Blakely Harbor Park Sediment Investigation

Final

Data Report

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List of Acronyms

CCV	continuation calibration verification
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CSL	Cleanup Screening Level
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
HPAH	high molecular weight polycyclic aromatic hydrocarbon
LPAH	low molecular weight polycyclic aromatic hydrocarbon
MS/MSD	matrix spike/matrix spike duplicate
NAD	North American Datum
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PSEP	Puget Sound Estuary Program
QA	quality assurance
QC	quality control
RPD	relative percent difference
R/V	research vessel
SAP/QAPP	Sampling and Analysis Plan / Quality Assurance Project Plan
SCO	Sediment Cleanup Objective
SCUM	Sediment Cleanup User's Manual
SIM	selective ion monitoring
SMARM	Sediment Management Annual Review Meeting
SMS	Sediment Management Standards
SVOC	semi-volatile organic compound
TEF	toxic equivalency factor
TEQ	toxic equivalent
TOC	total organic carbon
TVS	total volatile solid
WAC	Washington Administrative Code

1.0 Introduction

Blakely Harbor Park is located at the head of Blakely Harbor on Bainbridge Island, Washington, just south of Eagle Harbor (Figure 1). The Port Blakely Mill, a sawmill that operated at this location from 1864 until 1922, is associated with chemical contamination and wood debris accumulation in Blakely Harbor.

The Washington State Department of Ecology (Ecology) conducted a study in Blakely Harbor in July 2019 to characterize the intertidal and subtidal sediment contamination throughout the western portion of Blakely Harbor resulting from historical mill operations and to delineate the eastern extent of sediment chemical concentrations that exceed the Washington State Sediment Management Standards (SMS). The study followed a Sampling and Analysis Plan / Quality Assurance Project Plan (SAP/QAPP, Leidos and NewFields 2019) that was prepared in accordance with the SMS and Ecology's Sediment Cleanup User's Manual (SCUM II, Ecology 2017). Sediment sampling procedures and analytical methods followed guidance provided in the SCUM II (WAC 173-204 and WAC 173-340-830), except where noted within this report.

1.1. Background

The Port Blakely Mill operated from 1864 until closure in 1922, and at its peak was one of the largest sawmills on the West Coast, producing more than 70 million board feet of lumber per year. The mill burned down in 1888 and 1907 and was rebuilt both times. In its final configuration at closure, the mill consisted of a large sawmill building, a log pond used to raft and store logs, a foundry, machine shop, hog fuel burner, lumber storage sheds, and a large overwater wharf used to transfer lumber to ships (see Figure 1). Located on the former mill footprint is now Blakely Harbor Park, a 40-acre park that has unrestricted access for picnicking, kayaking, school field trips, and wildlife viewing. The park contains the remains of the old mill electrical building, a pontoon wall used to close off the log pond, slag heaps close to the footprint of the old foundry, and multiple derelict pilings.

Previous environmental sampling within Blakely Harbor conducted in 2008 on behalf of the Bainbridge Island Park District characterized chemical contamination and wood debris accumulation. Several samples exceeded Cleanup Screening Levels (CSLs, WAC 173-204-562) for copper, lead, and total volatile solids, and one sample exceeded the Sediment Cleanup Objective (SCO) for phenol. Wood surveys conducted in 2008 recorded significant intertidal and subtidal wood waste accumulation, up to 100% by volume at several sampling stations (Anchor 2009).

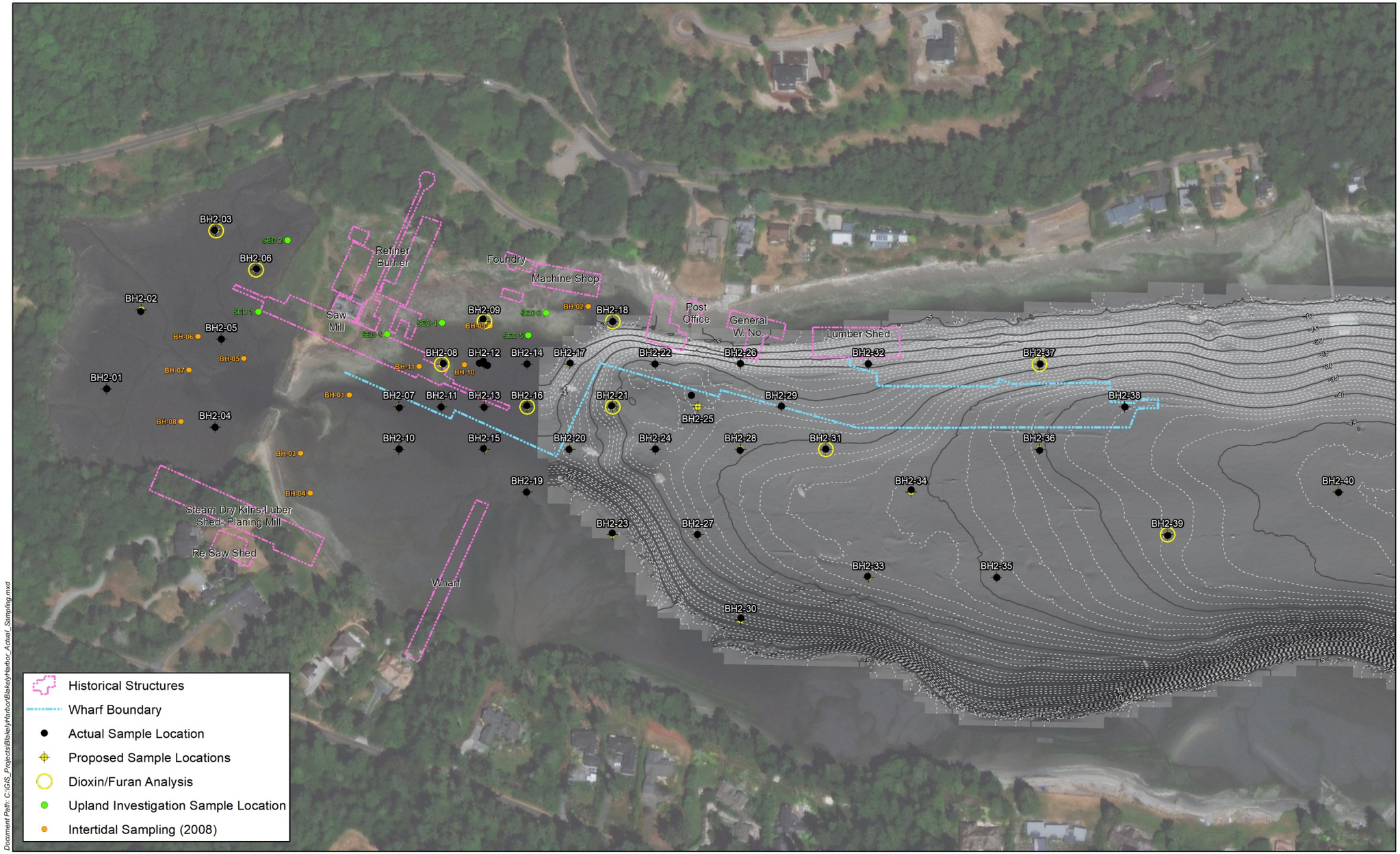

Figure 1. Blakely Harbor Actual Sediment Sample Locations

2.0 Methods

This section describes the study design and methods for the data collection effort in Blakely Harbor. The study design was informed by the findings of the 2008 intertidal sampling and analysis (Anchor 2009).

2.1. Study Design

A total of 40 locations in Blakely Harbor were sampled to evaluate SMS chemical parameters in sediments (Figure 1). A higher density of stations was sampled near historical mill structures and where historical chemical SMS exceedances were measured to provide better characterization of sediment contamination, located in the western part of the harbor. A lower density of stations was sampled in the eastern part of the harbor to provide greater spatial coverage and allow delineation of the eastern extent of sediment contamination.

2.2. Sediment Sample Collection and Handling

Surface sediment samples (0–10 cm) were collected at 40 locations during this investigation (Figure 1). Positioning, sediment sample collection, and processing followed the methods described in the SAP/QAPP unless documented below. Four intertidal locations (BH2-06, BH2-08, BH2-09, and BH2-12) were sampled by hand at low tide because of limited vessel accessibility and/or the abundance of wood debris. Subtidal locations were sampled with a stainless steel 0.2-m^2 power-assisted grab sampler deployed from the research vessel (R/V) *Carolyn Dow*, owned and operated by Research Support Services, Inc., Bainbridge Island, WA.

Geographic coordinates for the sampling locations are provided in Table 1. All sediment samples were collected in the vicinity of their original target coordinates with the exception of BH2-25. Location BH2-25 was moved approximately 30 feet northwest of the target coordinates to avoid potential fouling with an abandoned communication cable that crossed the harbor. Additional details regarding this station offset is provided in the Field Completion Report (Appendix A).

Photographic images of the sediment surface grab and intertidal samples as well as visual descriptions of the sediment samples documented in the Grab Logbook are also provided in Appendix A. All samples were stored on ice in coolers and kept under chain-of-custody until delivery to the analytical laboratory, Eurofins TestAmerica, in Fife, WA.

2.3. Chemical Analysis

All 40 sediment samples collected during the Blakely Harbor Park Sediment Investigation were analyzed for sediment conventional parameters (grain size distribution, total solids, total volatile solids [TVS], total sulfides, ammonia, and total organic carbon [TOC]), SMS metals, and SMS organic parameters (semivolatile organic compounds [SVOCs], polychlorinated biphenyls [PCBs]). In addition, a subset of 10 sediment samples was analyzed for dioxin/furan congeners.

The methods used for sample analysis are summarized in Table 2. The analytical results presented in dry weight and normalized to TOC, as appropriate, are provided in Appendix B (Tables B-1 and B-2, respectively). The analytical laboratory data reports submitted in three sample delivery groups (280-125895-1, 580-87377-1, and 580-87377-2) are provided in Appendix C.

2.4. Data Validation

A comprehensive quality assurance/quality control (QA/QC) program was followed during the Blakely Harbor Park Sediment Investigation to ensure that analytical results and the decisions based on these results are representative of the environmental conditions. The full data validation report is provided in Appendix D.

2.4.1. Laboratory Quality Control Assessment

The analytical data generated during the investigation underwent a quality assurance review and data validation. Validation conducted by Leidos included a minimum of Stage 2b validation for all SMS chemical data and Stage 4 validation for the dioxin/furan congener data. Validation was conducted using the most recent U.S. Environmental Protection Agency (EPA) (USEPA 2005, 2008, 2009, and 2010) and Puget Sound Estuary Program (PSEP) (PTI 1989) guidelines. In addition, data were verified based on guidelines and specifications in the Blakely Harbor Park Sediment Investigation SAP/QAPP (Leidos and NewFields 2019).

2.4.2. Data Validation Summary

All analytical data received from the laboratory underwent data verification and/or data validation. Total solids, TVS, ammonia nitrogen, and grain size underwent EPA Stage 1 (EPA1) verification and validation. EPA1 requires all samples be checked for completeness of results and adherence to all sample receipt condition checks.

Metals, mercury, TOC, sulfide, PCB Aroclors, and SVOCs underwent EPA Stage 2B (EPA2B) verification and validation. EPA2B requires all of EPA1 plus review of method QC summary forms plus instrument QC forms and preparation logs. Dioxins/furans underwent EPA Stage 4 (EPA4) verification and validation. EPA4 requires all of EPA1, EPA2B, and review of the raw data necessary to recalculate sample results (including recalculations of a subset of sample

results), standard traceability logs, and the review of data necessary to qualitatively evaluate the results (e.g., instrument chromatograms and spectra).

Total Solids, Total Volatile Solids, Ammonia Nitrogen and Grain Size

Overall completeness for total solids, TVS, ammonia nitrogen, and grain size data was 100%, and all data were considered fully usable for decision-making.

Semivolatile Organic Compounds

All SVOC sample extracts required dilutions ranging from 10X, 20X, and 50X prior to analysis because of sample matrix interferences or the high level of target and non-target compounds in the sample. The chromatograms were examined to determine if the samples warranted the dilutions performed by the laboratory. It was observed that a type of background interference was introducing a large number of peaks, resembling a "humpogram" which is often associated with some form of waste oil. Thus, it was determined that the dilutions were necessary. Even some samples with relatively low TOC results were found to have matrix interference that could possibly be due to oil or wood waste.

Two SVOC results were qualified as rejected (R) because of matrix spike/matrix spike duplicate (MS/MSD) recoveries below 10% for benzyl alcohol in samples BH2-02-S and BH2-34-S. These results were not considered usable for decision-making. All other SVOC results, including those qualified as estimated (J/UJ) (see Appendix D), were considered fully usable for decision-making. The overall completeness for SVOC data was 99.9%, which exceeded the completeness goal of 95%.

Polychlorinated Biphenyl Aroclors

Several PCB results were qualified as estimated because of low continuing calibration verification (CCV) recoveries, low surrogate recoveries, low internal standard area counts, or relative percent difference (RPD) values between two PCB columns exceeding 40% (Appendix D). These qualifications did not affect data quality and overall completeness was 100%. All PCB data were considered fully usable for decision-making.

Dioxin/Furan Data

Twenty low-level dioxin/furan results were qualified as non-detect (U) because of laboratory method blank contamination. All dioxin/furan data were considered usable for decision-making, and the overall completeness was 100%.

Metals and Mercury Data

Seven chromium results were qualified as estimated (J) because of low CCV recoveries. One mercury result was qualified as estimated (J) because of MS/MSD recoveries above the upper control limit (UCL) (see Appendix D). All metals and mercury data were considered fully usable for decision-making. The overall completeness for metals and mercury data was 100%.

Total Organic Carbon

No TOC data were qualified during the data validation process. All TOC data were considered fully usable for decision-making and completeness was 100%.

Sulfide Data

Two sulfide results were qualified as estimated (J/UJ) because of low MS/MSD recoveries (see Appendix D). These estimated data points were considered fully usable for decision-making. Overall completeness for sulfide data was 100%.

Table 1. Blakely Harbor Park Sediment Investigation Actual Sampling Coordinates

Station ID	Date	Time	Longitude (NAD83)	Latitude (NAD83)	Conventionals and SMS Parameters	Dioxins/ Furans
BH2-01	7/1/2019	4:27 PM	47.596079	-122.518107	Yes	
BH2-02	7/1/2019	4:09 PM	47.596582	-122.517801	Yes	
BH2-03	7/1/2019	3:56 PM	47.597113	-122.517116	Yes	Yes
BH2-04	7/1/2019	4:53 PM	47.595847	-122.517071	Yes	
BH2-05	7/1/2019	4:41 PM	47.596414	-122.517029	Yes	
BH2-06	7/1/2019	8:50 AM	47.596870	-122.516710	Yes	Yes
BH2-07	7/1/2019	3:40 PM	47.596000	-122.515327	Yes	
BH2-08	7/1/2019	11:03 AM	47.596290	-122.514920	Yes	Yes
BH2-09	7/1/2019	10:39 AM	47.596580	-122.514550	Yes	Yes
BH2-10	7/1/2019	5:11 PM	47.595733	-122.515318	Yes	
BH2-11	7/1/2019	5:24 PM	47.596010	-122.514930	Yes	
BH2-12	7/2/2019	10:22 AM	47.596310	-122.514540	Yes	
BH2-13	7/1/2019	5:41 PM	47.596013	-122.514522	Yes	
BH2-14	7/1/2019	2:57 PM	47.596297	-122.514122	Yes	
BH2-15	7/1/2019	5:54 PM	47.595748	-122.514519	Yes	
BH2-16	7/2/2019	2:43 PM	47.596028	-122.514115	Yes	Yes
BH2-17	7/1/2019	2:44 PM	47.596308	-122.513714	Yes	
BH2-18	7/1/2019	2:27 PM	47.596582	-122.513319	Yes	Yes
BH2-19	7/1/2019	2:04 PM	47.595474	-122.514102	Yes	
BH2-20	7/1/2019	1:44 PM	47.595755	-122.513709	Yes	
BH2-21	7/1/2019	2:02 PM	47.596041	-122.513310	Yes	Yes
BH2-22	7/1/2019	2:13 PM	47.596316	-122.512909	Yes	
BH2-23	7/1/2019	1:08 PM	47.595223	-122.513279	Yes	
BH2-24	7/2/2019	2:25 PM	47.595769	-122.512886	Yes	
BH2-25	7/2/2019	2:11 PM	47.596118	-122.512555	Yes	
BH2-26	7/2/2019	1:56 PM	47.596331	-122.512098	Yes	
BH2-27	7/1/2019	12:53 PM	47.595226	-122.512471	Yes	
BH2-28	7/1/2019	12:36 PM	47.595773	-122.512083	Yes	
BH2-29	7/2/2019	1:41 PM	47.596063	-122.511701	Yes	
BH2-30	7/2/2019	1:29 PM	47.594694	-122.512039	Yes	
BH2-31	7/2/2019	1:15 PM	47.595792	-122.511271	Yes	Yes
BH2-32	7/2/2019	12:57 PM	47.596348	-122.510884	Yes	
BH2-33	7/2/2019	12:41 PM	47.594982	-122.510847	Yes	
BH2-34	7/2/2019	12:22 PM	47.595544	-122.510451	Yes	
BH2-35	7/2/2019	12:08 PM	47.594992	-122.509620	Yes	
BH2-36	7/2/2019	11:54 AM	47.595816	-122.509241	Yes	
BH2-37	7/2/2019	11:42 AM	47.596369	-122.509253	Yes	Yes
BH2-38	7/2/2019	11:30 AM	47.596105	-122.508437	Yes	
BH2-39	7/2/2019	11:17 AM	47.595287	-122.508007	Yes	Yes
BH2-40	7/2/2019	11:05 AM	47.595586	-122.506395	Yes	

Notes

NAD83: North American Datum 1983

Table 2. Blakely Harbor Park Sediment Investigation Analytical Parameters

Analytical Name	Analytical Method
Total Solids	ASTM D2216
Total Volatile Solids	EPA 160.4
Ammonia Nitrogen	EPA 350.1
Grain Size	PSEP Plumb
Metals (As, Ad, Cr, Cu, Pb, Ni, Se, Ag, Zn)	SW 6020A/B
Metals (Hg)	SW 7470A/7471B
Total Organic Carbon	SW 9060
Sulfide	SW 9034
PCB Aroclors	SW 8082A
SVOCs	SW 8270D
Dioxins/Furans	EPA 1613B

3.0 Results

This section presents the conventional and contaminant chemistry results for the Blakely Harbor Park Sediment Investigation. The full summary of analytical results is presented in Tables B-1 and B-2 and includes comparisons to the Sediment Management Standards SCOs and CSLs. Table B-1 presents analytical results normalized to TOC, and Table B-2 presents the results in dry weight concentrations. Many of the sampling locations (24 samples, generally in the nearshore and inner harbor) contained very high TOC (>5%) because of the presence of wood debris. TOC in marine sediment typically ranges from 0.5% to 5% (Michelsen 1992). Therefore, per the guidance of SCUM II, samples outside of the typical TOC ranges were compared to both the TOC-normalized and dry weight Marine Sediment Apparent Effects Thresholds (AETs) (Tables B-1 and B-2, respectively).

Dioxin/furan congeners were calculated as a toxic equivalent (TEQ) for each sample using the toxic equivalency factor (TEF) values for mammals from the World Health Organization (Van den Berg et al. 2006).

The full laboratory reports are provided as Appendix C.

3.1. Conventionals and Grain Size Distribution

Conventional parameters measured during the Blakely Harbor Park Sediment Investigation included total solids, TVS, TOC, total sulfides, ammonia, and grain size.

Total solids ranged from a minimum of 28.2% at station BH2-32 near the former lumber shed to a maximum of 75.9% at BH2-23 along the southern shore of the inner harbor where sandy sediments were present. The average total solids for all Blakely Harbor samples was 52.8% (±15.5%, n=44). The distribution of sediment grain size followed a distribution pattern similar to total solids. The percentage of fines (silt and clay) in Blakely Harbor sediments is presented in Figure 2. Finer-grained sediments (percent fines >60%) were observed in the log pond, inner harbor, and shallow subtidal locations along the northern shore. Coarser-grained, sandy sediments (percent fines <20%) were generally observed in the central harbor and the southern shore of the inner harbor.

TVS can be considered a surrogate for providing a rough estimate of the amount of wood debris present in sediments (Ecology 2013). Lower TVS (<2%) was generally observed in the central and outer portions of Blakely Harbor as well as the southern shore of the inner harbor. Higher TVS (>6%) was measured in the log pond, inner harbor intertidal areas, and shallow subtidal areas along the northern shore near historical structures (Figure 3). These measurements were generally correlated with the presence of abundant wood debris observed in sediment samples during collection (see Appendix A).

TOC ranged from a minimum of 0.45% at station BH2-23 along the southern shore of the inner

harbor where sandy sediments were present to a maximum of 22% at BH2-16 near the former saw mill site (Figure 4). The average TOC for all Blakely Harbor samples was 7.0% (±5.74%, n=44), which was generally higher than typical marine sediments because of the presence of wood debris.

Elevated total sulfides concentrations in marine sediments can suggest higher sediment oxygen demand due to higher inputs of organic matter such as wood debris. Total sulfides in Blakely Harbor sediments ranged from undetected at 13 stations to a maximum of 1,100 mg/kg at BH2-12 in the inner harbor intertidal areas near the former saw mill site (Figure 5). Higher total sulfide concentrations were generally measured in the intertidal areas in the inner harbor near the former saw mill site and shallow subtidal areas along the northern shore.

Ammonia was undetected in Blakely Harbor surface sediments with the exception of low estimated concentrations measured at BH2-6 in the log pond and at intertidal stations BH2-7, BH2-8, and BH2-9 in the inner harbor, near the former saw mill site.

3.2. Metals

The SMS metals were detected in all Blakely Harbor sediment samples at concentrations below SMS criteria with the exception of a few samples near the historical structures. Lead exceeded the SCO at BH2-22 and exceeded the CSL at BH2-21 (Figure 6). Mercury exceeded the SCO at BH2-37 and exceeded the CSL at BH2-20, BH2-22, BH2-25, and BH2-32 (Figure 7). The mercury concentration at BH2-20 was measured at 2.2 mg/kg DW, well above the CSL of 0.59 mg/kg DW. Zinc exceeded the SCO at BH2-17 (Figure 8).

3.3. Polycyclic Aromatic Hydrocarbons (PAHs)

TOC concentrations in eighteen Blakely Harbor sediments fell within the typical range (0.5% to 5%) for Puget Sound marine sediments (samples BH2-01, BH2-10, BH2-15, BH2-18, BH2-19, BH2-21, BH2-27, BH2-28, BH2-29, BH2-30, BH2-31, BH2-33, BH2-34, BH2-35, BH2-36, BH2-38, BH2-39, and BH2-40). Therefore, PAH concentrations for these samples were compared to TOC-normalized SMS criteria (Table B-1). PAH concentrations for all other samples were compared to both TOC-normalized and dry weight SMS criteria (Tables B-1 and B-2).

3.3.1. Low Molecular Weight PAHs (LPAHs)

The LPAH concentrations for the eighteen Blakely Harbor samples with typical TOC ranges were below TOC-normalized SMS criteria.

For the Blakely Harbor samples outside of typical TOC ranges, LPAH concentrations for all samples were below TOC-normalized SMS criteria with the exception of BH2-32, where acenaphthene, fluorene, and phenanthrene exceeded the SCO (Table B-1). Dry weight

concentrations for phenanthrene exceeded the CSL for several samples in the inner harbor and near historical structures (BH2-07, BH2-08, BH2-09, BH2-13, BH2-14, BH2-16, BH2-17, BH2-22, and BH2-32). Samples with more than one LPAH compound exceeding the dry weight CSL included BH2-14, BH2-16, BH2-22, and BH2-32. Dry weight total LPAH concentrations exceeded the dry weight CSL at BH2-07, BH2-13, BH2-14, BH2-16, BH2-22, and BH2-32 (Figure 9). All measured LPAH compounds at BH2-32 were above the dry weight CSLs with the exception of acenaphthylene (Table B-2).

3.3.2. High Molecular Weight PAHs (HPAHs)

The HPAH concentrations for the eighteen Blakely Harbor samples with typical TOC ranges were below TOC-normalized SMS criteria.

For the Blakely Harbor samples outside of typical TOC ranges, HPAH concentrations for all samples were also below TOC-normalized SMS criteria. Dry weight concentrations for fluoranthene, pyrene, indeno(1,2,3-c,d)pyrene, and benzo(g,h,i)perylene exceeded the SCO or CSL for several samples (see Table B-2). Samples with several HPAH compounds that exceeded dry weight SCOs or CSLs included samples in the inner harbor and near historical structures (BH2-13, BH2-14, BH2-16, BH2-17, BH2-22, BH2-32, and BH2-37). Dry weight total HPAH concentrations exceeded the SCO at BH2-13, BH2-14, and BH2-37, and exceeded the CSL at BH2-16, BH2-22, and BH2-32 (Figure 10).

3.4. Chlorinated Hydrocarbons

Chlorinated hydrocarbon compounds were undetected in Blakely Harbor sediments. However, elevated detection limits for 1,2-dichlorobenzene, 1,2,4-trichlorobenzene, and hexachlorobenzene exceeded the CSO or CSL for several samples (Tables B-1 and B-2). As discussed in Section 2.4.4, SVOC sample extracts required dilutions ranging from 10X, 20X, and 50X prior to analysis because of sample matrix interferences for the high level of target and non-target compounds in the sample. These required dilutions resulted in elevated detection limits for the chlorinated hydrocarbons.

3.5. Phthalates

Phthalate compounds were generally undetected in Blakely Harbor sediments with the exception of butyl benzyl phthalate. Of the samples with typical TOC ranges, butyl benzyl phthalate estimated concentrations exceeded the TOC-normalized SCO at stations BH2-10 and BH2-18 (Figure 11).

For the Blakely Harbor samples outside of typical TOC ranges, butyl benzyl phthalate estimated concentrations exceeded the TOC-normalized SCO at stations BH2-07 and BH2-08 (Figure 11). Estimated dry weight concentrations of butyl benzyl phthalate exceeded the SCO at several

stations in the log pond and inner harbor (BH2-02, BH2-03, BH2-04, BH2-05, BH2-06, BH2-07, BH2-14, and BH2-17) (Figure 12). Similar to the chlorinated hydrocarbons, elevated detection limits due to SVOC sample dilutions resulted in undetected values for butyl benzyl phthalate exceeding the TOC-normalized SCO for several samples. Undetected values of dimethyl phthalate and diethyl phthalate for several samples also exceeded dry weight SCOs or CSLs because of elevated detection limits (Tables B-1 and B-2).

3.6. Miscellaneous Extractables

All TOC-normalized concentrations of miscellaneous extractables were below SMS criteria. However, the dry weight concentrations for dibenzofuran and N-nitrosodiphenylamine exceeded the CSL for two samples with non-typical TOC ranges (BH2-16 and BH2-32, Table B-2). Although undetected, elevated detection limits for hexachlorobutadiene (due to SVOC sample dilutions) exceeded the TOC-normalized SCO for three samples and the CSL for one sample. Elevated detection limits for hexachlorobutiadiene and N-nitrosodiphenylamine also exceeded the dry weight SCOs or CSLs for the majority samples (Table B-2).

3.7. PCBs

PCB Aroclors were undetected with the exception of Aroclor 1254, which was detected at very low or estimated concentrations (Tables B-1 and B-2). PCB Aroclors were not a concern in Blakely Harbor sediments.

3.8. Phenols

Organic waste such as wood debris can break down into soluble, toxic compounds such as phenols and methylphenols (Ecology 2017). Phenol and 3- and 4-methylphenol were detected in some Blakely Harbor samples that exceeded dry weight SMS criteria. Phenol exceeded the SCO at BH2-02, BH2-03, BH2-04, BH2-05, BH2-08, BH2-10, BH2-14, BH2-17, BH2-20, BH2-21, BH-22, and BH2-27, and exceeded the CSL at BH2-07, BH2-09, and BH2-37 (Figure 13). Concentrations of 3- and 4-Methylphenol exceeded the CSL at BH2-07, BH2-17, BH-20, BH-22, and BH-37. (Figure 14)

3.9. Dioxins/Furans

Dioxin/furan congeners were analyzed in 10 Blakely Harbor sediments and ranged from 1.2 ng/kg TEQ at BH2-31 to 15.4 ng/kg TEQ at BH2-03. The highest dioxin/furan TEQs (>10 ng/kg TEQ) were measured at BH2-03 and BH2-06 in the log pond and station BH2-16 in the inner harbor near the former saw mill (Figure 15). Stations with dioxin/furan TEQs just

above the Puget Sound natural background of 4 ng/kg TEQ included BH2-9, BH2-18, BH2-21, and BH2-37.

