-dry	1	8/6/2018 9:35:36 PM
Aroclor 1242	ND	0.0992		mg/Kg-dry	1	8/6/2018 9:35:36 PM
Aroclor 1248	ND	0.0992		mg/Kg-dry	1	8/6/2018 9:35:36 PM
Aroclor 1254	ND	0.0992		mg/Kg-dry	1	8/6/2018 9:35:36 PM
Aroclor 1260	ND	0.0992		mg/Kg-dry	1	8/6/2018 9:35:36 PM
Aroclor 1268	ND	0.0992		mg/Kg-dry	1	8/6/2018 9:35:36 PM
Total PCBs	ND	0.0992		mg/Kg-dry	1	8/6/2018 9:35:36 PM
Surr: Decachlorobiphenyl	133	30.8 - 168		%Rec	1	8/6/2018 9:35:36 PM
Surr: Tetrachloro-m-xylene	50.1	30.3 - 157		%Rec	1	8/6/2018 9:35:36 PM

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 21496

Analyst: SB

Diesel (Fuel Oil)	ND	74.1		mg/Kg-dry	1	8/6/2018 7:49:40 PM
Heavy Oil	ND	185		mg/Kg-dry	1	8/6/2018 7:49:40 PM
Surr: 2-Fluorobiphenyl	74.5	50 - 150		%Rec	1	8/6/2018 7:49:40 PM
Surr: o-Terphenyl	80.4	50 - 150		%Rec	1	8/6/2018 7:49:40 PM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 21516

Analyst: IH

Benzoic acid	ND	499		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Phenol	ND	39.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
3&4-Methylphenol (m, p-cresol)	ND	99.8		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Naphthalene	126	49.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
2-Methylnaphthalene	ND	49.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Acenaphthene	101	49.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Acenaphthylene	90.5	49.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Dibenzofuran	ND	74.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Fluorene	118	49.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Pentachlorophenol	132	99.8	Q	µg/Kg-dry	1	8/13/2018 10:49:21 PM
Phenanthrene	827	49.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Anthracene	235	49.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Carbazole	89.2	74.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Di-n-butylphthalate	ND	99.8		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Fluoranthene	2,210	49.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Pyrene	1,910	49.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Benz(a)anthracene	1,050	49.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Chrysene	1,430	49.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM



Client: Floyd | Snider

Collection Date: 8/1/2018 9:50:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-001

Matrix: Sediment

Client Sample ID: TOC-SS-01-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 21516 Analyst: IH

bis (2-Ethylhexyl) phthalate	853	99.8		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Di-n-octyl phthalate	116	39.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Benzo(b)fluoranthene	2,400	49.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Benzo(k)fluoranthene	950	49.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Benzo(a)pyrene	915	49.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Indeno(1,2,3-cd)pyrene	434	49.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Dibenz(a,h)anthracene	239	49.9		µg/Kg-dry	1	8/13/2018 10:49:21 PM
Benzo(g,h,i)perylene	408	49.9	Q	µg/Kg-dry	1	8/13/2018 10:49:21 PM
Surr: 2,4,6-Tribromophenol	95.8	14.8 - 165		%Rec	1	8/13/2018 10:49:21 PM
Surr: 2-Fluorobiphenyl	46.8	17.8 - 151		%Rec	1	8/13/2018 10:49:21 PM
Surr: Nitrobenzene-d5	23.8	12.5 - 163		%Rec	1	8/13/2018 10:49:21 PM
Surr: Phenol-d6	69.8	11.6 - 133		%Rec	1	8/13/2018 10:49:21 PM
Surr: p-Terphenyl	80.2	22 - 176		%Rec	1	8/13/2018 10:49:21 PM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift)

Mercury by EPA Method 7471

Batch ID: 21500 Analyst: WF

Mercury	0.489	0.262		mg/Kg-dry	1	8/6/2018 12:01:22 PM
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Total Metals by EPA Method 6020

Batch ID: 21494 Analyst: WC

Arsenic	88.6	0.764		mg/Kg-dry	1	8/6/2018 3:10:13 PM
Cadmium	1.25	0.611		mg/Kg-dry	1	8/6/2018 3:10:13 PM
Chromium	103	0.306		mg/Kg-dry	1	8/6/2018 3:10:13 PM
Copper	681	0.611		mg/Kg-dry	1	8/6/2018 3:10:13 PM
Lead	180	0.611		mg/Kg-dry	1	8/6/2018 3:10:13 PM
Nickel	47.0	1.53		mg/Kg-dry	1	8/6/2018 3:10:13 PM
Selenium	ND	1.53		mg/Kg-dry	1	8/6/2018 3:10:13 PM
Silver	0.441	0.306		mg/Kg-dry	1	8/6/2018 3:10:13 PM
Zinc	1,850	15.3	D	mg/Kg-dry	10	8/6/2018 3:46:37 PM

Sample Moisture (Percent Moisture)

Batch ID: R45461 Analyst: CW

Total Solids	23.5	0.500		wt%	1	8/15/2018 6:44:04 PM
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Sample Moisture (Percent Moisture)

Batch ID: R45199 Analyst: EAS

Percent Moisture	76.5	0.500		wt%	1	8/3/2018 3:26:16 PM
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Client: Floyd | Snider

Collection Date: 8/1/2018 9:50:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-001

Matrix: Sediment

Client Sample ID: TOC-SS-01-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Total Organic Carbon by EPA 9060

Batch ID: 21581 Analyst: KT

Total Organic Carbon	4.95	0.0750		%-dry	1	8/14/2018 1:07:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 21503 Analyst: GM

Nitrogen, Ammonia	24.3	0.595		mg/Kg-dry	1	8/7/2018 3:33:00 PM
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Client: Floyd | Snider

Collection Date: 8/1/2018 10:40:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-002

Matrix: Sediment

Client Sample ID: TOC-SS-02-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 21498

Analyst: SB

Aroclor 1016	ND	0.0998		mg/Kg-dry	1	8/6/2018 9:56:49 PM
Aroclor 1221	ND	0.0998		mg/Kg-dry	1	8/6/2018 9:56:49 PM
Aroclor 1232	ND	0.0998		mg/Kg-dry	1	8/6/2018 9:56:49 PM
Aroclor 1242	ND	0.0998		mg/Kg-dry	1	8/6/2018 9:56:49 PM
Aroclor 1248	ND	0.0998		mg/Kg-dry	1	8/6/2018 9:56:49 PM
Aroclor 1254	ND	0.0998		mg/Kg-dry	1	8/6/2018 9:56:49 PM
Aroclor 1260	ND	0.0998		mg/Kg-dry	1	8/6/2018 9:56:49 PM
Aroclor 1268	ND	0.0998		mg/Kg-dry	1	8/6/2018 9:56:49 PM
Total PCBs	ND	0.0998		mg/Kg-dry	1	8/6/2018 9:56:49 PM
Surr: Decachlorobiphenyl	95.0	30.8 - 168		%Rec	1	8/6/2018 9:56:49 PM
Surr: Tetrachloro-m-xylene	25.6	30.3 - 157	S	%Rec	1	8/6/2018 9:56:49 PM

NOTES:

S - Outlying surrogate recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 21496

Analyst: SB

Diesel (Fuel Oil)	ND	56.1		mg/Kg-dry	1	8/6/2018 10:52:03 PM
Heavy Oil	ND	140		mg/Kg-dry	1	8/6/2018 10:52:03 PM
Surr: 2-Fluorobiphenyl	80.7	50 - 150		%Rec	1	8/6/2018 10:52:03 PM
Surr: o-Terphenyl	86.9	50 - 150		%Rec	1	8/6/2018 10:52:03 PM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 21516

Analyst: IH

Benzoic acid	ND	498		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Phenol	ND	39.8		µg/Kg-dry	1	8/13/2018 9:17:40 PM
3&4-Methylphenol (m, p-cresol)	ND	99.6		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Naphthalene	124	49.8		µg/Kg-dry	1	8/13/2018 9:17:40 PM
2-Methylnaphthalene	77.9	49.8		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Acenaphthene	354	49.8		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Acenaphthylene	79.3	49.8		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Dibenzofuran	231	74.7		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Fluorene	546	49.8		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Pentachlorophenol	ND	99.6		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Phenanthrene	5,920	498	D	µg/Kg-dry	10	8/14/2018 11:32:15 AM
Anthracene	715	49.8		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Carbazole	952	74.7		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Di-n-butylphthalate	ND	99.6		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Fluoranthene	10,200	498	D	µg/Kg-dry	10	8/14/2018 11:32:15 AM



Client: Floyd | Snider

Collection Date: 8/1/2018 10:40:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-002

Matrix: Sediment

Client Sample ID: TOC-SS-02-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 21516

Analyst: IH

Pyrene	7,560	498	D	µg/Kg-dry	10	8/14/2018 11:32:15 AM
Benz(a)anthracene	3,670	49.8		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Chrysene	4,850	49.8		µg/Kg-dry	1	8/13/2018 9:17:40 PM
bis (2-Ethylhexyl) phthalate	630	99.6		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Di-n-octyl phthalate	123	39.8		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Benzo(b)fluoranthene	4,140	49.8		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Benzo(k)fluoranthene	3,300	49.8		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Benzo(a)pyrene	3,500	49.8		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Indeno(1,2,3-cd)pyrene	1,730	49.8		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Dibenz(a,h)anthracene	955	49.8		µg/Kg-dry	1	8/13/2018 9:17:40 PM
Benzo(g,h,i)perylene	1,720	49.8	Q	µg/Kg-dry	1	8/13/2018 9:17:40 PM
Surr: 2,4,6-Tribromophenol	113	14.8 - 165		%Rec	1	8/13/2018 9:17:40 PM
Surr: 2-Fluorobiphenyl	46.1	17.8 - 151		%Rec	1	8/13/2018 9:17:40 PM
Surr: Nitrobenzene-d5	28.9	12.5 - 163		%Rec	1	8/13/2018 9:17:40 PM
Surr: Phenol-d6	80.8	11.6 - 133		%Rec	1	8/13/2018 9:17:40 PM
Surr: p-Terphenyl	108	22 - 176		%Rec	1	8/13/2018 9:17:40 PM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift)

Mercury by EPA Method 7471

Batch ID: 21500

Analyst: WF

Mercury	0.494	0.335	D	mg/Kg-dry	2	8/6/2018 3:54:44 PM
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Total Metals by EPA Method 6020

Batch ID: 21494

Analyst: WC

Arsenic	69.9	0.534		mg/Kg-dry	1	8/6/2018 2:21:43 PM
Cadmium	1.57	0.428		mg/Kg-dry	1	8/6/2018 2:21:43 PM
Chromium	155	0.214		mg/Kg-dry	1	8/6/2018 2:21:43 PM
Copper	311	0.428		mg/Kg-dry	1	8/6/2018 2:21:43 PM
Lead	122	0.428		mg/Kg-dry	1	8/6/2018 2:21:43 PM
Nickel	240	1.07		mg/Kg-dry	1	8/6/2018 2:21:43 PM
Selenium	ND	1.07		mg/Kg-dry	1	8/6/2018 2:21:43 PM
Silver	0.346	0.214		mg/Kg-dry	1	8/6/2018 2:21:43 PM
Zinc	1,060	10.7	D	mg/Kg-dry	10	8/6/2018 3:50:38 PM

Sample Moisture (Percent Moisture)

Batch ID: R45461

Analyst: CW

Total Solids	32.5	0.500		wt%	1	8/15/2018 6:44:04 PM
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Client: Floyd | Snider

Collection Date: 8/1/2018 10:40:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-002

Matrix: Sediment

Client Sample ID: TOC-SS-02-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Sample Moisture (Percent Moisture)

Batch ID: R45199 Analyst: EAS

Percent Moisture	67.5	0.500		wt%	1	8/3/2018 3:26:16 PM
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Total Organic Carbon by EPA 9060

Batch ID: 21581 Analyst: KT

Total Organic Carbon	3.52	0.0750		%-dry	1	8/14/2018 1:25:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 21503 Analyst: GM

Nitrogen, Ammonia	19.0	0.530		mg/Kg-dry	1	8/7/2018 3:33:00 PM
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Client: Floyd | Snider

Collection Date: 8/1/2018 11:15:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-003

Matrix: Sediment

Client Sample ID: TOC-SS-03-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 21498

Analyst: SB

Aroclor 1016	ND	0.100		mg/Kg-dry	1	8/6/2018 10:28:35 PM
Aroclor 1221	ND	0.100		mg/Kg-dry	1	8/6/2018 10:28:35 PM
Aroclor 1232	ND	0.100		mg/Kg-dry	1	8/6/2018 10:28:35 PM
Aroclor 1242	ND	0.100		mg/Kg-dry	1	8/6/2018 10:28:35 PM
Aroclor 1248	ND	0.100		mg/Kg-dry	1	8/6/2018 10:28:35 PM
Aroclor 1254	ND	0.100		mg/Kg-dry	1	8/6/2018 10:28:35 PM
Aroclor 1260	ND	0.100		mg/Kg-dry	1	8/6/2018 10:28:35 PM
Aroclor 1268	ND	0.100		mg/Kg-dry	1	8/6/2018 10:28:35 PM
Total PCBs	ND	0.100		mg/Kg-dry	1	8/6/2018 10:28:35 PM
Surr: Decachlorobiphenyl	85.8	30.8 - 168		%Rec	1	8/6/2018 10:28:35 PM
Surr: Tetrachloro-m-xylene	43.6	30.3 - 157		%Rec	1	8/6/2018 10:28:35 PM

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 21496

Analyst: SB

Diesel (Fuel Oil)	ND	103		mg/Kg-dry	1	8/6/2018 8:20:17 PM
Heavy Oil	ND	257		mg/Kg-dry	1	8/6/2018 8:20:17 PM
Surr: 2-Fluorobiphenyl	66.7	50 - 150		%Rec	1	8/6/2018 8:20:17 PM
Surr: o-Terphenyl	72.7	50 - 150		%Rec	1	8/6/2018 8:20:17 PM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 21516

Analyst: IH

Benzoic acid	ND	497		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Phenol	ND	39.8		µg/Kg-dry	1	8/13/2018 11:12:10 PM
3&4-Methylphenol (m, p-cresol)	ND	99.4		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Naphthalene	ND	49.7		µg/Kg-dry	1	8/13/2018 11:12:10 PM
2-Methylnaphthalene	ND	49.7		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Acenaphthene	ND	49.7		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Acenaphthylene	ND	49.7		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Dibenzofuran	ND	74.6		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Fluorene	ND	49.7		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Pentachlorophenol	ND	99.4		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Phenanthrene	188	49.7		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Anthracene	180	49.7		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Carbazole	ND	74.6		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Di-n-butylphthalate	ND	99.4		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Fluoranthene	618	49.7		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Pyrene	542	49.7		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Benz(a)anthracene	240	49.7		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Chrysene	392	49.7		µg/Kg-dry	1	8/13/2018 11:12:10 PM



Client: Floyd | Snider

Collection Date: 8/1/2018 11:15:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-003

Matrix: Sediment

Client Sample ID: TOC-SS-03-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 21516

Analyst: IH

bis (2-Ethylhexyl) phthalate	511	99.4		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Di-n-octyl phthalate	76.3	39.8		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Benzo(b)fluoranthene	683	49.7		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Benzo(k)fluoranthene	246	49.7		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Benzo(a)pyrene	253	49.7		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Indeno(1,2,3-cd)pyrene	152	49.7		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Dibenz(a,h)anthracene	60.2	49.7		µg/Kg-dry	1	8/13/2018 11:12:10 PM
Benzo(g,h,i)perylene	156	49.7	Q	µg/Kg-dry	1	8/13/2018 11:12:10 PM
Surr: 2,4,6-Tribromophenol	47.9	14.8 - 165		%Rec	1	8/13/2018 11:12:10 PM
Surr: 2-Fluorobiphenyl	15.1	17.8 - 151	S	%Rec	1	8/13/2018 11:12:10 PM
Surr: Nitrobenzene-d5	5.50	12.5 - 163	S	%Rec	1	8/13/2018 11:12:10 PM
Surr: Phenol-d6	33.7	11.6 - 133		%Rec	1	8/13/2018 11:12:10 PM
Surr: p-Terphenyl	36.2	22 - 176		%Rec	1	8/13/2018 11:12:10 PM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift)

S - Outlying surrogate recovery(ies) observed.

Mercury by EPA Method 7471

Batch ID: 21500

Analyst: WF

Mercury	0.519	0.369		mg/Kg-dry	1	8/6/2018 12:04:41 PM
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Total Metals by EPA Method 6020

Batch ID: 21494

Analyst: WC

Arsenic	19.8	1.15		mg/Kg-dry	1	8/6/2018 3:14:15 PM
Cadmium	1.02	0.914		mg/Kg-dry	1	8/6/2018 3:14:15 PM
Chromium	53.2	0.458		mg/Kg-dry	1	8/6/2018 3:14:15 PM
Copper	342	0.914		mg/Kg-dry	1	8/6/2018 3:14:15 PM
Lead	141	0.914		mg/Kg-dry	1	8/6/2018 3:14:15 PM
Nickel	44.5	2.29		mg/Kg-dry	1	8/6/2018 3:14:15 PM
Selenium	ND	2.29		mg/Kg-dry	1	8/6/2018 3:14:15 PM
Silver	ND	0.458		mg/Kg-dry	1	8/6/2018 3:14:15 PM
Zinc	638	2.29		mg/Kg-dry	1	8/6/2018 3:14:15 PM

Sample Moisture (Percent Moisture)

Batch ID: R45461

Analyst: CW

Total Solids	16.5	0.500		wt%	1	8/15/2018 6:44:04 PM
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Client: Floyd | Snider

Collection Date: 8/1/2018 11:15:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-003

Matrix: Sediment

Client Sample ID: TOC-SS-03-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Sample Moisture (Percent Moisture)

Batch ID: R45199 Analyst: EAS

Percent Moisture	83.5	0.500		wt%	1	8/3/2018 3:26:16 PM
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Total Organic Carbon by EPA 9060

Batch ID: 21581 Analyst: KT

Total Organic Carbon	6.03	0.0750		%-dry	1	8/14/2018 6:13:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 21503 Analyst: GM

Nitrogen, Ammonia	38.8	0.399		mg/Kg-dry	1	8/7/2018 3:33:00 PM
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Salinity by SM 2520B

Batch ID: R45153 Analyst: KT

Salinity	811	6.06		ppm-dry	1	8/2/2018 12:40:00 PM
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Client: Floyd | Snider

Collection Date: 8/1/2018 11:45:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-004

Matrix: Sediment

Client Sample ID: TOC-SS-04-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 21498

Analyst: SB

Aroclor 1016	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:39:15 PM
Aroclor 1221	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:39:15 PM
Aroclor 1232	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:39:15 PM
Aroclor 1242	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:39:15 PM
Aroclor 1248	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:39:15 PM
Aroclor 1254	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:39:15 PM
Aroclor 1260	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:39:15 PM
Aroclor 1268	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:39:15 PM
Total PCBs	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:39:15 PM
Surr: Decachlorobiphenyl	55.3	30.8 - 168		%Rec	1	8/6/2018 10:39:15 PM
Surr: Tetrachloro-m-xylene	64.1	30.3 - 157		%Rec	1	8/6/2018 10:39:15 PM

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 21496

Analyst: SB

Diesel (Fuel Oil)	ND	104		mg/Kg-dry	1	8/6/2018 8:50:47 PM
Heavy Oil	ND	259		mg/Kg-dry	1	8/6/2018 8:50:47 PM
Surr: 2-Fluorobiphenyl	78.4	50 - 150		%Rec	1	8/6/2018 8:50:47 PM
Surr: o-Terphenyl	84.8	50 - 150		%Rec	1	8/6/2018 8:50:47 PM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 21516

Analyst: IH

Benzoic acid	ND	500		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Phenol	ND	40.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
3&4-Methylphenol (m, p-cresol)	ND	100		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Naphthalene	67.7	50.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
2-Methylnaphthalene	ND	50.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Acenaphthene	53.1	50.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Acenaphthylene	92.4	50.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Dibenzofuran	ND	75.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Fluorene	63.3	50.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Pentachlorophenol	ND	100		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Phenanthrene	285	50.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Anthracene	128	50.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Carbazole	ND	75.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Di-n-butylphthalate	ND	100		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Fluoranthene	929	50.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Pyrene	889	50.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Benz(a)anthracene	423	50.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Chrysene	663	50.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM



Client: Floyd | Snider

Collection Date: 8/1/2018 11:45:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-004

Matrix: Sediment

Client Sample ID: TOC-SS-04-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 21516

Analyst: IH

bis (2-Ethylhexyl) phthalate	910	100		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Di-n-octyl phthalate	110	40.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Benzo(b)fluoranthene	1,080	50.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Benzo(k)fluoranthene	862	50.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Benzo(a)pyrene	409	50.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Indeno(1,2,3-cd)pyrene	235	50.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Dibenz(a,h)anthracene	81.8	50.0		µg/Kg-dry	1	8/13/2018 11:35:03 PM
Benzo(g,h,i)perylene	242	50.0	Q	µg/Kg-dry	1	8/13/2018 11:35:03 PM
Surr: 2,4,6-Tribromophenol	35.1	14.8 - 165		%Rec	1	8/13/2018 11:35:03 PM
Surr: 2-Fluorobiphenyl	19.7	17.8 - 151		%Rec	1	8/13/2018 11:35:03 PM
Surr: Nitrobenzene-d5	14.0	12.5 - 163		%Rec	1	8/13/2018 11:35:03 PM
Surr: Phenol-d6	31.7	11.6 - 133		%Rec	1	8/13/2018 11:35:03 PM
Surr: p-Terphenyl	48.0	22 - 176		%Rec	1	8/13/2018 11:35:03 PM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift)

Mercury by EPA Method 7471

Batch ID: 21500

Analyst: WF

Mercury	0.538	0.302		mg/Kg-dry	1	8/6/2018 12:06:18 PM
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Total Metals by EPA Method 6020

Batch ID: 21494

Analyst: WC

Arsenic	19.8	1.11		mg/Kg-dry	1	8/6/2018 3:18:16 PM
Cadmium	0.976	0.887		mg/Kg-dry	1	8/6/2018 3:18:16 PM
Chromium	57.1	0.444		mg/Kg-dry	1	8/6/2018 3:18:16 PM
Copper	352	0.887		mg/Kg-dry	1	8/6/2018 3:18:16 PM
Lead	138	0.887		mg/Kg-dry	1	8/6/2018 3:18:16 PM
Nickel	47.0	2.22		mg/Kg-dry	1	8/6/2018 3:18:16 PM
Selenium	ND	2.22		mg/Kg-dry	1	8/6/2018 3:18:16 PM
Silver	ND	0.444		mg/Kg-dry	1	8/6/2018 3:18:16 PM
Zinc	568	2.22		mg/Kg-dry	1	8/6/2018 3:18:16 PM

Sample Moisture (Percent Moisture)

Batch ID: R45461

Analyst: CW

Total Solids	16.6	0.500		wt%	1	8/15/2018 6:44:04 PM
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Sample Moisture (Percent Moisture)

Batch ID: R45199

Analyst: EAS

Percent Moisture	83.4	0.500		wt%	1	8/3/2018 3:26:16 PM
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Client: Floyd | Snider

Collection Date: 8/1/2018 11:45:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-004

Matrix: Sediment

Client Sample ID: TOC-SS-04-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Total Organic Carbon by EPA 9060

Batch ID: 21581 Analyst: KT

Total Organic Carbon	5.94	0.0750		%-dry	1	8/14/2018 6:29:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 21503 Analyst: GM

Nitrogen, Ammonia	9.26	0.497		mg/Kg-dry	1	8/7/2018 3:33:00 PM
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Salinity by SM 2520B

Batch ID: R45153 Analyst: KT

Salinity	985	6.05		ppm-dry	1	8/2/2018 12:40:00 PM
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Client: Floyd | Snider

Collection Date: 8/1/2018 12:53:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-005

Matrix: Sediment

Client Sample ID: TOC-SS-05-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 21498 Analyst: SB

Aroclor 1016	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:49:54 PM
Aroclor 1221	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:49:54 PM
Aroclor 1232	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:49:54 PM
Aroclor 1242	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:49:54 PM
Aroclor 1248	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:49:54 PM
Aroclor 1254	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:49:54 PM
Aroclor 1260	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:49:54 PM
Aroclor 1268	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:49:54 PM
Total PCBs	ND	0.0998		mg/Kg-dry	1	8/6/2018 10:49:54 PM
Surr: Decachlorobiphenyl	40.3	30.8 - 168		%Rec	1	8/6/2018 10:49:54 PM
Surr: Tetrachloro-m-xylene	44.9	30.3 - 157		%Rec	1	8/6/2018 10:49:54 PM

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 21496 Analyst: SB

Diesel (Fuel Oil)	ND	98.0		mg/Kg-dry	1	8/6/2018 9:21:03 PM
Heavy Oil	ND	245		mg/Kg-dry	1	8/6/2018 9:21:03 PM
Surr: 2-Fluorobiphenyl	61.1	50 - 150		%Rec	1	8/6/2018 9:21:03 PM
Surr: o-Terphenyl	68.2	50 - 150		%Rec	1	8/6/2018 9:21:03 PM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 21516 Analyst: IH

Benzoic acid	ND	496		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Phenol	ND	39.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
3&4-Methylphenol (m, p-cresol)	ND	99.1		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Naphthalene	78.6	49.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
2-Methylnaphthalene	ND	49.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Acenaphthene	ND	49.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Acenaphthylene	85.3	49.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Dibenzofuran	ND	74.3		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Fluorene	124	49.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Pentachlorophenol	ND	99.1		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Phenanthrene	627	49.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Anthracene	426	49.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Carbazole	ND	74.3		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Di-n-butylphthalate	ND	99.1		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Fluoranthene	1,080	49.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Pyrene	990	49.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Benz(a)anthracene	797	49.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Chrysene	1,540	49.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM



Client: Floyd | Snider

Collection Date: 8/1/2018 12:53:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-005

Matrix: Sediment

Client Sample ID: TOC-SS-05-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 21516

Analyst: IH

bis (2-Ethylhexyl) phthalate	908	99.1		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Di-n-octyl phthalate	103	39.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Benzo(b)fluoranthene	1,280	49.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Benzo(k)fluoranthene	505	49.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Benzo(a)pyrene	491	49.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Indeno(1,2,3-cd)pyrene	270	49.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Dibenz(a,h)anthracene	154	49.6		µg/Kg-dry	1	8/13/2018 11:57:51 PM
Benzo(g,h,i)perylene	302	49.6	Q	µg/Kg-dry	1	8/13/2018 11:57:51 PM
Surr: 2,4,6-Tribromophenol	78.2	14.8 - 165		%Rec	1	8/13/2018 11:57:51 PM
Surr: 2-Fluorobiphenyl	24.5	17.8 - 151		%Rec	1	8/13/2018 11:57:51 PM
Surr: Nitrobenzene-d5	15.3	12.5 - 163		%Rec	1	8/13/2018 11:57:51 PM
Surr: Phenol-d6	56.7	11.6 - 133		%Rec	1	8/13/2018 11:57:51 PM
Surr: p-Terphenyl	65.6	22 - 176		%Rec	1	8/13/2018 11:57:51 PM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift)

Mercury by EPA Method 7471

Batch ID: 21500

Analyst: WF

Mercury	0.519	0.330		mg/Kg-dry	1	8/6/2018 12:07:56 PM
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Total Metals by EPA Method 6020

Batch ID: 21494

Analyst: WC

Arsenic	17.4	1.07		mg/Kg-dry	1	8/6/2018 3:22:18 PM
Cadmium	0.855	0.855		mg/Kg-dry	1	8/6/2018 3:22:18 PM
Chromium	50.2	0.428		mg/Kg-dry	1	8/6/2018 3:22:18 PM
Copper	291	0.855		mg/Kg-dry	1	8/6/2018 3:22:18 PM
Lead	118	0.855		mg/Kg-dry	1	8/6/2018 3:22:18 PM
Nickel	39.5	2.14		mg/Kg-dry	1	8/6/2018 3:22:18 PM
Selenium	ND	2.14		mg/Kg-dry	1	8/6/2018 3:22:18 PM
Silver	ND	0.428		mg/Kg-dry	1	8/6/2018 3:22:18 PM
Zinc	494	2.14		mg/Kg-dry	1	8/6/2018 3:22:18 PM

Sample Moisture (Percent Moisture)

Batch ID: R45461

Analyst: CW

Total Solids	17.7	0.500		wt%	1	8/15/2018 6:44:04 PM
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Sample Moisture (Percent Moisture)

Batch ID: R45199

Analyst: EAS

Percent Moisture	82.3	0.500		wt%	1	8/3/2018 3:26:16 PM
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Client: Floyd | Snider

Collection Date: 8/1/2018 12:53:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-005

Matrix: Sediment

Client Sample ID: TOC-SS-05-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Total Organic Carbon by EPA 9060

Batch ID: 21581 Analyst: KT

Total Organic Carbon	5.76	0.0750		%-dry	1	8/14/2018 6:41:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 21503 Analyst: GM

Nitrogen, Ammonia	28.2	0.492		mg/Kg-dry	1	8/7/2018 3:33:00 PM
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Client: Floyd | Snider

Collection Date: 8/1/2018 1:10:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-006

Matrix: Sediment

Client Sample ID: TOC-SS-06-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 21872

Analyst: SB

Aroclor 1016	ND	0.0968		mg/Kg-dry	1	9/10/2018 8:00:03 PM
Aroclor 1221	ND	0.0968		mg/Kg-dry	1	9/10/2018 8:00:03 PM
Aroclor 1232	ND	0.0968		mg/Kg-dry	1	9/10/2018 8:00:03 PM
Aroclor 1242	ND	0.0968		mg/Kg-dry	1	9/10/2018 8:00:03 PM
Aroclor 1248	ND	0.0968		mg/Kg-dry	1	9/10/2018 8:00:03 PM
Aroclor 1254	ND	0.0968		mg/Kg-dry	1	9/10/2018 8:00:03 PM
Aroclor 1260	ND	0.0968		mg/Kg-dry	1	9/10/2018 8:00:03 PM
Aroclor 1268	ND	0.0968		mg/Kg-dry	1	9/10/2018 8:00:03 PM
Total PCBs	ND	0.0968		mg/Kg-dry	1	9/10/2018 8:00:03 PM
Surr: Decachlorobiphenyl	63.1	30.8 - 168		%Rec	1	9/10/2018 8:00:03 PM
Surr: Tetrachloro-m-xylene	44.3	30.3 - 157		%Rec	1	9/10/2018 8:00:03 PM

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 21496

Analyst: SB

Diesel (Fuel Oil)	ND	81.5		mg/Kg-dry	1	8/6/2018 9:51:28 PM
Heavy Oil	ND	204		mg/Kg-dry	1	8/6/2018 9:51:28 PM
Surr: 2-Fluorobiphenyl	69.2	50 - 150		%Rec	1	8/6/2018 9:51:28 PM
Surr: o-Terphenyl	73.5	50 - 150		%Rec	1	8/6/2018 9:51:28 PM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 21516

Analyst: IH

Benzoic acid	ND	497		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Phenol	ND	39.8		µg/Kg-dry	1	8/14/2018 12:20:38 AM
3&4-Methylphenol (m, p-cresol)	ND	99.5		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Naphthalene	91.3	49.7		µg/Kg-dry	1	8/14/2018 12:20:38 AM
2-Methylnaphthalene	ND	49.7		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Acenaphthene	91.8	49.7		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Acenaphthylene	92.9	49.7		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Dibenzofuran	ND	74.6		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Fluorene	126	49.7		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Pentachlorophenol	ND	99.5		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Phenanthrene	702	49.7		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Anthracene	201	49.7		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Carbazole	ND	74.6		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Di-n-butylphthalate	ND	99.5		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Fluoranthene	1,760	49.7		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Pyrene	1,480	49.7		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Benz(a)anthracene	624	49.7		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Chrysene	936	49.7		µg/Kg-dry	1	8/14/2018 12:20:38 AM



Client: Floyd | Snider

Collection Date: 8/1/2018 1:10:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-006

Matrix: Sediment

Client Sample ID: TOC-SS-06-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 21516

Analyst: IH

bis (2-Ethylhexyl) phthalate	764	99.5		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Di-n-octyl phthalate	71.3	39.8		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Benzo(b)fluoranthene	1,360	49.7		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Benzo(k)fluoranthene	481	49.7		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Benzo(a)pyrene	493	49.7		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Indeno(1,2,3-cd)pyrene	225	49.7		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Dibenz(a,h)anthracene	95.6	49.7		µg/Kg-dry	1	8/14/2018 12:20:38 AM
Benzo(g,h,i)perylene	226	49.7	Q	µg/Kg-dry	1	8/14/2018 12:20:38 AM
Surr: 2,4,6-Tribromophenol	89.1	14.8 - 165		%Rec	1	8/14/2018 12:20:38 AM
Surr: 2-Fluorobiphenyl	35.8	17.8 - 151		%Rec	1	8/14/2018 12:20:38 AM
Surr: Nitrobenzene-d5	16.6	12.5 - 163		%Rec	1	8/14/2018 12:20:38 AM
Surr: Phenol-d6	63.9	11.6 - 133		%Rec	1	8/14/2018 12:20:38 AM
Surr: p-Terphenyl	82.4	22 - 176		%Rec	1	8/14/2018 12:20:38 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift)

Mercury by EPA Method 7471

Batch ID: 21500

Analyst: WF

Mercury	0.487	0.245		mg/Kg-dry	1	8/6/2018 12:09:34 PM
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Total Metals by EPA Method 6020

Batch ID: 21494

Analyst: WC

Arsenic	15.6	0.877		mg/Kg-dry	1	8/6/2018 3:26:19 PM
Cadmium	0.711	0.699		mg/Kg-dry	1	8/6/2018 3:26:19 PM
Chromium	46.8	0.350		mg/Kg-dry	1	8/6/2018 3:26:19 PM
Copper	272	0.699		mg/Kg-dry	1	8/6/2018 3:26:19 PM
Lead	107	0.699		mg/Kg-dry	1	8/6/2018 3:26:19 PM
Nickel	34.2	1.75		mg/Kg-dry	1	8/6/2018 3:26:19 PM
Selenium	ND	1.75		mg/Kg-dry	1	8/6/2018 3:26:19 PM
Silver	ND	0.350		mg/Kg-dry	1	8/6/2018 3:26:19 PM
Zinc	408	1.75		mg/Kg-dry	1	8/6/2018 3:26:19 PM

Sample Moisture (Percent Moisture)

Batch ID: R45461

Analyst: CW

Total Solids	20.6	0.500		wt%	1	8/15/2018 6:44:04 PM
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Sample Moisture (Percent Moisture)

Batch ID: R45199

Analyst: EAS

Percent Moisture	79.4	0.500		wt%	1	8/3/2018 3:26:16 PM
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Client: Floyd | Snider

Collection Date: 8/1/2018 1:10:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-006

Matrix: Sediment

Client Sample ID: TOC-SS-06-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Total Organic Carbon by EPA 9060

Batch ID: 21581 Analyst: KT

Total Organic Carbon	6.00	0.0750		%-dry	1	8/14/2018 6:52:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 21503 Analyst: GM

Nitrogen, Ammonia	27.3	0.491		mg/Kg-dry	1	8/7/2018 3:33:00 PM
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Client: Floyd | Snider

Collection Date: 8/1/2018 11:20:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-007

Matrix: Sediment

Client Sample ID: TOC-SS-03D-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 21521

Analyst: SB

Aroclor 1016	ND	0.0988		mg/Kg-dry	1	8/8/2018 12:51:52 PM
Aroclor 1221	ND	0.0988		mg/Kg-dry	1	8/8/2018 12:51:52 PM
Aroclor 1232	ND	0.0988		mg/Kg-dry	1	8/8/2018 12:51:52 PM
Aroclor 1242	ND	0.0988		mg/Kg-dry	1	8/8/2018 12:51:52 PM
Aroclor 1248	ND	0.0988		mg/Kg-dry	1	8/8/2018 12:51:52 PM
Aroclor 1254	ND	0.0988		mg/Kg-dry	1	8/8/2018 12:51:52 PM
Aroclor 1260	ND	0.0988		mg/Kg-dry	1	8/8/2018 12:51:52 PM
Aroclor 1268	ND	0.0988		mg/Kg-dry	1	8/8/2018 12:51:52 PM
Total PCBs	ND	0.0988		mg/Kg-dry	1	8/8/2018 12:51:52 PM
Surr: Decachlorobiphenyl	118	30.8 - 168		%Rec	1	8/8/2018 12:51:52 PM
Surr: Tetrachloro-m-xylene	73.3	30.3 - 157		%Rec	1	8/8/2018 12:51:52 PM

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 21496

Analyst: SB

Diesel (Fuel Oil)	ND	108		mg/Kg-dry	1	8/6/2018 10:21:43 PM
Heavy Oil	ND	270		mg/Kg-dry	1	8/6/2018 10:21:43 PM
Surr: 2-Fluorobiphenyl	73.2	50 - 150		%Rec	1	8/6/2018 10:21:43 PM
Surr: o-Terphenyl	78.1	50 - 150		%Rec	1	8/6/2018 10:21:43 PM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 21516

Analyst: IH

Benzoic acid	ND	500		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Phenol	ND	40.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
3&4-Methylphenol (m, p-cresol)	ND	99.9		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Naphthalene	ND	50.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
2-Methylnaphthalene	ND	50.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Acenaphthene	ND	50.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Acenaphthylene	ND	50.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Dibenzofuran	ND	74.9		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Fluorene	ND	50.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Pentachlorophenol	ND	99.9		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Phenanthrene	98.6	50.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Anthracene	ND	50.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Carbazole	ND	74.9		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Di-n-butylphthalate	ND	99.9		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Fluoranthene	369	50.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Pyrene	341	50.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Benz(a)anthracene	140	50.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Chrysene	253	50.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM



Client: Floyd | Snider

Collection Date: 8/1/2018 11:20:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-007

Matrix: Sediment

Client Sample ID: TOC-SS-03D-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 21516

Analyst: IH

bis (2-Ethylhexyl) phthalate	319	99.9		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Di-n-octyl phthalate	51.9	40.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Benzo(b)fluoranthene	552	50.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Benzo(k)fluoranthene	144	50.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Benzo(a)pyrene	176	50.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Indeno(1,2,3-cd)pyrene	63.6	50.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Dibenz(a,h)anthracene	ND	50.0		µg/Kg-dry	1	8/14/2018 12:43:26 AM
Benzo(g,h,i)perylene	64.5	50.0	Q	µg/Kg-dry	1	8/14/2018 12:43:26 AM
Surr: 2,4,6-Tribromophenol	36.4	14.8 - 165		%Rec	1	8/14/2018 12:43:26 AM
Surr: 2-Fluorobiphenyl	15.5	17.8 - 151	S	%Rec	1	8/14/2018 12:43:26 AM
Surr: Nitrobenzene-d5	10.3	12.5 - 163	S	%Rec	1	8/14/2018 12:43:26 AM
Surr: Phenol-d6	21.7	11.6 - 133		%Rec	1	8/14/2018 12:43:26 AM
Surr: p-Terphenyl	33.3	22 - 176		%Rec	1	8/14/2018 12:43:26 AM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift)

S - Outlying surrogate recovery(ies) observed.

Mercury by EPA Method 7471

Batch ID: 21500

Analyst: WF

Mercury	0.592	0.336		mg/Kg-dry	1	8/6/2018 12:11:10 PM
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Total Metals by EPA Method 6020

Batch ID: 21494

Analyst: WC

Arsenic	20.7	1.05		mg/Kg-dry	1	8/6/2018 3:30:21 PM
Cadmium	1.15	0.839		mg/Kg-dry	1	8/6/2018 3:30:21 PM
Chromium	59.3	0.421		mg/Kg-dry	1	8/6/2018 3:30:21 PM
Copper	383	0.839		mg/Kg-dry	1	8/6/2018 3:30:21 PM
Lead	146	0.839		mg/Kg-dry	1	8/6/2018 3:30:21 PM
Nickel	49.7	2.10		mg/Kg-dry	1	8/6/2018 3:30:21 PM
Selenium	2.11	2.10		mg/Kg-dry	1	8/6/2018 3:30:21 PM
Silver	ND	0.421		mg/Kg-dry	1	8/6/2018 3:30:21 PM
Zinc	727	2.10		mg/Kg-dry	1	8/6/2018 3:30:21 PM

Sample Moisture (Percent Moisture)

Batch ID: R45461

Analyst: CW

Total Solids	16.8	0.500		wt%	1	8/15/2018 6:44:04 PM
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Client: Floyd | Snider

Collection Date: 8/1/2018 11:20:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1808013-007

Matrix: Sediment

Client Sample ID: TOC-SS-03D-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Sample Moisture (Percent Moisture)

Batch ID: R45199 Analyst: EAS

Percent Moisture	83.2	0.500		wt%	1	8/3/2018 3:26:16 PM
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Total Organic Carbon by EPA 9060

Batch ID: 21581 Analyst: KT

Total Organic Carbon	6.31	0.0750		%-dry	1	8/14/2018 7:06:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 21503 Analyst: GM

Nitrogen, Ammonia	43.1	0.494		mg/Kg-dry	1	8/7/2018 3:33:00 PM
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Grain Size by ASTM D422

Project: Surface Sediment Quality Evaluation
Client: Floyd | Snider
Lab Project #: 1808013

Percent Finer (Passing) than the Indicated Size

UOM = Percent

Grain Size Classification	Gravel						Coarse Sand	Medium Sand		Fine Sand			Silt		
	Sieve Size	3"	2"	1 1/2"	1"	3/4"	3/8"	#4	#10	#20	#40	#60	#140	#200	#325
Particle Size (Microns)	76200	50800	38100	25400	19050	9525	4750	2000	850	425	250	106	75	45	34
TOC-SS-01-0-10	100%	100%	100%	100%	60.0%	35.5%	23.1%	15.4%	9.31%	6.52%	5.21%	2.85%	1.91%	1.01%	0.401%
TOC-SS-02-0-10	100%	100%	100%	100%	91.5%	73.6%	65.4%	56.3%	33.2%	25.7%	22.4%	14.3%	9.29%	6.90%	0.318%
TOC-SS-03-0-10	100%	100%	100%	100%	78.1%	32.6%	18.3%	13.2%	10.8%	9.81%	9.14%	7.16%	5.72%	4.12%	0.596%
TOC-SS-04-0-10	100%	100%	100%	100%	76.4%	29.8%	12.3%	5.53%	3.07%	2.06%	1.58%	0.689%	0.434%	0.434%	0.266%
TOC-SS-05-0-10	100%	100%	100%	100%	94.3%	62.4%	27.2%	11.0%	6.44%	4.83%	4.19%	2.75%	2.17%	1.54%	0.843%
TOC-SS-06-0-10	100%	100%	100%	100%	67.8%	22.3%	12.1%	6.78%	4.24%	2.98%	2.27%	0.97%	0.685%	0.406%	0.250%

Grain Size by ASTM D422

Project: Surface Sediment Quality Evaluation
Client: Floyd | Snider
Lab Project #: 1808013

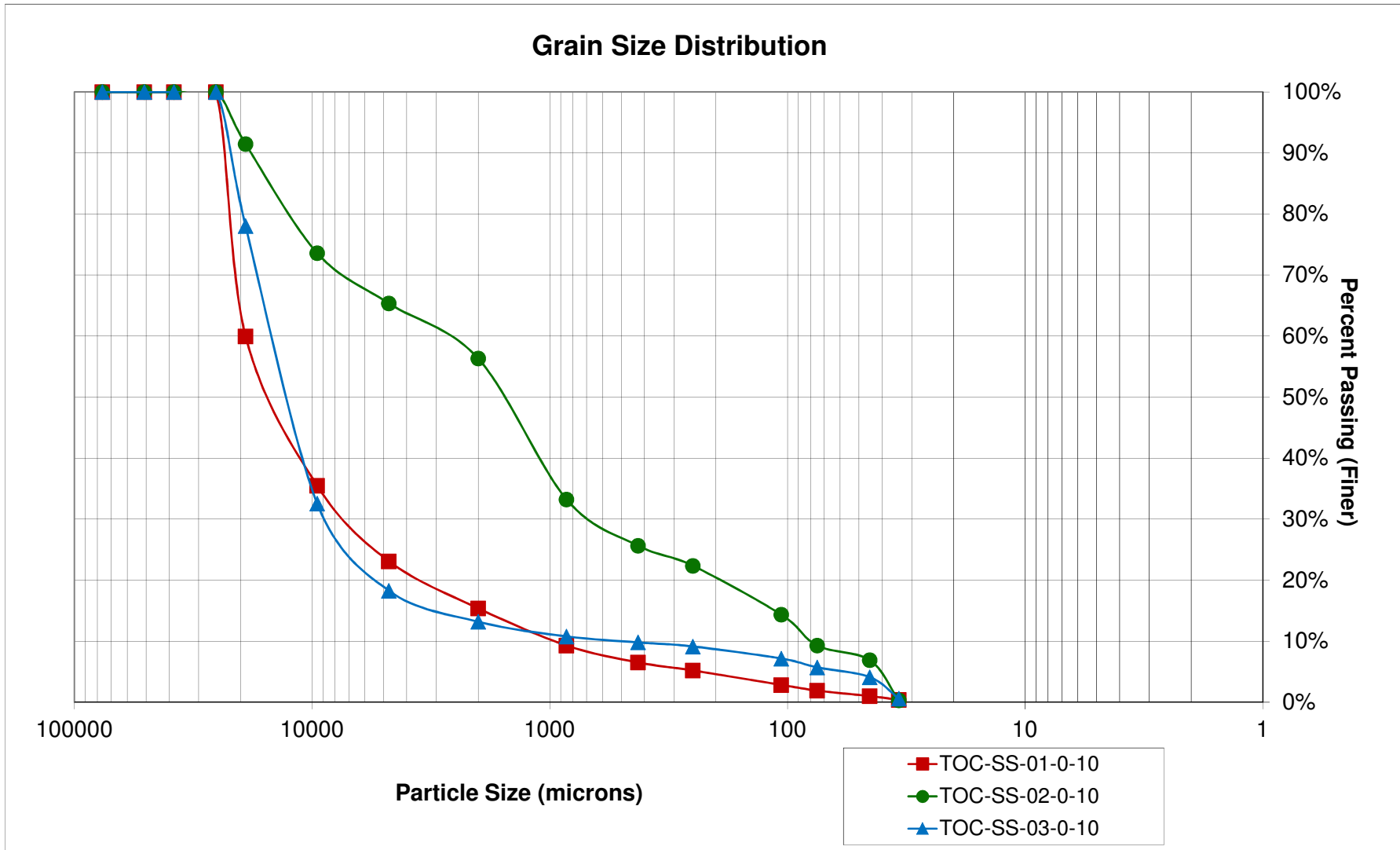
Percent Retained in Each Size Fraction

UOM = Percent

Grain Size Classification	Gravel							Coarse Sand	Medium Sand		Fine Sand			Silt		
	>76200	76200-50800	50800-38100	38100-25400	25400-19000	19050-9525	9525-4750	4750-2000	2000-850	850-425	425-250	250-106	106-75	75-45	45-34	<34
TOC-SS-01-0-10	0.00%	0.00%	0.00%	0.00%	39.8%	24.3%	12.3%	7.67%	6.04%	2.78%	1.30%	2.35%	0.930%	0.896%	0.606%	0.398%
TOC-SS-02-0-10	0.00%	0.00%	0.00%	0.00%	8.52%	17.9%	8.25%	9.02%	23.1%	7.57%	3.30%	8.02%	5.05%	2.39%	6.58%	0.318%
TOC-SS-03-0-10	0.00%	0.00%	0.00%	0.00%	21.5%	44.5%	14.0%	4.97%	2.35%	0.955%	0.653%	1.94%	1.41%	1.57%	3.45%	0.583%
TOC-SS-04-0-10	0.00%	0.00%	0.00%	0.00%	23.4%	46.2%	17.3%	6.73%	2.44%	0.994%	0.476%	0.885%	0.254%	0.00%	0.166%	0.264%
TOC-SS-05-0-10	0.00%	0.00%	0.00%	0.00%	5.60%	31.5%	34.7%	16.0%	4.49%	1.58%	0.638%	1.41%	0.577%	0.623%	0.684%	0.832%
TOC-SS-06-0-10	0.00%	0.00%	0.00%	0.00%	32.0%	45.2%	10.2%	5.30%	2.52%	1.26%	0.709%	1.28%	0.285%	0.277%	0.155%	0.249%

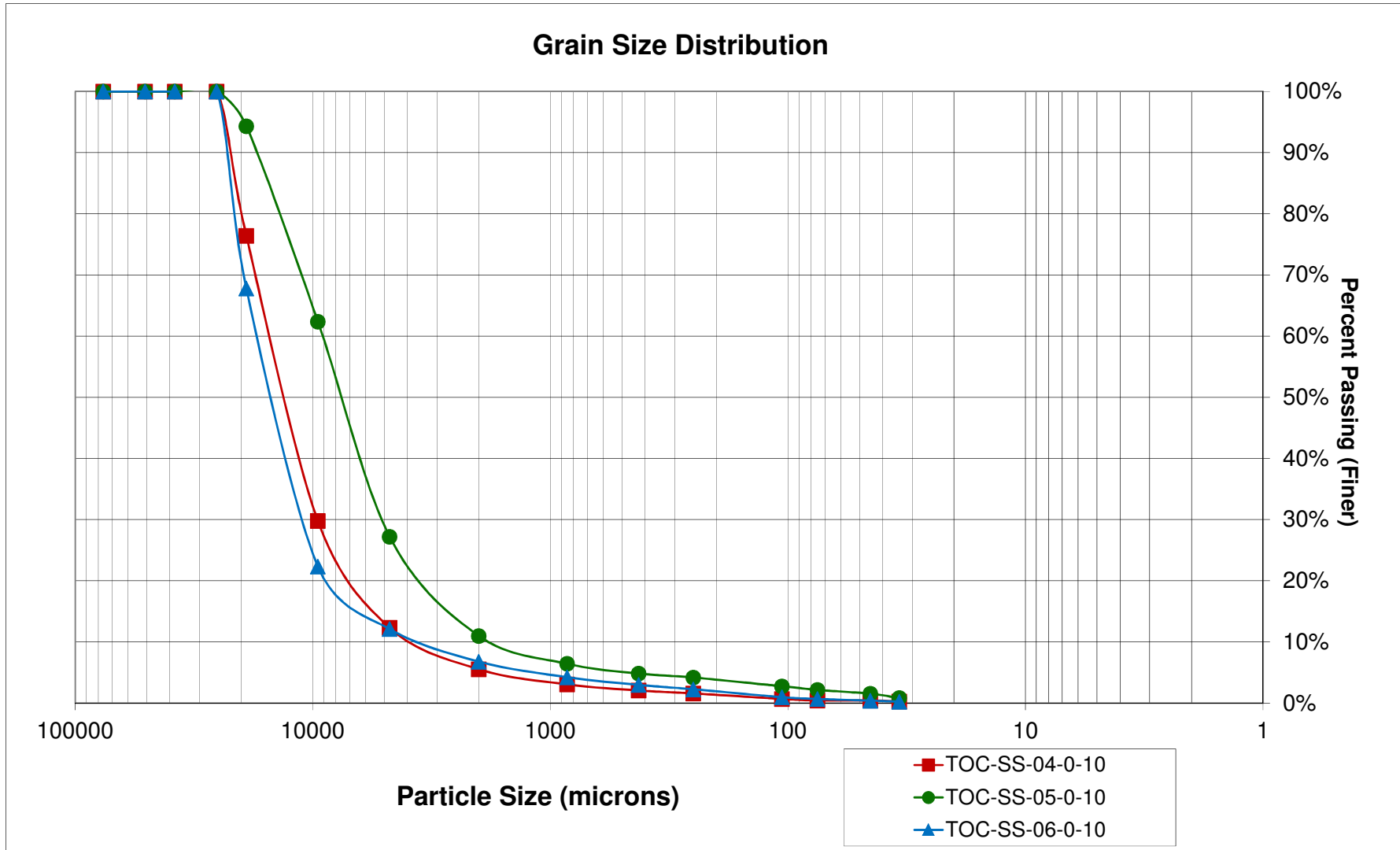
Grain Size by ASTM D422

Project: Surface Sediment Quality Evaluation
 Client: Floyd | Snider
 Lab Project #: 1808013



Grain Size by ASTM D422

Project: Surface Sediment Quality Evaluation
 Client: Floyd | Snider
 Lab Project #: 1808013



Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Ammonia by SM 4500 NH3 E

Sample ID MB-21503	SampType: MBLK	Units: mg/Kg	Prep Date: 8/6/2018	RunNo: 45274							
Client ID: MBLKS	Batch ID: 21503	Analysis Date: 8/7/2018	SeqNo: 875814								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrogen, Ammonia ND 1.00

Sample ID LCS-21503	SampType: LCS	Units: mg/Kg	Prep Date: 8/6/2018	RunNo: 45274							
Client ID: LCSS	Batch ID: 21503	Analysis Date: 8/7/2018	SeqNo: 875815								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrogen, Ammonia 19.4 1.00 20.00 0 97.2 85 115

Sample ID 1808013-002ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 8/6/2018	RunNo: 45274							
Client ID: TOC-SS-02-0-10	Batch ID: 21503	Analysis Date: 8/7/2018	SeqNo: 875818								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrogen, Ammonia 18.8 0.528 19.00 1.07 30

Sample ID 1808013-002AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 8/6/2018	RunNo: 45274							
Client ID: TOC-SS-02-0-10	Batch ID: 21503	Analysis Date: 8/7/2018	SeqNo: 875819								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrogen, Ammonia 27.1 0.526 15.05 19.00 53.9 80 120 S

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID 1808013-002AMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 8/6/2018	RunNo: 45274							
Client ID: TOC-SS-02-0-10	Batch ID: 21503	Analysis Date: 8/7/2018	SeqNo: 875820								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrogen, Ammonia 28.5 0.532 15.20 19.00 62.5 80 120 27.11 5.03 20 S

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID MB-21496	SampType: MBLK	Units: mg/Kg	Prep Date: 8/6/2018	RunNo: 45232							
Client ID: MBLKS	Batch ID: 21496		Analysis Date: 8/6/2018	SeqNo: 875156							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	16.1		20.00		80.3	50	150				
Surr: o-Terphenyl	17.3		20.00		86.7	50	150				

Sample ID LCS-21496	SampType: LCS	Units: mg/Kg	Prep Date: 8/6/2018	RunNo: 45232							
Client ID: LCSS	Batch ID: 21496		Analysis Date: 8/6/2018	SeqNo: 875157							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	499	20.0	500.0	0	99.8	65	135				
Surr: 2-Fluorobiphenyl	16.9		20.00		84.4	50	150				
Surr: o-Terphenyl	19.2		20.00		95.8	50	150				

Sample ID 1808049-001ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 8/6/2018	RunNo: 45232							
Client ID: BATCH	Batch ID: 21496		Analysis Date: 8/6/2018	SeqNo: 875555							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	20.3						0		30	
Heavy Oil	ND	50.8						0		30	
Surr: 2-Fluorobiphenyl	18.1		20.31		89.3	50	150		0		
Surr: o-Terphenyl	19.2		20.31		94.7	50	150		0		

Sample ID 1808049-010ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 8/6/2018	RunNo: 45232							
Client ID: BATCH	Batch ID: 21496		Analysis Date: 8/6/2018	SeqNo: 875556							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	18.4						0		30	
Heavy Oil	ND	46.1						0		30	
Surr: 2-Fluorobiphenyl	15.3		18.44		82.8	50	150		0		

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID 1808049-010ADUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 8/6/2018	RunNo: 45232					
Client ID: BATCH	Batch ID: 21496				Analysis Date: 8/6/2018	SeqNo: 875556					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: o-Terphenyl	16.1		18.44		87.3	50	150			0	
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Sample ID 1808013-002AMS	SampType: MS	Units: mg/Kg-dry			Prep Date: 8/6/2018	RunNo: 45232					
Client ID: TOC-SS-02-0-10	Batch ID: 21496				Analysis Date: 8/6/2018	SeqNo: 875564					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	1,380	55.1	1,377	12.30	99.4	65	135				
Surr: 2-Fluorobiphenyl	46.5		55.09		84.4	50	150				
Surr: o-Terphenyl	53.1		55.09		96.4	50	150				

Sample ID 1808013-002AMSD	SampType: MSD	Units: mg/Kg-dry			Prep Date: 8/6/2018	RunNo: 45232					
Client ID: TOC-SS-02-0-10	Batch ID: 21496				Analysis Date: 8/6/2018	SeqNo: 875565					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	1,370	56.5	1,411	12.30	96.4	65	135	1,382	0.590	30	
Surr: 2-Fluorobiphenyl	46.9		56.46		83.1	50	150		0		
Surr: o-Terphenyl	52.3		56.46		92.6	50	150		0		

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Mercury by EPA Method 7471

Sample ID MB-21500	SampType: MBLK	Units: mg/Kg	Prep Date: 8/6/2018	RunNo: 45305							
Client ID: MBLKS	Batch ID: 21500	Analysis Date: 8/6/2018	SeqNo: 876353								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.250

Sample ID LCS-21500	SampType: LCS	Units: mg/Kg	Prep Date: 8/6/2018	RunNo: 45305							
Client ID: LCSS	Batch ID: 21500	Analysis Date: 8/6/2018	SeqNo: 876354								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.517 0.250 0.5000 0 103 80 120

Sample ID 1808013-002ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 8/6/2018	RunNo: 45305							
Client ID: TOC-SS-02-0-10	Batch ID: 21500	Analysis Date: 8/6/2018	SeqNo: 876378								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.495 0.378 0.4941 0.0974 20 D

Sample ID 1808013-002AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 8/6/2018	RunNo: 45305							
Client ID: TOC-SS-02-0-10	Batch ID: 21500	Analysis Date: 8/6/2018	SeqNo: 876379								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.669 0.380 0.3812 0.4941 46.0 70 130 DS

NOTES:

S - Analyte concentration was too high for accurate spike recovery(ies).

Sample ID 1808013-002AMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 8/6/2018	RunNo: 45305							
Client ID: TOC-SS-02-0-10	Batch ID: 21500	Analysis Date: 8/6/2018	SeqNo: 876380								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.700 0.366 0.3666 0.4941 56.0 70 130 0.6693 4.42 20 DS

NOTES:

S - Analyte concentration was too high for accurate spike recovery(ies).

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Polychlorinated Biphenyls (PCB) by EPA 8082

Sample ID MB-21872	SampType: MBLK	Units: mg/Kg		Prep Date: 9/10/2018	RunNo: 46049						
Client ID: MBLKS	Batch ID: 21872			Analysis Date: 9/10/2018	SeqNo: 892041						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.100									
Aroclor 1221	ND	0.100									
Aroclor 1232	ND	0.100									
Aroclor 1242	ND	0.100									
Aroclor 1248	ND	0.100									
Aroclor 1254	ND	0.100									
Aroclor 1260	ND	0.100									
Aroclor 1268	ND	0.100									
Total PCBs	ND	0.100									
Surr: Decachlorobiphenyl	50.5		50.00		101	30.8	168				
Surr: Tetrachloro-m-xylene	39.8		50.00		79.6	30.3	157				

Sample ID LCS1-21872	SampType: LCS	Units: mg/Kg		Prep Date: 9/10/2018	RunNo: 46049						
Client ID: LCSS	Batch ID: 21872			Analysis Date: 9/10/2018	SeqNo: 892042						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	0.839	0.100	1.000	0	83.9	38.5	149				
Aroclor 1260	0.866	0.100	1.000	0	86.6	35.4	154				
Surr: Decachlorobiphenyl	55.5		50.00		111	30.8	168				
Surr: Tetrachloro-m-xylene	43.2		50.00		86.4	30.3	157				

Sample ID LCS2-21872	SampType: LCS	Units: mg/Kg		Prep Date: 9/10/2018	RunNo: 46049						
Client ID: LCSS	Batch ID: 21872			Analysis Date: 9/10/2018	SeqNo: 892043						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1254	0.974	0.100	1.000	0	97.4	31.9	167				
Surr: Decachlorobiphenyl	77.6		50.00		155	30.8	168				
Surr: Tetrachloro-m-xylene	65.8		50.00		132	30.3	157				

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Polychlorinated Biphenyls (PCB) by EPA 8082

Sample ID 1809094-001ADUP	SampType: DUP	Units: mg/Kg-dry			Prep Date: 9/10/2018	RunNo: 46049					
Client ID: BATCH	Batch ID: 21872				Analysis Date: 9/10/2018	SeqNo: 892045					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.0982						0		30	
Aroclor 1221	ND	0.0982						0		30	
Aroclor 1232	ND	0.0982						0		30	
Aroclor 1242	ND	0.0982						0		30	
Aroclor 1248	ND	0.0982						0		30	
Aroclor 1254	ND	0.0982						0		30	
Aroclor 1260	ND	0.0982						0		30	
Aroclor 1268	ND	0.0982						0		30	
Total PCBs	ND	0.0982						0		30	
Surr: Decachlorobiphenyl	53.5		49.12		109	30.8	168		0		
Surr: Tetrachloro-m-xylene	41.1		49.12		83.7	30.3	157		0		

Sample ID 1809094-001AMS	SampType: MS	Units: mg/Kg-dry			Prep Date: 9/10/2018	RunNo: 46049					
Client ID: BATCH	Batch ID: 21872				Analysis Date: 9/10/2018	SeqNo: 892046					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	0.848	0.105	1.046	0	81.1	27.1	166				
Aroclor 1260	0.884	0.105	1.046	0	84.5	20.6	168				
Surr: Decachlorobiphenyl	44.6		52.30		85.3	30.8	168				
Surr: Tetrachloro-m-xylene	33.2		52.30		63.4	30.3	157				

Sample ID 1809094-001AMSD	SampType: MSD	Units: mg/Kg-dry			Prep Date: 9/10/2018	RunNo: 46049					
Client ID: BATCH	Batch ID: 21872				Analysis Date: 9/10/2018	SeqNo: 892047					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	0.799	0.0982	0.9824	0	81.4	27.1	166	0.8484	5.96	30	
Aroclor 1260	0.820	0.0982	0.9824	0	83.5	20.6	168	0.8840	7.48	30	
Surr: Decachlorobiphenyl	54.4		49.12		111	30.8	168		0		
Surr: Tetrachloro-m-xylene	42.4		49.12		86.2	30.3	157		0		

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Polychlorinated Biphenyls (PCB) by EPA 8082

Sample ID MB-21521	SampType: MBLK	Units: mg/Kg		Prep Date: 8/7/2018	RunNo: 45288						
Client ID: MBLKS	Batch ID: 21521			Analysis Date: 8/8/2018	SeqNo: 876047						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.100									
Aroclor 1221	ND	0.100									
Aroclor 1232	ND	0.100									
Aroclor 1242	ND	0.100									
Aroclor 1248	ND	0.100									
Aroclor 1254	ND	0.100									
Aroclor 1260	ND	0.100									
Aroclor 1268	ND	0.100									
Total PCBs	ND	0.100									
Surr: Decachlorobiphenyl	53.3		50.00		107	30.8	168				
Surr: Tetrachloro-m-xylene	49.0		50.00		98.0	30.3	157				

Sample ID LCS1-21521	SampType: LCS	Units: mg/Kg		Prep Date: 8/7/2018	RunNo: 45288						
Client ID: LCSS	Batch ID: 21521			Analysis Date: 8/8/2018	SeqNo: 876048						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	0.889	0.100	1.000	0	88.9	38.5	149				
Aroclor 1260	0.938	0.100	1.000	0	93.8	35.4	154				
Surr: Decachlorobiphenyl	56.6		50.00		113	30.8	168				
Surr: Tetrachloro-m-xylene	51.4		50.00		103	30.3	157				

Sample ID LCS2-21521	SampType: LCS	Units: mg/Kg		Prep Date: 8/7/2018	RunNo: 45288						
Client ID: LCSS	Batch ID: 21521			Analysis Date: 8/8/2018	SeqNo: 876049						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1254	1.05	0.100	1.000	0	105	31.9	167				
Surr: Decachlorobiphenyl	55.8		50.00		112	30.8	168				
Surr: Tetrachloro-m-xylene	50.7		50.00		101	30.3	157				

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Polychlorinated Biphenyls (PCB) by EPA 8082

Sample ID	1808072-002ADUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	8/7/2018	RunNo:	45288		
Client ID:	BATCH	Batch ID:	21521			Analysis Date:	8/8/2018	SeqNo:	876051		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.0974						0		30	
Aroclor 1221	ND	0.0974						0		30	
Aroclor 1232	ND	0.0974						0		30	
Aroclor 1242	ND	0.0974						0		30	
Aroclor 1248	ND	0.0974						0		30	
Aroclor 1254	ND	0.0974						0		30	
Aroclor 1260	ND	0.0974						0		30	
Aroclor 1268	ND	0.0974						0		30	
Total PCBs	ND	0.0974						0		30	
Surr: Decachlorobiphenyl	49.3		48.70		101	30.8	168		0		
Surr: Tetrachloro-m-xylene	43.5		48.70		89.3	30.3	157		0		

Sample ID	1808072-002AMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	8/7/2018	RunNo:	45288		
Client ID:	BATCH	Batch ID:	21521			Analysis Date:	8/8/2018	SeqNo:	876052		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	0.836	0.103	1.032	0	81.0	27.1	166				
Aroclor 1260	0.878	0.103	1.032	0	85.1	20.6	168				
Surr: Decachlorobiphenyl	35.1		51.58		68.0	30.8	168				
Surr: Tetrachloro-m-xylene	31.3		51.58		60.7	30.3	157				

Sample ID	1808072-002AMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	8/7/2018	RunNo:	45288		
Client ID:	BATCH	Batch ID:	21521			Analysis Date:	8/8/2018	SeqNo:	876053		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	1.02	0.104	1.042	0	97.9	27.1	166	0.8356	19.9	30	
Aroclor 1260	1.11	0.104	1.042	0	107	20.6	168	0.8781	23.5	30	
Surr: Decachlorobiphenyl	47.2		52.08		90.6	30.8	168		0		
Surr: Tetrachloro-m-xylene	39.5		52.08		75.9	30.3	157		0		

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Polychlorinated Biphenyls (PCB) by EPA 8082

Sample ID MB-21498	SampType: MBLK	Units: mg/Kg		Prep Date: 8/6/2018	RunNo: 45257						
Client ID: MBLKS	Batch ID: 21498			Analysis Date: 8/6/2018	SeqNo: 875532						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.100									
Aroclor 1221	ND	0.100									
Aroclor 1232	ND	0.100									
Aroclor 1242	ND	0.100									
Aroclor 1248	ND	0.100									
Aroclor 1254	ND	0.100									
Aroclor 1260	ND	0.100									
Aroclor 1268	ND	0.100									
Total PCBs	ND	0.100									
Surr: Decachlorobiphenyl	64.0		50.00		128	30.8	168				
Surr: Tetrachloro-m-xylene	55.1		50.00		110	30.3	157				

Sample ID LCS1-21498	SampType: LCS	Units: mg/Kg		Prep Date: 8/6/2018	RunNo: 45257						
Client ID: LCSS	Batch ID: 21498			Analysis Date: 8/6/2018	SeqNo: 875533						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	1.08	0.100	1.000	0	108	38.5	149				
Aroclor 1260	1.01	0.100	1.000	0	101	35.4	154				
Surr: Decachlorobiphenyl	61.6		50.00		123	30.8	168				
Surr: Tetrachloro-m-xylene	58.8		50.00		118	30.3	157				

Sample ID LCS2-21498	SampType: LCS	Units: mg/Kg		Prep Date: 8/6/2018	RunNo: 45257						
Client ID: LCSS	Batch ID: 21498			Analysis Date: 8/6/2018	SeqNo: 875534						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1254	0.887	0.100	1.000	0	88.7	31.9	167				
Surr: Decachlorobiphenyl	52.6		50.00		105	30.8	168				
Surr: Tetrachloro-m-xylene	47.7		50.00		95.3	30.3	157				

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Polychlorinated Biphenyls (PCB) by EPA 8082

Sample ID	1808013-001ADUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	8/6/2018	RunNo:	45257		
Client ID:	TOC-SS-01-0-10	Batch ID:	21498			Analysis Date:	8/6/2018	SeqNo:	875536		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.0992						0		30	
Aroclor 1221	ND	0.0992						0		30	
Aroclor 1232	ND	0.0992						0		30	
Aroclor 1242	ND	0.0992						0		30	
Aroclor 1248	ND	0.0992						0		30	
Aroclor 1254	ND	0.0992						0		30	
Aroclor 1260	ND	0.0992						0		30	
Aroclor 1268	ND	0.0992						0		30	
Total PCBs	ND	0.0992						0		30	
Surr: Decachlorobiphenyl	62.4		49.58		126	30.8	168		0		
Surr: Tetrachloro-m-xylene	45.9		49.58		92.7	30.3	157		0		

Sample ID	1808013-002AMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	8/6/2018	RunNo:	45257		
Client ID:	TOC-SS-02-0-10	Batch ID:	21498			Analysis Date:	8/6/2018	SeqNo:	875538		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	0.534	0.0990	0.9900	0	53.9	27.1	166				
Aroclor 1260	0.647	0.0990	0.9900	0	65.4	20.6	168				
Surr: Decachlorobiphenyl	37.3		49.50		75.4	30.8	168				
Surr: Tetrachloro-m-xylene	7.02		49.50		14.2	30.3	157				S

NOTES:

S - Outlying surrogate recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID	1808013-002AMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	8/6/2018	RunNo:	45257		
Client ID:	TOC-SS-02-0-10	Batch ID:	21498			Analysis Date:	8/6/2018	SeqNo:	875539		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	0.710	0.0998	0.9973	0	71.2	27.1	166	0.5335	28.4	30	
Aroclor 1260	0.814	0.0998	0.9973	0	81.6	20.6	168	0.6470	22.9	30	
Surr: Decachlorobiphenyl	35.1		49.87		70.5	30.8	168		0		
Surr: Tetrachloro-m-xylene	11.9		49.87		23.8	30.3	157		0		S

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Polychlorinated Biphenyls (PCB) by EPA 8082

Sample ID	1808013-002AMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	8/6/2018	RunNo:	45257		
Client ID:	TOC-SS-02-0-10	Batch ID:	21498	Analysis Date:	8/6/2018	SeqNo:	875539				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

S - Outlying surrogate recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Salinity by SM 2520B

Sample ID MB-R45153	SampType: MBLK	Units: ppm	Prep Date: 8/2/2018	RunNo: 45153							
Client ID: MBLKW	Batch ID: R45153	Analysis Date: 8/2/2018	SeqNo: 873475								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	ND	1.00									

Sample ID LCS-R45153	SampType: LCS	Units: µS/cm	Prep Date: 8/2/2018	RunNo: 45153							
Client ID: LCSW	Batch ID: R45153	Analysis Date: 8/2/2018	SeqNo: 873476								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	956	1.00	1,000	0	95.6	70	130				

Sample ID 1808013-004FDUP	SampType: DUP	Units: ppm-dry	Prep Date: 8/2/2018	RunNo: 45153							
Client ID: TOC-SS-04-0-10	Batch ID: R45153	Analysis Date: 8/2/2018	SeqNo: 873479								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Salinity	979	6.05						984.7	0.615	30	



Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Sample Moisture (Percent Moisture)

Sample ID	1808013-001ADUP	SampType:	DUP	Units:	wt%	Prep Date:	8/3/2018	RunNo:	45199		
Client ID:	TOC-SS-01-0-10	Batch ID:	R45199			Analysis Date:	8/3/2018	SeqNo:	874438		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	77.0	0.500						76.47	0.633	20	

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID: MB-21516	SampType: MBLK	Units: µg/Kg	Prep Date: 8/7/2018	RunNo: 45412
Client ID: MBLKS	Batch ID: 21516		Analysis Date: 8/13/2018	SeqNo: 878455

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzoic acid	ND	500									
Phenol	ND	40.0									
3&4-Methylphenol (m, p-cresol)	ND	100									
Naphthalene	ND	50.0									
2-Methylnaphthalene	ND	50.0									
Acenaphthene	ND	50.0									
Acenaphthylene	ND	50.0									
Dibenzofuran	ND	75.0									
Fluorene	ND	50.0									
Pentachlorophenol	ND	100									
Phenanthrene	ND	50.0									
Anthracene	ND	50.0									
Carbazole	ND	75.0									
Di-n-butylphthalate	ND	100									
Fluoranthene	ND	50.0									
Pyrene	ND	50.0									
Benz(a)anthracene	ND	50.0									
Chrysene	ND	50.0									
bis (2-Ethylhexyl) phthalate	ND	100									
Di-n-octyl phthalate	ND	11.3									MDL
Benzo(b)fluoranthene	ND	50.0									
Benzo(k)fluoranthene	ND	50.0									
Benzo(a)pyrene	ND	50.0									
Indeno(1,2,3-cd)pyrene	ND	50.0									
Dibenz(a,h)anthracene	ND	50.0									
Benzo(g,h,i)perylene	ND	50.0									Q
Surr: 2,4,6-Tribromophenol	845		1,000		84.5	14.8	165				
Surr: 2-Fluorobiphenyl	179		500.0		35.8	17.8	151				
Surr: Nitrobenzene-d5	39.6		500.0		7.91	12.5	163				S
Surr: Phenol-d6	629		1,000		62.9	11.6	133				
Surr: p-Terphenyl	521		500.0		104	22	176				

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID MB-21516	SampType: MBLK	Units: µg/Kg	Prep Date: 8/7/2018	RunNo: 45412							
Client ID: MBLKS	Batch ID: 21516		Analysis Date: 8/13/2018	SeqNo: 878455							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

- Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift)
- MDL - Analyte reported to Method Detection Limit (MDL)
- S - Outlying surrogate recovery(ies) observed.

Sample ID LCS-21516	SampType: LCS	Units: µg/Kg	Prep Date: 8/7/2018	RunNo: 45412							
Client ID: LCSS	Batch ID: 21516		Analysis Date: 8/13/2018	SeqNo: 878456							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzoic acid	380	500	2,000	0	19.0	5	122				
Phenol	595	40.0	1,000	0	59.5	41.8	138				
3&4-Methylphenol (m, p-cresol)	302	100	500.0	0	60.4	48.6	128				
Naphthalene	553	50.0	1,000	0	55.3	52.9	131				
2-Methylnaphthalene	913	50.0	1,000	0	91.3	47	132				
Acenaphthene	1,010	50.0	1,000	0	101	49.2	127				
Acenaphthylene	1,040	50.0	1,000	0	104	53.7	137				
Dibenzofuran	985	75.0	1,000	0	98.5	38.2	125				
Fluorene	988	50.0	1,000	0	98.8	48.5	133				
Pentachlorophenol	785	100	1,000	0	78.5	10	123				
Phenanthrene	1,010	50.0	1,000	0	101	47.1	130				
Anthracene	1,050	50.0	1,000	0	105	59.2	135				
Carbazole	1,040	75.0	1,000	0	104	37	148				
Di-n-butylphthalate	1,040	100	1,000	0	104	46.6	145				
Fluoranthene	1,040	50.0	1,000	0	104	51.4	139				
Pyrene	1,070	50.0	1,000	0	107	45.4	140				
Benzo(a)anthracene	1,040	50.0	1,000	0	104	44	150				
Chrysene	1,070	50.0	1,000	0	107	58.9	129				
bis (2-Ethylhexyl) phthalate	1,060	100	1,000	0	106	36.3	149				
Di-n-octyl phthalate	1,130	40.0	1,000	0	113	31.5	152				MDL
Benzo(b)fluoranthene	1,100	50.0	1,000	0	110	45.6	146				
Benzo(k)fluoranthene	906	50.0	1,000	0	90.6	45.5	138				

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID	LCS-21516	SampType:	LCS	Units:	µg/Kg	Prep Date:	8/7/2018	RunNo:	45412
Client ID:	LCSS	Batch ID:	21516			Analysis Date:	8/13/2018	SeqNo:	878456

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzo(a)pyrene	934	50.0	1,000	0	93.4	35.6	148				
Indeno(1,2,3-cd)pyrene	808	50.0	1,000	0	80.8	44.2	146				
Dibenz(a,h)anthracene	858	50.0	1,000	0	85.8	37.5	152				
Benzo(g,h,i)perylene	760	50.0	1,000	0	76.0	24.1	156				
Surr: 2,4,6-Tribromophenol	1,170		1,000		117	14.8	165				
Surr: 2-Fluorobiphenyl	9.04		500.0		1.81	17.8	151				S
Surr: Nitrobenzene-d5	6.35		500.0		1.27	12.5	163				S
Surr: Phenol-d6	441		1,000		44.1	11.6	133				
Surr: p-Terphenyl	553		500.0		111	22	176				

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)
S - Outlying surrogate recovery(ies) observed.

Sample ID	1808013-002ADUP	SampType:	DUP	Units:	µg/Kg-dry	Prep Date:	8/7/2018	RunNo:	45412
Client ID:	TOC-SS-02-0-10	Batch ID:	21516			Analysis Date:	8/13/2018	SeqNo:	878458

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzoic acid	ND	498						0		50	
Phenol	ND	39.8						0		50	
3&4-Methylphenol (m, p-cresol)	ND	99.6						0		50	
Naphthalene	87.8	49.8						123.9	34.1	50	
2-Methylnaphthalene	ND	49.8						77.92	54.5	50	
Acenaphthene	159	49.8						353.8	75.9	50	R
Acenaphthylene	70.4	49.8						79.27	11.8	50	
Dibenzofuran	87.6	74.7						231.0	90.0	50	R
Fluorene	193	49.8						545.8	95.5	50	R
Pentachlorophenol	ND	99.6						0		50	
Phenanthrene	2,000	49.8						6,950	111	50	RE
Anthracene	309	49.8						714.8	79.4	50	R
Carbazole	255	74.7						952.0	116	50	R
Di-n-butylphthalate	ND	99.6						0		50	

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID	1808013-002ADUP	SampType:	DUP	Units:	µg/Kg-dry	Prep Date:	8/7/2018	RunNo:	45412		
Client ID:	TOC-SS-02-0-10	Batch ID:	21516			Analysis Date:	8/13/2018	SeqNo:	878458		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoranthene	3,850	49.8						10,800	95.0	50	RE
Pyrene	3,260	49.8						8,230	86.4	50	RE
Benz(a)anthracene	1,550	49.8						3,669	81.1	50	R
Chrysene	2,230	49.8						4,850	74.1	50	R
bis (2-Ethylhexyl) phthalate	566	99.6						629.6	10.6	50	
Di-n-octyl phthalate	177	39.8						123.2	35.7	50	R
Benzo(b)fluoranthene	3,650	49.8						4,144	12.6	50	
Benzo(k)fluoranthene	1,360	49.8						3,303	83.4	50	R
Benzo(a)pyrene	1,680	49.8						3,503	70.5	50	R
Indeno(1,2,3-cd)pyrene	861	49.8						1,733	67.2	50	R
Dibenz(a,h)anthracene	447	49.8						955.0	72.5	50	R
Benzo(g,h,i)perylene	805	49.8						1,715	72.2	50	RQ
Surr: 2,4,6-Tribromophenol	1,020		995.7		102	14.8	165		0		
Surr: 2-Fluorobiphenyl	159		497.9		31.9	17.8	151		0		
Surr: Nitrobenzene-d5	101		497.9		20.3	12.5	163		0		
Surr: Phenol-d6	680		995.7		68.3	11.6	133		0		
Surr: p-Terphenyl	510		497.9		102	22	176		0		

NOTES:

- R - High RPD due to suspected sample inhomogeneity. The method is in control as indicated by the Laboratory Control Sample (LCS).
- Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift)
- E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID	1808013-002AMS	SampType:	MS	Units:	µg/Kg-dry	Prep Date:	8/7/2018	RunNo:	45412		
Client ID:	TOC-SS-02-0-10	Batch ID:	21516			Analysis Date:	8/13/2018	SeqNo:	878459		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzoic acid	1,850	497	1,987	319.2	77.2	5	139				
Phenol	531	39.7	993.5	17.13	51.7	29.2	146				
3&4-Methylphenol (m, p-cresol)	253	99.3	496.7	0	50.9	37.6	125				
Naphthalene	538	49.7	993.5	123.9	41.7	32.4	137				
2-Methylnaphthalene	653	49.7	993.5	77.92	57.9	39.3	126				

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID: 1808013-002AMS	SampType: MS	Units: µg/Kg-dry	Prep Date: 8/7/2018	RunNo: 45412
Client ID: TOC-SS-02-0-10	Batch ID: 21516		Analysis Date: 8/13/2018	SeqNo: 878459

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthene	1,010	49.7	993.5	353.8	65.8	49.6	129				
Acenaphthylene	761	49.7	993.5	79.27	68.6	39.9	129				
Dibenzofuran	914	74.5	993.5	231.0	68.8	41.2	128				
Fluorene	1,190	49.7	993.5	545.8	64.4	37.7	133				
Pentachlorophenol	1,060	99.3	993.5	0	107	28.2	156				
Phenanthrene	5,270	49.7	993.5	6,950	-169	32.2	139				SE
Anthracene	1,100	49.7	993.5	714.8	38.8	41.2	136				S
Carbazole	1,360	74.5	993.5	952.0	40.8	32	147				
Di-n-butylphthalate	825	99.3	993.5	65.68	76.4	35.1	142				
Fluoranthene	7,550	49.7	993.5	10,800	-327	33.8	141				SE
Pyrene	6,040	49.7	993.5	8,230	-220	31.4	151				SE
Benzo(a)anthracene	3,070	49.7	993.5	3,669	-60.3	36	138				S
Chrysene	4,120	49.7	993.5	4,850	-73.8	25.5	136				S
bis (2-Ethylhexyl) phthalate	1,400	99.3	993.5	629.6	77.4	40.8	170				
Di-n-octyl phthalate	1,050	39.7	993.5	123.2	92.8	34.6	142				
Benzo(b)fluoranthene	6,380	49.7	993.5	4,144	225	31.8	166				S
Benzo(k)fluoranthene	2,550	49.7	993.5	3,303	-75.5	30.8	152				S
Benzo(a)pyrene	3,010	49.7	993.5	3,503	-49.4	31.1	153				S
Indeno(1,2,3-cd)pyrene	1,660	49.7	993.5	1,733	-7.06	38.1	155				S
Dibenz(a,h)anthracene	1,180	49.7	993.5	955.0	23.1	40.7	152				S
Benzo(g,h,i)perylene	139	49.7	993.5	1,715	-159	34	157				S
Surr: 2,4,6-Tribromophenol	975		993.5		98.2	14.8	165				
Surr: 2-Fluorobiphenyl	253		496.7		50.9	17.8	151				
Surr: Nitrobenzene-d5	117		496.7		23.6	12.5	163				
Surr: Phenol-d6	524		993.5		52.8	11.6	133				
Surr: p-Terphenyl	421		496.7		84.8	22	176				

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.
E - Estimated value. The amount exceeds the linear working range of the instrument.

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID: 1808013-002AMSDUP	SampType: MSD	Units: µg/Kg-dry	Prep Date: 8/7/2018	RunNo: 45412
Client ID: TOC-SS-02-0-10	Batch ID: 21516		Analysis Date: 8/13/2018	SeqNo: 878460

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	550	39.9	996.7	17.13	53.4	29.2	146	530.9	3.45	50	
3&4-Methylphenol (m, p-cresol)	339	99.7	498.3	0	68.1	37.6	125	253.1	29.2	50	
Naphthalene	466	49.8	996.7	123.9	34.3	32.4	137	537.8	14.4	50	
2-Methylnaphthalene	670	49.8	996.7	77.92	59.4	39.3	126	652.9	2.55	50	
Acenaphthene	988	49.8	996.7	353.8	63.6	49.6	129	1,007	1.92	50	
Acenaphthylene	777	49.8	996.7	79.27	70.0	39.9	129	760.5	2.10	50	
Dibenzofuran	922	74.8	996.7	231.0	69.3	41.2	128	914.1	0.813	50	
Fluorene	1,180	49.8	996.7	545.8	64.1	37.7	133	1,185	0.0682	50	
Pentachlorophenol	1,060	99.7	996.7	0	106	28.2	156	1,059	0.259	50	
Phenanthrene	5,670	49.8	996.7	6,950	-128	32.2	139	5,274	7.26	50	SE
Anthracene	1,150	49.8	996.7	714.8	43.8	41.2	136	1,101	4.47	50	
Carbazole	1,450	74.8	996.7	952.0	49.6	32	147	1,357	6.36	50	
Di-n-butylphthalate	809	99.7	996.7	65.68	74.6	35.1	142	825.2	1.96	50	
Fluoranthene	8,240	49.8	996.7	10,800	-257	33.8	141	7,553	8.69	50	SE
Pyrene	6,450	49.8	996.7	8,230	-178	31.4	151	6,043	6.59	50	SE
Benz(a)anthracene	3,180	49.8	996.7	3,669	-49.1	36	138	3,069	3.52	50	S
Chrysene	4,330	49.8	996.7	4,850	-51.9	25.5	136	4,116	5.12	50	S
bis (2-Ethylhexyl) phthalate	1,310	99.7	996.7	629.6	68.2	40.8	170	1,398	6.55	50	
Di-n-octyl phthalate	1,030	39.9	996.7	123.2	91.4	34.6	142	1,045	1.06	50	
Benzo(b)fluoranthene	6,680	49.8	996.7	4,144	255	31.8	166	6,377	4.69	50	S
Benzo(k)fluoranthene	2,670	49.8	996.7	3,303	-63.5	30.8	152	2,553	4.46	50	S
Benzo(a)pyrene	3,000	49.8	996.7	3,503	-50.3	31.1	153	3,012	0.353	50	S
Indeno(1,2,3-cd)pyrene	1,610	49.8	996.7	1,733	-12.6	38.1	155	1,663	3.38	50	S
Dibenz(a,h)anthracene	1,130	49.8	996.7	955.0	17.7	40.7	152	1,184	4.51	50	S
Benzo(g,h,i)perylene	1,480	49.8	996.7	1,715	-23.7	34	157	139.4	166	50	RS
Surr: 2,4,6-Tribromophenol	845		996.7		84.8	14.8	165		0		
Surr: 2-Fluorobiphenyl	200		498.3		40.2	17.8	151		0		
Surr: Nitrobenzene-d5	105		498.3		21.0	12.5	163		0		
Surr: Phenol-d6	536		996.7		53.8	11.6	133		0		
Surr: p-Terphenyl	423		498.3		84.9	22	176		0		

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT

Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID	1808013-002AMSDUP	SampType:	MSD	Units:	µg/Kg-dry	Prep Date:	8/7/2018	RunNo:	45412		
Client ID:	TOC-SS-02-0-10	Batch ID:	21516			Analysis Date:	8/13/2018	SeqNo:	878460		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

- S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.
- R - High RPD due to suspected sample inhomogeneity. The method is in control as indicated by the Laboratory Control Sample (LCS).
- E - Estimated value. The amount exceeds the linear working range of the instrument.



Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID MB-21494	SampType: MBLK	Units: mg/Kg		Prep Date: 8/6/2018	RunNo: 45234						
Client ID: MBLKS	Batch ID: 21494			Analysis Date: 8/6/2018	SeqNo: 875240						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.185									
Cadmium	ND	0.148									
Chromium	ND	0.0741									
Copper	ND	0.148									
Lead	ND	0.148									
Nickel	ND	0.370									
Selenium	ND	0.370									
Silver	ND	0.0741									
Zinc	ND	0.370									

Sample ID LCS-21494	SampType: LCS	Units: mg/Kg		Prep Date: 8/6/2018	RunNo: 45234						
Client ID: LCSS	Batch ID: 21494			Analysis Date: 8/6/2018	SeqNo: 875241						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	43.2	0.189	37.88	0	114	80	120				
Cadmium	2.22	0.152	1.894	0	117	80	120				
Chromium	45.1	0.0758	37.88	0	119	80	120				
Copper	45.1	0.152	37.88	0	119	80	120				
Lead	21.9	0.152	18.94	0	116	80	120				
Nickel	45.1	0.379	37.88	0	119	80	120				
Selenium	3.77	0.379	3.788	0	99.6	80	120				
Silver	8.44	0.0758	9.470	0	89.1	80	120				
Zinc	44.0	0.379	37.88	0	116	80	120				

Sample ID 1808013-002ADUP	SampType: DUP	Units: mg/Kg-dry		Prep Date: 8/6/2018	RunNo: 45234						
Client ID: TOC-SS-02-0-10	Batch ID: 21494			Analysis Date: 8/6/2018	SeqNo: 875243						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	52.4	0.534						69.90	28.6	20	R
Cadmium	1.04	0.428						1.573	40.8	20	R

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID	1808013-002ADUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	8/6/2018	RunNo:	45234		
Client ID:	TOC-SS-02-0-10	Batch ID:	21494			Analysis Date:	8/6/2018	SeqNo:	875243		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	270	0.214						154.7	54.5	20	R
Copper	318	0.428						310.9	2.31	20	
Lead	107	0.428						122.2	13.4	20	
Nickel	281	1.07						240.4	15.6	20	
Selenium	ND	1.07						0		20	
Silver	0.527	0.214						0.3463	41.4	20	
Zinc	919	1.07						1,036	12.0	20	E

NOTES:

R - High RPD observed. The method is in control as indicated by the LCS.
E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID	1808013-002AMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	8/6/2018	RunNo:	45234		
Client ID:	TOC-SS-02-0-10	Batch ID:	21494			Analysis Date:	8/6/2018	SeqNo:	875245		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	163	0.538	107.7	69.90	86.4	75	125				
Cadmium	6.97	0.430	5.384	1.573	100	75	125				
Chromium	326	0.216	107.7	154.7	160	75	125				S
Copper	421	0.430	107.7	310.9	102	75	125				
Lead	164	0.430	53.84	122.2	77.7	75	125				
Nickel	513	1.08	107.7	240.4	253	75	125				S
Selenium	7.95	1.08	10.77	0.5062	69.1	75	125				S
Silver	17.8	0.216	26.92	0.3463	64.9	75	125				S
Zinc	1,240	1.08	107.7	1,036	193	75	125				ES

NOTES:

S - Outlying spike recovery(ies) observed for Chromium, Nickel, Selenium, Silver and Zinc. A duplicate analysis was performed with similar results indicating a possible matrix effect.
E - Estimated value. The amount exceeds the linear working range of the instrument.

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID	1808013-002AMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	8/6/2018	RunNo:	45234
Client ID:	TOC-SS-02-0-10	Batch ID:	21494			Analysis Date:	8/6/2018	SeqNo:	875246

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	259	0.534	106.9	69.90	176	75	125	162.9	45.4	20	RS
Cadmium	7.03	0.428	5.347	1.573	102	75	125	6.973	0.848	20	
Chromium	358	0.214	106.9	154.7	191	75	125	326.5	9.33	20	S
Copper	559	0.428	106.9	310.9	232	75	125	421.1	28.1	20	ERS
Lead	239	0.428	53.47	122.2	218	75	125	164.1	37.1	20	RS
Nickel	411	1.07	106.9	240.4	160	75	125	513.0	22.0	20	RS
Selenium	7.92	1.07	10.69	0.5062	69.3	75	125	7.946	0.375	20	S
Silver	18.0	0.214	26.73	0.3463	66.0	75	125	17.82	0.950	20	S
Zinc	1,960	1.07	106.9	1,036	861	75	125	1,243	44.6	20	ERS

NOTES:

- S - Outlying spike recovery(ies) observed for Chromium, Nickel, Selenium, Silver and Zinc. A duplicate analysis was performed with similar results indicating a possible matrix effect.
- S - Outlying spike recovery(ies) observed for Arsenic, Barium, Copper and Lead. A duplicate analysis was performed and recovered within range.
- R - High RPD observed. The method is in control as indicated by the LCS.
- E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID	1808013-002APDS	SampType:	PDS	Units:	mg/Kg-dry	Prep Date:	8/6/2018	RunNo:	45234
Client ID:	TOC-SS-02-0-10	Batch ID:	21494			Analysis Date:	8/6/2018	SeqNo:	875247

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	287	0.214	50.0	145	142	75	125				S
Nickel	358	1.07	50.0	225	133	75	125				S
Selenium	11.2	1.07	5.00	0.473	107	75	125				
Silver	4.56	0.214	2.50	0.324	84.6	75	125				
Zinc	1,230	1.07	107	1,040	183	75	125				ES

NOTES:

- S - Spike recovery indicates a possible matrix effect. The method is in control as indicated by the Laboratory Control Sample (LCS).
- E - Estimated value. The amount exceeds the linear working range of the instrument.

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Total Organic Carbon by EPA 9060

Sample ID MB-21581	SampType: MBLK	Units: %-dry	Prep Date: 8/13/2018	RunNo: 45433							
Client ID: MBLKS	Batch ID: 21581	Analysis Date: 8/14/2018	SeqNo: 878794								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon ND 0.0750

Sample ID LCS-21581	SampType: LCS	Units: %-dry	Prep Date: 8/13/2018	RunNo: 45433							
Client ID: LCSS	Batch ID: 21581	Analysis Date: 8/14/2018	SeqNo: 878795								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon 0.566 0.0750 0.6160 0 91.9 59.1 139

Sample ID 1808013-002ADUP	SampType: DUP	Units: %-dry	Prep Date: 8/13/2018	RunNo: 45433							
Client ID: TOC-SS-02-0-10	Batch ID: 21581	Analysis Date: 8/14/2018	SeqNo: 878798								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon 2.62 0.0750 3.517 29.3 30

Sample ID 1808013-002AMS	SampType: MS	Units: %-dry	Prep Date: 8/13/2018	RunNo: 45433							
Client ID: TOC-SS-02-0-10	Batch ID: 21581	Analysis Date: 8/14/2018	SeqNo: 878799								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon 3.56 0.0750 0.9830 3.517 4.68 38.5 146 S

NOTES:

S - Spike recovery indicates a possible matrix effect. The method is in control as indicated by the Laboratory Control Sample (LCS).

Sample ID 1808013-002AMSD	SampType: MSD	Units: %-dry	Prep Date: 8/13/2018	RunNo: 45433							
Client ID: TOC-SS-02-0-10	Batch ID: 21581	Analysis Date: 8/14/2018	SeqNo: 878800								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon 3.22 0.0750 0.9660 3.517 -30.2 38.5 146 3.563 9.96 20 S

NOTES:

S - Spike recovery indicates a possible matrix effect. The method is in control as indicated by the Laboratory Control Sample (LCS).

Work Order: 1808013
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Total Organic Carbon by EPA 9060

Sample ID 1808079-001ADUP	SampType: DUP	Units: %-dry			Prep Date: 8/13/2018	RunNo: 45433					
Client ID: BATCH	Batch ID: 21581				Analysis Date: 8/14/2018	SeqNo: 878809					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon	2.72	0.0750						2.725	0.294	30	H
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NOTES:
 Result is Total Carbon, not Total Organic Carbon.

Sample ID 1808079-001AMS	SampType: MS	Units: %-dry			Prep Date: 8/13/2018	RunNo: 45433					
Client ID: BATCH	Batch ID: 21581				Analysis Date: 8/14/2018	SeqNo: 878810					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Total Organic Carbon	4.67	0.0750	1.922	2.725	101	38.5	146				H
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NOTES:
 Result is Total Carbon, not Total Organic Carbon.

Client Name: **FS**

 Work Order Number: **1808013**

 Logged by: **Clare Griggs**

 Date Received: **8/1/2018 3:00:00 PM**

Chain of Custody

1. Is Chain of Custody complete? Yes No Not Present
2. How was the sample delivered? Client

Log In

3. Coolers are present? Yes No NA
4. Shipping container/cooler in good condition? Yes No
5. Custody Seals present on shipping container/cooler?
(Refer to comments for Custody Seals not intact) Yes No Not Required
6. Was an attempt made to cool the samples? Yes No NA
7. Were all items received at a temperature of >0°C to 10.0°C * Yes No NA
- Refer to item information.
8. Sample(s) in proper container(s)? Yes No
9. Sufficient sample volume for indicated test(s)? Yes No
10. Are samples properly preserved? Yes No
11. Was preservative added to bottles? Yes No NA
12. Is there headspace in the VOA vials? Yes No NA
13. Did all samples containers arrive in good condition(unbroken)? Yes No
14. Does paperwork match bottle labels? Yes No
15. Are matrices correctly identified on Chain of Custody? Yes No
16. Is it clear what analyses were requested? Yes No
17. Were all holding times able to be met? Yes No

Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes No NA

Person Notified:	<input type="text"/>	Date	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

Item Information

Item #	Temp °C
Cooler 1	11.9
Cooler 2	13.3
Sample 1	8.5
Sample 2	10.2
Temp Blank 1	12.0

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C



Client Name: **FS**

Work Order Number: **1808013**

Logged by: **Clare Griggs**

Date Received: **8/1/2018 3:00:00 PM**

Item #	Temp °C
Temp Blank 2	6.6

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

August 21, 2018

FAL Project 11792

Mr. Michael Ridgeway
Fremont Analytical, Inc.
3600 Fremont Ave., N.
Seattle, WA 98103

Dear Mr. Ridgeway,

The following results are associated with Frontier Analytical Laboratory project **11792**. This corresponds to your project number **1808013**. Seven sediment samples were received on 8/8/2018 at Frontier Analytical Laboratory in good condition. The samples were extracted and analyzed by EPA Method 1613 for tetra through octa chlorinated dibenzo dioxin and furans. The Toxic Equivalency (TEQ) for your samples has been calculated using the 2005 World Health Organization's (WHO's) toxic equivalency factors (TEFs). Fremont Analytical, Inc. requested a turnaround time of ten business days for project **11792**.

The following report consists of an Analytical Data section and a Sample Receipt section. The Analytical Data section contains our sample tracking log and the analytical results. The Sample Receipt section contains your chain of custody, our sample login form and a sample photo. The enclosed results are specifically for the samples referenced in this report only. These results shall not be reproduced except in full. Frontier Analytical Laboratory's State of Oregon NELAP certificate number is **4041**. Our State of California ELAP certificate number is **2934**. This report along with the associated electronic data deliverables have been emailed to you as a portable document format (PDF) file. A hardcopy will not be sent to you unless specifically requested.

If you have any questions regarding project **11792**, please feel free to contact me at 916-934-0900. Thank you for choosing Frontier Analytical Laboratory for your analytical testing needs.

Sincerely,



Thomas C. Crabtree
Director

Frontier Analytical Laboratory

Sample Tracking Log

FAL Project ID: 11792

Received on: 08/08/2018

Project Due: 08/30/2018

Storage: R-3

FAL Sample ID	Dup	Client Project ID	Client Sample ID	Requested Method	Matrix	Sampling Date	Sampling Time	Hold Time Due Date
11792-001-SA	0	1808013	TOC-SS-01-0-10	EPA 1613 D/F	Sediment	08/01/2018	09:50 am	08/01/2019
11792-002-SA	0	1808013	TOC-SS-02-0-10	EPA 1613 D/F	Sediment	08/01/2018	10:40 am	08/01/2019
11792-003-SA	0	1808013	TOC-SS-03-0-10	EPA 1613 D/F	Sediment	08/01/2018	11:15 am	08/01/2019
11792-004-SA	0	1808013	TOC-SS-04-0-10	EPA 1613 D/F	Sediment	08/01/2018	11:45 am	08/01/2019
11792-005-SA	0	1808013	TOC-SS-05-0-10	EPA 1613 D/F	Sediment	08/01/2018	12:53 pm	08/01/2019
11792-006-SA	0	1808013	TOC-SS-06-0-10	EPA 1613 D/F	Sediment	08/01/2018	01:10 pm	08/01/2019
11792-007-SA	0	1808013	TOC-SS-03D-0-10	EPA 1613 D/F	Sediment	08/01/2018	11:20 am	08/01/2019

FAL Sample ID

Notes

11792-001-SA Hold remaining sample for possible PCB analysis.
 11792-002-SA Hold remaining sample for possible PCB analysis.
 11792-003-SA Hold remaining sample for possible PCB analysis.
 11792-004-SA Hold remaining sample for possible PCB analysis.
 11792-005-SA Hold remaining sample for possible PCB analysis.
 11792-006-SA Hold remaining sample for possible PCB analysis.
 11792-007-SA Hold remaining sample for possible PCB analysis.

EPA Method 1613
PCDD/F



FAL ID: 11792-001-MB
Client ID: Method Blank
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: NA
Amount: 5.00 g

ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: pg/g

Acquired: 08-17-2018
2005 WHO TEQ: 0.0
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.0561		-	0.0315				
1,2,3,7,8-PeCDD	ND	0.117		-	0.0468				
1,2,3,4,7,8-HxCDD	ND	0.169		-	0.0503				
1,2,3,6,7,8-HxCDD	ND	0.165		-	0.0490	Total TCDD	ND	0.0561	
1,2,3,7,8,9-HxCDD	ND	0.161		-	0.0488	Total PeCDD	ND	0.117	
1,2,3,4,6,7,8-HpCDD	ND	0.369		-	0.0541	Total HxCDD	ND	0.169	
OCDD	ND	2.04		-	0.0888	Total HpCDD	ND	0.369	
2,3,7,8-TCDF	ND	0.0773		-	0.0243				
1,2,3,7,8-PeCDF	ND	0.103		-	0.0285				
2,3,4,7,8-PeCDF	ND	0.107		-	0.0298				
1,2,3,4,7,8-HxCDF	ND	0.104		-	0.0255				
1,2,3,6,7,8-HxCDF	ND	0.108		-	0.0253				
2,3,4,6,7,8-HxCDF	ND	0.118		-	0.0279				
1,2,3,7,8,9-HxCDF	ND	0.132		-	0.0367	Total TCDF	ND	0.0773	
1,2,3,4,6,7,8-HpCDF	ND	0.220		-	0.0321	Total PeCDF	ND	0.107	
1,2,3,4,7,8,9-HpCDF	ND	0.248		-	0.0396	Total HxCDF	ND	0.132	
OCDF	ND	0.571		-	0.0843	Total HpCDF	ND	0.248	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	94.2	25.0 - 164	
13C-1,2,3,7,8-PeCDD	92.2	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	93.5	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	90.1	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	94.1	23.0 - 140	
13C-OCDD	82.2	17.0 - 157	
13C-2,3,7,8-TCDF	95.0	24.0 - 169	
13C-1,2,3,7,8-PeCDF	97.3	24.0 - 185	
13C-2,3,4,7,8-PeCDF	96.3	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	93.1	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	87.1	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	87.0	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	90.6	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	92.2	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	96.5	26.0 - 138	
13C-OCDF	85.7	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	83.0	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018

EPA Method 1613
PCDD/F



FAL ID: 11792-001-OPR
Client ID: OPR
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: NA
Amount: 5.00 g


ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: ng/ml

Acquired: 08-17-2018
2005 WHO TEQ: NA

Compound	Conc	QC Limits	Qual
2,3,7,8-TCDD	9.51	6.70 - 15.8	
1,2,3,7,8-PeCDD	46.9	35.0 - 71.0	
1,2,3,4,7,8-HxCDD	48.8	35.0 - 82.0	
1,2,3,6,7,8-HxCDD	48.0	38.0 - 67.0	
1,2,3,7,8,9-HxCDD	50.1	32.0 - 81.0	
1,2,3,4,6,7,8-HpCDD	48.2	35.0 - 70.0	
OCDD	95.5	78.0 - 144	
2,3,7,8-TCDF	9.77	7.50 - 15.8	
1,2,3,7,8-PeCDF	50.0	40.0 - 67.0	
2,3,4,7,8-PeCDF	50.4	34.0 - 80.0	
1,2,3,4,7,8-HxCDF	49.7	36.0 - 67.0	
1,2,3,6,7,8-HxCDF	51.2	42.0 - 65.0	
2,3,4,6,7,8-HxCDF	50.6	35.0 - 78.0	
1,2,3,7,8,9-HxCDF	50.6	39.0 - 65.0	
1,2,3,4,6,7,8-HpCDF	48.6	41.0 - 61.0	
1,2,3,4,7,8,9-HpCDF	48.1	39.0 - 69.0	
OCDF	99.1	63.0 - 170	
Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	92.3	20.0 - 175	
13C-1,2,3,7,8-PeCDD	93.0	21.0 - 227	
13C-1,2,3,4,7,8-HxCDD	92.5	21.0 - 193	
13C-1,2,3,6,7,8-HxCDD	89.8	25.0 - 163	
13C-1,2,3,4,6,7,8-HpCDD	89.9	26.0 - 166	
13C-OCDD	75.7	13.0 - 198	
13C-2,3,7,8-TCDF	95.9	22.0 - 152	
13C-1,2,3,7,8-PeCDF	93.2	21.0 - 192	
13C-2,3,4,7,8-PeCDF	92.9	13.0 - 328	
13C-1,2,3,4,7,8-HxCDF	90.9	19.0 - 202	
13C-1,2,3,6,7,8-HxCDF	84.0	21.0 - 159	
13C-2,3,4,6,7,8-HxCDF	85.8	22.0 - 176	
13C-1,2,3,7,8,9-HxCDF	89.6	17.0 - 205	
13C-1,2,3,4,6,7,8-HpCDF	88.0	21.0 - 158	
13C-1,2,3,4,7,8,9-HpCDF	95.5	20.0 - 186	
13C-OCDF	79.8	13.0 - 198	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	81.3	31.0 - 191	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018

EPA Method 1613
PCDD/F



FAL ID: 11792-001-SA
Client ID: TOC-SS-01-0-10
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: 08-08-2018
Amount: 5.00 g
% Solids: 21.89

ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: pg/g


Acquired: 08-17-2018
2005 WHO TEQ: 41.3
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.33	-		1.33	0.0315				
1,2,3,7,8-PeCDD	6.60	-		6.60	0.0468				
1,2,3,4,7,8-HxCDD	13.4	-		1.34	0.0503				
1,2,3,6,7,8-HxCDD	45.6	-		4.56	0.0490	Total TCDD	43.9	-	M
1,2,3,7,8,9-HxCDD	28.4	-		2.84	0.0488	Total PeCDD	92.1	-	M
1,2,3,4,6,7,8-HpCDD	1150	-		11.5	0.0541	Total HxCDD	404	-	
OCDD	10900	-		3.27	0.0888	Total HpCDD	2640	-	
2,3,7,8-TCDF	8.44	-	F	0.844	0.0243				
1,2,3,7,8-PeCDF	4.37	-	J	0.131	0.0285				
2,3,4,7,8-PeCDF	6.65	-		2.00	0.0298				
1,2,3,4,7,8-HxCDF	11.6	-		1.16	0.0255				
1,2,3,6,7,8-HxCDF	13.4	-		1.34	0.0253				
2,3,4,6,7,8-HxCDF	15.4	-		1.54	0.0279				
1,2,3,7,8,9-HxCDF	4.16	-	J	0.416	0.0367	Total TCDF	153	-	D,M
1,2,3,4,6,7,8-HpCDF	210	-		2.10	0.0321	Total PeCDF	201	-	D,M
1,2,3,4,7,8,9-HpCDF	11.8	-		0.118	0.0396	Total HxCDF	323	-	D,M
OCDF	637	-		0.191	0.0843	Total HpCDF	633	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	67.1	25.0 - 164	
13C-1,2,3,7,8-PeCDD	66.0	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	66.0	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	63.3	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	70.6	23.0 - 140	
13C-OCDD	73.2	17.0 - 157	
13C-2,3,7,8-TCDF	66.2	24.0 - 169	
13C-1,2,3,7,8-PeCDF	65.6	24.0 - 185	
13C-2,3,4,7,8-PeCDF	66.5	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	61.5	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	57.5	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	60.0	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	62.4	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	63.5	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	71.7	26.0 - 138	
13C-OCDF	66.6	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	58.0	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018

EPA Method 1613
PCDD/F



FAL ID: 11792-002-SA
Client ID: TOC-SS-02-0-10
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: 08-08-2018
Amount: 5.02 g
% Solids: 32.01

ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: pg/g

Acquired: 08-17-2018
2005 WHO TEQ: 24.0
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	0.866	-	J	0.866	0.0315				
1,2,3,7,8-PeCDD	3.75	-	J	3.75	0.0468				
1,2,3,4,7,8-HxCDD	8.01	-		0.801	0.0503				
1,2,3,6,7,8-HxCDD	27.4	-		2.74	0.0490	Total TCDD	18.0	-	M
1,2,3,7,8,9-HxCDD	15.9	-		1.59	0.0488	Total PeCDD	43.8	-	
1,2,3,4,6,7,8-HpCDD	668	-		6.68	0.0541	Total HxCDD	223	-	
OCDD	6100	-		1.83	0.0888	Total HpCDD	1550	-	
2,3,7,8-TCDF	5.00	-	F	0.500	0.0243				
1,2,3,7,8-PeCDF	2.72	-	J	0.0816	0.0285				
2,3,4,7,8-PeCDF	4.17	-	J	1.25	0.0298				
1,2,3,4,7,8-HxCDF	6.72	-		0.672	0.0255				
1,2,3,6,7,8-HxCDF	6.77	-		0.677	0.0253				
2,3,4,6,7,8-HxCDF	8.88	-		0.888	0.0279				
1,2,3,7,8,9-HxCDF	2.64	-	J	0.264	0.0367	Total TCDF	78.0	-	D,M
1,2,3,4,6,7,8-HpCDF	119	-		1.19	0.0321	Total PeCDF	102	-	D,M
1,2,3,4,7,8,9-HpCDF	7.13	-		0.0713	0.0396	Total HxCDF	176	-	D,M
OCDF	365	-		0.110	0.0843	Total HpCDF	360	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	85.6	25.0 - 164	
13C-1,2,3,7,8-PeCDD	86.1	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	83.7	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	79.6	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	91.6	23.0 - 140	
13C-OCDD	93.7	17.0 - 157	
13C-2,3,7,8-TCDF	85.5	24.0 - 169	
13C-1,2,3,7,8-PeCDF	86.7	24.0 - 185	
13C-2,3,4,7,8-PeCDF	87.8	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	76.8	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	72.1	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	75.4	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	78.9	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	81.7	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	92.9	26.0 - 138	
13C-OCDF	88.2	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	74.8	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018

EPA Method 1613
PCDD/F



FAL ID: 11792-003-SA
Client ID: TOC-SS-03-0-10
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: 08-08-2018
Amount: 5.01 g
% Solids: 17.91

ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: pg/g

Acquired: 08-18-2018
2005 WHO TEQ: 56.4
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.31	-		1.31	0.0315				
1,2,3,7,8-PeCDD	8.29	-		8.29	0.0468				
1,2,3,4,7,8-HxCDD	17.2	-		1.72	0.0503				
1,2,3,6,7,8-HxCDD	66.9	-		6.69	0.0490	Total TCDD	38.5	-	M
1,2,3,7,8,9-HxCDD	36.8	-		3.68	0.0488	Total PeCDD	85.3	-	
1,2,3,4,6,7,8-HpCDD	1560	-		15.6	0.0541	Total HxCDD	480	-	
OCDD	13500	-		4.05	0.0888	Total HpCDD	3640	-	
2,3,7,8-TCDF	10.1	-	F	1.01	0.0243				
1,2,3,7,8-PeCDF	7.15	-		0.215	0.0285				
2,3,4,7,8-PeCDF	11.5	-		3.45	0.0298				
1,2,3,4,7,8-HxCDF	20.5	-		2.05	0.0255				
1,2,3,6,7,8-HxCDF	16.5	-		1.65	0.0253				
2,3,4,6,7,8-HxCDF	22.6	-		2.26	0.0279				
1,2,3,7,8,9-HxCDF	9.35	-		0.935	0.0367	Total TCDF	146	-	D,M
1,2,3,4,6,7,8-HpCDF	303	-		3.03	0.0321	Total PeCDF	227	-	D,M
1,2,3,4,7,8,9-HpCDF	17.8	-		0.178	0.0396	Total HxCDF	493	-	D,M
OCDF	796	-		0.239	0.0843	Total HpCDF	934	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	75.5	25.0 - 164	
13C-1,2,3,7,8-PeCDD	75.3	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	74.8	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	70.7	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	81.9	23.0 - 140	
13C-OCDD	87.0	17.0 - 157	
13C-2,3,7,8-TCDF	74.7	24.0 - 169	
13C-1,2,3,7,8-PeCDF	72.9	24.0 - 185	
13C-2,3,4,7,8-PeCDF	78.1	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	65.9	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	63.1	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	66.0	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	70.2	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	72.9	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	82.9	26.0 - 138	
13C-OCDF	79.4	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	65.3	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018

EPA Method 1613
PCDD/F



FAL ID: 11792-004-SA
Client ID: TOC-SS-04-0-10
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: 08-08-2018
Amount: 5.01 g
% Solids: 16.90

ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: pg/g


Acquired: 08-18-2018
2005 WHO TEQ: 53.3
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.50	-		1.50	0.0315				
1,2,3,7,8-PeCDD	8.64	-		8.64	0.0468				
1,2,3,4,7,8-HxCDD	19.5	-		1.95	0.0503				
1,2,3,6,7,8-HxCDD	61.2	-		6.12	0.0490	Total TCDD	33.7	-	
1,2,3,7,8,9-HxCDD	38.7	-		3.87	0.0488	Total PeCDD	79.9	-	
1,2,3,4,6,7,8-HpCDD	1470	-		14.7	0.0541	Total HxCDD	481	-	
OCDD	13700	-		4.11	0.0888	Total HpCDD	3330	-	
2,3,7,8-TCDF	9.91	-	F	0.991	0.0243				
1,2,3,7,8-PeCDF	5.75	-		0.173	0.0285				
2,3,4,7,8-PeCDF	8.57	-		2.57	0.0298				
1,2,3,4,7,8-HxCDF	15.5	-		1.55	0.0255				
1,2,3,6,7,8-HxCDF	15.3	-		1.53	0.0253				
2,3,4,6,7,8-HxCDF	20.2	-		2.02	0.0279				
1,2,3,7,8,9-HpCDF	5.19	-		0.519	0.0367	Total TCDF	150	-	D,M
1,2,3,4,6,7,8-HpCDF	268	-		2.68	0.0321	Total PeCDF	222	-	D,M
1,2,3,4,7,8,9-HpCDF	15.1	-		0.151	0.0396	Total HxCDF	376	-	D,M
OCDF	836	-		0.251	0.0843	Total HpCDF	780	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	80.2	25.0 - 164	
13C-1,2,3,7,8-PeCDD	81.5	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	76.3	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	73.6	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	86.7	23.0 - 140	
13C-OCDD	86.2	17.0 - 157	
13C-2,3,7,8-TCDF	79.3	24.0 - 169	
13C-1,2,3,7,8-PeCDF	82.1	24.0 - 185	
13C-2,3,4,7,8-PeCDF	82.4	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	67.3	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	65.7	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	66.8	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	72.6	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	72.7	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	87.2	26.0 - 138	
13C-OCDF	81.2	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	69.4	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018

EPA Method 1613
PCDD/F



FAL ID: 11792-005-SA
Client ID: TOC-SS-05-0-10
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: 08-08-2018
Amount: 5.00 g
% Solids: 18.34

ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: pg/g


Acquired: 08-18-2018
2005 WHO TEQ: 49.4
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.40	-		1.40	0.0315				
1,2,3,7,8-PeCDD	8.35	-		8.35	0.0468				
1,2,3,4,7,8-HxCDD	18.2	-		1.82	0.0503				
1,2,3,6,7,8-HxCDD	55.9	-		5.59	0.0490	Total TCDD	30.9	-	M
1,2,3,7,8,9-HxCDD	35.3	-		3.53	0.0488	Total PeCDD	74.2	-	
1,2,3,4,6,7,8-HpCDD	1390	-		13.9	0.0541	Total HxCDD	468	-	
OCDD	13100	-		3.93	0.0888	Total HpCDD	3440	-	
2,3,7,8-TCDF	9.58	-	F	0.958	0.0243				
1,2,3,7,8-PeCDF	5.21	-		0.156	0.0285				
2,3,4,7,8-PeCDF	6.43	-		1.93	0.0298				
1,2,3,4,7,8-HxCDF	13.9	-		1.39	0.0255				
1,2,3,6,7,8-HxCDF	13.7	-		1.37	0.0253				
2,3,4,6,7,8-HxCDF	18.3	-		1.83	0.0279				
1,2,3,7,8,9-HpCDF	4.28	-	J	0.428	0.0367	Total TCDF	145	-	D,M
1,2,3,4,6,7,8-HpCDF	244	-		2.44	0.0321	Total PeCDF	208	-	D,M
1,2,3,4,7,8,9-HpCDF	13.8	-		0.138	0.0396	Total HxCDF	351	-	D,M
OCDF	779	-		0.234	0.0843	Total HpCDF	738	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	63.0	25.0 - 164	
13C-1,2,3,7,8-PeCDD	66.3	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	61.4	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	59.2	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	65.5	23.0 - 140	
13C-OCDD	64.7	17.0 - 157	
13C-2,3,7,8-TCDF	62.7	24.0 - 169	
13C-1,2,3,7,8-PeCDF	65.7	24.0 - 185	
13C-2,3,4,7,8-PeCDF	70.3	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	56.2	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	53.8	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	54.9	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	57.9	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	59.0	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	65.4	26.0 - 138	
13C-OCDF	59.3	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	52.1	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018

EPA Method 1613
PCDD/F



FAL ID: 11792-006-SA
Client ID: TOC-SS-06-0-10
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: 08-08-2018
Amount: 4.99 g
% Solids: 21.01

ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: pg/g


Acquired: 08-18-2018
2005 WHO TEQ: 46.5
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.30	-		1.30	0.0315				
1,2,3,7,8-PeCDD	7.35	-		7.35	0.0468				
1,2,3,4,7,8-HxCDD	15.5	-		1.55	0.0503				
1,2,3,6,7,8-HxCDD	51.3	-		5.13	0.0490	Total TCDD	26.6	-	M
1,2,3,7,8,9-HxCDD	30.4	-		3.04	0.0488	Total PeCDD	65.9	-	
1,2,3,4,6,7,8-HpCDD	1340	-		13.4	0.0541	Total HxCDD	419	-	
OCDD	13000	-		3.90	0.0888	Total HpCDD	3290	-	
2,3,7,8-TCDF	8.92	-	F	0.892	0.0243				
1,2,3,7,8-PeCDF	4.97	-	J	0.149	0.0285				
2,3,4,7,8-PeCDF	7.83	-		2.35	0.0298				
1,2,3,4,7,8-HxCDF	13.4	-		1.34	0.0255				
1,2,3,6,7,8-HxCDF	13.0	-		1.30	0.0253				
2,3,4,6,7,8-HxCDF	16.5	-		1.65	0.0279				
1,2,3,7,8,9-HxCDF	4.62	-	J	0.462	0.0367	Total TCDF	134	-	D,M
1,2,3,4,6,7,8-HpCDF	227	-		2.27	0.0321	Total PeCDF	197	-	D,M
1,2,3,4,7,8,9-HpCDF	13.9	-		0.139	0.0396	Total HxCDF	331	-	D,M
OCDF	808	-		0.242	0.0843	Total HpCDF	680	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	73.9	25.0 - 164	
13C-1,2,3,7,8-PeCDD	72.7	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	72.0	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	68.9	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	80.4	23.0 - 140	
13C-OCDD	83.7	17.0 - 157	
13C-2,3,7,8-TCDF	74.9	24.0 - 169	
13C-1,2,3,7,8-PeCDF	75.3	24.0 - 185	
13C-2,3,4,7,8-PeCDF	76.4	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	61.3	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	59.6	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	61.1	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	65.4	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	68.4	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	80.7	26.0 - 138	
13C-OCDF	78.3	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	63.0	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018

EPA Method 1613
PCDD/F



FAL ID: 11792-007-SA
Client ID: TOC-SS-03D-0-10
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: 08-08-2018
Amount: 5.01 g
% Solids: 17.16

ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: pg/g

Acquired: 08-18-2018
2005 WHO TEQ: 57.2
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.58	-		1.58	0.0315				
1,2,3,7,8-PeCDD	9.06	-		9.06	0.0468				
1,2,3,4,7,8-HxCDD	18.6	-		1.86	0.0503				
1,2,3,6,7,8-HxCDD	67.2	-		6.72	0.0490	Total TCDD	37.8	-	
1,2,3,7,8,9-HxCDD	37.3	-		3.73	0.0488	Total PeCDD	83.7	-	
1,2,3,4,6,7,8-HpCDD	1530	-		15.3	0.0541	Total HxCDD	489	-	
OCDD	13900	-		4.17	0.0888	Total HpCDD	3470	-	
2,3,7,8-TCDF	10.1	-	F	1.01	0.0243				
1,2,3,7,8-PeCDF	7.05	-		0.212	0.0285				
2,3,4,7,8-PeCDF	10.5	-		3.15	0.0298				
1,2,3,4,7,8-HxCDF	20.1	-		2.01	0.0255				
1,2,3,6,7,8-HxCDF	16.7	-		1.67	0.0253				
2,3,4,6,7,8-HxCDF	22.3	-		2.23	0.0279				
1,2,3,7,8,9-HpCDF	9.26	-		0.926	0.0367	Total TCDF	147	-	D,M
1,2,3,4,6,7,8-HpCDF	313	-		3.13	0.0321	Total PeCDF	228	-	D,M
1,2,3,4,7,8,9-HpCDF	18.6	-		0.186	0.0396	Total HxCDF	500	-	D,M
OCDF	813	-		0.244	0.0843	Total HpCDF	936	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	59.2	25.0 - 164	
13C-1,2,3,7,8-PeCDD	57.0	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	56.1	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	55.2	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	66.5	23.0 - 140	
13C-OCDD	70.0	17.0 - 157	
13C-2,3,7,8-TCDF	58.8	24.0 - 169	
13C-1,2,3,7,8-PeCDF	58.2	24.0 - 185	
13C-2,3,4,7,8-PeCDF	60.3	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	48.5	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	47.2	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	48.1	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	52.6	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	55.6	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	63.6	26.0 - 138	
13C-OCDF	65.7	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	50.3	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018



CHAIN OF CUSTODY RECORD

Omega COCID 540 PAGE: 1 OF: 1

ADDRESS
 Fremont Analytical, Inc.
 3600 Fremont Ave. N.
 Seattle, WA 98103
 TEL: 206-352-3790
 FAX: 206-352-7178
 Website: www.fremontanalytical.com

11792
 0°C

SUB CONTRACTOR: Frontier Analytical La COMPANY: Frontier Analytical Laboratory		SPECIAL INSTRUCTIONS / COMMENTS: Use CLIENT SAMPLE IDs for sample checkin. Please email results to Mike Ridgeway at mridgeway@fremontanalytical.com and Chelsea Ward at cward@fremontanalytical.com. <i>place samples in ARCTIC for possible congener analysis. DO NOT DISPOSE.</i>
ADDRESS: 5172 Hillside Circle		
CITY, STATE, ZIP: El Dorado Hills, CA 95762		
PHONE: (916) 934-0900 FAX: (916) 934-0999 EMAIL:		
ACCOUNT #:		

ITEM #	SAMPLE ID	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS: Methanol Preserved Weights HOT Sample Notation, Additional Sample Description.
1	1808013-001E O-DIOXIN	TOC-SS-01-0-10	AMBER JAR 8OZ	Sediment	8/1/2018 9:50:00 AM	1	
2	1808013-002E O-DIOXIN	TOC-SS-02-0-10	AMBER JAR 8OZ	Sediment	8/1/2018 10:40:00 AM	1	
3	1808013-003E O-DIOXIN	TOC-SS-03-0-10	AMBER JAR 8OZ	Sediment	8/1/2018 11:15:00 AM	1	
4	1808013-004E O-DIOXIN	TOC-SS-04-0-10	AMBER JAR 8OZ	Sediment	8/1/2018 11:45:00 AM	1	
5	1808013-005E O-DIOXIN	TOC-SS-05-0-10	AMBER JAR 8OZ	Sediment	8/1/2018 12:53:00 PM	1	
6	1808013-006E O-DIOXIN	TOC-SS-06-0-10	AMBER JAR 8OZ	Sediment	8/1/2018 1:10:00 PM	1	
7	1808013-007E O-DIOXIN	TOC-SS-03D-0-10	AMBER JAR 8OZ	Sediment	8/1/2018 11:20:00 AM	1	

Chelsea to Kathy - EPA method 1631 Full List.

Relinquished By: <i>[Signature]</i>	Date: 8/1/18	Time: 15:33	Received By: <i>[Signature]</i>	Date: 8/8/18	Time: 10:55	REPORT TRANSMITTAL DESIRED:	
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	<input type="checkbox"/> HARDCOPY (extra cost)	<input type="checkbox"/> FAX
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	<input type="checkbox"/> EMAIL	<input type="checkbox"/> ONLINE
TAT: Standard <input type="checkbox"/> RUSH <input type="checkbox"/> Next BD <input type="checkbox"/> 2nd BD <input type="checkbox"/> 3rd BD <input type="checkbox"/>						FOR LAB USE ONLY	
Note: RUSH requests will incur surcharges!						Temp of samples _____ °C Attempt to Cool? _____	
						Comments: _____	
						000012 of 000 (Page 70 of 139)	

Chemical	Unit ¹	Freshwater SMS		Marine SMS Criteria		Analytical Method	Method Reporting
		SCO	CSL				
Dioxins/Furans							
2,3,7,8-TCDD	ng/kg	--	--	--	--	USEPA 1613B	0.5
1,2,3,7,8-PeCDD	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,4,7,8-HxCDD	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,6,7,8-HxCDD	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,7,8,9-HxCDD	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,4,6,7,8-HpCDD	ng/kg	--	--	--	--	USEPA 1613B	2.5
Total OCDD	ng/kg	--	--	--	--	USEPA 1613B	5
2,3,7,8-TCDF	ng/kg	--	--	--	--	USEPA 1613B	0.5
1,2,3,7,8-PeCDF	ng/kg	--	--	--	--	USEPA 1613B	2.5
2,3,4,7,8-PeCDF	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,4,7,8-HxCDF	ng/kg	--	--	--	--	USEPA 1613B	2.5
2,3,4,6,7,8-HxCDF	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,7,8,9-HxCDF	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,4,6,7,8-HpCDF	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,6,7,8-HxCDF	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,4,7,8,9-HpCDF	ng/kg	--	--	--	--	USEPA 1613B	2.5
Total OCDF	ng/kg	--	--	--	--	USEPA 1613B	5
Summed dioxin/furan TEQ ⁵	ng/kg	--	--	--	--	--	--

Frontier Analytical Laboratory

Sample Login Form

FAL Project ID: 11792

Client:	Fremont Analytical
Client Project ID:	1808013
Date Received:	08/08/2018
Time Received:	10:55 am
Received By:	KZ
Logged In By:	KZ
# of Samples Received:	7
Duplicates:	0
Storage Location:	R-3

Method of Delivery:	UPS
Tracking Number:	1ZX6192X0340975540
Shipping Container Received Intact	Yes
Custody seals(s) present?	No
Custody seals(s) intact?	No
Sample Arrival Temperature (C)	0
Cooling Method	Blue Ice
Chain Of Custody Present?	Yes
Return Shipping Container To Client	No
Test aqueous sample for residual Chlorine	No
Sodium Thiosulfate Added	No
Adequate Sample Volume	Yes
Appropriate Sample Container	Yes
pH Range of Aqueous Sample	N/A
Anomalies or additional comments:	

SUB CONTRACTOR	Frontier Analytical La	COMPANY	Frontier Analytical Laboratory	SPECIAL INSTRUCTIONS/COMMENTS
ADDRESS	5172 Hillsdale Circle			Use CLIENT SAMPLE IDs for sample checks. Please email results to Mike Ridgeway at mrldgeway@frontieranalytical.com and Chelsea Ward at cward@frontieranalytical.com . <i>place samples in archive for possible congenener analyser. DO NOT DISPOSE.</i>
CITY, STATE, ZIP	El Dorado Hills, CA 95762			
PHONE	(916) 934-0900	FAX	(916) 934-0999	
ACCOUNT #				

Frontier Analytical Laboratory
11792-005-SA
Client ID: TOC-SS-05-0-10
Storage: R-3 (01 of 01)

TOC-SS-05-0-10

SAMPLED BY	DATE	TIME
AM, KH	8/1/18	12:53
LOCATION	PRESERVATIVE	
Time oil		
ANALYSIS	CLIENT	
Dioxins	FLS	

(800) 233-8425 www.essvial.com

Frontier Analytical Laboratory
11792-006-SA
Client ID: TOC-SS-06-0-10
Storage: R-3 (01 of 01)

TOC-SS-06-0-10

SAMPLED BY	DATE	TIME
AM, KH	8/1/18	13:10
LOCATION	PRESERVATIVE	
Time oil		
ANALYSIS	CLIENT	
Dioxins	FLS	

(800) 233-8425 www.essvial.com

Frontier Analytical Laboratory
11792-007-SA
Client ID: TOC-SS-03D-0-10
Storage: R-3 (01 of 01)

TOC-SS-03D-0-10

SAMPLED BY	DATE	TIME
AM, KH	8/1/18	11:20
LOCATION	PRESERVATIVE	
Time oil		
ANALYSIS	CLIENT	
Dioxins	FLS	

(800) 233-8425 www.essvial.com

Frontier Analytical Laboratory
11792-001-SA
Client ID: TOC-SS-01-0-10
Storage: R-3 (01 of 01)

TOC-SS-01-0-10

SAMPLED BY	DATE	TIME
AM, KH	8/1/18	9:50
LOCATION	PRESERVATIVE	
Time Cankra oil		
ANALYSIS	CLIENT	
Dioxin/Furan	FLS	

(800) 233-8425 www.essvial.com

Frontier Analytical Laboratory
11792-002-SA
Client ID: TOC-SS-02-0-10
Storage: R-3 (01 of 01)

TOC-SS-02-0-10

SAMPLED BY	DATE	TIME
AM, KH	8/1/18	10:40
LOCATION	PRESERVATIVE	
Time oil		
ANALYSIS	CLIENT	
Dioxins	FLS	

(800) 233-8425 www.essvial.com

Frontier Analytical Laboratory
11792-003-SA
Client ID: TOC-SS-03-0-10
Storage: R-3 (01 of 01)

TOC-SS-03-0-10

SAMPLED BY	DATE	TIME
AM, KH	8/1/18	11:15
LOCATION	PRESERVATIVE	
Time oil		
ANALYSIS	CLIENT	
Dioxins	FLS	

(800) 233-8425 www.essvial.com

Frontier Analytical Laboratory
11792-004-SA
Client ID: TOC-SS-04-0-10
Storage: R-3 (01 of 01)

TOC-SS-04-0-10

SAMPLED BY	DATE	TIME
AM, KH	8/1/18	11:45
LOCATION	PRESERVATIVE	
Time oil		
ANALYSIS	CLIENT	
Dioxins	FLS	

(800) 233-8425 www.essvial.com

2018/08/08



21 August 2018

Mike Ridgeway
Fremont Analytical
3600 Fremont Avenue N.
Seattle, WA 98103

RE: 1808013

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

<u>Associated Work Order(s)</u>	<u>Associated SDG ID(s)</u>
18H0061	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.





CHAIN OF CUSTODY RECORD

Omega COCID 539

PAGE: 1

OF: 2

ADDRESS

Fremont Analytical, Inc.
3600 Fremont Ave. N.
Seattle, WA 98103
TEL: 206-352-3790
FAX: 206-352-7178

Website: www.fremontanalytical.com

18H0061

SUB CONTRACTOR: ARI	COMPANY: Analytical Resources Inc.	SPECIAL INSTRUCTIONS / COMMENTS: Please email results to Mike Ridgeway at mridgeway@fremontanalytical.com and Chelsea Ward at cward@fremontanalytical.com. <i>use client sample ID for checkin.</i> <i>INCLUDE ISOMERS FOR DDD, DDT, DDE</i>
ADDRESS: 4611 South 134th Place, Suite 100		
CITY, STATE, ZIP: Tukwila, WA 98168		
PHONE: (206) 695-6200 FAX: EMAIL:		
ACCOUNT #:		

ITEM #	SAMPLE ID	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS: Methanol Preserved Weights HOT Sample Notation. Additional Sample Description.
1	1808013-001C	TOC-SS-01-0-10	SEPTA JAR 4OZ	Sediment	8/1/2018 9:50:00 AM	1	Total Sulfides (PSEP). Preserved with Zn Acetate.
	TEST_SUB						
2	1808013-001D	TOC-SS-01-0-10	CLEAR JARS 8 O	Sediment	8/1/2018 9:50:00 AM	1	Butyltin Species and Pesticides (see comments)
	O-PEST-S, TEST_SUB						
3	1808013-002C	TOC-SS-02-0-10	SEPTA JAR 4OZ	Sediment	8/1/2018 10:40:00 AM	1	Total Sulfides (PSEP). Preserved with Zn Acetate.
	TEST_SUB						
4	1808013-002D	TOC-SS-02-0-10	CLEAR JARS 8 O	Sediment	8/1/2018 10:40:00 AM	1	Butyltin Species and Pesticides (see comments)
	O-PEST-S, TEST_SUB						
5	1808013-003C	TOC-SS-03-0-10	SEPTA JAR 4OZ	Sediment	8/1/2018 11:15:00 AM	1	Total Sulfides (PSEP). Preserved with Zn Acetate.
	TEST_SUB						
6	1808013-003D	TOC-SS-03-0-10	CLEAR JARS 8 O	Sediment	8/1/2018 11:15:00 AM	1	Butyltin Species and Pesticides (see comments)
	O-PEST-S, TEST_SUB						
7	1808013-004C	TOC-SS-04-0-10	SEPTA JAR 4OZ	Sediment	8/1/2018 11:45:00 AM	1	Total Sulfides (PSEP). Preserved with Zn Acetate.
	TEST_SUB						
8	1808013-004D	TOC-SS-04-0-10	CLEAR JARS 8 O	Sediment	8/1/2018 11:45:00 AM	1	Butyltin Species and Pesticides (see comments)
	O-PEST-S, TEST_SUB						
9	1808013-005C	TOC-SS-05-0-10	SEPTA JAR 4OZ	Sediment	8/1/2018 12:53:00 PM	1	Total Sulfides (PSEP). Preserved with Zn Acetate.
	TEST_SUB						

Relinquished By:	Date: 8/1/18	Time: 1130	Received By: Stephanie Fiskel	Date: 8-1-18	Time: 512
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

TAT: Standard RUSH Next BD 2nd BD 3rd BD

Note: RUSH requests will incur surcharges!

REPORT TRANSMITTAL DESIRED:

HARDCOPY (extra cost) FAX EMAIL ONLINE

FOR LAB USE ONLY

Temp of samples: **5.8** °C Attempt to Cool? **yes**

Comments: **gel packs**

Page 75 of 139



CHAIN OF CUSTODY RECORD

Omega COCID 539 PAGE: 2 OF: 2

ADDRESS
 Fremont Analytical, Inc.
 3600 Fremont Ave. N.
 Seattle, WA 98103
 TEL: 206-352-3790
 FAX: 206-352-7178
 Website: www.fremontanalytical.com

18H0061

SUB CONTRACTOR: ARI	COMPANY: Analytical Resources Inc.	SPECIAL INSTRUCTIONS / COMMENTS: Please email results to Mike Ridgeway at mridgeway@fremontanalytical.com and Chelsea Ward at cward@fremontanalytical.com.	
ADDRESS: 4611 South 134th Place, Suite 100			
CITY, STATE, ZIP: Tukwila, WA 98168			
PHONE: (206) 695-6200	FAX: _____		EMAIL: _____
ACCOUNT #: _____			

ITEM #	SAMPLE ID	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS: Methanol Preserved Weights HOT Sample Notation, Additional Sample Description.
10	1808013-005D	TOC-SS-05-0-10	CLEAR JARS 8 O	Sediment	8/1/2018 12:53:00 PM	1	Butyltin Species and Pesticides (see comments)
	O-PEST-S, TEST_SUB						
11	1808013-006C	TOC-SS-06-0-10	SEPTA JAR 4OZ	Sediment	8/1/2018 1:10:00 PM	1	Total Sulfides (PSEP). Preserved with Zn Acetate.
	TEST_SUB						
12	1808013-006D	TOC-SS-06-0-10	CLEAR JARS 8 O	Sediment	8/1/2018 1:10:00 PM	1	Butyltin Species and Pesticides (see comments)
	O-PEST-S, TEST_SUB						
13	1808013-007C	TOC-SS-03D-0-10	SEPTA JAR 4OZ	Sediment	8/1/2018 11:20:00 AM	1	Total Sulfides (PSEP). Preserved with Zn Acetate.
	TEST_SUB						
14	1808013-007D	TOC-SS-03D-0-10	CLEAR JARS 8 O	Sediment	8/1/2018 11:20:00 AM	1	Butyltin Species and Pesticides (see comments)
	O-PEST-S, TEST_SUB						

Relinquished By: *[Signature]* Date: *8/6/18* Time: *1130*
 Relinquished By: _____ Date: _____ Time: _____
 Received By: *Stephanie Fisher* Date: *8-6-18* Time: *512*
 Received By: _____ Date: _____ Time: _____

TAT: Standard RUSH Next BD 2nd BD 3rd BD

Note: RUSH requests will incur surcharges!

REPORT TRANSMITTAL DESIRED:
 HARDCOPY (extra cost) FAX EMAIL ONLINE

FOR LAB USE ONLY
 Temp of samples *5.5* °C Attempt to Cool? *yes*
 Comments: *gel packs*



Fremont Analytical
3600 Fremont Avenue N.
Seattle WA, 98103

Project: 1808013
Project Number: 1808013
Project Manager: Mike Ridgeway

Reported:
21-Aug-2018 13:40

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TOC-SS-01-0-10	18H0061-01	Solid	01-Aug-2018 09:50	06-Aug-2018 15:12
TOC-SS-01-0-10	18H0061-02	Solid	01-Aug-2018 09:50	06-Aug-2018 15:12
TOC-SS-02-0-10	18H0061-03	Solid	01-Aug-2018 10:40	06-Aug-2018 15:12
TOC-SS-02-0-10	18H0061-04	Solid	01-Aug-2018 10:40	06-Aug-2018 15:12
TOC-SS-03-0-10	18H0061-05	Solid	01-Aug-2018 11:15	06-Aug-2018 15:12
TOC-SS-03-0-10	18H0061-06	Solid	01-Aug-2018 11:15	06-Aug-2018 15:12
TOC-SS-04-0-10	18H0061-07	Solid	01-Aug-2018 11:45	06-Aug-2018 15:12
TOC-SS-04-0-10	18H0061-08	Solid	01-Aug-2018 11:45	06-Aug-2018 15:12
TOC-SS-05-0-10	18H0061-09	Solid	01-Aug-2018 12:53	06-Aug-2018 15:12
TOC-SS-05-0-10	18H0061-10	Solid	01-Aug-2018 12:53	06-Aug-2018 15:12
TOC-SS-06-0-10	18H0061-11	Solid	01-Aug-2018 13:10	06-Aug-2018 15:12
TOC-SS-06-0-10	18H0061-12	Solid	01-Aug-2018 13:10	06-Aug-2018 15:12
TOC-SS-03D-0-10	18H0061-13	Solid	01-Aug-2018 11:20	06-Aug-2018 15:12
TOC-SS-03D-0-10	18H0061-14	Solid	01-Aug-2018 11:20	06-Aug-2018 15:12



Fremont Analytical
3600 Fremont Avenue N.
Seattle WA, 98103

Project: 1808013
Project Number: 1808013
Project Manager: Mike Ridgeway

Reported:
21-Aug-2018 13:40

Case Narrative

Sample receipt

Samples as listed on the preceding page were received August 6, 2018 under ARI work order 18H0061. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Pesticides - EPA Method SW8081A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Butyl Tin(s) - EPA Method SW8270D-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Wet Chemistry - Sulfide

The sample(s) were prepared and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

The Duplicate RPD were within control limits.



Cooler Receipt Form

ARI Client: Fremont
COC No(s): Omega COC17 S39 NA
Assigned ARI Job No: 18H0061

Project Name: 1802013
Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____
Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO
 Were custody papers included with the cooler? YES NO
 Were custody papers properly filled out (ink, signed, etc.) YES NO
 Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 5.8
 Time: 1512

If cooler temperature is out of compliance fill out form 00070F
 Cooler Accepted by: Self Date: 8-6-18 Time: 1512 Temp Gun ID#: D002565

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO
 What kind of packing material was used? ... Bubble Wrap Wet Ice Gel-Packs Baggies Foam Block Paper Other: _____
 Was sufficient ice used (if appropriate)? NA YES NO
 Were all bottles sealed in individual plastic bags? YES NO
 Did all bottles arrive in good condition (unbroken)? YES NO
 Were all bottle labels complete and legible? YES NO
 Did the number of containers listed on COC match with the number of containers received? YES NO
 Did all bottle labels and tags agree with custody papers? YES NO
 Were all bottles used correct for the requested analyses? YES NO
 Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO
 Were all VOC vials free of air bubbles? NA YES NO
 Was sufficient amount of sample sent in each bottle? YES NO
 Date VOC Trip Blank was made at ARI: NA
 Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

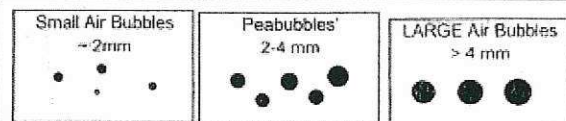
Samples Logged by: Self Date: 8-6-18 Time: 1707

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Small → "sm" (< 2 mm)
 Peabubbles → "pb" (2 to < 4 mm)
 Large → "lg" (4 to < 6 mm)
 Headspace → "hs" (> 6 mm)



Fremont Analytical
3600 Fremont Avenue N.
Seattle WA, 98103

Project: 1808013
Project Number: 1808013
Project Manager: Mike Ridgeway

Reported:
21-Aug-2018 13:40

TOC-SS-01-0-10
18H0061-01 (Solid)

Wet Chemistry

Method: PSEP 1986

Sampled: 08/01/2018 09:50

Instrument: BAL2

Analyzed: 07-Aug-2018 11:58

Sample Preparation:

Preparation Method: No Prep Wet Chem
Preparation Batch: BGH0163
Prepared: 07-Aug-2018

Sample Size: 5 g (wet)
Final Volume: 5 g

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids, Sulfide		1	0.04	0.04	26.16	%	



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Project Manager: Mike Ridgeway

Reported:
21-Aug-2018 13:40

TOC-SS-01-0-10
18H0061-01 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00

Sampled: 08/01/2018 09:50

Instrument: UV1800-2

Analyzed: 08-Aug-2018 11:31

Sample Preparation:

Preparation Method: No Prep - Volatiles
Preparation Batch: BGH0149
Prepared: 07-Aug-2018

Sample Size: 5.011 g (wet)
Final Volume: 100 g

Dry Weight: 1.31 g
% Solids: 26.16

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	50	191	191	2240	mg/kg	D



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Project: 1808013
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Project Manager: Mike Ridgeway

Reported:
21-Aug-2018 13:40

TOC-SS-01-0-10
18H0061-02 (Solid)

Butyl Tins

Method: EPA 8270D-SIM

Sampled: 08/01/2018 09:50

Instrument: NT14

Analyzed: 17-Aug-2018 12:53

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BGH0179 Prepared: 08-Aug-2018	Sample Size: 20.06 g (wet) Final Volume: 0.5 mL	Dry Weight: 5.15 g % Solids: 25.66
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CGH0103 Cleaned: 17-Aug-2018	Initial Volume: 0.5 mL Final Volume: 0.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.437	3.75	68.8	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.68	5.61	24.0	ug/kg	
Butyltin Ion	78763-54-9	1	1.84	3.96	7.42	ug/kg	
Tetrabutyltin	1461-25-2	1	4.86	4.86	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	64.6 %	
<i>Surrogate: Tripropyltin</i>					30-160 %	53.5 %	



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Project: 1808013
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Reported:
21-Aug-2018 13:40

TOC-SS-01-0-10
18H0061-02 (Solid)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 08/01/2018 09:50

Instrument: ECD6

Analyzed: 16-Aug-2018 12:10

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BGH0177 Prepared: 08-Aug-2018	Sample Size: 47.12 g (wet) Final Volume: 4 mL	Dry Weight: 12.09 g % Solids: 25.66
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CGH0091 Cleaned: 15-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CGH0090 Cleaned: 15-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	
Sample Cleanup:	Cleanup Method: GPC Cleanup Batch: CGH0089 Cleaned: 09-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	2	0.34	3.37	ND	ug/kg	U
beta-BHC	319-85-7	2	0.63	3.37	ND	ug/kg	U
gamma-BHC (Lindane)	58-89-9	2	0.35	3.37	ND	ug/kg	U
delta-BHC	319-86-8	2	0.60	3.37	ND	ug/kg	U
Heptachlor	76-44-8	2	0.43	3.37	ND	ug/kg	U
Aldrin	309-00-2	2	0.43	3.37	ND	ug/kg	U
Heptachlor Epoxide	1024-57-3	2	0.57	3.37	ND	ug/kg	U
trans-Chlordane (beta-Chlordane)	5103-74-2	2	0.52	3.37	ND	ug/kg	U
cis-Chlordane (alpha-chlordane)	5103-71-9	2	0.56	3.37	ND	ug/kg	U
Endosulfan I	959-98-8	2	0.54	3.37	ND	ug/kg	U
4,4'-DDE	72-55-9	2	1.13	6.55	3.84	ug/kg	J, D
Dieldrin	60-57-1	2	1.12	6.55	ND	ug/kg	U
Endrin	72-20-8	2	1.03	6.55	ND	ug/kg	U
Endosulfan II	33213-65-9	2	1.11	6.55	ND	ug/kg	U
4,4'-DDD	72-54-8	2	1.14	6.55	ND	ug/kg	U
Endrin Aldehyde	7421-93-4	2	1.91	6.55	ND	ug/kg	U
4,4'-DDT	50-29-3	2	1.14	6.55	ND	ug/kg	U
Endosulfan Sulfate	1031-07-8	2	1.68	6.55	ND	ug/kg	U
Endrin Ketone	53494-70-5	2	1.32	6.55	ND	ug/kg	U
Methoxychlor	72-43-5	2	6.99	33.7	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	2	1.62	6.55	ND	ug/kg	U
Hexachlorobenzene	118-74-1	2	1.21	6.55	ND	ug/kg	U
2,4'-DDE	3424-82-6	2	3.37	6.55	ND	ug/kg	U
2,4'-DDD	53-19-0	2	3.37	6.55	ND	ug/kg	U
2,4'-DDT	789-02-6	2	3.37	6.55	ND	ug/kg	U
Oxychlordane	27304-13-8	2	3.37	6.55	ND	ug/kg	U
cis-Nonachlor	5103-73-1	2	1.69	3.37	ND	ug/kg	U



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TOC-SS-01-0-10
18H0061-02 (Solid)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 08/01/2018 09:50

Instrument: ECD6

Analyzed: 16-Aug-2018 12:10

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
trans-Nonachlor	39765-80-5	2	3.37	6.55	ND	ug/kg	U
Mirex	2385-85-5	2	3.37	6.55	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				<i>34-145 %</i>	<i>145</i>	<i>%</i>	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				<i>34-145 %</i>	<i>118</i>	<i>%</i>	
<i>Surrogate: Tetrachlorometaxylene</i>				<i>23-135 %</i>	<i>106</i>	<i>%</i>	P1
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				<i>23-135 %</i>	<i>61.6</i>	<i>%</i>	P1



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Reported:
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TOC-SS-02-0-10
18H0061-03 (Solid)

Wet Chemistry

Method: PSEP 1986

Sampled: 08/01/2018 10:40

Instrument: BAL2

Analyzed: 07-Aug-2018 11:58

Sample Preparation:

Preparation Method: No Prep Wet Chem
Preparation Batch: BGH0163
Prepared: 07-Aug-2018

Sample Size: 5 g (wet)
Final Volume: 5 g

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids, Sulfide		1	0.04	0.04	30.45	%	



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TOC-SS-02-0-10
18H0061-03 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00

Sampled: 08/01/2018 10:40

Instrument: UV1800-2

Analyzed: 08-Aug-2018 11:34

Sample Preparation:

Preparation Method: No Prep - Volatiles
Preparation Batch: BGH0149
Prepared: 07-Aug-2018

Sample Size: 5.258 g (wet)
Final Volume: 100 g

Dry Weight: 1.60 g
% Solids: 30.45

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	50	156	156	868	mg/kg	D



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TOC-SS-02-0-10
18H0061-04 (Solid)

Butyl Tins

Method: EPA 8270D-SIM

Sampled: 08/01/2018 10:40

Instrument: NT14

Analyzed: 17-Aug-2018 13:07

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BGH0179 Prepared: 08-Aug-2018	Sample Size: 14.18 g (wet) Final Volume: 0.5 mL	Dry Weight: 5.05 g % Solids: 35.62
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CGH0103 Cleaned: 17-Aug-2018	Initial Volume: 0.5 mL Final Volume: 0.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.445	3.82	33.6	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.71	5.72	31.7	ug/kg	
Butyltin Ion	78763-54-9	1	1.87	4.04	11.3	ug/kg	
Tetrabutyltin	1461-25-2	1	4.95	4.95	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	63.2	%
<i>Surrogate: Tripropyltin</i>					30-160 %	56.2	%



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TOC-SS-02-0-10
18H0061-04 (Solid)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 08/01/2018 10:40

Instrument: ECD6

Analyzed: 16-Aug-2018 12:28

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BGH0177 Prepared: 08-Aug-2018	Sample Size: 34.07 g (wet) Final Volume: 4 mL	Dry Weight: 12.14 g % Solids: 35.62
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CGH0091 Cleaned: 15-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CGH0090 Cleaned: 15-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	
Sample Cleanup:	Cleanup Method: GPC Cleanup Batch: CGH0089 Cleaned: 09-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	2	0.34	3.36	ND	ug/kg	U
beta-BHC	319-85-7	2	0.63	3.36	ND	ug/kg	U
gamma-BHC (Lindane)	58-89-9	2	0.35	3.36	ND	ug/kg	U
delta-BHC	319-86-8	2	0.59	3.36	ND	ug/kg	U
Heptachlor	76-44-8	2	0.43	3.36	ND	ug/kg	U
Aldrin	309-00-2	2	0.43	3.36	ND	ug/kg	U
Heptachlor Epoxide	1024-57-3	2	0.57	3.36	ND	ug/kg	U
trans-Chlordane (beta-Chlordane)	5103-74-2	2	0.52	3.36	ND	ug/kg	U
cis-Chlordane (alpha-chlordane)	5103-71-9	2	0.56	3.36	ND	ug/kg	U
Endosulfan I	959-98-8	2	0.54	3.36	ND	ug/kg	U
4,4'-DDE	72-55-9	2	1.12	6.53	ND	ug/kg	U
Dieldrin	60-57-1	2	1.11	6.53	ND	ug/kg	U
Endrin	72-20-8	2	1.02	6.53	ND	ug/kg	U
Endosulfan II	33213-65-9	2	1.11	6.53	ND	ug/kg	U
4,4'-DDD	72-54-8	2	1.14	6.53	2.26	ug/kg	J, D
Endrin Aldehyde	7421-93-4	2	1.90	6.53	ND	ug/kg	U
4,4'-DDT	50-29-3	2	1.13	6.53	ND	ug/kg	U
Endosulfan Sulfate	1031-07-8	2	1.67	6.53	ND	ug/kg	U
Endrin Ketone	53494-70-5	2	1.31	6.53	ND	ug/kg	U
Methoxychlor	72-43-5	2	6.96	33.6	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	2	1.61	6.53	ND	ug/kg	U
Hexachlorobenzene	118-74-1	2	1.21	6.53	ND	ug/kg	U
2,4'-DDE	3424-82-6	2	3.36	6.53	ND	ug/kg	U
2,4'-DDD	53-19-0	2	3.36	6.53	ND	ug/kg	U
2,4'-DDT	789-02-6	2	3.36	6.53	ND	ug/kg	U
Oxychlordane	27304-13-8	2	3.36	6.53	ND	ug/kg	U
cis-Nonachlor	5103-73-1	2	1.68	3.36	ND	ug/kg	U



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TOC-SS-02-0-10
18H0061-04 (Solid)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 08/01/2018 10:40

Instrument: ECD6

Analyzed: 16-Aug-2018 12:28

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
trans-Nonachlor	39765-80-5	2	3.36	6.53	ND	ug/kg	U
Mirex	2385-85-5	2	3.36	6.53	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				<i>34-145 %</i>	<i>138</i>	<i>%</i>	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				<i>34-145 %</i>	<i>100</i>	<i>%</i>	
<i>Surrogate: Tetrachlorometaxylene</i>				<i>23-135 %</i>	<i>90.3</i>	<i>%</i>	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				<i>23-135 %</i>	<i>62.7</i>	<i>%</i>	



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Reported:
21-Aug-2018 13:40

TOC-SS-03-0-10
18H0061-05 (Solid)

Wet Chemistry

Method: PSEP 1986

Sampled: 08/01/2018 11:15

Instrument: BAL2

Analyzed: 07-Aug-2018 11:58

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGH0163 Sample Size: 5 g (wet)
Prepared: 07-Aug-2018 Final Volume: 5 g

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids, Sulfide		1	0.04	0.04	17.27	%	



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21-Aug-2018 13:40

TOC-SS-03-0-10
18H0061-05 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00

Sampled: 08/01/2018 11:15

Instrument: UV1800-2

Analyzed: 08-Aug-2018 11:34

Sample Preparation:

Preparation Method: No Prep - Volatiles
Preparation Batch: BGH0149
Prepared: 07-Aug-2018

Sample Size: 5.171 g (wet)
Final Volume: 100 g

Dry Weight: 0.89 g
% Solids: 17.27

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	50	280	280	2770	mg/kg	D



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Reported:
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TOC-SS-03-0-10
18H0061-06 (Solid)

Butyl Tins

Method: EPA 8270D-SIM

Sampled: 08/01/2018 11:15

Instrument: NT14

Analyzed: 17-Aug-2018 13:20

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BGH0179 Prepared: 08-Aug-2018	Sample Size: 28.01 g (wet) Final Volume: 0.5 mL	Dry Weight: 5.10 g % Solids: 18.21
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CGH0103 Cleaned: 17-Aug-2018	Initial Volume: 0.5 mL Final Volume: 0.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.441	3.78	50.9	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.70	5.67	23.5	ug/kg	
Butyltin Ion	78763-54-9	1	1.85	4.00	7.20	ug/kg	
Tetrabutyltin	1461-25-2	1	4.90	4.90	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	60.0 %	
<i>Surrogate: Tripropyltin</i>					30-160 %	53.0 %	



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21-Aug-2018 13:40

TOC-SS-03-0-10
18H0061-06 (Solid)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 08/01/2018 11:15

Instrument: ECD6

Analyzed: 16-Aug-2018 12:46

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BGH0177 Prepared: 08-Aug-2018	Sample Size: 10.02 g (wet) Final Volume: 4 mL	Dry Weight: 1.82 g % Solids: 18.21
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CGH0091 Cleaned: 15-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CGH0090 Cleaned: 15-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	
Sample Cleanup:	Cleanup Method: GPC Cleanup Batch: CGH0089 Cleaned: 09-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	1	1.12	11.2	ND	ug/kg	U
beta-BHC	319-85-7	1	2.09	11.2	ND	ug/kg	U
gamma-BHC (Lindane)	58-89-9	1	1.15	11.2	ND	ug/kg	U
delta-BHC	319-86-8	1	1.97	11.2	ND	ug/kg	U
Heptachlor	76-44-8	1	1.43	11.2	ND	ug/kg	U
Aldrin	309-00-2	1	1.43	11.2	ND	ug/kg	U
Heptachlor Epoxide	1024-57-3	1	1.88	11.2	ND	ug/kg	U
trans-Chlordane (beta-Chlordane)	5103-74-2	1	1.74	11.2	ND	ug/kg	U
cis-Chlordane (alpha-chlordane)	5103-71-9	1	1.85	11.2	ND	ug/kg	U
Endosulfan I	959-98-8	1	1.80	11.2	ND	ug/kg	U
4,4'-DDE	72-55-9	1	3.74	21.7	ND	ug/kg	U
Dieldrin	60-57-1	1	3.70	21.7	ND	ug/kg	U
Endrin	72-20-8	1	3.41	21.7	ND	ug/kg	U
Endosulfan II	33213-65-9	1	3.69	21.7	ND	ug/kg	U
4,4'-DDD	72-54-8	1	3.78	21.7	4.82	ug/kg	J
Endrin Aldehyde	7421-93-4	1	6.33	21.7	ND	ug/kg	U
4,4'-DDT	50-29-3	1	3.76	21.7	ND	ug/kg	U
Endosulfan Sulfate	1031-07-8	1	5.55	21.7	ND	ug/kg	U
Endrin Ketone	53494-70-5	1	4.36	21.7	ND	ug/kg	U
Methoxychlor	72-43-5	1	23.1	112	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	5.36	21.7	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	4.01	21.7	ND	ug/kg	U
2,4'-DDE	3424-82-6	1	11.2	21.7	ND	ug/kg	U
2,4'-DDD	53-19-0	1	11.2	21.7	ND	ug/kg	U
2,4'-DDT	789-02-6	1	11.2	21.7	ND	ug/kg	U
Oxychlordane	27304-13-8	1	11.2	21.7	ND	ug/kg	U
cis-Nonachlor	5103-73-1	1	5.59	11.2	ND	ug/kg	U



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TOC-SS-03-0-10
18H0061-06 (Solid)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 08/01/2018 11:15

Instrument: ECD6

Analyzed: 16-Aug-2018 12:46

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
trans-Nonachlor	39765-80-5	1	11.2	21.7	ND	ug/kg	U
Mirex	2385-85-5	1	11.2	21.7	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				34-145 %	91.4	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				34-145 %	76.8	%	
<i>Surrogate: Tetrachlorometaxylene</i>				23-135 %	80.4	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				23-135 %	65.2	%	



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TOC-SS-04-0-10
18H0061-07 (Solid)

Wet Chemistry

Method: PSEP 1986 Sampled: 08/01/2018 11:45

Instrument: BAL2 Analyzed: 07-Aug-2018 11:58

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGH0163 Sample Size: 5 g (wet)
Prepared: 07-Aug-2018 Final Volume: 5 g

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids, Sulfide		1	0.04	0.04	16.00	%	



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TOC-SS-04-0-10
18H0061-07 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00

Sampled: 08/01/2018 11:45

Instrument: UV1800-2

Analyzed: 08-Aug-2018 11:35

Sample Preparation: Preparation Method: No Prep - Volatiles
Preparation Batch: BGH0149
Prepared: 07-Aug-2018

Sample Size: 5.02 g (wet)
Final Volume: 100 g

Dry Weight: 0.80 g
% Solids: 16.00

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	50	311	311	1840	mg/kg	D



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TOC-SS-04-0-10
18H0061-08 (Solid)

Butyl Tins

Method: EPA 8270D-SIM

Sampled: 08/01/2018 11:45

Instrument: NT14

Analyzed: 17-Aug-2018 13:34

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BGH0179 Prepared: 08-Aug-2018	Sample Size: 26.07 g (wet) Final Volume: 0.5 mL	Dry Weight: 5.04 g % Solids: 19.35
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CGH0103 Cleaned: 17-Aug-2018	Initial Volume: 0.5 mL Final Volume: 0.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.446	3.83	69.5	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.71	5.73	30.2	ug/kg	
Butyltin Ion	78763-54-9	1	1.87	4.04	8.94	ug/kg	
Tetrabutyltin	1461-25-2	1	4.96	4.96	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	59.5 %	
<i>Surrogate: Tripropyltin</i>					30-160 %	48.2 %	



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TOC-SS-04-0-10
18H0061-08 (Solid)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 08/01/2018 11:45

Instrument: ECD6

Analyzed: 16-Aug-2018 13:04

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BGH0177 Prepared: 08-Aug-2018	Sample Size: 10.04 g (wet) Final Volume: 4 mL	Dry Weight: 1.94 g % Solids: 19.35
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CGH0091 Cleaned: 15-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CGH0090 Cleaned: 15-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	
Sample Cleanup:	Cleanup Method: GPC Cleanup Batch: CGH0089 Cleaned: 09-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	1	1.05	10.5	ND	ug/kg	U
beta-BHC	319-85-7	1	1.96	10.5	ND	ug/kg	U
gamma-BHC (Lindane)	58-89-9	1	1.08	10.5	ND	ug/kg	U
delta-BHC	319-86-8	1	1.85	10.5	ND	ug/kg	U
Heptachlor	76-44-8	1	1.35	10.5	ND	ug/kg	U
Aldrin	309-00-2	1	1.35	10.5	ND	ug/kg	U
Heptachlor Epoxide	1024-57-3	1	1.77	10.5	ND	ug/kg	U
trans-Chlordane (beta-Chlordane)	5103-74-2	1	1.63	10.5	ND	ug/kg	U
cis-Chlordane (alpha-chlordane)	5103-71-9	1	1.74	10.5	ND	ug/kg	U
Endosulfan I	959-98-8	1	1.69	10.5	ND	ug/kg	U
4,4'-DDE	72-55-9	1	3.51	20.4	ND	ug/kg	U
Dieldrin	60-57-1	1	3.48	20.4	ND	ug/kg	U
Endrin	72-20-8	1	3.20	20.4	ND	ug/kg	U
Endosulfan II	33213-65-9	1	3.47	20.4	ND	ug/kg	U
4,4'-DDD	72-54-8	1	3.55	20.4	5.59	ug/kg	J
Endrin Aldehyde	7421-93-4	1	5.95	20.4	ND	ug/kg	U
4,4'-DDT	50-29-3	1	3.53	20.4	ND	ug/kg	U
Endosulfan Sulfate	1031-07-8	1	5.21	20.4	ND	ug/kg	U
Endrin Ketone	53494-70-5	1	4.10	20.4	ND	ug/kg	U
Methoxychlor	72-43-5	1	21.7	105	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	5.03	20.4	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	3.77	20.4	ND	ug/kg	U
2,4'-DDE	3424-82-6	1	10.5	20.4	ND	ug/kg	U
2,4'-DDD	53-19-0	1	10.5	20.4	ND	ug/kg	U
2,4'-DDT	789-02-6	1	10.5	20.4	ND	ug/kg	U
Oxychlordane	27304-13-8	1	10.5	20.4	ND	ug/kg	U
cis-Nonachlor	5103-73-1	1	5.25	10.5	ND	ug/kg	U



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TOC-SS-04-0-10
18H0061-08 (Solid)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 08/01/2018 11:45

Instrument: ECD6

Analyzed: 16-Aug-2018 13:04

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
trans-Nonachlor	39765-80-5	1	10.5	20.4	ND	ug/kg	U
Mirex	2385-85-5	1	10.5	20.4	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				34-145 %	85.9	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				34-145 %	77.0	%	
<i>Surrogate: Tetrachlorometaxylene</i>				23-135 %	69.6	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				23-135 %	65.7	%	



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TOC-SS-05-0-10
18H0061-09 (Solid)

Wet Chemistry

Method: PSEP 1986

Sampled: 08/01/2018 12:53

Instrument: BAL2

Analyzed: 07-Aug-2018 11:58

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGH0163 Sample Size: 5 g (wet)
Prepared: 07-Aug-2018 Final Volume: 5 g

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids, Sulfide		1	0.04	0.04	29.80	%	



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TOC-SS-05-0-10
18H0061-09 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00

Sampled: 08/01/2018 12:53

Instrument: UV1800-2

Analyzed: 08-Aug-2018 11:35

Sample Preparation:

Preparation Method: No Prep - Volatiles
Preparation Batch: BGH0149
Prepared: 07-Aug-2018

Sample Size: 5.096 g (wet)
Final Volume: 100 g

Dry Weight: 1.52 g
% Solids: 29.80

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	50	165	165	1270	mg/kg	D



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18H0061-10 (Solid)

Butyl Tins

Method: EPA 8270D-SIM

Sampled: 08/01/2018 12:53

Instrument: NT14

Analyzed: 17-Aug-2018 13:48

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BGH0179 Prepared: 08-Aug-2018	Sample Size: 26.03 g (wet) Final Volume: 0.5 mL	Dry Weight: 5.11 g % Solids: 19.63
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CGH0103 Cleaned: 17-Aug-2018	Initial Volume: 0.5 mL Final Volume: 0.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.440	3.78	46.4	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.69	5.66	28.3	ug/kg	
Butyltin Ion	78763-54-9	1	1.85	3.99	9.02	ug/kg	
Tetrabutyltin	1461-25-2	1	4.89	4.89	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	69.6 %	
<i>Surrogate: Tripropyltin</i>					30-160 %	51.4 %	



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18H0061-10 (Solid)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 08/01/2018 12:53