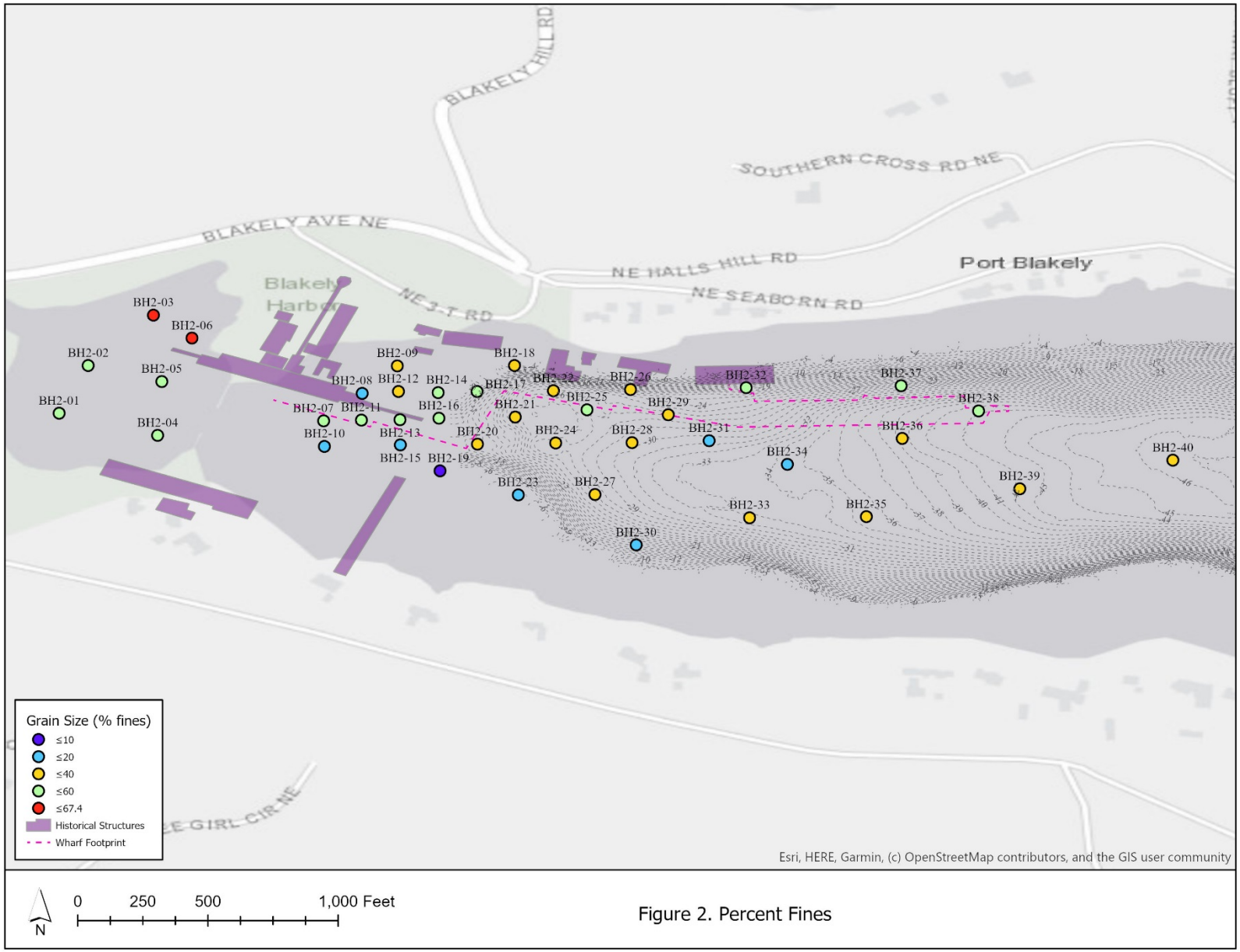

Figure 2. Percent Fines

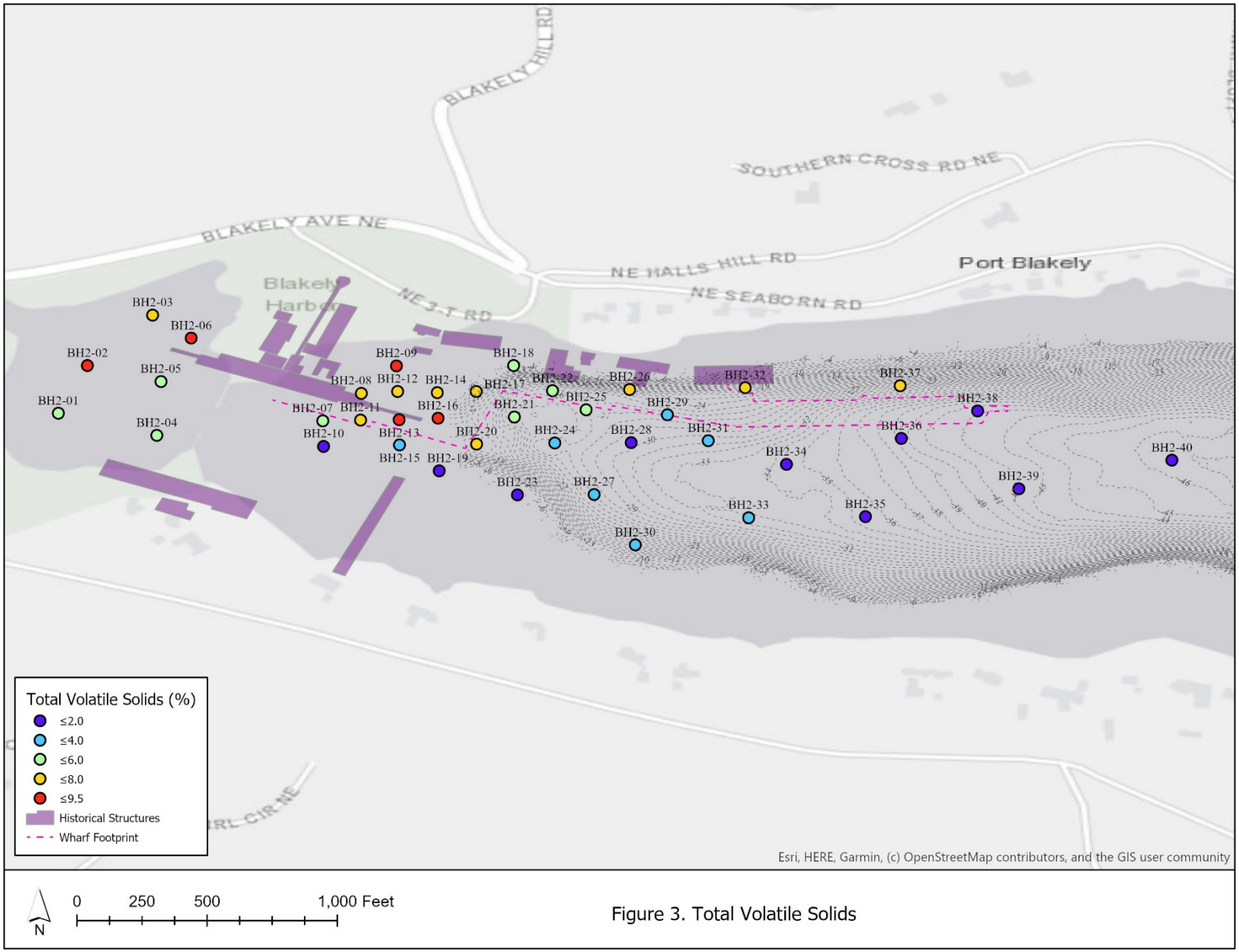

Figure 3. Total Volatile Solids

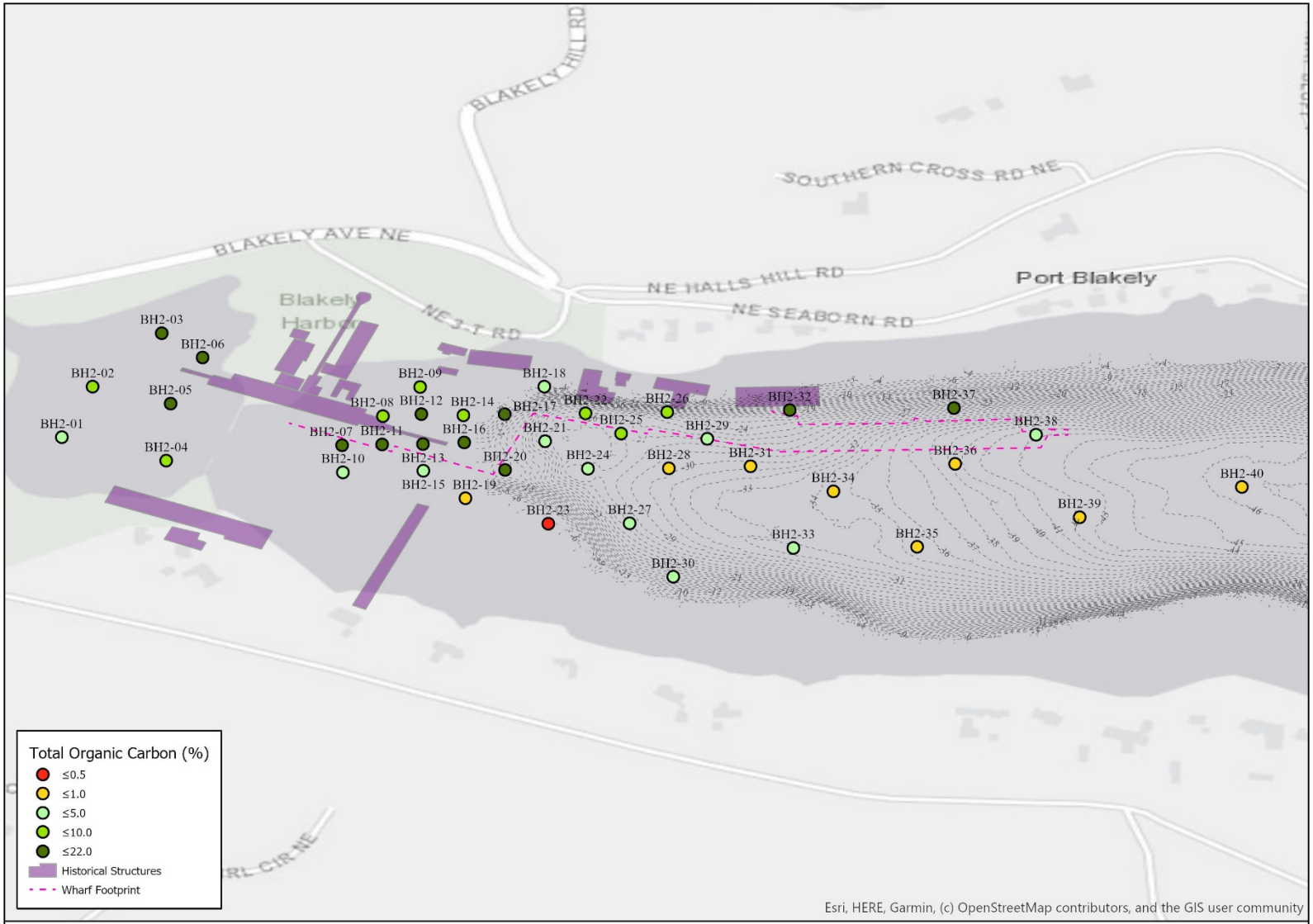

Figure 4. Total Organic Carbon

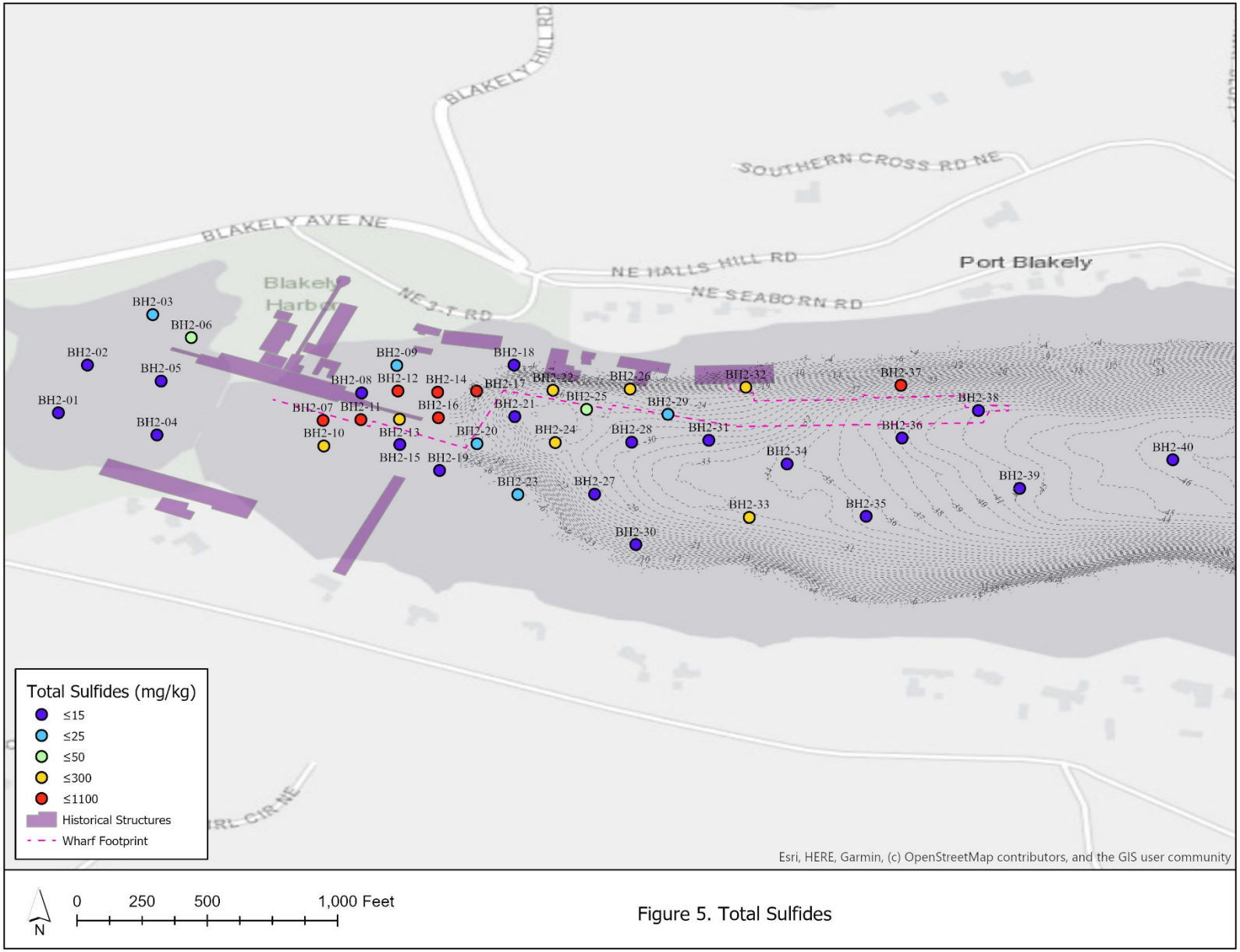

Figure 5. Total Sulfides

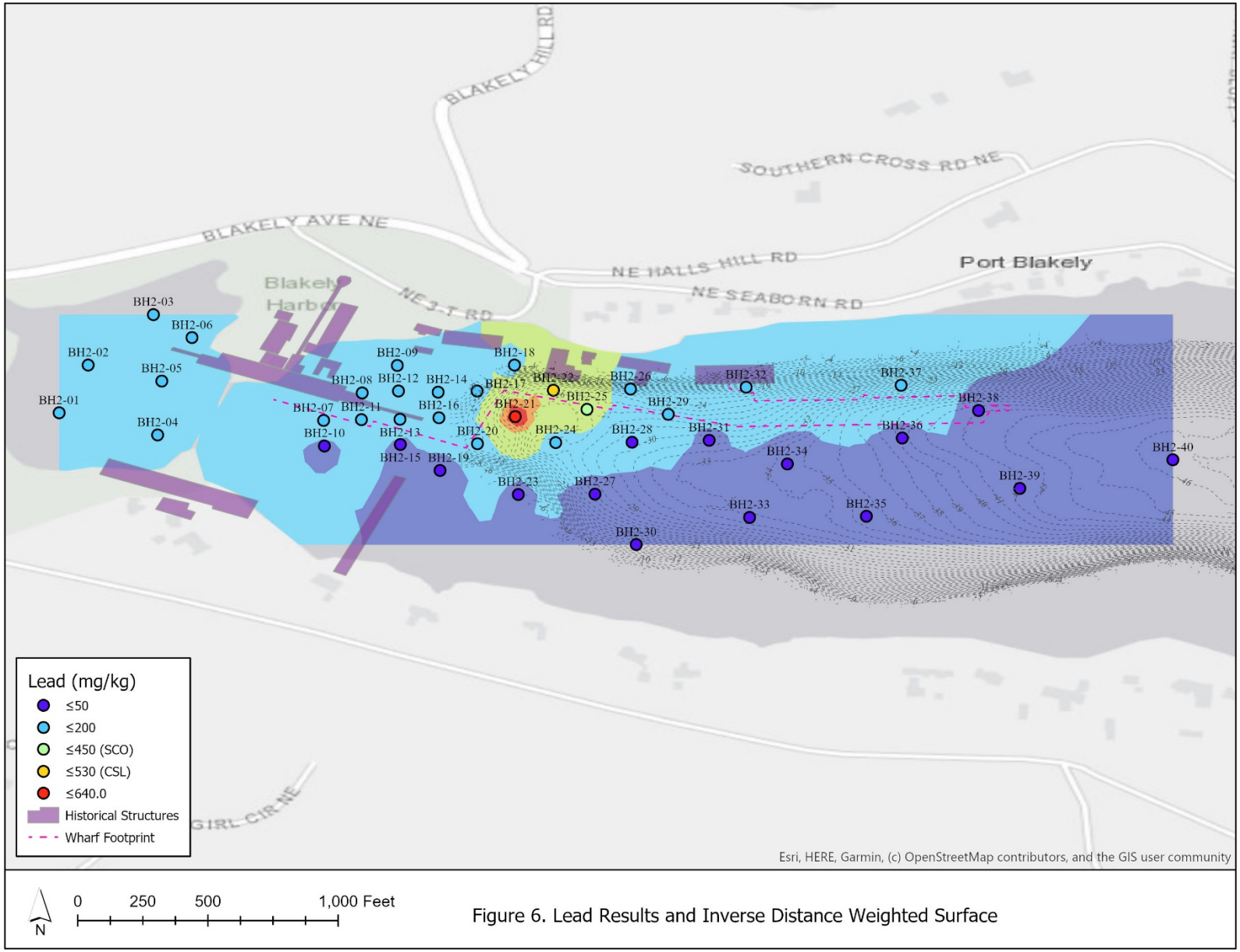

Figure 6. Lead Results and Inverse Distance Weighted Surface

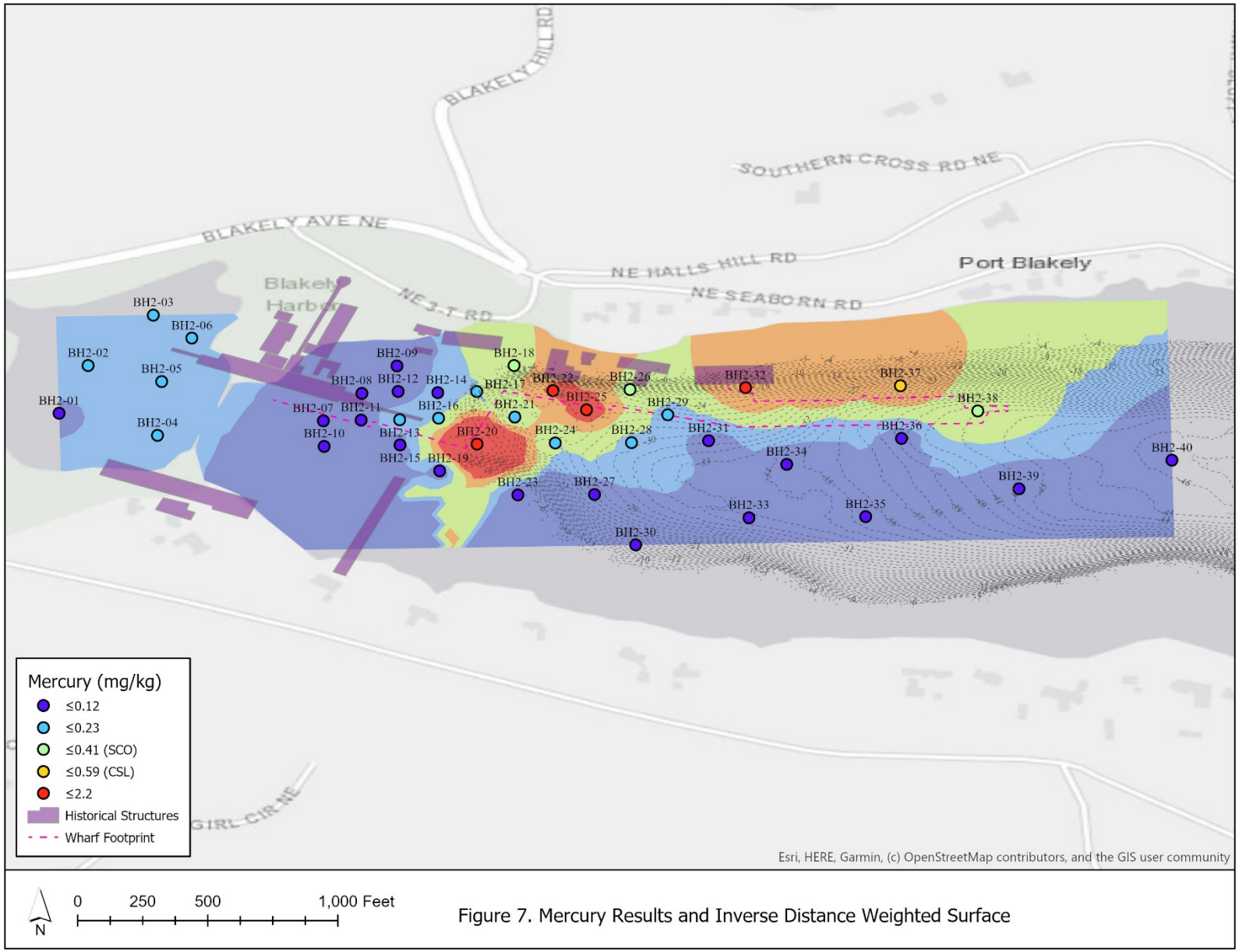

Figure 7. Mercury Results and Inverse Distance Weighted Surface

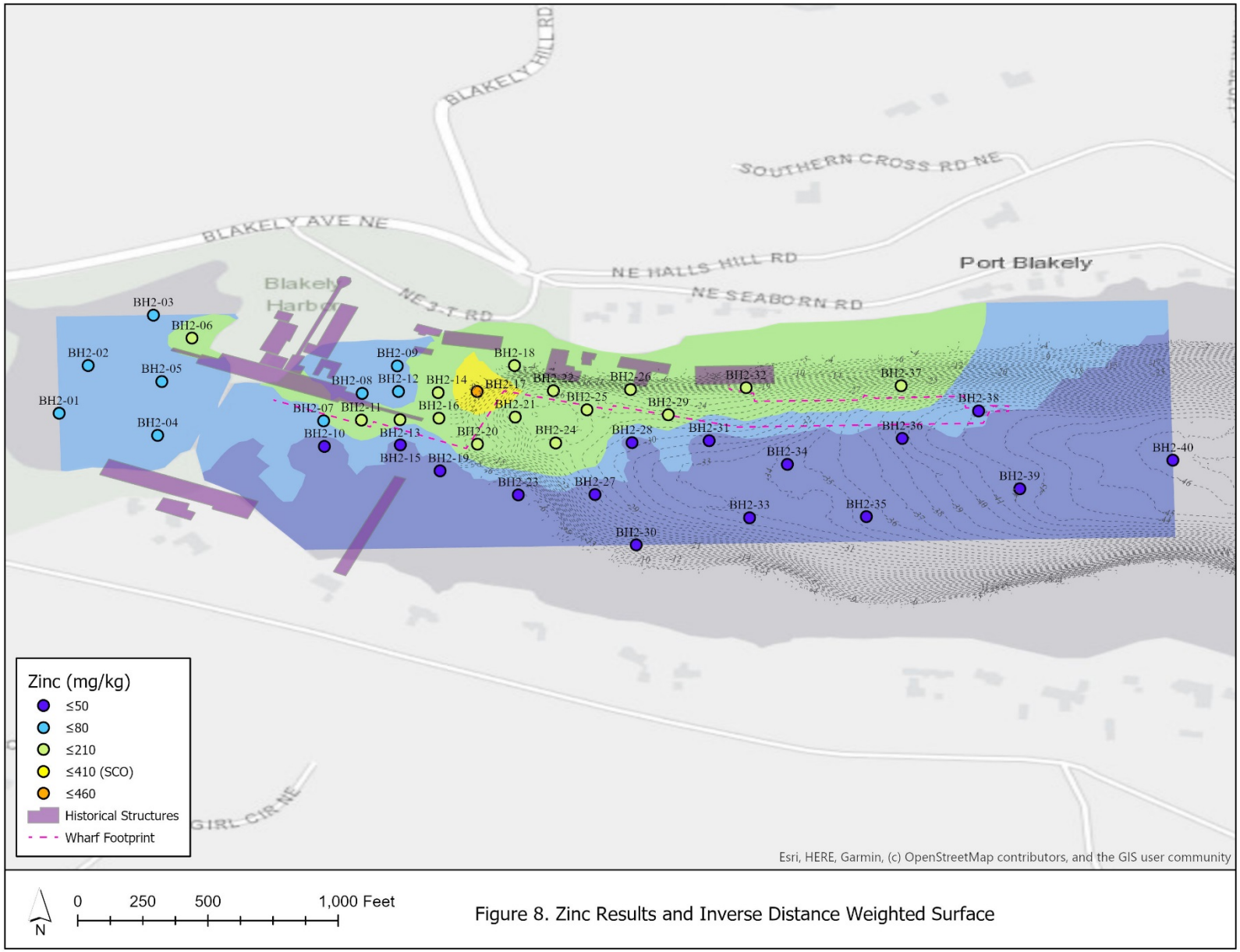

Figure 8. Zinc Results and Inverse Distance Weighted Surface

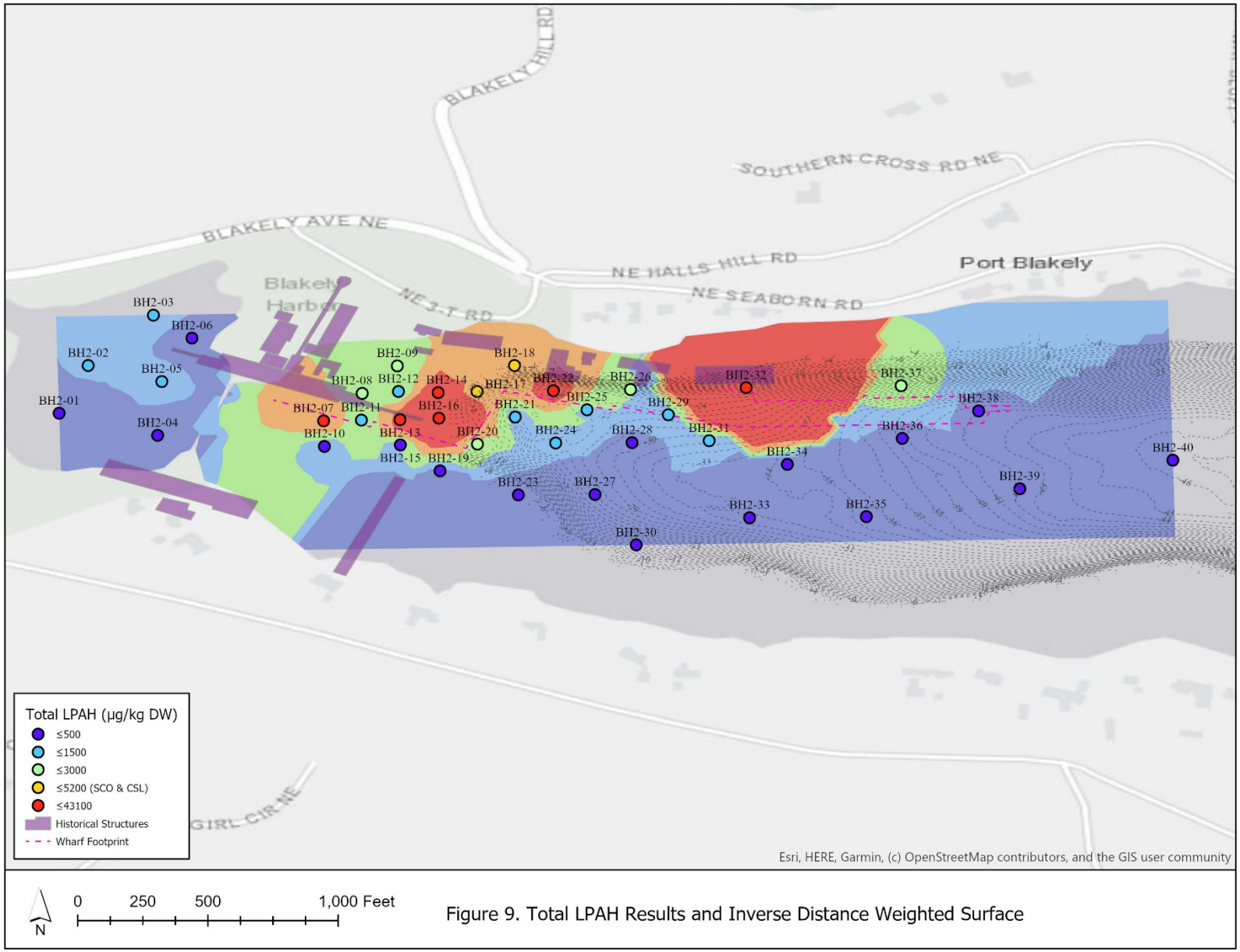

Figure 9. Total LPAH Results and Inverse Distance Weighted Surface

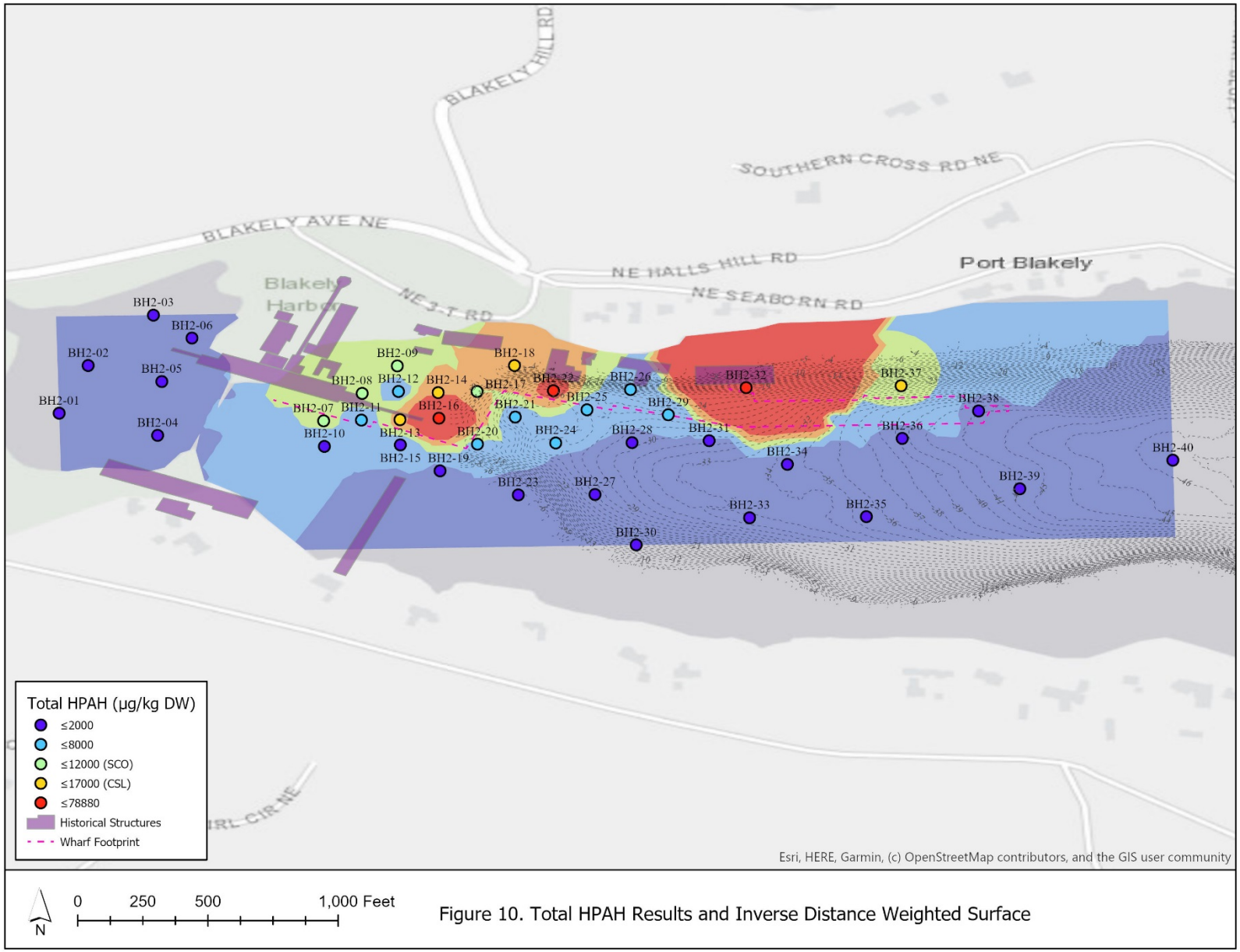

Figure 10. Total HPAH Results and Inverse Distance Weighted Surface

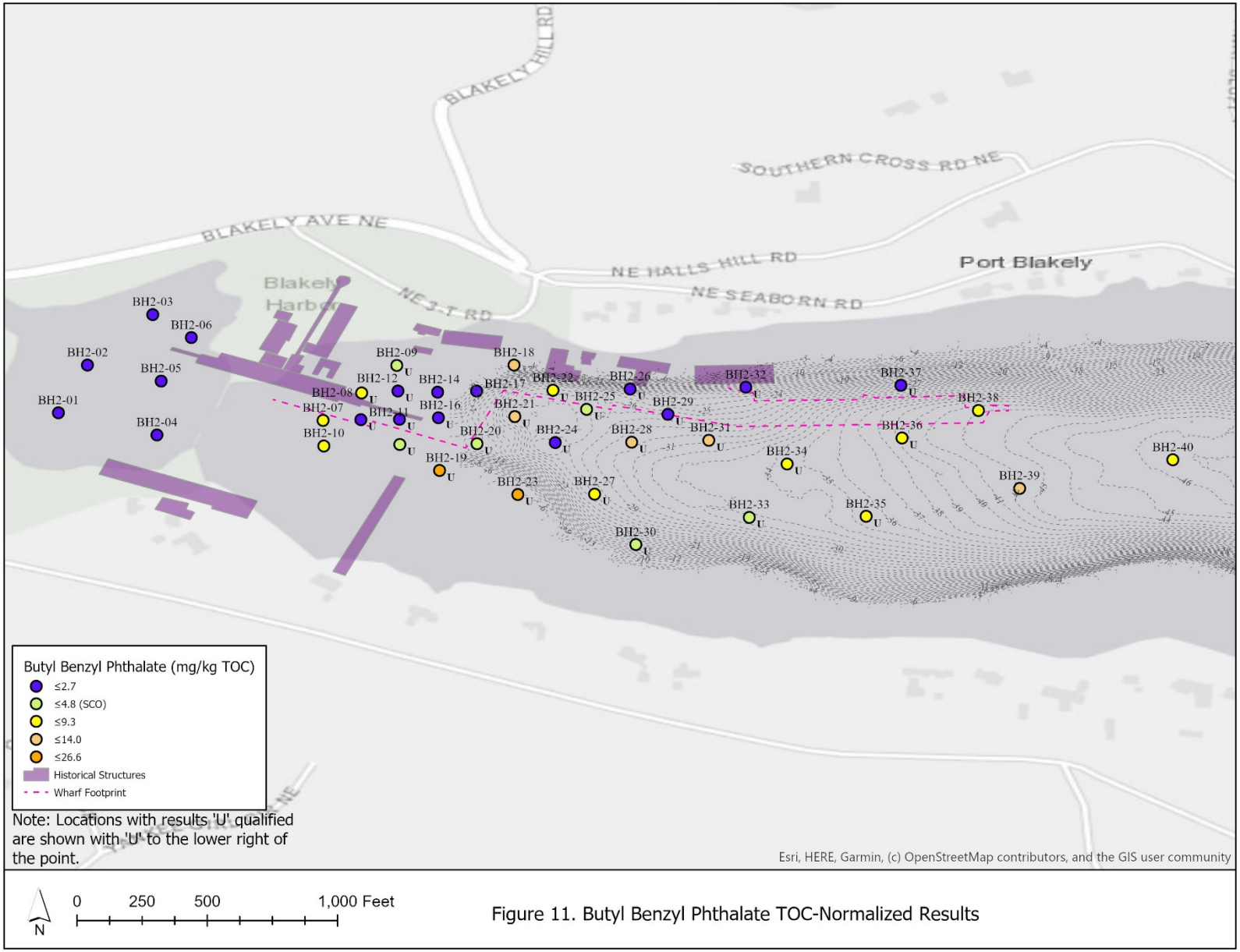

Figure 11. Butyl Benzyl Phthalate TOC-Normalized Results

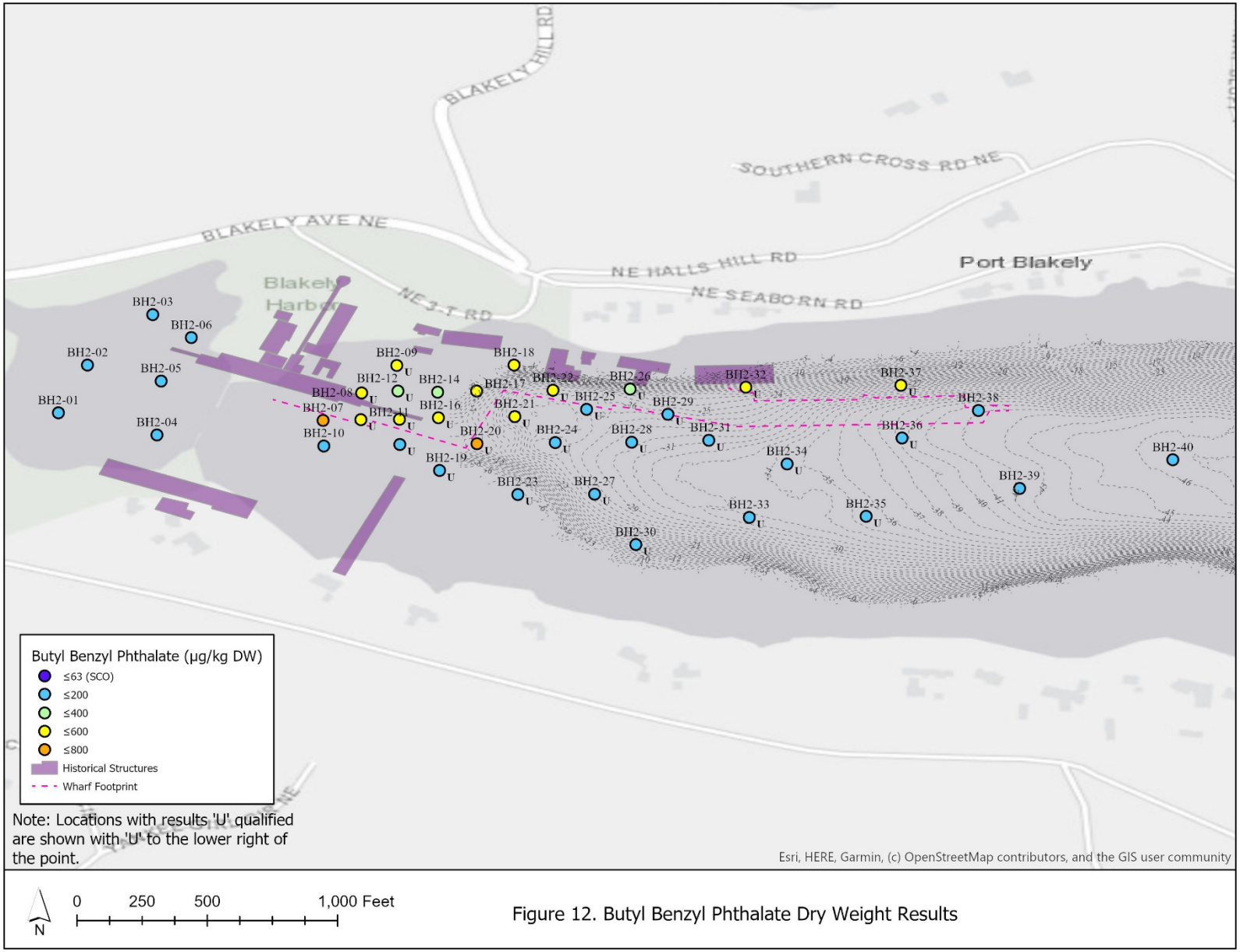

Figure 12. Butyl Benzyl Phthalate Dry Weight Results

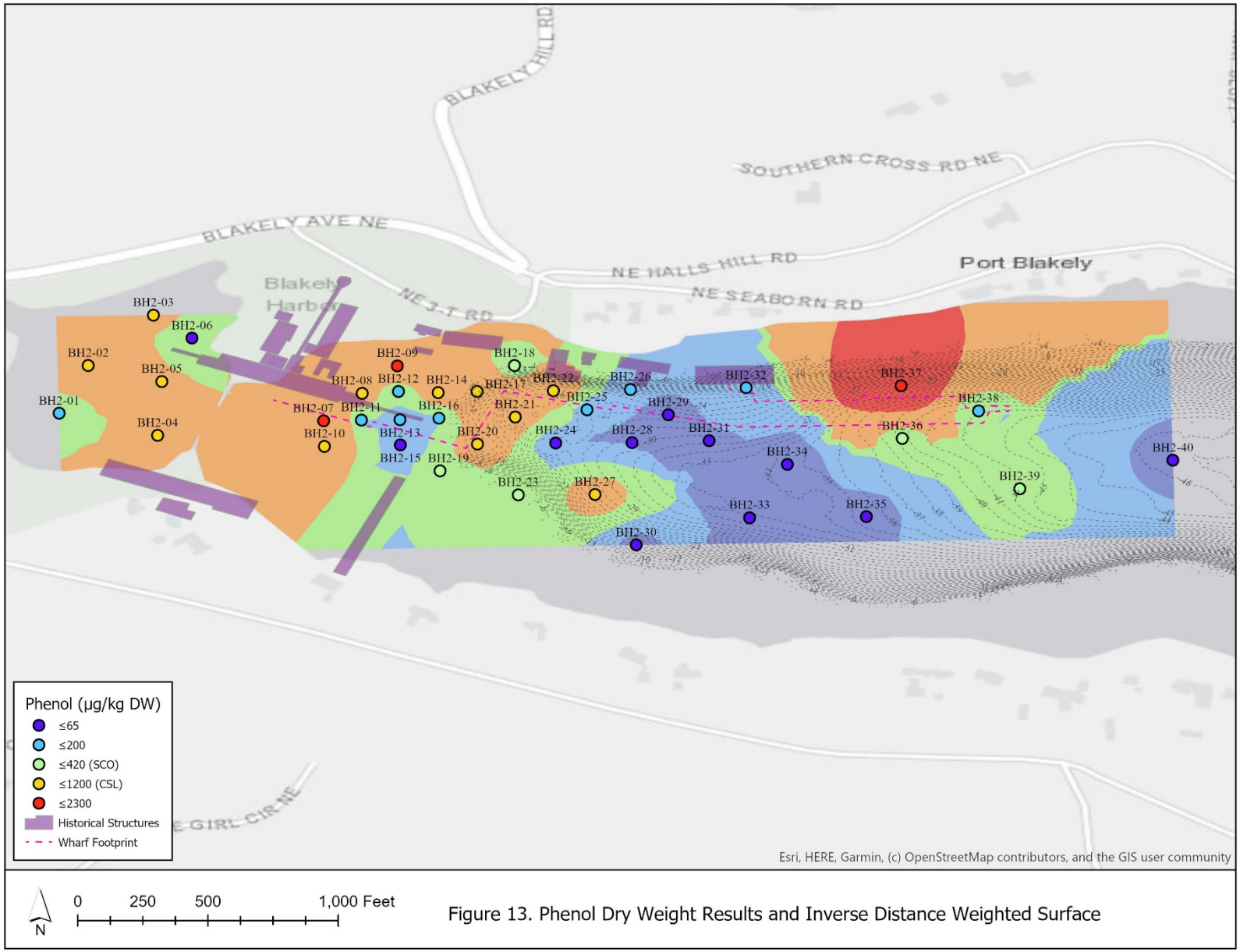

Figure 13. Phenol Dry Weight Results and Inverse Distance Weighted Surface

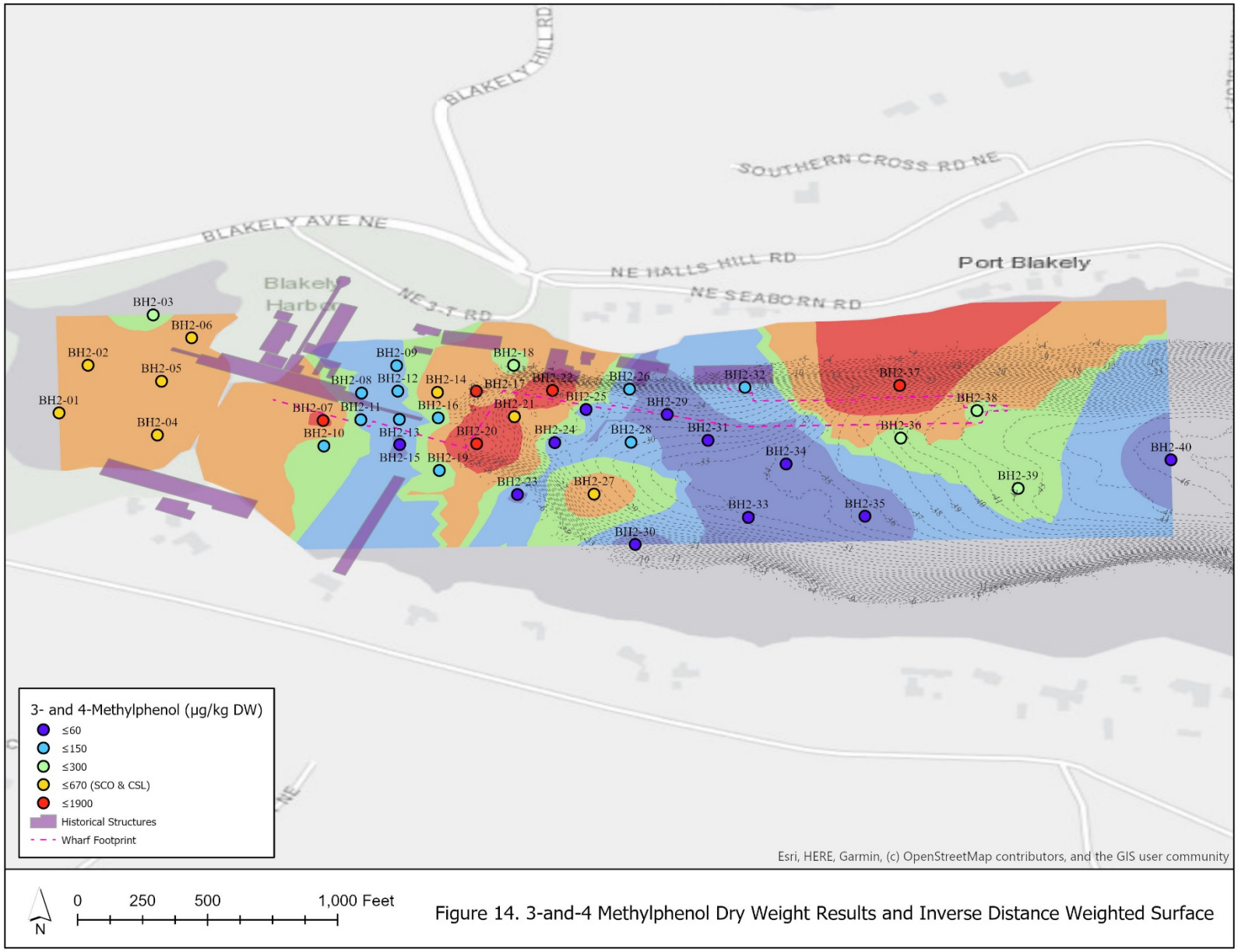

Figure 14. 3-and-4 Methylphenol Dry Weight Results and Inverse Distance Weighted Surface

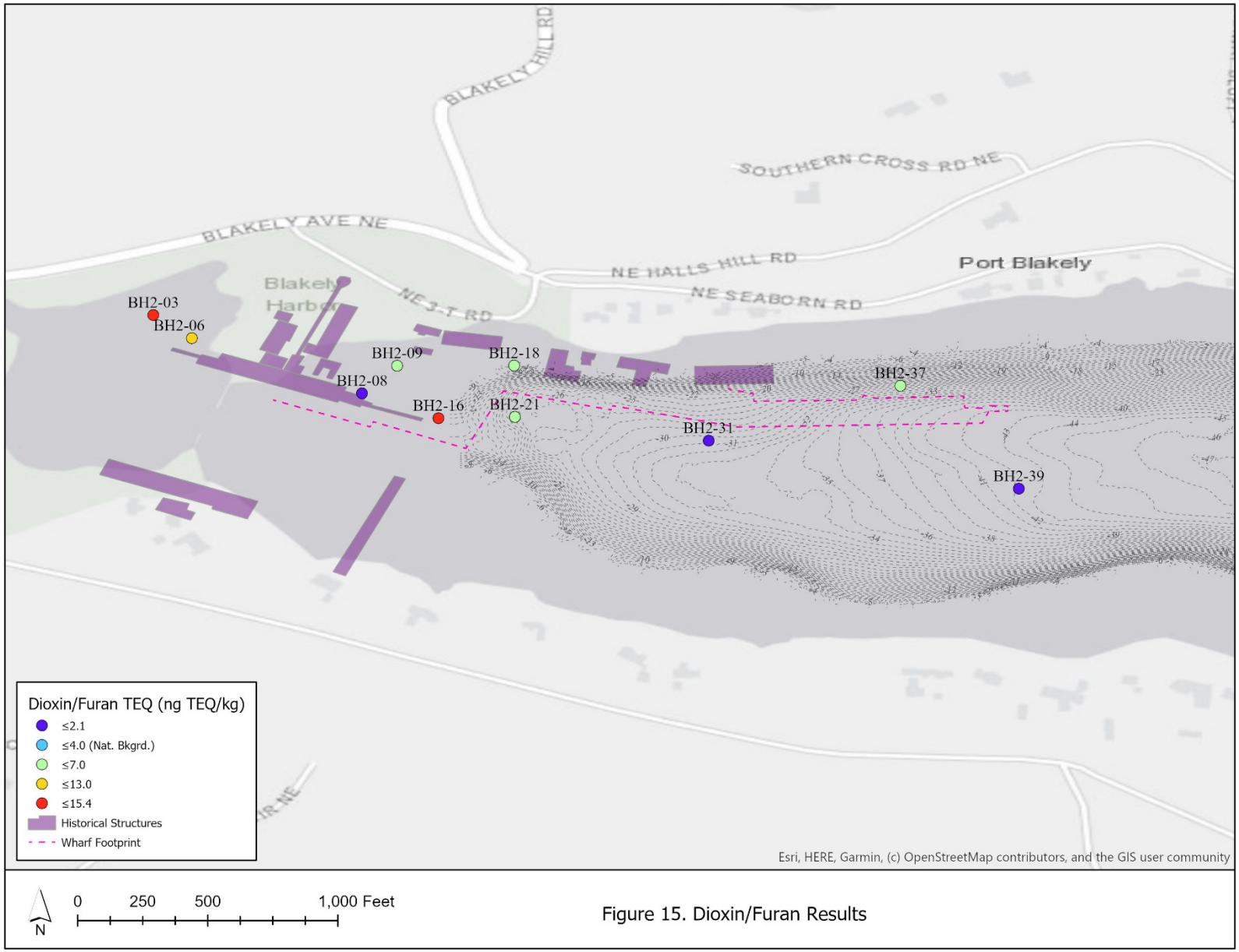

Figure 15. Dioxin/Furan Results

4.0 Summary and Recommendations

4.1. Summary of Findings

Surface sediment (0–10 cm) samples in Blakely Harbor with chemical concentrations that fall below SMS sediment quality criteria include one sample in the log pond (BH2-01), two samples near the former saw mill (BH2-11 and BH2-12), and the majority of samples in the outer harbor located south of the former wharf footprint (BH2-15, BH2-19, BH2-23, BH2-24, BH2-26, BH2-28, BH2-29, BH2-30, BH2-31, BH2-33, BH2-34, BH2-35, BH2-36, BH2-38, BH2-39, and BH2-40).

Surface sediment samples with typical TOC ranges (0.5% to 5.0%) all fell below TOC-normalized SMS criteria with the exception of four samples in the inner harbor that exceeded the SCO for phthalates or phenols (BH2-10, BH2-18, BH2-21, and BH-27) and the one sample that exceeded the CSL for mercury (BH-21) (Table 3).

Surface sediment samples with TOC outside of typical ranges (<0.5% or >5.0%) were compared to both TOC-normalized and dry weight SMS criteria (Table 4). Locations with the greatest number of compounds that exceeded their respective CSLs included BH2-16 (14 compounds) near the eastern end of the former saw mill, BH2-22 (12 compounds) near the former post office, and BH2-32 (17 compounds) near the former lumber shed. The majority of compounds were LPAHs and HPAHs. The miscellaneous extractables dibenzofuran and N-nitrosodiphenylamine also exceeded the CSLs at BH2-16 and BH2-32.

Several other stations in the vicinity of the historical structures (BH2-07, BH2-08, BH2-09, BH2-13, BH2-14, BH2-17, and BH2-20) had LPAH or HPAH concentrations that exceeded SCO and/or CSL criteria but with a lower number of compounds (3–10 compounds).

Elevated metals concentrations were measured in the northwest inner harbor near the historical structures (BH2-20, BH2-21, BH2-22, BH2-25, and BH2-32) and near the eastern end of the former wharf footprint (BH2-37). Mercury exceeded the CSL at BH2-20, BH2-22, BH2-25, and BH2-32, with the highest concentration (2.2 mg/kg DW) measured at BH2-20, just east of the former saw mill (and adjacent to BH2-16, where elevated PAHs were measured). Lead exceeded the CSL at BH2-21.

Phthalates and phenols were common contaminants in the log pond, exceeding the SCO criteria for butyl benzyl phthalate and phenol.

4.2. Recommendations

Further investigation is recommended in the shallow subtidal region between BH2-32 and BH2-

37 to delineate the extent of PAHs in this area and to evaluate the likely sources and extent of mercury and phenol measured at BH2-37.

Because of several PAH benthic exceedances, the carcinogenic PAH (cPAH) TEQ concentrations should be calculated and compared to natural background concentrations.

Subsurface sampling (e.g., coring) in the northwest inner harbor near the historical structures, particularly near BH2-16, BH2-22, and BH2-32, should be considered to delineate the vertical extent of contaminants in those areas.

Marine biological toxicity testing should be considered to determine the potential for adverse biological effects in those areas with compounds that exceed CSL criteria. Biological toxicity testing would also assist with the evaluation of potential synergistic effects of multiple chemicals and impacts from wood debris (Ecology 2017).

Dioxin/furan congener concentrations were elevated in the two log pond samples (BH2-03 and BH2-06) relative to the Puget Sound natural background concentration of 4.0 ng/kg TEQ and the majority of concentrations measured in the harbor. It may be advisable to analyze the archived samples for the other log pond locations (BH2-01, BH2-02, BH2-04, and BH2-05) to fully evaluate dioxin/furan congener concentrations in the log pond surface sediments.

As discussed in Section 2.4.2., it was necessary for the analytical laboratory to dilute the SVOC sample extracts prior to analysis. This resulted in elevated detection limits, which exceeded SMS criteria for chlorinated hydrocarbons, phthalates, and miscellaneous extractables. If follow-up sampling or testing is conducted, confirmatory analyses using additional extract cleanup or higher resolution SVOC analytical methods (e.g., selective ion monitoring [SIM]) is recommended to confirm that the affected compounds are not present at concentrations above the SCOs or CSLs.

Table 3. Number of Compounds Exceeding TOC-Normalized SMS Criteria for Typical TOC-Range Samples[1]

	Metals		LPAHs		HPAHs		Phthalates		Miscellaneous Extractables		Phenols		Total Exceeded	
Sample	SCO	CSL	SCO	CSL	SCO	CSL	SCO	CSL	SCO	CSL	SCO	CSL	SCO	CSL
BH2-10							1				1		2	0
BH2-18							1						1	0
BH2-21		1									1		1	1
BH2-27											1		1	0

[1] Typical TOC Range (0.5% to 5.0%)

Table 4. Number of Compounds Exceeding TOC-Normalized or Dry Weight SMS Criteria for Non-Typical TOC-Range Samples[1]

	Metals		LPAHs		HPAHs		Phthalates		Miscellaneous Extractables		Phenols		Total Exceeded	
Sample	**SCO**	**CSL**	**SCO**	**CSL**	**SCO**	**CSL**	**SCO**	**CSL**	**SCO**	**CSL**	**SCO**	**CSL**	**SCO**	**CSL**
BH2-02							1				1		2	0
BH2-03							1				1		2	0
BH2-04							1				1		2	0
BH2-05							1				1		2	0
BH2-06							1						1	0
BH2-07				2	1	1	1					2	2	5
BH2-08				1	1	2	1				1		3	3
BH2-09				1	1							1	1	2
BH2-13				1	2	4							2	5
BH2-14				1	1	5	1				1		3	6
BH2-16				4		8				2			0	14
BH2-17	1			1	4	1	1				1	1	7	3
BH2-20		1			1						1	1	2	2
BH2-22	1	1		3	1	7					1	1	3	12
BH2-25		1											0	1
BH2-32		1		6		8				2			0	17
BH2-37	1											2	1	2

[1] Non-Typical TOC Range (<0.5% or >5.0%)

5.0 References

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J. Tuomisto, M. Tysklind, N. Walker, and R. Peterson. 2006. The 2005 World Health Organization Re-Evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds. Prepared for the World Health Organization (WHO). ToxSci Advance Access published July 7, 2006. Published by Oxford University Press on behalf of the Society of Toxicology.