Instrument: ECD6

Analyzed: 16-Aug-2018 13:40

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BGH0177 Prepared: 08-Aug-2018	Sample Size: 10.05 g (wet) Final Volume: 4 mL	Dry Weight: 1.97 g % Solids: 19.63
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CGH0091 Cleaned: 15-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CGH0090 Cleaned: 15-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	
Sample Cleanup:	Cleanup Method: GPC Cleanup Batch: CGH0089 Cleaned: 09-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	1	1.03	10.3	ND	ug/kg	U
beta-BHC	319-85-7	1	1.93	10.3	ND	ug/kg	U
gamma-BHC (Lindane)	58-89-9	1	1.06	10.3	ND	ug/kg	U
delta-BHC	319-86-8	1	1.82	10.3	ND	ug/kg	U
Heptachlor	76-44-8	1	1.33	10.3	ND	ug/kg	U
Aldrin	309-00-2	1	1.33	10.3	ND	ug/kg	U
Heptachlor Epoxide	1024-57-3	1	1.74	10.3	ND	ug/kg	U
trans-Chlordane (beta-Chlordane)	5103-74-2	1	1.61	10.3	ND	ug/kg	U
cis-Chlordane (alpha-chlordane)	5103-71-9	1	1.72	10.3	ND	ug/kg	U
Endosulfan I	959-98-8	1	1.66	10.3	ND	ug/kg	U
4,4'-DDE	72-55-9	1	3.45	20.1	ND	ug/kg	U
Dieldrin	60-57-1	1	3.42	20.1	ND	ug/kg	U
Endrin	72-20-8	1	3.15	20.1	ND	ug/kg	U
Endosulfan II	33213-65-9	1	3.41	20.1	ND	ug/kg	U
4,4'-DDD	72-54-8	1	3.50	20.1	5.27	ug/kg	J
Endrin Aldehyde	7421-93-4	1	5.86	20.1	ND	ug/kg	U
4,4'-DDT	50-29-3	1	3.48	20.1	ND	ug/kg	U
Endosulfan Sulfate	1031-07-8	1	5.13	20.1	ND	ug/kg	U
Endrin Ketone	53494-70-5	1	4.03	20.1	ND	ug/kg	U
Methoxychlor	72-43-5	1	21.4	103	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	4.96	20.1	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	3.71	20.1	ND	ug/kg	U
2,4'-DDE	3424-82-6	1	10.3	20.1	ND	ug/kg	U
2,4'-DDD	53-19-0	1	10.3	20.1	ND	ug/kg	U
2,4'-DDT	789-02-6	1	10.3	20.1	ND	ug/kg	U
Oxychlordane	27304-13-8	1	10.3	20.1	ND	ug/kg	U
cis-Nonachlor	5103-73-1	1	5.17	10.3	ND	ug/kg	U



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TOC-SS-05-0-10
18H0061-10 (Solid)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 08/01/2018 12:53

Instrument: ECD6

Analyzed: 16-Aug-2018 13:40

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
trans-Nonachlor	39765-80-5	1	10.3	20.1	ND	ug/kg	U
Mirex	2385-85-5	1	10.3	20.1	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				<i>34-145 %</i>	<i>85.3</i>	<i>%</i>	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				<i>34-145 %</i>	<i>75.6</i>	<i>%</i>	
<i>Surrogate: Tetrachlorometaxylene</i>				<i>23-135 %</i>	<i>75.6</i>	<i>%</i>	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				<i>23-135 %</i>	<i>63.2</i>	<i>%</i>	



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TOC-SS-06-0-10
18H0061-11 (Solid)

Wet Chemistry

Method: PSEP 1986

Sampled: 08/01/2018 13:10

Instrument: BAL2

Analyzed: 07-Aug-2018 11:58

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGH0163 Sample Size: 5 g (wet)
Prepared: 07-Aug-2018 Final Volume: 5 g

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids, Sulfide		1	0.04	0.04	18.03	%	



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TOC-SS-06-0-10
18H0061-11 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00

Sampled: 08/01/2018 13:10

Instrument: UV1800-2

Analyzed: 08-Aug-2018 11:36

Sample Preparation:

Preparation Method: No Prep - Volatiles
Preparation Batch: BGH0149
Prepared: 07-Aug-2018

Sample Size: 5.245 g (wet)
Final Volume: 100 g

Dry Weight: 0.95 g
% Solids: 18.03

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	50	264	264	1490	mg/kg	D



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TOC-SS-06-0-10
18H0061-12 (Solid)

Butyl Tins

Method: EPA 8270D-SIM

Sampled: 08/01/2018 13:10

Instrument: NT14

Analyzed: 17-Aug-2018 14:01

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BGH0179 Prepared: 08-Aug-2018	Sample Size: 23.25 g (wet) Final Volume: 0.5 mL	Dry Weight: 5.02 g % Solids: 21.60
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CGH0103 Cleaned: 17-Aug-2018	Initial Volume: 0.5 mL Final Volume: 0.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.448	3.84	53.3	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.72	5.75	21.4	ug/kg	
Butyltin Ion	78763-54-9	1	1.88	4.06	7.43	ug/kg	
Tetrabutyltin	1461-25-2	1	4.98	4.98	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	56.1	%
<i>Surrogate: Tripropyltin</i>					30-160 %	51.2	%



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TOC-SS-06-0-10
18H0061-12 (Solid)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 08/01/2018 13:10

Instrument: ECD6

Analyzed: 16-Aug-2018 13:58

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BGH0177 Prepared: 08-Aug-2018	Sample Size: 10.18 g (wet) Final Volume: 4 mL	Dry Weight: 2.20 g % Solids: 21.60
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CGH0091 Cleaned: 15-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CGH0090 Cleaned: 15-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	
Sample Cleanup:	Cleanup Method: GPC Cleanup Batch: CGH0089 Cleaned: 09-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	1	0.93	9.28	ND	ug/kg	U
beta-BHC	319-85-7	1	1.74	9.28	ND	ug/kg	U
gamma-BHC (Lindane)	58-89-9	1	0.96	9.28	ND	ug/kg	U
delta-BHC	319-86-8	1	1.64	9.28	ND	ug/kg	U
Heptachlor	76-44-8	1	1.19	9.28	ND	ug/kg	U
Aldrin	309-00-2	1	1.19	9.28	ND	ug/kg	U
Heptachlor Epoxide	1024-57-3	1	1.56	9.28	ND	ug/kg	U
trans-Chlordane (beta-Chlordane)	5103-74-2	1	1.44	9.28	ND	ug/kg	U
cis-Chlordane (alpha-chlordane)	5103-71-9	1	1.54	9.28	ND	ug/kg	U
Endosulfan I	959-98-8	1	1.49	9.28	ND	ug/kg	U
4,4'-DDE	72-55-9	1	3.10	18.0	ND	ug/kg	U
Dieldrin	60-57-1	1	3.07	18.0	ND	ug/kg	U
Endrin	72-20-8	1	2.83	18.0	ND	ug/kg	U
Endosulfan II	33213-65-9	1	3.06	18.0	ND	ug/kg	U
4,4'-DDD	72-54-8	1	3.14	18.0	4.20	ug/kg	J
Endrin Aldehyde	7421-93-4	1	5.26	18.0	ND	ug/kg	U
4,4'-DDT	50-29-3	1	3.12	18.0	ND	ug/kg	U
Endosulfan Sulfate	1031-07-8	1	4.61	18.0	ND	ug/kg	U
Endrin Ketone	53494-70-5	1	3.62	18.0	ND	ug/kg	U
Methoxychlor	72-43-5	1	19.2	92.8	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	4.45	18.0	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	3.33	18.0	ND	ug/kg	U
2,4'-DDE	3424-82-6	1	9.28	18.0	ND	ug/kg	U
2,4'-DDD	53-19-0	1	9.28	18.0	ND	ug/kg	U
2,4'-DDT	789-02-6	1	9.28	18.0	ND	ug/kg	U
Oxychlordane	27304-13-8	1	9.28	18.0	ND	ug/kg	U
cis-Nonachlor	5103-73-1	1	4.64	9.28	ND	ug/kg	U



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TOC-SS-06-0-10
18H0061-12 (Solid)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 08/01/2018 13:10

Instrument: ECD6

Analyzed: 16-Aug-2018 13:58

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
trans-Nonachlor	39765-80-5	1	9.28	18.0	ND	ug/kg	U
Mirex	2385-85-5	1	9.28	18.0	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				34-145 %	73.3	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				34-145 %	72.7	%	
<i>Surrogate: Tetrachlorometaxylene</i>				23-135 %	73.7	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				23-135 %	57.6	%	



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Reported:
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TOC-SS-03D-0-10
18H0061-13 (Solid)

Wet Chemistry

Method: PSEP 1986

Sampled: 08/01/2018 11:20

Instrument: BAL2

Analyzed: 07-Aug-2018 11:58

Sample Preparation: Preparation Method: No Prep Wet Chem
Preparation Batch: BGH0163 Sample Size: 5 g (wet)
Prepared: 07-Aug-2018 Final Volume: 5 g

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids, Sulfide		1	0.04	0.04	16.93	%	



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Reported:
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TOC-SS-03D-0-10
18H0061-13 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00

Sampled: 08/01/2018 11:20

Instrument: UV1800-2

Analyzed: 08-Aug-2018 11:37

Sample Preparation:

Preparation Method: No Prep - Volatiles
Preparation Batch: BGH0149
Prepared: 07-Aug-2018

Sample Size: 5.05 g (wet)
Final Volume: 100 g

Dry Weight: 0.85 g
% Solids: 16.93

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	50	292	292	2830	mg/kg	D



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Seattle WA, 98103

Project: 1808013
Project Number: 1808013
Project Manager: Mike Ridgeway

Reported:
21-Aug-2018 13:40

TOC-SS-03D-0-10
18H0061-14 (Solid)

Butyl Tins

Method: EPA 8270D-SIM

Sampled: 08/01/2018 11:20

Instrument: NT14

Analyzed: 17-Aug-2018 14:15

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BGH0179 Prepared: 08-Aug-2018	Sample Size: 27.03 g (wet) Final Volume: 0.5 mL	Dry Weight: 5.05 g % Solids: 18.69
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CGH0103 Cleaned: 17-Aug-2018	Initial Volume: 0.5 mL Final Volume: 0.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.445	3.82	44.6	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.71	5.72	22.0	ug/kg	
Butyltin Ion	78763-54-9	1	1.87	4.04	7.21	ug/kg	
Tetrabutyltin	1461-25-2	1	4.95	4.95	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	57.7 %	
<i>Surrogate: Tripropyltin</i>					30-160 %	45.6 %	



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TOC-SS-03D-0-10
18H0061-14 (Solid)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 08/01/2018 11:20

Instrument: ECD6

Analyzed: 16-Aug-2018 15:56

Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BGH0177 Prepared: 08-Aug-2018	Sample Size: 10.02 g (wet) Final Volume: 4 mL	Dry Weight: 1.87 g % Solids: 18.69
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CGH0091 Cleaned: 15-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CGH0090 Cleaned: 15-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	
Sample Cleanup:	Cleanup Method: GPC Cleanup Batch: CGH0089 Cleaned: 09-Aug-2018	Initial Volume: 4 mL Final Volume: 4 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	1	1.09	10.9	ND	ug/kg	U
beta-BHC	319-85-7	1	2.04	10.9	ND	ug/kg	U
gamma-BHC (Lindane)	58-89-9	1	1.12	10.9	ND	ug/kg	U
delta-BHC	319-86-8	1	1.92	10.9	ND	ug/kg	U
Heptachlor	76-44-8	1	1.40	10.9	ND	ug/kg	U
Aldrin	309-00-2	1	1.40	10.9	ND	ug/kg	U
Heptachlor Epoxide	1024-57-3	1	1.83	10.9	ND	ug/kg	U
trans-Chlordane (beta-Chlordane)	5103-74-2	1	1.69	10.9	ND	ug/kg	U
cis-Chlordane (alpha-chlordane)	5103-71-9	1	1.81	10.9	ND	ug/kg	U
Endosulfan I	959-98-8	1	1.75	10.9	ND	ug/kg	U
4,4'-DDE	72-55-9	1	3.64	21.1	ND	ug/kg	U
Dieldrin	60-57-1	1	3.61	21.1	ND	ug/kg	U
Endrin	72-20-8	1	3.32	21.1	ND	ug/kg	U
Endosulfan II	33213-65-9	1	3.59	21.1	ND	ug/kg	U
4,4'-DDD	72-54-8	1	3.68	21.1	6.14	ug/kg	J
Endrin Aldehyde	7421-93-4	1	6.17	21.1	ND	ug/kg	U
4,4'-DDT	50-29-3	1	3.67	21.1	ND	ug/kg	U
Endosulfan Sulfate	1031-07-8	1	5.41	21.1	ND	ug/kg	U
Endrin Ketone	53494-70-5	1	4.25	21.1	ND	ug/kg	U
Methoxychlor	72-43-5	1	22.6	109	ND	ug/kg	U
Hexachlorobutadiene	87-68-3	1	5.22	21.1	ND	ug/kg	U
Hexachlorobenzene	118-74-1	1	3.91	21.1	ND	ug/kg	U
2,4'-DDE	3424-82-6	1	10.9	21.1	ND	ug/kg	U
2,4'-DDD	53-19-0	1	10.9	21.1	ND	ug/kg	U
2,4'-DDT	789-02-6	1	10.9	21.1	ND	ug/kg	U
Oxychlordane	27304-13-8	1	10.9	21.1	ND	ug/kg	U
cis-Nonachlor	5103-73-1	1	5.45	10.9	ND	ug/kg	U



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TOC-SS-03D-0-10
18H0061-14 (Solid)

Chlorinated Pesticides

Method: EPA 8081B

Sampled: 08/01/2018 11:20

Instrument: ECD6

Analyzed: 16-Aug-2018 15:56

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
trans-Nonachlor	39765-80-5	1	10.9	21.1	ND	ug/kg	U
Mirex	2385-85-5	1	10.9	21.1	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>				<i>34-145 %</i>	<i>82.9</i>	<i>%</i>	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				<i>34-145 %</i>	<i>74.7</i>	<i>%</i>	
<i>Surrogate: Tetrachlorometaxylene</i>				<i>23-135 %</i>	<i>72.2</i>	<i>%</i>	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				<i>23-135 %</i>	<i>60.1</i>	<i>%</i>	



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Project: 1808013
Project Number: 1808013
Project Manager: Mike Ridgeway

Reported:
21-Aug-2018 13:40

Butyl Tins - Quality Control

Batch BGH0179 - EPA 3546 (Microwave)

Instrument: NT14 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGH0179-BLK1)											
						Prepared: 08-Aug-2018 Analyzed: 17-Aug-2018 12:26					
Tributyltin Ion	ND	0.450	3.86	ug/kg							U
Dibutyltin Ion	ND	1.73	5.78	ug/kg							U
Butyltin Ion	ND	1.89	4.08	ug/kg							U
Tetrabutyltin	ND	5.00	5.00	ug/kg							U
<i>Surrogate: Tripentyltin</i>	31.6			ug/kg	45.2		69.9	30-160			
<i>Surrogate: Tripropyltin</i>	27.6			ug/kg	43.7		63.0	30-160			
LCS (BGH0179-BS1)											
						Prepared: 08-Aug-2018 Analyzed: 17-Aug-2018 12:40					
Tributyltin Ion	26.6	0.450	3.86	ug/kg	44.6		59.7	30-160			
Dibutyltin Ion	19.1	1.73	5.78	ug/kg	38.4		49.8	30-160			
Butyltin Ion	17.1	1.89	4.08	ug/kg	31.2		55.0	30-160			
<i>Surrogate: Tripentyltin</i>	28.6			ug/kg	45.2		63.3	30-160			
<i>Surrogate: Tripropyltin</i>	26.1			ug/kg	43.7		59.7	30-160			



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Project: 1808013
Project Number: 1808013
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Reported:
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Chlorinated Pesticides - Quality Control

Batch BGH0177 - EPA 3546 (Microwave)

Instrument: ECD6 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGH0177-BLK1)											
						Prepared: 08-Aug-2018 Analyzed: 16-Aug-2018 11:35					
alpha-BHC	ND	0.17	1.70	ug/kg							U
beta-BHC	ND	0.32	1.70	ug/kg							U
gamma-BHC (Lindane)	ND	0.18	1.70	ug/kg							U
delta-BHC	ND	0.30	1.70	ug/kg							U
Heptachlor	ND	0.22	1.70	ug/kg							U
Aldrin	ND	0.22	1.70	ug/kg							U
Heptachlor Epoxide	ND	0.29	1.70	ug/kg							U
trans-Chlordane (beta-Chlordane)	ND	0.26	1.70	ug/kg							U
cis-Chlordane (alpha-chlordane)	ND	0.28	1.70	ug/kg							U
Endosulfan I	ND	0.27	1.70	ug/kg							U
4,4'-DDE	ND	0.57	3.30	ug/kg							U
Dieldrin	ND	0.56	3.30	ug/kg							U
Endrin	ND	0.52	3.30	ug/kg							U
Endosulfan II	ND	0.56	3.30	ug/kg							U
4,4'-DDD	ND	0.58	3.30	ug/kg							U
Endrin Aldehyde	ND	0.96	3.30	ug/kg							U
4,4'-DDT	ND	0.57	3.30	ug/kg							U
Endosulfan Sulfate	ND	0.84	3.30	ug/kg							U
Endrin Ketone	ND	0.66	3.30	ug/kg							U
Methoxychlor	ND	3.52	17.0	ug/kg							U
Hexachlorobutadiene	ND	0.82	3.30	ug/kg							U
Hexachlorobenzene	ND	0.61	3.30	ug/kg							U
2,4'-DDE	ND	1.70	3.30	ug/kg							U
2,4'-DDD	ND	1.70	3.30	ug/kg							U
2,4'-DDT	ND	1.70	3.30	ug/kg							U
Oxychlordane	ND	1.70	3.30	ug/kg							U
cis-Nonachlor	ND	0.85	1.70	ug/kg							U
trans-Nonachlor	ND	1.70	3.30	ug/kg							U
Mirex	ND	1.70	3.30	ug/kg							U
Surrogate: Decachlorobiphenyl	11.4			ug/kg	13.3		85.8	34-145			
Surrogate: Decachlorobiphenyl [2C]	11.5			ug/kg	13.3		86.2	34-145			
Surrogate: Tetrachlorometaxylene	8.81			ug/kg	13.3		66.0	23-135			
Surrogate: Tetrachlorometaxylene [2C]	8.95			ug/kg	13.3		67.1	23-135			

LCS (BGH0177-BS1)

Prepared: 08-Aug-2018 Analyzed: 16-Aug-2018 11:52



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Project: 1808013
Project Number: 1808013
Project Manager: Mike Ridgeway

Reported:
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Chlorinated Pesticides - Quality Control

Batch BGH0177 - EPA 3546 (Microwave)

Instrument: ECD6 Analyst: JGR

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGH0177-BS1)						Prepared: 08-Aug-2018 Analyzed: 16-Aug-2018 11:52					
alpha-BHC	3.65	0.17	1.70	ug/kg	6.67		54.8	39-120			
beta-BHC	3.93	0.32	1.70	ug/kg	6.67		58.9	43-120			
gamma-BHC (Lindane)	3.94	0.18	1.70	ug/kg	6.67		59.2	46-120			
delta-BHC	4.47	0.30	1.70	ug/kg	6.67		67.0	31-132			
Heptachlor	3.69	0.22	1.70	ug/kg	6.67		55.4	40-120			
Aldrin	3.71	0.22	1.70	ug/kg	6.67		55.6	40-120			
Heptachlor Epoxide	4.25	0.29	1.70	ug/kg	6.67		63.7	46-126			
trans-Chlordane (beta-Chlordane)	4.24	0.26	1.70	ug/kg	6.67		63.5	44-125			
cis-Chlordane (alpha-chlordane)	4.22	0.28	1.70	ug/kg	6.67		63.3	43-127			
Endosulfan I	4.19	0.27	1.70	ug/kg	6.67		62.9	41-130			
4,4'-DDE	9.28	0.57	3.30	ug/kg	13.3		69.6	60-134			
Dieldrin	8.79	0.56	3.30	ug/kg	13.3		65.9	44-129			
Endrin	8.76	0.52	3.30	ug/kg	13.3		65.7	56-120			
Endosulfan II	9.01	0.56	3.30	ug/kg	13.3		67.5	56-120			
4,4'-DDD	8.81	0.58	3.30	ug/kg	13.3		66.1	60-120			
Endrin Aldehyde	7.60	0.96	3.30	ug/kg	13.3		57.0	32-120			
4,4'-DDT	8.59	0.57	3.30	ug/kg	13.3		64.4	63-120			
Endosulfan Sulfate	9.07	0.84	3.30	ug/kg	13.3		68.1	47-120			
Endrin Ketone	8.98	0.66	3.30	ug/kg	13.3		67.4	64-120			
Methoxychlor	42.5	3.52	17.0	ug/kg	66.7		63.7	58-120			
Hexachlorobutadiene	3.89	0.82	3.30	ug/kg	6.67		58.4	41-120			
Hexachlorobenzene	3.78	0.61	3.30	ug/kg	6.67		56.6	31-120			
Surrogate: Decachlorobiphenyl	10.5			ug/kg	13.3		78.8	34-145			
Surrogate: Decachlorobiphenyl [2C]	10.7			ug/kg	13.3		79.9	34-145			
Surrogate: Tetrachlorometaxylene	8.09			ug/kg	13.3		60.7	23-135			
Surrogate: Tetrachlorometaxylene [2C]	7.70			ug/kg	13.3		57.8	23-135			



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Project: 1808013
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Reported:
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Wet Chemistry - Quality Control

Batch BGH0149 - No Prep - Volatiles

Instrument: UV1800-2 Analyst: YK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGH0149-BLK1)						Prepared: 07-Aug-2018 Analyzed: 08-Aug-2018 11:30					
Sulfide	ND	1.00	1.00	mg/kg							U
LCS (BGH0149-BS1)						Prepared: 07-Aug-2018 Analyzed: 08-Aug-2018 11:30					
Sulfide	174	10.0	10.0	mg/kg	162		108	75-125			D
Duplicate (BGH0149-DUP1)						Source: 18H0061-01 Prepared: 07-Aug-2018 Analyzed: 08-Aug-2018 11:32					
Sulfide	2080	188	188	mg/kg		2240			7.18	20	D
Matrix Spike (BGH0149-MS1)						Source: 18H0061-01 Prepared: 07-Aug-2018 Analyzed: 08-Aug-2018 11:32					
Sulfide	2080	187	187	mg/kg	607	2240	NR	75-125			*, D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



Fremont Analytical 3600 Fremont Avenue N. Seattle WA, 98103	Project: 1808013 Project Number: 1808013 Project Manager: Mike Ridgeway	Reported: 21-Aug-2018 13:40
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Wet Chemistry - Quality Control

Batch BGH0163 - No Prep Wet Chem

Instrument: BAL2 Analyst: KLE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGH0163-BLK1)						Prepared: 07-Aug-2018 Analyzed: 07-Aug-2018 11:58					
Total Solids, Sulfide	ND	0.04	0.04	%							U
Duplicate (BGH0163-DUP1)						Source: 18H0061-01 Prepared: 07-Aug-2018 Analyzed: 07-Aug-2018 11:58					
Total Solids, Sulfide	23.80	0.04	0.04	%		26.16			9.45	20	



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Certified Analyses included in this Report

Analyte	Certifications
EPA 8081B in Solid	
alpha-BHC	DoD-ELAP,NELAP,WADOE
alpha-BHC [2C]	DoD-ELAP,NELAP,WADOE
beta-BHC	DoD-ELAP,NELAP,WADOE
beta-BHC [2C]	DoD-ELAP,NELAP,WADOE
gamma-BHC (Lindane)	DoD-ELAP,NELAP,WADOE
gamma-BHC (Lindane) [2C]	DoD-ELAP,NELAP,WADOE
delta-BHC	DoD-ELAP,NELAP,WADOE
delta-BHC [2C]	DoD-ELAP,NELAP,WADOE
Heptachlor	DoD-ELAP,NELAP,WADOE
Heptachlor [2C]	DoD-ELAP,NELAP,WADOE
Aldrin	DoD-ELAP,NELAP,WADOE
Aldrin [2C]	DoD-ELAP,NELAP,WADOE
Heptachlor Epoxide	DoD-ELAP,NELAP,WADOE
Heptachlor Epoxide [2C]	DoD-ELAP,NELAP,WADOE
trans-Chlordane (beta-Chlordane)	DoD-ELAP
trans-Chlordane (beta-Chlordane) [2C]	DoD-ELAP
cis-Chlordane (alpha-chlordane)	DoD-ELAP,NELAP,WADOE
cis-Chlordane (alpha-chlordane) [2C]	DoD-ELAP,NELAP,WADOE
Endosulfan I	DoD-ELAP,NELAP,WADOE
Endosulfan I [2C]	DoD-ELAP,NELAP,WADOE
4,4'-DDE	DoD-ELAP,NELAP,WADOE
4,4'-DDE [2C]	DoD-ELAP,NELAP,WADOE
Dieldrin	DoD-ELAP,NELAP,WADOE
Dieldrin [2C]	DoD-ELAP,NELAP,WADOE
Endrin	DoD-ELAP,NELAP,WADOE
Endrin [2C]	DoD-ELAP,NELAP,WADOE
Endosulfan II	DoD-ELAP,NELAP,WADOE
Endosulfan II [2C]	DoD-ELAP,NELAP,WADOE
4,4'-DDD	DoD-ELAP,NELAP,WADOE
4,4'-DDD [2C]	DoD-ELAP,NELAP,WADOE
Endrin Aldehyde	DoD-ELAP,NELAP,WADOE
Endrin Aldehyde [2C]	DoD-ELAP,NELAP,WADOE
4,4'-DDT	DoD-ELAP,NELAP,WADOE
4,4'-DDT [2C]	DoD-ELAP,NELAP,WADOE
Endosulfan Sulfate	DoD-ELAP,NELAP,WADOE



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Endosulfan Sulfate [2C]	DoD-ELAP,NELAP,WADOE
Endrin Ketone	DoD-ELAP,NELAP,WADOE
Endrin Ketone [2C]	DoD-ELAP,NELAP,WADOE
Methoxychlor	DoD-ELAP,NELAP,WADOE
Methoxychlor [2C]	DoD-ELAP,NELAP,WADOE
Hexachlorobutadiene	DoD-ELAP,NELAP,WADOE
Hexachlorobutadiene [2C]	DoD-ELAP,NELAP,WADOE
Hexachlorobenzene	DoD-ELAP,NELAP,WADOE
Hexachlorobenzene [2C]	DoD-ELAP,NELAP,WADOE
2,4'-DDE	DoD-ELAP,NELAP,WADOE
2,4'-DDE [2C]	DoD-ELAP,NELAP,WADOE
2,4'-DDD	DoD-ELAP,NELAP,WADOE
2,4'-DDD [2C]	DoD-ELAP,NELAP,WADOE
2,4'-DDT	DoD-ELAP,NELAP,WADOE
2,4'-DDT [2C]	DoD-ELAP,NELAP,WADOE
Oxychlorane	DoD-ELAP,NELAP,WADOE
Oxychlorane [2C]	DoD-ELAP,NELAP,WADOE
cis-Nonachlor	DoD-ELAP,NELAP,WADOE
cis-Nonachlor [2C]	DoD-ELAP,NELAP,WADOE
trans-Nonachlor	DoD-ELAP,NELAP
trans-Nonachlor [2C]	DoD-ELAP,NELAP
Mirex	DoD-ELAP,NELAP,WADOE
Mirex [2C]	DoD-ELAP,NELAP,WADOE
Hexachloroethane	DoD-ELAP,WADOE
Hexachloroethane [2C]	DoD-ELAP,WADOE
Toxaphene	DoD-ELAP,NELAP,WADOE
Toxaphene [2C]	DoD-ELAP,NELAP,WADOE
Chlordane, technical	DoD-ELAP,NELAP,WADOE
Chlordane, technical [2C]	DoD-ELAP,NELAP,WADOE

EPA 8270D-SIM in Solid

Tributyltin Ion	WADOE,DoD-ELAP
Dibutyltin Ion	WADOE,DoD-ELAP
Butyltin Ion	WADOE

SM 4500-S2 D-00 in Solid

Sulfide	DoD-ELAP,NELAP,WADOE
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Project: 1808013
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Reported:
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Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	02/07/2019
CALAP	California Department of Public Health CAELAP	2748	06/30/2019
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-011	05/12/2019
WADOE	WA Dept of Ecology	C558	06/30/2019
WA-DW	Ecology - Drinking Water	C558	06/30/2019



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Project: 1808013
Project Number: 1808013
Project Manager: Mike Ridgeway

Reported:
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Notes and Definitions

- * Flagged value is not within established control limits.
- D The reported value is from a dilution
- J Estimated concentration value detected below the reporting limit.
- P1 The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
- U This analyte is not detected above the applicable reporting or detection limit.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.

August 31, 2018

FAL Project 11792

Mr. Michael Ridgeway
Fremont Analytical, Inc.
3600 Fremont Ave., N.
Seattle, WA 98103

Dear Mr. Ridgeway,

The following results are associated with Frontier Analytical Laboratory project **11792**. This corresponds to your project number **1808013**. Seven sediment samples were received on 8/8/2018 at Frontier Analytical Laboratory in good condition. The samples were extracted and analyzed by EPA Method 1613 for tetra through octa chlorinated dibenzo dioxin and furans. The Toxic Equivalency (TEQ) for your samples has been calculated using the 2005 World Health Organization's (WHO's) toxic equivalency factors (TEFs). Fremont Analytical, Inc. requested a turnaround time of ten business days for project **11792**.

The following Level IV report consists of an Analytical Data section, a Sample Receipt section, a Laboratory Raw Data section, and an Instrument Raw Data section. The Analytical Data section contains our sample tracking log and the analytical results. The Sample Receipt section contains your chain of custody, your chain of custody attachment, our sample login form and the sample photo. The Laboratory Raw Data section contains our project request sheet, a percent solids sheet, an extraction bench sheet and the cleanup bench sheet. The instrument raw data section contains three sub-sections; the sample results section, the initial calibration section and the continuing/ending calibration section. The sample results sub-section consists of the quantitation summary forms with chromatograms for all samples and QC. The initial calibration sub-section consists of the individual quantitation summary forms and chromatograms for each point of the initial calibration curve as well as an overall quantitation summary form of the initial calibration curve. The continuing/ending calibration sub-section consists of the quantitation summary forms and chromatograms for all beginning and ending calibration injections associated with the samples and QC. The Level IV data package on compact disk has been sent to you via OnTrac. The enclosed results are specifically for the samples referenced in this report only. These results meet all National Environmental Laboratory Accreditation Program (NELAP) requirements and shall not be reproduced except in full. Frontier Analytical Laboratory's State of Oregon NELAP certificate number is **4041**. Our State of California ELAP certificate number is **2934**. If you have any questions regarding project **11742**, please contact me at (916) 934-0900. Thank you for choosing Frontier Analytical Laboratory for your analytical testing needs.

Sincerely,



Thomas C. Crabtree
Director

Frontier Analytical Laboratory

Sample Tracking Log

FAL Project ID: 11792

Received on: 08/08/2018

Project Due: 08/30/2018

Storage: R-3

FAL Sample ID	Dup	Client Project ID	Client Sample ID	Requested Method	Matrix	Sampling Date	Sampling Time	Hold Time Due Date
11792-001-SA	0	1808013	TOC-SS-01-0-10	EPA 1613 D/F	Sediment	08/01/2018	09:50 am	08/01/2019
11792-002-SA	0	1808013	TOC-SS-02-0-10	EPA 1613 D/F	Sediment	08/01/2018	10:40 am	08/01/2019
11792-003-SA	0	1808013	TOC-SS-03-0-10	EPA 1613 D/F	Sediment	08/01/2018	11:15 am	08/01/2019
11792-004-SA	0	1808013	TOC-SS-04-0-10	EPA 1613 D/F	Sediment	08/01/2018	11:45 am	08/01/2019
11792-005-SA	0	1808013	TOC-SS-05-0-10	EPA 1613 D/F	Sediment	08/01/2018	12:53 pm	08/01/2019
11792-006-SA	0	1808013	TOC-SS-06-0-10	EPA 1613 D/F	Sediment	08/01/2018	01:10 pm	08/01/2019
11792-007-SA	0	1808013	TOC-SS-03D-0-10	EPA 1613 D/F	Sediment	08/01/2018	11:20 am	08/01/2019

FAL Sample ID

Notes

11792-001-SA Hold remaining sample for possible PCB analysis.
 11792-002-SA Hold remaining sample for possible PCB analysis.
 11792-003-SA Hold remaining sample for possible PCB analysis.
 11792-004-SA Hold remaining sample for possible PCB analysis.
 11792-005-SA Hold remaining sample for possible PCB analysis.
 11792-006-SA Hold remaining sample for possible PCB analysis.
 11792-007-SA Hold remaining sample for possible PCB analysis.

EPA Method 1613
PCDD/F



FAL ID: 11792-001-MB
Client ID: Method Blank
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: NA
Amount: 5.00 g

ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: pg/g


Acquired: 08-17-2018
2005 WHO TEQ: 0.0
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.0561		-	0.0315				
1,2,3,7,8-PeCDD	ND	0.117		-	0.0468				
1,2,3,4,7,8-HxCDD	ND	0.169		-	0.0503				
1,2,3,6,7,8-HxCDD	ND	0.165		-	0.0490	Total TCDD	ND	0.0561	
1,2,3,7,8,9-HxCDD	ND	0.161		-	0.0488	Total PeCDD	ND	0.117	
1,2,3,4,6,7,8-HpCDD	ND	0.369		-	0.0541	Total HxCDD	ND	0.169	
OCDD	ND	2.04		-	0.0888	Total HpCDD	ND	0.369	
2,3,7,8-TCDF	ND	0.0773		-	0.0243				
1,2,3,7,8-PeCDF	ND	0.103		-	0.0285				
2,3,4,7,8-PeCDF	ND	0.107		-	0.0298				
1,2,3,4,7,8-HxCDF	ND	0.104		-	0.0255				
1,2,3,6,7,8-HxCDF	ND	0.108		-	0.0253				
2,3,4,6,7,8-HxCDF	ND	0.118		-	0.0279				
1,2,3,7,8,9-HxCDF	ND	0.132		-	0.0367	Total TCDF	ND	0.0773	
1,2,3,4,6,7,8-HpCDF	ND	0.220		-	0.0321	Total PeCDF	ND	0.107	
1,2,3,4,7,8,9-HpCDF	ND	0.248		-	0.0396	Total HxCDF	ND	0.132	
OCDF	ND	0.571		-	0.0843	Total HpCDF	ND	0.248	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	94.2	25.0 - 164	
13C-1,2,3,7,8-PeCDD	92.2	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	93.5	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	90.1	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	94.1	23.0 - 140	
13C-OCDD	82.2	17.0 - 157	
13C-2,3,7,8-TCDF	95.0	24.0 - 169	
13C-1,2,3,7,8-PeCDF	97.3	24.0 - 185	
13C-2,3,4,7,8-PeCDF	96.3	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	93.1	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	87.1	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	87.0	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	90.6	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	92.2	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	96.5	26.0 - 138	
13C-OCDF	85.7	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	83.0	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018

EPA Method 1613
PCDD/F



FAL ID: 11792-001-OPR
Client ID: OPR
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: NA
Amount: 5.00 g


ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: ng/ml

Acquired: 08-17-2018
2005 WHO TEQ: NA

Compound	Conc	QC Limits	Qual
2,3,7,8-TCDD	9.51	6.70 - 15.8	
1,2,3,7,8-PeCDD	46.9	35.0 - 71.0	
1,2,3,4,7,8-HxCDD	48.8	35.0 - 82.0	
1,2,3,6,7,8-HxCDD	48.0	38.0 - 67.0	
1,2,3,7,8,9-HxCDD	50.1	32.0 - 81.0	
1,2,3,4,6,7,8-HpCDD	48.2	35.0 - 70.0	
OCDD	95.5	78.0 - 144	
2,3,7,8-TCDF	9.77	7.50 - 15.8	
1,2,3,7,8-PeCDF	50.0	40.0 - 67.0	
2,3,4,7,8-PeCDF	50.4	34.0 - 80.0	
1,2,3,4,7,8-HxCDF	49.7	36.0 - 67.0	
1,2,3,6,7,8-HxCDF	51.2	42.0 - 65.0	
2,3,4,6,7,8-HxCDF	50.6	35.0 - 78.0	
1,2,3,7,8,9-HxCDF	50.6	39.0 - 65.0	
1,2,3,4,6,7,8-HpCDF	48.6	41.0 - 61.0	
1,2,3,4,7,8,9-HpCDF	48.1	39.0 - 69.0	
OCDF	99.1	63.0 - 170	
Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	92.3	20.0 - 175	
13C-1,2,3,7,8-PeCDD	93.0	21.0 - 227	
13C-1,2,3,4,7,8-HxCDD	92.5	21.0 - 193	
13C-1,2,3,6,7,8-HxCDD	89.8	25.0 - 163	
13C-1,2,3,4,6,7,8-HpCDD	89.9	26.0 - 166	
13C-OCDD	75.7	13.0 - 198	
13C-2,3,7,8-TCDF	95.9	22.0 - 152	
13C-1,2,3,7,8-PeCDF	93.2	21.0 - 192	
13C-2,3,4,7,8-PeCDF	92.9	13.0 - 328	
13C-1,2,3,4,7,8-HxCDF	90.9	19.0 - 202	
13C-1,2,3,6,7,8-HxCDF	84.0	21.0 - 159	
13C-2,3,4,6,7,8-HxCDF	85.8	22.0 - 176	
13C-1,2,3,7,8,9-HxCDF	89.6	17.0 - 205	
13C-1,2,3,4,6,7,8-HpCDF	88.0	21.0 - 158	
13C-1,2,3,4,7,8,9-HpCDF	95.5	20.0 - 186	
13C-OCDF	79.8	13.0 - 198	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	81.3	31.0 - 191	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018

EPA Method 1613
PCDD/F



FAL ID: 11792-001-SA
Client ID: TOC-SS-01-0-10
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: 08-08-2018
Amount: 5.00 g
% Solids: 21.89

ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: pg/g

Acquired: 08-17-2018
2005 WHO TEQ: 41.3
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.33	-		1.33	0.0315				
1,2,3,7,8-PeCDD	6.60	-		6.60	0.0468				
1,2,3,4,7,8-HxCDD	13.4	-		1.34	0.0503				
1,2,3,6,7,8-HxCDD	45.6	-		4.56	0.0490	Total TCDD	43.9	-	M
1,2,3,7,8,9-HxCDD	28.4	-		2.84	0.0488	Total PeCDD	92.1	-	M
1,2,3,4,6,7,8-HpCDD	1150	-		11.5	0.0541	Total HxCDD	404	-	
OCDD	10900	-		3.27	0.0888	Total HpCDD	2640	-	
2,3,7,8-TCDF	8.44	-	F	0.844	0.0243				
1,2,3,7,8-PeCDF	4.37	-	J	0.131	0.0285				
2,3,4,7,8-PeCDF	6.65	-		2.00	0.0298				
1,2,3,4,7,8-HxCDF	11.6	-		1.16	0.0255				
1,2,3,6,7,8-HxCDF	13.4	-		1.34	0.0253				
2,3,4,6,7,8-HxCDF	15.4	-		1.54	0.0279				
1,2,3,7,8,9-HxCDF	4.16	-	J	0.416	0.0367	Total TCDF	153	-	D,M
1,2,3,4,6,7,8-HpCDF	210	-		2.10	0.0321	Total PeCDF	201	-	D,M
1,2,3,4,7,8,9-HpCDF	11.8	-		0.118	0.0396	Total HxCDF	323	-	D,M
OCDF	637	-		0.191	0.0843	Total HpCDF	633	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	67.1	25.0 - 164	
13C-1,2,3,7,8-PeCDD	66.0	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	66.0	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	63.3	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	70.6	23.0 - 140	
13C-OCDD	73.2	17.0 - 157	
13C-2,3,7,8-TCDF	66.2	24.0 - 169	
13C-1,2,3,7,8-PeCDF	65.6	24.0 - 185	
13C-2,3,4,7,8-PeCDF	66.5	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	61.5	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	57.5	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	60.0	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	62.4	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	63.5	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	71.7	26.0 - 138	
13C-OCDF	66.6	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	58.0	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018

EPA Method 1613
PCDD/F



FAL ID: 11792-002-SA
Client ID: TOC-SS-02-0-10
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: 08-08-2018
Amount: 5.02 g
% Solids: 32.01

ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: pg/g

Acquired: 08-17-2018
2005 WHO TEQ: 24.0
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	0.866	-	J	0.866	0.0315				
1,2,3,7,8-PeCDD	3.75	-	J	3.75	0.0468				
1,2,3,4,7,8-HxCDD	8.01	-		0.801	0.0503				
1,2,3,6,7,8-HxCDD	27.4	-		2.74	0.0490	Total TCDD	18.0	-	M
1,2,3,7,8,9-HxCDD	15.9	-		1.59	0.0488	Total PeCDD	43.8	-	
1,2,3,4,6,7,8-HpCDD	668	-		6.68	0.0541	Total HxCDD	223	-	
OCDD	6100	-		1.83	0.0888	Total HpCDD	1550	-	
2,3,7,8-TCDF	5.00	-	F	0.500	0.0243				
1,2,3,7,8-PeCDF	2.72	-	J	0.0816	0.0285				
2,3,4,7,8-PeCDF	4.17	-	J	1.25	0.0298				
1,2,3,4,7,8-HxCDF	6.72	-		0.672	0.0255				
1,2,3,6,7,8-HxCDF	6.77	-		0.677	0.0253				
2,3,4,6,7,8-HxCDF	8.88	-		0.888	0.0279				
1,2,3,7,8,9-HxCDF	2.64	-	J	0.264	0.0367	Total TCDF	78.0	-	D,M
1,2,3,4,6,7,8-HpCDF	119	-		1.19	0.0321	Total PeCDF	102	-	D,M
1,2,3,4,7,8,9-HpCDF	7.13	-		0.0713	0.0396	Total HxCDF	176	-	D,M
OCDF	365	-		0.110	0.0843	Total HpCDF	360	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	85.6	25.0 - 164	
13C-1,2,3,7,8-PeCDD	86.1	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	83.7	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	79.6	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	91.6	23.0 - 140	
13C-OCDD	93.7	17.0 - 157	
13C-2,3,7,8-TCDF	85.5	24.0 - 169	
13C-1,2,3,7,8-PeCDF	86.7	24.0 - 185	
13C-2,3,4,7,8-PeCDF	87.8	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	76.8	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	72.1	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	75.4	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	78.9	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	81.7	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	92.9	26.0 - 138	
13C-OCDF	88.2	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	74.8	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018

EPA Method 1613
PCDD/F



FAL ID: 11792-003-SA
Client ID: TOC-SS-03-0-10
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: 08-08-2018
Amount: 5.01 g
% Solids: 17.91

ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: pg/g


Acquired: 08-18-2018
2005 WHO TEQ: 56.4
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.31	-		1.31	0.0315				
1,2,3,7,8-PeCDD	8.29	-		8.29	0.0468				
1,2,3,4,7,8-HxCDD	17.2	-		1.72	0.0503				
1,2,3,6,7,8-HxCDD	66.9	-		6.69	0.0490	Total TCDD	38.5	-	M
1,2,3,7,8,9-HxCDD	36.8	-		3.68	0.0488	Total PeCDD	85.3	-	
1,2,3,4,6,7,8-HpCDD	1560	-		15.6	0.0541	Total HxCDD	480	-	
OCDD	13500	-		4.05	0.0888	Total HpCDD	3640	-	
2,3,7,8-TCDF	10.1	-	F	1.01	0.0243				
1,2,3,7,8-PeCDF	7.15	-		0.215	0.0285				
2,3,4,7,8-PeCDF	11.5	-		3.45	0.0298				
1,2,3,4,7,8-HxCDF	20.5	-		2.05	0.0255				
1,2,3,6,7,8-HxCDF	16.5	-		1.65	0.0253				
2,3,4,6,7,8-HxCDF	22.6	-		2.26	0.0279				
1,2,3,7,8,9-HxCDF	9.35	-		0.935	0.0367	Total TCDF	146	-	D,M
1,2,3,4,6,7,8-HpCDF	303	-		3.03	0.0321	Total PeCDF	227	-	D,M
1,2,3,4,7,8,9-HpCDF	17.8	-		0.178	0.0396	Total HxCDF	493	-	D,M
OCDF	796	-		0.239	0.0843	Total HpCDF	934	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	75.5	25.0 - 164	
13C-1,2,3,7,8-PeCDD	75.3	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	74.8	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	70.7	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	81.9	23.0 - 140	
13C-OCDD	87.0	17.0 - 157	
13C-2,3,7,8-TCDF	74.7	24.0 - 169	
13C-1,2,3,7,8-PeCDF	72.9	24.0 - 185	
13C-2,3,4,7,8-PeCDF	78.1	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	65.9	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	63.1	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	66.0	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	70.2	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	72.9	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	82.9	26.0 - 138	
13C-OCDF	79.4	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	65.3	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018

EPA Method 1613
PCDD/F



FAL ID: 11792-004-SA
Client ID: TOC-SS-04-0-10
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: 08-08-2018
Amount: 5.01 g
% Solids: 16.90

ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: pg/g


Acquired: 08-18-2018
2005 WHO TEQ: 53.3
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.50	-		1.50	0.0315				
1,2,3,7,8-PeCDD	8.64	-		8.64	0.0468				
1,2,3,4,7,8-HxCDD	19.5	-		1.95	0.0503				
1,2,3,6,7,8-HxCDD	61.2	-		6.12	0.0490	Total TCDD	33.7	-	
1,2,3,7,8,9-HxCDD	38.7	-		3.87	0.0488	Total PeCDD	79.9	-	
1,2,3,4,6,7,8-HpCDD	1470	-		14.7	0.0541	Total HxCDD	481	-	
OCDD	13700	-		4.11	0.0888	Total HpCDD	3330	-	
2,3,7,8-TCDF	9.91	-	F	0.991	0.0243				
1,2,3,7,8-PeCDF	5.75	-		0.173	0.0285				
2,3,4,7,8-PeCDF	8.57	-		2.57	0.0298				
1,2,3,4,7,8-HxCDF	15.5	-		1.55	0.0255				
1,2,3,6,7,8-HxCDF	15.3	-		1.53	0.0253				
2,3,4,6,7,8-HxCDF	20.2	-		2.02	0.0279				
1,2,3,7,8,9-HxCDF	5.19	-		0.519	0.0367	Total TCDF	150	-	D,M
1,2,3,4,6,7,8-HpCDF	268	-		2.68	0.0321	Total PeCDF	222	-	D,M
1,2,3,4,7,8,9-HpCDF	15.1	-		0.151	0.0396	Total HxCDF	376	-	D,M
OCDF	836	-		0.251	0.0843	Total HpCDF	780	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	80.2	25.0 - 164	
13C-1,2,3,7,8-PeCDD	81.5	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	76.3	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	73.6	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	86.7	23.0 - 140	
13C-OCDD	86.2	17.0 - 157	
13C-2,3,7,8-TCDF	79.3	24.0 - 169	
13C-1,2,3,7,8-PeCDF	82.1	24.0 - 185	
13C-2,3,4,7,8-PeCDF	82.4	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	67.3	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	65.7	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	66.8	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	72.6	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	72.7	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	87.2	26.0 - 138	
13C-OCDF	81.2	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	69.4	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018

EPA Method 1613
PCDD/F



FAL ID: 11792-005-SA
Client ID: TOC-SS-05-0-10
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: 08-08-2018
Amount: 5.00 g
% Solids: 18.34

ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: pg/g


Acquired: 08-18-2018
2005 WHO TEQ: 49.4
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.40	-		1.40	0.0315				
1,2,3,7,8-PeCDD	8.35	-		8.35	0.0468				
1,2,3,4,7,8-HxCDD	18.2	-		1.82	0.0503				
1,2,3,6,7,8-HxCDD	55.9	-		5.59	0.0490	Total TCDD	30.9	-	M
1,2,3,7,8,9-HxCDD	35.3	-		3.53	0.0488	Total PeCDD	74.2	-	
1,2,3,4,6,7,8-HpCDD	1390	-		13.9	0.0541	Total HxCDD	468	-	
OCDD	13100	-		3.93	0.0888	Total HpCDD	3440	-	
2,3,7,8-TCDF	9.58	-	F	0.958	0.0243				
1,2,3,7,8-PeCDF	5.21	-		0.156	0.0285				
2,3,4,7,8-PeCDF	6.43	-		1.93	0.0298				
1,2,3,4,7,8-HxCDF	13.9	-		1.39	0.0255				
1,2,3,6,7,8-HxCDF	13.7	-		1.37	0.0253				
2,3,4,6,7,8-HxCDF	18.3	-		1.83	0.0279				
1,2,3,7,8,9-HpCDF	4.28	-	J	0.428	0.0367	Total TCDF	145	-	D,M
1,2,3,4,6,7,8-HpCDF	244	-		2.44	0.0321	Total PeCDF	208	-	D,M
1,2,3,4,7,8,9-HpCDF	13.8	-		0.138	0.0396	Total HxCDF	351	-	D,M
OCDF	779	-		0.234	0.0843	Total HpCDF	738	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	63.0	25.0 - 164	
13C-1,2,3,7,8-PeCDD	66.3	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	61.4	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	59.2	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	65.5	23.0 - 140	
13C-OCDD	64.7	17.0 - 157	
13C-2,3,7,8-TCDF	62.7	24.0 - 169	
13C-1,2,3,7,8-PeCDF	65.7	24.0 - 185	
13C-2,3,4,7,8-PeCDF	70.3	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	56.2	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	53.8	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	54.9	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	57.9	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	59.0	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	65.4	26.0 - 138	
13C-OCDF	59.3	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	52.1	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018

EPA Method 1613
PCDD/F



FAL ID: 11792-006-SA
Client ID: TOC-SS-06-0-10
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: 08-08-2018
Amount: 4.99 g
% Solids: 21.01

ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: pg/g

Acquired: 08-18-2018
2005 WHO TEQ: 46.5
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.30	-		1.30	0.0315				
1,2,3,7,8-PeCDD	7.35	-		7.35	0.0468				
1,2,3,4,7,8-HxCDD	15.5	-		1.55	0.0503				
1,2,3,6,7,8-HxCDD	51.3	-		5.13	0.0490	Total TCDD	26.6	-	M
1,2,3,7,8,9-HxCDD	30.4	-		3.04	0.0488	Total PeCDD	65.9	-	
1,2,3,4,6,7,8-HpCDD	1340	-		13.4	0.0541	Total HxCDD	419	-	
OCDD	13000	-		3.90	0.0888	Total HpCDD	3290	-	
2,3,7,8-TCDF	8.92	-	F	0.892	0.0243				
1,2,3,7,8-PeCDF	4.97	-	J	0.149	0.0285				
2,3,4,7,8-PeCDF	7.83	-		2.35	0.0298				
1,2,3,4,7,8-HxCDF	13.4	-		1.34	0.0255				
1,2,3,6,7,8-HxCDF	13.0	-		1.30	0.0253				
2,3,4,6,7,8-HxCDF	16.5	-		1.65	0.0279				
1,2,3,7,8,9-HxCDF	4.62	-	J	0.462	0.0367	Total TCDF	134	-	D,M
1,2,3,4,6,7,8-HpCDF	227	-		2.27	0.0321	Total PeCDF	197	-	D,M
1,2,3,4,7,8,9-HpCDF	13.9	-		0.139	0.0396	Total HxCDF	331	-	D,M
OCDF	808	-		0.242	0.0843	Total HpCDF	680	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	73.9	25.0 - 164	
13C-1,2,3,7,8-PeCDD	72.7	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	72.0	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	68.9	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	80.4	23.0 - 140	
13C-OCDD	83.7	17.0 - 157	
13C-2,3,7,8-TCDF	74.9	24.0 - 169	
13C-1,2,3,7,8-PeCDF	75.3	24.0 - 185	
13C-2,3,4,7,8-PeCDF	76.4	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	61.3	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	59.6	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	61.1	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	65.4	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	68.4	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	80.7	26.0 - 138	
13C-OCDF	78.3	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	63.0	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018

EPA Method 1613
PCDD/F



FAL ID: 11792-007-SA
Client ID: TOC-SS-03D-0-10
Matrix: Sediment
Batch No: X4614

Date Extracted: 08-16-2018
Date Received: 08-08-2018
Amount: 5.01 g
% Solids: 17.16

ICal: PCDDFAL3-6-6-18
GC Column: DB5MS
Units: pg/g


Acquired: 08-18-2018
2005 WHO TEQ: 57.2
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.58	-		1.58	0.0315				
1,2,3,7,8-PeCDD	9.06	-		9.06	0.0468				
1,2,3,4,7,8-HxCDD	18.6	-		1.86	0.0503				
1,2,3,6,7,8-HxCDD	67.2	-		6.72	0.0490	Total TCDD	37.8	-	
1,2,3,7,8,9-HxCDD	37.3	-		3.73	0.0488	Total PeCDD	83.7	-	
1,2,3,4,6,7,8-HpCDD	1530	-		15.3	0.0541	Total HxCDD	489	-	
OCDD	13900	-		4.17	0.0888	Total HpCDD	3470	-	
2,3,7,8-TCDF	10.1	-	F	1.01	0.0243				
1,2,3,7,8-PeCDF	7.05	-		0.212	0.0285				
2,3,4,7,8-PeCDF	10.5	-		3.15	0.0298				
1,2,3,4,7,8-HxCDF	20.1	-		2.01	0.0255				
1,2,3,6,7,8-HxCDF	16.7	-		1.67	0.0253				
2,3,4,6,7,8-HxCDF	22.3	-		2.23	0.0279				
1,2,3,7,8,9-HxCDF	9.26	-		0.926	0.0367	Total TCDF	147	-	D,M
1,2,3,4,6,7,8-HpCDF	313	-		3.13	0.0321	Total PeCDF	228	-	D,M
1,2,3,4,7,8,9-HpCDF	18.6	-		0.186	0.0396	Total HxCDF	500	-	D,M
OCDF	813	-		0.244	0.0843	Total HpCDF	936	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	59.2	25.0 - 164	
13C-1,2,3,7,8-PeCDD	57.0	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	56.1	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	55.2	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	66.5	23.0 - 140	
13C-OCDD	70.0	17.0 - 157	
13C-2,3,7,8-TCDF	58.8	24.0 - 169	
13C-1,2,3,7,8-PeCDF	58.2	24.0 - 185	
13C-2,3,4,7,8-PeCDF	60.3	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	48.5	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	47.2	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	48.1	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	52.6	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	55.6	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	63.6	26.0 - 138	
13C-OCDF	65.7	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	50.3	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 8/21/2018

Reviewed By: 
Date: 8/21/2018



CHAIN OF CUSTODY RECORD

Omega COCID 540 PAGE: 1 OF: 1

ADDRESS
 Fremont Analytical, Inc.
 3600 Fremont Ave. N.
 Seattle, WA 98103
 TEL: 206-352-3790
 FAX: 206-352-7178
 Website: www.fremontanalytical.com

11792
 0°C

SUB CONTRACTOR: Frontier Analytical La COMPANY: Frontier Analytical Laboratory		SPECIAL INSTRUCTIONS / COMMENTS: Use CLIENT SAMPLE IDs for sample checkin. Please email results to Mike Ridgeway at mridgeway@fremontanalytical.com and Chelsea Ward at cward@fremontanalytical.com. <i>place samples in ARCTIC for possible congener analysis. DO NOT DISPOSE.</i>
ADDRESS: 5172 Hillside Circle		
CITY, STATE, ZIP: El Dorado Hills, CA 95762		
PHONE: (916) 934-0900 FAX: (916) 934-0999 EMAIL:		
ACCOUNT #:		

ITEM #	SAMPLE ID	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS: Methanol Preserved Weights HOT Sample Notation, Additional Sample Description.
1	1808013-001E O-DIOXIN	TOC-SS-01-0-10	AMBER JAR 8OZ	Sediment	8/1/2018 9:50:00 AM	1	
2	1808013-002E O-DIOXIN	TOC-SS-02-0-10	AMBER JAR 8OZ	Sediment	8/1/2018 10:40:00 AM	1	
3	1808013-003E O-DIOXIN	TOC-SS-03-0-10	AMBER JAR 8OZ	Sediment	8/1/2018 11:15:00 AM	1	
4	1808013-004E O-DIOXIN	TOC-SS-04-0-10	AMBER JAR 8OZ	Sediment	8/1/2018 11:45:00 AM	1	
5	1808013-005E O-DIOXIN	TOC-SS-05-0-10	AMBER JAR 8OZ	Sediment	8/1/2018 12:53:00 PM	1	
6	1808013-006E O-DIOXIN	TOC-SS-06-0-10	AMBER JAR 8OZ	Sediment	8/1/2018 1:10:00 PM	1	
7	1808013-007E O-DIOXIN	TOC-SS-03D-0-10	AMBER JAR 8OZ	Sediment	8/1/2018 11:20:00 AM	1	

Chelsea to Kathy - EPA method 1631 Full List.

Relinquished By: <i>[Signature]</i>	Date: 8/1/18	Time: 15:33	Received By: <i>Kathy Zop</i>	Date: 8-8-18	Time: 10:55	REPORT TRANSMITTAL DESIRED: <input type="checkbox"/> HARDCOPY (extra cost) <input type="checkbox"/> FAX <input type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE	
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	FOR LAB USE ONLY Temp of samples _____ °C Attempt to Cool? _____ Comments: _____	
TAT: Standard <input type="checkbox"/> RUSH Next BD <input type="checkbox"/> 2nd BD <input type="checkbox"/> 3rd BD <input type="checkbox"/>						Note: RUSH requests will incur surcharges!	

Chemical	Unit ¹	Freshwater SMS		Marine SMS Criteria		Analytical Method	Method Reporting
		SCO	CSL				
Dioxins/Furans							
2,3,7,8-TCDD	ng/kg	--	--	--	--	USEPA 1613B	0.5
1,2,3,7,8-PeCDD	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,4,7,8-HxCDD	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,6,7,8-HxCDD	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,7,8,9-HxCDD	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,4,6,7,8-HpCDD	ng/kg	--	--	--	--	USEPA 1613B	2.5
Total OCDD	ng/kg	--	--	--	--	USEPA 1613B	5
2,3,7,8-TCDF	ng/kg	--	--	--	--	USEPA 1613B	0.5
1,2,3,7,8-PeCDF	ng/kg	--	--	--	--	USEPA 1613B	2.5
2,3,4,7,8-PeCDF	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,4,7,8-HxCDF	ng/kg	--	--	--	--	USEPA 1613B	2.5
2,3,4,6,7,8-HxCDF	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,7,8,9-HxCDF	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,4,6,7,8-HpCDF	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,6,7,8-HxCDF	ng/kg	--	--	--	--	USEPA 1613B	2.5
1,2,3,4,7,8,9-HpCDF	ng/kg	--	--	--	--	USEPA 1613B	2.5
Total OCDF	ng/kg	--	--	--	--	USEPA 1613B	5
Summed dioxin/furan TEQ ⁵	ng/kg	--	--	--	--	--	--

Frontier Analytical Laboratory

Sample Login Form

FAL Project ID: 11792

Client:	Fremont Analytical
Client Project ID:	1808013
Date Received:	08/08/2018
Time Received:	10:55 am
Received By:	KZ
Logged In By:	KZ
# of Samples Received:	7
Duplicates:	0
Storage Location:	R-3

Method of Delivery:	UPS
Tracking Number:	1ZX6192X0340975540
Shipping Container Received Intact	Yes
Custody seals(s) present?	No
Custody seals(s) intact?	No
Sample Arrival Temperature (C)	0
Cooling Method	Blue Ice
Chain Of Custody Present?	Yes
Return Shipping Container To Client	No
Test aqueous sample for residual Chlorine	No
Sodium Thiosulfate Added	No
Adequate Sample Volume	Yes
Appropriate Sample Container	Yes
pH Range of Aqueous Sample	N/A
Anomalies or additional comments:	

SUB CONTRACTOR	Frontier Analytical La	COMPANY	Frontier Analytical Laboratory	SPECIAL INSTRUCTIONS/COMMENTS
ADDRESS	5172 Hillsdale Circle			Use CLIENT SAMPLE IDs for sample checks. Please email results to Mike Rodgey at mrodgey@frontieranalytical.com and Chelsea Ward at cward@frontieranalytical.com. <i>place samples in archive for possible congenener analyser. DO NOT DISPOSE.</i>
CITY, STATE, ZIP	El Dorado Hills, CA 95762			
PHONE	(916) 934-0900	FAX	(916) 934-0999	
ACCOUNT #				

Frontier Analytical Laboratory
11792-005-SA
Client ID: TOC-SS-05-0-10
Storage: R-3 (01 of 01)

TOC-SS-05-0-10

SAMPLED BY	AM, KH	DATE	8/1/18
TIME	12:53	PRESERVATIVE	
LOCATION	Time oil	ANALYSIS	Dioxins
CLIENT	FLS		

(800) 233-8425 www.essvial.com

Frontier Analytical Laboratory
11792-006-SA
Client ID: TOC-SS-06-0-10
Storage: R-3 (01 of 01)

TOC-SS-06-0-10

SAMPLED BY	AM, KH	DATE	8/1/18
TIME	13:10	PRESERVATIVE	
LOCATION	Time oil	ANALYSIS	Dioxins
CLIENT	FLS		

CONTAINER # 000694
(800) 233-8425 www.essvial.com

Frontier Analytical Laboratory
11792-007-SA
Client ID: TOC-SS-03D-0-10
Storage: R-3 (01 of 01)

TOC-SS-03D-0-10

SAMPLED BY	AM, KH	DATE	8/1/18
TIME	11:20	PRESERVATIVE	
LOCATION	Time oil	ANALYSIS	Dioxins
CLIENT	FLS		

(800) 233-8425 www.essvial.com

Frontier Analytical Laboratory
11792-001-SA
Client ID: TOC-SS-01-0-10
Storage: R-3 (01 of 01)

TOC-SS-01-0-10

SAMPLED BY	AM, KH	DATE	8/1/18
TIME	9:50	PRESERVATIVE	
LOCATION	Time Cankra oil	ANALYSIS	Dioxin/Furan
CLIENT	FLS		

(800) 233-8425 www.essvial.com

Frontier Analytical Laboratory
11792-002-SA
Client ID: TOC-SS-02-0-10
Storage: R-3 (01 of 01)

TOC-SS-02-0-10

SAMPLED BY	AM KH	DATE	8/1/18
TIME	10:40	PRESERVATIVE	
LOCATION	Time oil	ANALYSIS	Dioxins
CLIENT	FLS		

(800) 233-8425 www.essvial.com

Frontier Analytical Laboratory
11792-003-SA
Client ID: TOC-SS-03-0-10
Storage: R-3 (01 of 01)

TOC-SS-03-0-10

SAMPLED BY	AM, KH	DATE	8/1/18
TIME	11:15	PRESERVATIVE	
LOCATION	Time oil	ANALYSIS	Dioxins
CLIENT	FLS		

(800) 233-8425 www.essvial.com

Frontier Analytical Laboratory
11792-004-SA
Client ID: TOC-SS-04-0-10
Storage: R-3 (01 of 01)

TOC-SS-04-0-10

SAMPLED BY	AM, KH	DATE	8/1/18
TIME	11:45	PRESERVATIVE	
LOCATION	Time oil	ANALYSIS	Dioxins
CLIENT	FLS		

(800) 233-8425 www.essvial.com

2018/08/08

Chain of Custody Record & Laboratory Analysis Request

1808013

FLOYD | SNIDER

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Laboratory: Fremont
 Date: 8/1/2018
 Project Name: Surface Sediment Quality Evaluation
 Project Number: Cantera-TOC
 Send Invoice to: Cantera Time Oil Company
 Send Results to Amanda McKay
 Project Manager: Amanda.McKay@floydsnider.com
 Phone Number: 206-292-2078
 Shipment Method:

Test Parameters													
Grain size	Total solids	TOC	Ammonia	Sulfides	Metals (USEPA 6020A)	Mercury (USEPA 7471B)	Butyltins	SVOCs	Pesticides	PCB Aroclors	Dioxin/furans	TPH (NWTPH-Dx)	Archive

Line	Field Sample ID	Collection Date/Time	Matrix	No. of Containers	Grain size	Total solids	TOC	Ammonia	Sulfides	Metals (USEPA 6020A)	Mercury (USEPA 7471B)	Butyltins	SVOCs	Pesticides	PCB Aroclors	Dioxin/furans	TPH (NWTPH-Dx)	Archive	Salinity porewater	MS/MSD	Comments/Preservation
1	TOC-SS-01 - 0-10	8/1/2018 / 9:50	SE	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		Archive for PCB congeners & herbicide
2	TOC-SS-02 - 0-10	8/1/2018 / 10:40	SE	6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Archive PCBs/herbicides, MS/MSD
3	TOC-SS-03 - 0-10	8/1/2018 / 11:15	SE	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Archive PCBs/herbs
4	TOC-SS-04 - 0-10	8/1/2018 / 11:45	SE	6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
5	TOC-SS-05 - 0-10	8/1/2018 / 12:53	SE	6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
6	TOC-SS-06 - 0-10	8/1/2018 / 13:10	SE	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
7	TOC-SS-03D-0-10	8/1/2018 / 11:20	SE	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
8																					
9																					
10																					
11																					
12																					
13																					
14																					
15																					

Notes: Run salinity ~~analysis~~ and report to Floyd/Snider, will determine SVOC analyte list based on salinity results.

Relinquished By: Kara Hitchcock Company: Floyd Snider
 Signature/Printed Name: Kara Hitchcock Date/Time: 8/1/18 15:00

Received By: [Signature] Company: FAT
 Signature/Printed Name: [Signature] Date/Time: 8/1/18 1500

Relinquished By: _____ Company: _____
 Signature/Printed Name: _____ Date/Time: _____

Received By: _____ Company: _____
 Signature/Printed Name: _____ Date/Time: _____



3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Floyd | Snider
Lynn Grochala
601 Union St., Suite 600
Seattle, WA 98101

RE: Surface Sediment Quality Evaluation
Work Order Number: 1903305

April 18, 2019

Attention Lynn Grochala:

Fremont Analytical, Inc. received 9 sample(s) on 3/20/2019 for the analyses presented in the following report.

Ammonia by SM 4500 NH3 E
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.
Dioxins by EPA Method 1613
Grain Size by ASTM D422
Mercury by EPA Method 7471
Organotins
Polychlorinated Biphenyls (PCB) by EPA 8082
Sample Moisture (Percent Moisture)
Semi-Volatile Organic Compounds by EPA Method 8270
Total Metals by EPA Method 6020
Total Organic Carbon by EPA 9060
Total Solids

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

DoD/ELAP Certification #L17-135, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)

Original

www.fremontanalytical.com

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Mike Ridgeway
Laboratory Director

CC:
Kara Hitchko
Pamela Osterhout

CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation
Work Order: 1903305

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1903305-001	TOC-SS-07-0-10	03/20/2019 12:33 PM	03/20/2019 6:01 PM
1903305-002	TOC-SS-08-0-10	03/20/2019 1:10 PM	03/20/2019 6:01 PM
1903305-003	TOC-SS-09-0-10	03/20/2019 1:50 PM	03/20/2019 6:01 PM
1903305-004	TOC-SS-10-0-10	03/20/2019 2:47 PM	03/20/2019 6:01 PM
1903305-005	TOC-SS-11-0-10	03/20/2019 3:27 PM	03/20/2019 6:01 PM
1903305-006	SB-SS-01-0-10	03/20/2019 10:30 AM	03/20/2019 6:01 PM
1903305-007	SB-SS-02-0-10	03/20/2019 11:10 AM	03/20/2019 6:01 PM
1903305-008	SB-SS-03-0-10	03/20/2019 11:52 AM	03/20/2019 6:01 PM
1903305-009	TOC-SS-111-0-10	03/20/2019 3:35 PM	03/20/2019 6:01 PM



Qualifiers:

- * - Flagged value is not within established control limits
- B - Analyte detected in the associated Method Blank
- D - Dilution was required
- E - Value above quantitation range
- H - Holding times for preparation or analysis exceeded
- I - Analyte with an internal standard that does not meet established acceptance criteria
- J - Analyte detected below Reporting Limit
- N - Tentatively Identified Compound (TIC)
- Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
- S - Spike recovery outside accepted recovery limits
- ND - Not detected at the Reporting Limit
- R - High relative percent difference observed

Acronyms:

- %Rec - Percent Recovery
- CCB - Continued Calibration Blank
- CCV - Continued Calibration Verification
- DF - Dilution Factor
- HEM - Hexane Extractable Material
- ICV - Initial Calibration Verification
- LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
- MB or MBLANK - Method Blank
- MDL - Method Detection Limit
- MS/MSD - Matrix Spike / Matrix Spike Duplicate
- PDS - Post Digestion Spike
- Ref Val - Reference Value
- RL - Reporting Limit
- RPD - Relative Percent Difference
- SD - Serial Dilution
- SGT - Silica Gel Treatment
- SPK - Spike
- Surr - Surrogate



Client: Floyd | Snider

Collection Date: 3/20/2019 12:33:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-001

Matrix: Sediment

Client Sample ID: TOC-SS-07-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 23976

Analyst: SB

Aroclor 1016	ND	0.00396	MDL	mg/Kg-dry	1	3/27/2019 9:10:15 PM
Aroclor 1221	ND	0.00396	MDL	mg/Kg-dry	1	3/27/2019 9:10:15 PM
Aroclor 1232	ND	0.00396	MDL	mg/Kg-dry	1	3/27/2019 9:10:15 PM
Aroclor 1242	ND	0.00396	MDL	mg/Kg-dry	1	3/27/2019 9:10:15 PM
Aroclor 1248	ND	0.00693	MDL	mg/Kg-dry	1	3/27/2019 9:10:15 PM
Aroclor 1254	ND	0.00693	MDL	mg/Kg-dry	1	3/27/2019 9:10:15 PM
Aroclor 1260	ND	0.00693	MDL	mg/Kg-dry	1	3/27/2019 9:10:15 PM
Aroclor 1268	ND	0.00693	MDL	mg/Kg-dry	1	3/27/2019 9:10:15 PM
Total PCBs	ND	0.00693	MDL	mg/Kg-dry	1	3/27/2019 9:10:15 PM
Surr: Decachlorobiphenyl	67.4	30.8 - 168		%Rec	1	3/27/2019 9:10:15 PM
Surr: Tetrachloro-m-xylene	67.9	30.3 - 157		%Rec	1	3/27/2019 9:10:15 PM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23956

Analyst: DW

Diesel (Fuel Oil)	ND	64.7		mg/Kg-dry	1	3/27/2019 12:58:08 AM
Heavy Oil	1,030	162		mg/Kg-dry	1	3/27/2019 12:58:08 AM
Surr: 2-Fluorobiphenyl	81.8	50 - 150		%Rec	1	3/27/2019 12:58:08 AM
Surr: o-Terphenyl	80.4	50 - 150		%Rec	1	3/27/2019 12:58:08 AM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benzoic acid	ND	512		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Phenol	ND	102		µg/Kg-dry	1	3/29/2019 3:32:18 PM
3&4-Methylphenol (m, p-cresol)	ND	102		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Naphthalene	52.1	40.9		µg/Kg-dry	1	3/29/2019 3:32:18 PM
2-Methylnaphthalene	ND	40.9		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Acenaphthene	ND	40.9		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Acenaphthylene	49.8	40.9		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Dibenzofuran	ND	76.7		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Fluorene	ND	40.9		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Pentachlorophenol	ND	102		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Phenanthrene	179	40.9		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Anthracene	67.0	40.9		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Carbazole	ND	76.7		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Di-n-butylphthalate	ND	102		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Fluoranthene	570	40.9		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Pyrene	535	40.9		µg/Kg-dry	1	3/29/2019 3:32:18 PM



Client: Floyd | Snider

Collection Date: 3/20/2019 12:33:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-001

Matrix: Sediment

Client Sample ID: TOC-SS-07-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benz(a)anthracene	385	40.9		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Chrysene	369	40.9		µg/Kg-dry	1	3/29/2019 3:32:18 PM
bis (2-Ethylhexyl) phthalate	286	102		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Di-n-octyl phthalate	40.5	11.5	MDL, J	µg/Kg-dry	1	3/29/2019 3:32:18 PM
Benzo(b)fluoranthene	348	40.9	Q*	µg/Kg-dry	1	3/29/2019 3:32:18 PM
Benzo(k)fluoranthene	379	40.9		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Benzo(a)pyrene	431	40.9		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Indeno(1,2,3-cd)pyrene	280	40.9		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Dibenz(a,h)anthracene	80.3	40.9		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Benzo(g,h,i)perylene	336	40.9		µg/Kg-dry	1	3/29/2019 3:32:18 PM
Surr: 2,4,6-Tribromophenol	68.2	14.8 - 165		%Rec	1	3/29/2019 3:32:18 PM
Surr: 2-Fluorobiphenyl	24.7	17.8 - 151		%Rec	1	3/29/2019 3:32:18 PM
Surr: Nitrobenzene-d5	24.9	12.5 - 163		%Rec	1	3/29/2019 3:32:18 PM
Surr: Phenol-d6	41.6	11.6 - 133		%Rec	1	3/29/2019 3:32:18 PM
Surr: p-Terphenyl	75.1	22 - 176		%Rec	1	3/29/2019 3:32:18 PM

NOTES:

Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

* - Flagged value is not within established control limits.

MDL - Analyte reported to Method Detection Limit (MDL)

Mercury by EPA Method 7471

Batch ID: 23916

Analyst: WF

Mercury	0.546	0.385	D	mg/Kg-dry	2	3/21/2019 5:45:02 PM
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Total Metals by EPA Method 6020

Batch ID: 23940

Analyst: WC

Arsenic	15.1	0.591		mg/Kg-dry	1	3/26/2019 1:05:10 PM
Cadmium	0.664	0.473		mg/Kg-dry	1	3/26/2019 1:05:10 PM
Chromium	40.9	0.236		mg/Kg-dry	1	3/26/2019 1:05:10 PM
Copper	205	0.473		mg/Kg-dry	1	3/26/2019 1:05:10 PM
Lead	115	0.473		mg/Kg-dry	1	3/26/2019 1:05:10 PM
Nickel	34.6	1.18		mg/Kg-dry	1	3/26/2019 1:05:10 PM
Selenium	1.43	1.18		mg/Kg-dry	1	3/26/2019 1:05:10 PM
Silver	0.339	0.236		mg/Kg-dry	1	3/26/2019 1:05:10 PM
Zinc	340	1.18		mg/Kg-dry	1	3/26/2019 1:05:10 PM

Sample Moisture (Percent Moisture)

Batch ID: R50211

Analyst: CJ

Percent Moisture	70.2			wt%	1	3/22/2019 8:21:33 AM
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Client: Floyd | Snider

Collection Date: 3/20/2019 12:33:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-001

Matrix: Sediment

Client Sample ID: TOC-SS-07-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Total Organic Carbon by EPA 9060

Batch ID: 23907 Analyst: GM

Total Organic Carbon	5.31	0.0750		%-dry	1	3/22/2019 4:29:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 23921 Analyst: GM

Nitrogen, Ammonia	ND	3.31		mg/Kg-dry	1	3/22/2019 8:50:00 AM
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Total Solids

Batch ID: R50744 Analyst: CW

Total Solids	29.8			wt%	1	4/15/2019 3:48:52 PM
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Client: Floyd | Snider

Collection Date: 3/20/2019 1:10:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-002

Matrix: Sediment

Client Sample ID: TOC-SS-08-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 23976

Analyst: SB

Aroclor 1016	ND	0.00219	MDL	mg/Kg-dry	1	3/27/2019 9:48:54 PM
Aroclor 1221	ND	0.00219	MDL	mg/Kg-dry	1	3/27/2019 9:48:54 PM
Aroclor 1232	ND	0.00219	MDL	mg/Kg-dry	1	3/27/2019 9:48:54 PM
Aroclor 1242	ND	0.00219	MDL	mg/Kg-dry	1	3/27/2019 9:48:54 PM
Aroclor 1248	ND	0.00384	MDL	mg/Kg-dry	1	3/27/2019 9:48:54 PM
Aroclor 1254	ND	0.00384	MDL	mg/Kg-dry	1	3/27/2019 9:48:54 PM
Aroclor 1260	ND	0.00384	MDL	mg/Kg-dry	1	3/27/2019 9:48:54 PM
Aroclor 1268	ND	0.00384	MDL	mg/Kg-dry	1	3/27/2019 9:48:54 PM
Total PCBs	ND	0.00384	MDL	mg/Kg-dry	1	3/27/2019 9:48:54 PM
Surr: Decachlorobiphenyl	95.9	30.8 - 168		%Rec	1	3/27/2019 9:48:54 PM
Surr: Tetrachloro-m-xylene	114	30.3 - 157		%Rec	1	3/27/2019 9:48:54 PM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23956

Analyst: DW

Diesel (Fuel Oil)	ND	31.1		mg/Kg-dry	1	3/27/2019 1:27:51 AM
Heavy Oil	487	77.8		mg/Kg-dry	1	3/27/2019 1:27:51 AM
Surr: 2-Fluorobiphenyl	75.9	50 - 150		%Rec	1	3/27/2019 1:27:51 AM
Surr: o-Terphenyl	77.5	50 - 150		%Rec	1	3/27/2019 1:27:51 AM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benzoic acid	ND	516		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Phenol	ND	103		µg/Kg-dry	1	3/29/2019 8:47:06 PM
3&4-Methylphenol (m, p-cresol)	ND	103		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Naphthalene	ND	41.3		µg/Kg-dry	1	3/29/2019 8:47:06 PM
2-Methylnaphthalene	ND	41.3		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Acenaphthene	ND	41.3		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Acenaphthylene	ND	41.3		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Dibenzofuran	ND	77.4		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Fluorene	ND	41.3		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Pentachlorophenol	ND	103		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Phenanthrene	317	41.3		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Anthracene	105	41.3		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Carbazole	ND	77.4		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Di-n-butylphthalate	ND	103		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Fluoranthene	1,000	41.3		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Pyrene	927	41.3		µg/Kg-dry	1	3/29/2019 8:47:06 PM



Client: Floyd | Snider

Collection Date: 3/20/2019 1:10:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-002

Matrix: Sediment

Client Sample ID: TOC-SS-08-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benz(a)anthracene	431	41.3		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Chrysene	536	41.3		µg/Kg-dry	1	3/29/2019 8:47:06 PM
bis (2-Ethylhexyl) phthalate	3,290	103		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Di-n-octyl phthalate	21.4	11.6	MDL, J	µg/Kg-dry	1	3/29/2019 8:47:06 PM
Benzo(b)fluoranthene	484	41.3	*	µg/Kg-dry	1	3/29/2019 8:47:06 PM
Benzo(k)fluoranthene	413	41.3		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Benzo(a)pyrene	621	41.3		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Indeno(1,2,3-cd)pyrene	329	41.3		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Dibenz(a,h)anthracene	128	41.3		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Benzo(g,h,i)perylene	371	41.3		µg/Kg-dry	1	3/29/2019 8:47:06 PM
Surr: 2,4,6-Tribromophenol	79.2	14.8 - 165		%Rec	1	3/29/2019 8:47:06 PM
Surr: 2-Fluorobiphenyl	62.9	17.8 - 151		%Rec	1	3/29/2019 8:47:06 PM
Surr: Nitrobenzene-d5	57.1	12.5 - 163		%Rec	1	3/29/2019 8:47:06 PM
Surr: Phenol-d6	66.4	11.6 - 133		%Rec	1	3/29/2019 8:47:06 PM
Surr: p-Terphenyl	89.5	22 - 176		%Rec	1	3/29/2019 8:47:06 PM

NOTES:

* - Flagged value is not within established control limits.

MDL - Analyte reported to Method Detection Limit (MDL)

Mercury by EPA Method 7471

Batch ID: 23916

Analyst: WF

Mercury	0.262	0.0954		mg/Kg-dry	1	3/21/2019 5:51:32 PM
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Total Metals by EPA Method 6020

Batch ID: 23940

Analyst: WC

Arsenic	13.6	0.281		mg/Kg-dry	1	3/26/2019 1:37:25 PM
Cadmium	0.290	0.225		mg/Kg-dry	1	3/26/2019 1:37:25 PM
Chromium	38.7	0.112		mg/Kg-dry	1	3/26/2019 1:37:25 PM
Copper	115	0.225		mg/Kg-dry	1	3/26/2019 1:37:25 PM
Lead	71.1	0.225		mg/Kg-dry	1	3/26/2019 1:37:25 PM
Nickel	33.1	0.562		mg/Kg-dry	1	3/26/2019 1:37:25 PM
Selenium	0.970	0.562		mg/Kg-dry	1	3/26/2019 1:37:25 PM
Silver	0.241	0.112		mg/Kg-dry	1	3/26/2019 1:37:25 PM
Zinc	186	0.562		mg/Kg-dry	1	3/26/2019 1:37:25 PM

Sample Moisture (Percent Moisture)

Batch ID: R50211

Analyst: CJ

Percent Moisture	37.3			wt%	1	3/22/2019 8:21:33 AM
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Client: Floyd | Snider

Collection Date: 3/20/2019 1:10:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-002

Matrix: Sediment

Client Sample ID: TOC-SS-08-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Total Organic Carbon by EPA 9060

Batch ID: 23907 Analyst: GM

Total Organic Carbon	1.28	0.0750		%-dry	1	3/22/2019 5:27:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 23921 Analyst: GM

Nitrogen, Ammonia	5.07	1.57		mg/Kg-dry	1	3/22/2019 8:50:00 AM
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Total Solids

Batch ID: R50744 Analyst: CW

Total Solids	62.7			wt%	1	4/15/2019 3:48:52 PM
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Client: Floyd | Snider

Collection Date: 3/20/2019 1:50:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-003

Matrix: Sediment

Client Sample ID: TOC-SS-09-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 23976

Analyst: SB

Aroclor 1016	ND	0.00198	MDL	mg/Kg-dry	1	3/27/2019 9:58:33 PM
Aroclor 1221	ND	0.00198	MDL	mg/Kg-dry	1	3/27/2019 9:58:33 PM
Aroclor 1232	ND	0.00198	MDL	mg/Kg-dry	1	3/27/2019 9:58:33 PM
Aroclor 1242	ND	0.00198	MDL	mg/Kg-dry	1	3/27/2019 9:58:33 PM
Aroclor 1248	ND	0.00347	MDL	mg/Kg-dry	1	3/27/2019 9:58:33 PM
Aroclor 1254	ND	0.00347	MDL	mg/Kg-dry	1	3/27/2019 9:58:33 PM
Aroclor 1260	ND	0.00347	MDL	mg/Kg-dry	1	3/27/2019 9:58:33 PM
Aroclor 1268	ND	0.00347	MDL	mg/Kg-dry	1	3/27/2019 9:58:33 PM
Total PCBs	ND	0.00347	MDL	mg/Kg-dry	1	3/27/2019 9:58:33 PM
Surr: Decachlorobiphenyl	93.6	30.8 - 168		%Rec	1	3/27/2019 9:58:33 PM
Surr: Tetrachloro-m-xylene	117	30.3 - 157		%Rec	1	3/27/2019 9:58:33 PM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23956

Analyst: DW

Diesel (Fuel Oil)	ND	25.7		mg/Kg-dry	1	3/27/2019 3:56:39 AM
Heavy Oil	216	64.3		mg/Kg-dry	1	3/27/2019 3:56:39 AM
Surr: 2-Fluorobiphenyl	84.9	50 - 150		%Rec	1	3/27/2019 3:56:39 AM
Surr: o-Terphenyl	86.2	50 - 150		%Rec	1	3/27/2019 3:56:39 AM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benzoic acid	ND	461		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Phenol	ND	92.1		µg/Kg-dry	1	3/29/2019 9:09:25 PM
3&4-Methylphenol (m, p-cresol)	ND	92.1		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Naphthalene	ND	36.9		µg/Kg-dry	1	3/29/2019 9:09:25 PM
2-Methylnaphthalene	ND	36.9		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Acenaphthene	ND	36.9		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Acenaphthylene	ND	36.9		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Dibenzofuran	ND	69.1		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Fluorene	ND	36.9		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Pentachlorophenol	ND	92.1		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Phenanthrene	195	36.9		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Anthracene	125	36.9		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Carbazole	ND	69.1		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Di-n-butylphthalate	ND	92.1		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Fluoranthene	1,360	36.9		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Pyrene	1,150	36.9		µg/Kg-dry	1	3/29/2019 9:09:25 PM



Client: Floyd | Snider

Collection Date: 3/20/2019 1:50:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-003

Matrix: Sediment

Client Sample ID: TOC-SS-09-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benz(a)anthracene	608	36.9		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Chrysene	828	36.9		µg/Kg-dry	1	3/29/2019 9:09:25 PM
bis (2-Ethylhexyl) phthalate	1,240	92.1		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Di-n-octyl phthalate	ND	10.4	MDL	µg/Kg-dry	1	3/29/2019 9:09:25 PM
Benzo(b)fluoranthene	602	36.9	*	µg/Kg-dry	1	3/29/2019 9:09:25 PM
Benzo(k)fluoranthene	493	36.9		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Benzo(a)pyrene	579	36.9		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Indeno(1,2,3-cd)pyrene	215	36.9		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Dibenz(a,h)anthracene	94.5	36.9		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Benzo(g,h,i)perylene	294	36.9		µg/Kg-dry	1	3/29/2019 9:09:25 PM
Surr: 2,4,6-Tribromophenol	121	14.8 - 165		%Rec	1	3/29/2019 9:09:25 PM
Surr: 2-Fluorobiphenyl	79.2	17.8 - 151		%Rec	1	3/29/2019 9:09:25 PM
Surr: Nitrobenzene-d5	72.9	12.5 - 163		%Rec	1	3/29/2019 9:09:25 PM
Surr: Phenol-d6	84.5	11.6 - 133		%Rec	1	3/29/2019 9:09:25 PM
Surr: p-Terphenyl	100	22 - 176		%Rec	1	3/29/2019 9:09:25 PM

NOTES:

* - Flagged value is not within established control limits.