Appendices

Appendix A. Field Completion Report

NewFields
Perspective. Vision. Solutions.

Sediment Management and Marine Sciences

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Edmonds, WA 98020

T: 425.967.5285

MEMORANDUM

DATE: July 15, 2019

TO: John Evered – Washington State Department of Ecology

FROM: John Nakayama, Stephani Shusta, Leon Delwiche – NewFields

COPY: Tom Dubé – Leidos

SUBJECT: Field Completion Report – Blakely Harbor Park Sediment Investigation

1.0 Introduction

This field completion report provides a summary of field sampling operations conducted for the 2019 Blakely Harbor Park Sediment Investigation on July 1 and 2, 2019. Field sampling methods were consistent with the Sampling and Analysis Plan and Quality Assurance Project Plan (SAP/QAPP; Leidos and NewFields 2019) except as noted in this memorandum. The following section provides a brief narrative of the field sampling operations. Attachments to the memorandum include the following:

1. Map showing actual sampling locations
2. Summary table of geographic coordinates
3. Photographs of the sediment surface grabs and intertidal samples
4. Field logbook
5. Grab logbook
6. Chain-of-custody forms
7. Sample container logbook

2.0 Summary of Field Operations

July 1, 2019

On the morning of July 1, John Nakayama and Stephani Shusta of NewFields traveled to Blakely Harbor Park on Bainbridge Island to conduct sediment sampling of intertidal locations at low tide. Sampling was attempted in the log pond by walking out to the proposed locations at low tide. Due to unconsolidated sediments, only one location in the log pond (BH2-06) could be accessed by foot and sampled. Two locations near the former saw mill site (BH2-08 and BH2-

09) were also sampled on foot before the tide came in.

Upon arrival at the target coordinates, the following tasks were completed to collect a sediment sample at each intertidal site:

- A geographic position was recorded using a hand-held WAAS-enabled GPS unit.
- A photograph was taken of the surface sediment.
- Visual descriptions of the sediment were recorded in the grab logbook, including the presence of wood debris and organisms and any noticeable odor.
- A 4-oz jar was filled directly with representative surface sediments (top 10 cm) and preserved with zinc acetate for total sulfide analysis.
- A pre-cleaned stainless steel spoon was used to collect the top 10 cm of sediment and placed in a pre-cleaned stainless steel bowl.
- The sediment was homogenized to a consistent color and texture, placed in appropriate sample jars, labeled, and stored in coolers on ice.

At approximately 12:30 pm, John Nakayama and Stephani Shusta traveled to the Eagle Harbor public boat launch to load sediment processing equipment and sample jars aboard the research vessel (R/V) *Carolyn Dow* to conduct grab sampling operations. Eric Parker captained the R/V *Carolyn Dow* and was assisted by the vessel deckhand, Andrew Muth, in conducting the deployment and recovery operations of the powered grab sampler. Surface sediment samples were successfully collected at 20 locations in Blakely Harbor, including the remaining log pond locations that were accessible by the sampling vessel at high tide. An equipment rinsate was also collected.

Upon arrival at the target coordinates, the following tasks were completed to collect a sediment sample using the powered grab sampler:

- The powered grab sampler was cleaned with Alconox soap, rinsed with site water, rinsed with distilled water, and then deployed.
- When the grab sampler reached the seafloor, a geographic position was recorded using the vessel's DGPS navigation system.
- The powered grab sampler was retrieved. If an acceptable grab was obtained, the overlying water was removed with a siphon.
- A photograph of the grab sample was taken.
- Visual descriptions of the sediment were recorded in the grab logbook, including the presence of wood debris and organisms and any noticeable odor.
- A 4-oz jar was filled directly with representative surface sediments (top 10 cm) and preserved with zinc acetate for total sulfide analysis.
- A pre-cleaned stainless steel spoon was used to collect the top 10 cm of sediment and placed in a pre-cleaned stainless steel bowl.
- The sediment was homogenized to a consistent color and texture, placed in appropriate sample jars, labeled, and stored in coolers on ice.

Three grab sample attempts were made at location BH2-12, but a successful grab sample could

not be collected due to the presence of compact wood debris on the sediment surface (boards or planks). It was decided that sampling would be attempted by foot at low tide on July 2.

A communication cable crossing sign (U.S. West) was noted on the northern shore near the former post office building. This marker was not observed during the initial site visit. Ecology and Leidos were notified, and a utility inquiry was initiated by Leidos to determine the nature and location of the cable.

All samples were stored on ice in coolers and kept under chain-of-custody.

July 2, 2019

On the morning of July 2, John Nakayama and Stephani Shusta of NewFields traveled to Blakely Harbor Park on Bainbridge Island to complete sediment sampling of the one remaining intertidal location at low tide. Sampling of BH2-12 was successfully completed. A utility locator specialist met with NewFields at Blakely Harbor Park to provide information regarding the communication cable. The cable route was reported to run north-south across the harbor, was abandoned by the utility, and likely buried under sediment. With concurrence from Ecology, any sampling locations in close proximity to the cable route were moved laterally to avoid potential fouling of the cable.

At approximately 11:00 am, John Nakayama and Stephani Shusta traveled to the Eagle Harbor public boat launch to meet the R/V *Carolyn Dow* and continue grab sampling operations. Surface sediment samples were successfully collected at the 16 remaining locations in Blakely Harbor. Location BH2-25 was moved approximately 30 feet northwest of the target coordinates to avoid potential fouling of the cable crossing the harbor. An equipment rinsate and a rinsate blank were collected.

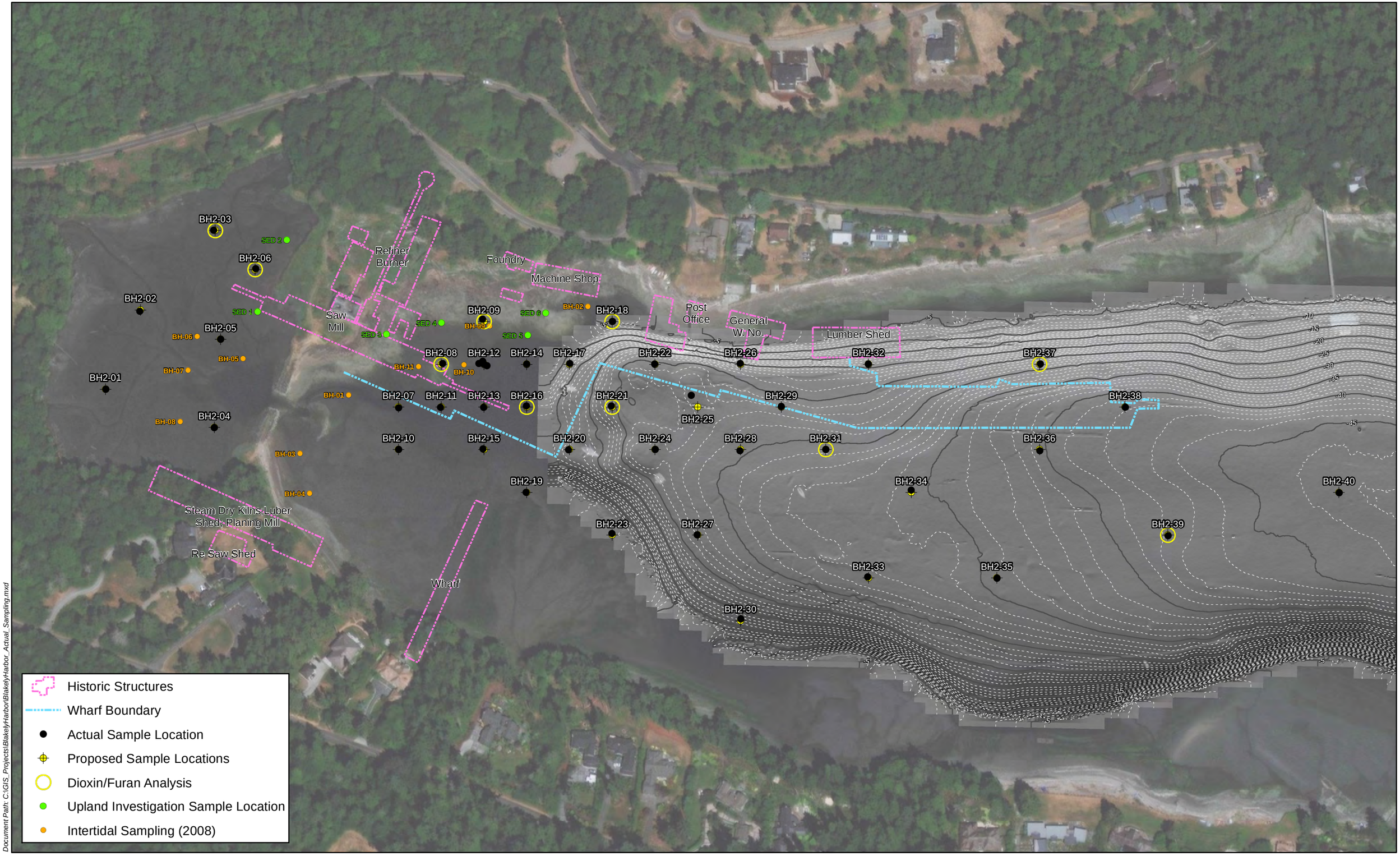
All samples were stored on ice in coolers and kept under chain-of-custody until delivery to the analytical laboratory, Eurofins TestAmerica. To meet holding times for total sulfide analyses, a subset of sample jars collected on July 1 were shipped overnight by FedEx to Eurofins TestAmerica in Denver, CO, on July 2, with arrival to the lab on July 3. All other samples were hand-delivered by NewFields to Eurofins TestAmerica in Fife, WA, on the morning of July 3.

3.0 References

Leidos and NewFields. 2019. Blakely Harbor Park Sediment Investigation. Final Sampling and Analysis Plan and Quality Assurance Project Plan. June 25, 2019. Submitted to Washington State Department of Ecology, Toxic Cleanup Program, Lacey, WA. Submitted by Leidos, Bothell, WA, and NewFields, Edmonds, WA.

Attachment 1

Map Showing Actual Sampling Locations



Document Path: C:\GIS_Projects\BlakelyHarbor\BlakelyHarbor_Actual_Sampling.mxd

N

Notes:
Projection: Lambert Conformal Conic (WA State Plane North);
Datum: NAD 83
Vertical: MLLW, contours in feet

0 200 400 800 Feet

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Bathymetry provided by NOAA

Attachment 1. Blakely Harbor Actual Sediment Sample Locations

Attachment 2

Summary Table of Geographic Coordinates

Attachment 2. Blakely Harbor Park Sediment Investigation Actual Sampling Coordinates

Station ID	Date	Time	Longitude (NAD83)	Latitude (NAD83)	Acceptable Sample
BH2-01	7/1/2019	4:27:00 PM	47.596079	-122.518107	Yes
BH2-02	7/1/2019	4:09:00 PM	47.596582	-122.517801	Yes
BH2-03	7/1/2019	3:56:00 PM	47.597113	-122.517116	Yes
BH2-04	7/1/2019	4:53:00 PM	47.595847	-122.517071	Yes
BH2-05	7/1/2019	4:41:00 PM	47.596414	-122.517029	Yes
BH2-06	7/1/2019	8:50:00 AM	47.596870	-122.516710	Yes
BH2-07	7/1/2019	3:40:00 PM	47.596000	-122.515327	Yes
BH2-08	7/1/2019	11:03:00 AM	47.596290	-122.514920	Yes
BH2-09	7/1/2019	10:39:00 AM	47.596580	-122.514550	Yes
BH2-10	7/1/2019	5:11:00 PM	47.595733	-122.515318	Yes
BH2-11	7/1/2019	5:24:00 PM	47.596010	-122.514930	Yes
BH2-12	7/1/2019	3:11:00 PM	47.596293	-122.514527	No
BH2-12	7/1/2019	3:19:00 PM	47.596283	-122.514498	No
BH2-12	7/1/2019	3:29:00 PM	47.596296	-122.514576	No
BH2-12	7/2/2019	10:22:00 AM	47.596310	-122.514540	Yes
BH2-13	7/1/2019	5:41:00 PM	47.596013	-122.514522	Yes
BH2-14	7/1/2019	2:57:00 PM	47.596297	-122.514122	Yes
BH2-15	7/1/2019	5:54:00 PM	47.595748	-122.514519	Yes
BH2-16	7/2/2019	2:43:00 PM	47.596028	-122.514115	Yes
BH2-17	7/1/2019	2:44:00 PM	47.596308	-122.513714	Yes
BH2-18	7/1/2019	2:27:00 PM	47.596582	-122.513319	Yes
BH2-19	7/1/2019	2:04:00 PM	47.595474	-122.514102	Yes
BH2-20	7/1/2019	1:44:00 PM	47.595755	-122.513709	Yes
BH2-21	7/1/2019	2:02:00 PM	47.596041	-122.513310	Yes
BH2-22	7/1/2019	2:13:00 PM	47.596316	-122.512909	Yes
BH2-23	7/1/2019	1:08:00 PM	47.595223	-122.513279	Yes
BH2-24	7/2/2019	2:25:00 PM	47.595769	-122.512886	Yes
BH2-25	7/2/2019	2:11:00 PM	47.596118	-122.512555	Yes
BH2-26	7/2/2019	1:56:00 PM	47.596331	-122.512098	Yes
BH2-27	7/1/2019	12:53:00 PM	47.595226	-122.512471	Yes
BH2-28	7/1/2019	12:36:00 PM	47.595773	-122.512083	Yes
BH2-29	7/2/2019	1:41:00 PM	47.596063	-122.511701	Yes
BH2-30	7/2/2019	1:29:00 PM	47.594694	-122.512039	Yes
BH2-31	7/2/2019	1:15:00 PM	47.595792	-122.511271	Yes
BH2-32	7/2/2019	12:57:00 PM	47.596348	-122.510884	Yes
BH2-33	7/2/2019	12:41:00 PM	47.594982	-122.510847	Yes
BH2-34	7/2/2019	12:22:00 PM	47.595544	-122.510451	Yes
BH2-35	7/2/2019	12:08:00 PM	47.594992	-122.509620	Yes
BH2-36	7/2/2019	11:54:00 AM	47.595816	-122.509241	Yes
BH2-37	7/2/2019	11:42:00 AM	47.596369	-122.509253	Yes
BH2-38	7/2/2019	11:30:00 AM	47.596105	-122.508437	Yes
BH2-39	7/2/2019	11:17:00 AM	47.595287	-122.508007	Yes
BH2-40	7/2/2019	11:05:00 AM	47.595586	-122.506395	Yes

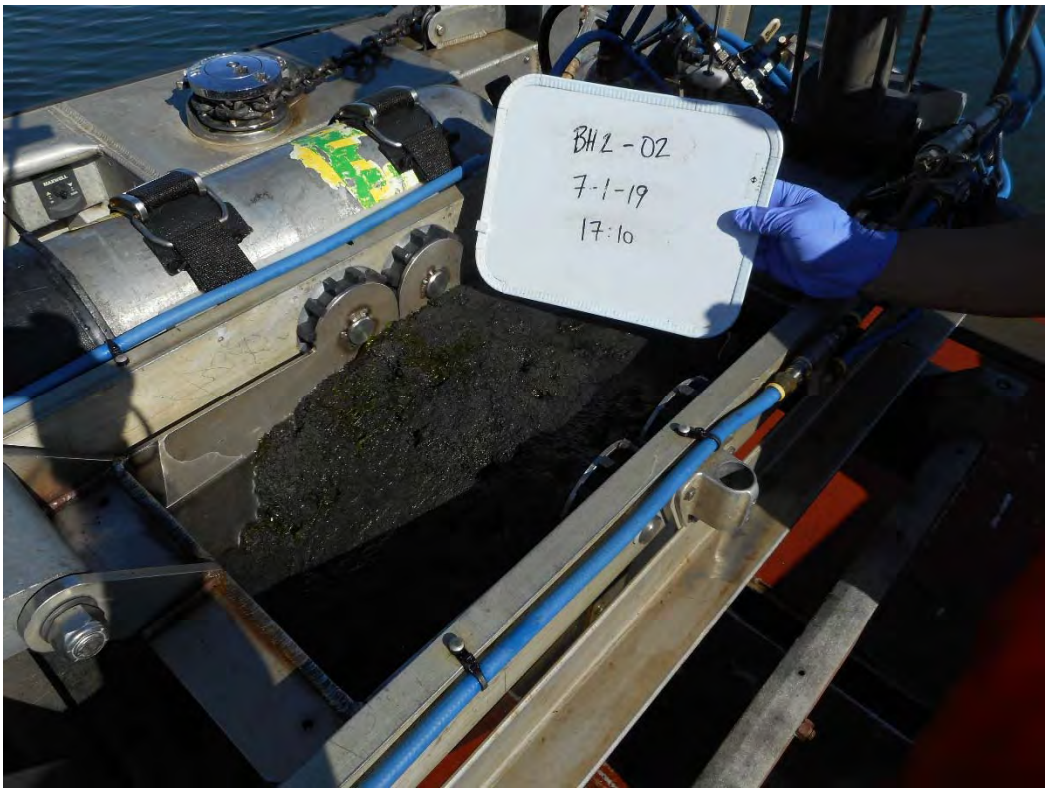
Notes

NAD83: North American Datum 1983

Attachment 3

Photographs of Sediment Surface Grabs and Intertidal Samples

Station BH2-01



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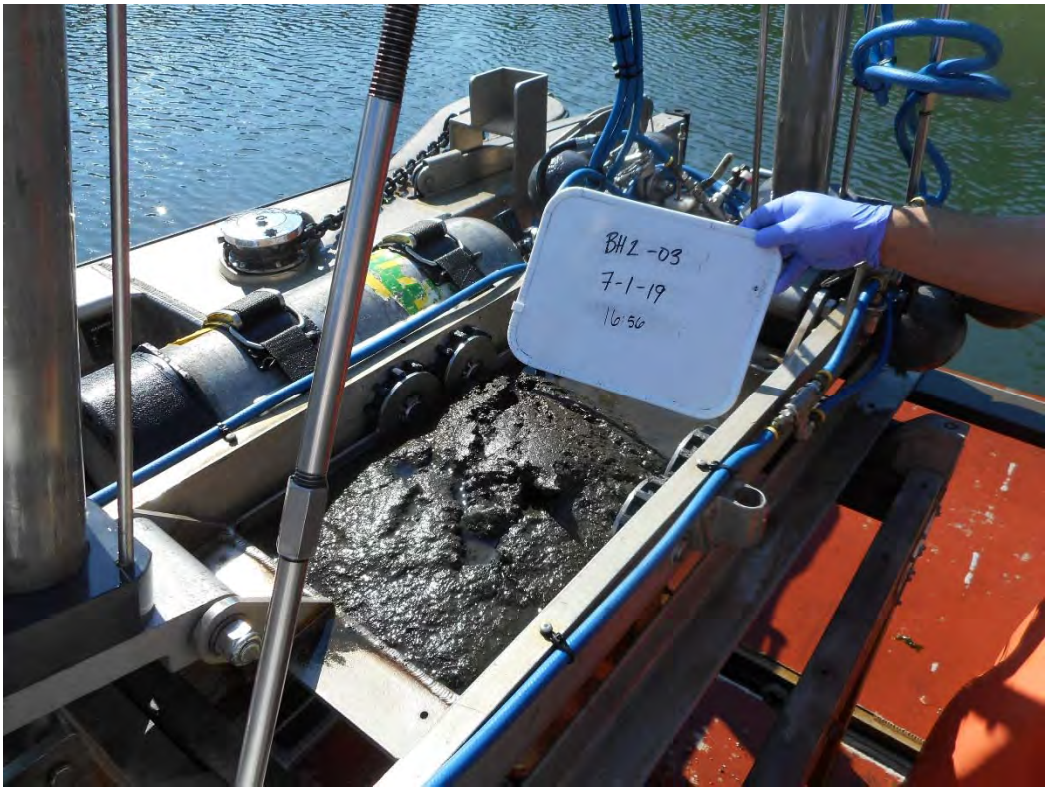
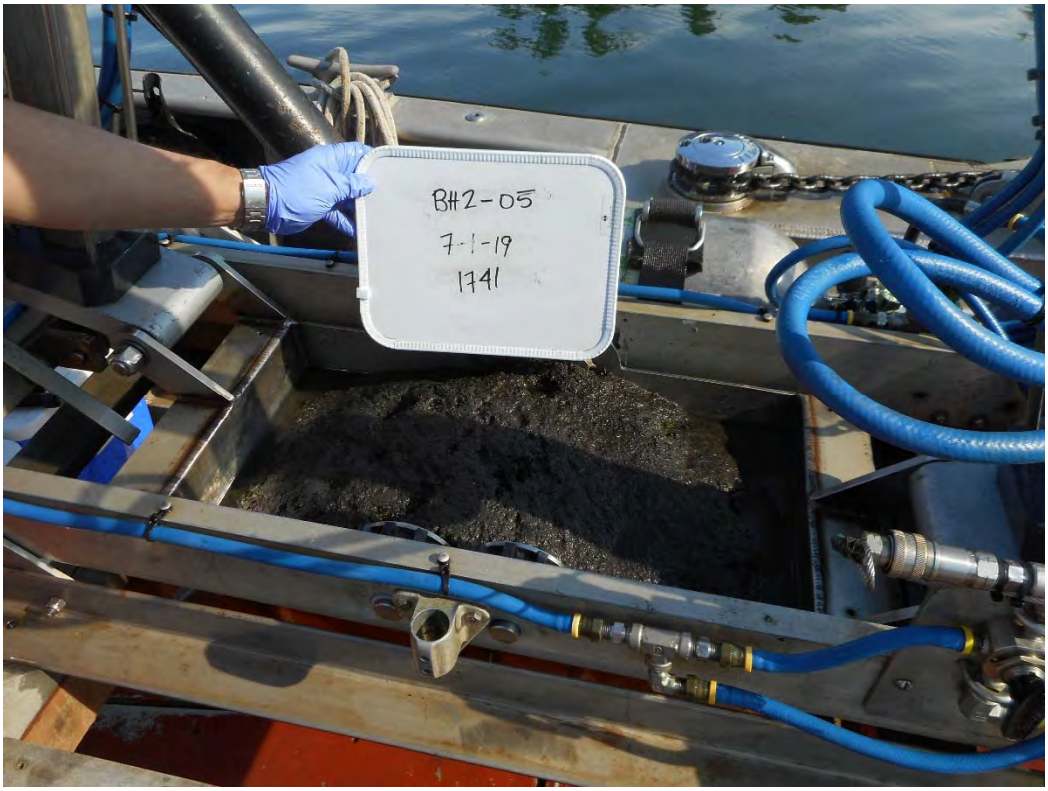


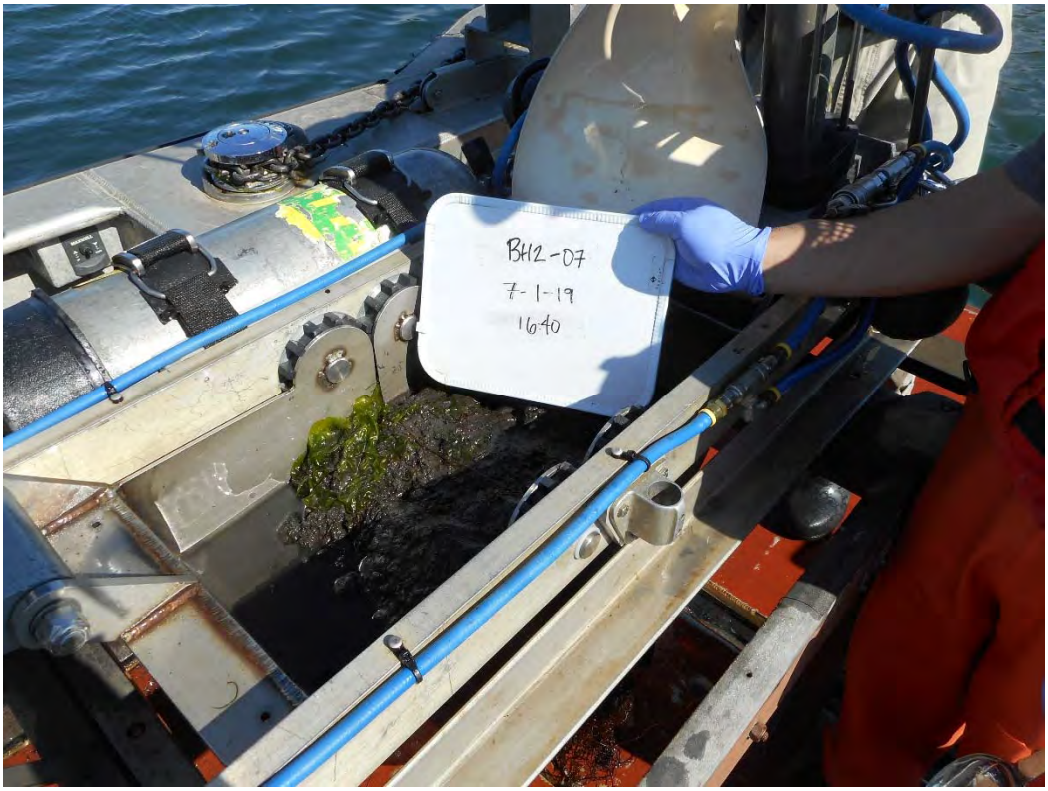
Station BH2-03

Station BH2-04



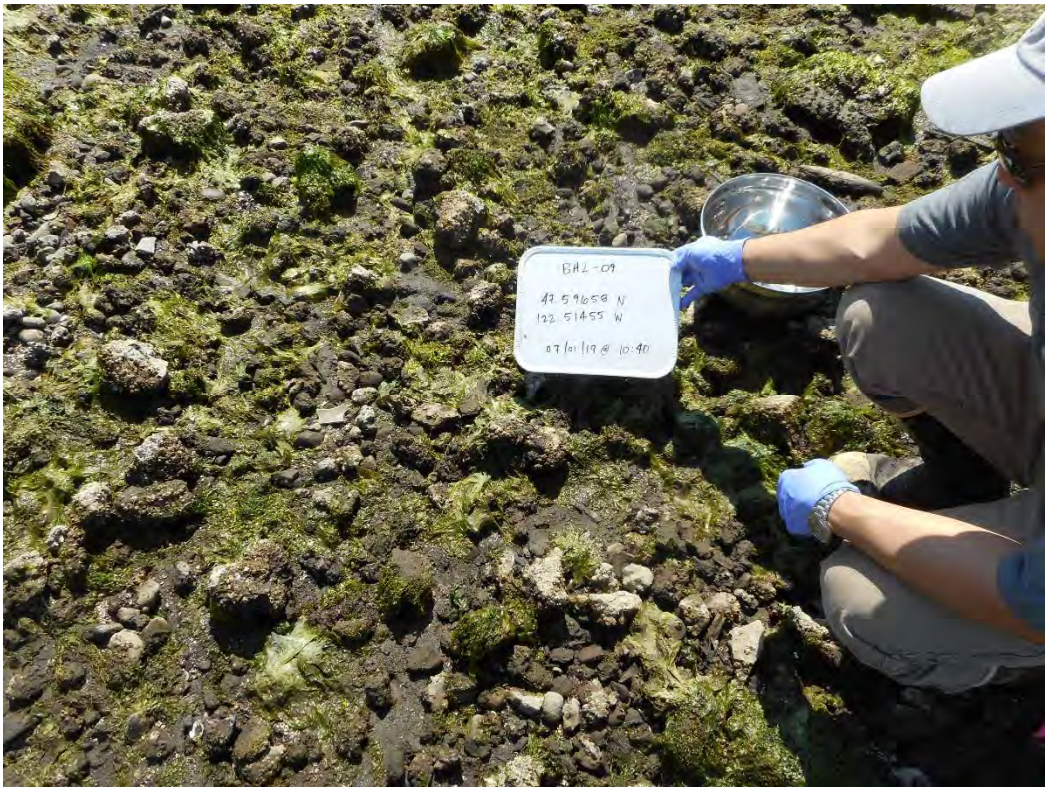
Station BH2-05

Station BH2-06



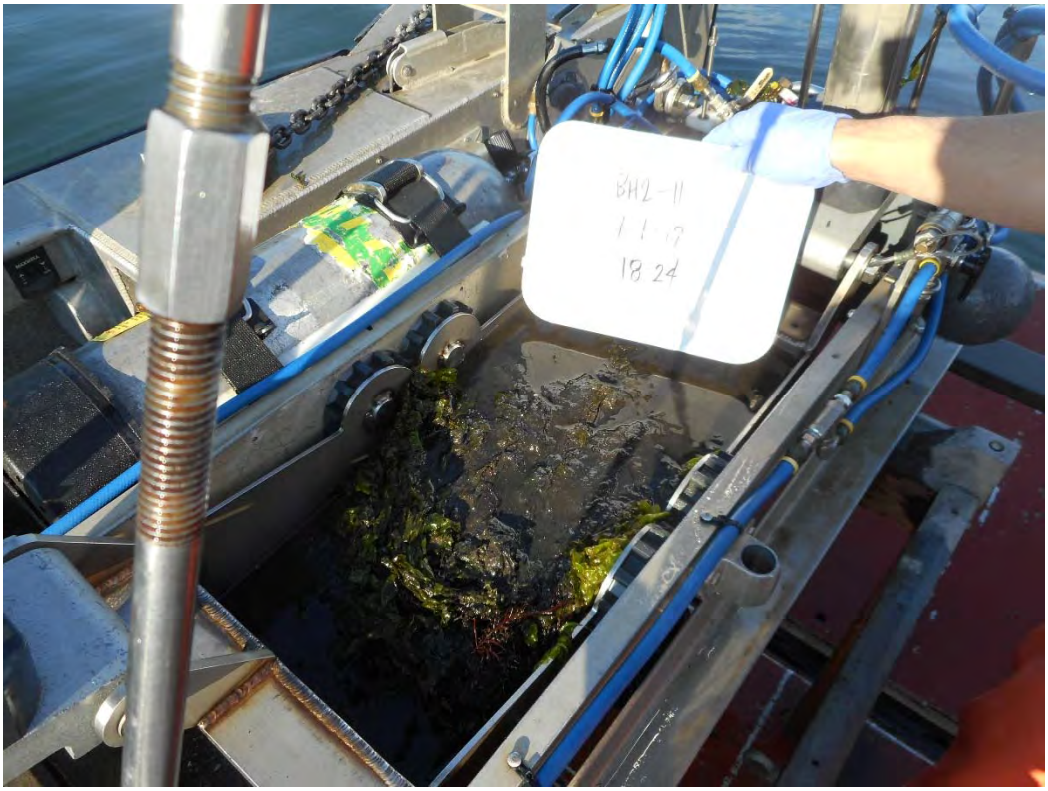
Station BH2-07

Station BH2-08



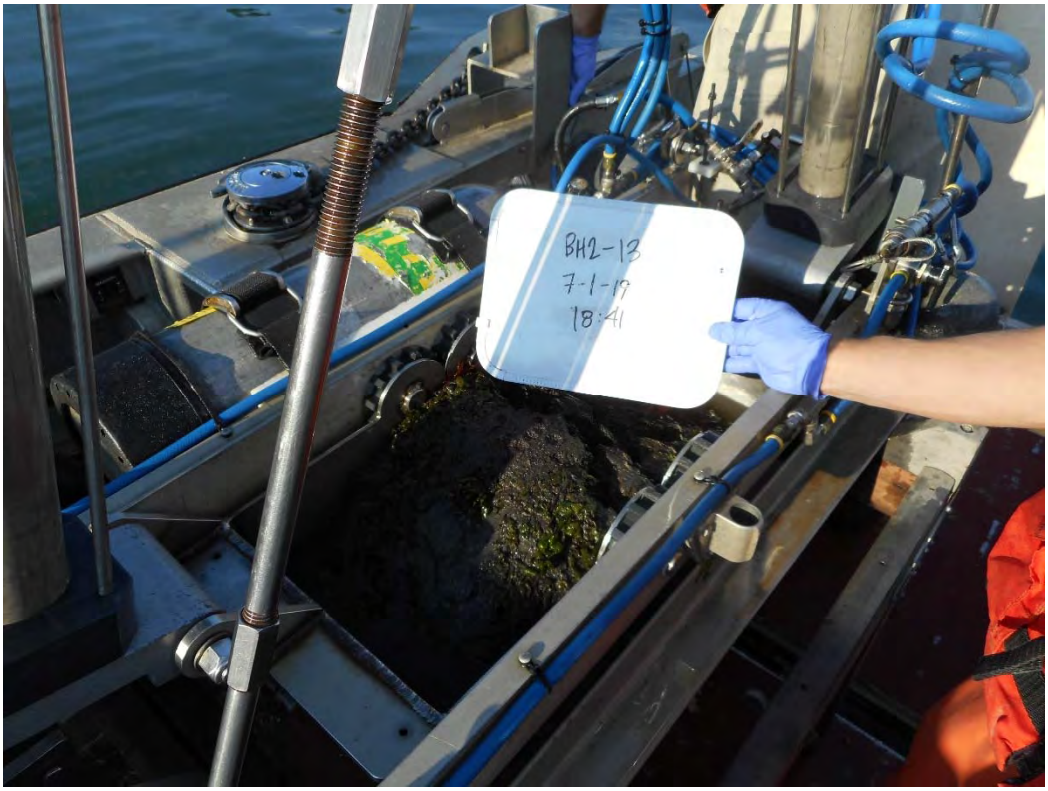
Station BH2-09

Station BH2-10



Station BH2-11

Station BH2-12

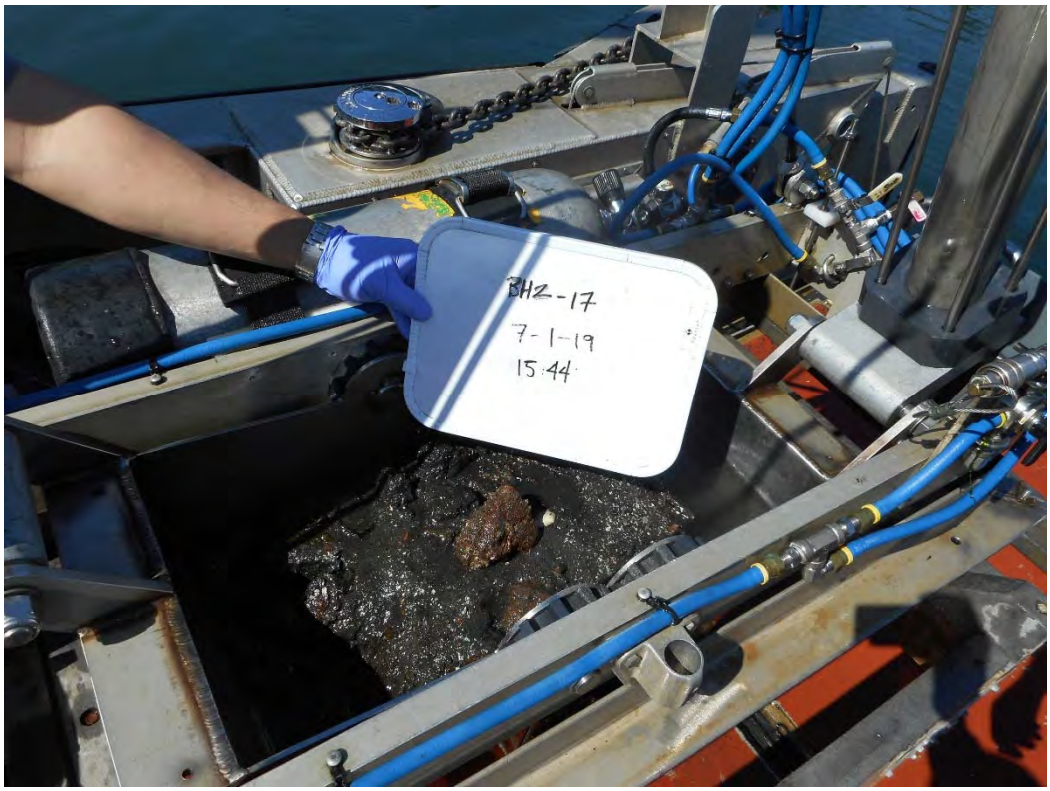


Station BH2-13

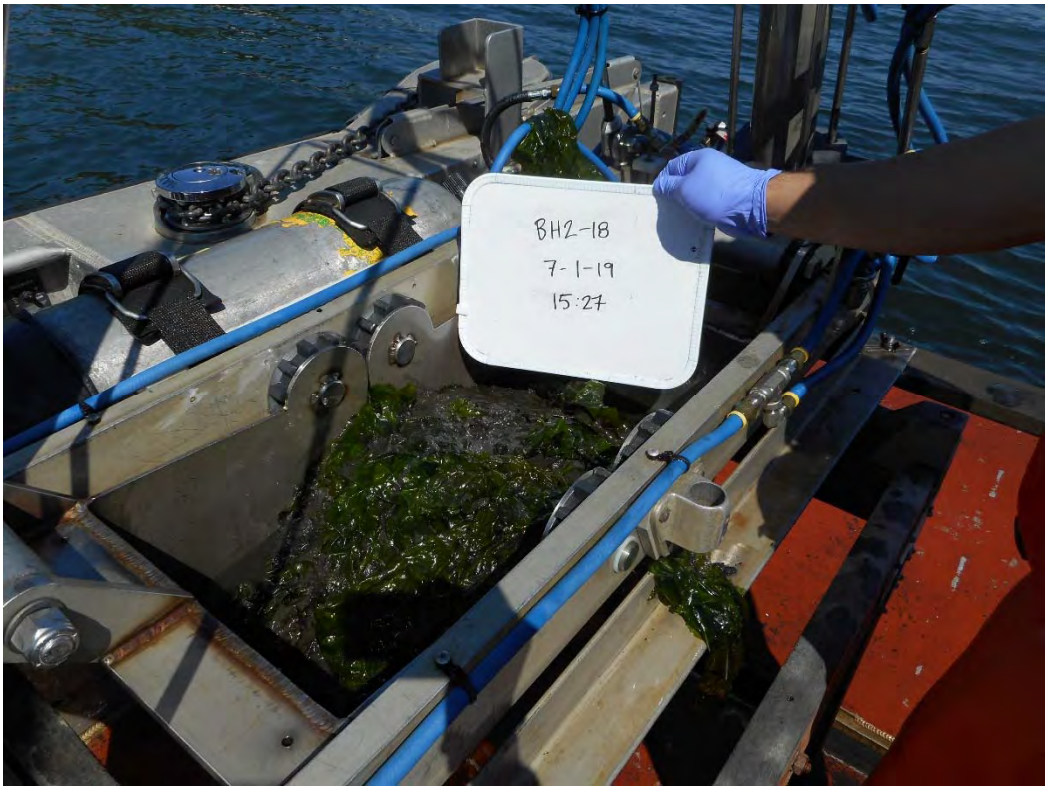
Station BH2-14

Station BH2-15

Station BH2-16

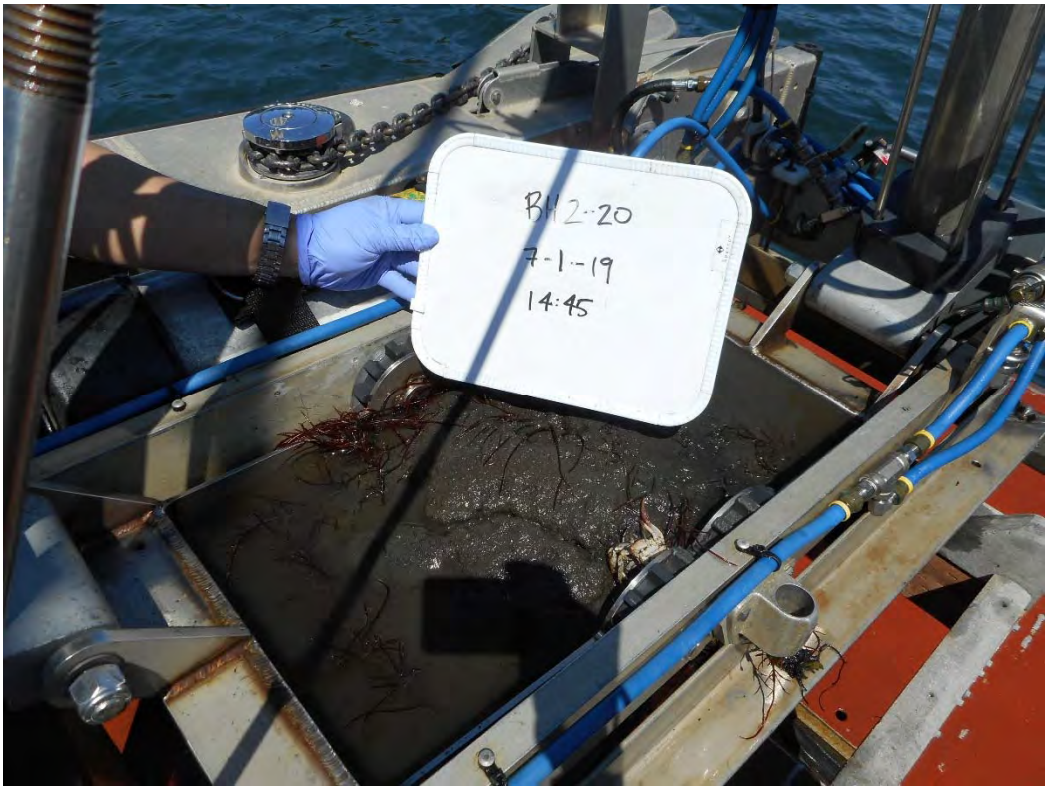


Station BH2-17



Station BH2-18

Station BH2-19



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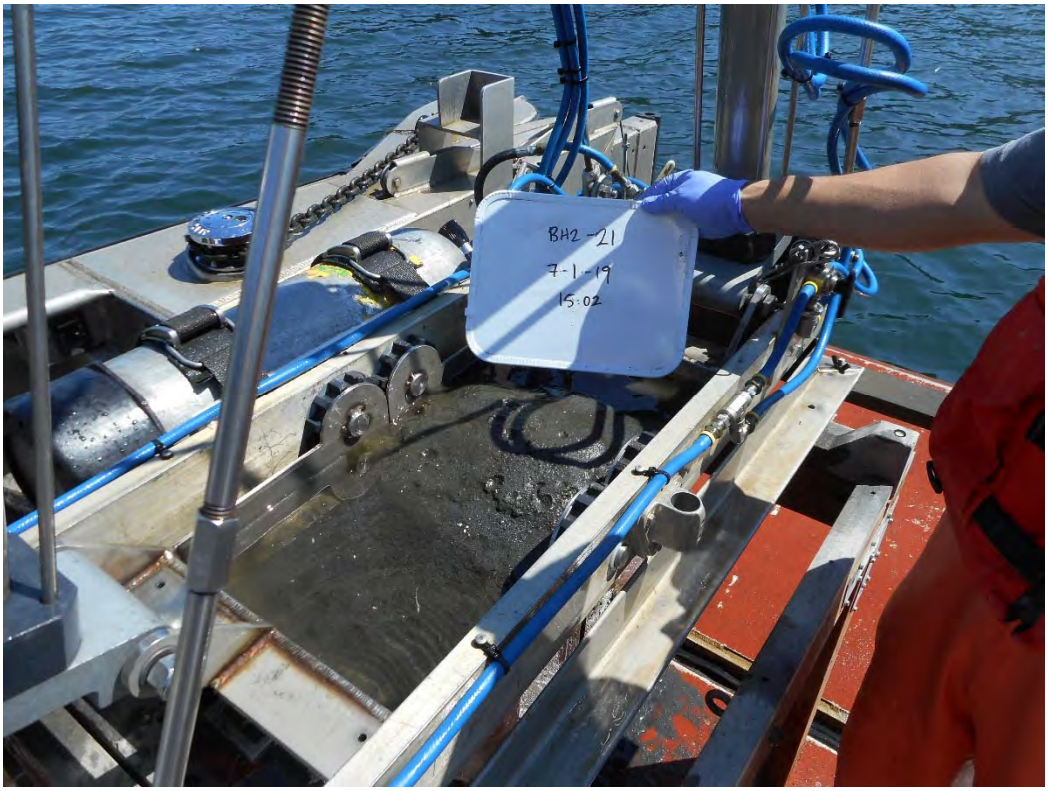
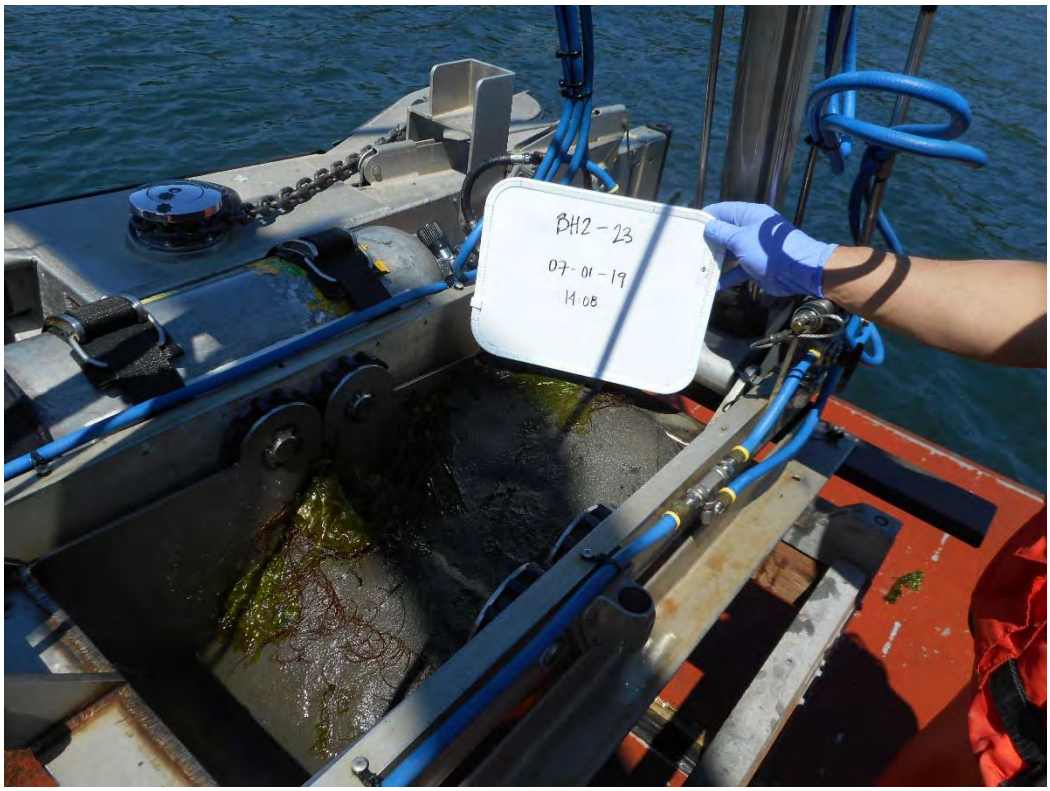