MDL - Analyte reported to Method Detection Limit (MDL)

Mercury by EPA Method 7471

Batch ID: 23916

Analyst: WF

Mercury	0.125	0.0834		mg/Kg-dry	1	3/21/2019 5:53:07 PM
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Total Metals by EPA Method 6020

Batch ID: 23940

Analyst: WC

Arsenic	8.10	0.268		mg/Kg-dry	1	3/26/2019 1:41:26 PM
Cadmium	ND	0.214		mg/Kg-dry	1	3/26/2019 1:41:26 PM
Chromium	23.1	0.107		mg/Kg-dry	1	3/26/2019 1:41:26 PM
Copper	46.3	0.214		mg/Kg-dry	1	3/26/2019 1:41:26 PM
Lead	43.2	0.214		mg/Kg-dry	1	3/26/2019 1:41:26 PM
Nickel	23.3	0.536		mg/Kg-dry	1	3/26/2019 1:41:26 PM
Selenium	0.795	0.536		mg/Kg-dry	1	3/26/2019 1:41:26 PM
Silver	ND	0.107		mg/Kg-dry	1	3/26/2019 1:41:26 PM
Zinc	103	0.536		mg/Kg-dry	1	3/26/2019 1:41:26 PM

Sample Moisture (Percent Moisture)

Batch ID: R50211

Analyst: CJ

Percent Moisture	31.9			wt%	1	3/22/2019 8:21:33 AM
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Client: Floyd | Snider

Collection Date: 3/20/2019 1:50:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-003

Matrix: Sediment

Client Sample ID: TOC-SS-09-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Total Organic Carbon by EPA 9060

Batch ID: 23907 Analyst: GM

Total Organic Carbon	0.832	0.0750		%-dry	1	3/22/2019 5:41:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 23921 Analyst: GM

Nitrogen, Ammonia	2.88	1.40		mg/Kg-dry	1	3/22/2019 8:50:00 AM
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Total Solids

Batch ID: R50744 Analyst: CW

Total Solids	68.1			wt%	1	4/15/2019 3:48:52 PM
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Client: Floyd | Snider

Collection Date: 3/20/2019 2:47:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-004

Matrix: Sediment

Client Sample ID: TOC-SS-10-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 23976

Analyst: SB

Aroclor 1016	ND	0.00218	MDL	mg/Kg-dry	1	3/27/2019 10:08:12 PM
Aroclor 1221	ND	0.00218	MDL	mg/Kg-dry	1	3/27/2019 10:08:12 PM
Aroclor 1232	ND	0.00218	MDL	mg/Kg-dry	1	3/27/2019 10:08:12 PM
Aroclor 1242	ND	0.00218	MDL	mg/Kg-dry	1	3/27/2019 10:08:12 PM
Aroclor 1248	ND	0.00382	MDL	mg/Kg-dry	1	3/27/2019 10:08:12 PM
Aroclor 1254	ND	0.00382	MDL	mg/Kg-dry	1	3/27/2019 10:08:12 PM
Aroclor 1260	ND	0.00382	MDL	mg/Kg-dry	1	3/27/2019 10:08:12 PM
Aroclor 1268	ND	0.00382	MDL	mg/Kg-dry	1	3/27/2019 10:08:12 PM
Total PCBs	ND	0.00382	MDL	mg/Kg-dry	1	3/27/2019 10:08:12 PM
Surr: Decachlorobiphenyl	85.1	30.8 - 168		%Rec	1	3/27/2019 10:08:12 PM
Surr: Tetrachloro-m-xylene	108	30.3 - 157		%Rec	1	3/27/2019 10:08:12 PM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23956

Analyst: DW

Diesel (Fuel Oil)	ND	28.7		mg/Kg-dry	1	3/27/2019 4:26:18 AM
Heavy Oil	326	71.7		mg/Kg-dry	1	3/27/2019 4:26:18 AM
Surr: 2-Fluorobiphenyl	89.0	50 - 150		%Rec	1	3/27/2019 4:26:18 AM
Surr: o-Terphenyl	90.3	50 - 150		%Rec	1	3/27/2019 4:26:18 AM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benzoic acid	ND	495		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Phenol	ND	98.9		µg/Kg-dry	1	3/29/2019 9:31:40 PM
3&4-Methylphenol (m, p-cresol)	ND	98.9		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Naphthalene	ND	39.6		µg/Kg-dry	1	3/29/2019 9:31:40 PM
2-Methylnaphthalene	ND	39.6		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Acenaphthene	ND	39.6		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Acenaphthylene	ND	39.6		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Dibenzofuran	ND	74.2		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Fluorene	ND	39.6		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Pentachlorophenol	ND	98.9		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Phenanthrene	283	39.6		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Anthracene	99.7	39.6		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Carbazole	ND	74.2		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Di-n-butylphthalate	ND	98.9		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Fluoranthene	1,240	39.6		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Pyrene	998	39.6		µg/Kg-dry	1	3/29/2019 9:31:40 PM



Client: Floyd | Snider

Collection Date: 3/20/2019 2:47:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-004

Matrix: Sediment

Client Sample ID: TOC-SS-10-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benz(a)anthracene	475	39.6		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Chrysene	627	39.6		µg/Kg-dry	1	3/29/2019 9:31:40 PM
bis (2-Ethylhexyl) phthalate	1,420	98.9		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Di-n-octyl phthalate	ND	11.1	MDL	µg/Kg-dry	1	3/29/2019 9:31:40 PM
Benzo(b)fluoranthene	412	39.6	*	µg/Kg-dry	1	3/29/2019 9:31:40 PM
Benzo(k)fluoranthene	355	39.6		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Benzo(a)pyrene	450	39.6		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Indeno(1,2,3-cd)pyrene	251	39.6		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Dibenz(a,h)anthracene	116	39.6		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Benzo(g,h,i)perylene	258	39.6		µg/Kg-dry	1	3/29/2019 9:31:40 PM
Surr: 2,4,6-Tribromophenol	80.3	14.8 - 165		%Rec	1	3/29/2019 9:31:40 PM
Surr: 2-Fluorobiphenyl	60.8	17.8 - 151		%Rec	1	3/29/2019 9:31:40 PM
Surr: Nitrobenzene-d5	47.4	12.5 - 163		%Rec	1	3/29/2019 9:31:40 PM
Surr: Phenol-d6	58.5	11.6 - 133		%Rec	1	3/29/2019 9:31:40 PM
Surr: p-Terphenyl	77.3	22 - 176		%Rec	1	3/29/2019 9:31:40 PM

NOTES:

* - Flagged value is not within established control limits.

MDL - Analyte reported to Method Detection Limit (MDL)

Mercury by EPA Method 7471

Batch ID: 23916

Analyst: WF

Mercury	0.158	0.0917		mg/Kg-dry	1	3/21/2019 5:54:43 PM
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Total Metals by EPA Method 6020

Batch ID: 23940

Analyst: WC

Arsenic	7.42	0.260		mg/Kg-dry	1	3/26/2019 1:45:28 PM
Cadmium	ND	0.208		mg/Kg-dry	1	3/26/2019 1:45:28 PM
Chromium	25.6	0.104		mg/Kg-dry	1	3/26/2019 1:45:28 PM
Copper	53.5	0.208		mg/Kg-dry	1	3/26/2019 1:45:28 PM
Lead	39.9	0.208		mg/Kg-dry	1	3/26/2019 1:45:28 PM
Nickel	23.6	0.520		mg/Kg-dry	1	3/26/2019 1:45:28 PM
Selenium	0.941	0.520		mg/Kg-dry	1	3/26/2019 1:45:28 PM
Silver	ND	0.104		mg/Kg-dry	1	3/26/2019 1:45:28 PM
Zinc	111	0.520		mg/Kg-dry	1	3/26/2019 1:45:28 PM

Sample Moisture (Percent Moisture)

Batch ID: R50211

Analyst: CJ

Percent Moisture	33.2			wt%	1	3/22/2019 8:21:33 AM
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Client: Floyd | Snider

Collection Date: 3/20/2019 2:47:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-004

Matrix: Sediment

Client Sample ID: TOC-SS-10-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Total Organic Carbon by EPA 9060

Batch ID: 23907 Analyst: GM

Total Organic Carbon	0.510	0.0750		%-dry	1	3/22/2019 5:54:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 23921 Analyst: GM

Nitrogen, Ammonia	2.72	1.46		mg/Kg-dry	1	3/22/2019 8:50:00 AM
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Total Solids

Batch ID: R50744 Analyst: CW

Total Solids	66.8			wt%	1	4/15/2019 3:48:52 PM
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Client: Floyd | Snider

Collection Date: 3/20/2019 3:27:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-005

Matrix: Sediment

Client Sample ID: TOC-SS-11-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 23976

Analyst: SB

Aroclor 1016	ND	0.00690	MDL	mg/Kg-dry	1	3/27/2019 10:17:50 PM
Aroclor 1221	ND	0.00690	MDL	mg/Kg-dry	1	3/27/2019 10:17:50 PM
Aroclor 1232	ND	0.00690	MDL	mg/Kg-dry	1	3/27/2019 10:17:50 PM
Aroclor 1242	ND	0.00690	MDL	mg/Kg-dry	1	3/27/2019 10:17:50 PM
Aroclor 1248	ND	0.0121	MDL	mg/Kg-dry	1	3/27/2019 10:17:50 PM
Aroclor 1254	ND	0.0121	MDL	mg/Kg-dry	1	3/27/2019 10:17:50 PM
Aroclor 1260	ND	0.0121	MDL	mg/Kg-dry	1	3/27/2019 10:17:50 PM
Aroclor 1268	ND	0.0121	MDL	mg/Kg-dry	1	3/27/2019 10:17:50 PM
Total PCBs	ND	0.0121	MDL	mg/Kg-dry	1	3/27/2019 10:17:50 PM
Surr: Decachlorobiphenyl	77.8	30.8 - 168		%Rec	1	3/27/2019 10:17:50 PM
Surr: Tetrachloro-m-xylene	98.4	30.3 - 157		%Rec	1	3/27/2019 10:17:50 PM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23956

Analyst: DW

Diesel (Fuel Oil)	ND	111		mg/Kg-dry	1	3/27/2019 4:55:57 AM
Heavy Oil	962	276		mg/Kg-dry	1	3/27/2019 4:55:57 AM
Surr: 2-Fluorobiphenyl	111	50 - 150		%Rec	1	3/27/2019 4:55:57 AM
Surr: o-Terphenyl	112	50 - 150		%Rec	1	3/27/2019 4:55:57 AM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benzoic acid	ND	491		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Phenol	ND	98.2		µg/Kg-dry	1	3/29/2019 9:53:54 PM
3&4-Methylphenol (m, p-cresol)	ND	98.2		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Naphthalene	ND	39.3		µg/Kg-dry	1	3/29/2019 9:53:54 PM
2-Methylnaphthalene	ND	39.3		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Acenaphthene	ND	39.3		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Acenaphthylene	ND	39.3		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Dibenzofuran	ND	73.6		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Fluorene	ND	39.3		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Pentachlorophenol	ND	98.2		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Phenanthrene	111	39.3		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Anthracene	ND	39.3		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Carbazole	ND	73.6		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Di-n-butylphthalate	ND	98.2		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Fluoranthene	281	39.3		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Pyrene	225	39.3		µg/Kg-dry	1	3/29/2019 9:53:54 PM



Client: Floyd | Snider

Collection Date: 3/20/2019 3:27:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-005

Matrix: Sediment

Client Sample ID: TOC-SS-11-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benz(a)anthracene	105	39.3		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Chrysene	162	39.3		µg/Kg-dry	1	3/29/2019 9:53:54 PM
bis (2-Ethylhexyl) phthalate	145	98.2		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Di-n-octyl phthalate	ND	11.0	MDL	µg/Kg-dry	1	3/29/2019 9:53:54 PM
Benzo(b)fluoranthene	132	39.3	*	µg/Kg-dry	1	3/29/2019 9:53:54 PM
Benzo(k)fluoranthene	144	39.3		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Benzo(a)pyrene	133	39.3		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Indeno(1,2,3-cd)pyrene	109	39.3		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Dibenz(a,h)anthracene	ND	39.3		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Benzo(g,h,i)perylene	123	39.3		µg/Kg-dry	1	3/29/2019 9:53:54 PM
Surr: 2,4,6-Tribromophenol	61.2	14.8 - 165		%Rec	1	3/29/2019 9:53:54 PM
Surr: 2-Fluorobiphenyl	12.6	17.8 - 151	S	%Rec	1	3/29/2019 9:53:54 PM
Surr: Nitrobenzene-d5	11.0	12.5 - 163	S	%Rec	1	3/29/2019 9:53:54 PM
Surr: Phenol-d6	32.2	11.6 - 133		%Rec	1	3/29/2019 9:53:54 PM
Surr: p-Terphenyl	65.8	22 - 176		%Rec	1	3/29/2019 9:53:54 PM

NOTES:

S - Outlying surrogate recovery(ies) observed.

* - Flagged value is not within established control limits.

MDL - Analyte reported to Method Detection Limit (MDL)

Mercury by EPA Method 7471

Batch ID: 23916

Analyst: WF

Mercury	0.531	0.329		mg/Kg-dry	1	3/21/2019 5:56:19 PM
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Total Metals by EPA Method 6020

Batch ID: 23940

Analyst: WC

Arsenic	17.0	0.995		mg/Kg-dry	1	3/26/2019 1:49:29 PM
Cadmium	0.927	0.796		mg/Kg-dry	1	3/26/2019 1:49:29 PM
Chromium	50.2	0.398		mg/Kg-dry	1	3/26/2019 1:49:29 PM
Copper	332	0.796		mg/Kg-dry	1	3/26/2019 1:49:29 PM
Lead	188	0.796		mg/Kg-dry	1	3/26/2019 1:49:29 PM
Nickel	41.7	1.99		mg/Kg-dry	1	3/26/2019 1:49:29 PM
Selenium	ND	1.99		mg/Kg-dry	1	3/26/2019 1:49:29 PM
Silver	ND	0.398		mg/Kg-dry	1	3/26/2019 1:49:29 PM
Zinc	601	1.99		mg/Kg-dry	1	3/26/2019 1:49:29 PM

Sample Moisture (Percent Moisture)

Batch ID: R50211

Analyst: CJ

Percent Moisture	82.4			wt%	1	3/22/2019 8:21:33 AM
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Client: Floyd | Snider

Collection Date: 3/20/2019 3:27:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-005

Matrix: Sediment

Client Sample ID: TOC-SS-11-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Total Organic Carbon by EPA 9060

Batch ID: 23907 Analyst: GM

Total Organic Carbon	6.68	0.0750		%-dry	1	3/22/2019 8:07:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 23921 Analyst: GM

Nitrogen, Ammonia	17.9	5.67		mg/Kg-dry	1	3/22/2019 8:50:00 AM
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Total Solids

Batch ID: R50744 Analyst: CW

Total Solids	17.6			wt%	1	4/15/2019 3:48:52 PM
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Client: Floyd | Snider

Collection Date: 3/20/2019 10:30:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-006

Matrix: Sediment

Client Sample ID: SB-SS-01-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 24121

Analyst: SB

Aroclor 1016	ND	0.00138	MDL	mg/Kg-dry	1	4/10/2019 3:04:27 PM
Aroclor 1221	ND	0.00138	MDL	mg/Kg-dry	1	4/10/2019 3:04:27 PM
Aroclor 1232	ND	0.00138	MDL	mg/Kg-dry	1	4/10/2019 3:04:27 PM
Aroclor 1242	ND	0.00138	MDL	mg/Kg-dry	1	4/10/2019 3:04:27 PM
Aroclor 1248	ND	0.00241	MDL	mg/Kg-dry	1	4/10/2019 3:04:27 PM
Aroclor 1254	ND	0.00241	MDL	mg/Kg-dry	1	4/10/2019 3:04:27 PM
Aroclor 1260	0.0232	0.00241	MDL	mg/Kg-dry	1	4/10/2019 3:04:27 PM
Aroclor 1268	ND	0.00241	MDL	mg/Kg-dry	1	4/10/2019 3:04:27 PM
Total PCBs	0.0232	0.00241	MDL	mg/Kg-dry	1	4/10/2019 3:04:27 PM
Surr: Decachlorobiphenyl	26.3	30.8 - 168	S	%Rec	1	4/10/2019 3:04:27 PM
Surr: Tetrachloro-m-xylene	31.0	30.3 - 157		%Rec	1	4/10/2019 3:04:27 PM

NOTES:

Tetrabutylammonium sulfite cleanup

S - Outlying surrogate recovery(ies) observed.

MDL - Analyte reported to Method Detection Limit (MDL)

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23956

Analyst: DW

Diesel (Fuel Oil)	ND	42.4		mg/Kg-dry	1	3/27/2019 5:25:36 AM
Heavy Oil	815	106		mg/Kg-dry	1	3/27/2019 5:25:36 AM
Surr: 2-Fluorobiphenyl	97.8	50 - 150		%Rec	1	3/27/2019 5:25:36 AM
Surr: o-Terphenyl	99.2	50 - 150		%Rec	1	3/27/2019 5:25:36 AM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benzoic acid	ND	495		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Phenol	ND	99.0		µg/Kg-dry	1	3/29/2019 10:16:16 PM
3&4-Methylphenol (m, p-cresol)	ND	99.0		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Naphthalene	362	39.6		µg/Kg-dry	1	3/29/2019 10:16:16 PM
2-Methylnaphthalene	105	39.6		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Acenaphthene	93.0	39.6		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Acenaphthylene	96.6	39.6		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Dibenzofuran	126	74.2	*	µg/Kg-dry	1	3/29/2019 10:16:16 PM
Fluorene	169	39.6		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Pentachlorophenol	ND	99.0		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Phenanthrene	635	39.6		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Anthracene	195	39.6		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Carbazole	74.3	74.2		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Di-n-butylphthalate	ND	99.0		µg/Kg-dry	1	3/29/2019 10:16:16 PM



Client: Floyd | Snider

Collection Date: 3/20/2019 10:30:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-006

Matrix: Sediment

Client Sample ID: SB-SS-01-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Fluoranthene	1,360	39.6		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Pyrene	1,440	39.6		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Benzo(a)anthracene	580	39.6		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Chrysene	819	39.6		µg/Kg-dry	1	3/29/2019 10:16:16 PM
bis (2-Ethylhexyl) phthalate	495	99.0		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Di-n-octyl phthalate	60.4	11.1	MDL, J	µg/Kg-dry	1	3/29/2019 10:16:16 PM
Benzo(b)fluoranthene	647	39.6	*	µg/Kg-dry	1	3/29/2019 10:16:16 PM
Benzo(k)fluoranthene	587	39.6		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Benzo(a)pyrene	769	39.6		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Indeno(1,2,3-cd)pyrene	395	39.6		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Dibenz(a,h)anthracene	205	39.6		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Benzo(g,h,i)perylene	516	39.6		µg/Kg-dry	1	3/29/2019 10:16:16 PM
Surr: 2,4,6-Tribromophenol	79.9	14.8 - 165		%Rec	1	3/29/2019 10:16:16 PM
Surr: 2-Fluorobiphenyl	58.5	17.8 - 151		%Rec	1	3/29/2019 10:16:16 PM
Surr: Nitrobenzene-d5	47.7	12.5 - 163		%Rec	1	3/29/2019 10:16:16 PM
Surr: Phenol-d6	58.7	11.6 - 133		%Rec	1	3/29/2019 10:16:16 PM
Surr: p-Terphenyl	75.2	22 - 176		%Rec	1	3/29/2019 10:16:16 PM

NOTES:

* - Flagged value is not within established control limits.
MDL - Analyte reported to Method Detection Limit (MDL)

Mercury by EPA Method 7471

Batch ID: 23916

Analyst: WF

Mercury	0.832	0.656	D	mg/Kg-dry	5	3/21/2019 6:05:59 PM
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Total Metals by EPA Method 6020

Batch ID: 23940

Analyst: WC

Arsenic	31.2	0.390		mg/Kg-dry	1	3/26/2019 1:53:31 PM
Cadmium	0.653	0.312		mg/Kg-dry	1	3/26/2019 1:53:31 PM
Chromium	49.2	0.156		mg/Kg-dry	1	3/26/2019 1:53:31 PM
Copper	233	0.312		mg/Kg-dry	1	3/26/2019 1:53:31 PM
Lead	163	0.312		mg/Kg-dry	1	3/26/2019 1:53:31 PM
Nickel	35.4	0.780		mg/Kg-dry	1	3/26/2019 1:53:31 PM
Selenium	1.56	0.780		mg/Kg-dry	1	3/26/2019 1:53:31 PM
Silver	0.330	0.156		mg/Kg-dry	1	3/26/2019 1:53:31 PM
Zinc	368	0.780		mg/Kg-dry	1	3/26/2019 1:53:31 PM



Client: Floyd | Snider

Collection Date: 3/20/2019 10:30:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-006

Matrix: Sediment

Client Sample ID: SB-SS-01-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Sample Moisture (Percent Moisture)

Batch ID: R50211 Analyst: CJ

Percent Moisture	54.9			wt%	1	3/22/2019 8:21:33 AM
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Total Organic Carbon by EPA 9060

Batch ID: 23907 Analyst: GM

Total Organic Carbon	4.26	0.0750		%-dry	1	3/22/2019 7:11:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 23921 Analyst: GM

Nitrogen, Ammonia	13.7	2.09		mg/Kg-dry	1	3/22/2019 8:50:00 AM
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Total Solids

Batch ID: R50744 Analyst: CW

Total Solids	45.1			wt%	1	4/15/2019 3:48:52 PM
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Client: Floyd | Snider

Collection Date: 3/20/2019 11:10:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-007

Matrix: Sediment

Client Sample ID: SB-SS-02-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 23976

Analyst: SB

Aroclor 1016	ND	0.00214	MDL	mg/Kg-dry	1	3/27/2019 10:37:09 PM
Aroclor 1221	ND	0.00214	MDL	mg/Kg-dry	1	3/27/2019 10:37:09 PM
Aroclor 1232	ND	0.00214	MDL	mg/Kg-dry	1	3/27/2019 10:37:09 PM
Aroclor 1242	ND	0.00214	MDL	mg/Kg-dry	1	3/27/2019 10:37:09 PM
Aroclor 1248	ND	0.00375	MDL	mg/Kg-dry	1	3/27/2019 10:37:09 PM
Aroclor 1254	ND	0.00375	MDL	mg/Kg-dry	1	3/27/2019 10:37:09 PM
Aroclor 1260	ND	0.00375	MDL	mg/Kg-dry	1	3/27/2019 10:37:09 PM
Aroclor 1268	ND	0.00375	MDL	mg/Kg-dry	1	3/27/2019 10:37:09 PM
Total PCBs	ND	0.00375	MDL	mg/Kg-dry	1	3/27/2019 10:37:09 PM
Surr: Decachlorobiphenyl	97.5	30.8 - 168		%Rec	1	3/27/2019 10:37:09 PM
Surr: Tetrachloro-m-xylene	119	30.3 - 157		%Rec	1	3/27/2019 10:37:09 PM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23956

Analyst: DW

Diesel (Fuel Oil)	ND	28.3		mg/Kg-dry	1	3/27/2019 5:55:17 AM
Heavy Oil	ND	70.8		mg/Kg-dry	1	3/27/2019 5:55:17 AM
Surr: 2-Fluorobiphenyl	98.2	50 - 150		%Rec	1	3/27/2019 5:55:17 AM
Surr: o-Terphenyl	99.6	50 - 150		%Rec	1	3/27/2019 5:55:17 AM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benzoic acid	ND	499		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Phenol	ND	99.9		µg/Kg-dry	1	3/29/2019 10:38:26 PM
3&4-Methylphenol (m, p-cresol)	ND	99.9		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Naphthalene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM
2-Methylnaphthalene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Acenaphthene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Acenaphthylene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Dibenzofuran	ND	74.9		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Fluorene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Pentachlorophenol	ND	99.9		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Phenanthrene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Anthracene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Carbazole	ND	74.9		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Di-n-butylphthalate	ND	99.9		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Fluoranthene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Pyrene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM



Client: Floyd | Snider

Collection Date: 3/20/2019 11:10:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-007

Matrix: Sediment

Client Sample ID: SB-SS-02-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benz(a)anthracene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Chrysene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM
bis (2-Ethylhexyl) phthalate	ND	99.9		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Di-n-octyl phthalate	ND	11.2	MDL	µg/Kg-dry	1	3/29/2019 10:38:26 PM
Benzo(b)fluoranthene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Benzo(k)fluoranthene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Benzo(a)pyrene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Indeno(1,2,3-cd)pyrene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Dibenz(a,h)anthracene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Benzo(g,h,i)perylene	ND	40.0		µg/Kg-dry	1	3/29/2019 10:38:26 PM
Surr: 2,4,6-Tribromophenol	88.8	14.8 - 165		%Rec	1	3/29/2019 10:38:26 PM
Surr: 2-Fluorobiphenyl	64.3	17.8 - 151		%Rec	1	3/29/2019 10:38:26 PM
Surr: Nitrobenzene-d5	57.6	12.5 - 163		%Rec	1	3/29/2019 10:38:26 PM
Surr: Phenol-d6	69.3	11.6 - 133		%Rec	1	3/29/2019 10:38:26 PM
Surr: p-Terphenyl	81.0	22 - 176		%Rec	1	3/29/2019 10:38:26 PM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Mercury by EPA Method 7471

Batch ID: 23916

Analyst: WF

Mercury	ND	0.0909		mg/Kg-dry	1	3/21/2019 6:07:36 PM
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Total Metals by EPA Method 6020

Batch ID: 23940

Analyst: WC

Arsenic	4.60	0.279		mg/Kg-dry	1	3/26/2019 1:57:32 PM
Cadmium	ND	0.224		mg/Kg-dry	1	3/26/2019 1:57:32 PM
Chromium	34.9	0.112		mg/Kg-dry	1	3/26/2019 1:57:32 PM
Copper	22.7	0.224		mg/Kg-dry	1	3/26/2019 1:57:32 PM
Lead	5.58	0.224		mg/Kg-dry	1	3/26/2019 1:57:32 PM
Nickel	35.7	0.559		mg/Kg-dry	1	3/26/2019 1:57:32 PM
Selenium	1.19	0.559		mg/Kg-dry	1	3/26/2019 1:57:32 PM
Silver	ND	0.112		mg/Kg-dry	1	3/26/2019 1:57:32 PM
Zinc	50.4	0.559		mg/Kg-dry	1	3/26/2019 1:57:32 PM

Sample Moisture (Percent Moisture)

Batch ID: R50211

Analyst: CJ

Percent Moisture	34.2			wt%	1	3/22/2019 8:21:33 AM
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Client: Floyd | Snider

Collection Date: 3/20/2019 11:10:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-007

Matrix: Sediment

Client Sample ID: SB-SS-02-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Total Organic Carbon by EPA 9060

Batch ID: 23907 Analyst: GM

Total Organic Carbon	0.742	0.0750		%-dry	1	3/22/2019 7:27:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 23921 Analyst: GM

Nitrogen, Ammonia	8.83	1.48		mg/Kg-dry	1	3/22/2019 8:50:00 AM
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Total Solids

Batch ID: R50744 Analyst: CW

Total Solids	65.8			wt%	1	4/15/2019 3:48:52 PM
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Client: Floyd | Snider

Collection Date: 3/20/2019 11:52:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-008

Matrix: Sediment

Client Sample ID: SB-SS-03-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 23976

Analyst: SB

Aroclor 1016	ND	0.00307	MDL	mg/Kg-dry	1	3/27/2019 10:46:51 PM
Aroclor 1221	ND	0.00307	MDL	mg/Kg-dry	1	3/27/2019 10:46:51 PM
Aroclor 1232	ND	0.00307	MDL	mg/Kg-dry	1	3/27/2019 10:46:51 PM
Aroclor 1242	ND	0.00307	MDL	mg/Kg-dry	1	3/27/2019 10:46:51 PM
Aroclor 1248	ND	0.00537	MDL	mg/Kg-dry	1	3/27/2019 10:46:51 PM
Aroclor 1254	ND	0.00537	MDL	mg/Kg-dry	1	3/27/2019 10:46:51 PM
Aroclor 1260	ND	0.00537	MDL	mg/Kg-dry	1	3/27/2019 10:46:51 PM
Aroclor 1268	ND	0.00537	MDL	mg/Kg-dry	1	3/27/2019 10:46:51 PM
Total PCBs	ND	0.00537	MDL	mg/Kg-dry	1	3/27/2019 10:46:51 PM
Surr: Decachlorobiphenyl	58.9	30.8 - 168		%Rec	1	3/27/2019 10:46:51 PM
Surr: Tetrachloro-m-xylene	55.6	30.3 - 157		%Rec	1	3/27/2019 10:46:51 PM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23956

Analyst: DW

Diesel (Fuel Oil)	51.1	48.6		mg/Kg-dry	1	3/27/2019 4:26:16 PM
Heavy Oil	453	121		mg/Kg-dry	1	3/27/2019 4:26:16 PM
Surr: 2-Fluorobiphenyl	78.9	50 - 150		%Rec	1	3/27/2019 4:26:16 PM
Surr: o-Terphenyl	84.1	50 - 150		%Rec	1	3/27/2019 4:26:16 PM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benzoic acid	ND	499		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Phenol	ND	99.8		µg/Kg-dry	1	3/29/2019 11:00:36 PM
3&4-Methylphenol (m, p-cresol)	ND	99.8		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Naphthalene	45.0	39.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
2-Methylnaphthalene	ND	39.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Acenaphthene	51.7	39.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Acenaphthylene	52.0	39.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Dibenzofuran	ND	74.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Fluorene	65.6	39.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Pentachlorophenol	ND	99.8		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Phenanthrene	466	39.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Anthracene	176	39.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Carbazole	215	74.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Di-n-butylphthalate	ND	99.8		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Fluoranthene	1,040	39.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Pyrene	952	39.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM



Client: Floyd | Snider

Collection Date: 3/20/2019 11:52:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-008

Matrix: Sediment

Client Sample ID: SB-SS-03-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benz(a)anthracene	878	39.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Chrysene	1,030	39.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
bis (2-Ethylhexyl) phthalate	233	99.8		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Di-n-octyl phthalate	ND	11.2	MDL	µg/Kg-dry	1	3/29/2019 11:00:36 PM
Benzo(b)fluoranthene	1,150	39.9	*	µg/Kg-dry	1	3/29/2019 11:00:36 PM
Benzo(k)fluoranthene	1,310	39.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Benzo(a)pyrene	1,750	39.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Indeno(1,2,3-cd)pyrene	1,140	39.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Dibenz(a,h)anthracene	545	39.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Benzo(g,h,i)perylene	1,180	39.9		µg/Kg-dry	1	3/29/2019 11:00:36 PM
Surr: 2,4,6-Tribromophenol	123	14.8 - 165		%Rec	1	3/29/2019 11:00:36 PM
Surr: 2-Fluorobiphenyl	35.6	17.8 - 151		%Rec	1	3/29/2019 11:00:36 PM
Surr: Nitrobenzene-d5	47.3	12.5 - 163		%Rec	1	3/29/2019 11:00:36 PM
Surr: Phenol-d6	78.4	11.6 - 133		%Rec	1	3/29/2019 11:00:36 PM
Surr: p-Terphenyl	127	22 - 176		%Rec	1	3/29/2019 11:00:36 PM

NOTES:

* - Flagged value is not within established control limits.

MDL - Analyte reported to Method Detection Limit (MDL)

Mercury by EPA Method 7471

Batch ID: 23916

Analyst: WF

Mercury	0.536	0.307	D	mg/Kg-dry	2	3/21/2019 6:15:43 PM
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Total Metals by EPA Method 6020

Batch ID: 23940

Analyst: WC

Arsenic	11.5	0.470		mg/Kg-dry	1	3/26/2019 2:01:34 PM
Cadmium	ND	0.376		mg/Kg-dry	1	3/26/2019 2:01:34 PM
Chromium	28.6	0.188		mg/Kg-dry	1	3/26/2019 2:01:34 PM
Copper	151	0.376		mg/Kg-dry	1	3/26/2019 2:01:34 PM
Lead	65.0	0.376		mg/Kg-dry	1	3/26/2019 2:01:34 PM
Nickel	22.6	0.940		mg/Kg-dry	1	3/26/2019 2:01:34 PM
Selenium	0.971	0.940		mg/Kg-dry	1	3/26/2019 2:01:34 PM
Silver	0.199	0.188		mg/Kg-dry	1	3/26/2019 2:01:34 PM
Zinc	174	0.940		mg/Kg-dry	1	3/26/2019 2:01:34 PM

Sample Moisture (Percent Moisture)

Batch ID: R50211

Analyst: CJ

Percent Moisture	61.7			wt%	1	3/22/2019 8:21:33 AM
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Client: Floyd | Snider

Collection Date: 3/20/2019 11:52:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-008

Matrix: Sediment

Client Sample ID: SB-SS-03-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Total Organic Carbon by EPA 9060

Batch ID: 23907 Analyst: GM

Total Organic Carbon	6.04	0.0750		%-dry	1	3/22/2019 8:23:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 23921 Analyst: GM

Nitrogen, Ammonia	6.52	2.59		mg/Kg-dry	1	3/22/2019 8:50:00 AM
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Total Solids

Batch ID: R50744 Analyst: CW

Total Solids	38.3			wt%	1	4/15/2019 3:48:52 PM
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Client: Floyd | Snider

Collection Date: 3/20/2019 3:35:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-009

Matrix: Sediment

Client Sample ID: TOC-SS-111-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 24121

Analyst: SB

Aroclor 1016	ND	0.00285	MDL	mg/Kg-dry	1	4/10/2019 3:14:13 PM
Aroclor 1221	ND	0.00285	MDL	mg/Kg-dry	1	4/10/2019 3:14:13 PM
Aroclor 1232	ND	0.00285	MDL	mg/Kg-dry	1	4/10/2019 3:14:13 PM
Aroclor 1242	ND	0.00285	MDL	mg/Kg-dry	1	4/10/2019 3:14:13 PM
Aroclor 1248	ND	0.00499	MDL	mg/Kg-dry	1	4/10/2019 3:14:13 PM
Aroclor 1254	ND	0.00499	MDL	mg/Kg-dry	1	4/10/2019 3:14:13 PM
Aroclor 1260	0.00878	0.00499	MDL	mg/Kg-dry	1	4/10/2019 3:14:13 PM
Aroclor 1268	ND	0.00499	MDL	mg/Kg-dry	1	4/10/2019 3:14:13 PM
Total PCBs	0.00878	0.00499	MDL	mg/Kg-dry	1	4/10/2019 3:14:13 PM
Surr: Decachlorobiphenyl	22.2	30.8 - 168	S	%Rec	1	4/10/2019 3:14:13 PM
Surr: Tetrachloro-m-xylene	25.4	30.3 - 157	S	%Rec	1	4/10/2019 3:14:13 PM

NOTES:

Tetrabutylammonium sulfite cleanup

S - Outlying surrogate recoveries were associated with this sample.

MDL - Analyte reported to Method Detection Limit (MDL)

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23956

Analyst: DW

Diesel (Fuel Oil)	ND	98.3		mg/Kg-dry	1	3/27/2019 3:56:09 PM
Heavy Oil	1,550	246		mg/Kg-dry	1	3/27/2019 3:56:09 PM
Surr: 2-Fluorobiphenyl	72.7	50 - 150		%Rec	1	3/27/2019 3:56:09 PM
Surr: o-Terphenyl	77.7	50 - 150		%Rec	1	3/27/2019 3:56:09 PM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benzoic acid	ND	498		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Phenol	ND	99.5		µg/Kg-dry	1	3/29/2019 11:22:48 PM
3&4-Methylphenol (m, p-cresol)	ND	99.5		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Naphthalene	ND	39.8		µg/Kg-dry	1	3/29/2019 11:22:48 PM
2-Methylnaphthalene	ND	39.8		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Acenaphthene	ND	39.8		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Acenaphthylene	ND	39.8		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Dibenzofuran	ND	74.6		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Fluorene	ND	39.8		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Pentachlorophenol	ND	99.5		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Phenanthrene	169	39.8		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Anthracene	58.3	39.8		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Carbazole	ND	74.6		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Di-n-butylphthalate	ND	99.5		µg/Kg-dry	1	3/29/2019 11:22:48 PM

Client: Floyd | Snider

Collection Date: 3/20/2019 3:35:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-009

Matrix: Sediment

Client Sample ID: TOC-SS-111-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Fluoranthene	452	39.8		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Pyrene	385	39.8		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Benz(a)anthracene	197	39.8		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Chrysene	337	39.8		µg/Kg-dry	1	3/29/2019 11:22:48 PM
bis (2-Ethylhexyl) phthalate	163	99.5		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Di-n-octyl phthalate	ND	11.2	MDL	µg/Kg-dry	1	3/29/2019 11:22:48 PM
Benzo(b)fluoranthene	234	39.8	*	µg/Kg-dry	1	3/29/2019 11:22:48 PM
Benzo(k)fluoranthene	161	39.8		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Benzo(a)pyrene	237	39.8		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Indeno(1,2,3-cd)pyrene	150	39.8		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Dibenz(a,h)anthracene	52.1	39.8		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Benzo(g,h,i)perylene	161	39.8		µg/Kg-dry	1	3/29/2019 11:22:48 PM
Surr: 2,4,6-Tribromophenol	135	14.8 - 165		%Rec	1	3/29/2019 11:22:48 PM
Surr: 2-Fluorobiphenyl	98.8	17.8 - 151		%Rec	1	3/29/2019 11:22:48 PM
Surr: Nitrobenzene-d5	78.9	12.5 - 163		%Rec	1	3/29/2019 11:22:48 PM
Surr: Phenol-d6	98.9	11.6 - 133		%Rec	1	3/29/2019 11:22:48 PM
Surr: p-Terphenyl	117	22 - 176		%Rec	1	3/29/2019 11:22:48 PM

NOTES:

* - Flagged value is not within established control limits.

MDL - Analyte reported to Method Detection Limit (MDL)

Mercury by EPA Method 7471

Batch ID: 23916

Analyst: WF

Mercury	0.598	0.336		mg/Kg-dry	1	3/21/2019 6:10:52 PM
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Total Metals by EPA Method 6020

Batch ID: 23940

Analyst: WC

Arsenic	16.7	1.07		mg/Kg-dry	1	3/26/2019 2:05:35 PM
Cadmium	0.882	0.853		mg/Kg-dry	1	3/26/2019 2:05:35 PM
Chromium	49.1	0.427		mg/Kg-dry	1	3/26/2019 2:05:35 PM
Copper	303	0.853		mg/Kg-dry	1	3/26/2019 2:05:35 PM
Lead	141	0.853		mg/Kg-dry	1	3/26/2019 2:05:35 PM
Nickel	38.3	2.13		mg/Kg-dry	1	3/26/2019 2:05:35 PM
Selenium	ND	2.13		mg/Kg-dry	1	3/26/2019 2:05:35 PM
Silver	ND	0.427		mg/Kg-dry	1	3/26/2019 2:05:35 PM
Zinc	628	2.13		mg/Kg-dry	1	3/26/2019 2:05:35 PM



Client: Floyd | Snider

Collection Date: 3/20/2019 3:35:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903305-009

Matrix: Sediment

Client Sample ID: TOC-SS-111-0-10

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Sample Moisture (Percent Moisture)

Batch ID: R50211 Analyst: CJ

Percent Moisture	83.0			wt%	1	3/22/2019 8:21:33 AM
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Total Organic Carbon by EPA 9060

Batch ID: 23907 Analyst: GM

Total Organic Carbon	5.69	0.0750		%-dry	1	3/22/2019 8:34:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 23921 Analyst: GM

Nitrogen, Ammonia	33.8	5.81		mg/Kg-dry	1	3/22/2019 8:50:00 AM
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Total Solids

Batch ID: R50744 Analyst: CW

Total Solids	17.0			wt%	1	4/15/2019 3:48:52 PM
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April 10, 2019

FAL Project 12280

Mr. Michael Ridgeway
Fremont Analytical, Inc.
3600 Fremont Ave., N.
Seattle, WA 98103

Dear Mr. Ridgeway,

The following results are associated with Frontier Analytical Laboratory project **12280**. This corresponds to your project number **1903305**. Nine sediment samples were received on 3/27/2019 at Frontier Analytical Laboratory in good condition. The samples were extracted and analyzed by EPA Method 1613 for tetra through octa chlorinated dibenzo dioxin and furans. The Toxic Equivalency (TEQ) for your samples has been calculated using the 2005 World Health Organization's (WHO's) toxic equivalency factors (TEFs). Fremont Analytical, Inc. requested a turnaround time of fifteen business days for project **12280**.

The following report consists of an Analytical Data section and a Sample Receipt section. The Analytical Data section contains our sample tracking log and the analytical results. The Sample Receipt section contains your chain of custody, our sample login form and a sample photo. The enclosed results are specifically for the samples referenced in this report only. These results shall not be reproduced except in full. Frontier Analytical Laboratory's State of Oregon NELAP certificate number is **4041**. Our State of California ELAP certificate number is **2934**. This report along with the associated electronic data deliverables have been emailed to you as a portable document format (PDF) file. A hardcopy will not be sent to you unless specifically requested.

If you have any questions regarding project **12280**, please feel free to contact me at 916-934-0900. Thank you for choosing Frontier Analytical Laboratory for your analytical testing needs.

Sincerely,



Thomas C. Crabtree
Director

Frontier Analytical Laboratory

Sample Tracking Log

FAL Project ID: 12280

Received on: 03/27/2019

Project Due: 04/18/2019

Storage: R-4

FAL Sample ID	Dup	Client Project ID	Client Sample ID	Requested Method	Matrix	Sampling Date	Sampling Time	Hold Time Due Date
12280-001-SA	0	1903305	TOC-SS-07-0-10	EPA 1613 D/F	Sediment	03/20/2019	12:33 pm	03/19/2020
12280-002-SA	0	1903305	TOC-SS-08-0-10	EPA 1613 D/F	Sediment	03/20/2019	01:10 pm	03/19/2020
12280-003-SA	0	1903305	TOC-SS-09-0-10	EPA 1613 D/F	Sediment	03/20/2019	01:50 pm	03/19/2020
12280-004-SA	0	1903305	TOC-SS-10-0-10	EPA 1613 D/F	Sediment	03/20/2019	02:47 pm	03/19/2020
12280-005-SA	0	1903305	TOC-SS-11-0-10	EPA 1613 D/F	Sediment	03/20/2019	03:27 pm	03/19/2020
12280-006-SA	0	1903305	SB-SS-01-0-10	EPA 1613 D/F	Sediment	03/20/2019	10:30 am	03/19/2020
12280-007-SA	0	1903305	SB-SS-02-0-10	EPA 1613 D/F	Sediment	03/20/2019	11:10 am	03/19/2020
12280-008-SA	0	1903305	SB-SS-03-0-10	EPA 1613 D/F	Sediment	03/20/2019	11:52 am	03/19/2020
12280-009-SA	0	1903305	TOC-SS-111-0-10	EPA 1613 D/F	Sediment	03/20/2019	03:35 pm	03/19/2020

EPA Method 1613
PCDD/F



FAL ID: 12280-001-MB
Client ID: Method Blank
Matrix: Sediment
Batch No: X4851

Date Extracted: 04-03-2019
Date Received: NA
Amount: 5.00 g

ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: pg/g


Acquired: 04-04-2019
2005 WHO TEQ: 0.0
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.146		-	0.0331				
1,2,3,7,8-PeCDD	ND	0.183		-	0.0536				
1,2,3,4,7,8-HxCDD	ND	0.369		-	0.0540				
1,2,3,6,7,8-HxCDD	ND	0.372		-	0.0538	Total TCDD	ND	0.146	
1,2,3,7,8,9-HxCDD	ND	0.356		-	0.0518	Total PeCDD	ND	0.183	
1,2,3,4,6,7,8-HpCDD	ND	0.416		-	0.0695	Total HxCDD	ND	0.372	
OCDD	ND	0.535		-	0.116	Total HpCDD	ND	0.416	
2,3,7,8-TCDF	ND	0.117		-	0.0345				
1,2,3,7,8-PeCDF	ND	0.174		-	0.0417				
2,3,4,7,8-PeCDF	ND	0.180		-	0.0449				
1,2,3,4,7,8-HxCDF	ND	0.245		-	0.0351				
1,2,3,6,7,8-HxCDF	ND	0.253		-	0.0382				
2,3,4,6,7,8-HxCDF	ND	0.264		-	0.0379				
1,2,3,7,8,9-HxCDF	ND	0.312		-	0.0423	Total TCDF	ND	0.117	
1,2,3,4,6,7,8-HpCDF	ND	0.281		-	0.0415	Total PeCDF	ND	0.180	
1,2,3,4,7,8,9-HpCDF	ND	0.340		-	0.0532	Total HxCDF	ND	0.312	
OCDF	ND	0.422		-	0.0833	Total HpCDF	ND	0.340	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	86.3	25.0 - 164	
13C-1,2,3,7,8-PeCDD	85.5	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	79.4	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	79.1	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	84.7	23.0 - 140	
13C-OCDD	73.2	17.0 - 157	
13C-2,3,7,8-TCDF	87.7	24.0 - 169	
13C-1,2,3,7,8-PeCDF	84.0	24.0 - 185	
13C-2,3,4,7,8-PeCDF	87.1	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	93.5	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	89.2	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	91.4	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	98.3	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	82.5	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	91.2	26.0 - 138	
13C-OCDF	88.2	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	78.8	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/9/2019

Reviewed By: 
Date: 4/9/2019

EPA Method 1613
PCDD/F



FAL ID: 12280-001-OPR
Client ID: OPR
Matrix: Sediment
Batch No: X4851

Date Extracted: 04-03-2019
Date Received: NA
Amount: 5.00 g


ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: ng/ml

Acquired: 04-04-2019
2005 WHO TEQ: NA

Compound	Conc	QC Limits	Qual
2,3,7,8-TCDD	9.96	6.70 - 15.8	
1,2,3,7,8-PeCDD	51.7	35.0 - 71.0	
1,2,3,4,7,8-HxCDD	52.8	35.0 - 82.0	
1,2,3,6,7,8-HxCDD	54.0	38.0 - 67.0	
1,2,3,7,8,9-HxCDD	54.8	32.0 - 81.0	
1,2,3,4,6,7,8-HpCDD	54.1	35.0 - 70.0	
OCDD	104	78.0 - 144	
2,3,7,8-TCDF	10.7	7.50 - 15.8	
1,2,3,7,8-PeCDF	47.5	40.0 - 67.0	
2,3,4,7,8-PeCDF	48.4	34.0 - 80.0	
1,2,3,4,7,8-HxCDF	46.0	36.0 - 67.0	
1,2,3,6,7,8-HxCDF	47.8	42.0 - 65.0	
2,3,4,6,7,8-HxCDF	47.6	35.0 - 78.0	
1,2,3,7,8,9-HxCDF	49.5	39.0 - 65.0	
1,2,3,4,6,7,8-HpCDF	49.4	41.0 - 61.0	
1,2,3,4,7,8,9-HpCDF	49.6	39.0 - 69.0	
OCDF	94.0	63.0 - 170	
Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	97.3	20.0 - 175	
13C-1,2,3,7,8-PeCDD	96.4	21.0 - 227	
13C-1,2,3,4,7,8-HxCDD	90.6	21.0 - 193	
13C-1,2,3,6,7,8-HxCDD	89.4	25.0 - 163	
13C-1,2,3,4,6,7,8-HpCDD	96.8	26.0 - 166	
13C-OCDD	81.9	13.0 - 198	
13C-2,3,7,8-TCDF	97.0	22.0 - 152	
13C-1,2,3,7,8-PeCDF	92.8	21.0 - 192	
13C-2,3,4,7,8-PeCDF	95.6	13.0 - 328	
13C-1,2,3,4,7,8-HxCDF	106	19.0 - 202	
13C-1,2,3,6,7,8-HxCDF	99.4	21.0 - 159	
13C-2,3,4,6,7,8-HxCDF	103	22.0 - 176	
13C-1,2,3,7,8,9-HxCDF	112	17.0 - 205	
13C-1,2,3,4,6,7,8-HpCDF	93.1	21.0 - 158	
13C-1,2,3,4,7,8,9-HpCDF	105	20.0 - 186	
13C-OCDF	98.1	13.0 - 198	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	89.4	31.0 - 191	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/9/2019

Reviewed By: 
Date: 4/9/2019

EPA Method 1613
PCDD/F



FAL ID: 12280-001-SA
Client ID: TOC-SS-07-0-10
Matrix: Sediment
Batch No: X4851

Date Extracted: 04-03-2019
Date Received: 03-27-2019
Amount: 5.01 g
% Solids: 28.35

ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: pg/g


Acquired: 04-04-2019
2005 WHO TEQ: 53.7
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.66	-		1.66	0.0331				
1,2,3,7,8-PeCDD	8.18	-		8.18	0.0536				
1,2,3,4,7,8-HxCDD	15.4	-		1.54	0.0540				
1,2,3,6,7,8-HxCDD	53.7	-		5.37	0.0538	Total TCDD	56.0	-	
1,2,3,7,8,9-HxCDD	32.7	-		3.27	0.0518	Total PeCDD	94.1	-	
1,2,3,4,6,7,8-HpCDD	1470	-		14.7	0.0695	Total HxCDD	510	-	
OCDD	14700	-		4.41	0.116	Total HpCDD	4220	-	
2,3,7,8-TCDF	10.6	-	F	1.06	0.0345				
1,2,3,7,8-PeCDF	4.84	-	J	0.145	0.0417				
2,3,4,7,8-PeCDF	19.4	-		5.82	0.0449				
1,2,3,4,7,8-HxCDF	13.0	-		1.30	0.0351				
1,2,3,6,7,8-HxCDF	12.7	-		1.27	0.0382				
2,3,4,6,7,8-HxCDF	17.1	-		1.71	0.0379				
1,2,3,7,8,9-HxCDF	4.92	-	J	0.492	0.0423	Total TCDF	225	-	D,M
1,2,3,4,6,7,8-HpCDF	248	-		2.48	0.0415	Total PeCDF	261	-	D,M
1,2,3,4,7,8,9-HpCDF	13.0	-		0.130	0.0532	Total HxCDF	347	-	D,M
OCDF	700	-		0.210	0.0833	Total HpCDF	781	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	91.3	25.0 - 164	
13C-1,2,3,7,8-PeCDD	91.7	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	84.3	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	83.3	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	90.3	23.0 - 140	
13C-OCDD	91.7	17.0 - 157	
13C-2,3,7,8-TCDF	93.3	24.0 - 169	
13C-1,2,3,7,8-PeCDF	84.5	24.0 - 185	
13C-2,3,4,7,8-PeCDF	90.4	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	96.5	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	93.4	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	96.9	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	102	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	85.0	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	96.0	26.0 - 138	
13C-OCDF	96.9	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	83.9	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/9/2019

Reviewed By: 
Date: 4/9/2019

EPA Method 1613
PCDD/F



FAL ID: 12280-002-SA
Client ID: TOC-SS-08-0-10
Matrix: Sediment
Batch No: X4851

Date Extracted: 04-03-2019
Date Received: 03-27-2019
Amount: 5.03 g
% Solids: 63.57

ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: pg/g


Acquired: 04-04-2019
2005 WHO TEQ: 17.9
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	0.547	-	J	0.547	0.0331				
1,2,3,7,8-PeCDD	3.21	-	J	3.21	0.0536				
1,2,3,4,7,8-HxCDD	5.28	-		0.528	0.0540				
1,2,3,6,7,8-HxCDD	19.2	-		1.92	0.0538	Total TCDD	13.8		-
1,2,3,7,8,9-HxCDD	10.3	-		1.03	0.0518	Total PeCDD	30.0		-
1,2,3,4,6,7,8-HpCDD	535	-		5.35	0.0695	Total HxCDD	207		-
OCDD	4200	-		1.26	0.116	Total HpCDD	1750		-
2,3,7,8-TCDF	3.30	-	F	0.330	0.0345				
1,2,3,7,8-PeCDF	1.49	-	J	0.0447	0.0417				
2,3,4,7,8-PeCDF	5.42	-		1.63	0.0449				
1,2,3,4,7,8-HxCDF	3.70	-	J	0.370	0.0351				
1,2,3,6,7,8-HxCDF	3.39	-	J	0.339	0.0382				
2,3,4,6,7,8-HxCDF	4.64	-	J	0.464	0.0379				
1,2,3,7,8,9-HxCDF	1.43	-	J	0.143	0.0423	Total TCDF	52.6		- D,M
1,2,3,4,6,7,8-HpCDF	67.0	-		0.670	0.0415	Total PeCDF	41.1		-
1,2,3,4,7,8,9-HpCDF	3.88	-	J	0.0388	0.0532	Total HxCDF	85.7		-
OCDF	209	-		0.0627	0.0833	Total HpCDF	214		-

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	112	25.0 - 164	
13C-1,2,3,7,8-PeCDD	110	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	102	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	116	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	112	23.0 - 140	
13C-OCDD	110	17.0 - 157	
13C-2,3,7,8-TCDF	118	24.0 - 169	
13C-1,2,3,7,8-PeCDF	111	24.0 - 185	
13C-2,3,4,7,8-PeCDF	115	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	109	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	110	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	114	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	125	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	102	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	129	26.0 - 138	
13C-OCDF	124	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	102	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/9/2019

Reviewed By: 
Date: 4/9/2019

EPA Method 1613
PCDD/F



FAL ID: 12280-003-SA
Client ID: TOC-SS-09-0-10
Matrix: Sediment
Batch No: X4851

Date Extracted: 04-03-2019
Date Received: 03-27-2019
Amount: 5.02 g
% Solids: 70.73

ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: pg/g


Acquired: 04-04-2019
2005 WHO TEQ: 6.82
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.132		-	0.0331				
1,2,3,7,8-PeCDD	1.26	-	J	1.26	0.0536				
1,2,3,4,7,8-HxCDD	1.93	-	J	0.193	0.0540				
1,2,3,6,7,8-HxCDD	6.53	-		0.653	0.0538	Total TCDD	4.19	-	M
1,2,3,7,8,9-HxCDD	3.96	-	J	0.396	0.0518	Total PeCDD	9.48	-	
1,2,3,4,6,7,8-HpCDD	209	-		2.09	0.0695	Total HxCDD	69.0	-	
OCDD	1900	-		0.570	0.116	Total HpCDD	700	-	
2,3,7,8-TCDF	1.40	-		0.140	0.0345				
1,2,3,7,8-PeCDF	0.523	-	J	0.0157	0.0417				
2,3,4,7,8-PeCDF	2.18	-	J	0.654	0.0449				
1,2,3,4,7,8-HxCDF	1.37	-	J	0.137	0.0351				
1,2,3,6,7,8-HxCDF	1.25	-	J	0.125	0.0382				
2,3,4,6,7,8-HxCDF	1.84	-	J	0.184	0.0379				
1,2,3,7,8,9-HxCDF	0.688	-	J	0.0688	0.0423	Total TCDF	24.6	-	D,M
1,2,3,4,6,7,8-HpCDF	29.0	-		0.290	0.0415	Total PeCDF	26.4	-	
1,2,3,4,7,8,9-HpCDF	1.87	-	J	0.0187	0.0532	Total HxCDF	36.6	-	
OCDF	97.6	-		0.0293	0.0833	Total HpCDF	96.2	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	113	25.0 - 164	
13C-1,2,3,7,8-PeCDD	109	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	104	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	101	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	111	23.0 - 140	
13C-OCDD	107	17.0 - 157	
13C-2,3,7,8-TCDF	113	24.0 - 169	
13C-1,2,3,7,8-PeCDF	105	24.0 - 185	
13C-2,3,4,7,8-PeCDF	111	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	119	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	112	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	116	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	125	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	105	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	122	26.0 - 138	
13C-OCDF	122	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	103	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/9/2019

Reviewed By: 
Date: 4/9/2019

EPA Method 1613
PCDD/F



FAL ID: 12280-004-SA
Client ID: TOC-SS-10-0-10
Matrix: Sediment
Batch No: X4851

Date Extracted: 04-03-2019
Date Received: 03-27-2019
Amount: 5.03 g
% Solids: 70.68

ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: pg/g


Acquired: 04-04-2019
2005 WHO TEQ: 4.81
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.151		-	0.0315				
1,2,3,7,8-PeCDD	0.781	-	J	0.781	0.0422				
1,2,3,4,7,8-HxCDD	1.25	-	J	0.125	0.0660				
1,2,3,6,7,8-HxCDD	4.54	-	J	0.454	0.0670	Total TCDD	0.977	-	J
1,2,3,7,8,9-HxCDD	4.02	-	J	0.402	0.0640	Total PeCDD	4.45	-	J
1,2,3,4,6,7,8-HpCDD	143	-		1.43	0.0738	Total HxCDD	50.7	-	
OCDD	1340	-		0.402	0.122	Total HpCDD	493	-	
2,3,7,8-TCDF	1.00	-		0.100	0.0338				
1,2,3,7,8-PeCDF	0.443	-	J	0.0133	0.0434				
2,3,4,7,8-PeCDF	1.38	-	J	0.414	0.0460				
1,2,3,4,7,8-HxCDF	1.70	-	J	0.170	0.0468				
1,2,3,6,7,8-HxCDF	1.06	-	J	0.106	0.0458				
2,3,4,6,7,8-HxCDF	1.16	-	J	0.116	0.0482				
1,2,3,7,8,9-HxCDF	0.647	-	J	0.0647	0.0460	Total TCDF	8.78	-	
1,2,3,4,6,7,8-HpCDF	19.5	-		0.195	0.0595	Total PeCDF	6.49	-	
1,2,3,4,7,8,9-HpCDF	1.29	-	J	0.0129	0.0707	Total HxCDF	15.7	-	
OCDF	77.7	-		0.0233	0.143	Total HpCDF	62.5	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	111	25.0 - 164	
13C-1,2,3,7,8-PeCDD	101	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	53.8	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	62.3	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	71.0	23.0 - 140	
13C-OCDD	69.3	17.0 - 157	
13C-2,3,7,8-TCDF	117	24.0 - 169	
13C-1,2,3,7,8-PeCDF	111	24.0 - 185	
13C-2,3,4,7,8-PeCDF	108	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	45.1	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	45.5	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	109	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	129	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	37.5	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	87.4	26.0 - 138	
13C-OCDF	61.4	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	102	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/9/2019

Reviewed By: 
Date: 4/9/2019

EPA Method 1613
PCDD/F



FAL ID: 12280-005-SA
Client ID: TOC-SS-11-0-10
Matrix: Sediment
Batch No: X4851

Date Extracted: 04-03-2019
Date Received: 03-27-2019
Amount: 5.00 g
% Solids: 17.84

ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: pg/g


Acquired: 04-04-2019
2005 WHO TEQ: 47.1
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.14	-		1.14	0.0331				
1,2,3,7,8-PeCDD	7.21	-		7.21	0.0536				
1,2,3,4,7,8-HxCDD	14.6	-		1.46	0.0540				
1,2,3,6,7,8-HxCDD	49.8	-		4.98	0.0538	Total TCDD	30.8	-	
1,2,3,7,8,9-HxCDD	30.8	-		3.08	0.0518	Total PeCDD	71.3	-	
1,2,3,4,6,7,8-HpCDD	1390	-		13.9	0.0695	Total HxCDD	434	-	
OCDD	13000	-		3.90	0.116	Total HpCDD	3440	-	
2,3,7,8-TCDF	9.16	-	F	0.916	0.0345				
1,2,3,7,8-PeCDF	4.46	-	J	0.134	0.0417				
2,3,4,7,8-PeCDF	13.5	-		4.05	0.0449				
1,2,3,4,7,8-HxCDF	11.0	-		1.10	0.0351				
1,2,3,6,7,8-HxCDF	10.8	-		1.08	0.0382				
2,3,4,6,7,8-HxCDF	13.3	-		1.33	0.0379				
1,2,3,7,8,9-HxCDF	4.21	-	J	0.421	0.0423	Total TCDF	152	-	D,M
1,2,3,4,6,7,8-HpCDF	214	-		2.14	0.0415	Total PeCDF	187	-	D,M
1,2,3,4,7,8,9-HpCDF	11.1	-		0.111	0.0532	Total HxCDF	296	-	D,M
OCDF	608	-		0.182	0.0833	Total HpCDF	642	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	97.7	25.0 - 164	
13C-1,2,3,7,8-PeCDD	94.2	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	85.5	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	83.2	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	95.3	23.0 - 140	
13C-OCDD	102	17.0 - 157	
13C-2,3,7,8-TCDF	99.1	24.0 - 169	
13C-1,2,3,7,8-PeCDF	91.7	24.0 - 185	
13C-2,3,4,7,8-PeCDF	93.2	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	94.3	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	92.2	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	96.9	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	104	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	86.1	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	104	26.0 - 138	
13C-OCDF	109	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	89.4	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/9/2019

Reviewed By: 
Date: 4/9/2019

EPA Method 1613
PCDD/F



FAL ID: 12280-006-SA
Client ID: SB-SS-01-0-10
Matrix: Sediment
Batch No: X4851

Date Extracted: 04-03-2019
Date Received: 03-27-2019
Amount: 5.01 g
% Solids: 47.31


ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: pg/g

Acquired: 04-04-2019
2005 WHO TEQ: 39.1
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.32	-		1.32	0.0331				
1,2,3,7,8-PeCDD	5.93	-		5.93	0.0536				
1,2,3,4,7,8-HxCDD	9.68	-		0.968	0.0540				
1,2,3,6,7,8-HxCDD	38.8	-		3.88	0.0538	Total TCDD	69.0	-	
1,2,3,7,8,9-HxCDD	20.3	-		2.03	0.0518	Total PeCDD	83.0	-	
1,2,3,4,6,7,8-HpCDD	1020	-		10.2	0.0695	Total HxCDD	305	-	
OCDD	9830	-		2.95	0.116	Total HpCDD	2480	-	
2,3,7,8-TCDF	8.57	-	F	0.857	0.0345				
1,2,3,7,8-PeCDF	3.85	-	J	0.116	0.0417				
2,3,4,7,8-PeCDF	17.4	-		5.22	0.0449				
1,2,3,4,7,8-HxCDF	9.93	-		0.993	0.0351				
1,2,3,6,7,8-HxCDF	8.88	-		0.888	0.0382				
2,3,4,6,7,8-HxCDF	13.5	-		1.35	0.0379				
1,2,3,7,8,9-HpCDF	3.62	-	J	0.362	0.0423	Total TCDF	208	-	D,M
1,2,3,4,6,7,8-HpCDF	178	-		1.78	0.0415	Total PeCDF	219	-	D,M
1,2,3,4,7,8,9-HpCDF	9.02	-		0.0902	0.0532	Total HxCDF	266	-	D,M
OCDF	634	-		0.190	0.0833	Total HpCDF	605	-	
Internal Standards	% Rec	QC Limits	Qual						
13C-2,3,7,8-TCDD	106	25.0 - 164							
13C-1,2,3,7,8-PeCDD	105	25.0 - 181							
13C-1,2,3,4,7,8-HxCDD	94.1	32.0 - 141							
13C-1,2,3,6,7,8-HxCDD	91.8	28.0 - 130							
13C-1,2,3,4,6,7,8-HpCDD	105	23.0 - 140							
13C-OCDD	104	17.0 - 157							
13C-2,3,7,8-TCDF	112	24.0 - 169							
13C-1,2,3,7,8-PeCDF	104	24.0 - 185							
13C-2,3,4,7,8-PeCDF	109	21.0 - 178							
13C-1,2,3,4,7,8-HxCDF	107	26.0 - 152							
13C-1,2,3,6,7,8-HxCDF	103	26.0 - 123							
13C-2,3,4,6,7,8-HxCDF	105	28.0 - 136							
13C-1,2,3,7,8,9-HxCDF	119	29.0 - 147							
13C-1,2,3,4,6,7,8-HpCDF	97.1	28.0 - 143							
13C-1,2,3,4,7,8,9-HpCDF	114	26.0 - 138							
13C-OCDF	112	17.0 - 157							
Cleanup Surrogate									
37Cl-2,3,7,8-TCDD	99.8	35.0 - 197							

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/9/2019

Reviewed By: 
Date: 4/9/2019

EPA Method 1613
PCDD/F



FAL ID: 12280-007-SA
Client ID: SB-SS-02-0-10
Matrix: Sediment
Batch No: X4851

Date Extracted: 04-03-2019
Date Received: 03-27-2019
Amount: 5.02 g
% Solids: 66.79

ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: pg/g


Acquired: 04-05-2019
2005 WHO TEQ: 0.499
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.154		-	0.0331				
1,2,3,7,8-PeCDD	ND	0.217		-	0.0536				
1,2,3,4,7,8-HxCDD	ND	0.292		-	0.0540				
1,2,3,6,7,8-HxCDD	0.807	-	J	0.0807	0.0538	Total TCDD	9.11	-	
1,2,3,7,8,9-HxCDD	0.538	-	J	0.0538	0.0518	Total PeCDD	8.16	-	
1,2,3,4,6,7,8-HpCDD	14.9	-		0.149	0.0695	Total HxCDD	10.6	-	
OCDD	121	-		0.0363	0.116	Total HpCDD	37.6	-	
2,3,7,8-TCDF	0.391	-	J	0.0391	0.0345				
1,2,3,7,8-PeCDF	ND	0.170		-	0.0417				
2,3,4,7,8-PeCDF	0.377	-	J	0.113	0.0449				
1,2,3,4,7,8-HxCDF	ND	0.305		-	0.0351				
1,2,3,6,7,8-HxCDF	ND	0.309		-	0.0382				
2,3,4,6,7,8-HxCDF	ND	0.314		-	0.0379				
1,2,3,7,8,9-HxCDF	ND	0.359		-	0.0423	Total TCDF	5.51	-	
1,2,3,4,6,7,8-HpCDF	2.52	-	J	0.0252	0.0415	Total PeCDF	2.71	-	J
1,2,3,4,7,8,9-HpCDF	ND	0.329		-	0.0532	Total HxCDF	2.64	-	J
OCDF	6.27	-	J	0.00188	0.0833	Total HpCDF	7.58	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	113	25.0 - 164	
13C-1,2,3,7,8-PeCDD	110	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	101	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	99.3	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	111	23.0 - 140	
13C-OCDD	104	17.0 - 157	
13C-2,3,7,8-TCDF	110	24.0 - 169	
13C-1,2,3,7,8-PeCDF	106	24.0 - 185	
13C-2,3,4,7,8-PeCDF	108	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	113	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	109	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	115	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	126	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	101	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	121	26.0 - 138	
13C-OCDF	125	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	107	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/9/2019

Reviewed By: 
Date: 4/9/2019

EPA Method 1613
PCDD/F



FAL ID: 12280-008-SA
Client ID: SB-SS-03-0-10
Matrix: Sediment
Batch No: X4851

Date Extracted: 04-03-2019
Date Received: 03-27-2019
Amount: 5.01 g
% Solids: 32.84

ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: pg/g


Acquired: 04-05-2019
2005 WHO TEQ: 43.2
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.90	-		1.90	0.0331				
1,2,3,7,8-PeCDD	7.02	-		7.02	0.0536				
1,2,3,4,7,8-HxCDD	11.6	-		1.16	0.0540				
1,2,3,6,7,8-HxCDD	42.0	-		4.20	0.0538	Total TCDD	50.7	-	
1,2,3,7,8,9-HxCDD	24.4	-		2.44	0.0518	Total PeCDD	78.8	-	
1,2,3,4,6,7,8-HpCDD	1020	-		10.2	0.0695	Total HxCDD	346	-	
OCDD	9130	-		2.74	0.116	Total HpCDD	2540	-	
2,3,7,8-TCDF	13.3	-	F	1.33	0.0345				
1,2,3,7,8-PeCDF	5.46	-		0.164	0.0417				
2,3,4,7,8-PeCDF	20.7	-		6.21	0.0449				
1,2,3,4,7,8-HxCDF	9.93	-		0.993	0.0351				
1,2,3,6,7,8-HxCDF	9.74	-		0.974	0.0382				
2,3,4,6,7,8-HxCDF	14.1	-		1.41	0.0379				
1,2,3,7,8,9-HpCDF	3.87	-	J	0.387	0.0423	Total TCDF	264	-	D,M
1,2,3,4,6,7,8-HpCDF	179	-		1.79	0.0415	Total PeCDF	247	-	D,M
1,2,3,4,7,8,9-HpCDF	9.43	-		0.0943	0.0532	Total HxCDF	263	-	D,M
OCDF	504	-		0.151	0.0833	Total HpCDF	551	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	108	25.0 - 164	
13C-1,2,3,7,8-PeCDD	107	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	96.3	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	92.9	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	111	23.0 - 140	
13C-OCDD	109	17.0 - 157	
13C-2,3,7,8-TCDF	110	24.0 - 169	
13C-1,2,3,7,8-PeCDF	100	24.0 - 185	
13C-2,3,4,7,8-PeCDF	106	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	108	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	105	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	107	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	119	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	99.4	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	121	26.0 - 138	
13C-OCDF	121	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	98.6	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/9/2019

Reviewed By: 
Date: 4/9/2019

EPA Method 1613
PCDD/F



FAL ID: 12280-009-SA
Client ID: TOC-SS-111-0-10
Matrix: Sediment
Batch No: X4851

Date Extracted: 04-03-2019
Date Received: 03-27-2019
Amount: 5.00 g
% Solids: 17.43

ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: pg/g


Acquired: 04-05-2019
2005 WHO TEQ: 46.0
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.25	-		1.25	0.0331				
1,2,3,7,8-PeCDD	7.36	-		7.36	0.0536				
1,2,3,4,7,8-HxCDD	14.5	-		1.45	0.0540				
1,2,3,6,7,8-HxCDD	49.7	-		4.97	0.0538	Total TCDD	32.2	-	
1,2,3,7,8,9-HxCDD	31.8	-		3.18	0.0518	Total PeCDD	72.2	-	
1,2,3,4,6,7,8-HpCDD	1310	-		13.1	0.0695	Total HxCDD	424	-	
OCDD	11800	-		3.54	0.116	Total HpCDD	3420	-	
2,3,7,8-TCDF	8.96	-	F	0.896	0.0345				
1,2,3,7,8-PeCDF	4.18	-	J	0.125	0.0417				
2,3,4,7,8-PeCDF	13.3	-		3.99	0.0449				
1,2,3,4,7,8-HxCDF	10.2	-		1.02	0.0351				
1,2,3,6,7,8-HxCDF	10.2	-		1.02	0.0382				
2,3,4,6,7,8-HxCDF	13.2	-		1.32	0.0379				
1,2,3,7,8,9-HpCDF	3.80	-	J	0.380	0.0423	Total TCDF	134	-	D,M
1,2,3,4,6,7,8-HpCDF	210	-		2.10	0.0415	Total PeCDF	179	-	D,M
1,2,3,4,7,8,9-HpCDF	11.1	-		0.111	0.0532	Total HxCDF	268	-	D,M
OCDF	578	-		0.173	0.0833	Total HpCDF	632	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	78.8	25.0 - 164	
13C-1,2,3,7,8-PeCDD	78.7	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	72.4	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	68.9	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	83.9	23.0 - 140	
13C-OCDD	84.1	17.0 - 157	
13C-2,3,7,8-TCDF	80.2	24.0 - 169	
13C-1,2,3,7,8-PeCDF	75.5	24.0 - 185	
13C-2,3,4,7,8-PeCDF	76.7	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	82.3	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	76.6	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	80.5	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	88.2	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	75.5	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	89.6	26.0 - 138	
13C-OCDF	92.5	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	68.2	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/9/2019

Reviewed By: 
Date: 4/9/2019



CHAIN OF CUSTODY RECORD

Omega COCID 648

PAGE: 1

OF: 1

ADDRESS

Fremont Analytical, Inc.
3600 Fremont Ave. N.
Seattle, WA 98103
TEL: 206-352-3790
FAX: 206-352-7178

Website: www.fremontanalytical.com

12280
00c

SUB CONTRACTOR: Frontier Analytical La COMPANY: Frontier Analytical Laboratory		SPECIAL INSTRUCTIONS / COMMENTS: Please email results to Mike Ridgeway at mridgeway@fremontanalytical.com and Chelsea Ward at cward@fremontanalytical.com.
ADDRESS: 5172 Hillsdale Circle		
CITY, STATE, ZIP: El Dorado Hills, CA 95762		
PHONE: (916) 934-0900 FAX: (916) 934-0999 EMAIL:		
ACCOUNT #:		

ITEM #	SAMPLE ID	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS: Methanol Preserved Weights HOT Sample Notation, Additional Sample Description.
1	1903305-001E	TOC-SS-07-0-10	AMBER JAR 8OZ	Sediment	3/20/2019 12:33:00 PM	1	Dioxins/furans (1613B) <i>MS/MSD - NO</i>
	O-DIOXIN						
2	1903305-002E	TOC-SS-08-0-10	AMBER JAR 8OZ	Sediment	3/20/2019 1:10:00 PM	1	Dioxins/furans (1613B)
	O-DIOXIN						
3	1903305-003E	TOC-SS-09-0-10	AMBER JAR 8OZ	Sediment	3/20/2019 1:50:00 PM	1	Dioxins/furans (1613B)
	O-DIOXIN						
4	1903305-004E	TOC-SS-10-0-10	AMBER JAR 8OZ	Sediment	3/20/2019 2:47:00 PM	1	Dioxins/furans (1613B)
	O-DIOXIN						
5	1903305-005E	TOC-SS-11-0-10	AMBER JAR 8OZ	Sediment	3/20/2019 3:27:00 PM	1	Dioxins/furans (1613B)
	O-DIOXIN						
6	1903305-006E	SB-SS-01-0-10	AMBER JAR 8OZ	Sediment	3/20/2019 10:30:00 AM	1	Dioxins/furans (1613B)
	O-DIOXIN						
7	1903305-007E	SB-SS-02-0-10	AMBER JAR 8OZ	Sediment	3/20/2019 11:10:00 AM	1	Dioxins/furans (1613B)
	O-DIOXIN						
8	1903305-008E	SB-SS-03-0-10	AMBER JAR 8OZ	Sediment	3/20/2019 11:52:00 AM	1	Dioxins/furans (1613B)
	O-DIOXIN						
9	1903305-009E	TOC-SS-111-0-10	AMBER JAR 8OZ	Sediment	3/20/2019 3:35:00 PM	1	Dioxins/furans (1613B)
	O-DIOXIN						

Relinquished By: <i>[Signature]</i>	Date: 3/25/19	Time: 1542	Received By: <i>[Signature]</i>	Date: 3/27/19	Time: 10:32	REPORT TRANSMITTAL DESIRED: <input type="checkbox"/> HARDCOPY (extra cost) <input type="checkbox"/> FAX <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE FOR LAB USE ONLY Temp of samples _____ °C Attempt to Cool? _____ Comments: _____
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	
TAT: Standard <input checked="" type="checkbox"/> RUSH Next BD <input type="checkbox"/> 2nd BD <input type="checkbox"/> 3rd BD <input type="checkbox"/>						000014 of 000 (Page 45 of 122)

Note: RUSH requests will incur surcharges!

Frontier Analytical Laboratory

Sample Login Form

FAL Project ID: 12280

Client:	Fremont Analytical
Client Project ID:	1903305
Date Received:	03/27/2019
Time Received:	10:32 am
Received By:	TC
Logged In By:	KZ
# of Samples Received:	9
Duplicates:	0
Storage Location:	R-4

Method of Delivery:	UPS
Tracking Number:	1ZX6192X0344853923
Shipping Container Received Intact	Yes
Custody seals(s) present?	Yes
Custody seals(s) intact?	Yes
Sample Arrival Temperature (C)	0
Cooling Method	Blue Ice
Chain Of Custody Present?	Yes
Return Shipping Container To Client	Yes
Test aqueous sample for residual Chlorine	No
Sodium Thiosulfate Added	No
Adequate Sample Volume	Yes
Appropriate Sample Container	Yes
pH Range of Aqueous Sample	N/A
Anomalies or additional comments:	



CHAIN OF CUSTODY RECORD

Omega COCID 648 PAGE 1 OF 1

ADDRESS

Frontier Analytical, Inc.
3600 Fremont Ave. N.
Seattle, WA 98103
TEL: 206-352-3790
FAX: 206-352-7178
Website: www.frontieranalytical.com

12280
00c

SUB CONTRACTOR: Frontier Analytical La COMPANY: Frontier Analytical Laboratory		SPECIAL INSTRUCTIONS / COMMENTS:
ADDRESS: 5172 Hillsdale Circle		Please email results to Mike Ridgeway at mridgeway@frontieranalytical.com and Chelsea Ward at cward@frontieranalytical.com.
CITY, STATE, ZIP: El Dorado Hills, CA 95762		
PHONE: (916) 934-0900 FAX: (916) 934-0999 EMAIL:		
ACCOUNT #:		

ITEM #	SAMPLE ID	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS: Method/Preserv Weights HJT Sample Notation, Addition
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2019/03/27



12 April 2019

Mike Ridgeway
Fremont Analytical
3600 Fremont Avenue N.
Seattle, WA 98103

RE: 1903305

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

<u>Associated Work Order(s)</u>	<u>Associated SDG ID(s)</u>
19C0381	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.





CHAIN OF CUSTODY RECORD

Omega COCID 647

PAGE: 1

OF: 2

ADDRESS

Fremont Analytical, Inc.
3600 Fremont Ave. N.
Seattle, WA 98103
TEL: 206-352-3790
FAX: 206-352-7178

Website: www.fremontanalytical.com

19C0381

SUB CONTRACTOR: ARI	COMPANY: Analytical Resources Inc.	SPECIAL INSTRUCTIONS / COMMENTS: Please email results to Mike Ridgeway at mridgeway@fremontanalytical.com and Chelsea Ward at cward@fremontanalytical.com. <i>Butyltins: Di-butyltin, Mono-butyltin, Tetra-butyltin, tri-butyltin.</i> <i>Pesticides: β-Hexachlorocyclohexane, Dieldrin, Total DDDs, total DDEs, total DDTs, endrin ketone.</i> <i>*Volume for sulfides preserved w/zn Acetate in the field.</i>
ADDRESS: 4611 South 134th Place, Suite 100		
CITY, STATE, ZIP: Tukwila, WA 98168		
PHONE: (206) 695-6200	FAX: _____ EMAIL: _____	
ACCOUNT #:		

ITEM #	SAMPLE ID	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS: Methanol Preserved Weights HOT Sample Notation, Additional Sample Description.
1	1903305-001C C-TBT	TOC-SS-07-0-10	CLEAR JARS 8 O	Sediment	3/20/2019 12:33:00 PM	1	Butyltins (8270 SIM), Pesticides (8081) <i>MS/MSD</i>
2	1903305-001D TEST_SUB	TOC-SS-07-0-10	SEPTA JAR 4OZ*	Sediment	3/20/2019 12:33:00 PM	1	Sulfides (PSEP prep) <i>MS/MSD</i>
3	1903305-002C C-TBT	TOC-SS-08-0-10	CLEAR JARS 8 O	Sediment	3/20/2019 1:10:00 PM	1	Butyltins (8270 SIM), Pesticides (8081)
4	1903305-002D TEST_SUB	TOC-SS-08-0-10	SEPTA JAR 4OZ*	Sediment	3/20/2019 1:10:00 PM	1	Sulfides (PSEP prep)
5	1903305-003C C-TBT	TOC-SS-09-0-10	CLEAR JARS 8 O	Sediment	3/20/2019 1:50:00 PM	1	Butyltins (8270 SIM), Pesticides (8081)
6	1903305-003D TEST_SUB	TOC-SS-09-0-10	SEPTA JAR 4OZ*	Sediment	3/20/2019 1:50:00 PM	1	Sulfides (PSEP prep)
7	1903305-004C C-TBT	TOC-SS-10-0-10	CLEAR JARS 8 O	Sediment	3/20/2019 2:47:00 PM	1	Butyltins (8270 SIM), Pesticides (8081)
8	1903305-004D TEST_SUB	TOC-SS-10-0-10	SEPTA JAR 4OZ*	Sediment	3/20/2019 2:47:00 PM	1	Sulfides (PSEP prep)
9	1903305-005C C-TBT	TOC-SS-11-0-10	CLEAR JARS 8 O	Sediment	3/20/2019 3:27:00 PM	1	Butyltins (8270 SIM), Pesticides (8081)

Relinquished By: <i>[Signature]</i>	Date: <i>3/22/19</i>	Time: <i>1:00</i>	Received By: <i>[Signature]</i>	Date: <i>03/22/19</i>	Time: <i>11:15</i>
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
TAT: Standard <input checked="" type="checkbox"/>	RUSH <input type="checkbox"/>	Next BD <input type="checkbox"/>	2nd BD <input type="checkbox"/>	3rd BD <input type="checkbox"/>	

Note: RUSH requests will incur surcharges!