Station BH2-21

Station BH2-22

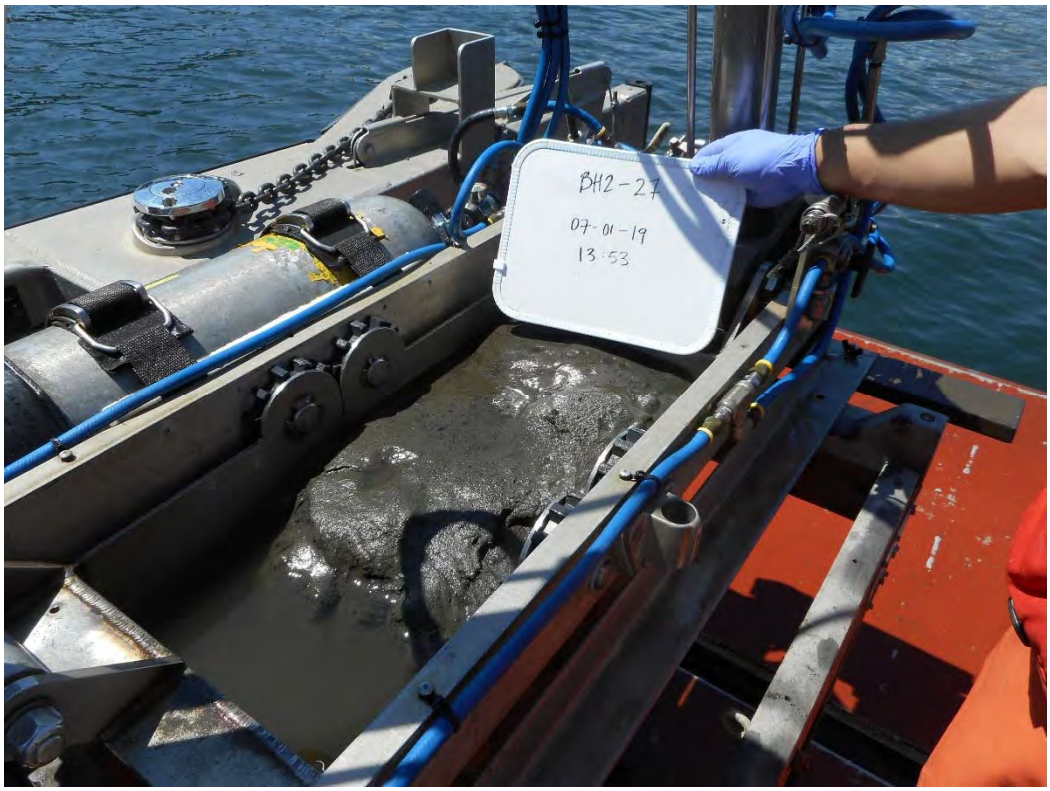


Station BH2-23

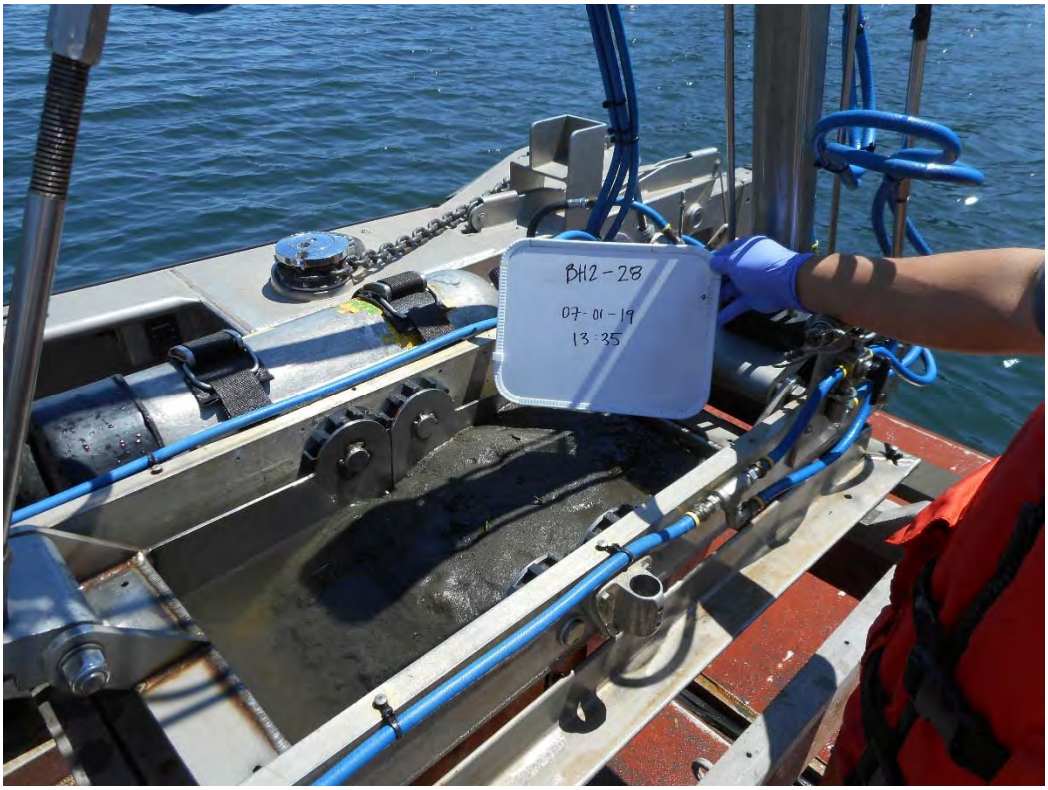
Station BH2-24

Station BH2-25

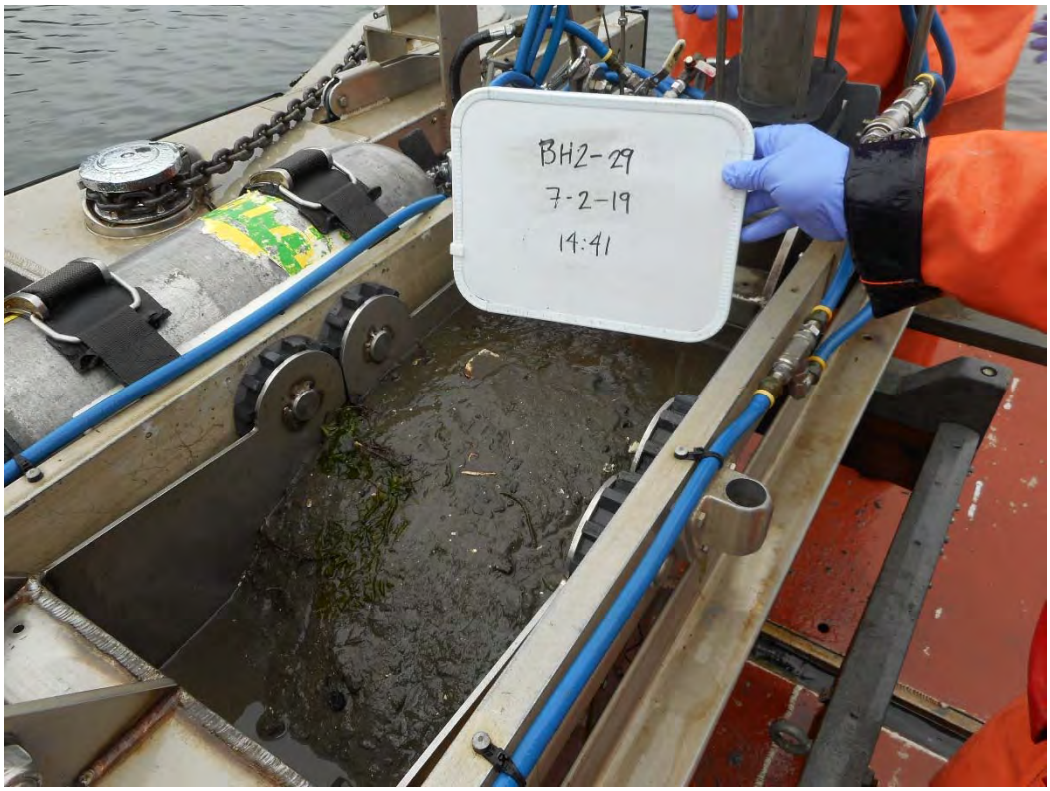
Station BH2-26



Station BH2-27



Station BH2-28



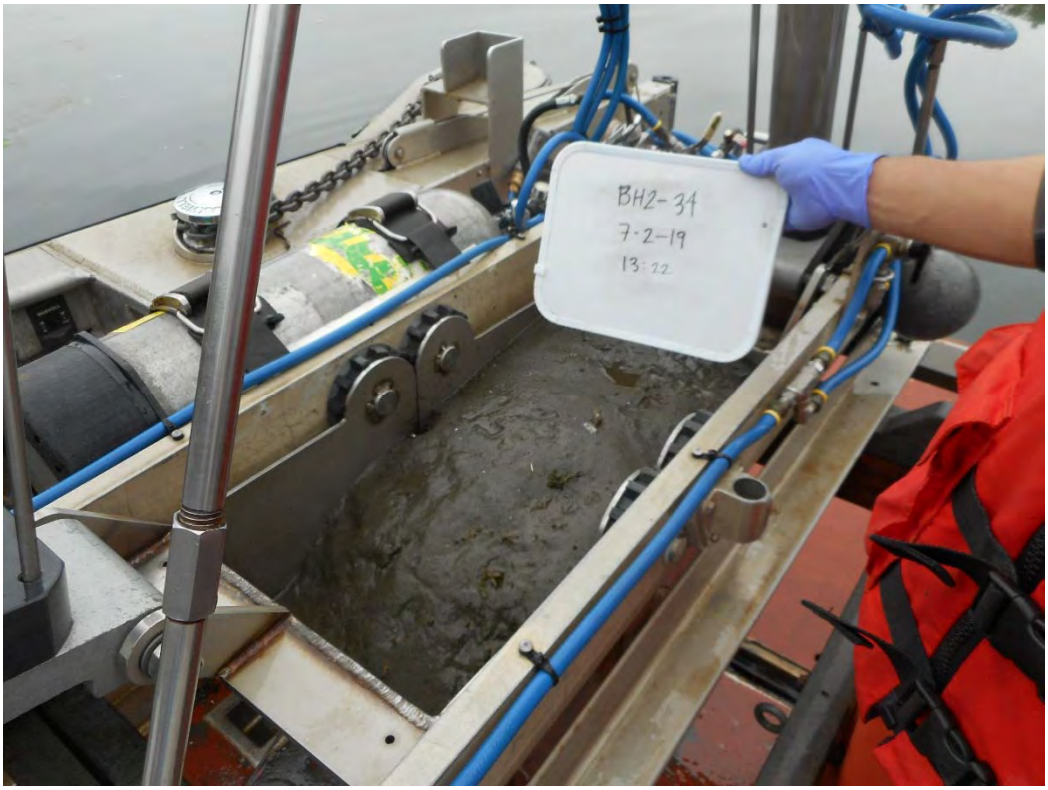
Station BH2-29

Station BH2-30

Station BH2-31

Station BH2-32

Station BH2-33



Station BH2-34

Station BH2-35

Station BH2-36

Station BH2-37

Station BH2-38

Station BH2-39

Station BH2-40

Attachment 4

Field Logbook

1

CONTENTS

PAGE	REFERENCE	DATE

Blakely Harbor Park 7/1/19

0700 Arrive edmonds
0755 Catch ferry to Kingston, transit to Bainbridge
Personnel: J. Nikayama
S. Shusta
0915 Arrive @ Park. Met with John Evered.
Prep equipment
Attempt intertidal sampling by foot.

0950 Collect BH2-06
Return to beach to process.
Attempted to reach BH2-03 by foot but sediments too unconsolidated. Will Attempt log pond sampling by boat.
1040 Collect BH2-09
1103 Collect BH2-08.
Attempted to reach BH2-18, but tide has come in. Will sample by boat.
Pack up gear and proceed to Eagle Harbor.

Scale: 1 square = _____

Rite in the Rain

7/1/19

1230 Arrive Eagle Harbor boat Launch, load Sampling equipment on Carolyn Dow.
Eric : Andrew
1300 Conduct vessel safety briefing
Weather: Mostly Sunny, 70°F.
1305 Depart for Blakely Harbor
1335 grab sample @ BH2-28
1345 water depth @ BH2-28
33.8' @ 13:45
(returned to BH2-28 to get water depth)

1353 32.0': water depth
Station BH2-27

1408 Station BH2-23
7.2' water depth

During transit to BH2-24, noticed cable crossing sign on shore. Cable runs from shore to middle of harbor and out to west Seattle. Avoiding area until further instruction from Leidos.

7/1/19

1434 Station BH2-19
water depth: 6.3'

1445 Station BH2-20
water depth 23.3'

1502 Station BH2-21
water depth: 32.0'

1514 Station BH2-22
water depth: 33.5'

1527 Station BH2-18
water depth: 11.6'
took dioxins/furans dup.

1544 Station BH2-17
water depth: 22.3'

1557 Station BH2-14
water depth: 14.6'

1612 Station BH2-12
water depth: 11.8'
Almost no penetration - wood debris
Added weight to power grab

7/1/19

1619 Station BH2-12
water depth: 12.7'
No penetration. Added more weight to power grab + changed air tank.

1629 Station BH2-12
water depth: 11.4'
No penetration. - wood debris

1640 Station BH2-07
water depth: 12.4'

1656 Station BH2-03
water depth: 6.1'

1710 Station BH2-02
water depth: 6.9'

MS/MSD: 2 extra H_2S
2 extra PCB/SVOCS
2 extra metals/TOC/Ammonia, Hg

1727 Station BH2-SSS 01
water depth: 7.1'

1741 Station BH2-05
water depth: 7.7'

1754 Station BH2-04
water depth: 7.6'

collected field ~~trip~~ dups. + trips.

1812 Station BH2-10
water depth: 11.2

1824 Station BH2-11
water depth: 13.2'

~~1838~~ SSS 1841 Station BH2-13
water depth: ~~12.7'~~ SSS 14.1'

1854 Station BH2-15
water depth: 13.0'

7/1/19

~~19~~ ~~Station BH2-12~~ SSS
~~water depth:~~

1915 collected equipment rinsate blanks
- 2 x PCBs (amber)
- 1 x Hg (plastic)
- 1 x metals (plastic)
- 2 x SVOCs (1 L amber)

- Stainless bowl and spoon rinsed with DI

1935 Returned to dock @ Eagle Harbor

Fed Ex #s for 3 coolers to TA Denver's
1065 6703 0339
0340
0350

7/2/19

Blakely Harbor Park
Sed Investigation Day 2.

0910 Arrive at Park will attempt to sample BH2-12 at low tide. 3 attempts with grab yesterday came up with board pieces.

1023 - collected BH2-12 sediment on shore during low tide
- wood planks substrate w/ pockets of sediment

1045 Randy, utility locator stopped by the site. He indicated the US West cable that runs N-S across the harbor is abandoned. It is about 1 inch in thickness and should be buried.
Based on this information we may move proposed sampling locations that may sit along this ~~~~ approximate N-S line, as well as another N-S line on the vessel's navigation chart.
John Evered was also present during this meeting and was informed of this plan.

Packed up gear and head to Eagle Harbor.

Scale: 1 square = _____
Rite in the Rain 7
Scale: 1 square = _____

7/2/19 Vessel Sampling off Carolyn Dow

1205 Station BH2-40
water depth: 44.6'

1218 Station BH2-39
water depth: 40.7'

1230 Station BH2-38
water depth: 40.5'

1242 Station BH2-37
water depth: 26.7'

1254 Station BH2-36
water depth: 39.3'

1308 Station BH2-35
water depth: 35.7'

1322 Station BH2-34
water depth: 34.2'

MS/MSD: 2 extra H_2S
2 extra SVOCs/PCBs
2 extra TOC/NH_3/metals/Hg

Light to mod. rain showers.

1341 Station BH2-33
water depth: 34.0'

1357 Station BH2-32
water depth: 19.0'

1415 Station BH2-31
water depth: 34.0'

1429 Station BH2-30
water depth: 20.3'

1441 Station BH2-29
water depth: 31.4'

1456 Station BH2-26
water depth: 22.8'

1511 Station BH2-25
water depth: 33.3'
collected field dups. & trips.

7/2/19

1525 Station BH2-24
water depth: 34.1'

1543 Station BH2-16
water depth: 13.3'

1602 Collected equipment rinsate blanks
2x PCBs (amber)
1x Hg (plastic)
1x metals (plastic)
2x SVOCs (1 L amber)
Stainless bowl and spoon rinsed with DI

1602 Hett collected rinsate blanks
SSS
2x PCBs
1x Hg
1x metals
2x SVOCs

1644 returned to dock, demobilized vessel.

Scale: 1 square = _____

Scale: 1 square = _____

Attachment 5

Grab Logbook

Blakely Harbor Park
Sediment Investigation

Grab Logbook

NewFields

115 2nd Avenue N, Suite 100
Edmonds, WA 98020

Project: 2019 Blakely Harbor Sediment Investigation
Location: _____

Station: _____
Date/Time: _____

Crew: John Nakayama, Stephani Shusta

Grab # BH2-06	**Bottom Depth** intertidal	**Penetration Depth** surface top 10 cm	**Time** 07/01/19 @ 09:50
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	Drab olive	None	47.59687 N
Gravel	Brown	Slight	122.51671 W
Sand C M F	Brown surface	Moderate	Lots of shore crabs
Silt / Clay	Gray	Strong	Wood chunks in top 10cm
Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Grab # BH2-09	**Bottom Depth** intertidal	**Penetration Depth** surface top 10cm	**Time** 07/01/19 @ 10:40
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	Drab olive	None	47.59658 N
Gravel	Brown	Slight	122.51455 W
Sand C M F	Brown surface	Moderate	metal debris
Silt / Clay	Gray	Strong	algae
Organic matter	Black	Overwhelming	polychaetes
Woody debris	Other:	H_2S	brick pieces
Shell debris		Petroleum	large wood chunk

Grab # BH2-08	**Bottom Depth** intertidal	**Penetration Depth** surface top 10cm 5-8cm	**Time** 07/01/19 @ 11:03
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	Drab olive	None	47.59629 N
Gravel	Brown	Slight	122.51492 W
Sand C M-F	Brown surface	Moderate	algae
Silty Clay	Gray	Strong	can't get more than 5cm - 8cm
Organic matter	Black	Overwhelming	before hitting wood
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Grab # BH2-28	**Bottom Depth** 32.0'	**Penetration Depth** 25cm	**Time** 07/01/19 @ 13:35
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	Drab olive	None	scattered tube worms @ surface
Gravel	Brown	Slight	ulva
Sand C M-F	Brown surface	Moderate	polychaetes
Silty Clay	Gray	Strong	small sea pen
Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Project: 2019 Blakely Harbor Sediment Investigation
Location: _____

Station: _____
Date/Time: _____

Crew: John Nakayama, Stephani Shusta, Eric Parker, Andrew

Grab # BH2-21	**Bottom Depth** 32.0'	**Penetration Depth** 25 cm	**Time** 7-1-19 @ 15:02
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	(Drab olive)	(None)	ulva
Gravel	(Brown – organic rich surface layer)	Slight	tunicates
(Sand) C (M-F)	Brown surface	Moderate	
Silt / Clay	Gray	Strong	
Organic matter	Black	Overwhelming	
(surface) Woody debris	Other:	H_2S	
(trace) Shell debris		Petroleum	

Grab # BH2-22	**Bottom Depth** 33.5'	**Penetration Depth**	**Time** 7-1-19 @ 1514
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	(Drab olive)	(None)	ghost shrimp
Gravel	Brown	Slight	
(Sand) C M (F)	Brown surface	Moderate	
(Silt) / Clay	Gray	Strong	
(Organic matter)	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Grab # BH2-18	**Bottom Depth** 11.6'	**Penetration Depth** 25 cm	**Time** 7-1-19 @ 15:27
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	Drab olive	None	(Dioxin Dup)
Gravel	Brown	(Slight)	ulva - abundant
(Sand) C M (F)	Brown surface	Moderate	amphipods
(Silt) / Clay	Gray	Strong	small gunnel
Organic matter	Black	Overwhelming	
Woody debris	Other:	(H_2S)	
(trace) Shell debris fine	(Dark olive gray)	Petroleum	

Grab # BH2-17	**Bottom Depth** 22.3'	**Penetration Depth** ~~22.3'~~ 25cm	**Time** 7-1-19 @ 15:44
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
(Cobble) & bricks	Drab olive	None	crab
Gravel	Brown	(Slight)	ulva
(Sand) C M (F)	Brown surface	Moderate	glass
(Silt) / Clay	Gray	Strong	
(Organic matter)	Black	Overwhelming	
(scattered) Woody debris - chunks	Other:	(H_2S)	
(moderate) Shell debris	(Dark olive gray)	Petroleum	

Project: 2019 Blakely Harbor Sediment Investigation

Station: _____

Location: _____

Date/Time: _____

Crew: John Nakayama, Stephani Shusta, Eric Parker, Andrew

Grab # BH2-14	**Bottom Depth** 14.6'	**Penetration Depth** 20 cm	**Time** 7-1-19 @ 1557
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:* ulva
Cobble	Drab olive	~~None~~ sss	
Gravel (scattered)	Brown	Slight	
Sand C M (F)	Brown surface	Moderate	
Silt / Clay	Gray	Strong	
Organic matter (wood)	Black	Overwhelming	
Woody debris	Other:	H_2S	
~~Shell debris~~ (moderate)	olive gray	Petroleum	

Grab # BH2-12	**Bottom Depth** sss ~~11.8'~~	**Penetration Depth**	**Time** 7-1-19 @ sss ~~1612~~
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:* Tried 3 grabs. No penetration. Wood debris.
Cobble	Drab olive	None	
Gravel	Brown	Slight	
Sand C M F	Brown surface	Moderate	
Silt / Clay	Gray	Strong	
Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Grab # BH2-07	**Bottom Depth** 12.4'	**Penetration Depth** 20 cm	**Time** 7-1-19 @ 1640
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:* ulva filamentous algae
Cobble	Drab olive	None	
Gravel	Brown	Slight	
Sand C M (F)	Brown surface	Moderate	
Silt / Clay	Gray	Strong	
Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris	olive gray	Petroleum	

Grab # BH2-03	**Bottom Depth** 6.1'	**Penetration Depth** 725	**Time** 7-1-19 @ 1656
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:* slight overpenetration sampled from side
Cobble	Drab olive	~~None~~ sss	
Gravel	Brown	Slight	
(slight) Sand C M (F)	Brown surface	Moderate	
Silt / Clay	Gray	Strong	
Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Project: 2019 Blakely Harbor Sediment Investigation **Station:** _____

Location: _____ **Date/Time:** _____

Crew: John Nakayama, Stephani Shusta, Eric Parker, Andrew

Grab # BH2-02	**Bottom Depth** 6.9'	**Penetration Depth** 25cm	**Time** 7-1-19 @ 1710
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	(Drab olive)	(None)	burrows, scattered – shore crabs
Gravel	Brown	Slight	ulva
(Sand) C M (F)	Brown surface	Moderate	fine organic wood particles on surface
(Silt) / Clay	Gray	Strong	
(Organic matter)	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Grab # BH2-01	**Bottom Depth** 7.1'	**Penetration Depth** 25cm	**Time** 7-1-19 @ 1727
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	(Drab olive)	(None)	burrows - shore crabs
Gravel	Brown	Slight	ulva
(Sand) C M (F)	Brown surface	Moderate	eel grass strand
(Silt / Clay)	Gray	Strong	fine organic wood particles on surface
(Organic matter)	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Grab # BH2-05	**Bottom Depth** 7.7'	**Penetration Depth** 25cm	**Time** 7-1-19 @ 1741
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	(Drab olive)	(None)	burrows
Gravel	Brown	Slight	ulva
(Sand) C M (F)	Brown surface	Moderate	eelgrass
(Silt / Clay)	Gray	Strong	
(fine Organic matter wood)	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Grab # BH2-04	**Bottom Depth** 7.6'	**Penetration Depth** 25cm	**Time** 7-1-19 @ 1754
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	(Drab olive)	(None)	burrows
Gravel	Brown	Slight	fine organics on surface
(Sand) C M (F)	Brown surface	Moderate	polychaete tubes
(Silt) / Clay	Gray	Strong	amphipods
Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Project: 2019 Blakely Harbor Sediment Investigation
Location: _____

Station: _____
Date/Time: _____

Crew: John Nakayama, Stephani Shusta, Eric Parker, Andrew

Grab # BH2-10	**Bottom Depth** 11.2'	**Penetration Depth** 20 cm	**Time** 7-1-19 @ 1812
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:* sloped surface, ulva, scattered shell debris, compact sand
Cobble	Drab olive 2cm (top)	None	
Gravel	Brown	Slight	
Sand C M–F	Brown surface	Moderate	
Silt / Clay	Gray (< 2cm)	Strong	
Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Grab # BH2-11	**Bottom Depth** 13.2'	**Penetration Depth** 25 cm	**Time** 7-1-19 @ 1824
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:* thick ulva on surface, filamentous algae, amphipods
Cobble	Drab olive	None	
Gravel	Brown	Slight	
Sand C M F	Brown surface	Moderate	
Silt / Clay	Gray	Strong	
Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Grab # BH2-13	**Bottom Depth** 14.1'	**Penetration Depth** 25 cm	**Time** 7-1-19 @ 1841
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:* ulva, filamentous algae
Cobble	Drab olive	None	
Gravel	Brown	Slight	
Sand C M F	Brown surface	Moderate	
Silt / Clay	Gray	Strong	
Fine Organic matter	Black	Overwhelming	
Woody debris chunks	Other:	H_2S	
Shell debris		Petroleum	

Grab # BH2-15	**Bottom Depth** 13.0'	**Penetration Depth** 25 cm	**Time** 7-1-19 @ 1854
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	Drab olive	None	
Gravel	Brown	Slight	
Sand C M F	Brown surface	Moderate	
Silt / Clay	Gray	Strong	
Fine Organic matter	Black	Overwhelming	
Woody debris on surface	Other:	H_2S	
Shell debris		Petroleum	

Project: 2019 Blakely Harbor Sediment Investigation **Station:** _____

Location: _____ **Date/Time:** _____

Crew: John Nakayama, Stephani Shusta, Eric Parker, Andrew

Grab # 12 BH2-46 sss	**Bottom Depth** intertidal	**Penetration Depth** top 10 cm	**Time** 7-2-19 @ 1023
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	Drab olive	None	47.59631 N
Gravel scattered	Brown	Slight	122.51454 W
Sand C-M-F	Brown surface	Moderate	covered in large wood debris - planks
Silt / Clay	Gray	Strong	ulva
Organic matter	Black	Overwhelming	filamentous algae
Woody debris	Other:	H_2S	wood plank substrate w/ pockets of sediment
moderate Shell debris		Petroleum	

Grab # BH2-40	**Bottom Depth** 44.6'	**Penetration Depth** 24cm	**Time** 7-2-19 @ 1205
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	Drab olive	None	rock w/ barnacles
Gravel	Brown	Slight	larger surface tubes
Sand C M F	Brown surface	Moderate	scattered ulva
slight Silt / Clay	Gray	Strong	maybe a few shells
Organic matter	Black	Overwhelming	healthy sand
Woody debris	Other:	H_2S	
trace Shell debris fine		Petroleum	

Grab # BH2-39	**Bottom Depth** 40.7'	**Penetration Depth** 25cm	**Time** 7-2-19 @ 1218
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	Drab olive	None	small gastropods on surface
Gravel	Brown	Slight	surface tubes
Sand C M F	Brown surface	Moderate	scattered ulva
slight Silt / Clay	Gray	Strong	
fine Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Grab # BH2-38	**Bottom Depth** 40.5'	**Penetration Depth** 25 cm	**Time** 7-2-19 @ 1230
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	Drab olive	None	polychaete
Gravel	Brown	Slight	ulva debris
Sand C M F	Brown surface	Moderate	
Silt / Clay	Gray	Strong	
Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
trace Shell debris		Petroleum	

Project: 2019 Blakely Harbor Sediment Investigation **Station:** _____

Location: _____ **Date/Time:** _____

Crew: John Nakayama, Stephani Shusta, Eric Parker, Andrew

Grab # BH2-37	**Bottom Depth** 26.7'	**Penetration Depth** 25cm	**Time** 7-2-19 @ 1242
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	(Drab olive)	(None)	large woody debris
Gravel	(Brown)	Slight	surface ulva
Sand C M (F)	Brown surface	Moderate	scattered shell particles
Silt / Clay	Gray	Strong	
(Organic matter) abundant	Black	Overwhelming	
(Woody debris)	Other:	H_2S	
(Shell debris)		Petroleum	

Grab # BH2-36	**Bottom Depth** 39.3'	**Penetration Depth** 25cm	**Time** 7-2-19 @ 1254
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	(Drab olive)	(None)	sloped
Gravel	Brown	Slight	tube worms
(Sand) C M (F)	Brown surface	Moderate	3 snails on surface
slight Silt / Clay	Gray	Strong	molpadia sea cucumber in jaw
Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
trace (Shell debris)		Petroleum	

Grab # BH2-35	**Bottom Depth** 35.7'	**Penetration Depth** 25cm	**Time** 7-2-19 @ 1308
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	(Drab olive)	(None)	sloped
Gravel	Brown	Slight	hermit crab
(Sand) C M (F)	Brown surface	Moderate	snails
(Silt) / Clay	Gray	Strong	tube worms
Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
a few (Shell debris)		Petroleum	

Grab # BH2-34	**Bottom Depth** 34.2'	**Penetration Depth** 25cm	**Time** 7-2-19 @ 1322
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	(Drab olive)	(None)	scattered surface tubes
Gravel	(Brown)	Slight	ulva particles
(Sand) C M (F)	Brown surface	Moderate	few small snails
(Silt) / Clay	Gray	Strong	
Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
scattered (Shell debris) few		Petroleum	

Project: 2019 Blakely Harbor Sediment Investigation
Location: _____

Station: _____
Date/Time: _____

Crew: John Nakayama, Stephani Shusta, Eric Parker, Andrew

Grab # BH2-33	**Bottom Depth** 34.0'	**Penetration Depth** 25cm	**Time** 7-2-19 @ 1341
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	(Drab olive)	None	fine organics surface
Gravel	Brown	(Slight) organic odor	twig
(Sand) C M (F)	Brown surface	Moderate	trace ulva
(Silt / Clay)	Gray	Strong	
Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Grab # BH2-32	**Bottom Depth** 19.0'	**Penetration Depth** 25 cm	**Time** 7-2-19 @ 1357
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	(Drab olive)	None	organic-rich
Gravel	Brown	(Slight)	wood pieces on surface
(Sand) C M (F)	Brown surface	Moderate	some ulva
(Silt / Clay)	Gray	Strong	1 tube worm
(Organic matter)	Black	Overwhelming	
(Woody debris)	Other:	(H_2S)	
(Shell debris)		Petroleum	

Grab # BH2-31	**Bottom Depth** 34.0'	**Penetration Depth** 25cm	**Time** 7-2-19 @ 1415
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	(Drab olive)	(None)	sloped
Gravel	Brown	Slight	rock w/ barnacles
Sand C (M-F)	Brown surface	Moderate	tubes
(Silt / Clay)	(Gray)	Strong	scattered shell particles
Organic matter	Black	Overwhelming	ulva & filamentous algae pieces
Woody debris	Other:	H_2S	snail stuck in jaws
(Shell debris)		Petroleum	

Grab # BH2-30	**Bottom Depth** 20.3'	**Penetration Depth** 20cm	**Time** 7-2-19 @ 1429
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	(Drab olive)	None	Big. wood debris in jaws
Gravel	Brown	(Slight organic odor)	
(Sand) C (M-F)	Brown surface	Moderate	
(Silt / Clay)	Gray	Strong	
Organic matter	Black	Overwhelming	
(Woody debris) large at depth	Other:	H_2S	
(Shell debris)		Petroleum	

Project: 2019 Blakely Harbor Sediment Investigation

Station: _____

Location: _____

Date/Time: _____

Crew: John Nakayama, Stephani Shusta, Eric Parker, Andrew

Grab # BH2-29	**Bottom Depth** 31.4'	**Penetration Depth** 25 cm	**Time** 7-2-19 @ 1441
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	Drab olive	None	ulva
Gravel	Brown	Slight	filamentous algae
Sand C M F	Brown surface	Moderate	moderate wood particles
Silt / Clay	Gray	Strong	large tubes
Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Grab # BH2-26	**Bottom Depth** 22.8'	**Penetration Depth** 25 cm	**Time** 7-2-19 @ 1456
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	Drab olive	None	moderate organics
Gravel	Brown	Slight	scattered fine wood debris on surface
Sand C M F	Brown surface	Moderate	
Silt / Clay	Gray	Strong	wood chunk
Organic matter	Black	Overwhelming	shell
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Grab # BH2-25	**Bottom Depth** 33.3'	**Penetration Depth** 25 cm	**Time** 7-2-19 @ 1511
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	Drab olive	None	kelp
Gravel	Brown	Slight	ulva
Sand C M F	Brown surface	Moderate	
Silt / Clay	Gray	Strong	
Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Grab # BH2-24	**Bottom Depth** 34.1'	**Penetration Depth** 24 cm	**Time** 7-2-19 @
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble	Drab olive	None	tube worms
Gravel	Brown	Slight	trace shell
Sand C M-F	Brown surface	Moderate	ulva
Silt / Clay	Gray pockets	Strong	
Organic matter	Black	Overwhelming	
Woody debris	Other:	H_2S	
Shell debris		Petroleum	

Project: 2019 Blakely Harbor Sediment Investigation

Station: ______________________

Location: ____________________

Date/Time: ______________________

Crew: John Nakayama, Stephani Shusta, Eric Parker, Andrew

Grab #	**Bottom Depth**	**Penetration Depth**	**Time**
BH2 - 16	13.3'	20 cm	7-2-19 @ 1543
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble Gravel (Sand) C M (F) (Silt) / Clay (Organic matter) (Woody debris) Shell debris	Drab olive (Brown) Brown surface (Gray) Black Other:	None (Slight) Moderate Strong Overwhelming (H_2S) Petroleum	filamentous algae significant wood debris in jaws snail
Grab #	**Bottom Depth**	**Penetration Depth**	**Time**
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble Gravel Sand C M F Silt / Clay Organic matter Woody debris Shell debris	Drab olive Brown Brown surface Gray Black Other:	None Slight Moderate Strong Overwhelming H_2S Petroleum	
Grab #	**Bottom Depth**	**Penetration Depth**	**Time**
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble Gravel Sand C M F Silt / Clay Organic matter Woody debris Shell debris	Drab olive Brown Brown surface Gray Black Other:	None Slight Moderate Strong Overwhelming H_2S Petroleum	
Grab #	**Bottom Depth**	**Penetration Depth**	**Time**
Sediment Type:	*Sediment Color:*	*Sediment Odor:*	*Comments:*
Cobble Gravel Sand C M F Silt / Clay Organic matter Woody debris Shell debris	Drab olive Brown Brown surface Gray Black Other:	None Slight Moderate Strong Overwhelming H_2S Petroleum	

Attachment 6

Chain-of-Custody Forms

Project Name:	2019 Blakely Harbor Sediment Investigation
Project Location:	Bainbridge Island, Washington
Client/Point of Contact:	John Evered, WA State Dept. of Ecology
Destination Lab:	Eurofins TestAmerica
Destination Contact:	Nate Lewis (253) 248-4975
Turn around Time:	Standard
Sample Originator:	Leidos/NewFields
Project Manager:	Tom Dubé/Tim Hammermeister
Originator Phone/Email:	(425) 482-3325 / thomas.e.dube@leidos.com
Sample Collectors:	NewFields

Analyses / Tests

Number of Shipping Containers: 11

Invoice to: Leidos

Address:
18939 120th Ave NE
Suite 112
Bothell WA, 98011
thomas.e.dube@leidos.com

Project Number:
860.0195.000

Sample ID	Matrix	Date	Time	No. and Type of Containers	Grain size	Total solids, TVS	TOC, NH_3, metals, Hg	SVOCs, PCBs	Total sulfides	Dioxins/Furans	Jar #s Comments
BH2-06-S	Sediment	7/1/19	0950	4 glass	X		X	X		X	5037, 5039, 5040, 5042
BH2-09-S			1040		X		X	X		X	5054, 5056, 5057, 5059
BH2-08-S			1103		X		X	X		X	5048, 5050, 5051, 5053
BH2-28-S			1335	3 glass	X		X	X			5153, 5155, 5156
BH2-27-S			1353		X		X	X			5148, 5150, 5151
BH2-23-S			1408		X		X	X			5128, 5130, 5131
BH2-19-S			1434		X		X	X			5107, 5109, 5110
BH2-20-S			1445		X		X	X			5112, 5114, 5115
BH2-21-S			1502	4 glass	X		X	X		X	5117, 5119, 5120, 5122
BH2-22-S			1514	3 glass	X		X	X			5123, 5125, 5126
BH2-18-S			1527	4 glass	X		X	X		X	5101, 5103, 5104, 5106
BH2-18-D			1527	1 glass						X	5231
BH2-17-S			1544	3 glass	X		X	X			5096, 5098, 5099
BH2-14-S			1557		X		X	X			5080, 5082, 5083
BH2-07-S			1640		X		X	X			5043, 5045, 5046

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature:	Signature:	Signature:	Signature:
Date/Time: 7/2/19 0815	Date/Time: 7/3/19 0815	Date/Time:	Date/Time:
Affiliation: NewFields	Affiliation: UKEA	Affiliation:	Affiliation:

• Sample originator and destination laboratory each sign and retain one copy.

Project Name:	2019 Blakely Harbor Sediment Investigation
Project Location:	Bainbridge Island, Washington
Client/Point of Contact:	John Evered, WA State Dept. of Ecology
Destination Lab:	Eurofins TestAmerica
Destination Contact:	Nate Lewis (253) 248-4975
Turn around Time:	Standard
Sample Originator:	Leidos/NewFields
Project Manager:	Tom Dubé/Tim Hammermeister
Originator Phone/Email:	(425) 482-3325 / thomas.e.dube@leidos.com
Sample Collectors:	NewFields

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Project Number:
860.0195.000

Sample ID	Matrix	Date	Time	No. and Type of Containers	Grain size	Total solids, TVS	TOC, NH_3, metals, Hg	SVOCs, PCBs	Total sulfides	Dioxins/Furans	TOC, NH_3						# of jars	Comments
BH2-03-S	Sediment	7/1/19	1656	4 glass	X		X	X		X								5021, 5023, 5024, 5026
BH2-02-S	"	"	1710	7 glass	X		X	X										Extra jars for MS/MSD
BH2-01-S	"	"	1727	3 glass	X		X	X										5011, 5013, 5014
BH2-05-S	"	"	1741	3 glass	X		X	X										5032, 5034, 5035
BH2-04-S	"	"	1254	"	X		X	X										5027, 5029, 5030
BH2-04-D	"	"	1254	"	X		X	X										5221, 5223, 5224
BH2-04-T	"	"	1754	2 glass	X		X	X	9		X						2	5232, 5234 ~~No metals or Hg~~
BH2-10-S	"	"	1812	3 glass	X		X	X										5060, 5062, 5063
BH2-11-S	"	"	1824	3 glass	X		X	X										5065, 5067, 5068
BH2-13-S	"	"	1841	"	X		X	X										5075, 5077, 5078
BH2-15-S	"	"	1854	"	X		X	X										5085, 5087, 5088

5016
5018
5019
5261-5264

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature:	Signature:	Signature:	Signature:
Date/Time: 7/3/19 0815	Date/Time: 7-3-19 0815	Date/Time:	Date/Time:
Affiliation: NewFields	Affiliation: TASEA	Affiliation:	Affiliation:

• Sample originator and destination laboratory each sign and retain one copy.

Project Name:	2019 Blakely Harbor Sediment Investigation
Project Location:	Bainbridge Island, Washington
Client/Point of Contact:	John Evered, WA State Dept. of Ecology
Destination Lab:	Eurofins TestAmerica
Destination Contact:	Nate Lewis (253) 248-4975
Turn around Time:	Standard
Sample Originator:	Leidos/NewFields
Project Manager:	Tom Dubé/Tim Hammermeister
Originator Phone/Email:	(425) 482-3325 / thomas.e.dube@leidos.com
Sample Collectors:	NewFields

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Project Number:
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Sample ID	Matrix	Date	Time	No. and Type of Containers	Grain size	Total solids, TVS	TOC, NH_3, metals, Hg	SVOCs, PCBs	Total sulfides	Dioxins/Furans							Jar #s	Comments
BH2-12-S	Sediment	7/2/19	1023	5 glass	X	X	X	X	X								5070-5074	
BH2-40-S	↓	↓	1205	↓	X	X	X	X	X								5216-5220	
BH2-39-S			1218	6 glass	X	X	X	X	X	X							5210-5215	
BH2-38-S			1230	5 glass	X	X	X	X	X								5205-5209	
BH2-37-S			1242	6 glass	X	X	X	X	X	X							5199-5204	
BH2-36-S			1254	5 glass	X	X	X	X	X								5194-5198	
BH2-35-S			1308	↓	X	X	X	X	X								5189-5193	Extra jars for MS/MSD
BH2-34-S			1322	11 glass	X	X	X	X	X								5184-5188, 5268-5270	
BH2-33-S			1341	5 glass	X	X	X	X	X								5179-5183	
BH2-32-S			1357	↓	X	X	X	X	X								5174-5178	
BH2-31-S			1415	6 glass	X	X	X	X	X	X							5168-5173	
BH2-30-S			1429	5 glass	X	X	X	X	X								5163-5167	
BH2-29-S			1441		X	X	X	X	X								5158-5162	
BH2-26-S			1456		X	X	X	X	X								5143-5147	
BH2-25-S	↓	↓	1511	↓	X	X	X	X	X								5138-5142	

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature:	Signature:	Signature:	Signature:
Date/Time: 7/2/19 0815	Date/Time: 7/3/19 0815	Date/Time:	Date/Time:
Affiliation: NewFields	Affiliation: TAL SEA	Affiliation:	Affiliation:

• Sample originator and destination laboratory each sign and retain one copy.

Project Name:	2019 Blakely Harbor Sediment Investigation
Project Location:	Bainbridge Island, Washington
Client/Point of Contact:	John Evered, WA State Dept. of Ecology
Destination Lab:	Eurofins TestAmerica
Destination Contact:	Nate Lewis (253) 248-4975
Turn around Time:	Standard
Sample Originator:	Leidos/NewFields
Project Manager:	Tom Dubé/Tim Hammermeister
Originator Phone/Email:	(425) 482-3325 / thomas.e.dube@leidos.com
Sample Collectors:	NewFields

Analyses / Tests

Number of Shipping Containers: 11

Invoice to: Leidos
Address:
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Suite 112
Bothell WA, 98011
thomas.e.dube@leidos.com

Project Number:
860.0195.000

Sample ID	Matrix	Date	Time	No. and Type of Containers	Grain size	Total solids, TVS	TOC, NH_3, metals, Hg	SVOCs, PCBs	Total sulfides	Dioxins/Furans	TOC, NH_3	Mercury					Jar #s Comments
BH2-25-D	Sediment	7/2/19	1511	5 glass	X	X	X	X	X								5226-5230
BH2-25-T	↓	↓	1511	4 glass	X	X			X		X						5237-5240
BH2-24-S	↓	↓	1525	5 glass	X	X	X	X	X								5133-5137
BH2-16-S	↓	↓	1543	6 glass	X	X	X	X	X	X							5090-5095
BH2-15-ER	Water	7/1/19	1915	4 amber 2 plastic				X				X					5241-5246
BH2-16-ER	↓	7/2/19	1602	↓				X				X					5247-5252
BH2-16-RB	↓	↓	1602	↓				X				X					5253-5258

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature:	Signature:	Signature:	Signature:
Date/Time: 7/3/19 0815	Date/Time: 07-03-19 0815	Date/Time:	Date/Time:
Affiliation: NewFields	Affiliation:	Affiliation:	Affiliation:

• Sample originator and destination laboratory each sign and retain one copy.

Project Name:	2019 Blakely Harbor Sediment Investigation
Project Location:	Bainbridge Island, Washington
Client/Point of Contact:	John Evered, WA State Dept. of Ecology
Destination Lab:	Eurofins TestAmerica
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Turn around Time:	Standard
Sample Originator:	Leidos/NewFields
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Originator Phone/Email:	(425) 482-3325 / thomas.e.dube@leidos.com
Sample Collectors:	NewFields

Analyses / Tests

Sample ID	Matrix	Date	Time	No. and Type of Containers	Grain size	Total solids, TVS	TOC, NH_3, metals, Hg	SVOCs, PCBs	Total sulfides	Dioxins/Furans						Comments
BH2-06-S	Sediment	7/1/19	0950	2 9/255		X			X							5038, 5041
BH2-09-S			1040	2 9/255		X			X							5055, 5058
BH2-08-S			1103	2 9/255		X			X							5049, 5052
BH2-28-S			1335			X			X							5154, 5157
BH2-27-S			1353			X			X							5149, 5152
BH2-23-S			1408			X			X							5129, 5132
BH2-19-S			1434			X			X							5108, 5111
BH2-20-S			1445			X			X							5113, 5116
BH2-21-S			1502			X			X							5118, 5121
BH2-22-S			1514			X			X							5124, 5127
BH2-18-S			1527			X			X							5102, 5105
BH2-17-S			1544			X			X							5097, 5100
BH2-14-S			1557			X			X							5081, 5084
BH2-7-S			1640			X			X							5044, 5047
BH2-3-S			1656			X			X							5022, 5025

Number of Shipping Containers:

Invoice to: Leidos

Address:
18939 120th Ave NE
Suite 112
Bothell WA, 98011
thomas.e.dube@leidos.com

Project Number:
860.0195.000

RELINQUISHED BY:	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:**
Signature:	**Signature:**	**Signature:**	**Signature:**
Date/Time: 7/2/19 0730	**Date/Time:**	**Date/Time:**	**Date/Time:**
Affiliation: NewFields	**Affiliation:**	**Affiliation:**	**Affiliation:**

• Sample originator and destination laboratory each sign and retain one copy.

Project Name:	2019 Blakely Harbor Sediment Investigation
Project Location:	Bainbridge Island, Washington
Client/Point of Contact:	John Evered, WA State Dept. of Ecology
Destination Lab:	Eurofins TestAmerica
Destination Contact:	Nate Lewis (253) 248-4975
Turn around Time:	Standard
Sample Originator:	Leidos/NewFields
Project Manager:	Tom Dubé/Tim Hammermeister
Originator Phone/Email:	(425) 482-3325 / thomas.e.dube@leidos.com
Sample Collectors:	NewFields

Analyses / Tests

Sample ID	Matrix	Date	Time	No. and Type of Containers	Grain size	Total solids, TVS	TOC, NH_3, metals, Hg	SVOCs, PCBs	Total sulfides	Dioxins/Furans	Jar # / Comments
BH2-2-S	Sediment	7/1/19	1710	2 9oz ss		X			X		2 extra for sulfide MS/MSD 5017 5020 5259 5266
BH2-1-S	↓	↓	1727	2 9/2oz ss		X			X		5012, 5015
BH2-5-S			1741	↓		X			X		5033, 5036
BH2-4-S			1754			X			X		5028, 5031
BH2-4-D			1754			X			X		5222, 5225
BH2-4-T			1754			X			X		5233, 5235
BH2-10-S			1812			X			X		5061, 5064
BH2-11-S			1824			X			X		5066, 5069
BH2-13-S			1841			X			X		5076, 5079
BH2-15-S	↓	↓	1854	↓		X			X		5086, 5089

Number of Shipping Containers:

Invoice to: Leidos

Address:
18939 120th Ave NE
Suite 112
Bothell WA, 98011
thomas.e.dube@leidos.com

Project Number:
860.0195.000

RELINQUISHED BY:	**RECEIVED BY:**	**RELINQUISHED BY:**	**RECEIVED BY:**
Signature:	**Signature:**	**Signature:**	**Signature:**
Date/Time: 7/2/19 0730	**Date/Time:**	**Date/Time:**	**Date/Time:**
Affiliation: NewFields	**Affiliation:**	**Affiliation:**	**Affiliation:**

• Sample originator and destination laboratory each sign and retain one copy.

Attachment 7

Sample Container Logbook

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 06
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 0950 / 07-01-19
Crew: JN, SS	**Time/Date Processed:** 1010 / 07-01-19
Comments: 47.59687 N 122.51671 W	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5037	BH 2-06-S	Grain size	TestAmerica
5038	↓	Total solids, TVS	TestAmerica
5039		TOC, NH_3, metals, Hg	TestAmerica
5040		SVOCs, PCBs	TestAmerica
5041		Total sulfides	TestAmerica
5042		Dioxins/Furans	TestAmerica

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 09
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1040 / 7-1-19
Crew: JN, SS	**Time/Date Processed:** 1050 / 7-1-19
Comments: 47.59658N 122.51455W	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5054	BH2-09-S	Grain size	TestAmerica
5055	↓	Total solids, TVS	TestAmerica
5056		TOC, NH_3, metals, Hg	TestAmerica
5057		SVOCs, PCBs	TestAmerica
5058		Total sulfides	TestAmerica
5059	↓	Dioxins/Furans	TestAmerica

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 08
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** ~~7~~ SSS 11:03/7-1-19
Crew: JN, SS	**Time/Date Processed:** 11:15 | 7-1-19
Comments: 47.59629N 122.51492W	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5048	BH2-08-S	Grain size	TestAmerica
5049		Total solids, TVS	TestAmerica
5050		TOC, NH_3, metals, Hg	TestAmerica
5051		SVOCs, PCBs	TestAmerica
5052		Total sulfides	TestAmerica
5053		Dioxins/Furans	TestAmerica

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 28
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1335 / 07-01-19
Crew: JN, SS, Eric Parker, Andrew	**Time/Date Processed:** 1340 / 07-01-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5153	BH2-28-S	Grain size	TestAmerica
5154	↓	Total solids, TVS	TestAmerica
5155	↓	TOC, NH_3, metals, Hg	TestAmerica
5156	↓	SVOCs, PCBs	TestAmerica
5157	↓	Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: J.S. Thurston

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 27
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 7-1-19 | 1353
Crew: JN, SS , EP , A	**Time/Date Processed:** 7-1-19 | 1756
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5148	BH2-27-S	Grain size	TestAmerica
5149	↓	Total solids, TVS	TestAmerica
5150	↓	TOC, NH_3, metals, Hg	TestAmerica
5151	↓	SVOCs, PCBs	TestAmerica
5152	↓	Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 23
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1408 / 7-1-19
Crew: JN, SS, EP, A	**Time/Date Processed:** ~~1412~~ 1424 / 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5128	BH2-23-S	Grain size	TestAmerica
5129	↓	Total solids, TVS	TestAmerica
5130		TOC, NH_3, metals, Hg	TestAmerica
5131		SVOCs, PCBs	TestAmerica
5132		Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 19
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1434 / 7-1-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1438 / 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5107	BH2-19-S	Grain size	TestAmerica
5108	↓	Total solids, TVS	TestAmerica
~~5~~ 5109	↓	TOC, NH_3, metals, Hg	TestAmerica
5110	↓	SVOCs, PCBs	TestAmerica
5111	↓	Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: _____

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 20
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1445 / 7-1-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1453 / 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5112	BH2-20-S	Grain size	TestAmerica
5113	↓	Total solids, TVS	TestAmerica
5114		TOC, NH_3, metals, Hg	TestAmerica
5115		SVOCs, PCBs	TestAmerica
5116		Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2-21
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1502 | 7-1-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1506 | 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5117	BH2-21-S	Grain size	TestAmerica
5118		Total solids, TVS	TestAmerica
5119		TOC, NH_3, metals, Hg	TestAmerica
5120		SVOCs, PCBs	TestAmerica
5121		Total sulfides	TestAmerica
5122		Dioxins/Furans	TestAmerica

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2-22
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1514 | 7-1-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1520 | 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5123	BH2-22-S	Grain size	TestAmerica
5124	↓	Total solids, TVS	TestAmerica
5125		TOC, NH_3, metals, Hg	TestAmerica
5126		SVOCs, PCBs	TestAmerica
5127		Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2-18
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1527 | 7-1-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1535 | 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5101	BH2-18-S	Grain size	TestAmerica
5102	↓	Total solids, TVS	TestAmerica
5103		TOC, NH_3, metals, Hg	TestAmerica
5104		SVOCs, PCBs	TestAmerica
5105		Total sulfides	TestAmerica
5106		Dioxins/Furans	TestAmerica
5231	BH2-18-D	Dioxins/Furans	TestAmerica

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 17
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1544 / 7-1-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1551 / 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5096	BH2-17-S	Grain size	TestAmerica
5097	↓	Total solids, TVS	TestAmerica
5098	↓	TOC, NH_3, metals, Hg	TestAmerica
5099	↓	SVOCs, PCBs	TestAmerica
5100	↓	Total sulfides	TestAmerica
	↓ SS	~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: C. C. Rivera

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 14
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1557 / 7-1-19
Crew: JN, SS, ED, A	**Time/Date Processed:** 1604 / 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5080	BH2-14-S	Grain size	TestAmerica
5081	↓	Total solids, TVS	TestAmerica
5082		TOC, NH_3, metals, Hg	TestAmerica
5083		SVOCs, PCBs	TestAmerica
5084		Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 07
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1640 | 7-1-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1646 | 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5043	BH2-07-S	Grain size	TestAmerica
5044	↓	Total solids, TVS	TestAmerica
5045	↓	TOC, NH_3, metals, Hg	TestAmerica
5046	↓	SVOCs, PCBs	TestAmerica
5047	↓	Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: L. L. Rusk

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 03
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1656 / 7-1-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1700 / 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5021	BH2-03-S	Grain size	TestAmerica
5022	↓	Total solids, TVS	TestAmerica
5023		TOC, NH_3, metals, Hg	TestAmerica
5024		SVOCs, PCBs	TestAmerica
5025		Total sulfides	TestAmerica
5026		Dioxins/Furans	TestAmerica

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2-02
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1710 / 7-1-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1717 / 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5016	BH2-02-S	Grain size	TestAmerica
5017		Total solids, TVS	TestAmerica
5018		TOC, NH_3, metals, Hg	TestAmerica
5019		SVOCs, PCBs	TestAmerica
5020		Total sulfides	TestAmerica
~~———~~	~~———~~	~~Dioxins/Furans~~	~~TestAmerica~~
5259	BH2-02-S	Total sulfides	"
5260		Total sulfides	"
5261		SVOCs, PCBs	"
5262		SVOCs, PCBs	"
5263		TOC, NH_3, metals, Hg	"
5264		TOC, NH_3, metals, Hg	"

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 01
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1727 / 7-1-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1734 / 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5011	BH2-01-S	Grain size	TestAmerica
5012	↓	Total solids, TVS	TestAmerica
5013	↓	TOC, NH_3, metals, Hg	TestAmerica
5014	↓	SVOCs, PCBs	TestAmerica
5015	↓	Total sulfides	TestAmerica
	↓	~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 05
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1741 / 7-1-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1747 / 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5032	BH2-05-S	Grain size	TestAmerica
5033	↓	Total solids, TVS	TestAmerica
5034	↓	TOC, NH_3, metals, Hg	TestAmerica
5035	↓	SVOCs, PCBs	TestAmerica
5036	↓	Total sulfides	TestAmerica
	↓	~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 04
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1754 | 7-1-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1800 | 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5027	BH2-04-S	Grain size	TestAmerica
5028	↓	Total solids, TVS	TestAmerica
5029		TOC, NH_3, metals, Hg	TestAmerica
5030		SVOCs, PCBs	TestAmerica
5031	↓	Total sulfides	TestAmerica
~~———~~	~~———~~	~~Dioxins/Furans~~	~~TestAmerica~~
5221	BH2-04-D	Grain size	"
5222	↓	Total solids, TVS	"
5223		TOC, NH_3, metals, Hg	"
5224		SVOCs, PCBs	"
5225	↓	Total sulfides	"
5232	BH2-04-T	Grain size	"
5233	↓	Total solids, TVS	"
5234		TOC, ammonia	"
5235	↓	Total sulfides	"

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2-10
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1812 | 7-1-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1819 | 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5060	BH2-10-S	Grain size	TestAmerica
5061	↓	Total solids, TVS	TestAmerica
5062		TOC, NH_3, metals, Hg	TestAmerica
5063		SVOCs, PCBs	TestAmerica
5064		Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: C. C. Thurlow

Sample Container Logbook

Client: Ecology	**Location ID:** BH2-11
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1824 | 7-1-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1830 | 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5065	BH2-11-S	Grain size	TestAmerica
5066	↓	Total solids, TVS	TestAmerica
5067		TOC, NH_3, metals, Hg	TestAmerica
5068		SVOCs, PCBs	TestAmerica
5069		Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 13
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1841 / 7-1-19
Crew: JN, SS, ER, A	**Time/Date Processed:** 1846 / 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5075	BH2-13-S	Grain size	TestAmerica
5076	↓	Total solids, TVS	TestAmerica
5077		TOC, NH_3, metals, Hg	TestAmerica
5078		SVOCs, PCBs	TestAmerica
5079		Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 15
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1854 / 7-1-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1859 / 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5085	BH2-15-S	Grain size	TestAmerica
5086	↓	Total solids, TVS	TestAmerica
5087	↓	TOC, NH_3, metals, Hg	TestAmerica
5088	↓	SVOCs, PCBs	TestAmerica
5089	↓	Total sulfides	TestAmerica
	↓	~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: C. J. Andrew

Sample Container Logbook

Client: Ecology	**Location ID:** BH2-12
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 10:23 / 7-2-19
Crew: JN, SS ~~ER, AS~~	**Time/Date Processed:** 10:28 / 7-2-19
Comments: wood plank substrate w/ pockets of sediment 47.59631 N 122.51454 W	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5070	~~BH12~~ BH2-12-S	Grain size	TestAmerica
5071	↓	Total solids, TVS	TestAmerica
5072	↓	TOC, NH_3, metals, Hg	TestAmerica
5073	↓	SVOCs, PCBs	TestAmerica
5074	↓	Total sulfides	TestAmerica
	↓	~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 40
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1205 / 7-2-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1210 / 7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5216	BH2-40-S	Grain size	TestAmerica
5217	↓	Total solids, TVS	TestAmerica
5218	↓	TOC, NH_3, metals, Hg	TestAmerica
5219	↓	SVOCs, PCBs	TestAmerica
5220	↓	Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: L. P. Sutton

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 39
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1218 / 7-2-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1225 / 7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5210	BH2-39-S	Grain size	TestAmerica
5211	↓	Total solids, TVS	TestAmerica
5212		TOC, NH_3, metals, Hg	TestAmerica
5213		SVOCs, PCBs	TestAmerica
5214		Total sulfides	TestAmerica
5215		Dioxins/Furans	TestAmerica

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 38
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1230 / 7-2-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1234 / 7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5205	BH2-38-S	Grain size	TestAmerica
5206	↓	Total solids, TVS	TestAmerica
5207	↓	TOC, NH_3, metals, Hg	TestAmerica
5208	↓	SVOCs, PCBs	TestAmerica
5209	↓	Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica.~~

Notes:

NewFields

Completed by: C. J. Mills

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 37
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1242 / 7-2-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1247 / 7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5199	BH2-37-S	Grain size	TestAmerica
5200	↓	Total solids, TVS	TestAmerica
5201		TOC, NH_3, metals, Hg	TestAmerica
5202		SVOCs, PCBs	TestAmerica
5203		Total sulfides	TestAmerica
5204		Dioxins/Furans	TestAmerica

Notes:

NewFields

Completed by: L. C. Mueller

Sample Container Logbook

Client: Ecology	**Location ID:** BH2-36
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1259/7-2-19 ~~7-2-19~~ 7-2-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1259/7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5194	BH2-36-S	Grain size	TestAmerica
5195		Total solids, TVS	TestAmerica
5196		TOC, NH_3, metals, Hg	TestAmerica
5197		SVOCs, PCBs	TestAmerica
5198		Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2-35
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1308 / 7-2-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1316 / 7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5189	BH2-35-S	Grain size	TestAmerica
5190	↓	Total solids, TVS	TestAmerica
5191		TOC, NH_3, metals, Hg	TestAmerica
5192		SVOCs, PCBs	TestAmerica
5193		Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2-~~2~~A
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1322/7-2-19
Crew: JN, SS, ER, A	**Time/Date Processed:** 1329/7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5184	BH2-3A-S	Grain size	TestAmerica
5185		Total solids, TVS	TestAmerica
5186		TOC, NH_3, metals, Hg	TestAmerica
5187		SVOCs, PCBs	TestAmerica
5188		Total sulfides	TestAmerica
~~———~~	~~———~~	~~Dioxins/Furans~~	~~TestAmerica~~
5269		Total sulfides	"
5270		Total Sulfides	"
5265		SVOCs, PCBs	"
5266		SVOCs, PCBs	"
5267		TOC, NH_3, metals, Hg	"
5268	↓	TOC, NH_3, metals, Hg	"

Notes:

NewFields

Completed by: L. C. Musto

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 33
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1341 / 7-2-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1340 / 7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5179	BH2-33-S	Grain size	TestAmerica
5180	↓	Total solids, TVS	TestAmerica
5181	↓	TOC, NH_3, metals, Hg	TestAmerica
5182	↓	SVOCs, PCBs	TestAmerica
5183	↓	Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: J. C. Mitchell

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 32
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1357 / 7-2-19
Crew: JN, SS, ~~EP~~, A	**Time/Date Processed:** 1403 / 7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5174	BH2-32-S	Grain size	TestAmerica
5175	↓	Total solids, TVS	TestAmerica
5176	↓	TOC, NH_3, metals, Hg	TestAmerica
5177	↓	SVOCs, PCBs	TestAmerica
5178	↓	Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 31
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1415 / 7-2-19
Crew: JN, SS, GP, A	**Time/Date Processed:** 1420 / 7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5168	BH2-31-S	Grain size	TestAmerica
5169	↓	Total solids, TVS	TestAmerica
5170		TOC, NH_3, metals, Hg	TestAmerica
5171		SVOCs, PCBs	TestAmerica
5172		Total sulfides	TestAmerica
5173		Dioxins/Furans	TestAmerica

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2-30
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1429 / 7-2-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1433 / 7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5163	BH2-30-S	Grain size	TestAmerica
5164	↓	Total solids, TVS	TestAmerica
5165		TOC, NH_3, metals, Hg	TestAmerica
5166		SVOCs, PCBs	TestAmerica
5167		Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: J. J. Mud

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 29
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1441 / 7-2-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1446 / 7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5158	BH2-29-S	Grain size	TestAmerica
5159	↓	Total solids, TVS	TestAmerica
5160	↓	TOC, NH_3, metals, Hg	TestAmerica
5161	↓	SVOCs, PCBs	TestAmerica
5162	↓	Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: J. J. Arnold

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 26
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1456 / 7-2-19
Crew: JN, SS, ED, A	**Time/Date Processed:** 1501 / 7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
~~A~~ 5143	BH2-26-S	Grain size	TestAmerica
5144	↓	Total solids, TVS	TestAmerica
5145		TOC, NH_3, metals, Hg	TestAmerica
5146		SVOCs, PCBs	TestAmerica
5147		Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 25
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1511 | 7-2-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1516 | 7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5138	BH2-25-S	Grain size	TestAmerica
5139	↓	Total solids, TVS	TestAmerica
5140	↓	TOC, NH_3, metals, Hg	TestAmerica
5141	↓	SVOCs, PCBs	TestAmerica
5142	↓	Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~
5226	BH2-25-D	Grain size	"
5227	↓	Total solids, TVS	"
5228	↓	TOC, NH_3, metals, Hg	"
5229	↓	SVOCs, PCBs	"
5230	↓	Total sulfides	"
5237	BH2-25-T	Grain size	"
5238	↓	Total solids, TVS	"
5239	↓	TOC, NH_3	"
5240	↓	Total sulfides	"

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 24
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1525 | 7-2-19
Crew: JN, SS, EP, A	**Time/Date Processed:** 1537 | 7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5133	BH2-24-S	Grain size	TestAmerica
5134	↓	Total solids, TVS	TestAmerica
5135	↓	TOC, NH_3, metals, Hg	TestAmerica
5136	↓	SVOCs, PCBs	TestAmerica
5137	↓	Total sulfides	TestAmerica
		~~Dioxins/Furans~~	~~TestAmerica~~

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2-16
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1543 / 7-2-19
Crew: JN, SS, ER, A	**Time/Date Processed:** 1549 / 7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5090	BH2-16-S	Grain size	TestAmerica
5091	↓	Total solids, TVS	TestAmerica
5092	↓	TOC, NH_3, metals, Hg	TestAmerica
5093	↓	SVOCs, PCBs	TestAmerica
5094	↓	Total sulfides	TestAmerica
~~———~~	~~———~~	~~Dioxins/Furans~~	~~TestAmerica~~
5095	↓	Dioxins / Furans	Test America

Notes:

NewFields

Completed by: [signature]

Sample Container Logbook

Client: Ecology	**Location ID:** BH2-15
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1915 / 7-1-19
Crew: JN, SS, ED, A	**Time/Date Processed:** 1915 / 7-1-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5241	BH2-15-ER	PCBs	TestAmerica
5242	↓	PCBs	TestAmerica
5243		Hg	TestAmerica
5244		Metals	TestAmerica
5245		SVOCs	TestAmerica
5246		SVOCs	TestAmerica

Notes:

NewFields

Completed by:_____

Sample Container Logbook

Client: Ecology	**Location ID:** BH2-16
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1602 | 7-2-19
Crew: JN, SS	**Time/Date Processed:** 1602 | 7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5247	BH2-16-ER	PCBs	TestAmerica
5248	↓	PCBs	TestAmerica
5249		Hg	TestAmerica
5250		Metals	TestAmerica
5251		SVOCs	TestAmerica
5252		SVOCs	TestAmerica

Notes:

NewFields

Completed by: J. J. Summ

Sample Container Logbook

Client: Ecology	**Location ID:** BH2- 16
Project: 2019 Blakely Harbor Sediment Investigation	**Time/Date Collected:** 1602 | 7-2-19
Crew: JN, SS	**Time/Date Processed:** 1602 | 7-2-19
Comments:	

Sample Container Tag Number	Sample ID	Analysis	Laboratory
5253	BH2-16-RB	PCBs	TestAmerica
5254	↓	PCBs	TestAmerica
5255		Hg	TestAmerica
5256		Metals	TestAmerica
5257		SVOCs	TestAmerica
5258		SVOCs	TestAmerica

Notes:

NewFields

Completed by: [signature]