REPORT TRANSMITTAL DESIRED:

HARDCOPY (extra cost) FAX EMAIL ONLINE

FOR LAB USE ONLY

Temp of samples _____ °C Attempt to Cool? _____

Comments: _____



CHAIN OF CUSTODY RECORD

Omega COCID 647

PAGE: 2

OF: 2

ADDRESS

Fremont Analytical, Inc.
3600 Fremont Ave. N.
Seattle, WA 98103
TEL: 206-352-3790
FAX: 206-352-7178

Website: www.fremontanalytical.com

19C0381

SUB CONTRACTOR: ARI		COMPANY: Analytical Resources Inc.		SPECIAL INSTRUCTIONS / COMMENTS:			
ADDRESS: 4611 South 134th Place, Suite 100		Please email results to Mike Ridgeway at mridgeway@fremontanalytical.com and Chelsea Ward at cward@fremontanalytical.com.				*Preserved w/zn Acetate in the field.	
CITY, STATE, ZIP: Tukwila, WA 98168							
PHONE: (206) 695-6200	FAX:						
ACCOUNT #:							

ITEM #	SAMPLE ID	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS: Methanol Preserved Weights HOT Sample Notation, Additional Sample Description.
10	1903305-005D	TOC-SS-11-0-10	SEPTA JAR 4OZ*	Sediment	3/20/2019 3:27:00 PM	1	Sulfides (PSEP prep)
	TEST_SUB						
11	1903305-006C	SB-SS-01-0-10	CLEAR JARS 8 O	Sediment	3/20/2019 10:30:00 AM	1	Butyltins (8270 SIM), Pesticides (8081)
	C-TBT						
12	1903305-006D	SB-SS-01-0-10	SEPTA JAR 4OZ*	Sediment	3/20/2019 10:30:00 AM	1	Sulfides (PSEP prep)
	TEST_SUB						
13	1903305-007C	SB-SS-02-0-10	CLEAR JARS 8 O	Sediment	3/20/2019 11:10:00 AM	1	Butyltins (8270 SIM), Pesticides (8081)
	C-TBT						
14	1903305-007D	SB-SS-02-0-10	SEPTA JAR 4OZ*	Sediment	3/20/2019 11:10:00 AM	1	Sulfides (PSEP prep)
	TEST_SUB						
15	1903305-008C	SB-SS-03-0-10	CLEAR JARS 8 O	Sediment	3/20/2019 11:52:00 AM	1	Butyltins (8270 SIM), Pesticides (8081)
	C-TBT						
16	1903305-008D	SB-SS-03-0-10	SEPTA JAR 4OZ*	Sediment	3/20/2019 11:52:00 AM	1	Sulfides (PSEP prep)
	TEST_SUB						
17	1903305-009C	TOC-SS-111-0-10	CLEAR JARS 8 O	Sediment	3/20/2019 3:35:00 PM	1	Butyltins (8270 SIM), Pesticides (8081)
	C-TBT						
18	1903305-009D	TOC-SS-111-0-10	SEPTA JAR 4OZ*	Sediment	3/20/2019 3:35:00 PM	1	Sulfides (PSEP prep)
	TEST_SUB						

Relinquished By:	Date: 3/21/19	Time: 11:00	Received By:	Date: 3/21/19	Time: 10:15
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

REPORT TRANSMITTAL DESIRED:

HARDCOPY (extra cost) FAX EMAIL ONLINE

FOR LAB USE ONLY

Temp of samples _____ °C Attempt to Cool? _____

Comments: _____

TAT: Standard RUSH Next BD 2nd BD 3rd BD

Note: RUSH requests will incur surcharges!



Fremont Analytical
3600 Fremont Avenue N.
Seattle WA, 98103

Project: 1903305
Project Number: [none]
Project Manager: Mike Ridgeway

Reported:
12-Apr-2019 16:17

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TOC-SS-07-0-10	19C0381-01	Solid	20-Mar-2019 12:33	22-Mar-2019 15:15
TOC-SS-07-0-10	19C0381-02	Solid	20-Mar-2019 12:33	22-Mar-2019 15:15
TOC-SS-08-0-10	19C0381-03	Solid	20-Mar-2019 13:10	22-Mar-2019 15:15
TOC-SS-08-0-10	19C0381-04	Solid	20-Mar-2019 13:10	22-Mar-2019 15:15
TOC-SS-09-0-10	19C0381-05	Solid	20-Mar-2019 13:50	22-Mar-2019 15:15
TOC-SS-09-0-10	19C0381-06	Solid	20-Mar-2019 13:50	22-Mar-2019 15:15
TOC-SS-10-0-10	19C0381-07	Solid	20-Mar-2019 14:47	22-Mar-2019 15:15
TOC-SS-10-0-10	19C0381-08	Solid	20-Mar-2019 14:47	22-Mar-2019 15:15
TOC-SS-11-0-10	19C0381-09	Solid	20-Mar-2019 15:27	22-Mar-2019 15:15
TOC-SS-11-0-10	19C0381-10	Solid	20-Mar-2019 15:27	22-Mar-2019 15:15
SB-SS-01-0-10	19C0381-11	Solid	20-Mar-2019 10:30	22-Mar-2019 15:15
SB-SS-01-0-10	19C0381-12	Solid	20-Mar-2019 10:30	22-Mar-2019 15:15
SB-SS-02-0-10	19C0381-13	Solid	20-Mar-2019 11:10	22-Mar-2019 15:15
SB-SS-02-0-10	19C0381-14	Solid	20-Mar-2019 11:10	22-Mar-2019 15:15
SB-SS-03-0-10	19C0381-15	Solid	20-Mar-2019 11:52	22-Mar-2019 15:15
SB-SS-03-0-10	19C0381-16	Solid	20-Mar-2019 11:52	22-Mar-2019 15:15
TOC-SS-111-0-10	19C0381-17	Solid	20-Mar-2019 15:35	22-Mar-2019 15:15
TOC-SS-111-0-10	19C0381-18	Solid	20-Mar-2019 15:35	22-Mar-2019 15:15



Fremont Analytical
3600 Fremont Avenue N.
Seattle WA, 98103

Project: 1903305
Project Number: [none]
Project Manager: Mike Ridgeway

Reported:
12-Apr-2019 16:17

Work Order Case Narrative

Sample receipt

Samples as listed on the preceding page were received March 22, 2019 under ARI work order 19C0381. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Pesticides - EPA Method SW8081B

The sample(s) were extracted and analyzed within the recommended holding times.

Samples 19C0381-01, 19C0381-09, 19C0381-11, 19C0381-15, MS and MSD were analyzed at a 2X dilution due to the yellow color of the extract which may be an oil residue. Therefore project reporting limits are not met on these samples.

Initial and continuing calibrations were within method requirements except DDT which failed low in the CCV on column CLP2. Data reported from passing column CLP1.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits except Decachlorobiphenyl which was out of control high in sample 19C0381-09 and is flagged within this report.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

The Matrix Spike/ Matrix Spike Duplicate RPD and percent recoveries were within control limits except for analytes flagged within the QC section of this report

Butyl Tin(s) - EPA Method SW8270D-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits except Butyltin Ion which was out of control low and is flagged within the QC section of this report.



Fremont Analytical
3600 Fremont Avenue N.
Seattle WA, 98103

Project: 1903305
Project Number: [none]
Project Manager: Mike Ridgeway

Reported:
12-Apr-2019 16:17

The Duplicate RPD were within control limits.

The Matrix Spike/Matrix Spike Duplicate RPD were within control limits except for Butyltin Ion which is flagged within the QC section of this report. Them Matrix Spike/ Matrix Spike Duplicate percent recoveries were out of control low and are flagged within the QC section of this report. Probable matrix interference.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

The Duplicate RPD and Matrix Spike percent recovery were within control limits.



Cooler Receipt Form

ARI Client: FLEMONT
 COC No(s): OMEGA00C10647 NA
 Assigned ARI Job No: 1960381

Project Name: 1903305
 Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____
 Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO
 Were custody papers included with the cooler? YES NO
 Were custody papers properly filled out (ink, signed, etc.) YES NO
 Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 15:15 4.9°C
 If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: D002565
 Cooler Accepted by: [Signature] Date: 03/22/19 Time: 15:15

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO
 What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____
 Was sufficient ice used (if appropriate)? NA YES NO
 Were all bottles sealed in individual plastic bags? YES NO
 Did all bottles arrive in good condition (unbroken)? YES NO
 Were all bottle labels complete and legible? YES NO
 Did the number of containers listed on COC match with the number of containers received? YES NO
 Did all bottle labels and tags agree with custody papers? YES NO
 Were all bottles used correct for the requested analyses? YES NO
 Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO
 Were all VOC vials free of air bubbles? NA YES NO
 Was sufficient amount of sample sent in each bottle? YES NO
 Date VOC Trip Blank was made at ARI..... NA
 Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: [Signature] Date: 03/25/19 Time: 0942 Labels checked by: [Signature]

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



Fremont Analytical
3600 Fremont Avenue N.
Seattle WA, 98103

Project: 1903305
Project Number: [none]
Project Manager: Mike Ridgeway

Reported:
12-Apr-2019 16:17

TOC-SS-07-0-10
19C0381-01 (Solid)

Butyl Tins

Method: EPA 8270D-SIM		Sampled: 03/20/2019 12:33	
Instrument: NT14 Analyst: VTS		Analyzed: 04/10/2019 09:00	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 15.87 g (wet)	Extract ID: 19C0381-01 A 02
	Preparation Batch: BHD0074	Final Volume: 0.5 mL	Dry Weight: 5.06 g
	Prepared: 03-Apr-2019		% Solids: 31.86
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 0.5 mL	Extract ID: 19C0381-01 A 02
	Cleanup Batch: CHD0057	Final Volume: 0.5 mL	
	Cleaned: 09-Apr-2019		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.445	3.82	80.9	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.71	5.72	28.5	ug/kg	
Butyltin Ion	78763-54-9	1	1.87	4.03	7.68	ug/kg	
Tetrabutyltin	1461-25-2	1	4.94	4.94	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	42.6	%
<i>Surrogate: Tripropyltin</i>					30-160 %	52.6	%



Fremont Analytical 3600 Fremont Avenue N. Seattle WA, 98103	Project: 1903305 Project Number: [none] Project Manager: Mike Ridgeway	Reported: 12-Apr-2019 16:17
---	--	--------------------------------

TOC-SS-07-0-10
19C0381-01 (Solid)

Chlorinated Pesticides

Method: EPA 8081B	Sampled: 03/20/2019 12:33	
Instrument: ECD6 Analyst: YZ	Analyzed: 04/11/2019 14:57	
Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic) Preparation Batch: BHC0828 Prepared: 03-Apr-2019	Sample Size: 39.2 g (wet) Final Volume: 4 mL
		Extract ID: 19C0381-01 A 01 Dry Weight: 12.49 g % Solids: 31.86
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CHD0040 Cleaned: 10-Apr-2019	Initial Volume: 4 mL Final Volume: 4 mL
		Extract ID: 19C0381-01 A 01
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CHD0039 Cleaned: 05-Apr-2019	Initial Volume: 4 mL Final Volume: 4 mL
		Extract ID: 19C0381-01 A 01
Sample Cleanup:	Cleanup Method: GPC Cleanup Batch: CHD0064 Cleaned: 09-Apr-2019	Initial Volume: 4 mL Final Volume: 4 mL
		Extract ID: 19C0381-01 A 01

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
beta-BHC	319-85-7	2	0.61	3.27	ND	ug/kg	U
4,4'-DDE	72-55-9	2	1.09	6.34	6.18	ug/kg	J, D
Dieldrin	60-57-1	2	1.08	6.34	ND	ug/kg	U
4,4'-DDD	72-54-8	2	1.10	6.34	ND	ug/kg	U
4,4'-DDT	50-29-3	2	1.10	6.34	ND	ug/kg	U
Endrin Ketone	53494-70-5	2	1.27	6.34	ND	ug/kg	U
2,4'-DDE	3424-82-6	2	3.27	6.34	ND	ug/kg	U
2,4'-DDD	53-19-0	2	3.27	6.34	ND	ug/kg	U
2,4'-DDT	789-02-6	2	3.27	6.34	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					34-145 %	NRS	NRS
<i>Surrogate: Decachlorobiphenyl [2C]</i>					34-145 %	125	%
<i>Surrogate: Tetrachlorometaxylene</i>					23-135 %	95.9	%
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					23-135 %	77.9	%



Fremont Analytical
3600 Fremont Avenue N.
Seattle WA, 98103

Project: 1903305
Project Number: [none]
Project Manager: Mike Ridgeway

Reported:
12-Apr-2019 16:17

TOC-SS-07-0-10
19C0381-02 (Solid)

Wet Chemistry

Method: PSEP 1986 Sampled: 03/20/2019 12:33
Instrument: BAL2 Analyst: KLE Analyzed: 03/27/2019 09:23

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19C0381-02
Preparation Batch: BHC0743 Sample Size: 5 g (wet)
Prepared: 27-Mar-2019 Final Volume: 5 g

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids, Sulfide		1	0.04	0.04	21.87	%	



Fremont Analytical
3600 Fremont Avenue N.
Seattle WA, 98103

Project: 1903305
Project Number: [none]
Project Manager: Mike Ridgeway

Reported:
12-Apr-2019 16:17

TOC-SS-07-0-10
19C0381-02 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00 (PSEP) Sampled: 03/20/2019 12:33
Instrument: UV1800-2 Analyst: YK Analyzed: 03/27/2019 13:19

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19C0381-02 A
Preparation Batch: BHC0709 Sample Size: 5.217 g (wet) Dry Weight: 1.14 g
Prepared: 26-Mar-2019 Final Volume: 100 g % Solids: 21.87

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	50	219	219	1900	mg/kg	D



Fremont Analytical
3600 Fremont Avenue N.
Seattle WA, 98103

Project: 1903305
Project Number: [none]
Project Manager: Mike Ridgeway

Reported:
12-Apr-2019 16:17

TOC-SS-08-0-10
19C0381-03 (Solid)

Butyl Tins

Method: EPA 8270D-SIM		Sampled: 03/20/2019 13:10	
Instrument: NT14 Analyst: VTS		Analyzed: 04/10/2019 09:40	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Extract ID: 19C0381-03 A 02	
	Preparation Batch: BHD0074	Sample Size: 7.54 g (wet)	Dry Weight: 5.10 g
	Prepared: 03-Apr-2019	Final Volume: 0.5 mL	% Solids: 67.62
Sample Cleanup:	Cleanup Method: Silica Gel	Extract ID: 19C0381-03 A 02	
	Cleanup Batch: CHD0057	Initial Volume: 0.5 mL	
	Cleaned: 09-Apr-2019	Final Volume: 0.5 mL	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.441	3.79	139	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.70	5.67	74.7	ug/kg	
Butyltin Ion	78763-54-9	1	1.85	4.00	11.0	ug/kg	
Tetrabutyltin	1461-25-2	1	4.90	4.90	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	48.2	%
<i>Surrogate: Tripropyltin</i>					30-160 %	59.2	%



Fremont Analytical
3600 Fremont Avenue N.
Seattle WA, 98103

Project: 1903305
Project Number: [none]
Project Manager: Mike Ridgeway

Reported:
12-Apr-2019 16:17

TOC-SS-08-0-10
19C0381-03 (Solid)

Chlorinated Pesticides

Method: EPA 8081B		Sampled: 03/20/2019 13:10	
Instrument: ECD6 Analyst: YZ		Analyzed: 04/11/2019 15:52	
Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 18.05 g (wet)	Extract ID: 19C0381-03 A 01
	Preparation Batch: BHC0828	Final Volume: 4 mL	Dry Weight: 12.21 g
	Prepared: 03-Apr-2019		% Solids: 67.62
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 4 mL	Extract ID: 19C0381-03 A 01
	Cleanup Batch: CHD0040	Final Volume: 4 mL	
	Cleaned: 10-Apr-2019		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 4 mL	Extract ID: 19C0381-03 A 01
	Cleanup Batch: CHD0039	Final Volume: 4 mL	
	Cleaned: 05-Apr-2019		
Sample Cleanup:	Cleanup Method: GPC	Initial Volume: 4 mL	Extract ID: 19C0381-03 A 01
	Cleanup Batch: CHD0064	Final Volume: 4 mL	
	Cleaned: 09-Apr-2019		

Analyte	CAS Number	Dilution	Detection	Reporting	Result	Units	Notes
			Limit	Limit			
beta-BHC	319-85-7	1	0.31	1.67	ND	ug/kg	U
4,4'-DDE	72-55-9	1	0.56	3.24	ND	ug/kg	U
Dieldrin	60-57-1	1	0.55	3.24	ND	ug/kg	U
4,4'-DDD	72-54-8	1	0.57	3.24	3.79	ug/kg	
4,4'-DDT	50-29-3	1	0.56	3.24	ND	ug/kg	U
Endrin Ketone	53494-70-5	1	0.65	3.24	ND	ug/kg	U
2,4'-DDE	3424-82-6	1	1.67	3.24	ND	ug/kg	U
2,4'-DDD	53-19-0	1	1.67	3.24	ND	ug/kg	U
2,4'-DDT	789-02-6	1	1.67	3.24	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					34-145 %	105 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					34-145 %	102 %	
<i>Surrogate: Tetrachlorometaxylene</i>					23-135 %	66.4 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					23-135 %	72.5 %	



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Project: 1903305
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Project Manager: Mike Ridgeway

Reported:
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TOC-SS-08-0-10
19C0381-04 (Solid)

Wet Chemistry

Method: PSEP 1986 Sampled: 03/20/2019 13:10
Instrument: BAL2 Analyst: KLE Analyzed: 03/27/2019 09:23

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19C0381-04
Preparation Batch: BHC0743 Sample Size: 5 g (wet)
Prepared: 27-Mar-2019 Final Volume: 5 g

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids, Sulfide		1	0.04	0.04	62.53	%	



Fremont Analytical 3600 Fremont Avenue N. Seattle WA, 98103	Project: 1903305 Project Number: [none] Project Manager: Mike Ridgeway	Reported: 12-Apr-2019 16:17
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TOC-SS-08-0-10
19C0381-04 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00 (PSEP)	Sampled: 03/20/2019 13:10
Instrument: UV1800-2 Analyst: YK	Analyzed: 03/27/2019 13:22
Sample Preparation:	Preparation Method: No Prep Wet Chem
	Preparation Batch: BHC0709
	Prepared: 26-Mar-2019
	Sample Size: 5.755 g (wet)
	Final Volume: 100 g
	Dry Weight: 3.60 g
	% Solids: 62.53
	Extract ID: 19C0381-04 A

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	1	1.39	1.39	23.4	mg/kg	



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Reported:
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TOC-SS-09-0-10
19C0381-05 (Solid)

Butyl Tins

Method: EPA 8270D-SIM		Sampled: 03/20/2019 13:50	
Instrument: NT14 Analyst: VTS		Analyzed: 04/10/2019 09:54	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 7.08 g (wet)	Extract ID: 19C0381-05 A 02
	Preparation Batch: BHD0074	Final Volume: 0.5 mL	Dry Weight: 5.06 g
	Prepared: 03-Apr-2019		% Solids: 71.43
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 0.5 mL	Extract ID: 19C0381-05 A 02
	Cleanup Batch: CHD0057	Final Volume: 0.5 mL	
	Cleaned: 09-Apr-2019		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.445	3.82	97.3	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.71	5.71	56.6	ug/kg	
Butyltin Ion	78763-54-9	1	1.87	4.03	10.8	ug/kg	
Tetrabutyltin	1461-25-2	1	4.94	4.94	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	49.3	%
<i>Surrogate: Tripropyltin</i>					30-160 %	60.6	%



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TOC-SS-09-0-10
19C0381-05 (Solid)

Chlorinated Pesticides

Method: EPA 8081B		Sampled: 03/20/2019 13:50	
Instrument: ECD6 Analyst: YZ		Analyzed: 04/11/2019 16:10	
Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 17.89 g (wet)	Extract ID: 19C0381-05 A 01
	Preparation Batch: BHC0828	Final Volume: 4 mL	Dry Weight: 12.78 g
	Prepared: 03-Apr-2019		% Solids: 71.43
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 4 mL	Extract ID: 19C0381-05 A 01
	Cleanup Batch: CHD0040	Final Volume: 4 mL	
	Cleaned: 10-Apr-2019		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 4 mL	Extract ID: 19C0381-05 A 01
	Cleanup Batch: CHD0039	Final Volume: 4 mL	
	Cleaned: 05-Apr-2019		
Sample Cleanup:	Cleanup Method: GPC	Initial Volume: 4 mL	Extract ID: 19C0381-05 A 01
	Cleanup Batch: CHD0064	Final Volume: 4 mL	
	Cleaned: 09-Apr-2019		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
beta-BHC	319-85-7	1	0.30	1.60	ND	ug/kg	U
4,4'-DDE	72-55-9	1	0.53	3.10	ND	ug/kg	U
Dieldrin	60-57-1	1	0.53	3.10	ND	ug/kg	U
4,4'-DDD	72-54-8	1	0.54	3.10	ND	ug/kg	U
4,4'-DDT	50-29-3	1	0.54	3.10	ND	ug/kg	U
Endrin Ketone	53494-70-5	1	0.62	3.10	ND	ug/kg	U
2,4'-DDE	3424-82-6	1	1.60	3.10	ND	ug/kg	U
2,4'-DDD	53-19-0	1	1.60	3.10	ND	ug/kg	U
2,4'-DDT	789-02-6	1	1.60	3.10	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					34-145 %	115	%
<i>Surrogate: Decachlorobiphenyl [2C]</i>					34-145 %	114	%
<i>Surrogate: Tetrachlorometaxylene</i>					23-135 %	70.0	%
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					23-135 %	73.4	%



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TOC-SS-09-0-10
19C0381-06 (Solid)

Wet Chemistry

Method: PSEP 1986	Preparation Method: No Prep Wet Chem	Sampled: 03/20/2019 13:50
Instrument: BAL2 Analyst: KLE	Preparation Batch: BHC0743	Analyzed: 03/27/2019 09:23
Sample Preparation:	Prepared: 27-Mar-2019	Extract ID: 19C0381-06
	Sample Size: 5 g (wet)	
	Final Volume: 5 g	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids, Sulfide		1	0.04	0.04	68.62	%	



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TOC-SS-09-0-10
19C0381-06 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00 (PSEP) Sampled: 03/20/2019 13:50
Instrument: UV1800-2 Analyst: YK Analyzed: 03/27/2019 13:23

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19C0381-06 A
Preparation Batch: BHC0709 Sample Size: 7.433 g (wet) Dry Weight: 5.10 g
Prepared: 26-Mar-2019 Final Volume: 100 g % Solids: 68.62

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	1	0.980	0.980	2.65	mg/kg	



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TOC-SS-10-0-10
19C0381-07 (Solid)

Butyl Tins

Method: EPA 8270D-SIM		Sampled: 03/20/2019 14:47
Instrument: NT14 Analyst: VTS		Analyzed: 04/10/2019 10:07
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BHD0074 Prepared: 03-Apr-2019	Extract ID: 19C0381-07 A 02 Dry Weight: 5.09 g % Solids: 74.43
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CHD0057 Cleaned: 09-Apr-2019	Initial Volume: 0.5 mL Final Volume: 0.5 mL Extract ID: 19C0381-07 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.442	3.79	23.5	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.70	5.68	13.5	ug/kg	
Butyltin Ion	78763-54-9	1	1.86	4.01	4.68	ug/kg	
Tetrabutyltin	1461-25-2	1	4.91	4.91	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	45.9	%
<i>Surrogate: Tripropyltin</i>					30-160 %	57.2	%



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TOC-SS-10-0-10
19C0381-07 (Solid)

Chlorinated Pesticides

Method: EPA 8081B				Sampled: 03/20/2019 14:47
Instrument: ECD6 Analyst: YZ				Analyzed: 04/11/2019 16:28
Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 16.62 g (wet)	Final Volume: 4 mL	Extract ID: 19C0381-07 A 01
	Preparation Batch: BHC0828			Dry Weight: 12.37 g
	Prepared: 03-Apr-2019			% Solids: 74.43
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 4 mL	Final Volume: 4 mL	Extract ID: 19C0381-07 A 01
	Cleanup Batch: CHD0040			
	Cleaned: 10-Apr-2019			
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 4 mL	Final Volume: 4 mL	Extract ID: 19C0381-07 A 01
	Cleanup Batch: CHD0039			
	Cleaned: 05-Apr-2019			
Sample Cleanup:	Cleanup Method: GPC	Initial Volume: 4 mL	Final Volume: 4 mL	Extract ID: 19C0381-07 A 01
	Cleanup Batch: CHD0064			
	Cleaned: 09-Apr-2019			

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
beta-BHC	319-85-7	1	0.31	1.65	ND	ug/kg	U
4,4'-DDE	72-55-9	1	0.55	3.20	ND	ug/kg	U
Dieldrin	60-57-1	1	0.55	3.20	ND	ug/kg	U
4,4'-DDD	72-54-8	1	0.56	3.20	ND	ug/kg	U
4,4'-DDT	50-29-3	1	0.55	3.20	ND	ug/kg	U
Endrin Ketone	53494-70-5	1	0.64	3.20	ND	ug/kg	U
2,4'-DDE	3424-82-6	1	1.65	3.20	ND	ug/kg	U
2,4'-DDD	53-19-0	1	1.65	3.20	ND	ug/kg	U
2,4'-DDT	789-02-6	1	1.65	3.20	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					34-145 %	94.6 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					34-145 %	99.6 %	
<i>Surrogate: Tetrachlorometaxylene</i>					23-135 %	66.0 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					23-135 %	70.7 %	



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TOC-SS-10-0-10
19C0381-08 (Solid)

Wet Chemistry

Method: PSEP 1986

Sampled: 03/20/2019 14:47

Instrument: BAL2 Analyst: KLE

Analyzed: 03/27/2019 09:23

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 19C0381-08

Preparation Batch: BHC0743

Sample Size: 5 g (wet)

Prepared: 27-Mar-2019

Final Volume: 5 g

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids, Sulfide		1	0.04	0.04	70.47	%	



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TOC-SS-10-0-10
19C0381-08 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00 (PSEP) Sampled: 03/20/2019 14:47
Instrument: UV1800-2 Analyst: YK Analyzed: 03/27/2019 13:23

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19C0381-08 A
Preparation Batch: BHC0709 Sample Size: 5.783 g (wet) Dry Weight: 4.08 g
Prepared: 26-Mar-2019 Final Volume: 100 g % Solids: 70.47

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	1	1.23	1.23	3.21	mg/kg	



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TOC-SS-11-0-10
19C0381-09 (Solid)

Butyl Tins

Method: EPA 8270D-SIM		Sampled: 03/20/2019 15:27	
Instrument: NT14 Analyst: VTS		Analyzed: 04/10/2019 10:20	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 23.8 g (wet)	Extract ID: 19C0381-09 A 02
	Preparation Batch: BHD0074	Final Volume: 0.5 mL	Dry Weight: 5.04 g
	Prepared: 03-Apr-2019		% Solids: 21.17
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 0.5 mL	Extract ID: 19C0381-09 A 02
	Cleanup Batch: CHD0057	Final Volume: 0.5 mL	
	Cleaned: 09-Apr-2019		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.447	3.83	37.2	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.72	5.74	16.3	ug/kg	
Butyltin Ion	78763-54-9	1	1.88	4.05	4.38	ug/kg	
Tetrabutyltin	1461-25-2	1	4.96	4.96	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	40.5	%
<i>Surrogate: Tripropyltin</i>					30-160 %	47.1	%



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TOC-SS-11-0-10
19C0381-09 (Solid)

Chlorinated Pesticides

Method: EPA 8081B		Sampled: 03/20/2019 15:27	
Instrument: ECD6 Analyst: YZ		Analyzed: 04/11/2019 16:46	
Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 57.84 g (wet)	Extract ID: 19C0381-09 A 01
	Preparation Batch: BHC0828	Final Volume: 4 mL	Dry Weight: 12.24 g
	Prepared: 03-Apr-2019		% Solids: 21.17
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 4 mL	Extract ID: 19C0381-09 A 01
	Cleanup Batch: CHD0040	Final Volume: 4 mL	
	Cleaned: 10-Apr-2019		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 4 mL	Extract ID: 19C0381-09 A 01
	Cleanup Batch: CHD0039	Final Volume: 4 mL	
	Cleaned: 05-Apr-2019		
Sample Cleanup:	Cleanup Method: GPC	Initial Volume: 4 mL	Extract ID: 19C0381-09 A 01
	Cleanup Batch: CHD0064	Final Volume: 4 mL	
	Cleaned: 09-Apr-2019		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
beta-BHC	319-85-7	2	0.62	3.33	ND	ug/kg	U
4,4'-DDE	72-55-9	2	1.11	6.47	5.94	ug/kg	J, D
Dieldrin	60-57-1	2	1.10	6.47	ND	ug/kg	U
4,4'-DDD	72-54-8	2	1.13	6.47	7.34	ug/kg	D
4,4'-DDT	50-29-3	2	1.12	6.47	ND	ug/kg	U
Endrin Ketone	53494-70-5	2	1.30	6.47	ND	ug/kg	U
2,4'-DDE	3424-82-6	2	3.33	6.47	ND	ug/kg	U
2,4'-DDD	53-19-0	2	3.33	6.47	ND	ug/kg	U
2,4'-DDT	789-02-6	2	3.33	6.47	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					34-145 %	158 %	*
<i>Surrogate: Decachlorobiphenyl [2C]</i>					34-145 %	176 %	*
<i>Surrogate: Tetrachlorometaxylene</i>					23-135 %	99.5 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					23-135 %	101 %	



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TOC-SS-11-0-10
19C0381-10 (Solid)

Wet Chemistry

Method: PSEP 1986

Sampled: 03/20/2019 15:27

Instrument: BAL2 Analyst: KLE

Analyzed: 03/27/2019 09:23

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 19C0381-10

Preparation Batch: BHC0743

Sample Size: 5 g (wet)

Prepared: 27-Mar-2019

Final Volume: 5 g

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids, Sulfide		1	0.04	0.04	17.83	%	



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TOC-SS-11-0-10
19C0381-10 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00 (PSEP) Sampled: 03/20/2019 15:27
Instrument: UV1800-2 Analyst: YK Analyzed: 03/27/2019 13:23

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19C0381-10 A
Preparation Batch: BHC0709 Sample Size: 5.835 g (wet) Dry Weight: 1.04 g
Prepared: 26-Mar-2019 Final Volume: 100 g % Solids: 17.85

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	50	240	240	3270	mg/kg	D



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Project: 1903305
Project Number: [none]
Project Manager: Mike Ridgeway

Reported:
12-Apr-2019 16:17

SB-SS-01-0-10
19C0381-11 (Solid)

Butyl Tins

Method: EPA 8270D-SIM		Sampled: 03/20/2019 10:30
Instrument: NT14 Analyst: VTS		Analyzed: 04/10/2019 10:34
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BHD0074 Prepared: 03-Apr-2019	Extract ID: 19C0381-11 A 02 Sample Size: 10.56 g (wet) Dry Weight: 5.03 g Final Volume: 0.5 mL % Solids: 47.64
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CHD0057 Cleaned: 09-Apr-2019	Initial Volume: 0.5 mL Final Volume: 0.5 mL Extract ID: 19C0381-11 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.447	3.84	165	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.72	5.74	85.3	ug/kg	
Butyltin Ion	78763-54-9	1	1.88	4.06	7.05	ug/kg	
Tetrabutyltin	1461-25-2	1	4.97	4.97	5.16	ug/kg	
<i>Surrogate: Tripentyltin</i>					30-160 %	48.0	%
<i>Surrogate: Tripropyltin</i>					30-160 %	57.0	%



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Project: 1903305
Project Number: [none]
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Reported:
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SB-SS-01-0-10
19C0381-11 (Solid)

Chlorinated Pesticides

Method: EPA 8081B		Sampled: 03/20/2019 10:30	
Instrument: ECD6 Analyst: YZ		Analyzed: 04/11/2019 17:04	
Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 25.71 g (wet)	Extract ID: 19C0381-11 A 01
	Preparation Batch: BHC0828	Final Volume: 4 mL	Dry Weight: 12.25 g
	Prepared: 03-Apr-2019		% Solids: 47.64
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 4 mL	Extract ID: 19C0381-11 A 01
	Cleanup Batch: CHD0040	Final Volume: 4 mL	
	Cleaned: 10-Apr-2019		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 4 mL	Extract ID: 19C0381-11 A 01
	Cleanup Batch: CHD0039	Final Volume: 4 mL	
	Cleaned: 05-Apr-2019		
Sample Cleanup:	Cleanup Method: GPC	Initial Volume: 4 mL	Extract ID: 19C0381-11 A 01
	Cleanup Batch: CHD0064	Final Volume: 4 mL	
	Cleaned: 09-Apr-2019		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
beta-BHC	319-85-7	2	0.62	3.33	ND	ug/kg	U
4,4'-DDE	72-55-9	2	1.11	6.47	8.08	ug/kg	D
Dieldrin	60-57-1	2	1.10	6.47	ND	ug/kg	U
4,4'-DDD	72-54-8	2	1.13	6.47	8.64	ug/kg	D
4,4'-DDT	50-29-3	2	1.12	6.47	ND	ug/kg	U
Endrin Ketone	53494-70-5	2	1.30	6.47	ND	ug/kg	U
2,4'-DDE	3424-82-6	2	3.33	6.47	ND	ug/kg	U
2,4'-DDD	53-19-0	2	3.33	6.47	ND	ug/kg	U
2,4'-DDT	789-02-6	2	3.33	6.47	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					34-145 %	120	%
<i>Surrogate: Decachlorobiphenyl [2C]</i>					34-145 %	143	%
<i>Surrogate: Tetrachlorometaxylene</i>					23-135 %	77.3	%
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					23-135 %	88.9	%



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SB-SS-01-0-10
19C0381-12 (Solid)

Wet Chemistry

Method: PSEP 1986	Instrument: BAL2	Analyst: KLE	Sampled: 03/20/2019 10:30
Sample Preparation:	Preparation Method: No Prep Wet Chem	Preparation Batch: BHC0743	Analyzed: 03/27/2019 09:23
	Prepared: 27-Mar-2019	Sample Size: 5 g (wet)	Extract ID: 19C0381-12
		Final Volume: 5 g	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids, Sulfide		1	0.04	0.04	42.05	%	



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SB-SS-01-0-10
19C0381-12 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00 (PSEP)	Sampled: 03/20/2019 10:30
Instrument: UV1800-2 Analyst: YK	Analyzed: 03/27/2019 13:24
Sample Preparation:	Preparation Method: No Prep Wet Chem
	Preparation Batch: BHC0709
	Prepared: 26-Mar-2019
	Sample Size: 5.063 g (wet)
	Final Volume: 100 g
	Dry Weight: 2.13 g
	% Solids: 42.05
	Extract ID: 19C0381-12 A

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	10	23.5	23.5	334	mg/kg	D



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SB-SS-02-0-10
19C0381-13 (Solid)

Butyl Tins

Method: EPA 8270D-SIM	Sampled: 03/20/2019 11:10	
Instrument: NT14 Analyst: VTS	Analyzed: 04/10/2019 10:47	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BHD0074 Prepared: 03-Apr-2019	Sample Size: 7.02 g (wet) Final Volume: 0.5 mL Extract ID: 19C0381-13 A 02 Dry Weight: 5.03 g % Solids: 71.63
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CHD0057 Cleaned: 09-Apr-2019	Initial Volume: 0.5 mL Final Volume: 0.5 mL Extract ID: 19C0381-13 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.447	3.84	1.43	ug/kg	J
Dibutyltin Ion	14488-53-0	1	1.72	5.75	ND	ug/kg	U
Butyltin Ion	78763-54-9	1	1.88	4.06	ND	ug/kg	U
Tetrabutyltin	1461-25-2	1	4.97	4.97	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	45.0	%
<i>Surrogate: Tripropyltin</i>					30-160 %	55.0	%



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SB-SS-02-0-10
19C0381-13 (Solid)

Chlorinated Pesticides

Method: EPA 8081B		Sampled: 03/20/2019 11:10	
Instrument: ECD6 Analyst: YZ		Analyzed: 04/11/2019 17:23	
Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 17.52 g (wet)	Extract ID: 19C0381-13 A 01
	Preparation Batch: BHC0828	Final Volume: 4 mL	Dry Weight: 12.55 g
	Prepared: 03-Apr-2019		% Solids: 71.63
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 4 mL	Extract ID: 19C0381-13 A 01
	Cleanup Batch: CHD0040	Final Volume: 4 mL	
	Cleaned: 10-Apr-2019		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 4 mL	Extract ID: 19C0381-13 A 01
	Cleanup Batch: CHD0039	Final Volume: 4 mL	
	Cleaned: 05-Apr-2019		
Sample Cleanup:	Cleanup Method: GPC	Initial Volume: 4 mL	Extract ID: 19C0381-13 A 01
	Cleanup Batch: CHD0064	Final Volume: 4 mL	
	Cleaned: 09-Apr-2019		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
beta-BHC	319-85-7	1	0.30	1.63	ND	ug/kg	U
4,4'-DDE	72-55-9	1	0.54	3.16	ND	ug/kg	U
Dieldrin	60-57-1	1	0.54	3.16	ND	ug/kg	U
4,4'-DDD	72-54-8	1	0.55	3.16	ND	ug/kg	U
4,4'-DDT	50-29-3	1	0.55	3.16	ND	ug/kg	U
Endrin Ketone	53494-70-5	1	0.63	3.16	ND	ug/kg	U
2,4'-DDE	3424-82-6	1	1.63	3.16	ND	ug/kg	U
2,4'-DDD	53-19-0	1	1.63	3.16	ND	ug/kg	U
2,4'-DDT	789-02-6	1	1.63	3.16	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					34-145 %	100	%
<i>Surrogate: Decachlorobiphenyl [2C]</i>					34-145 %	104	%
<i>Surrogate: Tetrachlorometaxylene</i>					23-135 %	66.5	%
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					23-135 %	72.4	%



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SB-SS-02-0-10
19C0381-14 (Solid)

Wet Chemistry

Method: PSEP 1986

Sampled: 03/20/2019 11:10

Instrument: BAL2 Analyst: KLE

Analyzed: 03/27/2019 09:23

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 19C0381-14

Preparation Batch: BHC0743

Sample Size: 5 g (wet)

Prepared: 27-Mar-2019

Final Volume: 5 g

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids, Sulfide		1	0.04	0.04	66.86	%	



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SB-SS-02-0-10
19C0381-14 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00 (PSEP) Sampled: 03/20/2019 11:10
Instrument: UV1800-2 Analyst: YK Analyzed: 03/27/2019 13:39

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19C0381-14 A
Preparation Batch: BHC0709 Sample Size: 5.707 g (wet) Dry Weight: 3.82 g
Prepared: 26-Mar-2019 Final Volume: 100 g % Solids: 66.86

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	1	1.31	1.31	ND	mg/kg	U



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SB-SS-03-0-10
19C0381-15 (Solid)

Butyl Tins

Method: EPA 8270D-SIM Sampled: 03/20/2019 11:52
Instrument: NT14 Analyst: VTS Analyzed: 04/10/2019 11:01

Sample Preparation: Preparation Method: EPA 3546 (Microwave) Extract ID: 19C0381-15 A 02
Preparation Batch: BHD0074 Sample Size: 14.15 g (wet)
Prepared: 03-Apr-2019 Final Volume: 0.5 mL Dry Weight: 5.04 g
% Solids: 35.61

Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 19C0381-15 A 02
Cleanup Batch: CHD0057 Initial Volume: 0.5 mL
Cleaned: 09-Apr-2019 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.447	3.83	89.8	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.72	5.74	51.6	ug/kg	
Butyltin Ion	78763-54-9	1	1.88	4.05	16.4	ug/kg	
Tetrabutyltin	1461-25-2	1	4.96	4.96	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	40.3	%
<i>Surrogate: Tripropyltin</i>					30-160 %	47.0	%



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SB-SS-03-0-10
19C0381-15 (Solid)

Chlorinated Pesticides

Method: EPA 8081B		Sampled: 03/20/2019 11:52	
Instrument: ECD6 Analyst: YZ		Analyzed: 04/11/2019 17:41	
Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 34.89 g (wet)	Extract ID: 19C0381-15 A 01
	Preparation Batch: BHC0828	Final Volume: 4 mL	Dry Weight: 12.42 g
	Prepared: 03-Apr-2019		% Solids: 35.61
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 4 mL	Extract ID: 19C0381-15 A 01
	Cleanup Batch: CHD0040	Final Volume: 4 mL	
	Cleaned: 10-Apr-2019		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 4 mL	Extract ID: 19C0381-15 A 01
	Cleanup Batch: CHD0039	Final Volume: 4 mL	
	Cleaned: 05-Apr-2019		
Sample Cleanup:	Cleanup Method: GPC	Initial Volume: 4 mL	Extract ID: 19C0381-15 A 01
	Cleanup Batch: CHD0064	Final Volume: 4 mL	
	Cleaned: 09-Apr-2019		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
beta-BHC	319-85-7	1	0.31	1.64	ND	ug/kg	U
4,4'-DDE	72-55-9	1	0.55	3.19	3.02	ug/kg	J
Dieldrin	60-57-1	1	0.54	3.19	ND	ug/kg	U
4,4'-DDD	72-54-8	1	0.56	3.19	4.91	ug/kg	
4,4'-DDT	50-29-3	1	0.55	3.19	ND	ug/kg	U
Endrin Ketone	53494-70-5	1	0.64	3.19	ND	ug/kg	U
2,4'-DDE	3424-82-6	1	1.64	3.19	ND	ug/kg	U
2,4'-DDD	53-19-0	1	1.64	3.19	ND	ug/kg	U
2,4'-DDT	789-02-6	1	1.64	3.19	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					34-145 %	71.0 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					34-145 %	64.5 %	
<i>Surrogate: Tetrachlorometaxylene</i>					23-135 %	42.0 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					23-135 %	44.1 %	



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SB-SS-03-0-10
19C0381-16 (Solid)

Wet Chemistry

Method: PSEP 1986	Preparation Method: No Prep Wet Chem	Sample Size: 5 g (wet)	Sampled: 03/20/2019 11:52
Instrument: BAL2 Analyst: KLE	Preparation Batch: BHC0743	Final Volume: 5 g	Analyzed: 03/27/2019 09:23
Sample Preparation:	Prepared: 27-Mar-2019		Extract ID: 19C0381-16

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids, Sulfide		1	0.04	0.04	30.29	%	



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SB-SS-03-0-10
19C0381-16 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00 (PSEP)	Sampled: 03/20/2019 11:52
Instrument: UV1800-2 Analyst: YK	Analyzed: 03/27/2019 13:39
Sample Preparation:	Preparation Method: No Prep Wet Chem
	Preparation Batch: BHC0709
	Prepared: 26-Mar-2019
	Sample Size: 5.571 g (wet)
	Final Volume: 100 g
	Dry Weight: 1.69 g
	% Solids: 30.29
	Extract ID: 19C0381-16 A

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	20	59.3	59.3	936	mg/kg	D



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TOC-SS-111-0-10
19C0381-17 (Solid)

Butyl Tins

Method: EPA 8270D-SIM		Sampled: 03/20/2019 15:35
Instrument: NT14 Analyst: VTS		Analyzed: 04/10/2019 11:14
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BHD0074 Prepared: 03-Apr-2019	Extract ID: 19C0381-17 A 02 Dry Weight: 5.03 g % Solids: 20.93
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CHD0057 Cleaned: 09-Apr-2019	Initial Volume: 0.5 mL Final Volume: 0.5 mL Extract ID: 19C0381-17 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.447	3.83	29.9	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.72	5.74	16.5	ug/kg	
Butyltin Ion	78763-54-9	1	1.88	4.05	3.60	ug/kg	J
Tetrabutyltin	1461-25-2	1	4.97	4.97	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	44.9	%
<i>Surrogate: Tripropyltin</i>					30-160 %	49.9	%



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TOC-SS-111-0-10
19C0381-17 (Solid)

Chlorinated Pesticides

Method: EPA 8081B		Sampled: 03/20/2019 15:35	
Instrument: ECD6 Analyst: YZ		Analyzed: 04/11/2019 17:59	
Sample Preparation:	Preparation Method: EPA 3550C (Ultrasonic)	Sample Size: 57.32 g (wet)	Extract ID: 19C0381-17 A 01
	Preparation Batch: BHC0828	Final Volume: 4 mL	Dry Weight: 12.00 g
	Prepared: 03-Apr-2019		% Solids: 20.93
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 4 mL	Extract ID: 19C0381-17 A 01
	Cleanup Batch: CHD0040	Final Volume: 4 mL	
	Cleaned: 10-Apr-2019		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 4 mL	Extract ID: 19C0381-17 A 01
	Cleanup Batch: CHD0039	Final Volume: 4 mL	
	Cleaned: 05-Apr-2019		
Sample Cleanup:	Cleanup Method: GPC	Initial Volume: 4 mL	Extract ID: 19C0381-17 A 01
	Cleanup Batch: CHD0064	Final Volume: 4 mL	
	Cleaned: 09-Apr-2019		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
beta-BHC	319-85-7	1	0.32	1.70	ND	ug/kg	U
4,4'-DDE	72-55-9	1	0.57	3.30	2.94	ug/kg	J
Dieldrin	60-57-1	1	0.56	3.30	ND	ug/kg	U
4,4'-DDD	72-54-8	1	0.58	3.30	8.42	ug/kg	
4,4'-DDT	50-29-3	1	0.57	3.30	50.5	ug/kg	
Endrin Ketone	53494-70-5	1	0.66	3.30	ND	ug/kg	U
2,4'-DDE	3424-82-6	1	1.70	3.30	ND	ug/kg	U
2,4'-DDD	53-19-0	1	1.70	3.30	ND	ug/kg	U
2,4'-DDT	789-02-6	1	1.70	3.30	9.84	ug/kg	
<i>Surrogate: Decachlorobiphenyl</i>					34-145 %	78.5 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					34-145 %	99.7 %	
<i>Surrogate: Tetrachlorometaxylene</i>					23-135 %	47.5 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					23-135 %	48.6 %	



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TOC-SS-111-0-10
19C0381-18 (Solid)

Wet Chemistry

Method: PSEP 1986

Sampled: 03/20/2019 15:35

Instrument: BAL2 Analyst: KLE

Analyzed: 03/27/2019 09:23

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 19C0381-18

Preparation Batch: BHC0743

Sample Size: 5 g (wet)

Prepared: 27-Mar-2019

Final Volume: 5 g

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids, Sulfide		1	0.04	0.04	16.50	%	



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TOC-SS-111-0-10
19C0381-18 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00 (PSEP)				Sampled: 03/20/2019 15:35
Instrument: UV1800-2 Analyst: YK				Analyzed: 03/27/2019 13:39
Sample Preparation:	Preparation Method: No Prep Wet Chem	Sample Size: 5.305 g (wet)	Dry Weight: 0.88 g	Extract ID: 19C0381-18 A
	Preparation Batch: BHC0709	Final Volume: 100 g	% Solids: 16.50	
	Prepared: 26-Mar-2019			

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	50	286	286	3510	mg/kg	D



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Butyl Tins - Quality Control

Batch BHD0074 - EPA 3546 (Microwave)

Instrument: NT14 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHD0074-BLK1)					Prepared: 03-Apr-2019 Analyzed: 10-Apr-2019 08:33						
Tributyltin Ion	ND	0.450	3.86	ug/kg							U
Dibutyltin Ion	ND	1.73	5.78	ug/kg							U
Butyltin Ion	ND	1.89	4.08	ug/kg							U
Tetrabutyltin	ND	5.00	5.00	ug/kg							U
Surrogate: Tripentyltin	19.2			ug/kg	45.2	42.5		30-160			
Surrogate: Tripropyltin	22.8			ug/kg	43.7	52.0		30-160			
LCS (BHD0074-BS1)					Prepared: 03-Apr-2019 Analyzed: 10-Apr-2019 08:46						
Tributyltin Ion	20.9	0.450	3.86	ug/kg	44.6		46.8	30-160			
Dibutyltin Ion	12.9	1.73	5.78	ug/kg	38.4		33.6	30-160			
Butyltin Ion	6.35	1.89	4.08	ug/kg	31.2		20.4	30-160			*
Surrogate: Tripentyltin	18.1			ug/kg	45.2	40.0		30-160			
Surrogate: Tripropyltin	20.3			ug/kg	43.7	46.4		30-160			
Matrix Spike (BHD0074-MS1)					Source: 19C0381-01 Prepared: 03-Apr-2019 Analyzed: 10-Apr-2019 09:13						
Tributyltin Ion	67.9	0.444	3.81	ug/kg	43.9	80.9	-29.7	30-160			*
Dibutyltin Ion	31.0	1.71	5.70	ug/kg	37.8	28.5	6.65	30-160			*
Butyltin Ion	11.6	1.86	4.02	ug/kg	30.7	7.68	12.8	30-160			*
Surrogate: Tripentyltin	16.3			ug/kg	44.6	19.0	36.6	30-160			
Surrogate: Tripropyltin	18.1			ug/kg	43.2	22.7	42.0	30-160			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BHD0074-MSD1)					Source: 19C0381-01 Prepared: 03-Apr-2019 Analyzed: 10-Apr-2019 09:27						
Tributyltin Ion	80.3	0.446	3.83	ug/kg	44.2	80.9	-1.43	30-160	16.80	30	*
Dibutyltin Ion	37.2	1.72	5.73	ug/kg	38.0	28.5	22.9	30-160	18.20	30	*
Butyltin Ion	14.4	1.87	4.04	ug/kg	30.9	7.68	21.7	30-160	21.50	30	*
Surrogate: Tripentyltin	19.8			ug/kg	44.8	19.0	44.2	30-160			
Surrogate: Tripropyltin	22.4			ug/kg	43.4	22.7	51.6	30-160			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Project Manager: Mike Ridgeway

Reported:
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Chlorinated Pesticides - Quality Control

Batch BHC0828 - EPA 3550C (Ultrasonic)

Instrument: ECD6 Analyst: YZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHC0828-BLK1)											
						Prepared: 03-Apr-2019	Analyzed: 11-Apr-2019 14:21				
beta-BHC	ND	0.32	1.70	ug/kg							U
4,4'-DDE	ND	0.57	3.30	ug/kg							U
Dieldrin	ND	0.56	3.30	ug/kg							U
4,4'-DDD	ND	0.58	3.30	ug/kg							U
4,4'-DDT	ND	0.57	3.30	ug/kg							U
Endrin Ketone	ND	0.66	3.30	ug/kg							U
2,4'-DDE	ND	1.70	3.30	ug/kg							U
2,4'-DDD	ND	1.70	3.30	ug/kg							U
2,4'-DDT	ND	1.70	3.30	ug/kg							U
Surrogate: Decachlorobiphenyl	14.8			ug/kg	13.3		111	34-145			
Surrogate: Decachlorobiphenyl [2C]	14.2			ug/kg	13.3		107	34-145			
Surrogate: Tetrachlorometaxyene	8.81			ug/kg	13.3		66.1	23-135			
Surrogate: Tetrachlorometaxyene [2C]	10.1			ug/kg	13.3		75.4	23-135			
LCS (BHC0828-BS1)											
						Prepared: 03-Apr-2019	Analyzed: 11-Apr-2019 14:39				
beta-BHC	4.92	0.32	1.70	ug/kg	6.67		73.8	43-120			
4,4'-DDE	12.1	0.57	3.30	ug/kg	13.3		90.7	60-134			
Dieldrin	12.3	0.56	3.30	ug/kg	13.3		91.9	44-129			
4,4'-DDD	12.5	0.58	3.30	ug/kg	13.3		93.6	60-120			
4,4'-DDT	11.2	0.57	3.30	ug/kg	13.3		84.1	63-120			
Endrin Ketone	11.9	0.66	3.30	ug/kg	13.3		89.5	64-120			
Surrogate: Decachlorobiphenyl	13.7			ug/kg	13.3		103	34-145			
Surrogate: Decachlorobiphenyl [2C]	13.4			ug/kg	13.3		100	34-145			
Surrogate: Tetrachlorometaxyene	8.70			ug/kg	13.3		65.3	23-135			
Surrogate: Tetrachlorometaxyene [2C]	9.53			ug/kg	13.3		71.5	23-135			
Matrix Spike (BHC0828-MS1)											
			Source: 19C0381-01								
						Prepared: 03-Apr-2019	Analyzed: 11-Apr-2019 15:16				
beta-BHC	2.69	0.64	3.42	ug/kg	6.70	ND	40.2	43-120			*, J, D
4,4'-DDE	14.6	1.14	6.63	ug/kg	13.4	6.18	62.9	60-134			D
Dieldrin	12.2	1.13	6.63	ug/kg	13.4	ND	91.0	44-129			D
4,4'-DDD	16.2	1.16	6.63	ug/kg	13.4	ND	121	60-120			*, D
4,4'-DDT	10.7	1.15	6.63	ug/kg	13.4	ND	80.0	63-120			D,Missing P1
Endrin Ketone	11.9	1.33	6.63	ug/kg	13.4	ND	89.1	64-120			D,Missing P1
Surrogate: Decachlorobiphenyl	17.1			ug/kg	13.4		127	34-145			



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Seattle WA, 98103

Project: 1903305
Project Number: [none]
Project Manager: Mike Ridgeway

Reported:
12-Apr-2019 16:17

Chlorinated Pesticides - Quality Control

Batch BHC0828 - EPA 3550C (Ultrasonic)

Instrument: ECD6 Analyst: YZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BHC0828-MS1)		Source: 19C0381-01		Prepared: 03-Apr-2019		Analyzed: 11-Apr-2019 15:16					
Surrogate: Decachlorobiphenyl [2C]	15.3			ug/kg	13.4		114	34-145			
Surrogate: Tetrachlorometaxylene	11.5			ug/kg	13.4		85.9	23-135			
Surrogate: Tetrachlorometaxylene [2C]	10.1			ug/kg	13.4		75.5	23-135			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BHC0828-MSD1)		Source: 19C0381-01		Prepared: 03-Apr-2019		Analyzed: 11-Apr-2019 15:34					
beta-BHC	2.67	0.64	3.41	ug/kg	6.68	ND	40.0	43-120	0.71	30	*, J, D
4,4'-DDE	14.8	1.14	6.61	ug/kg	13.4	6.18	64.9	60-134	1.59	30	D
Dieldrin	11.5	1.13	6.61	ug/kg	13.4	ND	85.8	44-129	6.06	30	D
4,4'-DDD	16.3	1.15	6.61	ug/kg	13.4	ND	122	60-120	0.30	30	*, D
4,4'-DDT	10.8	1.15	6.61	ug/kg	13.4	ND	80.9	63-120	0.77	30	D,Missing P1
Endrin Ketone	12.0	1.33	6.61	ug/kg	13.4	ND	89.9	64-120	0.65	30	D
Surrogate: Decachlorobiphenyl	17.2			ug/kg	13.4		129	34-145			
Surrogate: Decachlorobiphenyl [2C]	16.5			ug/kg	13.4		123	34-145			
Surrogate: Tetrachlorometaxylene	10.2			ug/kg	13.4		76.7	23-135			
Surrogate: Tetrachlorometaxylene [2C]	10.9			ug/kg	13.4		81.7	23-135			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



Fremont Analytical 3600 Fremont Avenue N. Seattle WA, 98103	Project: 1903305 Project Number: [none] Project Manager: Mike Ridgeway	Reported: 12-Apr-2019 16:17
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Wet Chemistry - Quality Control

Batch BHC0709 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: YK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHC0709-BLK1)						Prepared: 26-Mar-2019 Analyzed: 27-Mar-2019 13:18					
Sulfide	ND	1.00	1.00	mg/kg							U
LCS (BHC0709-BS1)						Prepared: 26-Mar-2019 Analyzed: 27-Mar-2019 13:19					
Sulfide	109	10.0	10.0	mg/kg	119		92.3	75-125			D
Matrix Spike (BHC0709-MS1)						Source: 19C0381-02 Prepared: 26-Mar-2019 Analyzed: 27-Mar-2019 13:20					
Sulfide	2340	221	221	mg/kg	523	1900	84.3	75-125			D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike Dup (BHC0709-MSD1)						Source: 19C0381-02 Prepared: 26-Mar-2019 Analyzed: 27-Mar-2019 13:21					
Sulfide	2480	212	212	mg/kg	503	1900	116	75-125	6.01	200	D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Wet Chemistry - Quality Control

Batch BHC0743 - No Prep Wet Chem

Instrument: BAL2 Analyst: KLE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHC0743-BLK1)						Prepared: 27-Mar-2019 Analyzed: 27-Mar-2019 09:23					
Total Solids, Sulfide	ND	0.04	0.04	%							U
Duplicate (BHC0743-DUP1)						Source: 19C0381-02 Prepared: 27-Mar-2019 Analyzed: 27-Mar-2019 09:23					
Total Solids, Sulfide	22.00	0.04	0.04	%		21.87			0.58	20	



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Project Manager: Mike Ridgeway

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Certified Analyses included in this Report

Analyte	Certifications
EPA 8081B in Solid	
alpha-BHC	DoD-ELAP,NELAP,WADOE
alpha-BHC [2C]	DoD-ELAP,NELAP,WADOE
beta-BHC	DoD-ELAP,NELAP,WADOE
beta-BHC [2C]	DoD-ELAP,NELAP,WADOE
gamma-BHC (Lindane)	DoD-ELAP,NELAP,WADOE
gamma-BHC (Lindane) [2C]	DoD-ELAP,NELAP,WADOE
delta-BHC	DoD-ELAP,NELAP,WADOE
delta-BHC [2C]	DoD-ELAP,NELAP,WADOE
Heptachlor	DoD-ELAP,NELAP,WADOE
Heptachlor [2C]	DoD-ELAP,NELAP,WADOE
Aldrin	DoD-ELAP,NELAP,WADOE
Aldrin [2C]	DoD-ELAP,NELAP,WADOE
Heptachlor Epoxide	DoD-ELAP,NELAP,WADOE
Heptachlor Epoxide [2C]	DoD-ELAP,NELAP,WADOE
trans-Chlordane (beta-Chlordane)	DoD-ELAP
trans-Chlordane (beta-Chlordane) [2C]	DoD-ELAP
cis-Chlordane (alpha-chlordane)	DoD-ELAP,NELAP,WADOE
cis-Chlordane (alpha-chlordane) [2C]	DoD-ELAP,NELAP,WADOE
Endosulfan I	DoD-ELAP,NELAP,WADOE
Endosulfan I [2C]	DoD-ELAP,NELAP,WADOE
4,4'-DDE	DoD-ELAP,NELAP,WADOE
4,4'-DDE [2C]	DoD-ELAP,NELAP,WADOE
Dieldrin	DoD-ELAP,NELAP,WADOE
Dieldrin [2C]	DoD-ELAP,NELAP,WADOE
Endrin	DoD-ELAP,NELAP,WADOE
Endrin [2C]	DoD-ELAP,NELAP,WADOE
Endosulfan II	DoD-ELAP,NELAP,WADOE
Endosulfan II [2C]	DoD-ELAP,NELAP,WADOE
4,4'-DDD	DoD-ELAP,NELAP,WADOE
4,4'-DDD [2C]	DoD-ELAP,NELAP,WADOE
Endrin Aldehyde	DoD-ELAP,NELAP,WADOE
Endrin Aldehyde [2C]	DoD-ELAP,NELAP,WADOE
4,4'-DDT	DoD-ELAP,NELAP,WADOE
4,4'-DDT [2C]	DoD-ELAP,NELAP,WADOE
Endosulfan Sulfate	DoD-ELAP,NELAP,WADOE



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Endosulfan Sulfate [2C]	DoD-ELAP,NELAP,WADOE
Endrin Ketone	DoD-ELAP,NELAP,WADOE
Endrin Ketone [2C]	DoD-ELAP,NELAP,WADOE
Methoxychlor	DoD-ELAP,NELAP,WADOE
Methoxychlor [2C]	DoD-ELAP,NELAP,WADOE
Hexachlorobutadiene	DoD-ELAP,NELAP,WADOE
Hexachlorobutadiene [2C]	DoD-ELAP,NELAP,WADOE
Hexachlorobenzene	DoD-ELAP,NELAP,WADOE
Hexachlorobenzene [2C]	DoD-ELAP,NELAP,WADOE
2,4'-DDE	DoD-ELAP,NELAP,WADOE
2,4'-DDE [2C]	DoD-ELAP,NELAP,WADOE
2,4'-DDD	DoD-ELAP,NELAP,WADOE
2,4'-DDD [2C]	DoD-ELAP,NELAP,WADOE
2,4'-DDT	DoD-ELAP,NELAP,WADOE
2,4'-DDT [2C]	DoD-ELAP,NELAP,WADOE
Oxychlorane	DoD-ELAP,NELAP,WADOE
Oxychlorane [2C]	DoD-ELAP,NELAP,WADOE
cis-Nonachlor	DoD-ELAP,NELAP,WADOE
cis-Nonachlor [2C]	DoD-ELAP,NELAP,WADOE
trans-Nonachlor	DoD-ELAP,NELAP
trans-Nonachlor [2C]	DoD-ELAP,NELAP
Mirex	DoD-ELAP,NELAP,WADOE
Mirex [2C]	DoD-ELAP,NELAP,WADOE
Hexachloroethane	WADOE
Hexachloroethane [2C]	WADOE
Toxaphene	DoD-ELAP,NELAP,WADOE
Toxaphene [2C]	DoD-ELAP,NELAP,WADOE
Chlordane, technical	DoD-ELAP,NELAP,WADOE
Chlordane, technical [2C]	DoD-ELAP,NELAP,WADOE

EPA 8270D-SIM in Solid

Tributyltin Ion	WADOE,DoD-ELAP
Dibutyltin Ion	WADOE,DoD-ELAP
Butyltin Ion	WADOE

SM 4500-S2 D-00 (PSEP) in Solid

Sulfide	DoD-ELAP,NELAP,WADOE
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Project Manager: Mike Ridgeway

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Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	01/31/2021
CALAP	California Department of Public Health CAELAP	2748	06/30/2019
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	01/01/2021
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-011	05/12/2019
WADOE	WA Dept of Ecology	C558	06/30/2019
WA-DW	Ecology - Drinking Water	C558	06/30/2019



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Seattle WA, 98103

Project: 1903305
Project Number: [none]
Project Manager: Mike Ridgeway

Reported:
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Notes and Definitions

- * Flagged value is not within established control limits.
- D The reported value is from a dilution
- J Estimated concentration value detected below the reporting limit.
- NRS This surrogate not reported due to chromatographic interference
- P1 The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
- U This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.

Grain Size by ASTM D422

Project: Surface Sediment Quality Evaluation
Client: Floyd|Snider
Lab Project #: 1903305

Percent Finer (Passing) than the Indicated Size

UOM = Percent

Grain Size Classification	Gravel						Coarse Sand	Medium Sand		Fine Sand			Silt		
	Sieve Size	3"	2"	1 1/2"	1"	3/4"	3/8"	#4	#10	#20	#40	#60	#140	#200	#325
Particle Size (Microns)	76200	50800	38100	25400	19050	9525	4750	2000	850	425	250	106	75	45	34
TOC-SS-07-0-10	100%	100%	100%	100%	100%	100%	100.0%	100.0%	49.8%	40.0%	36.6%	22.4%	17.5%	13.4%	4.14%
TOC-SS-08-0-10	100%	100%	100%	100%	100%	100%	99.8%	99.6%	97.7%	94.8%	90.0%	31.3%	17.6%	10.3%	4.82%
TOC-SS-09-0-10	100%	100%	100%	100%	100%	100%	99.8%	99.5%	98.3%	95.7%	84.7%	11.7%	5.97%	3.32%	1.83%
TOC-SS-10-0-10	100%	100%	100%	100%	100%	98.9%	98.8%	98.4%	97.5%	94.8%	78.6%	9.25%	4.06%	1.66%	1.00%
TOC-SS-11-0-10	100%	100%	100%	100%	15.1%	6.26%	3.71%	2.27%	1.70%	1.43%	1.28%	0.770%	0.510%	0.492%	0.243%
SB-SS-01-0-10	100%	100%	100%	100%	47.0%	38.8%	34.5%	31.4%	29.1%	27.1%	24.8%	12.7%	8.58%	5.40%	2.74%
SB-SS-02-0-10	100%	100%	100%	100%	63.8%	60.4%	56.9%	53.5%	51.3%	48.8%	39.5%	7.97%	3.51%	1.59%	0.234%
SB-SS-03-0-10	100%	100%	100%	100%	94.4%	81.9%	64.1%	52.7%	45.6%	39.8%	34.7%	20.7%	15.1%	10.8%	5.90%
TOC-SS-111-0-10	100%	100%	100%	100%	33.6%	29.3%	27.6%	25.1%	24.0%	23.3%	22.7%	18.2%	15.8%	12.5%	4.22%

Grain Size by ASTM D422

Project: Surface Sediment Quality Evaluation
Client: Floyd|Snider
Lab Project #: 1903305

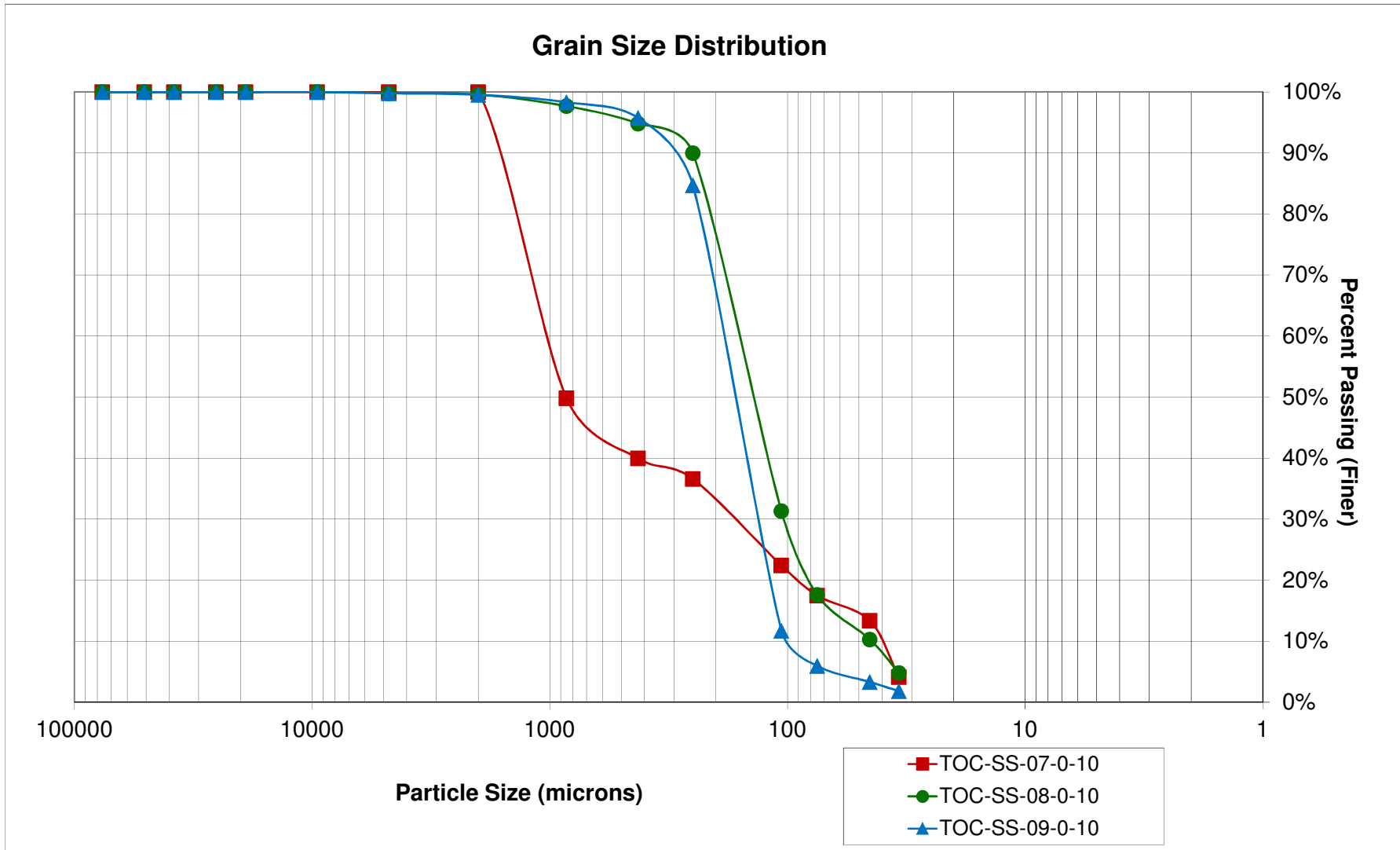
Percent Retained in Each Size Fraction

UOM = Percent

Grain Size Classification	Gravel							Coarse Sand	Medium Sand		Fine Sand			Silt		
	>76200	76200-50800	50800-38100	38100-25400	25400-19000	19050-9525	9525-4750	4750-2000	2000-850	850-425	425-250	250-106	106-75	75-45	45-34	<34
TOC-SS-07-0-10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	48.5%	9.51%	3.28%	13.7%	4.76%	4.00%	8.92%	4.00%
TOC-SS-08-0-10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.197%	0.242%	1.87%	2.87%	4.82%	58.4%	13.7%	7.27%	5.46%	4.81%
TOC-SS-09-0-10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.210%	0.262%	1.22%	2.56%	11.0%	72.9%	5.76%	2.65%	1.48%	1.83%
TOC-SS-10-0-10	0.00%	0.00%	0.00%	0.00%	0.00%	1.10%	0.0818%	0.432%	0.880%	2.69%	16.1%	69.2%	5.18%	2.39%	0.660%	1.00%
TOC-SS-11-0-10	0.00%	0.00%	0.00%	0.00%	84.3%	8.74%	2.54%	1.43%	0.568%	0.264%	0.143%	0.511%	0.258%	0.0178%	0.247%	0.241%
SB-SS-01-0-10	0.00%	0.00%	0.00%	0.00%	53.0%	8.29%	4.30%	3.04%	2.33%	2.03%	2.24%	12.2%	4.09%	3.18%	2.66%	2.74%
SB-SS-02-0-10	0.00%	0.00%	0.00%	0.00%	36.0%	3.46%	3.42%	3.38%	2.26%	2.47%	9.29%	31.3%	4.44%	1.91%	1.35%	0.233%
SB-SS-03-0-10	0.00%	0.00%	0.00%	0.00%	5.53%	12.3%	17.7%	11.3%	6.98%	5.77%	5.04%	13.9%	5.60%	4.18%	4.89%	5.84%
TOC-SS-111-0-10	0.00%	0.00%	0.00%	0.00%	65.6%	4.27%	1.68%	2.39%	1.14%	0.719%	0.551%	4.46%	2.38%	3.24%	8.20%	4.17%

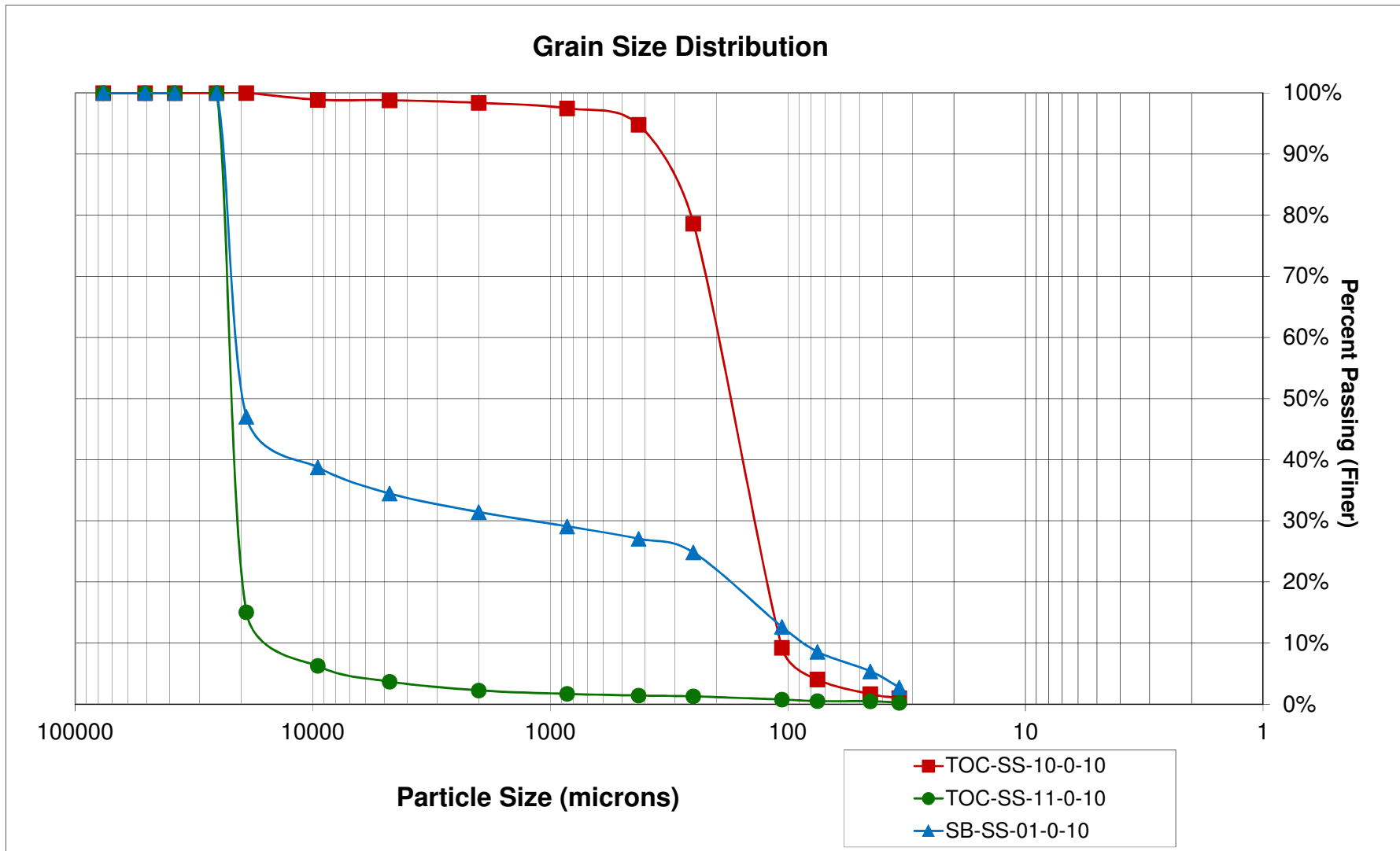
Grain Size by ASTM D422

Project: Surface Sediment Quality Evaluation
 Client: Floyd|Snider
 Lab Project #: 1903305



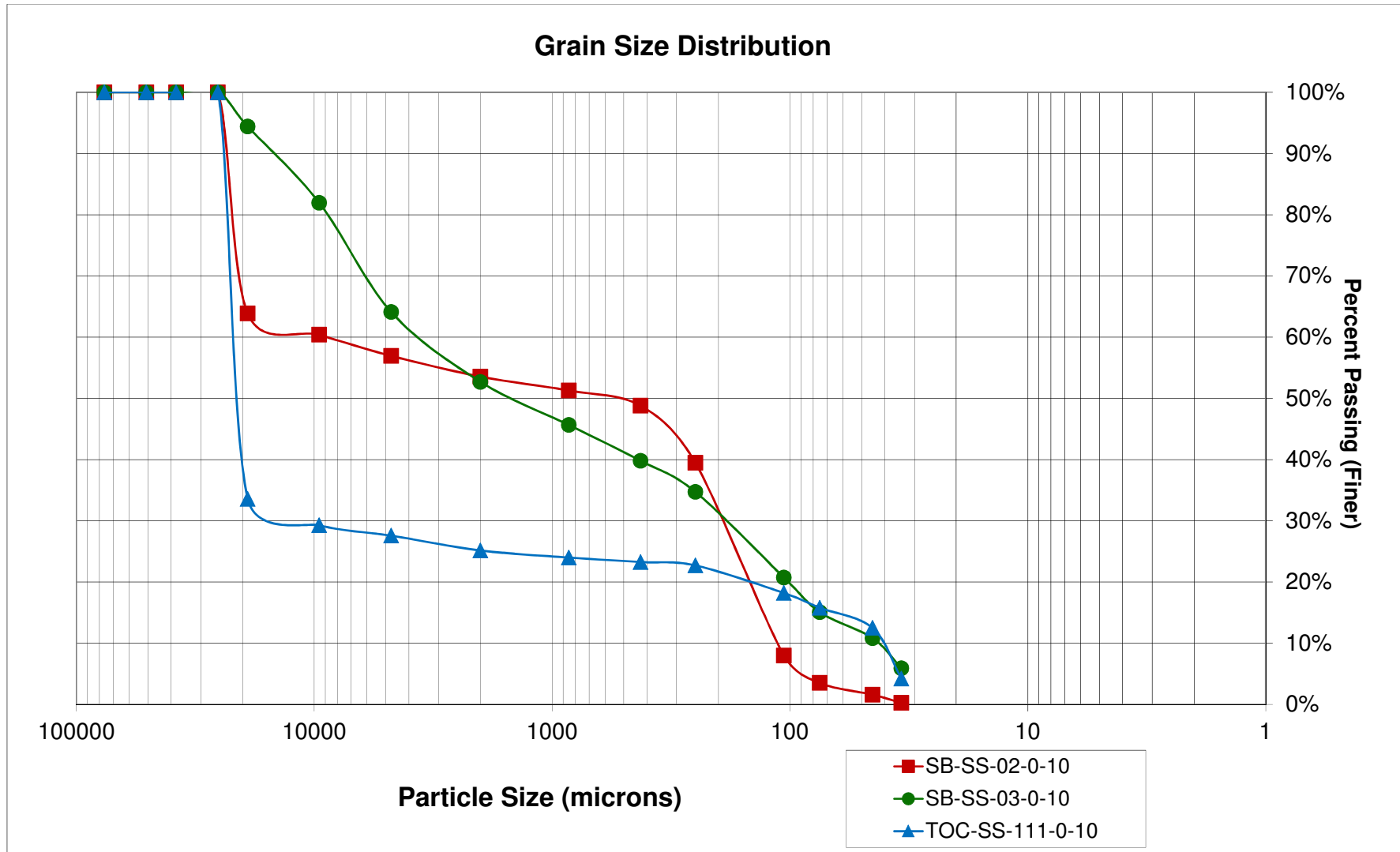
Grain Size by ASTM D422

Project: Surface Sediment Quality Evaluation
 Client: Floyd|Snider
 Lab Project #: 1903305



Grain Size by ASTM D422

Project: Surface Sediment Quality Evaluation
 Client: Floyd|Snider
 Lab Project #: 1903305



Work Order: 1903305
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Ammonia by SM 4500 NH3 E

Sample ID MB-23921	SampType: MBLK	Units: mg/Kg	Prep Date: 3/21/2019	RunNo: 50248							
Client ID: MBLKS	Batch ID: 23921		Analysis Date: 3/22/2019	SeqNo: 986875							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrogen, Ammonia ND 1.00

Sample ID LCS-23921	SampType: LCS	Units: mg/Kg	Prep Date: 3/21/2019	RunNo: 50248							
Client ID: LCSS	Batch ID: 23921		Analysis Date: 3/22/2019	SeqNo: 986876							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrogen, Ammonia 20.0 1.00 20.00 0 100 85 115

Sample ID 1903305-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 3/21/2019	RunNo: 50248							
Client ID: TOC-SS-07-0-10	Batch ID: 23921		Analysis Date: 3/22/2019	SeqNo: 986878							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrogen, Ammonia ND 3.27 0 30

Sample ID 1903305-001BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 3/21/2019	RunNo: 50248							
Client ID: TOC-SS-07-0-10	Batch ID: 23921		Analysis Date: 3/22/2019	SeqNo: 986879							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrogen, Ammonia ND 3.25 64.92 0.6399 -0.472 80 120 S

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID 1903305-001BMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 3/21/2019	RunNo: 50248							
Client ID: TOC-SS-07-0-10	Batch ID: 23921		Analysis Date: 3/22/2019	SeqNo: 986880							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrogen, Ammonia ND 3.25 64.97 0.6399 -0.446 80 120 0 20 S

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.



Date: 4/18/2019

Work Order: 1903305
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID MB-23940	SampType: MBLK	Units: mg/Kg	Prep Date: 3/25/2019	RunNo: 50302							
Client ID: MBLKS	Batch ID: 23940		Analysis Date: 3/26/2019	SeqNo: 987947							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	ND	0.197									
Cadmium	ND	0.157									
Chromium	ND	0.0787									
Copper	ND	0.157									
Lead	ND	0.157									
Nickel	ND	0.394									
Selenium	ND	0.394									
Silver	ND	0.0787									
Zinc	ND	0.394									

Sample ID LCS-23940	SampType: LCS	Units: mg/Kg	Prep Date: 3/25/2019	RunNo: 50302							
Client ID: LCSS	Batch ID: 23940		Analysis Date: 3/26/2019	SeqNo: 987948							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	37.0	0.198	39.68	0	93.1	80	120				
Cadmium	1.87	0.159	1.984	0	94.1	80	120				
Chromium	37.9	0.0794	39.68	0	95.6	80	120				
Copper	38.2	0.159	39.68	0	96.2	80	120				
Lead	18.8	0.159	19.84	0	94.5	80	120				
Nickel	38.3	0.397	39.68	0	96.4	80	120				
Selenium	3.79	0.397	3.968	0	95.6	80	120				
Silver	9.76	0.0794	9.921	0	98.3	80	120				
Zinc	40.7	0.397	39.68	0	103	80	120				

Sample ID 1903305-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 3/25/2019	RunNo: 50302							
Client ID: TOC-SS-07-0-10	Batch ID: 23940		Analysis Date: 3/26/2019	SeqNo: 987950							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	12.0	0.591						15.06	22.5	20	R
Cadmium	0.511	0.473						0.6635	26.0	20	

Work Order: 1903305
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID	1903305-001BDUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	3/25/2019	RunNo:	50302		
Client ID:	TOC-SS-07-0-10	Batch ID:	23940			Analysis Date:	3/26/2019	SeqNo:	987950		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	35.0	0.236						40.88	15.6	20	
Copper	172	0.473						205.2	17.5	20	
Lead	84.6	0.473						114.6	30.2	20	R
Nickel	29.6	1.18						34.65	15.8	20	
Selenium	ND	1.18						1.428	24.8	20	
Silver	0.264	0.236						0.3389	24.9	20	
Zinc	285	1.18						340.3	17.7	20	

NOTES:

R - High RPD observed. The method is in control as indicated by the LCS.