Appendix B. Chemistry Results

Table B-1. Blakely Harbor Chemistry Results - TOC Normalized

Parameter	SMS		BH2-01-S	Q	VQ	BH2-02-S	Q	VQ	BH2-03-S	Q	VQ	BH2-04-S	Q	VQ	BH2-04-D	Q	VQ	BH2-04-T	Q	VQ	BH2-05-S	Q	VQ	BH2-06-S	Q	VQ	BH2-07-S	Q	VQ
	SQS	CSL																											
Conventionals																													
Total Solids (%)	---	---	54.2			45.3			34.1			46.1			46.1			47.2			41.1			41.1			35.8		
Total Volatile Solids (%)	---	---	4.4			8.5			6.3			5.4			6.5			6.8			6			8.8			5.8		
Total Organic Carbon (%)	---	---	4			8.1			17			8.9			8.6			9.2			12			13			12		
Total Sulfides (mg/kg)	---	---	14	U		9.5	U F1 F2	UJ H02 L	25			12	U		11	U		11	U		13	U		39	F1	J H02 L	500		
Ammonia (mg/kg)	---	---	16	U		18	U F2	U	28	U		22	U		20	U		21	U		24	U		51	J B	J	52	J B	J
Grain Size (% fines)	---	---	40.5			42.5			67.4			54.6			51.4			27			45.9			67			41.7		
Metals (mg/kg DW)																													
Arsenic	57	93	9.3	B		11	B		14	B		9.1	B		10	B					10	B		13	B		14	B	
Cadmium	5.1	6.7	0.47			0.5			0.45			0.32			0.31						0.46			0.6			1.2		
Chromium	260	270	19	B	J D05 L	23	B		27	B	J D05 L	20	B	J D05 L	22	B	J D05 L				20	B	J D05 L	28	B	J D05 L	19	B	
Copper	390	390	29			41			63			36			40						39			66			58		
Lead	450	530	51	B		71	B		110	B		62	B		68	B					78	B		110	B		130	B	
Mercury	0.41	0.59	0.11			0.17			0.22			0.15			0.14						0.15			0.17			0.12		
Silver	6.1	6.1	0.12			0.17			0.25			0.15			0.17						0.16			0.26			0.21		
Zinc	410	960	62			67			77			52			57						76			82			80		
Organics																													
Low Molecular Polycyclic Aromatic Hydrocarbons (LPAH) (mg/kg OC)																													
Naphthalene	99	170	1.98			2.22	F1	J H02 L	2.24			1.57			1.40						1.67			0.37	J		1.67	J	
Acenaphthylene	66	66	0.53	J		0.46	J		0.24	J		0.29	J		0.27	J					0.31	J		0.12	J		0.56	U	
Acenaphthene	16	57	0.35	J		0.25	J		0.14	J		0.18	J		0.26	J					0.17	J		0.09	U		4.75		
Fluorene	23	79	0.40	J		0.37	J		0.15	J		0.20	J		0.30	J					0.24	J		0.12	J		3.92		
Phenanthrene	100	480	3.00			2.35	F1 F2	J H01 H	1.18			1.57			2.33						1.83			1.00	J		29.17		
Anthracene	220	1200	0.78	J		0.63	J F1	J H01 H	0.26	J		0.35	J		0.67						0.48			0.25	J		7.58		
2-Methylnaphthalene	38	64	0.40	U		0.25	J F1	J H02 L	0.15	J		0.19	U		0.20	U					0.17	J		0.16	U		1.08	J	
Total LPAH	370	780	7.03			6.52			4.36			4.17			5.22						4.86			1.85			48.17		
High Molecular Polycyclic Aromatic Hydrocarbons (HPAH) (mg/kg OC)																													
Fluoranthene	160	1,200	4.75			3.83	F1 F2	J H01 H, H04H	1.71			2.47			2.91						2.67			1.77			25.00		
Pyrene	1,000	1,400	5.00			4.07	F1 F2	J H01 H	1.82			2.58			3.02						2.83			1.85			26.67		
Benz[a]anthracene	110	270	2.05			1.60	F1 F2	J H01 H, H04 H	0.65			0.97			1.28						1.25			0.85			9.17		
Chrysene	110	460	2.38	J		1.48	J F1 F2	J H02 L, H04 H	0.71	J		1.11	J		1.28	J					1.25			0.77	J		9.17		
Benzofluoranthenes	230	450	2.50	J		1.85	J F1 F2	J H01 H, H04 H	0.32	J		1.35	J		0.58	J					1.67	J		0.44	J		3.50	J	
Benzo(a)pyrene	99	210	2.00	J		1.23	J F1 F2	J H01 H, H04 H	0.65	J		0.88	J		1.28	J					1.17			0.68	J		7.17		
Indeno(1,2,3-c,d)pyrene	34	88	1.53	J		1.04	J F1	J H01 H	0.65			0.74	J		1.01						0.92			0.66	J		4.75		
Dibenzo(a,h)anthracene	12	33	0.53	U		0.32	J F2	J H04 H	0.19	U		0.26	U		0.31	J					0.21	U		0.22	U		1.33	U	
Benzo(g,h,i)perylene	31	78	1.08	J		0.90	J F1 F2	J H01 H, H04 H	0.47	J		0.58	J		0.64	J					0.73	J		0.49	J		4.50	J	
Total HPAH	960	5,300	21.28			16.33			6.97			10.69			12.31						12.48			7.51			89.92		
Chlorinated Hydrocarbons (mg/kg OC)																													
1,4-Dichlorobenzene	3.1	9	0.38	U		0.22	U F1	UJ H02 L	0.14	U		0.18	U		0.19	U					0.15	U		0.15	U		0.92	U	
1,2-Dichlorobenzene	2.3	2.3	0.53	U		0.32	U F1	UJ H02 L	0.19	U		0.26	U		0.28	U					0.21	U		0.22	U		1.33	U	
1,2,4-Trichlorobenzene	0.81	1.8	0.28	U		0.16	U F1	UJ H02 L	0.10	U		0.13	U		0.14	U					0.11	U		0.11	U		0.67	U	
Hexachlorobenzene	0.38	2.3	0.68	U		0.41	U		0.25	U		0.33	U		0.34	U					0.27	U		0.27	U		1.67	U	
Phthalates (mg/kg OC)																													
Dimethyl phthalate	53	53	0.58	U		0.35	U		0.21	U		0.28	U		0.29	U					0.23	U		0.24	U		1.42	U	
Diethyl phthalate	61	110	3.25	U		2.10	U		1.24	U		1.69	U		1.74	U					1.33	U		1.38	U		8.33	U	
Di-n-butyl phthalate	220	1,700	2.50	U		1.48	U F1		0.94	U		1.24	U		1.28	U					1.00	U		1.00	U		6.33	U	
Butyl benzyl phthalate	4.9	64	2.50	J B	J	1.98	J B	J	1.06	J B	J	1.35	J B	J	1.16	J B	J				1.00	J B	J	1.00	J B	J	5.75	J B	J
Bis(2-ethylhexyl)phthalate	47	78	3.25	U		1.85	U F1	U	1.18	U		1.57	U		1.63	U					1.25	U		1.31	U		7.92	U	
Di-n-octyl phthalate	58	4,500	2.50	U		1.48	U F1		0.94	U		1.24	U		1.28	U					1.00	U		1.15	J		6.33	U	

Table B-1. Blakely Harbor Chemistry Results - TOC Normalized

Parameter	SMS		BH2-01-S	Q	VQ	BH2-02-S	Q	VQ	BH2-03-S	Q	VQ	BH2-04-S	Q	VQ	BH2-04-D	Q	VQ	BH2-04-T	Q	VQ	BH2-05-S	Q	VQ	BH2-06-S	Q	VQ	BH2-07-S	Q	VQ
	SQS	CSL																											
Miscellaneous Extractables (mg/kg OC)																													
Dibenzofuran	15	58	0.25	U		0.28	J		0.13	J		0.19	J		0.20	J					0.18	J		0.11	U		1.83	J	
Hexachlorobutadiene	3.9	6.2	0.68	U		0.41	U F1	UJ H02 L	0.25	U		0.33	U		0.34	U					0.27	U		0.27	U		1.67	U	
N-Nitrosodiphenylamine	11	11	0.35	U		0.21	U		0.13	U		0.17	U		0.19	U					0.14	U		0.15	U		0.92	U	
PCB Aroclors (mg/kg OC)																													
PCB-aroclor 1016	---	---	0.030	U		0.017	U		0.011	U		0.015	U		0.019	U					0.013	U		0.012	U		0.014	U	
PCB-aroclor 1221	---	---	0.038	U		0.022	U		0.015	U		0.019	U		0.023	U					0.016	U		0.016	U		0.018	U	
PCB-aroclor 1232	---	---	0.038	U		0.022	U		0.015	U		0.019	U		0.023	U					0.016	U		0.016	U		0.018	U	
PCB-aroclor 1242	---	---	0.019	U		0.012	U		0.008	U		0.010	U		0.012	U					0.008	U		0.008	U		0.009	U	
PCB-aroclor 1248	---	---	0.014	U		0.009	U		0.006	U		0.007	U		0.009	U					0.006	U		0.006	U		0.007	U	
PCB-aroclor 1254	---	---	0.053	J	UJ C05 L	0.051	J K01 L, C05 L		0.012	U	UJ C05 L	0.018	J p	J K01 L,	0.020	U	UJ C05 L				0.027	J	J K01 L, C05 L	0.013	U		0.016	U	UJ C05 L
PCB-aroclor 1260	---	---	0.030	U		0.019	U		0.012	U		0.016	U		0.019	U					0.013	U		0.013	U		0.015	U	
PCB-aroclor 1262	---	---	0.018	U		0.011	U		0.007	U		0.009	U		0.012	U					0.008	U		0.008	U		0.009	U	
PCB-aroclor 1268	---	---	0.019	U		0.012	U		0.008	U		0.010	U		0.012	U					0.008	U		0.008	U		0.009	U	
Total PCBs	12	65	0.053	J		0.051			0.015	U		0.018	J p		0.023	U					0.027	J		0.016	U		0.018	U	
Phenols (mg/kg DW)																													
Phenol	0.42	1.2	0.17	J		1.00			0.63			0.68			0.55						0.49			0.06	J		1.40	J	
2-Methylphenol	0.063	0.063	0.02	U		0.02	U		0.03	U		0.02	U		0.02	U					0.02	U		0.02	U		0.13	U	
3- and 4-Methylphenol	0.67	0.67	0.46			0.40	J F1	J H02 L	0.17	J		0.41			0.39						0.48			0.67			0.84	J	
2,4-Dimethylphenol	0.029	0.029	0.027	U		0.03	U		0.04	U		0.029	U		0.029	U					0.03	U		0.04	U		0.20	U	
Pentachlorophenol	0.36	0.96	0.23	U		0.29	U F1	U	0.37	U		0.26	U		0.26	U					0.28	U		0.31	U		1.80	U	
Benzyl alcohol	0.057	0.073	0.14	U		0.17	U F1	R H03 L	0.21	U		0.15	U		0.15	U					0.16	U		0.18	U		1.00	U	
Benzoic acid	0.65	0.65	1.00	U		1.30	U		1.60	U		1.10	U		1.10	U					1.20	U		1.40	U		7.70	U	
Dioxin/Furan Congeners (ng/kg DW)																													
2,3,7,8-TCDD	---								1.8	J														1.3	J				
1,2,3,7,8-PeCDD	---								4.6	J														3.4	J				
1,2,3,4,7,8-HxCDD	---								5.4	J B	J													4.4	J B	J			
1,2,3,6,7,8-HxCDD	---								9.8	J														8.2	J				
1,2,3,7,8,9-HxCDD	---								13	J														11	J				
1,2,3,4,6,7,8-HpCDD	---								140	B														120	B				
OCDD	---								1200	B														1000	B				
2,3,7,8-TCDF	---								9.7															7.3					
1,2,3,7,8-PeCDF	---								6	J B	J													4.9	J B	J			
2,3,4,7,8-PeCDF	---								4.3	J														3.4	J				
1,2,3,4,7,8-HxCDF	---								11	J														10	J				
1,2,3,6,7,8-HxCDF	---								3.5	J														3.1	J				
1,2,3,7,8,9-HxCDF	---								0.63	J B	U F01													0.58	J B	U F01			
2,3,4,6,7,8-HxCDF	---								2.2	J														1.7	J				
1,2,3,4,6,7,8-HpCDF	---								27	B														26	B				
1,2,3,4,7,8,9-HpCDF	---								1	J B	J													1.3	J B	J			
OCDF	---								29	B														23	J B	J			
Total TEQ (ND = 0)	---								15.4															12.2					
	Exceeds SQS	Exceeds CSL																											

Table B-1. Blakely Harbor Chemistry Results - TOC Normalized

Parameter	SMS		BH2-08-S	Q	VQ	BH2-09-S	Q	VQ	BH2-10-S	Q	VQ	BH2-11-S	Q	VQ	BH2-12-S	Q	VQ	BH2-13-S	Q	VQ	BH2-14-S	Q	VQ	BH2-15-S	Q	VQ	BH2-16-S	Q	VQ	BH2-17-S	Q	VQ
	SQS	CSL																														
Conventionals																																
Total Solids (%)	---	---	60.5			61			74.1			32.2			34.5			34.2			40.5			64.8			31			33.1		
Total Volatile Solids (%)	---	---	6.5			9.1			1.7			7			6.7			8.7			6.4			3.3			9.5			6.6		
Total Organic Carbon (%)	---	---	5.3			9.8			1.1			13			15			15			8.4			3.2			22			13		
Total Sulfides (mg/kg)	---	---	8.6	U		21			53			320			1100			140			570			8.7	U		790			740		
Ammonia (mg/kg)	---	---	25	J B	J	75	J B	J	13	U		52	J		28	U		27	U		24	U		14	U		31	U		27	U	
Grain Size (% fines)	---	---	11.1			24.5			11			43.1			28.2			43.3			43.6			12.1			46.4			44.3		
Metals (mg/kg DW)																																
Arsenic	57	93	8.3	B		11	B		3.8	B		15			16			16			15	B		13			22			17	B	
Cadmium	5.1	6.7	0.33			0.4			0.16			1.4			1.2			1.7			1.7			0.79			2.2			2.5		
Chromium	260	270	12	B		12	B		8.9	B	J D05 L	19			15			21			18	B		10			22			21	B	
Copper	390	390	46			84			7.9			56			56			58			47			11			64			64		
Lead	450	530	120	B		170	B		14	B		120			95			110			87	B		20			140			140	B	
Mercury	0.41	0.59	0.045			0.092			0.019	J		0.1			0.08			0.18			0.12			0.072			0.21			0.23		
Silver	6.1	6.1	0.096	J		0.12			0.037	J		0.28			0.14	J		0.22			0.17			0.06	J		0.27			0.23		
Zinc	410	960	60			72			21			140			62			82			100			37			100			460		
Organics																																
Low Molecular Polycyclic Aromatic Hydrocarbons (L																																
Naphthalene	99	170	0.70	U		0.41	U		2.27	J		0.51	J		0.28	J		2.20			2.62			1.50	J		4.55			1.31		
Acenaphthylene	66	66	2.45	J		0.67	J		1.36	J		0.36	J		0.43	J		0.73	J		1.43			0.66	J		0.68	J		1.00		
Acenaphthene	16	57	1.11	J		1.33	J		1.82	J		0.43	J		0.41	J		2.87			4.40			0.78	J		11.36			2.00		
Fluorene	23	79	2.45	J		1.43	J		2.00	J		0.56	J		0.58	J		3.27			5.12			1.31	J		8.18			2.08		
Phenanthrene	100	480	32.08			17.35			15.45			5.23			5.53			27.33			41.67			8.13			63.64			16.15		
Anthracene	220	1200	9.25			4.39			4.36			1.38			1.53			5.80			10.48			2.78			15.00			4.77		
2-Methylnaphthalene	38	64	1.25	U		0.71	U		0.91	U		0.39	U		0.31	U		0.87	J		1.19	J		0.78	U		2.59			0.49	J	
Total LPAH	370	780	47.34			25.16			27.27			8.48			8.77			43.07			66.90			15.16			106.00			27.80		
High Molecular Polycyclic Aromatic Hydrocarbons (H																																
Fluoranthene	160	1,200	54.72			23.47			16.36			7.69	B		7.33	B		25.33	B		46.43			11.25	B		50.00	B		19.23		
Pyrene	1,000	1,400	56.60			25.51			19.09			8.46			8.00			28.00			52.38			13.13			54.55			23.85		
Benz[a]anthracene	110	270	22.64			9.90			7.36			3.38			3.60			10.67			20.24			5.00			22.73			10.77		
Chrysene	110	460	20.75			9.80			7.27			3.23			3.53			10.67			20.24			5.63			22.27			11.54		
Benzofluoranthenes	230	450	9.25	J		3.57	J		2.27	J		1.92	J		1.27	J		3.53	J		7.02	J		2.06	J		7.27			4.15	J	
Benzo(a)pyrene	99	210	18.87			8.37			6.64			3.23			2.87			9.33			17.86			4.06	J		17.73			9.23		
Indeno(1,2,3-c,d)pyrene	34	88	13.58			5.61			5.09			2.46			2.00			5.73			10.36			3.75			10.00			5.77		
Dibenzo(a,h)anthracene	12	33	3.02	J		1.33	J		1.27	U		0.64	J		0.43	J		1.33	J		2.14	J		1.06	U		1.73			1.00	J	
Benzo(g,h,i)perylene	31	78	12.26			4.59	J		3.73	J		0.85	J		1.47	J		5.20			9.64			2.53	J		9.09			4.85		
Total HPAH	960	5,300	211.70			92.14			67.82			31.87			30.49			99.80			186.31			47.41			195.36			90.38		
Chlorinated Hydrocarbons (mg/kg OC)																																
1,4-Dichlorobenzene	3.1	9	1.17	U		0.67	U		0.87	U		0.37	U		0.29	U		0.32	U		0.45	U		0.75	U		0.24	U		0.32	U	
1,2-Dichlorobenzene	2.3	2.3	1.70	U		0.97	U		1.27	U		0.53	U		0.42	U		0.47	U		0.65	U		1.06	U		0.35	U		0.45	U	
1,2,4-Trichlorobenzene	0.81	1.8	0.85	U		0.49	U		0.63	U		0.27	U		0.21	U		0.23	U		0.33	U		0.53	U		0.18	U		0.22	U	
Hexachlorobenzene	0.38	2.3	2.08	U		1.22	U		1.55	U		0.66	U		0.53	U		0.58	U		0.82	U		1.34	U		0.44	U		0.56	U	
Phthalates (mg/kg OC)																																
Dimethyl phthalate	53	53	1.83	U		1.02	U		1.36	U		0.58	U		0.45	U		0.51	U		0.71	U		1.16	U		0.38	U		0.49	U	
Diethyl phthalate	61	110	10.75	U		6.12	U		8.00	U		3.38	U		2.67	U		2.93	U		4.17	U		6.88	U		2.23	U		2.85	U	
Di-n-butyl phthalate	220	1,700	8.11	U		4.59	U		6.00	U		2.54	U		2.00	U		2.20	U		3.10	U		5.00	U		1.68	U		2.15	U	
Butyl benzyl phthalate	4.9	64	7.17	U		4.08	U		6.27	J B	J	2.23	U		1.80	U		2.00	U		2.74	J B	J	4.38	U		1.50	U		2.23	J B	J
Bis(2-ethylhexyl)phthalate	47	78	10.00	U		5.71	U		7.45	U		3.15	U		2.47	U		2.73	U		7.14	J B	J	6.25	U		2.09	U		2.69	U	
Di-n-octyl phthalate	58	4,500	8.11	U		4.59	U		6.00	U		2.92	J B	J	2.33	J B	J	2.20	U		3.10	U		5.00	U		1.68	U		2.46	J	

Table B-1. Blakely Harbor Chemistry Results - TOC Normalized

Parameter	SMS		BH2-08-S	Q	VQ	BH2-09-S	Q	VQ	BH2-10-S	Q	VQ	BH2-11-S	Q	VQ	BH2-12-S	Q	VQ	BH2-13-S	Q	VQ	BH2-14-S	Q	VQ	BH2-15-S	Q	VQ	BH2-16-S	Q	VQ	BH2-17-S	Q	VQ
	SQS	CSL																														
Miscellaneous Extractables (mg/kg OC)																																
Dibenzofuran	15	58	0.83	U		0.48	U		1.00	J		0.26	U		0.21	U		1.60	J		1.79	J		0.53	U		3.50	J		0.72	J	
Hexachlorobutadiene	3.9	6.2	2.08	U		1.22	U		1.55	U		0.66	U		0.53	U		0.58	U		0.82	U		1.34	U		0.44	U		0.56	U	
N-Nitrosodiphenylamine	11	11	1.13	U		0.64	U		0.84	U		0.35	U		0.28	U		0.31	U		0.44	U		0.72	U		0.33	J		0.30	U	
PCB Aroclors (mg/kg OC)																																
PCB-aroclor 1016	---	---	0.021	U		0.010	U		0.085	U		0.016	U		0.012	U		0.013	U		0.021	U		0.031	U		0.010	U		0.015	U	
PCB-aroclor 1221	---	---	0.026	U		0.013	U		0.109	U		0.021	U		0.015	U		0.017	U		0.027	U		0.041	U		0.012	U		0.019	U	
PCB-aroclor 1232	---	---	0.026	U		0.013	U		0.109	U		0.021	U		0.015	U		0.017	U		0.027	U		0.041	U		0.012	U		0.019	U	
PCB-aroclor 1242	---	---	0.014	U		0.007	U		0.056	U		0.011	U		0.008	U		0.009	U		0.014	U		0.020	U		0.006	U		0.010	U	
PCB-aroclor 1248	---	---	0.010	U		0.005	U		0.041	U		0.008	U		0.006	U		0.006	U		0.010	U		0.015	U		0.005	U		0.007	U	
PCB-aroclor 1254	---	---	0.023	U		0.080	P	J K01 L	0.145	J	Uj C05 L	0.017	U		0.015	J		0.020	J		0.040	J	J C05 L	0.031	J p	J M08	0.010	U		0.048		
PCB-aroclor 1260	---	---	0.021	U		0.011	U		0.088	U		0.017	U		0.013	U		0.013	U		0.021	U		0.031	U		0.010	U		0.015	U	
PCB-aroclor 1262	---	---	0.013	U		0.007	U		0.054	U		0.010	U		0.007	U		0.008	U		0.013	U		0.019	U		0.006	U		0.009	U	
PCB-aroclor 1268	---	---	0.014	U		0.007	U		0.056	U		0.011	U		0.008	U		0.009	U		0.014	U		0.020	U		0.006	U		0.010	U	
Total PCBs	12	65	0.026	U		0.080	P		0.145	J		0.021	U		0.015	J		0.020	J		0.040	J		0.031	J p		0.012	U		0.048		
Phenols (mg/kg DW)																																
Phenol	0.42	1.2	0.63	J		1.40			0.51			0.13	U		0.12	U		0.13	U		0.66	J		0.07	U		0.15	U		1.00		
2-Methylphenol	0.063	0.063	0.07	U		0.08	U		0.01	U		0.06	U		0.05	U		0.06	U		0.05	U		0.03	U		0.06	U		0.05	U	
3- and 4-Methylphenol	0.67	0.67	0.11	U		0.12	U		0.13	J		0.09	U		0.08	U		0.09	U		0.62	J		0.04	U		0.10	U		0.70	J	
2,4-Dimethylphenol	0.029	0.029	0.11	U		0.12	U		0.02	U		0.09	U	UJ P02 L	0.08	U	UJ P02 L	0.09	U	UJ P02 L	0.07	U		0.04	U	UJ P01 L	0.10	U	UJ P02 L	0.07	U	
Pentachlorophenol	0.36	0.96	0.99	U		1.00	U		0.15	U		0.76	U		0.69	U		0.77	U		0.61	U		0.37	U		0.85	U		0.65	U	
Benzyl alcohol	0.057	0.073	0.58	U		0.61	U		0.09	U		0.44	U		0.40	U		0.45	U		0.35	U		0.22	U		0.49	U		0.38	U	
Benzoic acid	0.65	0.65	4.30	U		4.60	U		0.67	U		3.30	U		3.00	U		3.40	U		2.70	U		1.60	U		3.70	U		2.80	U	
Dioxin/Furan Congeners (ng/kg DW)																																
2,3,7,8-TCDD	---		0.17	U		0.43	J q	J																			1.8	J				
1,2,3,7,8-PeCDD	---		0.55	J		0.98	J																				3.9	J				
1,2,3,4,7,8-HxCDD	---		0.8	J B	J	1.2	J B	J																			4.4	J B	J			
1,2,3,6,7,8-HxCDD	---		1.4	J		2.3	J																				8.6	J				
1,2,3,7,8,9-HxCDD	---		1.7	J		3	J																				10	J				
1,2,3,4,6,7,8-HpCDD	---		24	B		34	B																				95	B				
OCDD	---		260	B		300	B																				780	B				
2,3,7,8-TCDF	---		1.5	J		3.2																					8.6					
1,2,3,7,8-PeCDF	---		1.2	J B	J	2.2	J B	J																			4.8	J B	J			
2,3,4,7,8-PeCDF	---		0.95	J		2.9	J																				4.1	J				
1,2,3,4,7,8-HxCDF	---		1.9	J		2.7	J																				8.7	J				
1,2,3,6,7,8-HxCDF	---		0.7	J		2.2	J																				3	J				
1,2,3,7,8,9-HxCDF	---		0.26	J B	U F01	0.41	J B	U F01																			1.1	J B	J			
2,3,4,6,7,8-HxCDF	---		0.61	J		1.8	J																				2.1	J				
1,2,3,4,6,7,8-HpCDF	---		5.5	J B	J	15	B																				21	B				
1,2,3,4,7,8,9-HpCDF	---		0.37	J B	U F01	0.68	J B	J																			2.3	J B	J			
OCDF	---		17	B		12	J B	U F01																			26	J B	J			
Total TEQ (ND = 0)	---		2.1			4.6																					13.1					
	Exceeds SQS	Exceeds CSL																														

Table B-1. Blakely Harbor Chemistry Results - TOC Normalized

Parameter	SMS		BH2-18-S	Q	VQ	BH2-18-D	Q	VQ	BH2-19-S	Q	VQ	BH2-20-S	Q	VQ	BH2-21-S	Q	VQ	BH2-22-S	Q	VQ	BH2-23-S	Q	VQ	BH2-24-S	Q	VQ	BH2-25-S	Q	VQ
	SQS	CSL																											
Conventionals																													
Total Solids (%)	---	---	48.1						75.2			29.1			49.6			47.6			75.9			57			46.4		
Total Volatile Solids (%)	---	---	4.5						1.4			7.7			4.7			5.4			1.5			3.7			4.9		
Total Organic Carbon (%)	---	---	4.7						0.59			17			4.2			7.1			0.45			3.7			5.6		
Total Sulfides (mg/kg)	---	---	11	U					6.8	U		17	U		11	U		160			21			54			41		
Ammonia (mg/kg)	---	---	18	U					13	U		33	U		19	U		18	U		12	U		15	U		19	U	
Grain Size (% fines)	---	---	33.1						7			39.5			21.3			36			14.5			30.3			49.1		
Metals (mg/kg DW)																													
Arsenic	57	93	14	B					4	B		24	B		13	B		18	B		4	B		10			13		
Cadmium	5.1	6.7	1.4						0.15	J		2.8			1.2			1.8			0.18			1.3			1.8		
Chromium	260	270	21	B					9.1	B		19	B		17	B		20	B		12	B		17			27		
Copper	390	390	140						6.1			55			50			170			14			41			67		
Lead	450	530	140	B					11	B		110	B		640	B		500	B		11	B		120			260		
Mercury	0.41	0.59	0.38						0.016	J		2.2			0.2			0.62			0.014	J		0.21			0.74		
Silver	6.1	6.1	0.24						0.027	J		0.25			0.14			0.2			0.033	J		0.14			0.25		
Zinc	410	960	110						29			110			130			210			29			180			150		
Organics																													
Low Molecular Polycyclic Aromatic Hydrocarbons (l																													
Naphthalene	99	170	4.47	J					2.03	U		1.18	J		2.07	J		3.52			2.67	U		1.73			1.66	J	
Acenaphthylene	66	66	2.34	J					2.03	U		0.65	J		1.17	U		3.80			2.67	U		1.00	J		1.07	J	
Acenaphthene	16	57	6.60						2.03	U		0.65	J		1.17	U		7.61			2.67	U		0.95	J		1.39	J	
Fluorene	23	79	6.38						2.03	U		0.94	J		2.00	J		7.46			2.67	U		1.03	J		1.46	J	
Phenanthrene	100	480	57.45						4.92	U		6.47			13.10	J		64.79			6.44	U		10.00			11.61		
Anthracene	220	1200	12.77						2.03	U		1.88	J		1.17	U		15.49			2.67	U		2.27			3.04		
2-Methylnaphthalene	38	64	2.02	J					3.56	U		0.82	U		2.05	U		1.83	J		4.67	U		0.43	J		0.70	J	
Total LPAH	370	780	92.02						4.92	U		11.76			17.17			104.51			6.44	U		17.41			20.93		
High Molecular Polycyclic Aromatic Hydrocarbons (																													
Fluoranthene	160	1,200	65.96						9.49	J		10.59			26.19			69.01			9.33	J		14.05	B		16.25	B	
Pyrene	1,000	1,400	76.60						8.81	J		10.59			28.57			80.28			9.33	J		14.59			19.64		
Benz[a]anthracene	110	270	27.66						4.41	J		4.35			11.43			35.21			3.11	J		5.68			7.86		
Chrysene	110	460	29.79						5.25	U		4.47	J		12.38	J		30.99			6.89	U		5.14			7.32		
Benzofluoranthenes	230	450	12.77	J					5.76	U		1.94	J		14.05	J		15.49	J		7.56	U		2.30	J		4.11	J	
Benzo(a)pyrene	99	210	23.40						5.25	U		4.18	J		9.52	J		28.17			6.89	U		5.68			7.68		
Indeno(1,2,3-c,d)pyrene	34	88	15.74						2.03	U		3.18	J		7.86	J		19.72			2.67	U		4.32			5.36		
Dibenzo(a,h)anthracene	12	33	3.62	J					4.92	U		1.12	U		2.86	U		4.37	J		6.44	U		1.14	J		1.52	J	
Benzo(g,h,i)perylene	31	78	11.70	J					3.73	U		2.47	J		5.00	J		15.49			4.89	U		3.51			4.29		
Total HPAH	960	5,300	267.23						22.71			41.76			115.00			298.73			21.78			56.41			74.02		
Chlorinated Hydrocarbons (mg/kg OC)																													
1,4-Dichlorobenzene	3.1	9	1.72	U					3.39	U		0.76	U		1.93	U		1.10	U		4.44	U		0.38	U		0.59	U	
1,2-Dichlorobenzene	2.3	2.3	2.55	U					4.92	U		1.12	U		2.86	U		1.55	U		6.44	U		0.54	U		0.86	U	
1,2,4-Trichlorobenzene	0.81	1.8	1.26	U					2.37	U		0.56	U		1.40	U		0.79	U		3.11	U		0.27	U		0.43	U	
Hexachlorobenzene	0.38	2.3	3.19	U					6.10	U		1.41	U		3.57	U		1.97	U		8.00	U		0.68	U		1.07	U	
Phthalates (mg/kg OC)																													
Dimethyl phthalate	53	53	2.77	U					5.25	U		1.18	U		3.10	U		1.69	U		6.89	U		0.59	U		0.93	U	
Diethyl phthalate	61	110	15.96	U					30.51	U		7.06	U		17.62	U		10.00	U		40.00	U		3.51	U		5.36	U	
Di-n-butyl phthalate	220	1,700	11.91	U					23.73	U		5.29	U		13.33	U		7.61	U		31.11	U		2.62	U		4.11	U	
Butyl benzyl phthalate	4.9	64	10.85	J	B	J			20.34	U		4.71	U		11.90	U		6.76	U		26.67	U		2.32	U		3.57	U	
Bis(2-ethylhexyl)phthalate	47	78	14.89	U					28.81	U		6.47	U		16.43	U		9.44	U		37.78	U		3.24	U		5.00	U	
Di-n-octyl phthalate	58	4,500	11.91	U					23.73	U		5.29	U		13.33	U		7.61	U		31.11	U		2.62	U		4.11	U	

Table B-1. Blakely Harbor Chemistry Results - TOC Normalized

Parameter	SMS		BH2-18-S	Q	VQ	BH2-18-D	Q	VQ	BH2-19-S	Q	VQ	BH2-20-S	Q	VQ	BH2-21-S	Q	VQ	BH2-22-S	Q	VQ	BH2-23-S	Q	VQ	BH2-24-S	Q	VQ	BH2-25-S	Q	VQ
	SQS	CSL																											
Miscellaneous Extractables (mg/kg OC)																													
Dibenzofuran	15	58	2.55	J					2.37	U		0.55	U		1.38	U		2.11	J		3.11	U		0.65	J		0.55	J	
Hexachlorobutadiene	3.9	6.2	3.19	U					6.10	U		1.41	U		3.57	U		1.97	U		8.00	U		0.68	U		1.07	U	
N-Nitrosodiphenylamine	11	11	1.68	U					3.22	U		0.76	U		1.86	U		1.06	U		4.22	U		0.38	U		0.57	U	
PCB Aroclors (mg/kg OC)																													
PCB-aroclor 1016	---	---	0.030	U					0.139	U		0.015	U		0.031	U		0.021	U		0.180	U		0.030	U	UJ G02 L	0.029	U	
PCB-aroclor 1221	---	---	0.036	U					0.169	U		0.019	U		0.040	U		0.027	U		0.222	U		0.038	U	UJ G02 L	0.036	U	
PCB-aroclor 1232	---	---	0.036	U					0.169	U		0.019	U		0.040	U		0.027	U		0.222	U		0.038	U	UJ G02 L	0.036	U	
PCB-aroclor 1242	---	---	0.019	U					0.092	U		0.010	U		0.021	U		0.014	U		0.120	U		0.020	U	UJ G02 L	0.018	U	
PCB-aroclor 1248	---	---	0.014	U					0.068	U		0.007	U		0.015	U		0.010	U		0.087	U		0.015	U	UJ G02 L	0.014	U	
PCB-aroclor 1254	---	---	0.030	U					0.147	U		0.050	p	J M08	0.064	J p	J M08	0.034	J p	J M08	0.191	U		0.032	U	UJ G02 L	0.125		
PCB-aroclor 1260	---	---	0.030	U					0.144	U		0.015	U		0.033	U		0.021	U		0.187	U		0.032	U	UJ G02 L	0.029	U	
PCB-aroclor 1262	---	---	0.018	U					0.088	U		0.009	U		0.020	U		0.013	U		0.113	U		0.019	U		0.018	U	
PCB-aroclor 1268	---	---	0.019	U					0.092	U		0.010	U		0.021	U		0.014	U		0.120	U		0.020	U		0.018	U	
Total PCBs	12	65	0.036	U					0.169	U		0.050	p		0.064	J p		0.034	J p		0.222	U		0.038	U		0.125		
Phenols (mg/kg DW)																													
Phenol	0.42	1.2	0.23	U					0.27	J		0.67	J		0.53	J		0.79	J		0.21	J		0.04	U		0.09	U	
2-Methylphenol	0.063	0.063	0.10	U					0.02	U		0.15	U		0.10	U		0.09	U		0.02	U		0.02	U		0.04	U	
3- and 4-Methylphenol	0.67	0.67	0.15	U					0.10	J		1.90	J		0.65	J		1.20	J		0.05	J		0.03	U		0.06	U	
2,4-Dimethylphenol	0.029	0.029	0.15	U					0.04	U		0.24	U		0.15	U		0.14	U		0.04	U		0.03	U	UJ P02 L	0.06	U	UJ P02 L
Pentachlorophenol	0.36	0.96	1.30	U					0.32	U		2.10	U		1.30	U		1.20	U		0.32	U		0.22	U		0.53	U	
Benzyl alcohol	0.057	0.073	0.76	U					0.18	U		1.20	U		0.75	U		0.72	U		0.19	U		0.13	U		0.31	U	
Benzoic acid	0.65	0.65	5.70	U					1.40	U		9.10	U		5.70	U		5.40	U		1.40	U		0.98	U		2.30	U	
Dioxin/Furan Congeners (ng/kg DW)																													
2,3,7,8-TCDD	---		0.36	U		0.66	J q	J							0.69	J													
1,2,3,7,8-PeCDD	---		1.2	J q	J	1.3	J								1.1	J													
1,2,3,4,7,8-HxCDD	---		1.9	J B	J	1.5	J B	J							1.5	J B	J												
1,2,3,6,7,8-HxCDD	---		6.8	J		3.5	J								3.1	J													
1,2,3,7,8,9-HxCDD	---		7.6	J		4.3	J								4.3	J													
1,2,3,4,6,7,8-HpCDD	---		54	B		40	B								48	B													
OCDD	---		370	B		350	B								410	B													
2,3,7,8-TCDF	---		1.5	J q		3.2									3.1														
1,2,3,7,8-PeCDF	---		1.7	J B	J	2.5	J B	J							2	J B	J												
2,3,4,7,8-PeCDF	---		1.6	J		2.2	J								2.4	J													
1,2,3,4,7,8-HxCDF	---		2.9	J		4.6	J								4.5	J													
1,2,3,6,7,8-HxCDF	---		1.2	J		2	J								1.8	J													
1,2,3,7,8,9-HxCDF	---		0.44	J B q	U F01	0.38	J q B	U F01							0.4	J B	U F01												
2,3,4,6,7,8-HxCDF	---		0.94	J		1.2	J								1.5	J													
1,2,3,4,6,7,8-HpCDF	---		7.2	J B	J	8.3	J B	J							9.2	J B	J												
1,2,3,4,7,8,9-HpCDF	---		0.75	J B	J	0.65	J B	J							0.57	J B	J												
OCDF	---		12	J B	U F01	11	J B	U F01							15	J B	J												
Total TEQ (ND = 0)	---		4.7			5.3									5.3														
	Exceeds SQS	Exceeds CSL																											