Sample ID	1903305-001BMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	3/25/2019	RunNo:	50302		
Client ID:	TOC-SS-07-0-10	Batch ID:	23940			Analysis Date:	3/26/2019	SeqNo:	987952		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	117	0.583	116.5	15.06	87.2	75	125				
Cadmium	5.90	0.466	5.826	0.6635	90.0	75	125				
Chromium	146	0.233	116.5	40.88	90.4	75	125				
Copper	322	0.466	116.5	205.2	99.9	75	125				
Lead	153	0.466	58.26	114.6	66.4	75	125				S
Nickel	141	1.17	116.5	34.65	91.5	75	125				
Selenium	10.5	1.17	11.65	1.428	78.2	75	125				
Silver	18.8	0.233	29.13	0.3389	63.5	75	125				S
Zinc	498	1.17	116.5	340.3	135	75	125				S

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect (Lead, Silver, Zinc).

Sample ID	1903305-001BMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	3/25/2019	RunNo:	50302		
Client ID:	TOC-SS-07-0-10	Batch ID:	23940			Analysis Date:	3/26/2019	SeqNo:	987953		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	112	0.587	117.3	15.06	82.5	75	125	116.7	4.25	20	
Cadmium	5.52	0.469	5.866	0.6635	82.9	75	125	5.904	6.63	20	

Work Order: 1903305
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID	1903305-001BMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	3/25/2019	RunNo:	50302		
Client ID:	TOC-SS-07-0-10	Batch ID:	23940			Analysis Date:	3/26/2019	SeqNo:	987953		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	137	0.235	117.3	40.88	81.9	75	125	146.2	6.51	20	
Copper	281	0.469	117.3	205.2	64.3	75	125	321.6	13.6	20	S
Lead	137	0.469	58.66	114.6	39.0	75	125	153.3	10.9	20	S
Nickel	127	1.17	117.3	34.65	79.1	75	125	141.2	10.2	20	
Selenium	10.0	1.17	11.73	1.428	73.5	75	125	10.54	4.77	20	S
Silver	18.6	0.235	29.33	0.3389	62.3	75	125	18.83	1.26	20	S
Zinc	428	1.17	117.3	340.3	74.7	75	125	498.1	15.1	20	S

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect (Lead, Silver, Zinc).
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed and recovered within range (Copper, Selenium).

Sample ID	1903305-001BPDS	SampType:	PDS	Units:	mg/Kg-dry	Prep Date:	3/25/2019	RunNo:	50302		
Client ID:	TOC-SS-07-0-10	Batch ID:	23940			Analysis Date:	3/26/2019	SeqNo:	987954		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	141	0.473	25.0	97.0	89.0	75	125				
Silver	3.81	0.236	2.50	0.287	70.5	75	125				S
Zinc	396	1.18	50.0	288	108	75	125				

NOTES:

S - Spike recovery indicates a possible matrix effect. The method is in control as indicated by the Laboratory Control Sample (LCS).

Work Order: 1903305
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Mercury by EPA Method 7471

Sample ID MB-23916	SampType: MBLK	Units: mg/Kg	Prep Date: 3/21/2019	RunNo: 50206							
Client ID: MBLKS	Batch ID: 23916	Analysis Date: 3/21/2019	SeqNo: 986112								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.250

Sample ID LCS-23916	SampType: LCS	Units: mg/Kg	Prep Date: 3/21/2019	RunNo: 50206							
Client ID: LCSS	Batch ID: 23916	Analysis Date: 3/21/2019	SeqNo: 986113								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.503 0.250 0.5000 0 101 80 120

Sample ID 1903305-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 3/21/2019	RunNo: 50206							
Client ID: TOC-SS-07-0-10	Batch ID: 23916	Analysis Date: 3/21/2019	SeqNo: 986115								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.571 0.396 0.5464 4.47 20 D

Sample ID 1903305-001BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 3/21/2019	RunNo: 50206							
Client ID: TOC-SS-07-0-10	Batch ID: 23916	Analysis Date: 3/21/2019	SeqNo: 986116								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.948 0.405 0.4053 0.5464 99.2 70 130 D

Sample ID 1903305-001BMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 3/21/2019	RunNo: 50206							
Client ID: TOC-SS-07-0-10	Batch ID: 23916	Analysis Date: 3/21/2019	SeqNo: 986117								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.850 0.388 0.3884 0.5464 78.1 70 130 0.9483 11.0 20 D

Work Order: 1903305
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID MB-23956	SampType: MBLK	Units: mg/Kg	Prep Date: 3/26/2019	RunNo: 50324							
Client ID: MBLKS	Batch ID: 23956		Analysis Date: 3/26/2019	SeqNo: 988476							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	17.4		20.00		87.2	50	150				
Surr: o-Terphenyl	18.0		20.00		89.9	50	150				

Sample ID LCS-23956	SampType: LCS	Units: mg/Kg	Prep Date: 3/26/2019	RunNo: 50324							
Client ID: LCSS	Batch ID: 23956		Analysis Date: 3/26/2019	SeqNo: 988477							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	550	20.0	500.0	0	110	65	135				
Surr: 2-Fluorobiphenyl	19.4		20.00		96.9	50	150				
Surr: o-Terphenyl	18.4		20.00		92.0	50	150				

Sample ID 1903105-005ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 3/26/2019	RunNo: 50324							
Client ID: BATCH	Batch ID: 23956		Analysis Date: 3/26/2019	SeqNo: 988479							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	23.9						0		30	H
Heavy Oil	ND	59.7						0		30	H
Surr: 2-Fluorobiphenyl	18.8		23.89		78.7	50	150		0		H
Surr: o-Terphenyl	19.6		23.89		82.0	50	150		0		H

Sample ID 1903105-005AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 3/26/2019	RunNo: 50324							
Client ID: BATCH	Batch ID: 23956		Analysis Date: 3/26/2019	SeqNo: 988480							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	616	23.8	595.5	0	103	65	135				H
Surr: 2-Fluorobiphenyl	22.3		23.82		93.7	50	150				H
Surr: o-Terphenyl	20.8		23.82		87.4	50	150				H

Work Order: 1903305
 CLIENT: Floyd | Snider
 Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID	1903105-005AMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	3/26/2019	RunNo:	50324		
Client ID:	BATCH	Batch ID:	23956			Analysis Date:	3/26/2019	SeqNo:	988480		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID	1903105-005AMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	3/26/2019	RunNo:	50324		
Client ID:	BATCH	Batch ID:	23956			Analysis Date:	3/26/2019	SeqNo:	988481		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	608	23.3	581.7	0	105	65	135	616.1	1.34	30	H
Surr: 2-Fluorobiphenyl	21.4		23.27		92.1	50	150		0		H
Surr: o-Terphenyl	20.6		23.27		88.5	50	150		0		H

Sample ID	1903367-007ADUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	3/26/2019	RunNo:	50324		
Client ID:	BATCH	Batch ID:	23956			Analysis Date:	3/27/2019	SeqNo:	989165		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	22.1						0		30	
Heavy Oil	ND	55.4						0		30	
Surr: 2-Fluorobiphenyl	23.8		22.14		108	50	150		0		
Surr: o-Terphenyl	24.7		22.14		111	50	150		0		

Work Order: 1903305
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Polychlorinated Biphenyls (PCB) by EPA 8082

Sample ID MB-24121	SampType: MBLK	Units: mg/Kg		Prep Date: 4/9/2019	RunNo: 50653						
Client ID: MBLKS	Batch ID: 24121			Analysis Date: 4/10/2019	SeqNo: 994720						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.00149									MDL
Aroclor 1221	ND	0.00149									MDL
Aroclor 1232	ND	0.00149									MDL
Aroclor 1242	ND	0.00149									MDL
Aroclor 1248	ND	0.00261									MDL
Aroclor 1254	ND	0.00261									MDL
Aroclor 1260	ND	0.00261									MDL
Aroclor 1268	ND	0.00261									MDL
Total PCBs	ND	0.00261									MDL
Surr: Decachlorobiphenyl	44.4		50.00		88.9	30.8	168				
Surr: Tetrachloro-m-xylene	52.8		50.00		106	30.3	157				

NOTES:

Tetrabutylammonium sulfite cleanup
MDL - Analyte reported to Method Detection Limit (MDL)

Sample ID LCS1-24121	SampType: LCS	Units: mg/Kg		Prep Date: 4/9/2019	RunNo: 50653						
Client ID: LCSS	Batch ID: 24121			Analysis Date: 4/10/2019	SeqNo: 994721						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	1.14	0.100	1.000	0	114	38.5	149				
Aroclor 1260	1.03	0.100	1.000	0	103	35.4	154				
Surr: Decachlorobiphenyl	44.1		50.00		88.3	30.8	168				
Surr: Tetrachloro-m-xylene	51.7		50.00		103	30.3	157				

NOTES:

Tetrabutylammonium sulfite cleanup

Sample ID LCS1D-24121	SampType: LCS D	Units: mg/Kg		Prep Date: 4/9/2019	RunNo: 50653						
Client ID: LCSS02	Batch ID: 24121			Analysis Date: 4/10/2019	SeqNo: 994722						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	1.17	0.100	1.000	0	117	38.5	149	1.144	1.95	20	
Aroclor 1260	1.03	0.100	1.000	0	103	35.4	154	1.029	0.0657	20	

Work Order: 1903305
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Polychlorinated Biphenyls (PCB) by EPA 8082

Sample ID	LCS1D-24121	SampType:	LCS	Units:	mg/Kg	Prep Date:	4/9/2019	RunNo:	50653		
Client ID:	LCSS02	Batch ID:	24121			Analysis Date:	4/10/2019	SeqNo:	994722		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: Decachlorobiphenyl	46.0		50.00		92.0	30.8	168		0		
Surr: Tetrachloro-m-xylene	55.0		50.00		110	30.3	157		0		

NOTES:
Tetrabutylammonium sulfite cleanup

Sample ID	LCS2-24121	SampType:	LCS	Units:	mg/Kg	Prep Date:	4/9/2019	RunNo:	50653		
Client ID:	LCSS	Batch ID:	24121			Analysis Date:	4/10/2019	SeqNo:	994723		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aroclor 1254	1.09	0.100	1.000	0	109	31.9	167				
Surr: Decachlorobiphenyl	43.6		50.00		87.2	30.8	168				
Surr: Tetrachloro-m-xylene	52.3		50.00		105	30.3	157				

NOTES:
Tetrabutylammonium sulfite cleanup

Sample ID	1903320-005BDUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	4/9/2019	RunNo:	50653		
Client ID:	BATCH	Batch ID:	24121			Analysis Date:	4/10/2019	SeqNo:	994727		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aroclor 1016	ND	0.00136						0		30	MDL
Aroclor 1221	ND	0.00136						0		30	MDL
Aroclor 1232	ND	0.00136						0		30	MDL
Aroclor 1242	ND	0.00136						0		30	MDL
Aroclor 1248	ND	0.00238						0		30	MDL
Aroclor 1254	ND	0.00238						0		30	MDL
Aroclor 1260	0.0101	0.00238						0.03559	112	30	RMDL
Aroclor 1268	ND	0.00238						0		30	MDL
Total PCBs	0.0101	0.00238						0.03559	112	30	RMDL
Surr: Decachlorobiphenyl	15.4		45.51		33.7	30.8	168		0		
Surr: Tetrachloro-m-xylene	15.8		45.51		34.6	30.3	157		0		



Date: 4/18/2019

Work Order: 1903305
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Polychlorinated Biphenyls (PCB) by EPA 8082

Sample ID	1903320-005BDUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	4/9/2019	RunNo:	50653		
Client ID:	BATCH	Batch ID:	24121			Analysis Date:	4/10/2019	SeqNo:	994727		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

R - High RPD due to low analyte concentration. In this range, high RPD's may be expected.
MDL - Analyte reported to Method Detection Limit (MDL)

Work Order: 1903305
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID: MB-24010	SampType: MBLK	Units: µg/Kg	Prep Date: 3/28/2019	RunNo: 50506
Client ID: MBLKS	Batch ID: 24010		Analysis Date: 3/29/2019	SeqNo: 991975

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzoic acid	ND	500									
Phenol	ND	100									
3&4-Methylphenol (m, p-cresol)	ND	100									
Naphthalene	ND	40.0									
2-Methylnaphthalene	ND	40.0									
Acenaphthene	ND	40.0									
Acenaphthylene	ND	40.0									
Dibenzofuran	ND	75.0									
Fluorene	ND	40.0									
Pentachlorophenol	ND	100									
Phenanthrene	ND	40.0									
Anthracene	ND	40.0									
Carbazole	ND	75.0									
Di-n-butylphthalate	ND	100									
Fluoranthene	ND	40.0									
Pyrene	ND	40.0									
Benz(a)anthracene	ND	40.0									
Chrysene	ND	40.0									
bis (2-Ethylhexyl) phthalate	ND	100									
Di-n-octyl phthalate	ND	11.3									MDL
Benzo(b)fluoranthene	ND	40.0									
Benzo(k)fluoranthene	ND	40.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									
Dibenz(a,h)anthracene	ND	40.0									
Benzo(g,h,i)perylene	ND	40.0									
Surr: 2,4,6-Tribromophenol	935		1,000		93.5	14.8	165				
Surr: 2-Fluorobiphenyl	524		500.0		105	17.8	151				
Surr: Nitrobenzene-d5	315		500.0		63.0	12.5	163				
Surr: Phenol-d6	801		1,000		80.1	11.6	133				
Surr: p-Terphenyl	629		500.0		126	22	176				

Work Order: 1903305
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID MB-24010	SampType: MBLK	Units: µg/Kg	Prep Date: 3/28/2019	RunNo: 50506							
Client ID: MBLKS	Batch ID: 24010		Analysis Date: 3/29/2019	SeqNo: 991975							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:
MDL - Analyte reported to Method Detection Limit (MDL)

Sample ID 1903305-001BDUP	SampType: DUP	Units: µg/Kg-dry	Prep Date: 3/28/2019	RunNo: 50506							
Client ID: TOC-SS-07-0-10	Batch ID: 24010		Analysis Date: 3/29/2019	SeqNo: 991979							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzoic acid	ND	501						0		50	
Phenol	ND	100						0		50	
3&4-Methylphenol (m, p-cresol)	ND	100						0		50	
Naphthalene	42.4	40.1						52.11	20.6	50	
2-Methylnaphthalene	ND	40.1						0		50	
Acenaphthene	ND	40.1						0		50	
Acenaphthylene	47.5	40.1						49.83	4.72	50	
Dibenzofuran	ND	75.2						0		50	
Fluorene	ND	40.1						40.15	2.66	50	
Pentachlorophenol	ND	100						0		50	
Phenanthrene	238	40.1						179.4	28.3	50	R
Anthracene	70.4	40.1						67.00	4.99	50	
Carbazole	ND	75.2						0		50	
Di-n-butylphthalate	ND	100						0		50	
Fluoranthene	794	40.1						570.4	32.8	50	
Pyrene	716	40.1						535.1	29.0	50	
Benz(a)anthracene	518	40.1						385.3	29.4	50	
Chrysene	500	40.1						369.1	30.2	50	
bis (2-Ethylhexyl) phthalate	302	100						286.3	5.30	50	
Di-n-octyl phthalate	36.6	11.3						40.54	10.3	50	MDL, J
Benzo(b)fluoranthene	404	40.1						347.9	15.0	50	Q*
Benzo(k)fluoranthene	314	40.1						378.7	18.6	50	
Benzo(a)pyrene	424	40.1						430.8	1.63	50	
Indeno(1,2,3-cd)pyrene	253	40.1						280.4	10.4	50	

Work Order: 1903305
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID	1903305-001BDUP	SampType:	DUP	Units:	µg/Kg-dry	Prep Date:	3/28/2019	RunNo:	50506		
Client ID:	TOC-SS-07-0-10	Batch ID:	24010			Analysis Date:	3/29/2019	SeqNo:	991979		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dibenz(a,h)anthracene	89.3	40.1						80.27	10.7	50	
Benzo(g,h,i)perylene	313	40.1						336.5	7.18	50	
Surr: 2,4,6-Tribromophenol	523		1,002		52.2	14.8	165		0		
Surr: 2-Fluorobiphenyl	138		501.1		27.5	17.8	151		0		
Surr: Nitrobenzene-d5	143		501.1		28.5	12.5	163		0		
Surr: Phenol-d6	369		1,002		36.8	11.6	133		0		
Surr: p-Terphenyl	293		501.1		58.5	22	176		0		

NOTES:

- R - High RPD due to suspected sample inhomogeneity. The method is in control as indicated by the Laboratory Control Sample (LCS).
- Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria
- * - Flagged value is not within established control limits.
- MDL - Analyte reported to Method Detection Limit (MDL)

Sample ID	1903305-001BMS	SampType:	MS	Units:	µg/Kg-dry	Prep Date:	3/28/2019	RunNo:	50506		
Client ID:	TOC-SS-07-0-10	Batch ID:	24010			Analysis Date:	3/29/2019	SeqNo:	991980		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzoic acid	366	497	1,989	0	18.4	5	139				
Phenol	417	99.5	994.5	0	41.9	29.2	146				
3&4-Methylphenol (m, p-cresol)	279	99.5	497.3	0	56.1	37.6	125				
Naphthalene	479	39.8	994.5	52.11	42.9	32.4	137				
2-Methylnaphthalene	518	39.8	994.5	18.10	50.2	39.3	126				
Acenaphthene	604	39.8	994.5	32.42	57.5	49.6	129				
Acenaphthylene	594	39.8	994.5	49.83	54.8	39.9	129				
Dibenzofuran	580	74.6	994.5	0	58.4	41.2	128				
Fluorene	630	39.8	994.5	40.15	59.3	37.7	133				
Pentachlorophenol	690	99.5	994.5	0	69.4	28.2	156				
Phenanthrene	792	39.8	994.5	179.4	61.6	32.2	139				
Anthracene	605	39.8	994.5	67.00	54.1	41.2	136				
Carbazole	566	74.6	994.5	0	56.9	32	147				
Di-n-butylphthalate	535	99.5	994.5	24.59	51.3	35.1	142				

Work Order: 1903305
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID 1903305-001BMS	SampType: MS	Units: µg/Kg-dry	Prep Date: 3/28/2019	RunNo: 50506
Client ID: TOC-SS-07-0-10	Batch ID: 24010		Analysis Date: 3/29/2019	SeqNo: 991980

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluoranthene	1,240	39.8	994.5	570.4	67.6	33.8	141				
Pyrene	1,220	39.8	994.5	535.1	69.1	31.4	151				
Benz(a)anthracene	948	39.8	994.5	385.3	56.6	36	138				
Chrysene	1,050	39.8	994.5	369.1	68.8	25.5	136				
bis (2-Ethylhexyl) phthalate	872	99.5	994.5	286.3	58.9	40.8	170				
Di-n-octyl phthalate	669	11.2	994.5	40.54	63.2	34.6	142				
Benzo(b)fluoranthene	1,100	39.8	994.5	347.9	75.4	31.8	166				
Benzo(k)fluoranthene	974	39.8	994.5	378.7	59.9	30.8	152				
Benzo(a)pyrene	1,030	39.8	994.5	430.8	60.3	31.1	153				
Indeno(1,2,3-cd)pyrene	857	39.8	994.5	280.4	58.0	38.1	155				
Dibenz(a,h)anthracene	658	39.8	994.5	80.27	58.1	40.7	152				
Benzo(g,h,i)perylene	916	39.8	994.5	336.5	58.3	34	157				
Surr: 2,4,6-Tribromophenol	616		994.5		61.9	14.8	165				
Surr: 2-Fluorobiphenyl	71.0		497.3		14.3	17.8	151				S
Surr: Nitrobenzene-d5	75.9		497.3		15.3	12.5	163				
Surr: Phenol-d6	363		994.5		36.5	11.6	133				
Surr: p-Terphenyl	315		497.3		63.4	22	176				

NOTES:

S - Outlying surrogate recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID 1903305-001BMSD	SampType: MSD	Units: µg/Kg-dry	Prep Date: 3/28/2019	RunNo: 50506
Client ID: TOC-SS-07-0-10	Batch ID: 24010		Analysis Date: 3/29/2019	SeqNo: 991981

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	398	96.4	963.7	0	41.3	29.2	146	417.1	4.81	50	
3&4-Methylphenol (m, p-cresol)	245	96.4	481.8	0	50.8	37.6	125	278.7	13.0	50	
Naphthalene	423	38.5	963.7	52.11	38.4	32.4	137	478.8	12.5	50	
2-Methylnaphthalene	466	38.5	963.7	18.10	46.4	39.3	126	517.5	10.6	50	
Acenaphthene	528	38.5	963.7	32.42	51.4	49.6	129	604.5	13.5	50	
Acenaphthylene	531	38.5	963.7	49.83	50.0	39.9	129	594.4	11.2	50	
Dibenzofuran	522	72.3	963.7	0	54.2	41.2	128	580.4	10.6	50	

Work Order: 1903305
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID: 1903305-001BMSD	SampType: MSD	Units: µg/Kg-dry	Prep Date: 3/28/2019	RunNo: 50506
Client ID: TOC-SS-07-0-10	Batch ID: 24010		Analysis Date: 3/29/2019	SeqNo: 991981

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluorene	596	38.5	963.7	40.15	57.7	37.7	133	629.8	5.47	50	
Pentachlorophenol	667	96.4	963.7	0	69.2	28.2	156	689.8	3.36	50	
Phenanthrene	631	38.5	963.7	179.4	46.8	32.2	139	791.7	22.6	50	
Anthracene	563	38.5	963.7	67.00	51.5	41.2	136	604.9	7.13	50	
Carbazole	485	72.3	963.7	0	50.4	32	147	565.9	15.3	50	
Di-n-butylphthalate	492	96.4	963.7	24.59	48.5	35.1	142	535.2	8.51	50	
Fluoranthene	1,030	38.5	963.7	570.4	48.1	33.8	141	1,243	18.3	50	
Pyrene	992	38.5	963.7	535.1	47.5	31.4	151	1,222	20.8	50	
Benz(a)anthracene	789	38.5	963.7	385.3	41.9	36	138	948.1	18.3	50	
Chrysene	849	38.5	963.7	369.1	49.8	25.5	136	1,054	21.5	50	
bis (2-Ethylhexyl) phthalate	882	96.4	963.7	286.3	61.9	40.8	170	871.7	1.23	50	
Di-n-octyl phthalate	585	10.8	963.7	40.54	56.5	34.6	142	669.0	13.4	50	
Benzo(b)fluoranthene	959	38.5	963.7	347.9	63.4	31.8	166	1,098	13.5	50	
Benzo(k)fluoranthene	800	38.5	963.7	378.7	43.7	30.8	152	974.2	19.6	50	
Benzo(a)pyrene	897	38.5	963.7	430.8	48.4	31.1	153	1,031	13.9	50	
Indeno(1,2,3-cd)pyrene	744	38.5	963.7	280.4	48.1	38.1	155	857.4	14.2	50	
Dibenz(a,h)anthracene	592	38.5	963.7	80.27	53.1	40.7	152	658.1	10.6	50	
Benzo(g,h,i)perylene	808	38.5	963.7	336.5	49.0	34	157	915.8	12.5	50	
Surr: 2,4,6-Tribromophenol	456		963.7		47.3	14.8	165		0		
Surr: 2-Fluorobiphenyl	20.6		481.8		4.28	17.8	151		0		S
Surr: Nitrobenzene-d5	24.6		481.8		5.11	12.5	163		0		S
Surr: Phenol-d6	196		963.7		20.3	11.6	133		0		
Surr: p-Terphenyl	275		481.8		57.2	22	176		0		

NOTES:

S - Outlying surrogate recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.



Work Order: 1903305
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Sample Moisture (Percent Moisture)

Sample ID 1903305-003BDUP	SampType: DUP	Units: wt%			Prep Date: 3/22/2019	RunNo: 50211					
Client ID: TOC-SS-09-0-10	Batch ID: R50211				Analysis Date: 3/22/2019	SeqNo: 986176					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	31.0	0.500						31.86	2.72	20	

Sample ID 1903318-001ADUP	SampType: DUP	Units: wt%			Prep Date: 3/22/2019	RunNo: 50211					
Client ID: BATCH	Batch ID: R50211				Analysis Date: 3/22/2019	SeqNo: 986186					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	7.91	0.500						7.984	0.941	20	

Chain of Custody Record & Laboratory Analysis Request

1903305

FLOYD | SNIDER

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Laboratory: Fremont					Test Parameters													Comments/Preservation	
Date: 3/20/19					Grain Size	Total solids	TOC	Ammonia	Sulfides	Metals	Mercury	Butyltins	SVOCs	Pesticides	PCB Aroclors	Dioxins/furans	TPH		MS/MSD
Line	Field Sample ID	Date	Time	Matrix	No. of Containers														
1	TOC-SS-07-0-10	3/20/19	12:33	SE	8	X	X	X	X	X	X	X	X	X	X	X	X	X	MS/MSD
2	TOC-SS-08-0-10		13:10	SE	6														
3	TOC-SS-09-0-10		13:50	SE	6														
4	TOC-SS-10-0-10		14:47	SE	6														
5	TOC-SS-11-0-10		15:27	SE	6														Use 32oz jar for grain size only
6	SB-SS-01-0-10		10:30	SE	6														
7	SB-SS-02-0-10		11:10	SE	6														
8	SB-SS-03-0-10		11:52	SE	6														
9	TOC-SS- 111-0-10		15:35	SE	6	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	Use 32oz jar for grain size only
10	TOC-SC-01- KA			SE															
11	TOC-SC-01-			SE															
12	TOC-SC-01-			SE															
13	TOC-SC-02-																		
14	TOC-SC-02-																		
15	TOC-SC-02-																		

Notes:

*Please see SAP Addendum Table 1 for methods, analyte lists, reporting limits, and QC requirements

Relinquished By: Kara Hitchko Company: Floyd Snider
 Signature/Printed Name: Kara Hitchko Date/Time: 3/20/19 1801

Received By: [Signature] Company: FAI
 Signature/Printed Name: [Signature] Date/Time: 3/20/19 1801

Relinquished By: _____ Company: _____
 Signature/Printed Name: _____ Date/Time: _____

Received By: _____ Company: _____
 Signature/Printed Name: _____ Date/Time: _____



3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Floyd | Snider
Lynn Grochala
601 Union St., Suite 600
Seattle, WA 98101

RE: Surface Sediment Quality Evaluation
Work Order Number: 1903320

April 18, 2019

Attention Lynn Grochala:

Fremont Analytical, Inc. received 7 sample(s) on 3/21/2019 for the analyses presented in the following report.

Ammonia by SM 4500 NH3 E
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.
Dioxins by EPA Method 1613
Grain Size by ASTM D422
Mercury by EPA Method 7471
Organotins
Polychlorinated Biphenyls (PCB) by EPA 8082
Sample Moisture (Percent Moisture)
Semi-Volatile Organic Compounds by EPA Method 8270
Total Metals by EPA Method 6020
Total Organic Carbon by EPA 9060
Total Solids

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

DoD/ELAP Certification #L17-135, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)



Mike Ridgeway
Laboratory Director

CC:
Kara Hitchko
Pamela Osterhout

CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation
Work Order: 1903320

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1903320-001	TOC-SC-03-0-0.5	03/21/2019 3:30 PM	03/21/2019 6:09 PM
1903320-002	TOC-SC-01-0.5-2.0	03/21/2019 11:11 AM	03/21/2019 6:09 PM
1903320-003	TOC-SC-01-2.5-4.0	03/21/2019 11:07 AM	03/21/2019 6:09 PM
1903320-004	TOC-SC-03-1.0-2.5	03/21/2019 3:40 PM	03/21/2019 6:09 PM
1903320-005	TOC-SC-02-0.5-1.2	03/21/2019 12:50 PM	03/21/2019 6:09 PM
1903320-006	TOC-SC-02-1.2-2.2	03/21/2019 1:00 PM	03/21/2019 6:09 PM
1903320-007	TOC-SC-02-2.6-4.0	03/21/2019 12:55 PM	03/21/2019 6:09 PM

CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

1903320-001C

C-TBT has been Sub Contracted.

1903320-001D

TEST_SUB has been Sub Contracted.

1903320-002C

C-TBT has been Sub Contracted.

1903320-002D

TEST_SUB has been Sub Contracted.

1903320-003C

C-TBT has been Sub Contracted.

1903320-003D

TEST_SUB has been Sub Contracted.

1903320-005C

C-TBT has been Sub Contracted.

1903320-005D

TEST_SUB has been Sub Contracted.

1903320-006C

C-TBT has been Sub Contracted.

1903320-006D

TEST_SUB has been Sub Contracted.

1903320-007C

C-TBT has been Sub Contracted.

1903320-007D

TEST_SUB has been Sub Contracted.

1903320-002E

O-DIOXIN has been Sub Contracted.

1903320-003E

O-DIOXIN has been Sub Contracted.

1903320-005E

O-DIOXIN has been Sub Contracted.

1903320-006E

O-DIOXIN has been Sub Contracted.

CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

1903320-007E

O-DIOXIN has been Sub Contracted.

Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1903320-001B) required Acid Cleanup Procedure (Using Method No 3665A).

Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1903320-003B) required Acid Cleanup Procedure (Using Method No 3665A).

Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1903320-001B) required Florisil Cleanup Procedure (Using Method No 3620C).

Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1903320-002B) required Florisil Cleanup Procedure (Using Method No 3620C).

Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1903320-003B) required Florisil Cleanup Procedure (Using Method No 3620C).

Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1903320-005B) required Florisil Cleanup Procedure (Using Method No 3620C).

Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1903320-006B) required Florisil Cleanup Procedure (Using Method No 3620C).

Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1903320-007B) required Florisil Cleanup Procedure (Using Method No 3620C).

Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1903320-002B) required Acid Cleanup Procedure (Using Method No 3665A).

Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1903320-005B) required Acid Cleanup Procedure (Using Method No 3665A).

Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1903320-006B) required Acid Cleanup Procedure (Using Method No 3665A).

Prep Comments for METHOD (PREP-PCB-S), SAMPLE (1903320-007B) required Acid Cleanup Procedure (Using Method No 3665A).

Qualifiers:

- * - Flagged value is not within established control limits
- B - Analyte detected in the associated Method Blank
- D - Dilution was required
- E - Value above quantitation range
- H - Holding times for preparation or analysis exceeded
- I - Analyte with an internal standard that does not meet established acceptance criteria
- J - Analyte detected below Reporting Limit
- N - Tentatively Identified Compound (TIC)
- Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
- S - Spike recovery outside accepted recovery limits
- ND - Not detected at the Reporting Limit
- R - High relative percent difference observed

Acronyms:

- %Rec - Percent Recovery
- CCB - Continued Calibration Blank
- CCV - Continued Calibration Verification
- DF - Dilution Factor
- HEM - Hexane Extractable Material
- ICV - Initial Calibration Verification
- LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
- MB or MBLANK - Method Blank
- MDL - Method Detection Limit
- MS/MSD - Matrix Spike / Matrix Spike Duplicate
- PDS - Post Digestion Spike
- Ref Val - Reference Value
- RL - Reporting Limit
- RPD - Relative Percent Difference
- SD - Serial Dilution
- SGT - Silica Gel Treatment
- SPK - Spike
- Surr - Surrogate



Client: Floyd | Snider

Collection Date: 3/21/2019 3:30:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-001

Matrix: Sediment

Client Sample ID: TOC-SC-03-0-0.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 23976

Analyst: SB

Aroclor 1016	ND	0.00180	MDL	mg/Kg-dry	1	3/27/2019 11:15:59 PM
Aroclor 1221	ND	0.00180	MDL	mg/Kg-dry	1	3/27/2019 11:15:59 PM
Aroclor 1232	ND	0.00180	MDL	mg/Kg-dry	1	3/27/2019 11:15:59 PM
Aroclor 1242	ND	0.00180	MDL	mg/Kg-dry	1	3/27/2019 11:15:59 PM
Aroclor 1248	ND	0.00314	MDL	mg/Kg-dry	1	3/27/2019 11:15:59 PM
Aroclor 1254	ND	0.00314	MDL	mg/Kg-dry	1	3/27/2019 11:15:59 PM
Aroclor 1260	ND	0.00314	MDL	mg/Kg-dry	1	3/27/2019 11:15:59 PM
Aroclor 1268	ND	0.00314	MDL	mg/Kg-dry	1	3/27/2019 11:15:59 PM
Total PCBs	ND	0.00314	MDL	mg/Kg-dry	1	3/27/2019 11:15:59 PM
Surr: Decachlorobiphenyl	97.1	30.8 - 168		%Rec	1	3/27/2019 11:15:59 PM
Surr: Tetrachloro-m-xylene	115	30.3 - 157		%Rec	1	3/27/2019 11:15:59 PM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23981

Analyst: DW

Diesel (Fuel Oil)	ND	22.8		mg/Kg-dry	1	3/27/2019 8:26:30 PM
Heavy Oil	ND	56.9		mg/Kg-dry	1	3/27/2019 8:26:30 PM
Surr: 2-Fluorobiphenyl	74.0	50 - 150		%Rec	1	3/27/2019 8:26:30 PM
Surr: o-Terphenyl	88.5	50 - 150		%Rec	1	3/27/2019 8:26:30 PM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benzoic acid	ND	480		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Phenol	ND	96.0		µg/Kg-dry	1	3/29/2019 11:44:56 PM
3&4-Methylphenol (m, p-cresol)	ND	96.0		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Naphthalene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM
2-Methylnaphthalene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Acenaphthene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Acenaphthylene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Dibenzofuran	ND	72.0		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Fluorene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Pentachlorophenol	ND	96.0		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Phenanthrene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Anthracene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Carbazole	ND	72.0		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Di-n-butylphthalate	ND	96.0		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Fluoranthene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Pyrene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM



Client: Floyd | Snider

Collection Date: 3/21/2019 3:30:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-001

Matrix: Sediment

Client Sample ID: TOC-SC-03-0-0.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benz(a)anthracene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Chrysene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM
bis (2-Ethylhexyl) phthalate	ND	96.0		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Di-n-octyl phthalate	ND	10.8	MDL	µg/Kg-dry	1	3/29/2019 11:44:56 PM
Benzo(b)fluoranthene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Benzo(k)fluoranthene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Benzo(a)pyrene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Indeno(1,2,3-cd)pyrene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Dibenz(a,h)anthracene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Benzo(g,h,i)perylene	ND	38.4		µg/Kg-dry	1	3/29/2019 11:44:56 PM
Surr: 2,4,6-Tribromophenol	79.8	14.8 - 165		%Rec	1	3/29/2019 11:44:56 PM
Surr: 2-Fluorobiphenyl	62.4	17.8 - 151		%Rec	1	3/29/2019 11:44:56 PM
Surr: Nitrobenzene-d5	51.6	12.5 - 163		%Rec	1	3/29/2019 11:44:56 PM
Surr: Phenol-d6	67.1	11.6 - 133		%Rec	1	3/29/2019 11:44:56 PM
Surr: p-Terphenyl	79.4	22 - 176		%Rec	1	3/29/2019 11:44:56 PM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Mercury by EPA Method 7471

Batch ID: 24022

Analyst: WF

Mercury	ND	0.0754		mg/Kg-dry	1	3/29/2019 2:46:14 PM
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Total Metals by EPA Method 6020

Batch ID: 23940

Analyst: WC

Arsenic	5.28	0.238		mg/Kg-dry	1	3/26/2019 2:09:37 PM
Cadmium	ND	0.191		mg/Kg-dry	1	3/26/2019 2:09:37 PM
Chromium	33.9	0.0953		mg/Kg-dry	1	3/26/2019 2:09:37 PM
Copper	15.0	0.191		mg/Kg-dry	1	3/26/2019 2:09:37 PM
Lead	4.12	0.191		mg/Kg-dry	1	3/26/2019 2:09:37 PM
Nickel	37.8	0.477		mg/Kg-dry	1	3/26/2019 2:09:37 PM
Selenium	1.18	0.477		mg/Kg-dry	1	3/26/2019 2:09:37 PM
Silver	ND	0.0953		mg/Kg-dry	1	3/26/2019 2:09:37 PM
Zinc	48.4	0.477		mg/Kg-dry	1	3/26/2019 2:09:37 PM

Sample Moisture (Percent Moisture)

Batch ID: R50211

Analyst: CJ

Percent Moisture	24.0			wt%	1	3/22/2019 8:21:33 AM
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Client: Floyd | Snider

Collection Date: 3/21/2019 3:30:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-001

Matrix: Sediment

Client Sample ID: TOC-SC-03-0-0.5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
<u>Total Organic Carbon by EPA 9060</u>				Batch ID: 23946		Analyst: GM
Total Organic Carbon	0.799	0.0750		%-dry	1	3/26/2019 11:28:00 AM
<u>Ammonia by SM 4500 NH3 E</u>				Batch ID: 23951		Analyst: GM
Nitrogen, Ammonia	4.13	1.31		mg/Kg-dry	1	3/28/2019 11:19:00 AM
<u>Total Solids</u>				Batch ID: R50744		Analyst: CW
Total Solids	76.0			wt%	1	4/15/2019 3:48:52 PM



Client: Floyd | Snider

Collection Date: 3/21/2019 11:11:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-002

Matrix: Sediment

Client Sample ID: TOC-SC-01-0.5-2.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 23976

Analyst: SB

Aroclor 1016	ND	0.00196	MDL	mg/Kg-dry	1	3/27/2019 11:25:39 PM
Aroclor 1221	ND	0.00196	MDL	mg/Kg-dry	1	3/27/2019 11:25:39 PM
Aroclor 1232	ND	0.00196	MDL	mg/Kg-dry	1	3/27/2019 11:25:39 PM
Aroclor 1242	ND	0.00196	MDL	mg/Kg-dry	1	3/27/2019 11:25:39 PM
Aroclor 1248	ND	0.00343	MDL	mg/Kg-dry	1	3/27/2019 11:25:39 PM
Aroclor 1254	ND	0.00343	MDL	mg/Kg-dry	1	3/27/2019 11:25:39 PM
Aroclor 1260	ND	0.00343	MDL	mg/Kg-dry	1	3/27/2019 11:25:39 PM
Aroclor 1268	ND	0.00343	MDL	mg/Kg-dry	1	3/27/2019 11:25:39 PM
Total PCBs	ND	0.00343	MDL	mg/Kg-dry	1	3/27/2019 11:25:39 PM
Surr: Decachlorobiphenyl	100	30.8 - 168		%Rec	1	3/27/2019 11:25:39 PM
Surr: Tetrachloro-m-xylene	120	30.3 - 157		%Rec	1	3/27/2019 11:25:39 PM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23981

Analyst: DW

Diesel (Fuel Oil)	ND	25.7		mg/Kg-dry	1	3/27/2019 8:56:23 PM
Heavy Oil	ND	64.3		mg/Kg-dry	1	3/27/2019 8:56:23 PM
Surr: 2-Fluorobiphenyl	63.8	50 - 150		%Rec	1	3/27/2019 8:56:23 PM
Surr: o-Terphenyl	70.4	50 - 150		%Rec	1	3/27/2019 8:56:23 PM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benzoic acid	ND	474		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Phenol	ND	94.7		µg/Kg-dry	1	3/30/2019 12:07:03 AM
3&4-Methylphenol (m, p-cresol)	ND	94.7		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Naphthalene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM
2-Methylnaphthalene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Acenaphthene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Acenaphthylene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Dibenzofuran	ND	71.1		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Fluorene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Pentachlorophenol	ND	94.7		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Phenanthrene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Anthracene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Carbazole	ND	71.1		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Di-n-butylphthalate	ND	94.7		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Fluoranthene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Pyrene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM



Client: Floyd | Snider

Collection Date: 3/21/2019 11:11:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-002

Matrix: Sediment

Client Sample ID: TOC-SC-01-0.5-2.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benz(a)anthracene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Chrysene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM
bis (2-Ethylhexyl) phthalate	ND	94.7		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Di-n-octyl phthalate	ND	10.7	MDL	µg/Kg-dry	1	3/30/2019 12:07:03 AM
Benzo(b)fluoranthene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Benzo(k)fluoranthene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Benzo(a)pyrene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Indeno(1,2,3-cd)pyrene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Dibenz(a,h)anthracene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Benzo(g,h,i)perylene	ND	37.9		µg/Kg-dry	1	3/30/2019 12:07:03 AM
Surr: 2,4,6-Tribromophenol	120	14.8 - 165		%Rec	1	3/30/2019 12:07:03 AM
Surr: 2-Fluorobiphenyl	90.7	17.8 - 151		%Rec	1	3/30/2019 12:07:03 AM
Surr: Nitrobenzene-d5	78.4	12.5 - 163		%Rec	1	3/30/2019 12:07:03 AM
Surr: Phenol-d6	84.3	11.6 - 133		%Rec	1	3/30/2019 12:07:03 AM
Surr: p-Terphenyl	109	22 - 176		%Rec	1	3/30/2019 12:07:03 AM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Mercury by EPA Method 7471

Batch ID: 24022

Analyst: WF

Mercury	ND	0.0916		mg/Kg-dry	1	3/29/2019 2:47:51 PM
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Total Metals by EPA Method 6020

Batch ID: 23940

Analyst: WC

Arsenic	4.63	0.277		mg/Kg-dry	1	3/26/2019 2:13:38 PM
Cadmium	ND	0.221		mg/Kg-dry	1	3/26/2019 2:13:38 PM
Chromium	24.0	0.111		mg/Kg-dry	1	3/26/2019 2:13:38 PM
Copper	9.36	0.221		mg/Kg-dry	1	3/26/2019 2:13:38 PM
Lead	2.67	0.221		mg/Kg-dry	1	3/26/2019 2:13:38 PM
Nickel	29.7	0.554		mg/Kg-dry	1	3/26/2019 2:13:38 PM
Selenium	0.930	0.554		mg/Kg-dry	1	3/26/2019 2:13:38 PM
Silver	ND	0.111		mg/Kg-dry	1	3/26/2019 2:13:38 PM
Zinc	30.7	0.554		mg/Kg-dry	1	3/26/2019 2:13:38 PM

Sample Moisture (Percent Moisture)

Batch ID: R50211

Analyst: CJ

Percent Moisture	34.1			wt%	1	3/22/2019 8:21:33 AM
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Client: Floyd | Snider

Collection Date: 3/21/2019 11:11:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-002

Matrix: Sediment

Client Sample ID: TOC-SC-01-0.5-2.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Total Organic Carbon by EPA 9060

Batch ID: 23946 Analyst: GM

Total Organic Carbon	1.19	0.0750		%-dry	1	3/26/2019 12:25:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 23951 Analyst: GM

Nitrogen, Ammonia	6.93	1.49		mg/Kg-dry	1	3/28/2019 11:19:00 AM
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Total Solids

Batch ID: R50744 Analyst: CW

Total Solids	65.9			wt%	1	4/15/2019 3:48:52 PM
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Client: Floyd | Snider

Collection Date: 3/21/2019 11:07:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-003

Matrix: Sediment

Client Sample ID: TOC-SC-01-2.5-4.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 23976

Analyst: SB

Aroclor 1016	ND	0.00170	MDL	mg/Kg-dry	1	3/27/2019 11:35:22 PM
Aroclor 1221	ND	0.00170	MDL	mg/Kg-dry	1	3/27/2019 11:35:22 PM
Aroclor 1232	ND	0.00170	MDL	mg/Kg-dry	1	3/27/2019 11:35:22 PM
Aroclor 1242	ND	0.00170	MDL	mg/Kg-dry	1	3/27/2019 11:35:22 PM
Aroclor 1248	ND	0.00298	MDL	mg/Kg-dry	1	3/27/2019 11:35:22 PM
Aroclor 1254	ND	0.00298	MDL	mg/Kg-dry	1	3/27/2019 11:35:22 PM
Aroclor 1260	ND	0.00298	MDL	mg/Kg-dry	1	3/27/2019 11:35:22 PM
Aroclor 1268	ND	0.00298	MDL	mg/Kg-dry	1	3/27/2019 11:35:22 PM
Total PCBs	ND	0.00298	MDL	mg/Kg-dry	1	3/27/2019 11:35:22 PM
Surr: Decachlorobiphenyl	105	30.8 - 168		%Rec	1	3/27/2019 11:35:22 PM
Surr: Tetrachloro-m-xylene	110	30.3 - 157		%Rec	1	3/27/2019 11:35:22 PM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23981

Analyst: DW

Diesel (Fuel Oil)	ND	22.0		mg/Kg-dry	1	3/27/2019 9:26:18 PM
Heavy Oil	ND	54.9		mg/Kg-dry	1	3/27/2019 9:26:18 PM
Surr: 2-Fluorobiphenyl	88.4	50 - 150		%Rec	1	3/27/2019 9:26:18 PM
Surr: o-Terphenyl	92.3	50 - 150		%Rec	1	3/27/2019 9:26:18 PM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benzoic acid	ND	475		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Phenol	ND	95.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
3&4-Methylphenol (m, p-cresol)	ND	95.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Naphthalene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
2-Methylnaphthalene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Acenaphthene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Acenaphthylene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Dibenzofuran	ND	71.2		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Fluorene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Pentachlorophenol	ND	95.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Phenanthrene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Anthracene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Carbazole	ND	71.2		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Di-n-butylphthalate	ND	95.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Fluoranthene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Pyrene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM



Client: Floyd | Snider

Collection Date: 3/21/2019 11:07:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-003

Matrix: Sediment

Client Sample ID: TOC-SC-01-2.5-4.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benz(a)anthracene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Chrysene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
bis (2-Ethylhexyl) phthalate	ND	95.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Di-n-octyl phthalate	ND	10.7	MDL	µg/Kg-dry	1	3/30/2019 12:29:12 AM
Benzo(b)fluoranthene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Benzo(k)fluoranthene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Benzo(a)pyrene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Indeno(1,2,3-cd)pyrene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Dibenz(a,h)anthracene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Benzo(g,h,i)perylene	ND	38.0		µg/Kg-dry	1	3/30/2019 12:29:12 AM
Surr: 2,4,6-Tribromophenol	99.4	14.8 - 165		%Rec	1	3/30/2019 12:29:12 AM
Surr: 2-Fluorobiphenyl	58.3	17.8 - 151		%Rec	1	3/30/2019 12:29:12 AM
Surr: Nitrobenzene-d5	45.9	12.5 - 163		%Rec	1	3/30/2019 12:29:12 AM
Surr: Phenol-d6	62.7	11.6 - 133		%Rec	1	3/30/2019 12:29:12 AM
Surr: p-Terphenyl	89.6	22 - 176		%Rec	1	3/30/2019 12:29:12 AM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Mercury by EPA Method 7471

Batch ID: 24022

Analyst: WF

Mercury	ND	0.0733		mg/Kg-dry	1	3/29/2019 2:49:30 PM
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Total Metals by EPA Method 6020

Batch ID: 23940

Analyst: WC

Arsenic	3.19	0.235		mg/Kg-dry	1	3/26/2019 2:25:46 PM
Cadmium	ND	0.188		mg/Kg-dry	1	3/26/2019 2:25:46 PM
Chromium	35.3	0.0939		mg/Kg-dry	1	3/26/2019 2:25:46 PM
Copper	13.3	0.188		mg/Kg-dry	1	3/26/2019 2:25:46 PM
Lead	1.87	0.188		mg/Kg-dry	1	3/26/2019 2:25:46 PM
Nickel	51.1	0.470		mg/Kg-dry	1	3/26/2019 2:25:46 PM
Selenium	0.908	0.470		mg/Kg-dry	1	3/26/2019 2:25:46 PM
Silver	ND	0.0939		mg/Kg-dry	1	3/26/2019 2:25:46 PM
Zinc	37.6	0.470		mg/Kg-dry	1	3/26/2019 2:25:46 PM

Sample Moisture (Percent Moisture)

Batch ID: R50211

Analyst: CJ

Percent Moisture	22.8			wt%	1	3/22/2019 8:21:33 AM
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Client: Floyd | Snider

Collection Date: 3/21/2019 11:07:00 AM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-003

Matrix: Sediment

Client Sample ID: TOC-SC-01-2.5-4.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Total Organic Carbon by EPA 9060

Batch ID: 23946 Analyst: GM

Total Organic Carbon	0.149	0.0750		%-dry	1	3/26/2019 12:40:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 23951 Analyst: GM

Nitrogen, Ammonia	16.6	1.29		mg/Kg-dry	1	3/28/2019 11:19:00 AM
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Total Solids

Batch ID: R50744 Analyst: CW

Total Solids	77.2			wt%	1	4/15/2019 3:48:52 PM
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Client: Floyd | Snider

Collection Date: 3/21/2019 12:50:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-005

Matrix: Sediment

Client Sample ID: TOC-SC-02-0.5-1.2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 24121

Analyst: SB

Aroclor 1016	ND	0.00139	MDL	mg/Kg-dry	1	4/10/2019 3:23:53 PM
Aroclor 1221	ND	0.00139	MDL	mg/Kg-dry	1	4/10/2019 3:23:53 PM
Aroclor 1232	ND	0.00139	MDL	mg/Kg-dry	1	4/10/2019 3:23:53 PM
Aroclor 1242	ND	0.00139	MDL	mg/Kg-dry	1	4/10/2019 3:23:53 PM
Aroclor 1248	ND	0.00242	MDL	mg/Kg-dry	1	4/10/2019 3:23:53 PM
Aroclor 1254	ND	0.00242	MDL	mg/Kg-dry	1	4/10/2019 3:23:53 PM
Aroclor 1260	0.00533	0.00242	MDL	mg/Kg-dry	1	4/10/2019 3:23:53 PM
Aroclor 1268	ND	0.00242	MDL	mg/Kg-dry	1	4/10/2019 3:23:53 PM
Total PCBs	0.00533	0.00242	MDL	mg/Kg-dry	1	4/10/2019 3:23:53 PM
Surr: Decachlorobiphenyl	34.7	30.8 - 168		%Rec	1	4/10/2019 3:23:53 PM
Surr: Tetrachloro-m-xylene	34.4	30.3 - 157		%Rec	1	4/10/2019 3:23:53 PM

NOTES:

Tetrabutylammonium sulfite cleanup
MDL - Analyte reported to Method Detection Limit (MDL)

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23981

Analyst: DW

Diesel (Fuel Oil)	ND	43.6		mg/Kg-dry	1	3/27/2019 9:56:08 PM
Diesel Range Organics (C12-C24)	870	43.6		mg/Kg-dry	1	3/27/2019 9:56:08 PM
Heavy Oil	901	109		mg/Kg-dry	1	3/27/2019 9:56:08 PM
Surr: 2-Fluorobiphenyl	77.3	50 - 150		%Rec	1	3/27/2019 9:56:08 PM
Surr: o-Terphenyl	87.3	50 - 150		%Rec	1	3/27/2019 9:56:08 PM

NOTES:

DRO - Indicates the presence of unresolved compounds eluting from dodecane through tetracosane (~C12-C24).

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benzoic acid	ND	461		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Phenol	ND	92.1		µg/Kg-dry	1	3/30/2019 12:51:17 AM
3&4-Methylphenol (m, p-cresol)	ND	92.1		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Naphthalene	128	36.9		µg/Kg-dry	1	3/30/2019 12:51:17 AM
2-Methylnaphthalene	44.2	36.9		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Acenaphthene	78.7	36.9		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Acenaphthylene	80.0	36.9		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Dibenzofuran	ND	69.1		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Fluorene	69.5	36.9		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Pentachlorophenol	ND	92.1		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Phenanthrene	302	36.9		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Anthracene	92.7	36.9		µg/Kg-dry	1	3/30/2019 12:51:17 AM



Client: Floyd | Snider

Collection Date: 3/21/2019 12:50:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-005

Matrix: Sediment

Client Sample ID: TOC-SC-02-0.5-1.2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Carbazole	ND	69.1		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Di-n-butylphthalate	ND	92.1		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Fluoranthene	699	36.9		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Pyrene	708	36.9		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Benz(a)anthracene	317	36.9		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Chrysene	397	36.9		µg/Kg-dry	1	3/30/2019 12:51:17 AM
bis (2-Ethylhexyl) phthalate	173	92.1		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Di-n-octyl phthalate	40.0	10.4	MDL, J	µg/Kg-dry	1	3/30/2019 12:51:17 AM
Benzo(b)fluoranthene	295	36.9	*	µg/Kg-dry	1	3/30/2019 12:51:17 AM
Benzo(k)fluoranthene	311	36.9		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Benzo(a)pyrene	386	36.9		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Indeno(1,2,3-cd)pyrene	232	36.9		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Dibenz(a,h)anthracene	88.2	36.9		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Benzo(g,h,i)perylene	284	36.9		µg/Kg-dry	1	3/30/2019 12:51:17 AM
Surr: 2,4,6-Tribromophenol	102	14.8 - 165		%Rec	1	3/30/2019 12:51:17 AM
Surr: 2-Fluorobiphenyl	56.9	17.8 - 151		%Rec	1	3/30/2019 12:51:17 AM
Surr: Nitrobenzene-d5	42.7	12.5 - 163		%Rec	1	3/30/2019 12:51:17 AM
Surr: Phenol-d6	67.0	11.6 - 133		%Rec	1	3/30/2019 12:51:17 AM
Surr: p-Terphenyl	96.9	22 - 176		%Rec	1	3/30/2019 12:51:17 AM

NOTES:

* - Flagged value is not within established control limits.
MDL - Analyte reported to Method Detection Limit (MDL)

Mercury by EPA Method 7471

Batch ID: 24022

Analyst: WF

Mercury	0.722	0.620	D	mg/Kg-dry	5	3/29/2019 2:56:38 PM
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Total Metals by EPA Method 6020

Batch ID: 23940

Analyst: WC

Arsenic	13.6	0.433		mg/Kg-dry	1	3/26/2019 2:29:48 PM
Cadmium	0.862	0.347		mg/Kg-dry	1	3/26/2019 2:29:48 PM
Chromium	32.6	0.173		mg/Kg-dry	1	3/26/2019 2:29:48 PM
Copper	93.0	0.347		mg/Kg-dry	1	3/26/2019 2:29:48 PM
Lead	138	0.347		mg/Kg-dry	1	3/26/2019 2:29:48 PM
Nickel	29.7	0.867		mg/Kg-dry	1	3/26/2019 2:29:48 PM
Selenium	1.26	0.867		mg/Kg-dry	1	3/26/2019 2:29:48 PM
Silver	0.209	0.173		mg/Kg-dry	1	3/26/2019 2:29:48 PM
Zinc	299	0.867		mg/Kg-dry	1	3/26/2019 2:29:48 PM



Client: Floyd | Snider

Collection Date: 3/21/2019 12:50:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-005

Matrix: Sediment

Client Sample ID: TOC-SC-02-0.5-1.2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Sample Moisture (Percent Moisture)

Batch ID: R50211 Analyst: CJ

Percent Moisture	57.0			wt%	1	3/22/2019 8:21:33 AM
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Total Organic Carbon by EPA 9060

Batch ID: 23946 Analyst: GM

Total Organic Carbon	5.82	0.0750		%-dry	1	3/26/2019 1:40:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 23951 Analyst: GM

Nitrogen, Ammonia	47.8	2.29		mg/Kg-dry	1	3/28/2019 11:19:00 AM
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Total Solids

Batch ID: R50744 Analyst: CW

Total Solids	43.0			wt%	1	4/15/2019 3:48:52 PM
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Client: Floyd | Snider

Collection Date: 3/21/2019 1:00:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-006

Matrix: Sediment

Client Sample ID: TOC-SC-02-1.2-2.2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 23976

Analyst: SB

Aroclor 1016	ND	0.00219	MDL	mg/Kg-dry	1	3/27/2019 11:54:46 PM
Aroclor 1221	ND	0.00219	MDL	mg/Kg-dry	1	3/27/2019 11:54:46 PM
Aroclor 1232	ND	0.00219	MDL	mg/Kg-dry	1	3/27/2019 11:54:46 PM
Aroclor 1242	ND	0.00219	MDL	mg/Kg-dry	1	3/27/2019 11:54:46 PM
Aroclor 1248	ND	0.00383	MDL	mg/Kg-dry	1	3/27/2019 11:54:46 PM
Aroclor 1254	ND	0.00383	MDL	mg/Kg-dry	1	3/27/2019 11:54:46 PM
Aroclor 1260	ND	0.00383	MDL	mg/Kg-dry	1	3/27/2019 11:54:46 PM
Aroclor 1268	ND	0.00383	MDL	mg/Kg-dry	1	3/27/2019 11:54:46 PM
Total PCBs	ND	0.00383	MDL	mg/Kg-dry	1	3/27/2019 11:54:46 PM
Surr: Decachlorobiphenyl	82.9	30.8 - 168		%Rec	1	3/27/2019 11:54:46 PM
Surr: Tetrachloro-m-xylene	108	30.3 - 157		%Rec	1	3/27/2019 11:54:46 PM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23981

Analyst: DW

Diesel (Fuel Oil)	ND	30.6		mg/Kg-dry	1	3/27/2019 10:25:56 PM
Heavy Oil	406	76.5		mg/Kg-dry	1	3/27/2019 10:25:56 PM
Surr: 2-Fluorobiphenyl	71.2	50 - 150		%Rec	1	3/27/2019 10:25:56 PM
Surr: o-Terphenyl	85.9	50 - 150		%Rec	1	3/27/2019 10:25:56 PM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benzoic acid	ND	441		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Phenol	ND	88.2		µg/Kg-dry	1	3/30/2019 1:13:21 AM
3&4-Methylphenol (m, p-cresol)	ND	88.2		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Naphthalene	84.8	35.3		µg/Kg-dry	1	3/30/2019 1:13:21 AM
2-Methylnaphthalene	ND	35.3		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Acenaphthene	37.5	35.3		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Acenaphthylene	44.8	35.3		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Dibenzofuran	ND	66.2		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Fluorene	ND	35.3		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Pentachlorophenol	ND	88.2		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Phenanthrene	148	35.3		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Anthracene	ND	35.3		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Carbazole	ND	66.2		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Di-n-butylphthalate	ND	88.2		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Fluoranthene	295	35.3		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Pyrene	297	35.3		µg/Kg-dry	1	3/30/2019 1:13:21 AM



Client: Floyd | Snider

Collection Date: 3/21/2019 1:00:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-006

Matrix: Sediment

Client Sample ID: TOC-SC-02-1.2-2.2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benz(a)anthracene	104	35.3		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Chrysene	128	35.3		µg/Kg-dry	1	3/30/2019 1:13:21 AM
bis (2-Ethylhexyl) phthalate	ND	88.2		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Di-n-octyl phthalate	ND	9.93	MDL	µg/Kg-dry	1	3/30/2019 1:13:21 AM
Benzo(b)fluoranthene	125	35.3	*	µg/Kg-dry	1	3/30/2019 1:13:21 AM
Benzo(k)fluoranthene	80.3	35.3		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Benzo(a)pyrene	120	35.3		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Indeno(1,2,3-cd)pyrene	68.5	35.3		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Dibenz(a,h)anthracene	ND	35.3		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Benzo(g,h,i)perylene	129	35.3		µg/Kg-dry	1	3/30/2019 1:13:21 AM
Surr: 2,4,6-Tribromophenol	79.4	14.8 - 165		%Rec	1	3/30/2019 1:13:21 AM
Surr: 2-Fluorobiphenyl	62.2	17.8 - 151		%Rec	1	3/30/2019 1:13:21 AM
Surr: Nitrobenzene-d5	54.0	12.5 - 163		%Rec	1	3/30/2019 1:13:21 AM
Surr: Phenol-d6	61.8	11.6 - 133		%Rec	1	3/30/2019 1:13:21 AM
Surr: p-Terphenyl	72.2	22 - 176		%Rec	1	3/30/2019 1:13:21 AM

NOTES:

* - Flagged value is not within established control limits.

MDL - Analyte reported to Method Detection Limit (MDL)

Mercury by EPA Method 7471

Batch ID: 24022

Analyst: WF

Mercury	0.186	0.0901		mg/Kg-dry	1	3/29/2019 2:58:14 PM
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Total Metals by EPA Method 6020

Batch ID: 23940

Analyst: WC

Arsenic	5.51	0.299		mg/Kg-dry	1	3/26/2019 2:33:49 PM
Cadmium	0.361	0.240		mg/Kg-dry	1	3/26/2019 2:33:49 PM
Chromium	24.9	0.120		mg/Kg-dry	1	3/26/2019 2:33:49 PM
Copper	31.5	0.240		mg/Kg-dry	1	3/26/2019 2:33:49 PM
Lead	39.4	0.240		mg/Kg-dry	1	3/26/2019 2:33:49 PM
Nickel	24.9	0.599		mg/Kg-dry	1	3/26/2019 2:33:49 PM
Selenium	0.921	0.599		mg/Kg-dry	1	3/26/2019 2:33:49 PM
Silver	ND	0.120		mg/Kg-dry	1	3/26/2019 2:33:49 PM
Zinc	138	0.599		mg/Kg-dry	1	3/26/2019 2:33:49 PM

Sample Moisture (Percent Moisture)

Batch ID: R50211

Analyst: CJ

Percent Moisture	39.9			wt%	1	3/22/2019 8:21:33 AM
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Client: Floyd | Snider

Collection Date: 3/21/2019 1:00:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-006

Matrix: Sediment

Client Sample ID: TOC-SC-02-1.2-2.2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Total Organic Carbon by EPA 9060

Batch ID: 23946 Analyst: GM

Total Organic Carbon	2.15	0.0750		%-dry	1	3/26/2019 1:51:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 23951 Analyst: GM

Nitrogen, Ammonia	30.2	1.65		mg/Kg-dry	1	3/28/2019 11:19:00 AM
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Total Solids

Batch ID: R50744 Analyst: CW

Total Solids	60.1			wt%	1	4/15/2019 3:48:52 PM
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Client: Floyd | Snider

Collection Date: 3/21/2019 12:55:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-007

Matrix: Sediment

Client Sample ID: TOC-SC-02-2.6-4.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Polychlorinated Biphenyls (PCB) by EPA 8082

Batch ID: 23976

Analyst: SB

Aroclor 1016	ND	0.00155	MDL	mg/Kg-dry	1	3/28/2019 12:04:27 AM
Aroclor 1221	ND	0.00155	MDL	mg/Kg-dry	1	3/28/2019 12:04:27 AM
Aroclor 1232	ND	0.00155	MDL	mg/Kg-dry	1	3/28/2019 12:04:27 AM
Aroclor 1242	ND	0.00155	MDL	mg/Kg-dry	1	3/28/2019 12:04:27 AM
Aroclor 1248	ND	0.00271	MDL	mg/Kg-dry	1	3/28/2019 12:04:27 AM
Aroclor 1254	ND	0.00271	MDL	mg/Kg-dry	1	3/28/2019 12:04:27 AM
Aroclor 1260	ND	0.00271	MDL	mg/Kg-dry	1	3/28/2019 12:04:27 AM
Aroclor 1268	ND	0.00271	MDL	mg/Kg-dry	1	3/28/2019 12:04:27 AM
Total PCBs	ND	0.00271	MDL	mg/Kg-dry	1	3/28/2019 12:04:27 AM
Surr: Decachlorobiphenyl	104	30.8 - 168		%Rec	1	3/28/2019 12:04:27 AM
Surr: Tetrachloro-m-xylene	121	30.3 - 157		%Rec	1	3/28/2019 12:04:27 AM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Batch ID: 23981

Analyst: DW

Diesel (Fuel Oil)	ND	19.5		mg/Kg-dry	1	3/27/2019 10:55:44 PM
Heavy Oil	ND	48.8		mg/Kg-dry	1	3/27/2019 10:55:44 PM
Surr: 2-Fluorobiphenyl	86.6	50 - 150		%Rec	1	3/27/2019 10:55:44 PM
Surr: o-Terphenyl	95.0	50 - 150		%Rec	1	3/27/2019 10:55:44 PM

Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benzoic acid	ND	473		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Phenol	ND	94.6		µg/Kg-dry	1	3/30/2019 1:35:35 AM
3&4-Methylphenol (m, p-cresol)	ND	94.6		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Naphthalene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM
2-Methylnaphthalene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Acenaphthene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Acenaphthylene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Dibenzofuran	ND	71.0		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Fluorene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Pentachlorophenol	ND	94.6		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Phenanthrene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Anthracene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Carbazole	ND	71.0		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Di-n-butylphthalate	ND	94.6		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Fluoranthene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Pyrene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM



Client: Floyd | Snider

Collection Date: 3/21/2019 12:55:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-007

Matrix: Sediment

Client Sample ID: TOC-SC-02-2.6-4.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Semi-Volatile Organic Compounds by EPA Method 8270

Batch ID: 24010

Analyst: SB

Benz(a)anthracene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Chrysene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM
bis (2-Ethylhexyl) phthalate	ND	94.6		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Di-n-octyl phthalate	ND	10.6	MDL	µg/Kg-dry	1	3/30/2019 1:35:35 AM
Benzo(b)fluoranthene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Benzo(k)fluoranthene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Benzo(a)pyrene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Indeno(1,2,3-cd)pyrene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Dibenz(a,h)anthracene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Benzo(g,h,i)perylene	ND	37.8		µg/Kg-dry	1	3/30/2019 1:35:35 AM
Surr: 2,4,6-Tribromophenol	110	14.8 - 165		%Rec	1	3/30/2019 1:35:35 AM
Surr: 2-Fluorobiphenyl	76.3	17.8 - 151		%Rec	1	3/30/2019 1:35:35 AM
Surr: Nitrobenzene-d5	62.3	12.5 - 163		%Rec	1	3/30/2019 1:35:35 AM
Surr: Phenol-d6	74.3	11.6 - 133		%Rec	1	3/30/2019 1:35:35 AM
Surr: p-Terphenyl	93.7	22 - 176		%Rec	1	3/30/2019 1:35:35 AM

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Mercury by EPA Method 7471

Batch ID: 24022

Analyst: WF

Mercury	ND	0.0668		mg/Kg-dry	1	3/29/2019 2:59:50 PM
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Total Metals by EPA Method 6020

Batch ID: 23940

Analyst: WC

Arsenic	3.54	0.213		mg/Kg-dry	1	3/26/2019 2:37:50 PM
Cadmium	ND	0.170		mg/Kg-dry	1	3/26/2019 2:37:50 PM
Chromium	28.9	0.0850		mg/Kg-dry	1	3/26/2019 2:37:50 PM
Copper	14.2	0.170		mg/Kg-dry	1	3/26/2019 2:37:50 PM
Lead	2.35	0.170		mg/Kg-dry	1	3/26/2019 2:37:50 PM
Nickel	39.1	0.425		mg/Kg-dry	1	3/26/2019 2:37:50 PM
Selenium	1.22	0.425		mg/Kg-dry	1	3/26/2019 2:37:50 PM
Silver	ND	0.0850		mg/Kg-dry	1	3/26/2019 2:37:50 PM
Zinc	35.1	0.425		mg/Kg-dry	1	3/26/2019 2:37:50 PM

Sample Moisture (Percent Moisture)

Batch ID: R50211

Analyst: CJ

Percent Moisture	14.1			wt%	1	3/22/2019 8:21:33 AM
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Client: Floyd | Snider

Collection Date: 3/21/2019 12:55:00 PM

Project: Surface Sediment Quality Evaluation

Lab ID: 1903320-007

Matrix: Sediment

Client Sample ID: TOC-SC-02-2.6-4.0

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
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Total Organic Carbon by EPA 9060

Batch ID: 23946 Analyst: GM

Total Organic Carbon	0.289	0.0750		%-dry	1	3/26/2019 2:07:00 PM
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Ammonia by SM 4500 NH3 E

Batch ID: 23951 Analyst: GM

Nitrogen, Ammonia	20.2	1.13		mg/Kg-dry	1	3/28/2019 11:19:00 AM
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Total Solids

Batch ID: R50744 Analyst: CW

Total Solids	85.9			wt%	1	4/15/2019 3:48:52 PM
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April 8, 2019

FAL Project 12279

Mr. Michael Ridgeway
Fremont Analytical, Inc.
3600 Fremont Ave., N.
Seattle, WA 98103

Dear Mr. Ridgeway,

The following results are associated with Frontier Analytical Laboratory project **12279**. This corresponds to your project number **1903320**. Five sediment samples were received on 3/27/2019 at Frontier Analytical Laboratory in good condition. The samples were extracted and analyzed by EPA Method 1613 for tetra through octa chlorinated dibenzo dioxin and furans. The Toxic Equivalency (TEQ) for your samples has been calculated using the 2005 World Health Organization's (WHO's) toxic equivalency factors (TEFs). Fremont Analytical, Inc. requested a turnaround time of fifteen business days for project **12279**.

The following report consists of an Analytical Data section and a Sample Receipt section. The Analytical Data section contains our sample tracking log and the analytical results. The Sample Receipt section contains your chain of custody, our sample login form and a sample photo. The enclosed results are specifically for the samples referenced in this report only. These results shall not be reproduced except in full. Frontier Analytical Laboratory's State of Oregon NELAP certificate number is **4041**. Our State of California ELAP certificate number is **2934**. This report along with the associated electronic data deliverables have been emailed to you as a portable document format (PDF) file. A hardcopy will not be sent to you unless specifically requested.

If you have any questions regarding project **12279**, please feel free to contact me at 916-934-0900. Thank you for choosing Frontier Analytical Laboratory for your analytical testing needs.

Sincerely,



Thomas C. Crabtree
Director

Frontier Analytical Laboratory

Sample Tracking Log

FAL Project ID: 12279

Received on: 03/27/2019

Project Due: 04/18/2019 Storage: R-4

FAL Sample ID	Dup	Client Project ID	Client Sample ID	Requested Method	Matrix	Sampling Date	Sampling Time	Hold Time Due Date
12279-001-SA	0	1903320	TOC-SC-01-0.5-2.0	EPA 1613 D/F	Sediment	03/21/2019	11:11 am	03/20/2020
12279-002-SA	0	1903320	TOC-SC-01-2.5-4.0	EPA 1613 D/F	Sediment	03/21/2019	11:07 am	03/20/2020
12279-003-SA	0	1903320	TOC-SC-02-0.5-1.2	EPA 1613 D/F	Sediment	03/21/2019	12:50 pm	03/20/2020
12279-004-SA	0	1903320	TOC-SC-02-1.2-2.2	EPA 1613 D/F	Sediment	03/21/2019	01:00 pm	03/20/2020
12279-005-SA	0	1903320	TOC-SC-02-2.6-4.0	EPA 1613 D/F	Sediment	03/21/2019	12:55 pm	03/20/2020

EPA Method 1613
PCDD/F



FAL ID: 12279-001-MB
Client ID: Method Blank
Matrix: Sediment
Batch No: X4846

Date Extracted: 03-29-2019
Date Received: NA
Amount: 5.00 g


ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: pg/g


Acquired: 04-01-2019
2005 WHO TEQ: 0.0
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.128		-	0.0331				
1,2,3,7,8-PeCDD	ND	0.182		-	0.0536				
1,2,3,4,7,8-HxCDD	ND	0.184		-	0.0540				
1,2,3,6,7,8-HxCDD	ND	0.191		-	0.0538	Total TCDD	ND	0.128	
1,2,3,7,8,9-HxCDD	ND	0.180		-	0.0518	Total PeCDD	ND	0.182	
1,2,3,4,6,7,8-HpCDD	ND	0.383		-	0.0695	Total HxCDD	ND	0.191	
OCDD	ND	0.635		-	0.116	Total HpCDD	ND	0.383	
2,3,7,8-TCDF	ND	0.113		-	0.0345				
1,2,3,7,8-PeCDF	ND	0.194		-	0.0417				
2,3,4,7,8-PeCDF	ND	0.201		-	0.0449				
1,2,3,4,7,8-HxCDF	ND	0.158		-	0.0351				
1,2,3,6,7,8-HxCDF	ND	0.167		-	0.0382				
2,3,4,6,7,8-HxCDF	ND	0.191		-	0.0379				
1,2,3,7,8,9-HxCDF	ND	0.278		-	0.0423	Total TCDF	ND	0.113	
1,2,3,4,6,7,8-HpCDF	ND	0.205		-	0.0415	Total PeCDF	ND	0.201	
1,2,3,4,7,8,9-HpCDF	ND	0.281		-	0.0532	Total HxCDF	ND	0.278	
OCDF	ND	0.415		-	0.0833	Total HpCDF	ND	0.281	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	99.0	25.0 - 164	
13C-1,2,3,7,8-PeCDD	91.5	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	91.4	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	100	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	88.7	23.0 - 140	
13C-OCDD	65.7	17.0 - 157	
13C-2,3,7,8-TCDF	106	24.0 - 169	
13C-1,2,3,7,8-PeCDF	101	24.0 - 185	
13C-2,3,4,7,8-PeCDF	104	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	111	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	114	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	109	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	104	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	99.2	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	101	26.0 - 138	
13C-OCDF	80.2	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	89.0	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/3/2019

Reviewed By: 
Date: 4/3/2019

EPA Method 1613
PCDD/F



FAL ID: 12279-001-OPR
Client ID: OPR
Matrix: Sediment
Batch No: X4846

Date Extracted: 03-29-2019
Date Received: NA
Amount: 5.00 g


ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: ng/ml

Acquired: 04-01-2019
2005 WHO TEQ: NA

Compound	Conc	QC Limits	Qual
2,3,7,8-TCDD	9.13	6.70 - 15.8	
1,2,3,7,8-PeCDD	48.8	35.0 - 71.0	
1,2,3,4,7,8-HxCDD	51.2	35.0 - 82.0	
1,2,3,6,7,8-HxCDD	50.7	38.0 - 67.0	
1,2,3,7,8,9-HxCDD	50.0	32.0 - 81.0	
1,2,3,4,6,7,8-HpCDD	52.8	35.0 - 70.0	
OCDD	103	78.0 - 144	
2,3,7,8-TCDF	10.3	7.50 - 15.8	
1,2,3,7,8-PeCDF	48.9	40.0 - 67.0	
2,3,4,7,8-PeCDF	48.8	34.0 - 80.0	
1,2,3,4,7,8-HxCDF	47.6	36.0 - 67.0	
1,2,3,6,7,8-HxCDF	48.2	42.0 - 65.0	
2,3,4,6,7,8-HxCDF	47.7	35.0 - 78.0	
1,2,3,7,8,9-HxCDF	48.5	39.0 - 65.0	
1,2,3,4,6,7,8-HpCDF	50.0	41.0 - 61.0	
1,2,3,4,7,8,9-HpCDF	51.8	39.0 - 69.0	
OCDF	95.3	63.0 - 170	
Internal Standards			
13C-2,3,7,8-TCDD	97.6	20.0 - 175	
13C-1,2,3,7,8-PeCDD	87.8	21.0 - 227	
13C-1,2,3,4,7,8-HxCDD	96.4	21.0 - 193	
13C-1,2,3,6,7,8-HxCDD	109	25.0 - 163	
13C-1,2,3,4,6,7,8-HpCDD	92.3	26.0 - 166	
13C-OCDD	65.7	13.0 - 198	
13C-2,3,7,8-TCDF	100	22.0 - 152	
13C-1,2,3,7,8-PeCDF	92.4	21.0 - 192	
13C-2,3,4,7,8-PeCDF	99.7	13.0 - 328	
13C-1,2,3,4,7,8-HxCDF	118	19.0 - 202	
13C-1,2,3,6,7,8-HxCDF	123	21.0 - 159	
13C-2,3,4,6,7,8-HxCDF	115	22.0 - 176	
13C-1,2,3,7,8,9-HxCDF	102	17.0 - 205	
13C-1,2,3,4,6,7,8-HpCDF	104	21.0 - 158	
13C-1,2,3,4,7,8,9-HpCDF	98.9	20.0 - 186	
13C-OCDF	82.8	13.0 - 198	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	86.3	31.0 - 191	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/3/2019

Reviewed By: 
Date: 4/3/2019

EPA Method 1613
PCDD/F



FAL ID: 12279-001-SA
Client ID: TOC-SC-01-0.5-2.0
Matrix: Sediment
Batch No: X4846

Date Extracted: 03-29-2019
Date Received: 03-27-2019
Amount: 5.04 g
% Solids: 66.64


ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: pg/g


Acquired: 04-01-2019
2005 WHO TEQ: 0.138
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.109		-	0.0331				
1,2,3,7,8-PeCDD	ND	0.194		-	0.0536				
1,2,3,4,7,8-HxCDD	ND	0.280		-	0.0540				
1,2,3,6,7,8-HxCDD	ND	0.299		-	0.0538	Total TCDD	1.05	-	
1,2,3,7,8,9-HxCDD	ND	0.278		-	0.0518	Total PeCDD	0.397	-	J
1,2,3,4,6,7,8-HpCDD	1.72	-	J	0.0172	0.0695	Total HxCDD	1.62	-	J
OCDD	12.8	-		0.00384	0.116	Total HpCDD	4.89	-	J
2,3,7,8-TCDF	ND	0.143		-	0.0345				
1,2,3,7,8-PeCDF	ND	0.215		-	0.0417				
2,3,4,7,8-PeCDF	0.371	-	J	0.111	0.0449				
1,2,3,4,7,8-HxCDF	ND	0.193		-	0.0351				
1,2,3,6,7,8-HxCDF	ND	0.203		-	0.0382				
2,3,4,6,7,8-HxCDF	ND	0.224		-	0.0379				
1,2,3,7,8,9-HpCDF	ND	0.306		-	0.0423	Total TCDF	4.28	-	D,M
1,2,3,4,6,7,8-HpCDF	0.509	-	J	0.00509	0.0415	Total PeCDF	3.57	-	J
1,2,3,4,7,8,9-HpCDF	ND	0.201		-	0.0532	Total HxCDF	1.09	-	J
OCDF	1.27	-	J	0.000381	0.0833	Total HpCDF	1.25	-	J

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	102	25.0 - 164	
13C-1,2,3,7,8-PeCDD	92.1	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	91.5	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	96.8	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	87.0	23.0 - 140	
13C-OCDD	66.8	17.0 - 157	
13C-2,3,7,8-TCDF	103	24.0 - 169	
13C-1,2,3,7,8-PeCDF	98.5	24.0 - 185	
13C-2,3,4,7,8-PeCDF	102	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	110	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	112	26.0 - 123	
13C-2,3,4,6,7,8-HpCDF	107	28.0 - 136	
13C-1,2,3,7,8,9-HpCDF	107	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	95.5	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	101	26.0 - 138	
13C-OCDF	81.8	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	89.5	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/3/2019

Reviewed By: 
Date: 4/3/2019

EPA Method 1613
PCDD/F



FAL ID: 12279-002-SA
Client ID: TOC-SC-01-2.5-4.0
Matrix: Sediment
Batch No: X4846

Date Extracted: 03-29-2019
Date Received: 03-27-2019
Amount: 5.02 g
% Solids: 77.66

ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: pg/g


Acquired: 04-01-2019
2005 WHO TEQ: 0.00983
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.153		-	0.0331				
1,2,3,7,8-PeCDD	ND	0.185		-	0.0536				
1,2,3,4,7,8-HxCDD	ND	0.307		-	0.0540				
1,2,3,6,7,8-HxCDD	ND	0.324		-	0.0538	Total TCDD	0.651	-	J
1,2,3,7,8,9-HxCDD	ND	0.303		-	0.0518	Total PeCDD	ND	0.185	
1,2,3,4,6,7,8-HpCDD	0.792	-	J	0.00792	0.0695	Total HxCDD	0.466	-	J
OCDD	6.37	-	J	0.00191	0.116	Total HpCDD	2.21	-	J
2,3,7,8-TCDF	ND	0.147		-	0.0345				
1,2,3,7,8-PeCDF	ND	0.202		-	0.0417				
2,3,4,7,8-PeCDF	ND	0.219		-	0.0449				
1,2,3,4,7,8-HxCDF	ND	0.176		-	0.0351				
1,2,3,6,7,8-HxCDF	ND	0.186		-	0.0382				
2,3,4,6,7,8-HxCDF	ND	0.203		-	0.0379				
1,2,3,7,8,9-HxCDF	ND	0.279		-	0.0423	Total TCDF	ND	0.147	
1,2,3,4,6,7,8-HpCDF	ND	0.196		-	0.0415	Total PeCDF	ND	0.219	
1,2,3,4,7,8,9-HpCDF	ND	0.252		-	0.0532	Total HxCDF	ND	0.279	
OCDF	ND	0.536		-	0.0833	Total HpCDF	ND	0.252	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	88.1	25.0 - 164	
13C-1,2,3,7,8-PeCDD	80.0	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	81.8	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	85.1	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	77.8	23.0 - 140	
13C-OCDD	55.1	17.0 - 157	
13C-2,3,7,8-TCDF	87.8	24.0 - 169	
13C-1,2,3,7,8-PeCDF	84.1	24.0 - 185	
13C-2,3,4,7,8-PeCDF	85.8	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	99.4	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	101	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	94.6	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	94.0	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	84.8	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	91.0	26.0 - 138	
13C-OCDF	69.6	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	79.7	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/3/2019

Reviewed By: 
Date: 4/3/2019

EPA Method 1613
PCDD/F



FAL ID: 12279-003-SA
Client ID: TOC-SC-02-0.5-1.2
Matrix: Sediment
Batch No: X4846

Date Extracted: 03-29-2019
Date Received: 03-27-2019
Amount: 2.03 g
% Solids: 43.43


ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: pg/g


Acquired: 04-01-2019
2005 WHO TEQ: 53.1
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	2.19	-	J	2.19	0.0331				
1,2,3,7,8-PeCDD	8.30	-	J	8.30	0.0536				
1,2,3,4,7,8-HxCDD	9.74	-	J	0.974	0.0540				
1,2,3,6,7,8-HxCDD	34.5	-	-	3.45	0.0538	Total TCDD	92.0	-	-
1,2,3,7,8,9-HxCDD	19.2	-	-	1.92	0.0518	Total PeCDD	126	-	-
1,2,3,4,6,7,8-HpCDD	715	-	-	7.15	0.0695	Total HxCDD	281	-	-
OCDD	6180	-	-	1.85	0.116	Total HpCDD	1360	-	-
2,3,7,8-TCDF	14.7	-	F	1.47	0.0345				
1,2,3,7,8-PeCDF	7.62	-	J	0.229	0.0417				
2,3,4,7,8-PeCDF	51.1	-	-	15.3	0.0449				
1,2,3,4,7,8-HxCDF	17.5	-	-	1.75	0.0351				
1,2,3,6,7,8-HxCDF	21.7	-	-	2.17	0.0382				
2,3,4,6,7,8-HxCDF	26.7	-	-	2.67	0.0379				
1,2,3,7,8,9-HpCDF	7.07	-	J	0.707	0.0423	Total TCDF	726	-	D,M
1,2,3,4,6,7,8-HpCDF	268	-	-	2.68	0.0415	Total PeCDF	640	-	D,M
1,2,3,4,7,8,9-HpCDF	10.5	-	J	0.105	0.0532	Total HxCDF	439	-	D,M
OCDF	586	-	-	0.176	0.0833	Total HpCDF	712	-	-

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	101	25.0 - 164	
13C-1,2,3,7,8-PeCDD	96.7	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	91.1	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	92.2	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	92.5	23.0 - 140	
13C-OCDD	71.6	17.0 - 157	
13C-2,3,7,8-TCDF	109	24.0 - 169	
13C-1,2,3,7,8-PeCDF	105	24.0 - 185	
13C-2,3,4,7,8-PeCDF	111	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	107	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	106	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	107	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	107	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	96.9	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	105	26.0 - 138	
13C-OCDF	84.5	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	90.8	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/3/2019

Reviewed By: 
Date: 4/3/2019

EPA Method 1613
PCDD/F



FAL ID: 12279-004-SA
Client ID: TOC-SC-02-1.2-2.2
Matrix: Sediment
Batch No: X4846

Date Extracted: 03-29-2019
Date Received: 03-27-2019
Amount: 2.05 g
% Solids: 59.89


ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: pg/g


Acquired: 04-01-2019
2005 WHO TEQ: 8.25
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	0.581	-	J	0.581	0.0331				
1,2,3,7,8-PeCDD	1.58	-	J	1.58	0.0536				
1,2,3,4,7,8-HxCDD	2.27	-	J	0.227	0.0540				
1,2,3,6,7,8-HxCDD	5.33	-	J	0.533	0.0538	Total TCDD	16.0	-	
1,2,3,7,8,9-HxCDD	3.34	-	J	0.334	0.0518	Total PeCDD	20.7	-	
1,2,3,4,6,7,8-HpCDD	127	-		1.27	0.0695	Total HxCDD	53.5	-	
OCDD	1250	-		0.375	0.116	Total HpCDD	296	-	
2,3,7,8-TCDF	3.74	-		0.374	0.0345				
1,2,3,7,8-PeCDF	1.30	-	J	0.0390	0.0417				
2,3,4,7,8-PeCDF	5.48	-	J	1.64	0.0449				
1,2,3,4,7,8-HxCDF	2.38	-	J	0.238	0.0351				
1,2,3,6,7,8-HxCDF	2.83	-	J	0.283	0.0382				
2,3,4,6,7,8-HxCDF	3.09	-	J	0.309	0.0379				
1,2,3,7,8,9-HxCDF	1.16	-	J	0.116	0.0423	Total TCDF	82.0	-	D,M
1,2,3,4,6,7,8-HpCDF	31.6	-		0.316	0.0415	Total PeCDF	66.2	-	D,M
1,2,3,4,7,8,9-HpCDF	1.63	-	J	0.0163	0.0532	Total HxCDF	51.1	-	
OCDF	64.6	-		0.0194	0.0833	Total HpCDF	80.9	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	109	25.0 - 164	
13C-1,2,3,7,8-PeCDD	103	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	96.6	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	99.5	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	102	23.0 - 140	
13C-OCDD	85.9	17.0 - 157	
13C-2,3,7,8-TCDF	108	24.0 - 169	
13C-1,2,3,7,8-PeCDF	109	24.0 - 185	
13C-2,3,4,7,8-PeCDF	111	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	117	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	116	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	118	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	117	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	109	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	120	26.0 - 138	
13C-OCDF	105	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	93.5	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/3/2019

Reviewed By: 
Date: 4/3/2019

EPA Method 1613
PCDD/F



FAL ID: 12279-005-SA
Client ID: TOC-SC-02-2.6-4.0
Matrix: Sediment
Batch No: X4846

Date Extracted: 03-29-2019
Date Received: 03-27-2019
Amount: 5.00 g
% Solids: 85.63

ICal: PCDDFAL3-12-3-18
GC Column: DB5MS
Units: pg/g


Acquired: 04-01-2019
2005 WHO TEQ: 0.0212
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.141		-	0.0331				
1,2,3,7,8-PeCDD	ND	0.207		-	0.0536				
1,2,3,4,7,8-HxCDD	ND	0.245		-	0.0540				
1,2,3,6,7,8-HxCDD	ND	0.254		-	0.0538	Total TCDD	0.948	-	J
1,2,3,7,8,9-HxCDD	ND	0.240		-	0.0518	Total PeCDD	ND	0.207	
1,2,3,4,6,7,8-HpCDD	1.59	-	J	0.0159	0.0695	Total HxCDD	1.78	-	J
OCDD	17.8	-		0.00534	0.116	Total HpCDD	4.86	-	J
2,3,7,8-TCDF	ND	0.135		-	0.0345				
1,2,3,7,8-PeCDF	ND	0.152		-	0.0417				
2,3,4,7,8-PeCDF	ND	0.158		-	0.0449				
1,2,3,4,7,8-HxCDF	ND	0.114		-	0.0351				
1,2,3,6,7,8-HxCDF	ND	0.121		-	0.0382				
2,3,4,6,7,8-HxCDF	ND	0.127		-	0.0379				
1,2,3,7,8,9-HxCDF	ND	0.184		-	0.0423	Total TCDF	ND	0.135	
1,2,3,4,6,7,8-HpCDF	ND	0.158		-	0.0415	Total PeCDF	ND	0.158	
1,2,3,4,7,8,9-HpCDF	ND	0.204		-	0.0532	Total HxCDF	ND	0.184	
OCDF	ND	0.300		-	0.0833	Total HpCDF	ND	0.204	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	100	25.0 - 164	
13C-1,2,3,7,8-PeCDD	90.9	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	90.3	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	97.2	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	89.4	23.0 - 140	
13C-OCDD	69.5	17.0 - 157	
13C-2,3,7,8-TCDF	94.1	24.0 - 169	
13C-1,2,3,7,8-PeCDF	94.3	24.0 - 185	
13C-2,3,4,7,8-PeCDF	98.8	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	111	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	113	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	109	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	109	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	98.3	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	105	26.0 - 138	
13C-OCDF	85.3	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	88.4	35.0 - 197	

- A Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
- B Analyte is present in Method Blank
- C Chemical Interference
- D Presence of Diphenyl Ethers
- DNQ Analyte concentration is below calibration range
- E Analyte concentration is above calibration range
- F Analyte confirmation on secondary column
- J Analyte concentration is below calibration range
- M Maximum possible concentration
- ND Analyte Not Detected at Detection Limit Level
- NP Not Provided
- P Pre-filtered through a Whatman 0.7um GF/F filter
- S Sample acceptance criteria not met
- X Matrix interferences
- * Result taken from dilution or reinjection

Analyst: 
Date: 4/3/2019

Reviewed By: 
Date: 4/3/2019



CHAIN OF CUSTODY RECORD

Omega COCID 650 PAGE: 1 OF: 1

ADDRESS

Fremont Analytical, Inc.
 3600 Fremont Ave. N.
 Seattle, WA 98103
 TEL: 206-352-3790
 FAX: 206-352-7178

Website: www.fremontanalytical.com

12279
 000

SUB CONTRACTOR: Frontier Analytical La COMPANY: Frontier Analytical Laboratory ADDRESS: 5172 Hillside Circle CITY, STATE, ZIP: El Dorado Hills, CA 95762 PHONE: (916) 934-0900 FAX: (916) 934-0999 EMAIL: ACCOUNT #:	SPECIAL INSTRUCTIONS / COMMENTS: Please email results to Mike Ridgeway at mridgeway@fremontanalytical.com and Chelsea Ward at cward@fremontanalytical.com.
--	---

ITEM #	SAMPLE ID	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS: Methanol Preserved Weights HOT Sample Notation, Additional Sample Description.
1	1903320-002E	TOC-SC-01-0.5-2.0	AMBER JAR 8OZ	Sediment	3/21/2019 11:11:00 AM	1	Dioxins/furans (1613B)
	O-DIOXIN						
2	1903320-003E	TOC-SC-01-2.5-4.0	AMBER JAR 8OZ	Sediment	3/21/2019 11:07:00 AM	1	Dioxins/furans (1613B)
	O-DIOXIN						
3	1903320-005E	TOC-SC-02-0.5-1.2	AMBER JAR 8OZ	Sediment	3/21/2019 12:50:00 PM	1	Dioxins/furans (1613B)
	O-DIOXIN						
4	1903320-006E	TOC-SC-02-1.2-2.2	AMBER JAR 8OZ	Sediment	3/21/2019 1:00:00 PM	1	Dioxins/furans (1613B)
	O-DIOXIN						
5	1903320-007E	TOC-SC-02-2.6-4.0	AMBER JAR 8OZ	Sediment	3/21/2019 12:55:00 PM	1	Dioxins/furans (1613B)
	O-DIOXIN						

Relinquished By: <i>[Signature]</i> Relinquished By: Relinquished By:	Date: 3/25/19 Date: Date:	Time: 1542 Time: Time:	Received By: <i>[Signature]</i> Received By: Received By:	Date: 3/27/19 Date: Date:	Time: 00532 Time: Time:	REPORT TRANSMITTAL DESIRED: <input type="checkbox"/> HARDCOPY (extra cost) <input type="checkbox"/> FAX <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE FOR LAB USE ONLY Temp of samples _____ °C Attempt to Cool? _____ Comments: _____
TAT: Standard <input checked="" type="checkbox"/> RUSH Next BD <input type="checkbox"/> 2nd BD <input type="checkbox"/> 3rd BD <input type="checkbox"/>						
Note: RUSH requests will incur surcharges!						

Frontier Analytical Laboratory

Sample Login Form

FAL Project ID: 12279

Client:	Fremont Analytical
Client Project ID:	1903320
Date Received:	03/27/2019
Time Received:	10:32 am
Received By:	TC
Logged In By:	KZ
# of Samples Received:	5
Duplicates:	0
Storage Location:	R-4

Method of Delivery:	UPS
Tracking Number:	1ZX6192X0344853923
Shipping Container Received Intact	Yes
Custody seals(s) present?	Yes
Custody seals(s) intact?	Yes
Sample Arrival Temperature (C)	0
Cooling Method	Blue Ice
Chain Of Custody Present?	Yes
Return Shipping Container To Client	Yes
Test aqueous sample for residual Chlorine	No
Sodium Thiosulfate Added	No
Adequate Sample Volume	Yes
Appropriate Sample Container	Yes
pH Range of Aqueous Sample	N/A
Anomalies or additional comments:	



CHAIN OF CUSTODY RECORD

Omega COCID 650 PAGE: 1 OF: 1

ADDRESS
Fremont Analytical, Inc.
3600 Fremont Ave. N.
Seattle, WA 98103
TEL: 206-352-3790
FAX: 206-352-7178
Website: www.frontieranalytical.com

12279
OC

SUB CONTRACTOR: **Frontier Analytical La** COMPANY: **Frontier Analytical Laboratory** SPECIAL INSTRUCTIONS / COMMENTS:

ADDRESS: **5172 Hillside Circle** Please email or call for more information. Chelsea Ward at

CITY, STATE, ZIP: **El Dorado Hills, CA**

PHONE: **(916) 934-0900** FAX: **(916) 934-0999**

ACCOUNT #:

ITEM #	SAMPLE ID	DESCRIPTION
1	1903320-002E	O-DIOXIN
2	1903320-003E	O-DIOXIN
3	1903320-005E	O-DIOXIN
4	1903320-006E	O-DIOXIN
5	1903320-007E	O-DIOXIN

Frontier Analytical Laboratory
12279-001-SA
Client ID: TOC-SC-01-0.5-2.0
Storage: R-4 (01 of 01)
Client: Floyd|Snider Sampled by: KH, PO
Project: Cantera
Sample ID: TOC-SC-01-0.5-2.0
Analysis: _____ Date: 3-21-2019
Preservative: None Time: 11:11

Frontier Analytical Laboratory
12279-002-SA
Client ID: TOC-SC-01-2.5-4.0
Storage: R-4 (01 of 01)
Client: Floyd|Snider Sampled by: KH, PO
Project: Cantera
Sample ID: TOC-SC-01-2.5-4.0
Analysis: _____ Date: 3-21-2019
Preservative: None Time: 11:07

Frontier Analytical Laboratory
12279-003-SA
Client ID: TOC-SC-02-0.5-1.2
Storage: R-4 (01 of 01)
Client: Floyd|Snider Sampled by: KH, PO
Project: Cantera
Sample ID: TOC-SC-02-0.5-1.2
Analysis: _____ Date: 3-21-2019
Preservative: None Time: 12:50

Frontier Analytical Laboratory
12279-004-SA
Client ID: TOC-SC-02-1.2-2.2
Storage: R-4 (01 of 01)
Client: Floyd|Snider Sampled by: KH, PO
Project: Cantera
Sample ID: TOC-SC-02-1.2-2.2
Analysis: _____ Date: 3-21-2019
Preservative: None Time: 13:00

Frontier Analytical Laboratory
12279-005-SA
Client ID: TOC-SC-02-2.6-4.0
Storage: R-4 (01 of 01)
Client: Floyd|Snider Sampled by: KH, PO
Project: Cantera
Sample ID: TOC-SC-02-2.6-4.0
Analysis: _____ Date: 3-21-2019
Preservative: None Time: 12:55

2019/03/27



16 April 2019

Mike Ridgeway
Fremont Analytical
3600 Fremont Avenue N.
Seattle, WA 98103

RE: 1903320

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

<u>Associated Work Order(s)</u>	<u>Associated SDG ID(s)</u>
19C0395	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.





CHAIN OF CUSTODY RECORD

Omega COCID 649

PAGE: 1

OF: 2

ADDRESS

Fremont Analytical, Inc.
3600 Fremont Ave. N.
Seattle, WA 98103
TEL: 206-352-3790
FAX: 206-352-7178

Website: www.fremontanalytical.com

19C0395

SUB CONTRACTOR: ARI	COMPANY: Analytical Resources Inc.	SPECIAL INSTRUCTIONS / COMMENTS: Please email results to Mike Ridgeway at mridgeway@fremontanalytical.com and Chelsea Ward at cward@fremontanalytical.com. <i>Butyltins: Dibutyltin, Monobutyltin, Tetrabutyltin, Tributyltin</i> <i>Pesticides: β-Hexachlorocyclohexane, Dieldrin, Total DDDs, total DDES, total DDTs, endrin ketone.</i> <i>Volume for sulfides preserved w/zn acetate in the field.</i>
ADDRESS: 4611 South 134th Place, Suite 100		
CITY, STATE, ZIP: Tukwila, WA 98168		
PHONE: (206) 695-6200 FAX: EMAIL:		
ACCOUNT #:		

ITEM #	SAMPLE ID	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS: Methanol Preserved Weights HOT Sample Notation, Additional Sample Description.
1	1903320-001C C-TBT	TOC-SC-03-0-0.5	CLEAR JARS 8 O	Sediment	3/21/2019 3:30:00 PM	1	Butyltins (8270 SIM), Pesticides (8081)
2	1903320-001D TEST_SUB	TOC-SC-03-0-0.5	SEPTA JAR 4OZ	Sediment	3/21/2019 3:30:00 PM	1	Sulfides (PSEP prep)
3	1903320-002C C-TBT	TOC-SC-01-0.5-2.0	CLEAR JARS 8 O	Sediment	3/21/2019 11:11:00 AM	1	Butyltins (8270 SIM), Pesticides (8081)
4	1903320-002D TEST_SUB	TOC-SC-01-0.5-2.0	SEPTA JAR 4OZ	Sediment	3/21/2019 11:11:00 AM	1	Sulfides (PSEP prep)
5	1903320-003C C-TBT	TOC-SC-01-2.5-4.0	CLEAR JARS 8 O	Sediment	3/21/2019 11:07:00 AM	1	Butyltins (8270 SIM), Pesticides (8081)
6	1903320-003D TEST_SUB	TOC-SC-01-2.5-4.0	SEPTA JAR 4OZ	Sediment	3/21/2019 11:07:00 AM	1	Sulfides (PSEP prep)
7	1903320-005C C-TBT	TOC-SC-02-0.5-1.2	CLEAR JARS 8 O	Sediment	3/21/2019 12:50:00 PM	1	Butyltins (8270 SIM), Pesticides (8081)
8	1903320-005D TEST_SUB	TOC-SC-02-0.5-1.2	SEPTA JAR 4OZ	Sediment	3/21/2019 12:50:00 PM	1	Sulfides (PSEP prep)
9	1903320-006C C-TBT	TOC-SC-02-1.2-2.2	CLEAR JARS 8 O	Sediment	3/21/2019 1:00:00 PM	1	Butyltins (8270 SIM), Pesticides (8081)

Relinquished By:	Date: 3/22/19	Time: 11:00	Received By:	Date: 3/22/19	Time: 15:15
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
TAT: Standard <input checked="" type="checkbox"/>	RUSH <input type="checkbox"/>	Next BD <input type="checkbox"/>	2nd BD <input type="checkbox"/>	3rd BD <input type="checkbox"/>	

Note: RUSH requests will incur surcharges!

REPORT TRANSMITTAL DESIRED:

HARDCOPY (extra cost) FAX EMAIL ONLINE

FOR LAB USE ONLY

Temp of samples _____ °C Attempt to Cool? _____

Comments: _____



CHAIN OF CUSTODY RECORD

Omega COCID 649

PAGE: 2 OF: 2

ADDRESS

Fremont Analytical, Inc.
 3600 Fremont Ave. N.
 Seattle, WA 98103
 TEL: 206-352-3790
 FAX: 206-352-7178

Website: www.fremontanalytical.com

19C0395

SUB CONTRACTOR: ARI	COMPANY: Analytical Resources Inc.	SPECIAL INSTRUCTIONS / COMMENTS: Please email results to Mike Ridgeway at mridgeway@fremontanalytical.com and Chelsea Ward at cward@fremontanalytical.com.
ADDRESS: 4611 South 134th Place, Suite 100		
CITY, STATE, ZIP: Tukwila, WA 98168		
PHONE: (206) 695-6200 FAX: EMAIL:		
ACCOUNT #:		

ITEM #	SAMPLE ID	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS: Methanol Preserved Weights HOT Sample Notation, Additional Sample Description.
10	1903320-006D TEST_SUB	TOC-SC-02-1.2-2.2	SEPTA JAR 4OZ	Sediment	3/21/2019 1:00:00 PM	1	Sulfides (PSEP prep)
11	1903320-007C C-TBT	TOC-SC-02-2.6-4.0	CLEAR JARS 8 O	Sediment	3/21/2019 12:55:00 PM	1	Butyltins (8270 SIM), Pesticides (8081)
12	1903320-007D TEST_SUB	TOC-SC-02-2.6-4.0	SEPTA JAR 4OZ	Sediment	3/21/2019 12:55:00 PM	1	Sulfides (PSEP prep)

Relinquished By:	Date: 3/21/19	Time: 1100	Received By:	Date: 03/22/19	Time: 10:15
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
TAT: Standard <input checked="" type="checkbox"/>	RUSH	Next BD <input type="checkbox"/>	2nd BD <input type="checkbox"/>	3rd BD <input type="checkbox"/>	

Note: RUSH requests will incur surcharges!

REPORT TRANSMITTAL DESIRED:	
<input type="checkbox"/> HARDCOPY (extra cost)	<input type="checkbox"/> FAX <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE
FOR LAB USE ONLY	
Temp of samples _____ °C	Attempt to Cool? _____
Comments: _____	



CHAIN OF CUSTODY RECORD

Omega COCID 649 PAGE: 2 OF: 2

ADDRESS

Fremont Analytical, Inc.
 3600 Fremont Ave. N.
 Seattle, WA 98103
 TEL: 206-352-3790
 FAX: 206-352-7178
 Website: www.fremontanalytical.com

19C0395

SUB CONTRACTOR: ARI COMPANY: Analytical Resources Inc.		SPECIAL INSTRUCTIONS / COMMENTS: Please email results to Mike Ridgeway at mridgeway@fremontanalytical.com and Chelsea Ward at cward@fremontanalytical.com.
ADDRESS: 4611 South 134th Place, Suite 100		
CITY, STATE, ZIP: Tukwila, WA 98168		
PHONE: (206) 695-6200	FAX: _____	
ACCOUNT #: _____		

ITEM #	SAMPLE ID	CLIENT SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS: Methanol Preserved Weights HOT Sample Notation, Additional Sample Description.
10	1903320-006D TEST_SUB	TOC-SC-02-1.2-2.2	SEPTA JAR 4OZ	Sediment	3/21/2019 1:00:00 PM	1	Sulfides (PSEP prep)
11	1903320-007C C-TBT	TOC-SC-02-2.6-4.0	CLEAR JARS 8 OZ	Sediment	3/21/2019 12:55:00 PM	1	Butyltins (8270 SIM), Pesticides (9081)
12	1903320-007D TEST_SUB	TOC-SC-02-2.6-4.0	SEPTA JAR 4OZ	Sediment	3/21/2019 12:55:00 PM	1	Sulfides (PSEP prep)

13 : 1903320-004C - TOC-SC-02-1.0-2.5 - HOLD

Relinquished By:	Date: 3/21/19	Time: 1:00	Received By:	Date: 3/21/19	Time: 1:15	REPORT TRANSMITTAL DESIRED: <input type="checkbox"/> HARD COPY (extra cost) <input type="checkbox"/> FAX <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE FOR LAB USE ONLY Temp of samples: _____ Attempt to Cool: _____ Comments: _____
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	
TAT: Standard <input checked="" type="checkbox"/> RUSH Next BD: <input type="checkbox"/> End BD: <input type="checkbox"/> 3rd BD: <input type="checkbox"/> Note: RUSH requests will incur surcharges!						



Fremont Analytical
3600 Fremont Avenue N.
Seattle WA, 98103

Project: 1903320
Project Number: 1903320
Project Manager: Mike Ridgeway

Reported:
16-Apr-2019 15:55

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TOC-SC-03-0-0.5	19C0395-01	Solid	21-Mar-2019 15:30	25-Mar-2019 15:15
TOC-SC-03-0-0.5	19C0395-02	Solid	21-Mar-2019 15:30	25-Mar-2019 15:15
TOC-SC-01-0.5-2.0	19C0395-03	Solid	21-Mar-2019 11:11	25-Mar-2019 15:15
TOC-SC-01-0.5-2.0	19C0395-04	Solid	21-Mar-2019 11:11	25-Mar-2019 15:15
TOC-SC-01-2.5-4.0	19C0395-05	Solid	21-Mar-2019 11:07	25-Mar-2019 15:15
TOC-SC-01-2.5-4.0	19C0395-06	Solid	21-Mar-2019 11:07	25-Mar-2019 15:15
TOC-SC-02-0.5-1.2	19C0395-07	Solid	21-Mar-2019 12:50	25-Mar-2019 15:15
TOC-SC-02-0.5-1.2	19C0395-08	Solid	21-Mar-2019 12:50	25-Mar-2019 15:15
TOC-SC-02-1.2-2.2	19C0395-09	Solid	21-Mar-2019 13:00	25-Mar-2019 15:15
TOC-SC-02-1.2-2.2	19C0395-10	Solid	21-Mar-2019 13:00	25-Mar-2019 15:15
TOC-SC-02-2.6-4.0	19C0395-11	Solid	21-Mar-2019 12:55	25-Mar-2019 15:15
TOC-SC-02-2.6-4.0	19C0395-12	Solid	21-Mar-2019 12:55	25-Mar-2019 15:15



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Project Manager: Mike Ridgeway

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Work Order Case Narrative

Sample receipt

Samples as listed on the preceding page were received March 25, 2019 under ARI work order 19C0395. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Pesticides - EPA Method SW8081B

The sample(s) were extracted and analyzed within the recommended holding times.

Sample 19C0395-07 was run at a 2X dilution due to bright yellow color of the extract.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

Butyl Tin(s) - EPA Method SW8270D-SIM

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements except Dibutyltin Ion which was out of control low. All samples which contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits except Butyltin Ion which was out of control low and is flagged within the QC section of this report.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times.



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Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.



Cooler Receipt Form

ARI Client: FILE MONT
 COC No(s): OMEGA VOC ID 649 NA
 Assigned ARI Job No: 19C0395

Project Name: 1903320
 Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____
 Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO
 Were custody papers included with the cooler? YES NO
 Were custody papers properly filled out (ink, signed, etc.) YES NO
 Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 15:15 4.9°C
 If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: D002565
 Cooler Accepted by: [Signature] Date: 03/22/19 Time: 15:15

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO
 What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____
 Was sufficient ice used (if appropriate)? NA YES NO
 Were all bottles sealed in individual plastic bags? YES NO
 Did all bottles arrive in good condition (unbroken)? YES NO
 Were all bottle labels complete and legible? YES NO
 Did the number of containers listed on COC match with the number of containers received? YES NO
 Did all bottle labels and tags agree with custody papers? YES NO
 Were all bottles used correct for the requested analyses? YES NO
 Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO
 Were all VOC vials free of air bubbles? NA YES NO
 Was sufficient amount of sample sent in each bottle? YES NO
 Date VOC Trip Blank was made at ARI: NA _____

Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: SeF Date: 3-25-19 Time: 1444 Labels checked by: SeF

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____



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Project Manager: Mike Ridgeway

Reported:
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TOC-SC-03-0-0.5
19C0395-01 (Solid)

Butyl Tins

Method: EPA 8270D-SIM Sampled: 03/21/2019 15:30
Instrument: NT14 Analyst: VTS Analyzed: 04/11/2019 15:01

Sample Preparation: Preparation Method: EPA 3546 (Microwave) Extract ID: 19C0395-01 A 01
Preparation Batch: BHD0111 Sample Size: 6.46 g (wet) Dry Weight: 5.02 g
Prepared: 04-Apr-2019 Final Volume: 0.5 mL % Solids: 77.73

Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 19C0395-01 A 01
Cleanup Batch: CHD0071 Initial Volume: 0.5 mL
Cleaned: 11-Apr-2019 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.448	3.84	2.14	ug/kg	J
Dibutyltin Ion	14488-53-0	1	1.72	5.76	3.27	ug/kg	J
Butyltin Ion	78763-54-9	1	1.88	4.06	ND	ug/kg	U
Tetrabutyltin	1461-25-2	1	4.98	4.98	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	47.8	%
<i>Surrogate: Tripropyltin</i>					30-160 %	63.7	%



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TOC-SC-03-0-0.5
19C0395-01 (Solid)

Chlorinated Pesticides

Method: EPA 8081B		Sampled: 03/21/2019 15:30	
Instrument: ECD6 Analyst: YZ		Analyzed: 04/15/2019 15:06	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BHD0112 Prepared: 04-Apr-2019	Sample Size: 15.46 g (wet) Final Volume: 4 mL	Extract ID: 19C0395-01 A 02 Dry Weight: 12.02 g % Solids: 77.73
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CHD0094 Cleaned: 12-Apr-2019	Initial Volume: 4 mL Final Volume: 4 mL	Extract ID: 19C0395-01 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CHD0093 Cleaned: 12-Apr-2019	Initial Volume: 4 mL Final Volume: 4 mL	Extract ID: 19C0395-01 A 02
Sample Cleanup:	Cleanup Method: Alumina Cleanup Batch: CHD0092 Cleaned: 10-Apr-2019	Initial Volume: 4 mL Final Volume: 4 mL	Extract ID: 19C0395-01 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
beta-BHC	319-85-7	1	0.32	1.70	ND	ug/kg	U
4,4'-DDE	72-55-9	1	0.57	3.30	ND	ug/kg	U
Dieldrin	60-57-1	1	0.56	3.30	ND	ug/kg	U
4,4'-DDD	72-54-8	1	0.57	3.30	ND	ug/kg	U
4,4'-DDT	50-29-3	1	0.57	3.30	ND	ug/kg	U
Endrin Ketone	53494-70-5	1	0.66	3.30	ND	ug/kg	U
2,4'-DDE	3424-82-6	1	1.70	3.30	ND	ug/kg	U
2,4'-DDD	53-19-0	1	1.70	3.30	ND	ug/kg	U
2,4'-DDT	789-02-6	1	1.70	3.30	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					34-145 %	80.0 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					34-145 %	76.9 %	
<i>Surrogate: Tetrachlorometaxylene</i>					23-135 %	57.7 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					23-135 %	63.8 %	



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TOC-SC-03-0-0.5
19C0395-02 (Solid)

Wet Chemistry

Method: SM 2540 G-97 Sampled: 03/21/2019 15:30
Instrument: BAL2 Analyst: KLE Analyzed: 03/26/2019 07:08

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19C0395-02
Preparation Batch: BHC0695 Sample Size: 10 g (wet) Dry Weight: 7.26 g
Prepared: 26-Mar-2019 Final Volume: 10 g % Solids: 72.63

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	72.63	%	



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TOC-SC-03-0-0.5
19C0395-02 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00 (PSEP) Sampled: 03/21/2019 15:30
Instrument: UV1800-2 Analyst: YK Analyzed: 03/27/2019 13:40
Sample Preparation: Extract ID: 19C0395-02 A
Preparation Method: No Prep Wet Chem
Preparation Batch: BHC0709 Sample Size: 5.272 g (wet) Dry Weight: 3.83 g
Prepared: 26-Mar-2019 Final Volume: 100 g % Solids: 72.63

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	10	13.1	13.1	89.8	mg/kg	D



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TOC-SC-01-0.5-2.0
19C0395-03 (Solid)

Butyl Tins

Method: EPA 8270D-SIM Sampled: 03/21/2019 11:11
Instrument: NT14 Analyst: VTS Analyzed: 04/11/2019 15:15

Sample Preparation: Preparation Method: EPA 3546 (Microwave) Extract ID: 19C0395-03 A 01
Preparation Batch: BHD0111 Sample Size: 7.4 g (wet) Dry Weight: 5.04 g
Prepared: 04-Apr-2019 Final Volume: 0.5 mL % Solids: 68.05

Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 19C0395-03 A 01
Cleanup Batch: CHD0071 Initial Volume: 0.5 mL
Cleaned: 11-Apr-2019 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.447	3.83	ND	ug/kg	U
Dibutyltin Ion	14488-53-0	1	1.72	5.74	ND	ug/kg	U
Butyltin Ion	78763-54-9	1	1.88	4.05	ND	ug/kg	U
Tetrabutyltin	1461-25-2	1	4.96	4.96	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	43.3	%
<i>Surrogate: Tripropyltin</i>					30-160 %	59.3	%



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TOC-SC-01-0.5-2.0
19C0395-03 (Solid)

Chlorinated Pesticides

Method: EPA 8081B		Sampled: 03/21/2019 11:11
Instrument: ECD6 Analyst: YZ		Analyzed: 04/15/2019 15:24
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BHD0112 Prepared: 04-Apr-2019	Extract ID: 19C0395-03 A 02 Sample Size: 17.67 g (wet) Dry Weight: 12.02 g Final Volume: 4 mL % Solids: 68.05
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CHD0094 Cleaned: 12-Apr-2019	Extract ID: 19C0395-03 A 02 Initial Volume: 4 mL Final Volume: 4 mL
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CHD0093 Cleaned: 12-Apr-2019	Extract ID: 19C0395-03 A 02 Initial Volume: 4 mL Final Volume: 4 mL
Sample Cleanup:	Cleanup Method: Alumina Cleanup Batch: CHD0092 Cleaned: 10-Apr-2019	Extract ID: 19C0395-03 A 02 Initial Volume: 4 mL Final Volume: 4 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
beta-BHC	319-85-7	1	0.32	1.70	ND	ug/kg	U
4,4'-DDE	72-55-9	1	0.57	3.29	ND	ug/kg	U
Dieldrin	60-57-1	1	0.56	3.29	ND	ug/kg	U
4,4'-DDD	72-54-8	1	0.57	3.29	ND	ug/kg	U
4,4'-DDT	50-29-3	1	0.57	3.29	ND	ug/kg	U
Endrin Ketone	53494-70-5	1	0.66	3.29	ND	ug/kg	U
2,4'-DDE	3424-82-6	1	1.70	3.29	ND	ug/kg	U
2,4'-DDD	53-19-0	1	1.70	3.29	ND	ug/kg	U
2,4'-DDT	789-02-6	1	1.70	3.29	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					34-145 %	81.8 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					34-145 %	80.1 %	
<i>Surrogate: Tetrachlorometaxylene</i>					23-135 %	60.3 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					23-135 %	66.2 %	



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TOC-SC-01-0.5-2.0
19C0395-04 (Solid)

Wet Chemistry

Method: SM 2540 G-97

Sampled: 03/21/2019 11:11

Instrument: BAL2 Analyst: KLE

Analyzed: 03/26/2019 07:08

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 19C0395-04

Preparation Batch: BHC0695

Sample Size: 10 g (wet)

Dry Weight: 5.97 g

Prepared: 26-Mar-2019

Final Volume: 10 g

% Solids: 59.74

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	59.74	%	



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TOC-SC-01-0.5-2.0
19C0395-04 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00 (PSEP) Sampled: 03/21/2019 11:11
Instrument: UV1800-2 Analyst: YK Analyzed: 03/27/2019 13:40

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19C0395-04 A
Preparation Batch: BHC0709 Sample Size: 6.448 g (wet) Dry Weight: 3.85 g
Prepared: 26-Mar-2019 Final Volume: 100 g % Solids: 59.74

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	1	1.30	1.30	ND	mg/kg	U



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TOC-SC-01-2.5-4.0
19C0395-05 (Solid)

Butyl Tins

Method: EPA 8270D-SIM Sampled: 03/21/2019 11:07
Instrument: NT14 Analyst: VTS Analyzed: 04/11/2019 15:28

Sample Preparation: Preparation Method: EPA 3546 (Microwave) Extract ID: 19C0395-05 A 01
Preparation Batch: BHD0111 Sample Size: 6.51 g (wet) Dry Weight: 5.03 g
Prepared: 04-Apr-2019 Final Volume: 0.5 mL % Solids: 77.21

Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 19C0395-05 A 01
Cleanup Batch: CHD0071 Initial Volume: 0.5 mL
Cleaned: 11-Apr-2019 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.448	3.84	ND	ug/kg	U
Dibutyltin Ion	14488-53-0	1	1.72	5.75	ND	ug/kg	U
Butyltin Ion	78763-54-9	1	1.88	4.06	ND	ug/kg	U
Tetrabutyltin	1461-25-2	1	4.97	4.97	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	51.3	%
<i>Surrogate: Tripropyltin</i>					30-160 %	68.1	%



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Reported:
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TOC-SC-01-2.5-4.0
19C0395-05 (Solid)

Chlorinated Pesticides

Method: EPA 8081B		Sampled: 03/21/2019 11:07
Instrument: ECD6 Analyst: YZ		Analyzed: 04/15/2019 15:42
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BHD0112 Prepared: 04-Apr-2019	Extract ID: 19C0395-05 A 02 Sample Size: 15.57 g (wet) Dry Weight: 12.02 g Final Volume: 4 mL % Solids: 77.21
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CHD0094 Cleaned: 12-Apr-2019	Extract ID: 19C0395-05 A 02 Initial Volume: 4 mL Final Volume: 4 mL
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CHD0093 Cleaned: 12-Apr-2019	Extract ID: 19C0395-05 A 02 Initial Volume: 4 mL Final Volume: 4 mL
Sample Cleanup:	Cleanup Method: Alumina Cleanup Batch: CHD0092 Cleaned: 10-Apr-2019	Extract ID: 19C0395-05 A 02 Initial Volume: 4 mL Final Volume: 4 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
beta-BHC	319-85-7	1	0.32	1.70	ND	ug/kg	U
4,4'-DDE	72-55-9	1	0.57	3.29	ND	ug/kg	U
Dieldrin	60-57-1	1	0.56	3.29	ND	ug/kg	U
4,4'-DDD	72-54-8	1	0.57	3.29	ND	ug/kg	U
4,4'-DDT	50-29-3	1	0.57	3.29	ND	ug/kg	U
Endrin Ketone	53494-70-5	1	0.66	3.29	ND	ug/kg	U
2,4'-DDE	3424-82-6	1	1.70	3.29	ND	ug/kg	U
2,4'-DDD	53-19-0	1	1.70	3.29	ND	ug/kg	U
2,4'-DDT	789-02-6	1	1.70	3.29	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					34-145 %	90.0 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					34-145 %	87.2 %	
<i>Surrogate: Tetrachlorometaxylene</i>					23-135 %	70.9 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					23-135 %	71.6 %	



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Reported:
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TOC-SC-01-2.5-4.0
19C0395-06 (Solid)

Wet Chemistry

Method: SM 2540 G-97 Sampled: 03/21/2019 11:07
Instrument: BAL2 Analyst: KLE Analyzed: 03/26/2019 07:08

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19C0395-06
Preparation Batch: BHC0695 Sample Size: 10 g (wet) Dry Weight: 7.05 g
Prepared: 26-Mar-2019 Final Volume: 10 g % Solids: 70.45

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	70.45	%	



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TOC-SC-01-2.5-4.0
19C0395-06 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00 (PSEP) Sampled: 03/21/2019 11:07
Instrument: UV1800-2 Analyst: YK Analyzed: 03/27/2019 13:40

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19C0395-06 A
Preparation Batch: BHC0709 Sample Size: 5.415 g (wet) Dry Weight: 3.81 g
Prepared: 26-Mar-2019 Final Volume: 100 g % Solids: 70.45

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	1	1.31	1.31	10.6	mg/kg	



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TOC-SC-02-0.5-1.2
19C0395-07 (Solid)

Butyl Tins

Method: EPA 8270D-SIM Sampled: 03/21/2019 12:50
Instrument: NT14 Analyst: VTS Analyzed: 04/11/2019 15:42

Sample Preparation: Preparation Method: EPA 3546 (Microwave) Extract ID: 19C0395-07 A 01
Preparation Batch: BHD0111 Sample Size: 10.73 g (wet) Dry Weight: 5.01 g
Prepared: 04-Apr-2019 Final Volume: 0.5 mL % Solids: 46.66

Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 19C0395-07 A 01
Cleanup Batch: CHD0071 Initial Volume: 0.5 mL
Cleaned: 11-Apr-2019 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.449	3.85	261	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.73	5.77	124	ug/kg	Q
Butyltin Ion	78763-54-9	1	1.89	4.07	21.2	ug/kg	
Tetrabutyltin	1461-25-2	1	4.99	4.99	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	48.5	%
<i>Surrogate: Tripropyltin</i>					30-160 %	46.2	%



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TOC-SC-02-0.5-1.2
19C0395-07 (Solid)

Chlorinated Pesticides

Method: EPA 8081B		Sampled: 03/21/2019 12:50	
Instrument: ECD6 Analyst: YZ		Analyzed: 04/15/2019 16:00	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BHD0112 Prepared: 04-Apr-2019	Sample Size: 25.74 g (wet) Final Volume: 4 mL	Extract ID: 19C0395-07 A 02 Dry Weight: 12.01 g % Solids: 46.66
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CHD0094 Cleaned: 12-Apr-2019	Initial Volume: 4 mL Final Volume: 4 mL	Extract ID: 19C0395-07 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CHD0093 Cleaned: 12-Apr-2019	Initial Volume: 4 mL Final Volume: 4 mL	Extract ID: 19C0395-07 A 02
Sample Cleanup:	Cleanup Method: Alumina Cleanup Batch: CHD0092 Cleaned: 10-Apr-2019	Initial Volume: 4 mL Final Volume: 4 mL	Extract ID: 19C0395-07 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
beta-BHC	319-85-7	2	0.64	3.40	ND	ug/kg	U
4,4'-DDE	72-55-9	2	1.14	6.59	ND	ug/kg	U
Dieldrin	60-57-1	2	1.13	6.59	ND	ug/kg	U
4,4'-DDD	72-54-8	2	1.15	6.59	ND	ug/kg	U
4,4'-DDT	50-29-3	2	1.14	6.59	ND	ug/kg	U
Endrin Ketone	53494-70-5	2	1.32	6.59	ND	ug/kg	U
2,4'-DDE	3424-82-6	2	3.40	6.59	ND	ug/kg	U
2,4'-DDD	53-19-0	2	3.40	6.59	ND	ug/kg	U
2,4'-DDT	789-02-6	2	3.40	6.59	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					34-145 %	109 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>					34-145 %	102 %	
<i>Surrogate: Tetrachlorometaxylene</i>					23-135 %	102 %	P1
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					23-135 %	65.3 %	P1



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Project Number: 1903320
Project Manager: Mike Ridgeway

Reported:
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TOC-SC-02-0.5-1.2
19C0395-08 (Solid)

Wet Chemistry

Method: SM 2540 G-97 Sampled: 03/21/2019 12:50
Instrument: BAL2 Analyst: KLE Analyzed: 03/26/2019 07:08

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19C0395-08
Preparation Batch: BHC0695 Sample Size: 10 g (wet) Dry Weight: 3.94 g
Prepared: 26-Mar-2019 Final Volume: 10 g % Solids: 39.41

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	39.41	%	



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TOC-SC-02-0.5-1.2
19C0395-08 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00 (PSEP) Sampled: 03/21/2019 12:50
Instrument: UV1800-2 Analyst: YK Analyzed: 03/27/2019 13:41

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19C0395-08 A
Preparation Batch: BHC0709 Sample Size: 5.245 g (wet) Dry Weight: 2.07 g
Prepared: 26-Mar-2019 Final Volume: 100 g % Solids: 39.41

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	20	48.4	48.4	705	mg/kg	D



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TOC-SC-02-1.2-2.2
19C0395-09 (Solid)

Butyl Tins

Method: EPA 8270D-SIM Sampled: 03/21/2019 13:00
Instrument: NT14 Analyst: VTS Analyzed: 04/11/2019 15:55

Sample Preparation: Preparation Method: EPA 3546 (Microwave) Extract ID: 19C0395-09 A 01
Preparation Batch: BHD0111 Sample Size: 8.75 g (wet) Dry Weight: 5.03 g
Prepared: 04-Apr-2019 Final Volume: 0.5 mL % Solids: 57.44

Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 19C0395-09 A 01
Cleanup Batch: CHD0071 Initial Volume: 0.5 mL
Cleaned: 11-Apr-2019 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.448	3.84	62.8	ug/kg	
Dibutyltin Ion	14488-53-0	1	1.72	5.75	44.1	ug/kg	Q
Butyltin Ion	78763-54-9	1	1.88	4.06	5.97	ug/kg	
Tetrabutyltin	1461-25-2	1	4.97	4.97	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	57.9	%
<i>Surrogate: Tripropyltin</i>					30-160 %	60.7	%



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TOC-SC-02-1.2-2.2
19C0395-09 (Solid)

Chlorinated Pesticides

Method: EPA 8081B		Sampled: 03/21/2019 13:00	
Instrument: ECD6 Analyst: YZ		Analyzed: 04/15/2019 16:18	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave)	Sample Size: 20.91 g (wet)	Extract ID: 19C0395-09 A 02
	Preparation Batch: BHD0112	Final Volume: 4 mL	Dry Weight: 12.01 g
	Prepared: 04-Apr-2019		% Solids: 57.44
Sample Cleanup:	Cleanup Method: Silica Gel	Initial Volume: 4 mL	Extract ID: 19C0395-09 A 02
	Cleanup Batch: CHD0094	Final Volume: 4 mL	
	Cleaned: 12-Apr-2019		
Sample Cleanup:	Cleanup Method: Sulfur	Initial Volume: 4 mL	Extract ID: 19C0395-09 A 02
	Cleanup Batch: CHD0093	Final Volume: 4 mL	
	Cleaned: 12-Apr-2019		
Sample Cleanup:	Cleanup Method: Alumina	Initial Volume: 4 mL	Extract ID: 19C0395-09 A 02
	Cleanup Batch: CHD0092	Final Volume: 4 mL	
	Cleaned: 10-Apr-2019		

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
beta-BHC	319-85-7	1	0.32	1.70	ND	ug/kg	U
4,4'-DDE	72-55-9	1	0.57	3.30	ND	ug/kg	U
Dieldrin	60-57-1	1	0.56	3.30	ND	ug/kg	U
4,4'-DDD	72-54-8	1	0.57	3.30	ND	ug/kg	U
4,4'-DDT	50-29-3	1	0.57	3.30	ND	ug/kg	U
Endrin Ketone	53494-70-5	1	0.66	3.30	ND	ug/kg	U
2,4'-DDE	3424-82-6	1	1.70	3.30	ND	ug/kg	U
2,4'-DDD	53-19-0	1	1.70	3.30	ND	ug/kg	U
2,4'-DDT	789-02-6	1	1.70	3.30	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					34-145 %	91.9	%
<i>Surrogate: Decachlorobiphenyl [2C]</i>					34-145 %	83.3	%
<i>Surrogate: Tetrachlorometaxylene</i>					23-135 %	69.3	%
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					23-135 %	63.2	%



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TOC-SC-02-1.2-2.2
19C0395-10 (Solid)

Wet Chemistry

Method: SM 2540 G-97 Sampled: 03/21/2019 13:00
Instrument: BAL2 Analyst: KLE Analyzed: 03/26/2019 07:08

Sample Preparation: Preparation Method: No Prep Wet Chem Extract ID: 19C0395-10
Preparation Batch: BHC0695 Sample Size: 10 g (wet) Dry Weight: 5.97 g
Prepared: 26-Mar-2019 Final Volume: 10 g % Solids: 59.67

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	59.67	%	



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TOC-SC-02-1.2-2.2
19C0395-10 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00 (PSEP)				Sampled: 03/21/2019 13:00
Instrument: UV1800-2 Analyst: YK				Analyzed: 03/27/2019 13:42
Sample Preparation:	Preparation Method: No Prep Wet Chem	Sample Size: 5.257 g (wet)	Extract ID: 19C0395-10 A	
	Preparation Batch: BHC0709	Final Volume: 100 g	Dry Weight: 3.14 g	
	Prepared: 26-Mar-2019		% Solids: 59.67	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	10	15.9	15.9	127	mg/kg	D



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TOC-SC-02-2.6-4.0
19C0395-11 (Solid)

Butyl Tins

Method: EPA 8270D-SIM Sampled: 03/21/2019 12:55
Instrument: NT14 Analyst: VTS Analyzed: 04/11/2019 16:09

Sample Preparation: Preparation Method: EPA 3546 (Microwave) Extract ID: 19C0395-11 A 01
Preparation Batch: BHD0111 Sample Size: 5.95 g (wet) Dry Weight: 5.04 g
Prepared: 04-Apr-2019 Final Volume: 0.5 mL % Solids: 84.74

Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 19C0395-11 A 01
Cleanup Batch: CHD0071 Initial Volume: 0.5 mL
Cleaned: 11-Apr-2019 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Tributyltin Ion	36643-28-4	1	0.446	3.83	ND	ug/kg	U
Dibutyltin Ion	14488-53-0	1	1.72	5.73	ND	ug/kg	U
Butyltin Ion	78763-54-9	1	1.87	4.05	ND	ug/kg	U
Tetrabutyltin	1461-25-2	1	4.96	4.96	ND	ug/kg	U
<i>Surrogate: Tripentyltin</i>					30-160 %	53.4	%
<i>Surrogate: Tripropyltin</i>					30-160 %	56.9	%



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TOC-SC-02-2.6-4.0
19C0395-11 (Solid)

Chlorinated Pesticides

Method: EPA 8081B		Sampled: 03/21/2019 12:55	
Instrument: ECD6 Analyst: YZ		Analyzed: 04/15/2019 16:36	
Sample Preparation:	Preparation Method: EPA 3546 (Microwave) Preparation Batch: BHD0112 Prepared: 04-Apr-2019	Sample Size: 14.21 g (wet) Final Volume: 4 mL	Extract ID: 19C0395-11 A 02 Dry Weight: 12.04 g % Solids: 84.74
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CHD0094 Cleaned: 12-Apr-2019	Initial Volume: 4 mL Final Volume: 4 mL	Extract ID: 19C0395-11 A 02
Sample Cleanup:	Cleanup Method: Sulfur Cleanup Batch: CHD0093 Cleaned: 12-Apr-2019	Initial Volume: 4 mL Final Volume: 4 mL	Extract ID: 19C0395-11 A 02
Sample Cleanup:	Cleanup Method: Alumina Cleanup Batch: CHD0092 Cleaned: 10-Apr-2019	Initial Volume: 4 mL Final Volume: 4 mL	Extract ID: 19C0395-11 A 02

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
beta-BHC	319-85-7	1	0.32	1.69	ND	ug/kg	U
4,4'-DDE	72-55-9	1	0.57	3.29	ND	ug/kg	U
Dieldrin	60-57-1	1	0.56	3.29	ND	ug/kg	U
4,4'-DDD	72-54-8	1	0.57	3.29	ND	ug/kg	U
4,4'-DDT	50-29-3	1	0.57	3.29	ND	ug/kg	U
Endrin Ketone	53494-70-5	1	0.66	3.29	ND	ug/kg	U
2,4'-DDE	3424-82-6	1	1.69	3.29	ND	ug/kg	U
2,4'-DDD	53-19-0	1	1.69	3.29	ND	ug/kg	U
2,4'-DDT	789-02-6	1	1.69	3.29	ND	ug/kg	U
<i>Surrogate: Decachlorobiphenyl</i>					34-145 %	95.2	%
<i>Surrogate: Decachlorobiphenyl [2C]</i>					34-145 %	93.5	%
<i>Surrogate: Tetrachlorometaxylene</i>					23-135 %	63.6	%
<i>Surrogate: Tetrachlorometaxylene [2C]</i>					23-135 %	68.9	%



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TOC-SC-02-2.6-4.0
19C0395-12 (Solid)

Wet Chemistry

Method: SM 2540 G-97

Sampled: 03/21/2019 12:55

Instrument: BAL2 Analyst: KLE

Analyzed: 03/26/2019 07:08

Sample Preparation:

Preparation Method: No Prep Wet Chem

Extract ID: 19C0395-12

Preparation Batch: BHC0695

Sample Size: 10 g (wet)

Dry Weight: 8.16 g

Prepared: 26-Mar-2019

Final Volume: 10 g

% Solids: 81.60

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Total Solids		1	0.04	0.04	81.60	%	



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TOC-SC-02-2.6-4.0
19C0395-12 (Solid)

Wet Chemistry

Method: SM 4500-S2 D-00 (PSEP)	Preparation Method: No Prep Wet Chem	Sample Size: 7.197 g (wet)	Sampled: 03/21/2019 12:55
Instrument: UV1800-2 Analyst: YK	Preparation Batch: BHC0709	Final Volume: 100 g	Analyzed: 03/27/2019 13:43
Sample Preparation:	Prepared: 26-Mar-2019		Extract ID: 19C0395-12 A
			Dry Weight: 5.87 g
			% Solids: 81.60

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfide	18496-25-8	1	0.851	0.851	ND	mg/kg	U



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Butyl Tins - Quality Control

Batch BHD0111 - EPA 3546 (Microwave)

Instrument: NT14 Analyst: VTS

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHD0111-BLK1)											
						Prepared: 04-Apr-2019 Analyzed: 11-Apr-2019 14:34					
Tributyltin Ion	ND	0.450	3.86	ug/kg							U
Dibutyltin Ion	ND	1.73	5.78	ug/kg							U
Butyltin Ion	ND	1.89	4.08	ug/kg							U
Tetrabutyltin	ND	5.00	5.00	ug/kg							U
Surrogate: Tripentyltin	21.5			ug/kg	45.2	47.5		30-160			
Surrogate: Tripropyltin	27.3			ug/kg	43.7	62.3		30-160			
LCS (BHD0111-BS1)											
						Prepared: 04-Apr-2019 Analyzed: 11-Apr-2019 14:48					
Tributyltin Ion	28.4	0.450	3.86	ug/kg	44.6		63.8	30-160			
Dibutyltin Ion	17.8	1.73	5.78	ug/kg	38.4		46.3	30-160			Q
Butyltin Ion	15.2	1.89	4.08	ug/kg	31.2		48.8	30-160			
Surrogate: Tripentyltin	23.3			ug/kg	45.2	51.5		30-160			
Surrogate: Tripropyltin	30.6			ug/kg	43.7	70.0		30-160			



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Chlorinated Pesticides - Quality Control

Batch BHD0112 - EPA 3546 (Microwave)

Instrument: ECD6 Analyst: YZ

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHD0112-BLK1)											
						Prepared: 04-Apr-2019	Analyzed: 15-Apr-2019 14:29				
beta-BHC	ND	0.32	1.70	ug/kg							U
4,4'-DDE	ND	0.57	3.30	ug/kg							U
Dieldrin	ND	0.56	3.30	ug/kg							U
4,4'-DDD	ND	0.58	3.30	ug/kg							U
4,4'-DDT	ND	0.57	3.30	ug/kg							U
Endrin Ketone	ND	0.66	3.30	ug/kg							U
2,4'-DDE	ND	1.70	3.30	ug/kg							U
2,4'-DDD	ND	1.70	3.30	ug/kg							U
2,4'-DDT	ND	1.70	3.30	ug/kg							U
<i>Surrogate: Decachlorobiphenyl</i>	12.6			ug/kg	13.3		94.7	34-145			
<i>Surrogate: Decachlorobiphenyl [2C]</i>	11.7			ug/kg	13.3		87.9	34-145			
<i>Surrogate: Tetrachlorometaxylene</i>	7.98			ug/kg	13.3		59.8	23-135			
<i>Surrogate: Tetrachlorometaxylene [2C]</i>	9.08			ug/kg	13.3		68.1	23-135			
LCS (BHD0112-BS1)											
						Prepared: 04-Apr-2019	Analyzed: 15-Apr-2019 14:48				
beta-BHC	4.81	0.32	1.70	ug/kg	6.67		72.1	43-120			
4,4'-DDE	12.2	0.57	3.30	ug/kg	13.3		91.1	60-134			
Dieldrin	11.5	0.56	3.30	ug/kg	13.3		86.1	44-129			
4,4'-DDD	11.8	0.58	3.30	ug/kg	13.3		88.5	60-120			
4,4'-DDT	10.5	0.57	3.30	ug/kg	13.3		78.5	63-120			
Endrin Ketone	11.2	0.66	3.30	ug/kg	13.3		83.7	64-120			
<i>Surrogate: Decachlorobiphenyl</i>	12.8			ug/kg	13.3		96.2	34-145			
<i>Surrogate: Decachlorobiphenyl [2C]</i>	12.2			ug/kg	13.3		91.4	34-145			
<i>Surrogate: Tetrachlorometaxylene</i>	8.49			ug/kg	13.3		63.7	23-135			
<i>Surrogate: Tetrachlorometaxylene [2C]</i>	9.70			ug/kg	13.3		72.8	23-135			



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Wet Chemistry - Quality Control

Batch BHC0695 - No Prep Wet Chem

Instrument: BAL2 Analyst: KLE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHC0695-BLK1)						Prepared: 26-Mar-2019 Analyzed: 26-Mar-2019 07:08					
Total Solids	ND	0.04	0.04	%							U



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Wet Chemistry - Quality Control

Batch BHC0709 - No Prep Wet Chem

Instrument: UV1800-2 Analyst: YK

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHC0709-BLK1)						Prepared: 26-Mar-2019 Analyzed: 27-Mar-2019 13:18					
Sulfide	ND	1.00	1.00	mg/kg							U
LCS (BHC0709-BS1)						Prepared: 26-Mar-2019 Analyzed: 27-Mar-2019 13:19					
Sulfide	109	10.0	10.0	mg/kg	119		92.3	75-125			D



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Certified Analyses included in this Report

Analyte	Certifications
EPA 8081B in Solid	
alpha-BHC	DoD-ELAP,NELAP,WADOE
alpha-BHC [2C]	DoD-ELAP,NELAP,WADOE
beta-BHC	DoD-ELAP,NELAP,WADOE
beta-BHC [2C]	DoD-ELAP,NELAP,WADOE
gamma-BHC (Lindane)	DoD-ELAP,NELAP,WADOE
gamma-BHC (Lindane) [2C]	DoD-ELAP,NELAP,WADOE
delta-BHC	DoD-ELAP,NELAP,WADOE
delta-BHC [2C]	DoD-ELAP,NELAP,WADOE
Heptachlor	DoD-ELAP,NELAP,WADOE
Heptachlor [2C]	DoD-ELAP,NELAP,WADOE
Aldrin	DoD-ELAP,NELAP,WADOE
Aldrin [2C]	DoD-ELAP,NELAP,WADOE
Heptachlor Epoxide	DoD-ELAP,NELAP,WADOE
Heptachlor Epoxide [2C]	DoD-ELAP,NELAP,WADOE
trans-Chlordane (beta-Chlordane)	DoD-ELAP
trans-Chlordane (beta-Chlordane) [2C]	DoD-ELAP
cis-Chlordane (alpha-chlordane)	DoD-ELAP,NELAP,WADOE
cis-Chlordane (alpha-chlordane) [2C]	DoD-ELAP,NELAP,WADOE
Endosulfan I	DoD-ELAP,NELAP,WADOE
Endosulfan I [2C]	DoD-ELAP,NELAP,WADOE
4,4'-DDE	DoD-ELAP,NELAP,WADOE
4,4'-DDE [2C]	DoD-ELAP,NELAP,WADOE
Dieldrin	DoD-ELAP,NELAP,WADOE
Dieldrin [2C]	DoD-ELAP,NELAP,WADOE
Endrin	DoD-ELAP,NELAP,WADOE
Endrin [2C]	DoD-ELAP,NELAP,WADOE
Endosulfan II	DoD-ELAP,NELAP,WADOE
Endosulfan II [2C]	DoD-ELAP,NELAP,WADOE
4,4'-DDD	DoD-ELAP,NELAP,WADOE
4,4'-DDD [2C]	DoD-ELAP,NELAP,WADOE
Endrin Aldehyde	DoD-ELAP,NELAP,WADOE
Endrin Aldehyde [2C]	DoD-ELAP,NELAP,WADOE
4,4'-DDT	DoD-ELAP,NELAP,WADOE
4,4'-DDT [2C]	DoD-ELAP,NELAP,WADOE
Endosulfan Sulfate	DoD-ELAP,NELAP,WADOE



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Endosulfan Sulfate [2C]	DoD-ELAP,NELAP,WADOE
Endrin Ketone	DoD-ELAP,NELAP,WADOE
Endrin Ketone [2C]	DoD-ELAP,NELAP,WADOE
Methoxychlor	DoD-ELAP,NELAP,WADOE
Methoxychlor [2C]	DoD-ELAP,NELAP,WADOE
Hexachlorobutadiene	DoD-ELAP,NELAP,WADOE
Hexachlorobutadiene [2C]	DoD-ELAP,NELAP,WADOE
Hexachlorobenzene	DoD-ELAP,NELAP,WADOE
Hexachlorobenzene [2C]	DoD-ELAP,NELAP,WADOE
2,4'-DDE	DoD-ELAP,NELAP,WADOE
2,4'-DDE [2C]	DoD-ELAP,NELAP,WADOE
2,4'-DDD	DoD-ELAP,NELAP,WADOE
2,4'-DDD [2C]	DoD-ELAP,NELAP,WADOE
2,4'-DDT	DoD-ELAP,NELAP,WADOE
2,4'-DDT [2C]	DoD-ELAP,NELAP,WADOE
Oxychlorane	DoD-ELAP,NELAP,WADOE
Oxychlorane [2C]	DoD-ELAP,NELAP,WADOE
cis-Nonachlor	DoD-ELAP,NELAP,WADOE
cis-Nonachlor [2C]	DoD-ELAP,NELAP,WADOE
trans-Nonachlor	DoD-ELAP,NELAP
trans-Nonachlor [2C]	DoD-ELAP,NELAP
Mirex	DoD-ELAP,NELAP,WADOE
Mirex [2C]	DoD-ELAP,NELAP,WADOE
Hexachloroethane	WADOE
Hexachloroethane [2C]	WADOE
Toxaphene	DoD-ELAP,NELAP,WADOE
Toxaphene [2C]	DoD-ELAP,NELAP,WADOE
Chlordane, technical	DoD-ELAP,NELAP,WADOE
Chlordane, technical [2C]	DoD-ELAP,NELAP,WADOE

EPA 8270D-SIM in Solid

Tributyltin Ion	WADOE,DoD-ELAP
Dibutyltin Ion	WADOE,DoD-ELAP
Butyltin Ion	WADOE

SM 4500-S2 D-00 (PSEP) in Solid

Sulfide	DoD-ELAP,NELAP,WADOE
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Fremont Analytical
3600 Fremont Avenue N.
Seattle WA, 98103

Project: 1903320
Project Number: 1903320
Project Manager: Mike Ridgeway

Reported:
16-Apr-2019 15:55

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	01/31/2021
CALAP	California Department of Public Health CAELAP	2748	06/30/2019
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	01/01/2021
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-011	05/12/2019
WADOE	WA Dept of Ecology	C558	06/30/2019
WA-DW	Ecology - Drinking Water	C558	06/30/2019



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3600 Fremont Avenue N.
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Notes and Definitions

- * Flagged value is not within established control limits.
- D The reported value is from a dilution
- J Estimated concentration value detected below the reporting limit.
- P1 The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
- U This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.

Grain Size by ASTM D422

Project: Surface Sediment Quality Evaluation
Client: Floyd|Snider
Lab Project #: 1903305

Percent Finer (Passing) than the Indicated Size

UOM = Percent

Grain Size Classification	Gravel						Coarse Sand	Medium Sand		Fine Sand			Silt		
	Sieve Size	3"	2"	1 1/2"	1"	3/4"	3/8"	#4	#10	#20	#40	#60	#140	#200	#325
Particle Size (Microns)	76200	50800	38100	25400	19050	9525	4750	2000	850	425	250	106	75	45	34
TOC-SS-07-0-10	100%	100%	100%	100%	100%	100%	100.0%	100.0%	49.8%	40.0%	36.6%	22.4%	17.5%	13.4%	4.14%
TOC-SS-08-0-10	100%	100%	100%	100%	100%	100%	99.8%	99.6%	97.7%	94.8%	90.0%	31.3%	17.6%	10.3%	4.82%
TOC-SS-09-0-10	100%	100%	100%	100%	100%	100%	99.8%	99.5%	98.3%	95.7%	84.7%	11.7%	5.97%	3.32%	1.83%
TOC-SS-10-0-10	100%	100%	100%	100%	100%	98.9%	98.8%	98.4%	97.5%	94.8%	78.6%	9.25%	4.06%	1.66%	1.00%
TOC-SS-11-0-10	100%	100%	100%	100%	15.1%	6.26%	3.71%	2.27%	1.70%	1.43%	1.28%	0.770%	0.510%	0.492%	0.243%
SB-SS-01-0-10	100%	100%	100%	100%	47.0%	38.8%	34.5%	31.4%	29.1%	27.1%	24.8%	12.7%	8.58%	5.40%	2.74%
SB-SS-02-0-10	100%	100%	100%	100%	63.8%	60.4%	56.9%	53.5%	51.3%	48.8%	39.5%	7.97%	3.51%	1.59%	0.234%
SB-SS-03-0-10	100%	100%	100%	100%	94.4%	81.9%	64.1%	52.7%	45.6%	39.8%	34.7%	20.7%	15.1%	10.8%	5.90%
TOC-SS-111-0-10	100%	100%	100%	100%	33.6%	29.3%	27.6%	25.1%	24.0%	23.3%	22.7%	18.2%	15.8%	12.5%	4.22%

Grain Size by ASTM D422

Project: Surface Sediment Quality Evaluation
Client: Floyd|Snider
Lab Project #: 1903305

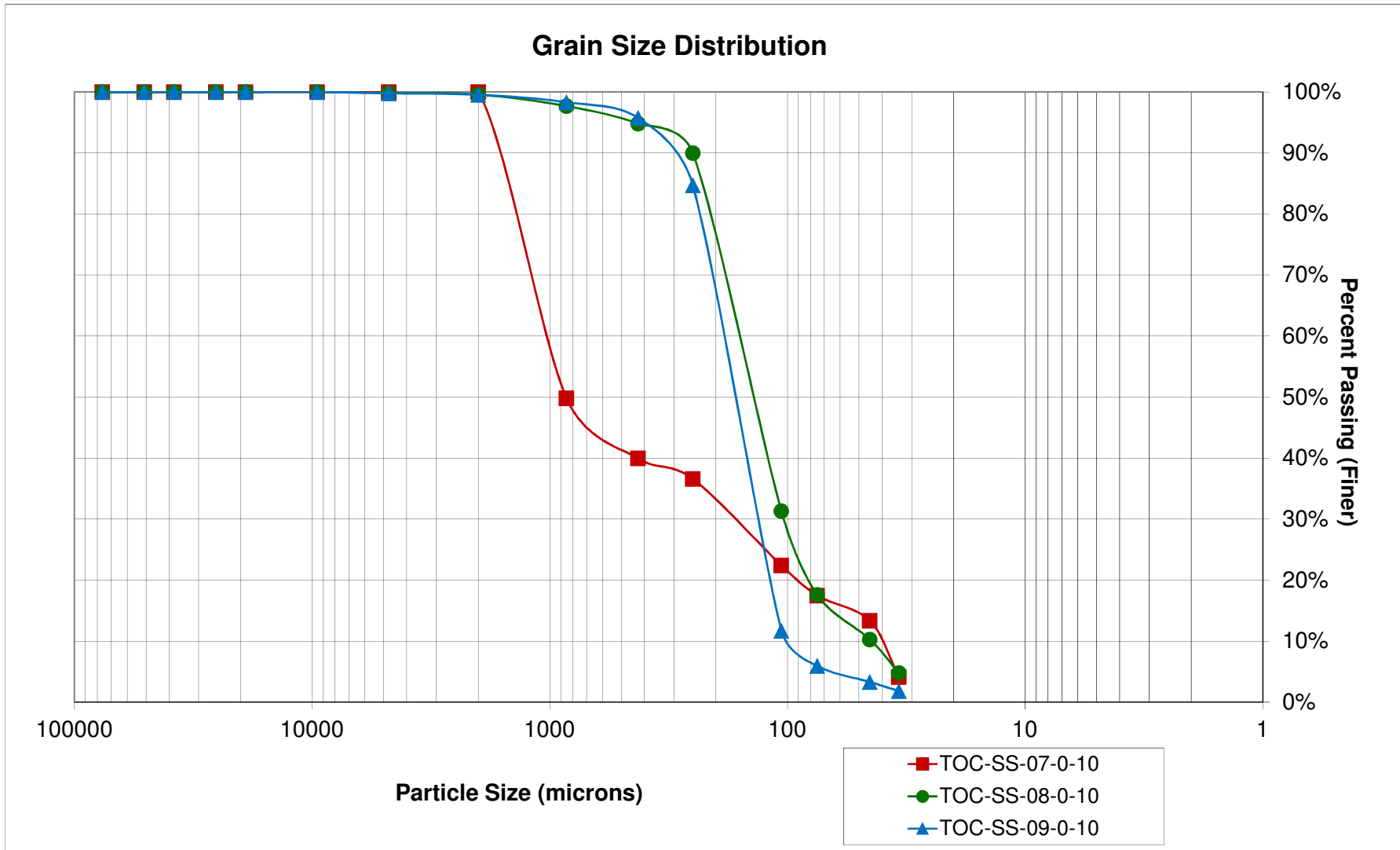
Percent Retained in Each Size Fraction

UOM = Percent

Grain Size Classification	Gravel							Coarse Sand	Medium Sand		Fine Sand			Silt		
	>76200	76200-50800	50800-38100	38100-25400	25400-19000	19050-9525	9525-4750	4750-2000	2000-850	850-425	425-250	250-106	106-75	75-45	45-34	<34
TOC-SS-07-0-10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	48.5%	9.51%	3.28%	13.7%	4.76%	4.00%	8.92%	4.00%
TOC-SS-08-0-10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.197%	0.242%	1.87%	2.87%	4.82%	58.4%	13.7%	7.27%	5.46%	4.81%
TOC-SS-09-0-10	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.210%	0.262%	1.22%	2.56%	11.0%	72.9%	5.76%	2.65%	1.48%	1.83%
TOC-SS-10-0-10	0.00%	0.00%	0.00%	0.00%	0.00%	1.10%	0.0818%	0.432%	0.880%	2.69%	16.1%	69.2%	5.18%	2.39%	0.660%	1.00%
TOC-SS-11-0-10	0.00%	0.00%	0.00%	0.00%	84.3%	8.74%	2.54%	1.43%	0.568%	0.264%	0.143%	0.511%	0.258%	0.0178%	0.247%	0.241%
SB-SS-01-0-10	0.00%	0.00%	0.00%	0.00%	53.0%	8.29%	4.30%	3.04%	2.33%	2.03%	2.24%	12.2%	4.09%	3.18%	2.66%	2.74%
SB-SS-02-0-10	0.00%	0.00%	0.00%	0.00%	36.0%	3.46%	3.42%	3.38%	2.26%	2.47%	9.29%	31.3%	4.44%	1.91%	1.35%	0.233%
SB-SS-03-0-10	0.00%	0.00%	0.00%	0.00%	5.53%	12.3%	17.7%	11.3%	6.98%	5.77%	5.04%	13.9%	5.60%	4.18%	4.89%	5.84%
TOC-SS-111-0-10	0.00%	0.00%	0.00%	0.00%	65.6%	4.27%	1.68%	2.39%	1.14%	0.719%	0.551%	4.46%	2.38%	3.24%	8.20%	4.17%

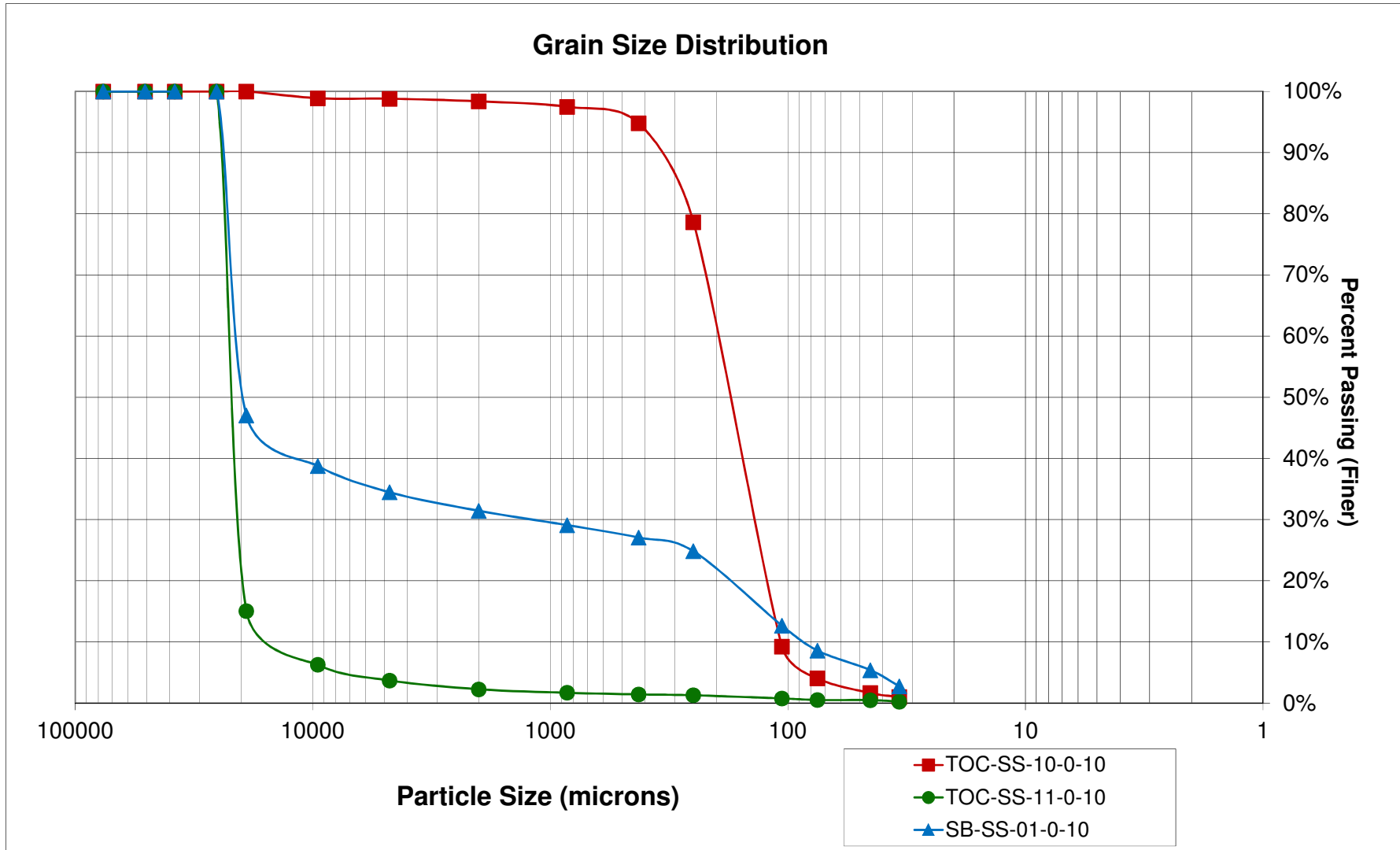
Grain Size by ASTM D422

Project: Surface Sediment Quality Evaluation
 Client: Floyd|Snider
 Lab Project #: 1903305



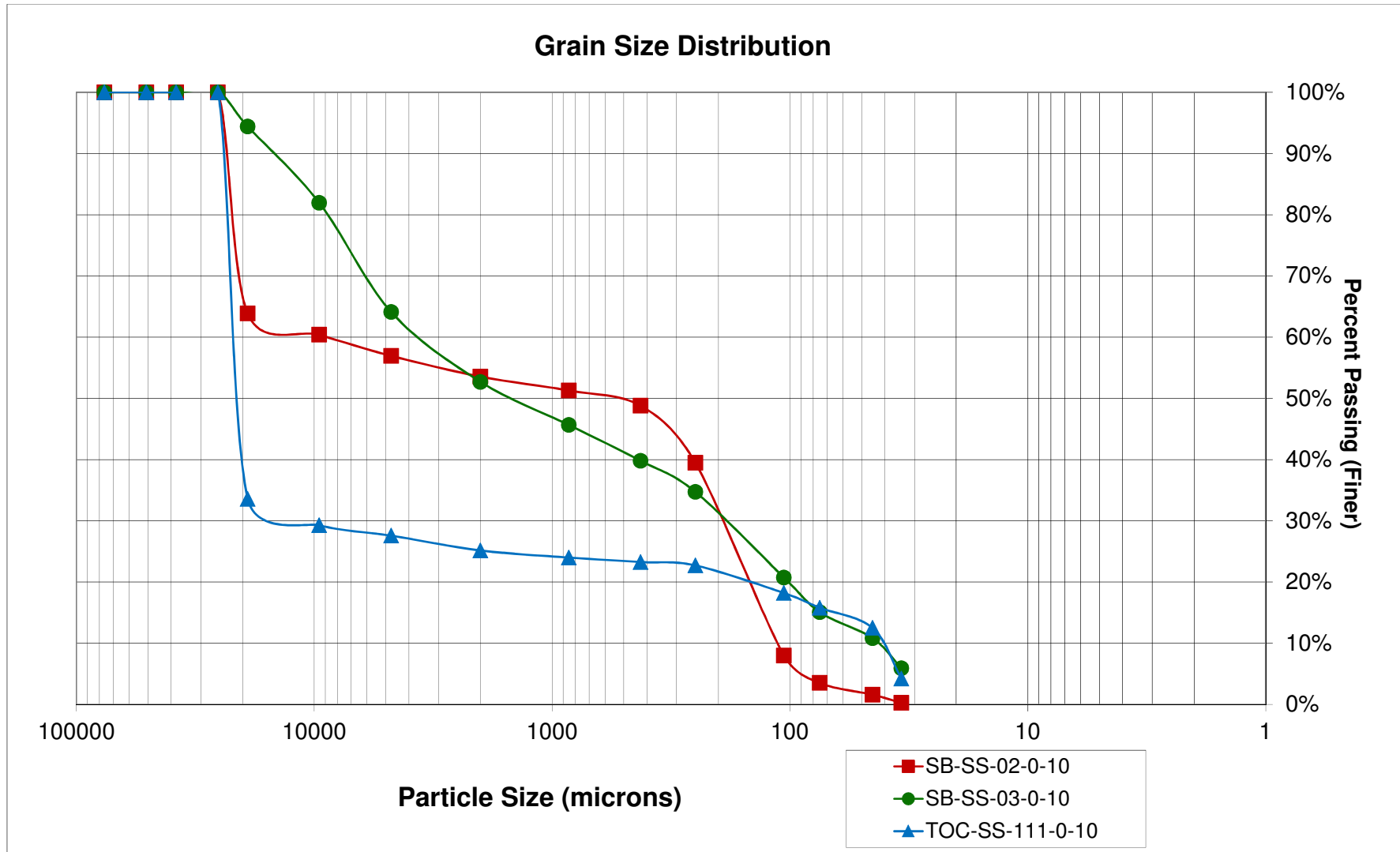
Grain Size by ASTM D422

Project: Surface Sediment Quality Evaluation
 Client: Floyd|Snider
 Lab Project #: 1903305



Grain Size by ASTM D422

Project: Surface Sediment Quality Evaluation
 Client: Floyd|Snider
 Lab Project #: 1903305



Work Order: 1903320
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Ammonia by SM 4500 NH3 E

Sample ID MB-23951	SampType: MBLK	Units: mg/Kg	Prep Date: 3/25/2019	RunNo: 50363							
Client ID: MBLKS	Batch ID: 23951		Analysis Date: 3/28/2019	SeqNo: 989353							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrogen, Ammonia ND 1.00

Sample ID LCS-23951	SampType: LCS	Units: mg/Kg	Prep Date: 3/25/2019	RunNo: 50363							
Client ID: LCSS	Batch ID: 23951		Analysis Date: 3/28/2019	SeqNo: 989354							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrogen, Ammonia 20.3 1.00 20.00 0 102 85 115

Sample ID 1903320-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 3/25/2019	RunNo: 50363							
Client ID: TOC-SC-03-0-0.5	Batch ID: 23951		Analysis Date: 3/28/2019	SeqNo: 989356							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrogen, Ammonia 4.11 1.27 4.127 0.334 30

Sample ID 1903320-001BMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 3/25/2019	RunNo: 50363							
Client ID: TOC-SC-03-0-0.5	Batch ID: 23951		Analysis Date: 3/28/2019	SeqNo: 989357							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrogen, Ammonia 23.9 1.27 25.37 4.127 77.9 80 120 S

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID 1903320-001BMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 3/25/2019	RunNo: 50363							
Client ID: TOC-SC-03-0-0.5	Batch ID: 23951		Analysis Date: 3/28/2019	SeqNo: 989358							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrogen, Ammonia 24.6 1.30 26.01 4.127 78.8 80 120 23.88 3.05 20 S

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.



Date: 4/18/2019

Work Order: 1903320
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID MB-23940	SampType: MBLK	Units: mg/Kg	Prep Date: 3/25/2019	RunNo: 50302							
Client ID: MBLKS	Batch ID: 23940		Analysis Date: 3/26/2019	SeqNo: 987947							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	ND	0.197									
Cadmium	ND	0.157									
Chromium	ND	0.0787									
Copper	ND	0.157									
Lead	ND	0.157									
Nickel	ND	0.394									
Selenium	ND	0.394									
Silver	ND	0.0787									
Zinc	ND	0.394									

Sample ID LCS-23940	SampType: LCS	Units: mg/Kg	Prep Date: 3/25/2019	RunNo: 50302							
Client ID: LCSS	Batch ID: 23940		Analysis Date: 3/26/2019	SeqNo: 987948							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	37.0	0.198	39.68	0	93.1	80	120				
Cadmium	1.87	0.159	1.984	0	94.1	80	120				
Chromium	37.9	0.0794	39.68	0	95.6	80	120				
Copper	38.2	0.159	39.68	0	96.2	80	120				
Lead	18.8	0.159	19.84	0	94.5	80	120				
Nickel	38.3	0.397	39.68	0	96.4	80	120				
Selenium	3.79	0.397	3.968	0	95.6	80	120				
Silver	9.76	0.0794	9.921	0	98.3	80	120				
Zinc	40.7	0.397	39.68	0	103	80	120				

Sample ID 1903305-001BDUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 3/25/2019	RunNo: 50302							
Client ID: BATCH	Batch ID: 23940		Analysis Date: 3/26/2019	SeqNo: 987950							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	12.0	0.591						15.06	22.5	20	R
Cadmium	0.511	0.473						0.6635	26.0	20	



Work Order: 1903320
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID	1903305-001BDUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	3/25/2019	RunNo:	50302		
Client ID:	BATCH	Batch ID:	23940			Analysis Date:	3/26/2019	SeqNo:	987950		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	35.0	0.236						40.88	15.6	20	
Copper	172	0.473						205.2	17.5	20	
Lead	84.6	0.473						114.6	30.2	20	R
Nickel	29.6	1.18						34.65	15.8	20	
Selenium	ND	1.18						1.428	24.8	20	
Silver	0.264	0.236						0.3389	24.9	20	
Zinc	285	1.18						340.3	17.7	20	

NOTES:

R - High RPD observed. The method is in control as indicated by the LCS.

Sample ID	1903305-001BMS	SampType:	MS	Units:	mg/Kg-dry	Prep Date:	3/25/2019	RunNo:	50302		
Client ID:	BATCH	Batch ID:	23940			Analysis Date:	3/26/2019	SeqNo:	987952		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	117	0.583	116.5	15.06	87.2	75	125				
Cadmium	5.90	0.466	5.826	0.6635	90.0	75	125				
Chromium	146	0.233	116.5	40.88	90.4	75	125				
Copper	322	0.466	116.5	205.2	99.9	75	125				
Lead	153	0.466	58.26	114.6	66.4	75	125				S
Nickel	141	1.17	116.5	34.65	91.5	75	125				
Selenium	10.5	1.17	11.65	1.428	78.2	75	125				
Silver	18.8	0.233	29.13	0.3389	63.5	75	125				S
Zinc	498	1.17	116.5	340.3	135	75	125				S

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect (Lead, Silver, Zinc).

Sample ID	1903305-001BMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	3/25/2019	RunNo:	50302		
Client ID:	BATCH	Batch ID:	23940			Analysis Date:	3/26/2019	SeqNo:	987953		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	112	0.587	117.3	15.06	82.5	75	125	116.7	4.25	20	
Cadmium	5.52	0.469	5.866	0.6635	82.9	75	125	5.904	6.63	20	

Work Order: 1903320
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Total Metals by EPA Method 6020

Sample ID	1903305-001BMSD	SampType:	MSD	Units:	mg/Kg-dry	Prep Date:	3/25/2019	RunNo:	50302		
Client ID:	BATCH	Batch ID:	23940			Analysis Date:	3/26/2019	SeqNo:	987953		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chromium	137	0.235	117.3	40.88	81.9	75	125	146.2	6.51	20	
Copper	281	0.469	117.3	205.2	64.3	75	125	321.6	13.6	20	S
Lead	137	0.469	58.66	114.6	39.0	75	125	153.3	10.9	20	S
Nickel	127	1.17	117.3	34.65	79.1	75	125	141.2	10.2	20	
Selenium	10.0	1.17	11.73	1.428	73.5	75	125	10.54	4.77	20	S
Silver	18.6	0.235	29.33	0.3389	62.3	75	125	18.83	1.26	20	S
Zinc	428	1.17	117.3	340.3	74.7	75	125	498.1	15.1	20	S

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect (Lead, Silver, Zinc).
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed and recovered within range (Copper, Selenium).

Sample ID	1903305-001BPDS	SampType:	PDS	Units:	mg/Kg-dry	Prep Date:	3/25/2019	RunNo:	50302		
Client ID:	BATCH	Batch ID:	23940			Analysis Date:	3/26/2019	SeqNo:	987954		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	167	0.473	59.1	115	89.0	75	125				
Silver	4.51	0.236	5.91	0.339	70.5	75	125				S
Zinc	468	1.18	118	340	108	75	125				

NOTES:

S - Spike recovery indicates a possible matrix effect. The method is in control as indicated by the Laboratory Control Sample (LCS).

Work Order: 1903320
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Mercury by EPA Method 7471

Sample ID MB-24022	SampType: MBLK	Units: mg/Kg	Prep Date: 3/29/2019	RunNo: 50399							
Client ID: MBLKS	Batch ID: 24022		Analysis Date: 3/29/2019	SeqNo: 990254							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.250

Sample ID LCS-24022	SampType: LCS	Units: mg/Kg	Prep Date: 3/29/2019	RunNo: 50399							
Client ID: LCSS	Batch ID: 24022		Analysis Date: 3/29/2019	SeqNo: 990255							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.517 0.250 0.5000 0 103 80 120

Sample ID 1903388-002ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 3/29/2019	RunNo: 50399							
Client ID: BATCH	Batch ID: 24022		Analysis Date: 3/29/2019	SeqNo: 990257							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury ND 0.248 0 20

Sample ID 1903388-002AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 3/29/2019	RunNo: 50399							
Client ID: BATCH	Batch ID: 24022		Analysis Date: 3/29/2019	SeqNo: 990258							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.598 0.253 0.5063 0.02977 112 70 130

Sample ID 1903388-002AMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 3/29/2019	RunNo: 50399							
Client ID: BATCH	Batch ID: 24022		Analysis Date: 3/29/2019	SeqNo: 990259							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Mercury 0.653 0.258 0.5160 0.02977 121 70 130 0.5985 8.76 20

Work Order: 1903320
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID MB-23981	SampType: MBLK	Units: mg/Kg	Prep Date: 3/27/2019	RunNo: 50357							
Client ID: MBLKS	Batch ID: 23981		Analysis Date: 3/27/2019	SeqNo: 989181							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	20.0									
Heavy Oil	ND	50.0									
Surr: 2-Fluorobiphenyl	21.3		20.00		107	50	150				
Surr: o-Terphenyl	21.2		20.00		106	50	150				

Sample ID LCS-23981	SampType: LCS	Units: mg/Kg	Prep Date: 3/27/2019	RunNo: 50357							
Client ID: LCSS	Batch ID: 23981		Analysis Date: 3/27/2019	SeqNo: 989182							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	558	20.0	500.0	0	112	65	135				
Surr: 2-Fluorobiphenyl	19.4		20.00		97.1	50	150				
Surr: o-Terphenyl	19.2		20.00		95.9	50	150				

Sample ID 1903347-008ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 3/27/2019	RunNo: 50357							
Client ID: BATCH	Batch ID: 23981		Analysis Date: 3/28/2019	SeqNo: 989193							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	24.5						0		30	
Heavy Oil	ND	61.1						0		30	
Surr: 2-Fluorobiphenyl	22.9		24.45		93.6	50	150		0		
Surr: o-Terphenyl	23.3		24.45		95.3	50	150		0		

Sample ID 1903347-008AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 3/27/2019	RunNo: 50357							
Client ID: BATCH	Batch ID: 23981		Analysis Date: 3/28/2019	SeqNo: 989194							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	700	22.2	555.6	0	126	65	135				
Surr: 2-Fluorobiphenyl	23.6		22.22		106	50	150				
Surr: o-Terphenyl	22.6		22.22		102	50	150				

Work Order: 1903320
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Diesel and Heavy Oil by NWTPH-Dx/Dx Ext.

Sample ID 1903347-008AMS	SampType: MS	Units: mg/Kg-dry	Prep Date: 3/27/2019	RunNo: 50357							
Client ID: BATCH	Batch ID: 23981	Analysis Date: 3/28/2019	SeqNo: 989194								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID 1903347-008AMSD	SampType: MSD	Units: mg/Kg-dry	Prep Date: 3/27/2019	RunNo: 50357							
Client ID: BATCH	Batch ID: 23981	Analysis Date: 3/28/2019	SeqNo: 989195								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	758	24.0	598.9	0	127	65	135	699.9	8.02	30
Surr: 2-Fluorobiphenyl	25.8		23.96		108	50	150		0	
Surr: o-Terphenyl	25.6		23.96		107	50	150		0	

Sample ID 1903368-002ADUP	SampType: DUP	Units: mg/Kg-dry	Prep Date: 3/27/2019	RunNo: 50357							
Client ID: BATCH	Batch ID: 23981	Analysis Date: 3/28/2019	SeqNo: 989205								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diesel (Fuel Oil)	ND	22.6						0		30
Heavy Oil	ND	56.6						0		30
Surr: 2-Fluorobiphenyl	23.7		22.64		105	50	150		0	
Surr: o-Terphenyl	23.5		22.64		104	50	150		0	

Work Order: 1903320
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Polychlorinated Biphenyls (PCB) by EPA 8082

Sample ID MB-24121	SampType: MBLK	Units: mg/Kg			Prep Date: 4/9/2019	RunNo: 50653					
Client ID: MBLKS	Batch ID: 24121				Analysis Date: 4/10/2019	SeqNo: 994720					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	ND	0.00149									MDL
Aroclor 1221	ND	0.00149									MDL
Aroclor 1232	ND	0.00149									MDL
Aroclor 1242	ND	0.00149									MDL
Aroclor 1248	ND	0.00261									MDL
Aroclor 1254	ND	0.00261									MDL
Aroclor 1260	ND	0.00261									MDL
Aroclor 1268	ND	0.00261									MDL
Total PCBs	ND	0.00261									MDL
Surr: Decachlorobiphenyl	44.4		50.00		88.9	30.8	168				
Surr: Tetrachloro-m-xylene	52.8		50.00		106	30.3	157				

NOTES:

Tetrabutylammonium sulfite cleanup
 MDL - Analyte reported to Method Detection Limit (MDL)

Sample ID LCS1-24121	SampType: LCS	Units: mg/Kg			Prep Date: 4/9/2019	RunNo: 50653					
Client ID: LCSS	Batch ID: 24121				Analysis Date: 4/10/2019	SeqNo: 994721					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	1.14	0.100	1.000	0	114	38.5	149				
Aroclor 1260	1.03	0.100	1.000	0	103	35.4	154				
Surr: Decachlorobiphenyl	44.1		50.00		88.3	30.8	168				
Surr: Tetrachloro-m-xylene	51.7		50.00		103	30.3	157				

NOTES:

Tetrabutylammonium sulfite cleanup

Sample ID LCS1D-24121	SampType: LCSD	Units: mg/Kg			Prep Date: 4/9/2019	RunNo: 50653					
Client ID: LCSS02	Batch ID: 24121				Analysis Date: 4/10/2019	SeqNo: 994722					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aroclor 1016	1.17	0.100	1.000	0	117	38.5	149	1.144	1.95	20	
Aroclor 1260	1.03	0.100	1.000	0	103	35.4	154	1.029	0.0657	20	

Work Order: 1903320
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Polychlorinated Biphenyls (PCB) by EPA 8082

Sample ID	LCS1D-24121	SampType:	LCS	Units:	mg/Kg	Prep Date:	4/9/2019	RunNo:	50653		
Client ID:	LCSS02	Batch ID:	24121			Analysis Date:	4/10/2019	SeqNo:	994722		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: Decachlorobiphenyl	46.0		50.00		92.0	30.8	168		0		
Surr: Tetrachloro-m-xylene	55.0		50.00		110	30.3	157		0		

NOTES:
Tetrabutylammonium sulfite cleanup

Sample ID	LCS2-24121	SampType:	LCS	Units:	mg/Kg	Prep Date:	4/9/2019	RunNo:	50653		
Client ID:	LCSS	Batch ID:	24121			Analysis Date:	4/10/2019	SeqNo:	994723		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aroclor 1254	1.09	0.100	1.000	0	109	31.9	167				
Surr: Decachlorobiphenyl	43.6		50.00		87.2	30.8	168				
Surr: Tetrachloro-m-xylene	52.3		50.00		105	30.3	157				

NOTES:
Tetrabutylammonium sulfite cleanup

Sample ID	1903320-005BDUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	4/9/2019	RunNo:	50653		
Client ID:	TOC-SC-02-0.5-1.2	Batch ID:	24121			Analysis Date:	4/10/2019	SeqNo:	994727		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Aroclor 1016	ND	0.00136						0		30	MDL
Aroclor 1221	ND	0.00136						0		30	MDL
Aroclor 1232	ND	0.00136						0		30	MDL
Aroclor 1242	ND	0.00136						0		30	MDL
Aroclor 1248	ND	0.00238						0		30	MDL
Aroclor 1254	ND	0.00238						0		30	MDL
Aroclor 1260	0.0101	0.00238						0.03559	112	30	RMDL
Aroclor 1268	ND	0.00238						0		30	MDL
Total PCBs	0.0101	0.00238						0.03559	112	30	RMDL
Surr: Decachlorobiphenyl	15.4		45.51		33.7	30.8	168		0		
Surr: Tetrachloro-m-xylene	15.8		45.51		34.6	30.3	157		0		

Work Order: 1903320
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Polychlorinated Biphenyls (PCB) by EPA 8082

Sample ID	1903320-005BDUP	SampType:	DUP	Units:	mg/Kg-dry	Prep Date:	4/9/2019	RunNo:	50653		
Client ID:	TOC-SC-02-0.5-1.2	Batch ID:	24121			Analysis Date:	4/10/2019	SeqNo:	994727		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

R - High RPD due to low analyte concentration. In this range, high RPD's may be expected.
 MDL - Analyte reported to Method Detection Limit (MDL)

Work Order: 1903320
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID: MB-24010	SampType: MBLK	Units: µg/Kg	Prep Date: 3/28/2019	RunNo: 50506
Client ID: MBLKS	Batch ID: 24010		Analysis Date: 3/29/2019	SeqNo: 991975

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzoic acid	ND	500									
Phenol	ND	100									
3&4-Methylphenol (m, p-cresol)	ND	100									
Naphthalene	ND	40.0									
2-Methylnaphthalene	ND	40.0									
Acenaphthene	ND	40.0									
Acenaphthylene	ND	40.0									
Dibenzofuran	ND	75.0									
Fluorene	ND	40.0									
Pentachlorophenol	ND	100									
Phenanthrene	ND	40.0									
Anthracene	ND	40.0									
Carbazole	ND	75.0									
Di-n-butylphthalate	ND	100									
Fluoranthene	ND	40.0									
Pyrene	ND	40.0									
Benz(a)anthracene	ND	40.0									
Chrysene	ND	40.0									
bis (2-Ethylhexyl) phthalate	ND	100									
Di-n-octyl phthalate	ND	11.3									MDL
Benzo(b)fluoranthene	ND	40.0									
Benzo(k)fluoranthene	ND	40.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									
Dibenz(a,h)anthracene	ND	40.0									
Benzo(g,h,i)perylene	ND	40.0									
Surr: 2,4,6-Tribromophenol	935		1,000		93.5	14.8	165				
Surr: 2-Fluorobiphenyl	524		500.0		105	17.8	151				
Surr: Nitrobenzene-d5	315		500.0		63.0	12.5	163				
Surr: Phenol-d6	801		1,000		80.1	11.6	133				
Surr: p-Terphenyl	629		500.0		126	22	176				

Work Order: 1903320
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID MB-24010	SampType: MBLK	Units: µg/Kg	Prep Date: 3/28/2019	RunNo: 50506							
Client ID: MBLKS	Batch ID: 24010		Analysis Date: 3/29/2019	SeqNo: 991975							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

MDL - Analyte reported to Method Detection Limit (MDL)

Sample ID 1903305-001BDUP	SampType: DUP	Units: µg/Kg-dry	Prep Date: 3/28/2019	RunNo: 50506							
Client ID: BATCH	Batch ID: 24010		Analysis Date: 3/29/2019	SeqNo: 991979							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzoic acid	ND	501						0		50	
Phenol	ND	100						0		50	
3&4-Methylphenol (m, p-cresol)	ND	100						0		50	
Naphthalene	42.4	40.1						52.11	20.6	50	
2-Methylnaphthalene	ND	40.1						0		50	
Acenaphthene	ND	40.1						0		50	
Acenaphthylene	47.5	40.1						49.83	4.72	50	
Dibenzofuran	ND	75.2						0		50	
Fluorene	ND	40.1						40.15	2.66	50	
Pentachlorophenol	ND	100						0		50	
Phenanthrene	238	40.1						179.4	28.3	50	R
Anthracene	70.4	40.1						67.00	4.99	50	
Carbazole	ND	75.2						0		50	
Di-n-butylphthalate	ND	100						0		50	
Fluoranthene	794	40.1						570.4	32.8	50	
Pyrene	716	40.1						535.1	29.0	50	
Benz(a)anthracene	518	40.1						385.3	29.4	50	
Chrysene	500	40.1						369.1	30.2	50	
bis (2-Ethylhexyl) phthalate	302	100						286.3	5.30	50	
Di-n-octyl phthalate	36.6	11.3						40.54	10.3	50	MDL, J
Benzo(b)fluoranthene	404	40.1						347.9	15.0	50	Q*
Benzo(k)fluoranthene	314	40.1						378.7	18.6	50	
Benzo(a)pyrene	424	40.1						430.8	1.63	50	
Indeno(1,2,3-cd)pyrene	253	40.1						280.4	10.4	50	

Work Order: 1903320
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID 1903305-001BDUP	SampType: DUP	Units: µg/Kg-dry	Prep Date: 3/28/2019	RunNo: 50506							
Client ID: BATCH	Batch ID: 24010		Analysis Date: 3/29/2019	SeqNo: 991979							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Dibenz(a,h)anthracene	89.3	40.1						80.27	10.7	50	
Benzo(g,h,i)perylene	313	40.1						336.5	7.18	50	
Surr: 2,4,6-Tribromophenol	523		1,002		52.2	14.8	165		0		
Surr: 2-Fluorobiphenyl	138		501.1		27.5	17.8	151		0		
Surr: Nitrobenzene-d5	143		501.1		28.5	12.5	163		0		
Surr: Phenol-d6	369		1,002		36.8	11.6	133		0		
Surr: p-Terphenyl	293		501.1		58.5	22	176		0		

NOTES:

- R - High RPD due to suspected sample inhomogeneity. The method is in control as indicated by the Laboratory Control Sample (LCS).
- Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria
- * - Flagged value is not within established control limits.
- MDL - Analyte reported to Method Detection Limit (MDL)

Sample ID 1903305-001BMS	SampType: MS	Units: µg/Kg-dry	Prep Date: 3/28/2019	RunNo: 50506							
Client ID: BATCH	Batch ID: 24010		Analysis Date: 3/29/2019	SeqNo: 991980							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzoic acid	366	497	1,989	0	18.4	5	139				
Phenol	417	99.5	994.5	0	41.9	29.2	146				
3&4-Methylphenol (m, p-cresol)	279	99.5	497.3	0	56.1	37.6	125				
Naphthalene	479	39.8	994.5	52.11	42.9	32.4	137				
2-Methylnaphthalene	518	39.8	994.5	18.10	50.2	39.3	126				
Acenaphthene	604	39.8	994.5	32.42	57.5	49.6	129				
Acenaphthylene	594	39.8	994.5	49.83	54.8	39.9	129				
Dibenzofuran	580	74.6	994.5	0	58.4	41.2	128				
Fluorene	630	39.8	994.5	40.15	59.3	37.7	133				
Pentachlorophenol	690	99.5	994.5	0	69.4	28.2	156				
Phenanthrene	792	39.8	994.5	179.4	61.6	32.2	139				
Anthracene	605	39.8	994.5	67.00	54.1	41.2	136				
Carbazole	566	74.6	994.5	0	56.9	32	147				
Di-n-butylphthalate	535	99.5	994.5	24.59	51.3	35.1	142				

Work Order: 1903320
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID 1903305-001BMS	SampType: MS	Units: µg/Kg-dry	Prep Date: 3/28/2019	RunNo: 50506							
Client ID: BATCH	Batch ID: 24010		Analysis Date: 3/29/2019	SeqNo: 991980							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Fluoranthene	1,240	39.8	994.5	570.4	67.6	33.8	141				
Pyrene	1,220	39.8	994.5	535.1	69.1	31.4	151				
Benz(a)anthracene	948	39.8	994.5	385.3	56.6	36	138				
Chrysene	1,050	39.8	994.5	369.1	68.8	25.5	136				
bis (2-Ethylhexyl) phthalate	872	99.5	994.5	286.3	58.9	40.8	170				
Di-n-octyl phthalate	669	11.2	994.5	40.54	63.2	34.6	142				
Benzo(b)fluoranthene	1,100	39.8	994.5	347.9	75.4	31.8	166				
Benzo(k)fluoranthene	974	39.8	994.5	378.7	59.9	30.8	152				
Benzo(a)pyrene	1,030	39.8	994.5	430.8	60.3	31.1	153				
Indeno(1,2,3-cd)pyrene	857	39.8	994.5	280.4	58.0	38.1	155				
Dibenz(a,h)anthracene	658	39.8	994.5	80.27	58.1	40.7	152				
Benzo(g,h,i)perylene	916	39.8	994.5	336.5	58.3	34	157				
Surr: 2,4,6-Tribromophenol	616		994.5		61.9	14.8	165				
Surr: 2-Fluorobiphenyl	71.0		497.3		14.3	17.8	151				S
Surr: Nitrobenzene-d5	75.9		497.3		15.3	12.5	163				
Surr: Phenol-d6	363		994.5		36.5	11.6	133				
Surr: p-Terphenyl	315		497.3		63.4	22	176				

NOTES:

S - Outlying surrogate recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID 1903305-001BMSD	SampType: MSD	Units: µg/Kg-dry	Prep Date: 3/28/2019	RunNo: 50506							
Client ID: BATCH	Batch ID: 24010		Analysis Date: 3/29/2019	SeqNo: 991981							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Phenol	398	96.4	963.7	0	41.3	29.2	146	417.1	4.81	50	
3&4-Methylphenol (m, p-cresol)	245	96.4	481.8	0	50.8	37.6	125	278.7	13.0	50	
Naphthalene	423	38.5	963.7	52.11	38.4	32.4	137	478.8	12.5	50	
2-Methylnaphthalene	466	38.5	963.7	18.10	46.4	39.3	126	517.5	10.6	50	
Acenaphthene	528	38.5	963.7	32.42	51.4	49.6	129	604.5	13.5	50	
Acenaphthylene	531	38.5	963.7	49.83	50.0	39.9	129	594.4	11.2	50	
Dibenzofuran	522	72.3	963.7	0	54.2	41.2	128	580.4	10.6	50	

Work Order: 1903320
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Semi-Volatile Organic Compounds by EPA Method 8270

Sample ID	1903305-001BMSD	SampType:	MSD	Units:	µg/Kg-dry	Prep Date:	3/28/2019	RunNo:	50506		
Client ID:	BATCH	Batch ID:	24010	Analysis Date:	3/29/2019	SeqNo:	991981				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluorene	596	38.5	963.7	40.15	57.7	37.7	133	629.8	5.47	50	
Pentachlorophenol	667	96.4	963.7	0	69.2	28.2	156	689.8	3.36	50	
Phenanthrene	631	38.5	963.7	179.4	46.8	32.2	139	791.7	22.6	50	
Anthracene	563	38.5	963.7	67.00	51.5	41.2	136	604.9	7.13	50	
Carbazole	485	72.3	963.7	0	50.4	32	147	565.9	15.3	50	
Di-n-butylphthalate	492	96.4	963.7	24.59	48.5	35.1	142	535.2	8.51	50	
Fluoranthene	1,030	38.5	963.7	570.4	48.1	33.8	141	1,243	18.3	50	
Pyrene	992	38.5	963.7	535.1	47.5	31.4	151	1,222	20.8	50	
Benz(a)anthracene	789	38.5	963.7	385.3	41.9	36	138	948.1	18.3	50	
Chrysene	849	38.5	963.7	369.1	49.8	25.5	136	1,054	21.5	50	
bis (2-Ethylhexyl) phthalate	882	96.4	963.7	286.3	61.9	40.8	170	871.7	1.23	50	
Di-n-octyl phthalate	585	10.8	963.7	40.54	56.5	34.6	142	669.0	13.4	50	
Benzo(b)fluoranthene	959	38.5	963.7	347.9	63.4	31.8	166	1,098	13.5	50	
Benzo(k)fluoranthene	800	38.5	963.7	378.7	43.7	30.8	152	974.2	19.6	50	
Benzo(a)pyrene	897	38.5	963.7	430.8	48.4	31.1	153	1,031	13.9	50	
Indeno(1,2,3-cd)pyrene	744	38.5	963.7	280.4	48.1	38.1	155	857.4	14.2	50	
Dibenz(a,h)anthracene	592	38.5	963.7	80.27	53.1	40.7	152	658.1	10.6	50	
Benzo(g,h,i)perylene	808	38.5	963.7	336.5	49.0	34	157	915.8	12.5	50	
Surr: 2,4,6-Tribromophenol	456		963.7		47.3	14.8	165		0		
Surr: 2-Fluorobiphenyl	20.6		481.8		4.28	17.8	151		0		S
Surr: Nitrobenzene-d5	24.6		481.8		5.11	12.5	163		0		S
Surr: Phenol-d6	196		963.7		20.3	11.6	133		0		
Surr: p-Terphenyl	275		481.8		57.2	22	176		0		

NOTES:

S - Outlying surrogate recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 1903320
CLIENT: Floyd | Snider
Project: Surface Sediment Quality Evaluation

QC SUMMARY REPORT
Sample Moisture (Percent Moisture)

Sample ID 1903305-003BDUP	SampType: DUP	Units: wt%	Prep Date: 3/22/2019	RunNo: 50211							
Client ID: BATCH	Batch ID: R50211		Analysis Date: 3/22/2019	SeqNo: 986176							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	31.0	0.500						31.86	2.72	20	

Sample ID 1903318-001ADUP	SampType: DUP	Units: wt%	Prep Date: 3/22/2019	RunNo: 50211							
Client ID: BATCH	Batch ID: R50211		Analysis Date: 3/22/2019	SeqNo: 986186							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Percent Moisture	7.91	0.500						7.984	0.941	20	

Client Name: **FS**

 Work Order Number: **1903320**

 Logged by: **Brianna Barnes**

 Date Received: **3/21/2019 6:09:00 PM**
Chain of Custody

1. Is Chain of Custody complete? Yes No Not Present
2. How was the sample delivered? Client

Log In

3. Coolers are present? Yes No NA
4. Shipping container/cooler in good condition? Yes No
5. Custody Seals present on shipping container/cooler?
(Refer to comments for Custody Seals not intact) Yes No Not Required
6. Was an attempt made to cool the samples? Yes No NA
7. Were all items received at a temperature of >0°C to 10.0°C * Yes No NA
8. Sample(s) in proper container(s)? Yes No
9. Sufficient sample volume for indicated test(s)? Yes No
10. Are samples properly preserved? Yes No
11. Was preservative added to bottles? Yes No NA
12. Is there headspace in the VOA vials? Yes No NA
13. Did all samples containers arrive in good condition(unbroken)? Yes No
14. Does paperwork match bottle labels? Yes No
15. Are matrices correctly identified on Chain of Custody? Yes No
16. Is it clear what analyses were requested? Yes No
17. Were all holding times able to be met? Yes No

Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes No NA

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

Item Information

Item #	Temp °C
Cooler 1	4.0
Cooler 2	4.9
Sample 1	4.6
Sample 2	4.3
Temp Blank 1	6.0

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C



Client Name: **FS**

Work Order Number: **1903320**

Logged by: **Brianna Barnes**

Date Received: **3/21/2019 6:09:00 PM**

Item #	Temp °C
Temp Blank 2	9.9

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Chain of Custody Record & Laboratory Analysis Request

1903320

Laboratory: **Fremont**
 Date: **3/21/2019**
 Project Name: **Surface Sediment Quality Evaluation**
 Project Number: **Cantera-TOC**
 Send Invoice to: **Cantera Time Oil Company**
 Send Results to **Kara Hitchko**
 Project Manager: **kara.hitchko@floydsnyder.com**
 Phone Number: **206-805-2185**
 Shipment Method: _____

Test Parameters													
Grain Size	Total solids	TOC	Ammonia	Sulfides	Metals	Mercury	Butyltins	SVOCs	Pesticides	PCB Aroclors	Dioxins/furans	TPH	MS/MSD
													Archive

FLOYD | SNIDER
 Call if you have questions regarding prioritizing analyses for samples w/o sufficient mass.

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Line	Field Sample ID	Date	Time	Matrix	No. of Containers	Grain Size	Total solids	TOC	Ammonia	Sulfides	Metals	Mercury	Butyltins	SVOCs	Pesticides	PCB Aroclors	Dioxins/furans	TPH	MS/MSD	Archive	Comments/Preservation		
1	TOC-SS-07-0-10			SE																			
2	TOC-SS-08-0-10			SE																			
3	TOC-SS-09-0-10			SE																			
4	TOC-SS-10-0-10			SE																			
5	TOC-SS-11-0-10			SE																			
6	SB-SS-01-0-10			SE																			
7	SB-SS-02-0-10			SE																			
8	SB-SS-03-0-10			SE																			
9	TOC-SC-03-0-0.5	3/21/19	15:30	SE	4		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	NO D/Fs	
10	TOC-SC-01-0.5-2.0	3/21/19	11:07	SE	6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	sample time: 11:11	
11	TOC-SC-01-2.5-4.0	3/21/19	11:07	SE	6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
12	TOC-SC-03-1.0-2.5	3/21/19	15:40	SE	5																X	Archive all jars	
13	TOC-SC-02-0.5-1.2	3/21/19	12:50	SE	4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
14	TOC-SC-02-1.2-2.2	3/21/19	13:00	SE	7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	32oz jar for grain size only	
15	TOC-SC-02-2.6-4.0	3/21/19	12:55	SE	6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		

Notes:
 For TOC-SC-03-0-0.5 prioritize the following: TPH, metals, SVOCs (penta+cPAHs), TOC, butyltins
 TOC-SC-02-0.5-1.2 → including mercury

*Please see SAP Addendum Table 1 for methods, analyte lists, reporting limits, and QC requirements

Relinquished By: **Kara Hitchko** Company: **Floyd Snider**
 Signature/Printed Name: **Kara Hitchko** Date/Time: **3/21/19 18:09**

Received By: **[Signature]** Company: **EAL**
 Signature/Printed Name: **[Signature]** Date/Time: **3/21/19 18:09**

Relinquished By: _____ Company: _____
 Signature/Printed Name: _____ Date/Time: _____

Received By: _____ Company: _____
 Signature/Printed Name: _____ Date/Time: _____

Attachment 3
Data Validation Reports

Data Validation Summary

Prepared by: Chell Black

Date: August 2018

Project No.: Cantera-TOC

Sample Event(s): August 2018 Sediment Sampling

Sample Delivery Group(s): 1808013

Sample Media: Sediment

A Compliance Screening (Stages 1 & 2A) data quality review was performed on metals, TPH, PCBs, SVOCs, ammonia, total organic carbon, butyl tins, and pesticide data resulting from laboratory analysis. The analytical data were validated in accordance with the *National Functional Guidelines for Inorganic Superfund Methods Data Review* (USEPA 2017a) and *National Functional Guidelines for Organic Superfund Data Review* (USEPA 2017b). Dioxin/furans were also analyzed; however, they were validated by EcoChem under a separate report.

A total of 7 sediment samples were submitted in one sample delivery group (SDG), 180813, to Fremont Analytical of Seattle, WA, for chemical analysis by USEPA 6020, USEPA 7471, NWTPH-Dx, USEPA 8082, USEPA 8270, Standard Method 4500-NH3E, and USEPA 9060. Samples were sent to Analytical Resources, Inc for chemical analysis by USEPA 8270D-SIM, and USEPA 8081A.

For all analysis methods the analytical holding times were met, and the method blanks had no detections. The surrogate, matrix spike (MS), matrix spike duplicate (MSD), laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) recoveries and MS/MSD, LCS/LCSD, and sample/sample duplicate relative percent differences (RPDs) all met U.S. Environmental Protection Agency (USEPA) requirements, with some results requiring qualifications based on USEPA guidelines as reflected below.

For all methods the laboratory flagged any reported concentrations between the reporting limit and method detection limit as "J". These qualifiers shall be retained as the final qualifier "JQ" for database loading and report tables.

For the USEPA 8082 analysis the laboratory noted that the Tetrachloro-m-xylene surrogate recovery was 25.6% and outside laboratory control limits (30.3-157%) low for sample TOC-SS-02-0-10. A duplicate analysis was performed with similar results indicating a possible matrix effect. All analytes were non-detect; per EPA guidelines they are to be qualified "UJ" as estimated.

For the USEPA 8082 analysis the laboratory noted that the Tetrachloro-m-xylene surrogate recovery was 3.77% and outside laboratory control limits (30.3-157%) low for sample TOC-SS-06-0-10. All analytes were non-detect, per EPA guidelines because the recovery was <10% all results are to be qualified "R" as rejected. The sample was later re-extracted and re-analyzed with no surrogate issues, that re-analysis will be the reported result for this sample.

For the USEPA 8270 analysis the laboratory noted that the continuing calibration for Pentachlorophenol and Benzo(g,h,i)perylene did not meet established acceptance criteria, and flagged any detected results in all samples as "Q". These laboratory flags will be retained as the final qualifier "J" to indicate the concentration should be considered as estimated.

For the USEPA 8270 analysis the laboratory noted that the 2-Fluorobiphenyl (Acid) & Nitrobenzene-d5 (Base/Neutral) surrogate recoveries (15.1% and 5.5% respectively) were outside laboratory control limits low (17.8-151% and 12.5-163%) for sample TOC-SS-03-0-10, and TOC-SS-03D-0-10 (15.5% and 10.3% respectively). Per USEPA guidelines data is not qualified unless two or more surrogates from the same fraction are outside of specifications. Therefore, it is with professional judgment that no results be qualified at this time.

For the USEPA 8270 analysis the laboratory noted that multiple analytes were outside the laboratory control limits of a 50% RPD for sample TOC-SS-02-0-10 due to suspected sample inhomogeneity. Results for analytes outside control limits will be qualified "J" as estimated.

For the USEPA 8270 analysis the laboratory noted that multiple analytes had outlying spike recoveries for sample TOC-SS-02-0-10 and that a duplicate analysis was performed with similar results indicating a possible matrix effect. In addition, the original sample had original concentrations that were higher than the spike amounts. Except for benzo(b)fluoranthene, all analytes were already qualified "J" as estimated based on the sample/sample duplicate RPDs. Benzo(b)fluoranthene will now also be qualified "J" as estimated based on this additional MS/MSD information. As the LCS recoveries are within control limits all other samples in this SDG will not be qualified based on this MS/MSD information alone.

For the USEPA 6020 analysis the laboratory noted high RPDs for Arsenic, Cadmium and Chromium in sample TOC-SS-02-0-10, but that the method is in control as indicated by the LCS. These results will be flagged "J" as estimated for this sample only, as inhomogeneity in this sample has been noted during other analysis.

For the USEPA 6020 analysis the laboratory noted that the MS/MSD recoveries for Chromium, Nickel, Selenium, Silver and Zinc were outside control limits for sample TOC-SS-02-0-10 and that a duplicate analysis was performed with similar results indicating a possible matrix effect. Therefore, it is with professional judgment that only these analytes for this sample be qualified "J" as estimated based on this MS/MSD information.

For the Standard Method 4500-NH3E analysis the laboratory noted that the MS/MSD recoveries for Ammonia for sample TOC-SS-02-0-10 were outside control limits low. The sample/sample

duplicate and MS/MSD RPDs were within control limits as well as the LCS recoveries. Therefore, it is with professional judgment that only the Ammonia result from this sample be qualified "J" as estimated based on this MS/MSD recovery information.

For the USEPA 9060 analysis the laboratory noted that the MS/MSD recoveries for Total Organic Carbon (TOC) for sample TOC-SS-02-0-10 were outside of control limits low, but the method was in control as indicated by the LCS. In addition, the original concentration was three times greater than that of the spike value. It is with professional judgment that only the TOC result from this sample be qualified "J" as estimated based on this MS/MSD recovery information.

For the USEPA 8081A analysis the laboratory noted that there was a greater than 40% difference between surrogate recoveries for Tetrachlormetaxylene on the primary and secondary columns. Both recoveries were within laboratory control limits. It is with professional judgment that no results be qualified based on this surrogate recovery information.

Based on the data quality review, data are determined to be of acceptable quality for use as reported by the laboratory unless specifically qualified above, and with some laboratory qualifiers being updated to conform to the final qualifiers used for data table reporting and database storage.

REFERENCES

- U.S. Environmental Protection Agency (USEPA). 2017a. *National Functional Guidelines for Inorganic Superfund Methods Data Review*. Prepared by the Office of Superfund Remediation and Technology Innovation. EPA-540-R-2017-001/OLEM 9355.0-135. January.
- _____. 2017b. *National Functional Guidelines for Organic Superfund Methods Data Review*. Prepared by the Office of Superfund Remediation and Technology Innovation. EPA-540-R-2017-002/OLEM 9355.0-136. January.

Data Validation Summary

Prepared by: Chell Black

Date: March 2019

Project No.: Cantera-TOC

Sample Event(s): March 2019 Sediment Sampling

Sample Delivery Group(s): 1903305 and 1903320

Sample Media: Sediment

A Compliance Screening (Stages 1 & 2A) data quality review was performed on metals, TPH, PCBs, SVOCs, ammonia, butyl tins, and pesticide data resulting from laboratory analysis. The analytical data were validated in accordance with the *National Functional Guidelines for Inorganic Superfund Methods Data Review* (USEPA 2017a) and *National Functional Guidelines for Organic Superfund Data Review* (USEPA 2017b). Dioxin/furans were also analyzed; however, they were validated by EcoChem under a separate report.

A total of 16 sediment samples were submitted in two sample delivery groups (SDGs), 1903305 and 1903320, to Fremont Analytical of Seattle, WA, for chemical analysis by USEPA 6020, USEPA 7471, NWTPH-Dx, USEPA 8082, USEPA 8270, Standard Method 4500-NH3E, USEPA 8270D-SIM, and USEPA 8081B.

For all sample delivery groups, the analytical holding times were met, and the method blanks had no detections. The surrogate, matrix spike (MS), matrix spike duplicate (MSD), laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) recoveries and MS/MSD, LCS/LCSD, and sample/sample duplicate relative percent differences (RPDs) all met U.S. Environmental Protection Agency (USEPA) requirements, with some results requiring qualifications based on USEPA guidelines as reflected below.

For the USEPA 8082 analysis in SDG 1903305, the laboratory noted that for samples SB-SS-01-0-10 and TOC-SS-111-0-10, the decachlorobiphenyl surrogate was outside laboratory control limits low. Per USEPA Guidelines, detected results will be flagged "J" and non-detect results will be flagged "UJ".

For the USEPA 8082 analysis in SDGs 1903305 and 1903320, the laboratory noted that the sample/sample duplicate RPD performed on sample TOC-SC-02-0.5-1.2 for Aroclor 1260 was outside laboratory control limits high and potentially due to the low concentration being

reported. It is with professional judgment that only the result from TOC-SC-02-0.5-1.2 be qualified "J" as estimated based on this RPD information.

For the USEPA 6020 analysis in SDGs 1903305 and 1903320, the laboratory noted that the sample/sample duplicate RPD for Arsenic, Cadmium, Lead, Selenium and Silver in TOC-SS-07-0-10 were outside of laboratory control limits, but that the method was in control as indicated by the LCS. It is with professional judgment that only the results from TOC-SS-07-0-10 be qualified "J" as estimated based on this sample/sample duplicate RPD information for Arsenic, Cadmium, Lead, Selenium, and Silver.

Based on the data quality review, data are determined to be of acceptable quality for use as reported by the laboratory unless specifically qualified above, and with some laboratory qualifiers being updated to conform to the final qualifiers used for data table reporting and database storage.

REFERENCES

- U.S. Environmental Protection Agency (USEPA). 2017a. *National Functional Guidelines for Inorganic Superfund Methods Data Review*. Prepared by the Office of Superfund Remediation and Technology Innovation. EPA-540-R-2017-001/OLEM 9355.0-135. January.
- _____. 2017b. *National Functional Guidelines for Organic Superfund Methods Data Review*. Prepared by the Office of Superfund Remediation and Technology Innovation. EPA-540-R-2017-002/OLEM 9355.0-136. January.



ECO CHEM
Data Quality

DATA VALIDATION REPORT

CANTERA-TOC

Prepared for:

Floyd | Snider
601 Union Street, Suite 600
Seattle, WA 98101

Prepared by:

EcoChem, Inc.
500 Union Street, Suite 1010
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EcoChem Project: C15228-1

September 18, 2018

Approved for Release:

Christine Ransom
Senior Project Chemist
EcoChem, Inc.

PROJECT NARRATIVE

Basis for the Data Validation

This report summarizes the results of data validation performed on sediment and quality control (QC) sample data for the Cantera-OC project. A complete list of samples is provided in the **Sample Index**.

Frontier Analytical Laboratory, El Dorado Hills, California performed the analysis. The analytical method and EcoChem project chemists are listed in the table below.

ANALYSIS	METHOD	PRIMARY REVIEW	SECONDARY REVIEW
Dioxin/Furans	EPA 1613B	A. Bodkin	C. Ransom

The data were reviewed using guidance and quality control criteria documented in the analytical methods; *Former Time Oil Company Sampling and Analysis/Quality Assurance Project Plan* (Floyd | Snider, July 2018); and *USEPA National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review* (USEPA, September 2011).

EcoChem's goal in assigning data assessment qualifiers is to assist in proper data interpretation. If values are estimated (J or UJ), data may be used for site evaluation and risk assessment purposes but reasons for data qualification should be taken into consideration when interpreting sample concentrations. If values are assigned an R or DNR, the data should not be used for any site evaluation purposes. If values have no data qualifier assigned, then the data meet the data quality objectives as stated in the documents and methods referenced above.

Data qualifier definitions, reason codes, and validation criteria are included as **Appendix A**. A Qualified Data Summary Table is included in **Appendix B**. Data Validation Worksheets will be kept on file at EcoChem, Inc. A qualified laboratory electronic data deliverable (EDD) is also submitted with this report.

Sample Index
Cantera-TOC

SDG	SAMPLE ID	LAB ID	Matrix	Dioxin/Furans
11792	11792-001-SA	TOC-SS-01-0-10	Sediment	✓
11792	11792-002-SA	TOC-SS-02-0-10	Sediment	✓
11792	11792-003-SA	TOC-SS-03-0-10	Sediment	✓
11792	11792-004-SA	TOC-SS-04-0-10	Sediment	✓
11792	11792-005-SA	TOC-SS-05-0-10	Sediment	✓
11792	11792-006-SA	TOC-SS-06-0-10	Sediment	✓
11792	11792-007-SA	TOC-SS-03D-0-10	Sediment	✓

DATA VALIDATION REPORT
Cantera-TOC
Dioxin/Furan Compounds by Method 1613

This report documents the review of analytical data from the analysis of sediment samples and the associated laboratory and field quality control (QC) samples. Samples were analyzed by Frontier Analytical Laboratory, El Dorado Hills, California. Refer to the **SAMPLE INDEX** for a complete list of samples.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
11792	7 sediment	EPA Stage 4

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

EDD TO HARDCOPY VERIFICATION

Sample results and related quality control data were received as an electronic data deliverable (EDD) and laboratory report. The EDD was verified against the laboratory report (10%). No errors were noted.

TECHNICAL DATA VALIDATION

The quality control (QC) requirements reviewed are summarized in the following table:

✓	Sample Receipt, Preservation, and Holding Times	✓	Ongoing Precision and Recovery (OPR)
✓	System Performance and Resolution Checks	✓	Laboratory Duplicates
✓	Initial Calibration (ICAL)	1	Field Duplicates
✓	Calibration Verification	✓	Target Analyte List
✓	Blanks (Laboratory and Field)	✓	Reported Results
✓	Labeled Compounds	2	Compound Identification
1	Matrix Spike/Matrix Spike Duplicates (MS/MSD)	1	Calculation Verification

✓ Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.

1 Quality control results are discussed below, but no data were qualified.

2 Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Matrix Spike/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate analyses were not performed; they are not required by the method. Accuracy was evaluated using the labeled compound and ongoing precision and recovery (OPR) standard results. The acceptable OPR results indicates acceptable precision from analytical

batch to batch. The field duplicate relative percent difference (RPD) values were also used to evaluate precision.

Field Duplicates

One field duplicate set, Samples TOC-SS-03-0-10 and TOC-SS-03D-0-10, was submitted. Field precision was acceptable.

Compound Identification

The method requires the confirmation of 2,3,7,8-TCDF using an alternate GC column as the DB5 column that is typically used cannot fully separate 2,3,7,8-TCDF from closely eluting non-target TCDF isomers. The laboratory used the DB-5MS column, which can adequately resolve these isomers. The lab also performed confirmation on a secondary column, but the results from the primary column were reported. There was good agreement between the two columns.

The laboratory assigned an "M" flag to one or more analytes to indicate that the ion ratio criterion for positive identification was not met. Since the ion abundance ratio is the primary identification criterion for high resolution mass spectroscopy, an outlier indicates that the reported result may be a false positive. Only homologue groups were "M" flagged. These "M" flagged results were estimated (J-25) at the reported concentration.

Diphenyl ether interferences were indicated for several samples. The laboratory assigned an "D" flag to these results. Where diphenyl ether interferences were present, and the identification criteria were met, the results were estimated (J-23H) to indicate a potential high bias.

Calculation Verification

Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable as demonstrated by the labeled compound and OPR recoveries and precision was acceptable as demonstrated by the OPR recoveries and field duplicate RPD values.

Results were estimated based on ion ratio outliers and diphenyl ether interference.

All data, as qualified, are acceptable for use.



APPENDIX A

DATA QUALIFIER DEFINITIONS

REASON CODES

AND CRITERIA TABLES

DATA VALIDATION QUALIFIER CODES **Based on National Functional Guidelines**

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents the approximate concentration.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

The following is an EcoChem qualifier that may also be assigned during the data review process:

DNR	Do not report; a more appropriate result is reported from another analysis or dilution.
-----	---

DATA QUALIFIER REASON CODES

Group	Code	Reason for Qualification
Sample Handling	1	Improper Sample Handling or Sample Preservation (i.e., headspace, cooler temperature, pH, summa canister pressure); Exceeded Holding Times
Instrument Performance	24	Instrument Performance (i.e., tune, resolution, retention time window, endrin breakdown, lock-mass)
	5A	Initial Calibration (RF, %RSD, r^2)
	5B	Calibration Verification (CCV, CCAL; RF, %D, %R) Use bias flags (H,L) ¹ where appropriate
	5C	Initial Calibration Verification (ICV %D, %R) Use bias flags (H,L) ¹ where appropriate
Blank Contamination	6	Field Blank Contamination (Equipment Rinsate, Trip Blank, etc.)
	7	Lab Blank Contamination (i.e., method blank, instrument blank, etc.) Use low bias flag (L) ¹ for negative instrument blanks
Precision and Accuracy	8	Matrix Spike (MS and/or MSD) Recoveries Use bias flags (H,L) ¹ where appropriate
	9	Precision (all replicates: LCS/LCSD, MS/MSD, Lab Replicate, Field Replicate)
	10	Laboratory Control Sample Recoveries (a.k.a. Blank Spikes) Use bias flags (H,L) ¹ where appropriate
	12	Reference Material Use bias flags (H,L) ¹ where appropriate
	13	Surrogate Spike Recoveries (a.k.a. labeled compounds, recovery standards) Use bias flags (H,L) ¹ where appropriate
Interferences	16	ICP/ICP-MS Serial Dilution Percent Difference
	17	ICP/ICP-MS Interference Check Standard Recovery Use bias flags (H,L) ¹ where appropriate
	19	Internal Standard Performance (i.e., area, retention time, recovery)
	22	Elevated Detection Limit due to Interference (i.e., chemical and/or matrix)
	23	Bias from Matrix Interference (i.e. diphenyl ether, PCB/pesticides)
Identification and Quantitation	2	Chromatographic pattern in sample does not match pattern of calibration standard
	3	2 nd column confirmation (RPD or %D)
	4	Tentatively Identified Compound (TIC) (associated with NJ only)
	20	Calibration Range or Linear Range Exceeded
	25	Compound Identification (i.e., ion ratio, retention time, relative abundance, etc.)
Miscellaneous	11	A more appropriate result is reported (multiple reported analyses i.e., dilutions, re-extractions, etc. Associated with "R" and "DNR" only)
	14	Other (See DV report for details)
	26	Method QC information not provided

¹H = high bias indicated

L = low bias indicated

Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	Waters/Solids ≤ 6°C & in the dark Tissues < -10°C & in the dark Preservation Aqueous: If Cl ₂ is present Thiosulfate must be added and if pH > 9 it must be adjusted to 7 - 9	NFG ⁽¹⁾ Method ⁽²⁾	J(pos)/R(ND) if thiosulfate not added if Cl ₂ present; J(pos)/UJ(ND) if pH not adjusted J(pos)/UJ(ND) if temp > 20°C	1	EcoChem PJ, see TM-05
Holding Time	If properly stored, 1 year or: Extraction (all matrices): 30 days from collection Analysis (all matrices): 45 days from extraction	NFG ⁽¹⁾ Method ⁽²⁾	If not properly stored or HT exceedance: J(pos)/UJ(ND)	1	EcoChem PJ, see TM-05 Gross exceedance = > 1 year 2011 NFG Note: Under CWA, SDWA, and RCRA the HT for H ₂ O is 7 days.
Instrument Performance					
Mass Resolution (Tuning)	PFK (Perfluorokerosene) ≥10,000 resolving power at m/z 304.9824. Exact mass of m/z 380.9760 w/in 5 ppm of theoretical value (380.97410 to 380.97790) . Analyzed prior to ICAL and at the start and end of each 12 hr. shift.	NFG ⁽¹⁾ Method ⁽²⁾	R(pos/ND) all analytes in all samples associated with the tune	24	Notify PM
Windows Defining Mix	Peaks for first and last eluters must be within established retention time windows for each selector group (chlorination level)	NFG ⁽¹⁾ Method ⁽²⁾	If peaks are not completely within windows (clipped): If natives are ok, J(pos)/UJ(ND) homologs (Totals) If natives are affected, R all results for that selector group	24	Notify PM
Column Performance Mix	Both mixes must be analyzed before ICAL and CCAL Valley < 25% (valley = (x/y)*100%) where x = ht. of TCDD (or TCDF) & y = baseline to bottom of valley For all isomers eluting near the 2378-TCDD (TCDF) peak (TCDD only for 8290)	NFG ⁽¹⁾ Method ⁽²⁾	J(pos) if valley > 25%	24	EcoChem PJ, see TM-05, Rev. 2; Note: TCDF is evaluated only if second column confirmation is performed
Initial Calibration Sensitivity	S/N ratio > 10 for all native and labeled compounds in CS1 std.	NFG ⁽¹⁾ Method ⁽²⁾	If <10, elevate Det. Limit or R(ND)	5A	
Initial Calibration Selectivity	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	NFG ⁽¹⁾ Method ⁽²⁾	If 2 or more ion ratios are out for one compound in ICAL, J(pos)	5A	EcoChem PJ, see TM-05, Rev. 2

**Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)**

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Instrument Performance (continued)					
Initial Calibration (Minimum 5 stds.) Stability	%RSD < 20% for native compounds %RSD < 30% for labeled compounds (%RSD < 35% for labeled compounds under 1613b)	NFG ⁽¹⁾ Method ⁽²⁾	J(pos) natives if %RSD > 20%	5A	EcoChem PJ, see TM-05, Rev. 2
	Absolute RT of ¹³ C ₁₂ -1234-TCDD >25 min on DB5 & >15 min on DB-225	NFG ⁽¹⁾ Method ⁽²⁾	Narrate, no action		
Continuing Calibration (Prior to each 12 hr. shift) Sensitivity	S/N ratio for CS3 standard > 10	NFG ⁽¹⁾ Method ⁽²⁾	If <10, elevate Det. Limit or R(ND)	5B	
Continuing Calibration (Prior to each 12 hr. shift) Selectivity	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	NFG ⁽¹⁾ Method ⁽²⁾	For congener with ion ratio outlier, J(pos) natives in all samples associated with CCAL. No action for labeled congener ion ratio outliers.	25	EcoChem PJ, see TM-05
Continuing Calibration (Prior to each 12 hr. shift) Stability	%D +/-20% for native compounds %D +/-30% for labeled compounds (Must meet limits in Table 6, Method 1613B) If %D in the closing CCAL are within 25%/35%, the mean RF from the two CCAL may be used to calculate samples (Section 8.3.2.4 of 8290).	NFG ⁽¹⁾ Method ⁽²⁾	Labeled compounds: Narrate, no action. Native compounds: 1613: J(pos)/UJ(ND) if %D is outside Table 6 limits J(pos)/R(ND) if %D is +/-75% of Table 6 limits 8290: J(pos)/UJ(ND) if %D = 20% - 75% J(pos)/R(ND) if %D > 75%	5B (H,L) ³	EcoChem PJ, see TM-05
	Absolute RT of ¹³ C ₁₂ -1234-TCDD and ¹³ C ₁₂ -123789-HxCDD should be ± 15 seconds of ICAL RRT for all other compounds must meet criteria listed in Table 2 Method 1316.		NFG ⁽¹⁾ Method ⁽²⁾		
Blank Contamination					
Method Blank (MB)	MB: One per matrix per batch of (of ≤ 20 samples) No detected compounds > RL	NFG ⁽¹⁾ Method ⁽²⁾	U(pos) if result is < 5X action level.	7	Hierarchy of blank review: #1 - Review MB, qualify as needed #2 - Review FB, qualify as needed
Field Blank (FB)	FB: frequency as per QAPP No detected compounds > RL		U(pos) if result is < 5X action level.	6	

**Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)**

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy					
MS/MSD (recovery)	MS/MSD not typically required for HRMS analyses. If lab analyzes MS/MSD then one set per matrix per batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos) if both %R > UCL - high bias J(pos)/UJ(ND) if both %R < LCL - low bias J(pos)/R(ND) if both %R < 10% - very low bias J(pos)/UJ(ND) if one > UCL & one < LCL, with no bias PJ if only one %R outlier	8 (H,L) ³	No action if only one spike %R is outside criteria. No action if parent concentration is > 4x the amount spiked. Qualify parent sample only unless other QC indicates systematic problems.
MS/MSD (RPD)	MS/MSD not typically required for HRMS analyses. If lab analyzes MS/MSD then one set per matrix per batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos) in parent sample if RPD > CL	9	Qualify parent sample only.
LCS (or OPR)	One per lab batch (of ≤ 20 samples) Use most current laboratory control limits or Limits from Table 6 of 1613B	NFG ⁽¹⁾ Method ⁽²⁾	J(pos) if %R > UCL - high bias J(pos)/UJ(ND) if %R < LCL - low bias J(pos)/R(ND) if %R < 10% - very low bias	10 (H,L) ³	No action if only one spike %R is outside criteria, when LCSD is analyzed. Qualify all associated samples.
LCS/LCSD (RPD)	LCSD not typically required for HRMS analyses. One set per matrix and batch of 20 samples RPD < 35%	Method ⁽²⁾ EcoChem standard policy	J(pos) assoc. compound in all samples if RPD > CL	9	Qualify all associated samples.
Lab Duplicate (RPD)	Lab Dup not typically required for HRMS analyses. One per lab batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos)/UJ(ND) if RPD > CL	9	
Labeled Compounds (Internal Standards)	Added to all samples %R = 40% - 135% in all samples 8290 %R must meet limits in Table 7 Method 1613B	NFG ⁽¹⁾ Method ⁽²⁾	J(pos) if %R > UCL - high bias J(pos)/UJ(ND) if %R < LCL - low bias J(pos)/R(ND) if %R < 10% - very low bias	13 (H,L) ³	
Field Duplicates	Solids: RPD < 50% OR difference < 2X RL (for results < 5X RL) Aqueous: RPD < 35% OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	Narrate and qualify if required by project	9	Use professional judgment

**Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)**

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Compound ID and Calculation					
Quantitation/ Identification	All ions for each isomer must maximize within ± 2 seconds. S/N ratio >2.5 Ion ratios must meet criteria listed in Table 8 Method 8290, or Table 9 of 1613B; RRTs w/in limits in Table 2 of 1613B	NFG ⁽¹⁾ Method ⁽²⁾	Narrate in report; qualify if necessary NJ(pos) for retention time outliers. U(pos) for ion ratio outliers.	25	EcoChem PJ, see TM-05
EMPC (estimated maximum possible concentration)	If quantitation identification criteria are not met, laboratory should report an EMPC value.	NFG ⁽¹⁾ Method ⁽²⁾	If laboratory correctly reported an EMPC value, qualify the native compound U(pos) to indicate that the value is a detection limit and qualify total homolog groups J (pos)	25	Use professional judgment See TM-18
Interferences	Interferences from chlorodiphenyl ether compounds	NFG ⁽¹⁾ Method ⁽²⁾	J(pos)/UJ(ND) if present	23	See TM-16
	Lock masses must not deviate $\pm 20\%$ from values in Table 8 of 1613B	Method ⁽²⁾	J(pos)/UJ(ND) if present	24	See TM-17
Second Column Confirmation	All 2,3,7,8-TCDF hits must be confirmed on a DB-225 (or equiv) column. All QC criteria must also be met for the confirmation analysis.	NFG ⁽¹⁾ Method ⁽²⁾	Report the DB-225 value. If not performed use PJ.	3	DNR-11 DB5 result if both results from both columns are reported. EcoChem PJ, see TM-05
Calculation Check	Check 10% of field & QC sample results	EcoChem standard policy	Contact laboratory for resolution and/or corrective action	na	Full data validation only.
Electronic Data Deliverable (EDD)					
Verification of EDD to hardcopy data	EcoChem verify @ 10% unless problems noted; then increase level up to 100% for next several packages.		Depending on scope of problem, correct at EcoChem (minor issues) to resubmittal by laboratory (major issues).	na	EcoChem Project Manager and/or Database Administrator will work with lab to provide long-term corrective action.
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	Standard reporting policy	Use "DNR" to flag results that will not be reported.	11	

(pos) - positive (detected) results; (ND) - not detected results

¹ National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) & Chlorinated Dibenzofurans (CDFs) Data Review, September 2011

² Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High-Resolution Gas Chromatography/High-Resolution Mass Spectrometry (HRGC/HRMS), USEPA SW-846, Method 8290

² EPA Method 1613, Rev.B, Tetra-through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGS/HRMS, October 1994

³ NFG 2013 suggests using "+" / "-" to indicate bias; EcoChem has chosen "H" = high bias indicated; "L" = low bias indicated.



ECO-CHEM
Data Quality

APPENDIX B

QUALIFIED DATA SUMMARY TABLE

**Qualified Data Summary Table
Cantera-TOC**

SDG	SAMPLE ID	LAB ID	METHOD	ANALYTE	RESULT	UNITS	DV QUAL	DV CODE
11792	TOC-SS-01-0-10	11792-001-SA	EPA 1613 D/F	Total HxCDF	323	pg/g	J	23,25
11792	TOC-SS-01-0-10	11792-001-SA	EPA 1613 D/F	Total PeCDD	92.1	pg/g	J	25
11792	TOC-SS-01-0-10	11792-001-SA	EPA 1613 D/F	Total PeCDF	201	pg/g	J	23,25
11792	TOC-SS-01-0-10	11792-001-SA	EPA 1613 D/F	Total TCDD	43.9	pg/g	J	25
11792	TOC-SS-01-0-10	11792-001-SA	EPA 1613 D/F	Total TCDF	153	pg/g	J	23,25
11792	TOC-SS-02-0-10	11792-002-SA	EPA 1613 D/F	Total HxCDF	176	pg/g	J	23,25
11792	TOC-SS-02-0-10	11792-002-SA	EPA 1613 D/F	Total PeCDF	102	pg/g	J	23,25
11792	TOC-SS-02-0-10	11792-002-SA	EPA 1613 D/F	Total TCDD	18	pg/g	J	25
11792	TOC-SS-02-0-10	11792-002-SA	EPA 1613 D/F	Total TCDF	78	pg/g	J	23,25
11792	TOC-SS-03-0-10	11792-003-SA	EPA 1613 D/F	Total HxCDF	493	pg/g	J	23,25
11792	TOC-SS-03-0-10	11792-003-SA	EPA 1613 D/F	Total PeCDF	227	pg/g	J	23,25
11792	TOC-SS-03-0-10	11792-003-SA	EPA 1613 D/F	Total TCDD	38.5	pg/g	J	25
11792	TOC-SS-03-0-10	11792-003-SA	EPA 1613 D/F	Total TCDF	146	pg/g	J	23,25
11792	TOC-SS-04-0-10	11792-004-SA	EPA 1613 D/F	Total HxCDF	376	pg/g	J	23,25
11792	TOC-SS-04-0-10	11792-004-SA	EPA 1613 D/F	Total PeCDF	222	pg/g	J	23,25
11792	TOC-SS-04-0-10	11792-004-SA	EPA 1613 D/F	Total TCDF	150	pg/g	J	23,25
11792	TOC-SS-05-0-10	11792-005-SA	EPA 1613 D/F	Total HxCDF	351	pg/g	J	23,25
11792	TOC-SS-05-0-10	11792-005-SA	EPA 1613 D/F	Total PeCDF	208	pg/g	J	23,25
11792	TOC-SS-05-0-10	11792-005-SA	EPA 1613 D/F	Total TCDD	30.9	pg/g	J	25
11792	TOC-SS-05-0-10	11792-005-SA	EPA 1613 D/F	Total TCDF	145	pg/g	J	23,25
11792	TOC-SS-06-0-10	11792-006-SA	EPA 1613 D/F	Total HxCDF	331	pg/g	J	23,25
11792	TOC-SS-06-0-10	11792-006-SA	EPA 1613 D/F	Total PeCDF	197	pg/g	J	23,25
11792	TOC-SS-06-0-10	11792-006-SA	EPA 1613 D/F	Total TCDD	26.6	pg/g	J	25
11792	TOC-SS-06-0-10	11792-006-SA	EPA 1613 D/F	Total TCDF	134	pg/g	J	23,25
11792	TOC-SS-03D-0-10	11792-007-SA	EPA 1613 D/F	Total HxCDF	500	pg/g	J	23,25
11792	TOC-SS-03D-0-10	11792-007-SA	EPA 1613 D/F	Total PeCDF	228	pg/g	J	23,25
11792	TOC-SS-03D-0-10	11792-007-SA	EPA 1613 D/F	Total TCDF	147	pg/g	J	23,25



ECOChem
Data Quality

DATA VALIDATION REPORT

CANTERA-TOC

Prepared for:

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EcoChem Project: C15228-2

May 1, 2019

Approved for Release:

Christine Ransom
Senior Project Chemist
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PROJECT NARRATIVE

Basis for the Data Validation

This report summarizes the results of data validation performed on sediment and quality control (QC) sample data for the Cantera-TOC project. A complete list of samples is provided in the Sample Index.

Frontier Analytical Laboratory, El Dorado Hills, California performed the analysis. The analytical method and EcoChem project chemists are listed in the table below.

ANALYSIS	METHOD	PRIMARY REVIEW	SECONDARY REVIEW
Dioxin/Furans	EPA 1613B	E. Clayton	C. Ransom

The data were reviewed using guidance and quality control criteria documented in the analytical methods; *Former Time Oil Company Sampling and Analysis/Quality Assurance Project Plan* (Floyd | Snider, July 2018); and *USEPA National Functional Guidelines for Chlorinated Dibenzo-*p*-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review* (USEPA, September 2011).

EcoChem's goal in assigning data assessment qualifiers is to assist in proper data interpretation. If values are estimated (J or UJ), data may be used for site evaluation and risk assessment purposes but reasons for data qualification should be taken into consideration when interpreting sample concentrations. If values are assigned an R or DNR, the data should not be used for any site evaluation purposes. If values have no data qualifier assigned, then the data meet the data quality objectives as stated in the documents and methods referenced above.

Data qualifier definitions, reason codes, and validation criteria are included as Appendix A. A Qualified Data Summary Table is included in Appendix B. Data Validation Worksheets will be kept on file at EcoChem, Inc. A qualified laboratory electronic data deliverable (EDD) is also submitted with this report.

Sample Index
Cantera-TOC

SDG	SAMPLE ID	LAB ID	Matrix	Dioxin/Furans
12279	TOC-SC-01-0.5-2.0	12279-001-SA	Sediment	✓
12279	TOC-SC-01-2.5-4.0	12279-002-SA	Sediment	✓
12279	TOC-SC-02-0.5-1.2	12279-003-SA	Sediment	✓
12279	TOC-SC-02-1.2-2.2	12279-004-SA	Sediment	✓
12279	TOC-SC-02-2.6-4.0	12279-005-SA	Sediment	✓
12280	TOC-SS-07-0-10	12280-001-SA	Sediment	✓
12280	TOC-SS-08-0-10	12280-002-SA	Sediment	✓
12280	TOC-SS-09-0-10	12280-003-SA	Sediment	✓
12280	TOC-SS-10-0-10	12280-004-SA	Sediment	✓
12280	TOC-SS-11-0-10	12280-005-SA	Sediment	✓
12280	SB-SS-01-0-10	12280-006-SA	Sediment	✓
12280	SB-SS-02-0-10	12280-007-SA	Sediment	✓
12280	SB-SS-03-0-10	12280-008-SA	Sediment	✓
12280	TOC-SS-111-0-10	12280-009-SA	Sediment	✓

DATA VALIDATION REPORT
Cantera-TOC
Dioxin/Furan Compounds by Method 1613

This report documents the review of analytical data from the analysis of sediment samples and the associated laboratory and field quality control (QC) samples. Samples were analyzed by Frontier Analytical Laboratory, El Dorado Hills, California. Refer to the **SAMPLE INDEX** for a complete list of samples.

SDG	NUMBER OF SAMPLES	VALIDATION LEVEL
12279	5 sediment	EPA Stage 4
12280	9 sediment	EPA Stage 4

DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

EDD TO HARDCOPY VERIFICATION

Sample results and related quality control data were received as an electronic data deliverable (EDD) and laboratory report. The EDD was verified against the laboratory report (10%). No errors were noted.

TECHNICAL DATA VALIDATION

The quality control (QC) requirements reviewed are summarized in the following table:

1	Sample Receipt, Preservation, and Holding Times	✓	Ongoing Precision and Recovery (OPR)
✓	System Performance and Resolution Checks	✓	Laboratory Duplicates
✓	Initial Calibration (ICAL)	1	Field Duplicates
✓	Calibration Verification	✓	Target Analyte List
✓	Blanks (Laboratory and Field)	✓	Reported Results
✓	Labeled Compounds	2	Compound Identification
1	Matrix Spike/Matrix Spike Duplicates (MS/MSD)	1	Calculation Verification

✓ Stated method quality objectives (MQO) and QC criteria have been met. No outliers are noted or discussed.

1 Quality control results are discussed below, but no data were qualified.

2 Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.

Sample Receipt, Preservation, and Holding Times

The validation guidance documents state that the cooler temperatures should be at an advisory temperature of < 6°C. With the following exception noted below, the laboratory received the sample coolers within the advisory temperature range.

SDG 12279: One sample cooler temperature was greater than the upper control limit at 9.9°C. This outlier did not impact data quality; no data were qualified.

Matrix Spike/Matrix Spike Duplicates

Matrix spike/matrix spike duplicate analyses were not performed; they are not required by the method. Accuracy was evaluated using the labeled compound and ongoing precision and recovery (OPR) standard results. The acceptable OPR results indicates acceptable precision from analytical batch to batch. The field duplicate relative percent difference (RPD) values were also used to evaluate precision.

Field Duplicates

SDG 12280: One set of field duplicates was submitted: TOC-SS-11-0-10 and TOC-SS-111-0-10. All RPD values were less than the control limit of 50%. Field precision was acceptable.

Compound Identification

The method requires the confirmation of 2,3,7,8-TCDF using an alternate GC column as the DB5 column that is typically used cannot fully separate 2,3,7,8-TCDF from closely eluting non-target TCDF isomers. The laboratory used the DB-5MS column, which can adequately resolve these isomers. The lab also performed confirmation on a secondary column, but the results from the primary column were reported. There was good agreement between the two columns.

The laboratory assigned an "M" flag to one or more analytes to indicate that the ion ratio criterion for positive identification was not met. Since the ion abundance ratio is the primary identification criterion for high resolution mass spectroscopy, an outlier indicates that the reported result may be a false positive. Only homologue groups were "M" flagged. These "M" flagged results were estimated (J-25) at the reported concentration.

Diphenyl ether interferences were indicated for several samples. The laboratory assigned an "D" flag to these results. Where diphenyl ether interferences were present, and the identification criteria were met, the results were estimated (J-23H) to indicate a potential high bias.

Calculation Verification

Several results were verified by recalculation from the raw data. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable as demonstrated by the labeled compound and OPR recoveries and precision was acceptable as demonstrated by the OPR recoveries and field duplicate RPD values.

Results were estimated based on ion ratio outliers and diphenyl ether interference.

All data, as qualified, are acceptable for use.



APPENDIX A

**DATA QUALIFIER DEFINITIONS
REASON CODES
AND CRITERIA TABLES**

DATA VALIDATION QUALIFIER CODES **Based on National Functional Guidelines**

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents the approximate concentration.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

The following is an EcoChem qualifier that may also be assigned during the data review process:

DNR	Do not report; a more appropriate result is reported from another analysis or dilution.
-----	---

DATA QUALIFIER REASON CODES

Group	Code	Reason for Qualification
Sample Handling	1	Improper Sample Handling or Sample Preservation (i.e., headspace, cooler temperature, pH, summa canister pressure); Exceeded Holding Times
Instrument Performance	24	Instrument Performance (i.e., tune, resolution, retention time window, endrin breakdown, lock-mass)
	5A	Initial Calibration (RF, %RSD, r^2)
	5B	Calibration Verification (CCV, CCAL; RF, %D, %R) Use bias flags (H,L) ¹ where appropriate
	5C	Initial Calibration Verification (ICV %D, %R) Use bias flags (H,L) ¹ where appropriate
Blank Contamination	6	Field Blank Contamination (Equipment Rinsate, Trip Blank, etc.)
	7	Lab Blank Contamination (i.e., method blank, instrument blank, etc.) Use low bias flag (L) ¹ for negative instrument blanks
Precision and Accuracy	8	Matrix Spike (MS and/or MSD) Recoveries Use bias flags (H,L) ¹ where appropriate
	9	Precision (all replicates: LCS/LCSD, MS/MSD, Lab Replicate, Field Replicate)
	10	Laboratory Control Sample Recoveries (a.k.a. Blank Spikes) Use bias flags (H,L) ¹ where appropriate
	12	Reference Material Use bias flags (H,L) ¹ where appropriate
	13	Surrogate Spike Recoveries (a.k.a. labeled compounds, recovery standards) Use bias flags (H,L) ¹ where appropriate
Interferences	16	ICP/ICP-MS Serial Dilution Percent Difference
	17	ICP/ICP-MS Interference Check Standard Recovery Use bias flags (H,L) ¹ where appropriate
	19	Internal Standard Performance (i.e., area, retention time, recovery)
	22	Elevated Detection Limit due to Interference (i.e., chemical and/or matrix)
	23	Bias from Matrix Interference (i.e. diphenyl ether, PCB/pesticides)
Identification and Quantitation	2	Chromatographic pattern in sample does not match pattern of calibration standard
	3	2 nd column confirmation (RPD or %D)
	4	Tentatively Identified Compound (TIC) (associated with NJ only)
	20	Calibration Range or Linear Range Exceeded
	25	Compound Identification (i.e., ion ratio, retention time, relative abundance, etc.)
Miscellaneous	11	A more appropriate result is reported (multiple reported analyses i.e., dilutions, re-extractions, etc. Associated with "R" and "DNR" only)
	14	Other (See DV report for details)
	26	Method QC information not provided

¹H = high bias indicated

L = low bias indicated

Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Sample Handling					
Cooler/Storage Temperature Preservation	Waters/Solids ≤ 6°C & in the dark Tissues < -10°C & in the dark Preservation Aqueous: If Cl ₂ is present Thiosulfate must be added and if pH > 9 it must be adjusted to 7 - 9	NFG ⁽¹⁾ Method ⁽²⁾	J(pos)/R(ND) if thiosulfate not added if Cl ₂ present; J(pos)/UJ(ND) if pH not adjusted J(pos)/UJ(ND) if temp > 20°C	1	EcoChem PJ, see TM-05
Holding Time	If properly stored, 1 year or: Extraction (all matrices): 30 days from collection Analysis (all matrices): 45 days from extraction	NFG ⁽¹⁾ Method ⁽²⁾	If not properly stored or HT exceedance: J(pos)/UJ(ND)	1	EcoChem PJ, see TM-05 Gross exceedance = > 1 year 2011 NFG Note: Under CWA, SDWA, and RCRA the HT for H ₂ O is 7 days.
Instrument Performance					
Mass Resolution (Tuning)	PFK (Perfluorokerosene) ≥10,000 resolving power at m/z 304.9824. Exact mass of m/z 380.9760 w/in 5 ppm of theoretical value (380.97410 to 380.97790) . Analyzed prior to ICAL and at the start and end of each 12 hr. shift.	NFG ⁽¹⁾ Method ⁽²⁾	R(pos/ND) all analytes in all samples associated with the tune	24	Notify PM
Windows Defining Mix	Peaks for first and last eluters must be within established retention time windows for each selector group (chlorination level)	NFG ⁽¹⁾ Method ⁽²⁾	If peaks are not completely within windows (clipped): If natives are ok, J(pos)/UJ(ND) homologs (Totals) If natives are affected, R all results for that selector group	24	Notify PM
Column Performance Mix	Both mixes must be analyzed before ICAL and CCAL Valley < 25% (valley = (x/y)*100%) where x = ht. of TCDD (or TCDF) & y = baseline to bottom of valley For all isomers eluting near the 2378-TCDD (TCDF) peak (TCDD only for 8290)	NFG ⁽¹⁾ Method ⁽²⁾	J(pos) if valley > 25%	24	EcoChem PJ, see TM-05, Rev. 2; Note: TCDF is evaluated only if second column confirmation is performed
Initial Calibration Sensitivity	S/N ratio > 10 for all native and labeled compounds in CS1 std.	NFG ⁽¹⁾ Method ⁽²⁾	If <10, elevate Det. Limit or R(ND)	5A	
Initial Calibration Selectivity	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	NFG ⁽¹⁾ Method ⁽²⁾	If 2 or more ion ratios are out for one compound in ICAL, J(pos)	5A	EcoChem PJ, see TM-05, Rev. 2

Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Instrument Performance (continued)					
Initial Calibration (Minimum 5 stds.) Stability	%RSD < 20% for native compounds %RSD < 30% for labeled compounds (%RSD < 35% for labeled compounds under 1613b)	NFG ⁽¹⁾ Method ⁽²⁾	J(pos) natives if %RSD > 20%	5A	EcoChem PJ, see TM-05, Rev. 2
	Absolute RT of ¹³ C ₁₂ -1234-TCDD >25 min on DB5 & >15 min on DB-225	NFG ⁽¹⁾ Method ⁽²⁾	Narrate, no action		
Continuing Calibration (Prior to each 12 hr. shift) Sensitivity	S/N ratio for CS3 standard > 10	NFG ⁽¹⁾ Method ⁽²⁾	If <10, elevate Det. Limit or R(ND)	5B	
Continuing Calibration (Prior to each 12 hr. shift) Selectivity	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	NFG ⁽¹⁾ Method ⁽²⁾	For congener with ion ratio outlier, J(pos) natives in all samples associated with CCAL. No action for labeled congener ion ratio outliers.	25	EcoChem PJ, see TM-05
Continuing Calibration (Prior to each 12 hr. shift) Stability	%D +/-20% for native compounds %D +/-30% for labeled compounds (Must meet limits in Table 6, Method 1613B) If %D in the closing CCAL are within 25%/35%, the mean RF from the two CCAL may be used to calculate samples (Section 8.3.2.4 of 8290).	NFG ⁽¹⁾ Method ⁽²⁾	Labeled compounds: Narrate, no action. Native compounds: 1613: J(pos)/UJ(ND) if %D is outside Table 6 limits J(pos)/R(ND) if %D is +/-75% of Table 6 limits 8290: J(pos)/UJ(ND) if %D = 20% - 75% J(pos)/R(ND) if %D > 75%	5B (H,L) ³	
	Absolute RT of ¹³ C ₁₂ -1234-TCDD and ¹³ C ₁₂ -123789-HxCDD should be ± 15 seconds of ICAL RRT for all other compounds must meet criteria listed in Table 2 Method 1316.	NFG ⁽¹⁾ Method ⁽²⁾	Narrate, no action	5B	EcoChem PJ, see TM-05
Blank Contamination					
Method Blank (MB)	MB: One per matrix per batch of (of ≤ 20 samples) No detected compounds > RL	NFG ⁽¹⁾ Method ⁽²⁾	U(pos) if result is < 5X action level.	7	Hierarchy of blank review: #1 - Review MB, qualify as needed #2 - Review FB, qualify as needed
Field Blank (FB)	FB: frequency as per QAPP No detected compounds > RL		U(pos) if result is < 5X action level.	6	

**Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)**

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Precision and Accuracy					
MS/MSD (recovery)	MS/MSD not typically required for HRMS analyses. If lab analyzes MS/MSD then one set per matrix per batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos) if both %R > UCL - high bias J(pos)/UJ(ND) if both %R < LCL - low bias J(pos)/R(ND) if both %R < 10% - very low bias J(pos)/UJ(ND) if one > UCL & one < LCL, with no bias PJ if only one %R outlier	8 (H,L) ³	No action if only one spike %R is outside criteria. No action if parent concentration is > 4x the amount spiked. Qualify parent sample only unless other QC indicates systematic problems.
MS/MSD (RPD)	MS/MSD not typically required for HRMS analyses. If lab analyzes MS/MSD then one set per matrix per batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos) in parent sample if RPD > CL	9	Qualify parent sample only.
LCS (or OPR)	One per lab batch (of ≤ 20 samples) Use most current laboratory control limits or Limits from Table 6 of 1613B	NFG ⁽¹⁾ Method ⁽²⁾	J(pos) if %R > UCL - high bias J(pos)/UJ(ND) if %R < LCL - low bias J(pos)/R(ND) if %R < 10% - very low bias	10 (H,L) ³	No action if only one spike %R is outside criteria, when LCSD is analyzed. Qualify all associated samples.
LCS/LCSD (RPD)	LCSD not typically required for HRMS analyses. One set per matrix and batch of 20 samples RPD < 35%	Method ⁽²⁾ Ecochem standard policy	J(pos) assoc. compound in all samples if RPD > CL	9	Qualify all associated samples.
Lab Duplicate (RPD)	Lab Dup not typically required for HRMS analyses. One per lab batch (of ≤ 20 samples) Use most current laboratory control limits	EcoChem standard policy	J(pos)/UJ(ND) if RPD > CL	9	
Labeled Compounds (Internal Standards)	Added to all samples %R = 40% - 135% in all samples 8290 %R must meet limits in Table 7 Method 1613B	NFG ⁽¹⁾ Method ⁽²⁾	J(pos) if %R > UCL - high bias J(pos)/UJ(ND) if %R < LCL - low bias J(pos)/R(ND) if %R < 10% - very low bias	13 (H,L) ³	
Field Duplicates	Solids: RPD < 50% OR difference < 2X RL (for results < 5X RL) Aqueous: RPD < 35% OR difference < 1X RL (for results < 5X RL)	EcoChem standard policy	Narrate and qualify if required by project	9	Use professional judgment

**Dioxin/Furan Analysis by HRMS
(Based on Dioxin NFG 2011 and Methods EPA 1613B and SW-846 8290)**

QC Element	Acceptance Criteria	Source of Criteria	Action for Non-Conformance	Reason Code	Discussion and Comments
Compound ID and Calculation					
Quantitation/ Identification	All ions for each isomer must maximize within ± 2 seconds. S/N ratio >2.5 Ion ratios must meet criteria listed in Table 8 Method 8290, or Table 9 of 1613B; RRTs w/in limits in Table 2 of 1613B	NFG ⁽¹⁾ Method ⁽²⁾	Narrate in report; qualify if necessary NJ(pos) for retention time outliers. U(pos) for ion ratio outliers.	25	EcoChem PJ, see TM-05
EMPC (estimated maximum possible concentration)	If quantitation identification criteria are not met, laboratory should report an EMPC value.	NFG ⁽¹⁾ Method ⁽²⁾	If laboratory correctly reported an EMPC value, qualify the native compound U(pos) to indicate that the value is a detection limit and qualify total homolog groups J (pos)	25	Use professional judgment See TM-18
Interferences	Interferences from chlorodiphenyl ether compounds	NFG ⁽¹⁾ Method ⁽²⁾	J(pos)/UJ(ND) if present	23	See TM-16
	Lock masses must not deviate $\pm 20\%$ from values in Table 8 of 1613B	Method ⁽²⁾	J(pos)/UJ(ND) if present	24	See TM-17
Second Column Confirmation	All 2,3,7,8-TCDF hits must be confirmed on a DB-225 (or equiv) column. All QC criteria must also be met for the confirmation analysis.	NFG ⁽¹⁾ Method ⁽²⁾	Report the DB-225 value. If not performed use PJ.	3	DNR-11 DB5 result if both results from both columns are reported. EcoChem PJ, see TM-05
Calculation Check	Check 10% of field & QC sample results	EcoChem standard policy	Contact laboratory for resolution and/or corrective action	na	Full data validation only.
Electronic Data Deliverable (EDD)					
Verification of EDD to hardcopy data	EcoChem verify @ 10% unless problems noted; then increase level up to 100% for next several packages.		Depending on scope of problem, correct at EcoChem (minor issues) to resubmittal by laboratory (major issues).	na	EcoChem Project Manager and/or Database Administrator will work with lab to provide long-term corrective action.
Dilutions, Re-extractions and/or Reanalyses	Report only one result per analyte	Standard reporting policy	Use "DNR" to flag results that will not be reported.	11	

(pos) - positive (detected) results; (ND) - not detected results

¹ National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) & Chlorinated Dibenzofurans (CDFs) Data Review, September 2011

² Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High-Resolution Gas Chromatography/High-Resolution Mass Spectrometry (HRGC/HRMS), USEPA SW-846, Method 8290

² EPA Method 1613, Rev.B, Tetra-through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGS/HRMS, October 1994

³ NFG 2013 suggests using "+" / "-" to indicate bias; EcoChem has chosen "H" = high bias indicated; "L" = low bias indicated.



ECO-CHEM
Data Quality

APPENDIX B

QUALIFIED DATA SUMMARY TABLE

**Qualified Data Summary Table
Cantera-TOC**

SDG	SAMPLE ID	LAB ID	METHOD	ANALYTE	RESULT	UNITS	DV QUAL	DV CODE
12280	12280-001-SA	TOC-SS-07-0-10	EPA 1613 D/F	Total TCDF	225	pg/g	J	23H,25
12280	12280-001-SA	TOC-SS-07-0-10	EPA 1613 D/F	Total PeCDF	261	pg/g	J	23H,25
12280	12280-001-SA	TOC-SS-07-0-10	EPA 1613 D/F	Total HxCDF	347	pg/g	J	23H,25
12280	12280-002-SA	TOC-SS-08-0-10	EPA 1613 D/F	Total TCDF	52.6	pg/g	J	23H,25
12280	12280-003-SA	TOC-SS-09-0-10	EPA 1613 D/F	Total TCDD	4.19	pg/g	J	25
12280	12280-003-SA	TOC-SS-09-0-10	EPA 1613 D/F	Total TCDF	24.6	pg/g	J	23H,25
12280	12280-005-SA	TOC-SS-11-0-10	EPA 1613 D/F	Total TCDF	152	pg/g	J	23H,25
12280	12280-005-SA	TOC-SS-11-0-10	EPA 1613 D/F	Total PeCDF	187	pg/g	J	23H,25
12280	12280-005-SA	TOC-SS-11-0-10	EPA 1613 D/F	Total HxCDF	296	pg/g	J	23H,25
12280	12280-006-SA	SB-SS-01-0-10	EPA 1613 D/F	Total TCDF	208	pg/g	J	23H,25
12280	12280-006-SA	SB-SS-01-0-10	EPA 1613 D/F	Total PeCDF	219	pg/g	J	23H,25
12280	12280-006-SA	SB-SS-01-0-10	EPA 1613 D/F	Total HxCDF	266	pg/g	J	23H,25
12280	12280-008-SA	SB-SS-03-0-10	EPA 1613 D/F	Total TCDF	264	pg/g	J	23H,25
12280	12280-008-SA	SB-SS-03-0-10	EPA 1613 D/F	Total PeCDF	247	pg/g	J	23H,25
12280	12280-008-SA	SB-SS-03-0-10	EPA 1613 D/F	Total HxCDF	263	pg/g	J	23H,25
12280	12280-009-SA	TOC-SS-111-0-10	EPA 1613 D/F	Total TCDF	134	pg/g	J	23H,25
12280	12280-009-SA	TOC-SS-111-0-10	EPA 1613 D/F	Total PeCDF	179	pg/g	J	23H,25
12280	12280-009-SA	TOC-SS-111-0-10	EPA 1613 D/F	Total HxCDF	268	pg/g	J	23H,25
12279	12279-001-SA	TOC-SC-01-0.5-2.0	EPA 1613 D/F	Total TCDF	4.28	pg/g	J	23H,25
12279	12279-003-SA	TOC-SC-02-0.5-1.2	EPA 1613 D/F	Total TCDF	726	pg/g	J	23,25
12279	12279-003-SA	TOC-SC-02-0.5-1.2	EPA 1613 D/F	Total PeCDF	640	pg/g	J	23,25
12279	12279-003-SA	TOC-SC-02-0.5-1.2	EPA 1613 D/F	Total HxCDF	439	pg/g	J	23,25
12279	12279-004-SA	TOC-SC-02-1.2-2.2	EPA 1613 D/F	Total TCDF	82	pg/g	J	23,25
12279	12279-004-SA	TOC-SC-02-1.2-2.2	EPA 1613 D/F	Total PeCDF	66.2	pg/g	J	23,25