Table B-1. Blakely Harbor Chemistry Results - TOC Normalized

Parameter	SMS		BH2-25-D	Q	VQ	BH2-25-T	Q	VQ	BH2-26-S	Q	VQ	BH2-27-S	Q	VQ	BH2-28-S	Q	VQ	BH2-29-S	Q	VQ	BH2-30-S	Q	VQ	BH2-31-S	Q	VQ	BH2-32-S	Q	VQ	BH2-33-S	Q	VQ
	SQS	CSL																														
Conventionals																																
Total Solids (%)	---	---	46.1			46			47.2			66.1			70.8			64.7			70.3			73.4			28.2			68.1		
Total Volatile Solids (%)	---	---	4.6			4.9			6.9			2.6			1.9			4			2.5			2.1			7			2.2		
Total Organic Carbon (%)	---	---	5.8			5.9			9			1.4			1			3.5			1.8			0.99			16			1.6		
Total Sulfides (mg/kg)	---	---	100			190			200			8	U		7.8	U		17			7.9	U		7.1	U		130			220		
Ammonia (mg/kg)	---	---	19	U		20	U		21	U		15	U		13	U		14	U		14	U		12	U		33	U		14	U	
Grain Size (% fines)	---	---	48.9			48.4			32.1			24.9			21.3			25.9			15.8			15.9			57.8			25.9		
Metals (mg/kg DW)																																
Arsenic	57	93	14						19			8	B		4	B		8.2			8.8			5.5			22			7.4		
Cadmium	5.1	6.7	1.7						1.8			0.93			0.44			0.84			0.64			0.33			2.2			0.75		
Chromium	260	270	26						30			11	B		13	B		24			11			21			34			14		
Copper	390	390	67						80			13			15			46			12			17			86			14		
Lead	450	530	210						170			21	B		37	B		76			17			35			170			19		
Mercury	0.41	0.59	0.81						0.35			0.1			0.19			0.19			0.071			0.088			0.6			0.086		
Silver	6.1	6.1	0.25						0.22			0.078	J		0.071	J		0.14			0.067	J		0.074	J		0.35			0.085	J	
Zinc	410	960	150						130			36			38			100			30			42			120			35		
Organics																																
Low Molecular Polycyclic Aromatic Hydrocarbons (L																																
Naphthalene	99	170	1.48	J					1.11			0.93	U		1.50	J		1.09			0.72	J		2.83	J		20.00			0.69	J	
Acenaphthylene	66	66	1.07	J					0.70	J		0.93	U		1.20	J		1.06			0.38	U		3.64	J		6.88			0.48	J	
Acenaphthene	16	57	1.10	J					0.86	J		0.93	U		1.20	U		1.77			0.38	U		3.33	J		22.50			0.43	U	
Fluorene	23	79	1.66	J					1.33			0.93	J		1.50	J		1.86			0.38	J		4.34	J		26.25			0.61	J	
Phenanthrene	100	480	12.59						10.00			6.57	J		12.00	J		15.14			1.56	J		38.38			150.00			4.88	J	
Anthracene	220	1200	3.28						2.67			1.86	J		4.10	J		3.71			0.78	J		10.10			34.38			1.69	J	
2-Methylnaphthalene	38	64	0.64	U					0.41	J		1.64	U		2.20	U		0.46	J		0.67	U		2.32	U		9.38			0.75	U	
Total LPAH	370	780	21.17						17.08			9.36			20.30			25.09			3.44			62.63			269.38			8.34		
High Molecular Polycyclic Aromatic Hydrocarbons (H																																
Fluoranthene	160	1,200	20.69	B					13.33	B		10.00			21.00			20.57	B		2.94	B		45.45	B		118.75	B		9.38	B	
Pyrene	1,000	1,400	22.41						15.56			11.43			24.00			23.14			3.28	J		47.47			143.75			10.00		
Benz[a]anthracene	110	270	10.69						8.00			4.50	J		8.70			9.43			1.17	J		20.20			57.50			4.50		
Chrysene	110	460	11.03						7.78			4.64	J		10.00	J		9.43			1.22	J		17.17			55.63			3.69	J	
Benzofluoranthenes	230	450	5.17	J					3.22	J		2.64	U		4.20	J		4.00	J		1.06	U		6.16	J		18.13			1.63	J	
Benzo(a)pyrene	99	210	10.00						5.78			4.57	J		8.90	J		8.57			1.28	J		16.16			46.25			4.00	J	
Indeno(1,2,3-c,d)pyrene	34	88	6.21						4.22			4.36	J		7.70	J		5.71			1.67	J		14.14			25.00			3.44		
Dibenzo(a,h)anthracene	12	33	1.26	J					0.82	J		2.21	U		3.00	U		1.11	J		0.89	U		3.13	U		6.13			1.06	U	
Benzo(g,h,i)perylene	31	78	5.52						3.44			2.36	J		5.90	J		4.57			0.72	J		10.10	J		21.88			2.69	J	
Total HPAH	960	5,300	92.98						62.16			41.86			90.40			86.54			12.28			176.87			493.00			39.31		
Chlorinated Hydrocarbons (mg/kg OC)																																
1,4-Dichlorobenzene	3.1	9	0.60	U					0.38	U		1.57	U		2.10	U		0.34	U		0.61	U		2.22	U		0.36	U		0.69	U	
1,2-Dichlorobenzene	2.3	2.3	0.88	U					0.54	U		2.21	U		3.00	U		0.51	U		0.89	U		3.13	U		0.53	U		1.06	U	
1,2,4-Trichlorobenzene	0.81	1.8	0.43	U					0.27	U		1.14	U		1.50	U		0.25	U		0.46	U		1.62	U		0.26	U		0.52	U	
Hexachlorobenzene	0.38	2.3	1.10	U					0.68	U		2.79	U		3.70	U		0.63	U		1.17	U		3.94	U		0.69	U		1.31	U	
Phthalates (mg/kg OC)																																
Dimethyl phthalate	53	53	0.95	U					0.59	U		2.43	U		3.20	U		0.54	U		1.00	U		3.43	U		0.57	U		1.13	U	
Diethyl phthalate	61	110	5.52	U					3.44	U		14.29	U		19.00	U		3.14	U		5.56	U		20.20	U		3.31	U		6.25	U	
Di-n-butyl phthalate	220	1,700	4.14	U					2.56	U		10.71	U		14.00	U		2.37	U		4.33	U		15.15	U		2.50	U		4.94	U	
Butyl benzyl phthalate	4.9	64	3.79	U					2.33	U		9.29	U		13.00	U		2.14	U		3.89	U		13.13	U		2.25	U		4.38	U	
Bis(2-ethylhexyl)phthalate	47	78	5.17	U					3.22	U		13.57	U		18.00	U		2.86	U		5.39	U		19.19	U		3.13	U		6.13	U	
Di-n-octyl phthalate	58	4,500	4.14	U					2.56	U		10.71	U		14.00	U		2.37	U		4.33	U		15.15	U		2.50	U		5.56	J B	J

Table B-1. Blakely Harbor Chemistry Results - TOC Normalized

Parameter	SMS		BH2-25-D	Q	VQ	BH2-25-T	Q	VQ	BH2-26-S	Q	VQ	BH2-27-S	Q	VQ	BH2-28-S	Q	VQ	BH2-29-S	Q	VQ	BH2-30-S	Q	VQ	BH2-31-S	Q	VQ	BH2-32-S	Q	VQ	BH2-33-S	Q	VQ
	SQS	CSL																														
Miscellaneous Extractables (mg/kg OC)																																
Dibenzofuran	15	58	0.45	J					0.37	J		1.07	U		1.50	U		0.54	J		0.45	U		1.72	J		5.13	J		0.51	U	
Hexachlorobutadiene	3.9	6.2	1.10	U					0.68	U		2.79	U		3.70	U		0.63	U		1.17	U		3.94	U		0.69	U		1.31	U	
N-Nitrosodiphenylamine	11	11	0.59	U					0.36	U		1.50	U		2.00	U		0.34	U		0.61	U		2.12	U		0.56	J		0.69	U	
PCB Aroclors (mg/kg OC)																																
PCB-aroclor 1016	---	---	0.026	U					0.017	U		0.070	U		0.086	U		0.031	U		0.053	U		0.097	U		0.016	U		0.063	U	
PCB-aroclor 1221	---	---	0.034	U					0.021	U		0.093	U		0.110	U		0.040	U		0.067	U		0.121	U		0.020	U		0.081	U	
PCB-aroclor 1232	---	---	0.034	U					0.021	U		0.093	U		0.110	U		0.040	U		0.067	U		0.121	U		0.020	U		0.081	U	
PCB-aroclor 1242	---	---	0.017	U					0.011	U		0.046	U		0.057	U		0.021	U		0.035	U		0.065	U		0.010	U		0.043	U	
PCB-aroclor 1248	---	---	0.013	U					0.008	U		0.034	U		0.042	U		0.015	U		0.026	U		0.047	U		0.008	U		0.032	U	
PCB-aroclor 1254	---	---	0.083						0.077			0.071	U		0.091	U		0.094			0.056	J		0.101	U		0.034	J		0.081	J	
PCB-aroclor 1260	---	---	0.028	U					0.018	U		0.071	U		0.089	U		0.031	U		0.055	U		0.101	U		0.016	U		0.069	U	
PCB-aroclor 1262	---	---	0.017	U					0.011	U		0.044	U		0.054	U		0.020	U		0.033	U		0.062	U		0.010	U		0.041	U	
PCB-aroclor 1268	---	---	0.017	U					0.011	U		0.046	U		0.057	U		0.021	U		0.035	U		0.065	U		0.010	U		0.043	U	
Total PCBs	12	65	0.083						0.077			0.093	U		0.110	U		0.094			0.056	J		0.121	U		0.034	J		0.081	J	
Phenols (mg/kg DW)																																
Phenol	0.42	1.2	0.10	U					0.09	U		0.56			0.06	U		0.03	U		0.03	U		0.06	U		0.16	U		0.03	U	
2-Methylphenol	0.063	0.063	0.04	U					0.04	U		0.03	U		0.02	U		0.01	U		0.01	U		0.03	U		0.07	U		0.01	U	
3- and 4-Methylphenol	0.67	0.67	0.06	U					0.06	U		0.45	J		0.09	J		0.02	U		0.02	U		0.04	U		0.11	U		0.02	U	
2,4-Dimethylphenol	0.029	0.029	0.06	U	UJ P02 L				0.06	U	UJ P02 L	0.04	U		0.04	U		0.02	U	UJ P02 L	0.02	U	UJ P02 L	0.04	U	UJ P02 L	0.11	U	UJ P02 L	0.02	U	UJ P02 L
Pentachlorophenol	0.36	0.96	0.56	U					0.53	U		0.34	U		0.33	U		0.19	U		0.18	U		0.35	U		0.93	U		0.18	U	
Benzyl alcohol	0.057	0.073	0.33	U					0.31	U		0.20	U		0.19	U		0.11	U		0.11	U		0.20	U		0.54	U		0.11	U	
Benzoic acid	0.65	0.65	2.50	U					2.30	U		1.50	U		1.40	U		0.85	U		0.79	U		1.50	U		4.10	U		0.80	U	
Dioxin/Furan Congeners (ng/kg DW)																																
2,3,7,8-TCDD	---																							0.13	J q	J						
1,2,3,7,8-PeCDD	---																							0.31	J q	J						
1,2,3,4,7,8-HxCDD	---																							0.55	J B	U F01						
1,2,3,6,7,8-HxCDD	---																							0.94	J							
1,2,3,7,8,9-HxCDD	---																							1.2	J							
1,2,3,4,6,7,8-HpCDD	---																							17	B							
OCDD	---																							170	B							
2,3,7,8-TCDF	---																							1	J							
1,2,3,7,8-PeCDF	---																							0.43	J B	J						
2,3,4,7,8-PeCDF	---																							0.36	J							
1,2,3,4,7,8-HxCDF	---																							0.71	J							
1,2,3,6,7,8-HxCDF	---																							0.3	J							
1,2,3,7,8,9-HxCDF	---																							0.22	J q B	U F01						
2,3,4,6,7,8-HxCDF	---																							0.22	J							
1,2,3,4,6,7,8-HpCDF	---																							2.5	J B	J						
1,2,3,4,7,8,9-HpCDF	---																							0.24	J B	U F01						
OCDF	---																							5.9	J B	U F01						
Total TEQ (ND = 0)	---																							1.2								
	Exceeds SQS	Exceeds CSL																														

Table B-1. Blakely Harbor Chemistry Results - TOC Normalized

Parameter	SMS		BH2-34-S	Q	VQ	BH2-35-S	Q	VQ	BH2-36-S	Q	VQ	BH2-37-S	Q	VQ	BH2-38-S	Q	VQ	BH2-39-S	Q	VQ	BH2-40-S	Q	VQ
	SQS	CSL																					
Conventionals																							
Total Solids (%)	---	---	73.7			71.6			72.2			31.5			65.5			69.7			70.8		
Total Volatile Solids (%)	---	---	1.7			1.5			0.24			7.1			1.9			1.7			1.4		
Total Organic Carbon (%)	---	---	0.95			1			0.85			13			1.4			1			0.79		
Total Sulfides (mg/kg)	---	---	7.2	U		7.8	U		7.6	U		500			7.9	U		7.5	U		7.6	U	
Ammonia (mg/kg)	---	---	12	U		14	U		12	U		29	U		14	U		13	U		12	U	
Grain Size (% fines)	---	---	17.6			24.2			25.3			52.4			40.8			23.9			27.4		
Metals (mg/kg DW)																							
Arsenic	57	93	4.1			4.5			4.2			22			5.7			4.3			4.1		
Cadmium	5.1	6.7	0.32			0.41			0.28			1.7			0.58			0.33			0.34		
Chromium	260	270	13			13			14			34			20			14			16		
Copper	390	390	13			12			13			110			23			13			12		
Lead	450	530	22			16			20			200			32			16			14		
Mercury	0.41	0.59	0.075	F1	J H01 H	0.062			0.069			0.57			0.36			0.063			0.057		
Silver	6.1	6.1	0.073	J		0.073	J		0.069	J		0.39			0.12			0.077	J		0.071	J	
Zinc	410	960	30			28			31			130			49			32			31		
Organics																							
Low Molecular Polycyclic Aromatic Hydrocarbons (L																							
Naphthalene	99	170	1.58	J F1	J H02 L	0.97	J		1.07	J		0.92	J		0.79	J		1.30	U		0.85	U	
Acenaphthylene	66	66	1.03	J		0.83	J		1.18	J		0.92	J		1.00	J		1.30	U		0.89	J	
Acenaphthene	16	57	0.80	J		0.68	U		0.82	J		0.92	J		1.29	J		1.30	U		0.85	U	
Fluorene	23	79	1.16	J		0.77	J		1.41	J		1.38			2.07	J		1.30	U		1.15	J	
Phenanthrene	100	480	9.79			4.70	J		9.76			10.77			9.29			5.50	J		7.09	J	
Anthracene	220	1200	3.79			1.70	J		3.29	J		3.46			3.57			2.10	J		2.03	J	
2-Methylnaphthalene	38	64	1.16	U		1.20	U		1.41	U		0.51	J		0.93	U		2.40	U		1.52	U	
Total LPAH	370	780	18.15			8.97			17.54			18.89			18.00			7.60			11.15		
High Molecular Polycyclic Aromatic Hydrocarbons (H																							
Fluoranthene	160	1,200	17.89	F1 B	J H02 L	8.70	B		14.12	B		20.00	B		21.43	B		9.20	B		11.27	B	
Pyrene	1,000	1,400	20.00	F1	J H02 L	9.50			18.82			20.77			18.57			9.70	J		12.41		
Benz[a]anthracene	110	270	9.79			3.60			7.76			10.77			9.29			4.00	J		4.81		
Chrysene	110	460	11.58	F1	J H02 L	3.70	J		8.00	J		12.31			9.29			3.80	J		5.32	J	
Benzofluoranthenes	230	450	11.58	J F1	J H02 L	1.90	U		3.06	J		4.31	J		4.50	J		3.80	U		2.66	J	
Benzo(a)pyrene	99	210	8.00	J		3.20	J		6.35	J		10.77			7.86			4.50	J		5.06	J	
Indeno(1,2,3-c,d)pyrene	34	88	5.79			3.30	J		6.00	J		5.92			5.36			4.70	J		4.81	J	
Dibenzo(a,h)anthracene	12	33	1.68	J		1.60	U		1.88	U		2.15	J		1.50	J		3.20	U		2.03	U	
Benzo(g,h,i)perylene	31	78	4.53	J		2.20	J		4.24	J		6.08			4.00	J		2.40	J		2.41	J	
Total HPAH	960	5,300	90.84			34.20			68.35			93.08			81.79			38.30			48.73		
Chlorinated Hydrocarbons (mg/kg OC)																							
1,4-Dichlorobenzene	3.1	9	1.16	J F2 F	UJ H02 L	1.10	U		1.29	U		0.38	U		0.86	U		2.20	U		1.39	U	
1,2-Dichlorobenzene	2.3	2.3	1.68	U F1	UJ H02 L	1.60	U		1.88	U		0.56	U		1.29	U		3.20	U		2.03	U	
1,2,4-Trichlorobenzene	0.81	1.8	0.82	U F1	UJ H02 L	0.81	U		0.93	U		0.28	U		0.64	U		1.60	U		1.01	U	
Hexachlorobenzene	0.38	2.3	2.11	U		2.00	U		2.35	U		0.70	U		1.57	U		4.00	U		2.53	U	
Phthalates (mg/kg OC)																							
Dimethyl phthalate	53	53	1.79	U		1.80	U		2.00	U		0.61	U		1.36	U		3.50	U		2.15	U	
Diethyl phthalate	61	110	10.42	U		10.00	U		11.76	U		3.54	U		7.86	U		20.00	U		12.66	U	
Di-n-butyl phthalate	220	1,700	7.79	U F1	U	7.70	U		8.82	U		2.69	U		6.00	U		15.00	U		9.62	U	
Butyl benzyl phthalate	4.9	64	7.05	U F1	U	6.90	U		7.88	U		2.38	U		5.36	U		14.00	U		8.61	U	
Bis(2-ethylhexyl)phthalate	47	78	9.79	U F1	U	9.60	U		11.06	U		3.31	U		7.14	U		19.00	U		11.90	U	
Di-n-octyl phthalate	58	4,500	7.79	U F1	U	7.70	U		8.82	U		2.69	U		6.86	J B	J	15.00	U		11.01	J B	J

Table B-1. Blakely Harbor Chemistry Results - TOC Normalized

Parameter	SMS		BH2-34-S	Q	VQ	BH2-35-S	Q	VQ	BH2-36-S	Q	VQ	BH2-37-S	Q	VQ	BH2-38-S	Q	VQ	BH2-39-S	Q	VQ	BH2-40-S	Q	VQ
	SQS	CSL																					
Miscellaneous Extractables (mg/kg OC)																							
Dibenzofuran	15	58	0.81	U		0.80	U		0.92	U		0.57	J		1.00	J		1.60	U		0.99	U	
Hexachlorobutadiene	3.9	6.2	2.11	U F1	UJ H02 L	2.00	U		2.35	U		0.70	U		1.57	U		4.00	U		2.53	U	
N-Nitrosodiphenylamine	11	11	1.05	U		1.10	U		1.29	U		0.38	U		0.86	U		2.20	U		1.39	U	
PCB Aroclors (mg/kg OC)																							
PCB-aroclor 1016	---	---	0.104	J F1 F	U	0.099	U		0.115	U		0.016	U		0.071	U		0.097	U		0.114	U	
PCB-aroclor 1221	---	---	0.137	U		0.130	U		0.153	U		0.021	U		0.093	U		0.120	U		0.152	U	
PCB-aroclor 1232	---	---	0.137	U		0.130	U		0.153	U		0.021	U		0.093	U		0.120	U		0.152	U	
PCB-aroclor 1242	---	---	0.068	U		0.066	U		0.076	U		0.011	U		0.049	U		0.064	U		0.076	U	
PCB-aroclor 1248	---	---	0.051	U		0.048	U		0.056	U		0.008	U		0.036	U		0.047	U		0.056	U	
PCB-aroclor 1254	---	---	0.116	U		0.110	U		0.129	U		0.043			0.379			0.160	J		0.190	J	
PCB-aroclor 1260	---	---	0.105	U		0.100	U		0.118	U		0.017	U		0.079	U		0.100	U		0.119	U	
PCB-aroclor 1262	---	---	0.066	U		0.063	U		0.074	U		0.010	U		0.047	U		0.062	U		0.072	U	
PCB-aroclor 1268	---	---	0.068	U		0.066	U		0.076	U		0.011	U		0.049	U		0.064	U		0.076	U	
Total PCBs	12	65	0.137	U		0.130	U		0.153	U		0.043			0.379			0.160	J		0.190	J	
Phenols (mg/kg DW)																							
Phenol	0.42	1.2	0.03	U F1	U	0.03	U		0.27			2.30			0.19	J		0.25	J		0.03	U	
2-Methylphenol	0.063	0.063	0.01	U		0.01	U		0.01	U		0.06	U		0.01	U		0.03	U		0.01	U	
3- and 4-Methylphenol	0.67	0.67	0.02	U F1	U	0.02	U		0.19	J		1.50			0.25	J		0.16	J		0.02	U	
2,4-Dimethylphenol	0.029	0.029	0.02	U	UJ P02 L	0.02	U	UJ P02 L	0.02	U	UJ P02 L	0.09	U	UJ P02 L	0.02	U	UJ P02 L	0.04	U	UJ P02 L	0.02	U	UJ P02 L
Pentachlorophenol	0.36	0.96	0.17	U		0.18	U		0.17	U		0.80	U		0.19	U		0.35	U		0.18	U	
Benzyl alcohol	0.057	0.073	0.10	U F1	R H03 L	0.10	U		0.10	U		0.47	U		0.11	U		0.21	U		0.10	U	
Benzoic acid	0.65	0.65	0.76	U		0.79	U		0.77	U		3.50	U		0.86	U		1.60	U		0.77	U	
Dioxin/Furan Congeners (ng/kg DW)																							
2,3,7,8-TCDD	---											0.49	J q	J				0.16	J				
1,2,3,7,8-PeCDD	---											1.7	J					0.35	J				
1,2,3,4,7,8-HxCDD	---											2.1	J B	J				0.55	J q B	U F01			
1,2,3,6,7,8-HxCDD	---											5.9	J					1.2	J				
1,2,3,7,8,9-HxCDD	---											5.3	J					1.4	J				
1,2,3,4,6,7,8-HpCDD	---											100	B					22	B				
OCDD	---											920	B					250	B				
2,3,7,8-TCDF	---											4						0.96	J				
1,2,3,7,8-PeCDF	---											2.1	J B	J				0.52	J B	J			
2,3,4,7,8-PeCDF	---											2.6	J					0.36	J				
1,2,3,4,7,8-HxCDF	---											4.7	J					0.7	J				
1,2,3,6,7,8-HxCDF	---											1.9	J					0.24	J q	J			
1,2,3,7,8,9-HxCDF	---											0.57	J B	U F01				0.33	J B	U F01			
2,3,4,6,7,8-HxCDF	---											1.4	J					0.18	J q	J			
1,2,3,4,6,7,8-HpCDF	---											17	B					2.6	J B	J			
1,2,3,4,7,8,9-HpCDF	---											0.73	J q B	J				0.19	J q B	U F01			
OCDF	---											31	B					6	J B	U F01			
Total TEQ (ND = 0)	---											7.0						1.4					
	Exceeds SQS	Exceeds CSL																					

Table B-2. Blakely Harbor Chemistry Results - Dry Weight

Parameter	Sediment		Marine Sediment AETs		BH2-01-S	Q	VQ	BH2-02-S	Q	VQ	BH2-03-S	Q	VQ	BH2-04-S	Q	VQ	BH2-04-D	Q	VQ	BH2-04-T	Q	VQ	BH2-05-S	Q	VQ	BH2-06-S	Q	VQ	BH2-07-S	Q	VQ
	MDL	RL	SCO	CSL																											
Conventionals																															
Total Solids (%)	---	0.1	---	---	54.2			45.3			34.1			46.1			46.1			47.2			41.1			41.1			35.8		
Total Volatile Solids (%)	---	0.1	---	---	4.4			8.5			6.3			5.4			6.5			6.8			6			8.8			5.8		
Total Organic Carbon (%)	0.004	0.2	---	---	4			8.1			17			8.9			8.6			9.2			12			13			12		
Total Sulfides (mg/kg)	5.63	10	---	---	14	U		9.5	U F1 F2	UJ H02 L	25			12	U		11	U		11	U		13	U		39	F1	J H02 L	500		
Ammonia (mg/kg)	10	125	---	---	16	U		18	U F2	U	28	U		22	U		20	U		21	U		24	U		51	J B	J	52	J B	J
Grain Size (% fines)	---	0.1	---	---	40.5			42.5			67.4			54.6			51.4			27			45.9			67			41.7		
Metals (mg/kg DW)																															
Arsenic	0.05	0.25	57	93	9.3	B		11	B		14	B		9.1	B		10	B					10	B		13	B		14	B	
Cadmium	0.039	0.2	5.1	6.7	0.47			0.5			0.45			0.32			0.31						0.46			0.6			1.2		
Chromium	0.32	0.25	260	270	19	B	J D05 L	23	B		27	B	J D05 L	20	B	J D05 L	22	B	J D05 L				20	B	J D05 L	28	B	J D05 L	19	B	
Copper	0.11	0.5	390	390	29			41			63			36			40						39			66			58		
Lead	0.024	0.25	450	530	51	B		71	B		110	B		62	B		68	B					78	B		110	B		130	B	
Mercury	0.002	0.02	0.41	0.59	0.11			0.17			0.22			0.15			0.14						0.15			0.17			0.12		
Silver	0.01	0.1	6.1	6.1	0.12			0.17			0.25			0.15			0.17						0.16			0.26			0.21		
Zinc	0.81	2.5	410	960	62			67			77			52			57						76			82			80		
Organics																															
Low Molecular Polycyclic Aromatic Hydrocarbons (LPAH) (µg/kg DW)																															
Naphthalene	0.5	2.5	2,100	2,100	79			180	F1	J H02 L	380			140			120						200			48	J		200	J	
Acenaphthylene	0.5	2.5	1,300	1,300	21	J		37	J		41	J		26	J		23	J					37	J		16	J		67	U	
Acenaphthene	0.5	2.5	500	500	14	J		20	J		23	J		16	J		22	J					20	J		12	U		570		
Fluorene	0.5	2.5	540	540	16	J		30	J		26	J		18	J		26	J					29	J		15	J		470		
Phenanthrene	1.2	6	1,500	1,500	120			190	F1 F2	J H01 H	200			140			200						220			130	J		3500		
Anthracene	0.5	2.5	960	960	31	J		51	J F1	J H01 H	45	J		31	J		58						57			32	J		910		
2-Methylnaphthalene	0.88	5	670	670	16	U		20	J F1	J H02 L	26	J		17	U		17	U					20	J		21	U		130	J	
Total LPAH	---	---	5,200	5,200	281			528			741			371			449						583			241			5780		
High Molecular Polycyclic Aromatic Hydrocarbons (HPAH) (µg/kg DW)																															
Fluoranthene	0.5	2.5	1,700	2,500	190			310	F1 F2	J H01 H, H04H	290			220			250						320			230			3000		
Pyrene	0.64	6	2,600	3,300	200			330	F1 F2	J H01 H	310			230			260						340			240			3200		
Benz[a]anthracene	0.5	2.5	1,300	1,600	82			130	F1 F2	J H01 H, H04 H	110			86			110						150			110			1100		
Chrysene	1.3	6	1,400	2,800	95	J		120	J F1 F2	J H02 L, H04 H	120	J		99	J		110	J					150			100	J		1100		
Benzofluoranthenes	1.4	15	3,200	3,600	100	J		150	J F1 F2	J H01 H, H04 H	55	J		120	J		50	J					200	J		57	J		420	J	
Benzo(a)pyrene	1.3	6	1,600	1,600	80	J		100	J F1 F2	J H01 H, H04 H	110	J		78	J		110	J					140			89	J		860		
Indeno(1,2,3-c,d)pyrene	0.5	4	600	690	61	J		84	J F1	J H01 H	110			66	J		87						110			86	J		570		
Dibenzo(a,h)anthracene	1.2	5	230	230	21	U		26	J F2	J H04 H	33	U		23	U		27	J					25	U		28	U		160	U	
Benzo(g,h,i)perylene	0.9	6	670	720	43	J		73	J F1 F2	J H01 H, H04 H	80	J		52	J		55	J					88	J		64	J		540	J	
Total HPAH	---	---	12,000	17,000	851			1323			1185			951			1059						1498			976			10790		
Chlorinated Hydrocarbons (µg/kg DW)																															
1,4-Dichlorobenzene	0.83	5	110	110	15	U		18	U F1	UJ H02 L	23	U		16	U		16	U					18	U		20	U		110	U	
1,2-Dichlorobenzene	1.2	5	35	50	21	U		26	U F1	UJ H02 L	33	U		23	U		24	U					25	U		28	U		160	U	
1,2,4-Trichlorobenzene	0.6	5	31	51	11	U		13	U F1	UJ H02 L	17	U		12	U		12	U					13	U		14	U		80	U	
Hexachlorobenzene	1.5	5	22	70	27	U		33	U		42	U		29	U		29	U					32	U		35	U		200	U	
Phthalates (µg/kg DW)																															
Dimethyl phthalate	1.3	15	71	160	23	U		28	U		36	U		25	U		25	U					27	U		31	U		170	U	
Diethyl phthalate	7.5	150	200	***1,200***	130	U		170	U		210	U		150	U		150	U					160	U		180	U		1000	U	
Di-n-butyl phthalate	5.7	50	1,400	1,400	100	U		120	U F1		160	U		110	U		110	U					120	U		130	U		760	U	
Butyl benzyl phthalate	5.1	20	63	900	100	J B	J	160	J B	J	180	J B	J	120	J B	J	100	J B	J				120	J B	J	130	J B	J	690	J B	J
Bis(2-ethylhexyl)phthalate	7.1	60	1,300	1,900	130	U		150	U F1	U	200	U		140	U		140	U					150	U		170	U		950	U	
Di-n-octyl phthalate	5.7	15	6,200	6,200	100	U		120	U F1		160	U		110	U		110	U					120	U		150	J		760	U	

Table B-2. Blakely Harbor Chemistry Results - Dry Weight

Parameter	Sediment		Marine Sediment AETs		BH2-01-S	Q	VQ	BH2-02-S	Q	VQ	BH2-03-S	Q	VQ	BH2-04-S	Q	VQ	BH2-04-D	Q	VQ	BH2-04-T	Q	VQ	BH2-05-S	Q	VQ	BH2-06-S	Q	VQ	BH2-07-S	Q	VQ
	MDL	RL	SCO	CSL																											
Miscellaneous Extractables (µg/kg DW)																															
Dibenzofuran	0.59	15	540	540	10	U		23	J		22	J		17	J		17	J					22	J		14	U		220	J	
Hexachlorobutadiene	1.5	5	11	120	27	U		33	U F1	UJ H02 L	42	U		29	U		29	U					32	U		35	U		200	U	
N-Nitrosodiphenylamine	0.8	6	28	40	14	U		17	U		22	U		15	U		16	U					17	U		19	U		110	U	
PCB Aroclors (mg/kg DW)																															
PCB-aroclor 1016	0.0021	0.01	---	---	0.0012	U		0.0014	U		0.0019	U		0.0013	U		0.0016	U					0.0015	U		0.0016	U		0.0017	U	
PCB-aroclor 1221	0.0021	0.01	---	---	0.0015	U		0.0018	U		0.0025	U		0.0017	U		0.002	U					0.0019	U		0.0021	U		0.0022	U	
PCB-aroclor 1232	0.0021	0.01	---	---	0.0015	U		0.0018	U		0.0025	U		0.0017	U		0.002	U					0.0019	U		0.0021	U		0.0022	U	
PCB-aroclor 1242	0.0021	0.01	---	---	0.00077	U		0.00095	U		0.0013	U		0.00087	U		0.001	U					0.00099	U		0.0011	U		0.0011	U	
PCB-aroclor 1248	0.0021	0.01	---	---	0.00056	U		0.0007	U		0.00094	U		0.00064	U		0.00077	U					0.00073	U		0.00078	U		0.00084	U	
PCB-aroclor 1254	0.0021	0.01	---	---	0.0012	U	UJ C05 L	0.0041	J K01 L, C05 L		0.0021	U	UJ C05 L	0.0016	J	J K01 L, C05 L	0.0017	U	UJ C05 L				0.0032	J	J K01 L, C05 L	0.0017	U		0.0019	U	UJ C05 L
PCB-aroclor 1260	0.0021	0.01	---	---	0.0012	U		0.0015	U		0.002	U		0.0014	U		0.0016	U					0.0016	U		0.0017	U		0.0018	U	
PCB-aroclor 1262	0.0021	0.01	---	---	0.00073	U		0.00091	U		0.0012	U		0.00083	U		0.001	U					0.00095	U		0.001	U		0.0011	U	
PCB-aroclor 1268	0.0021	0.01	---	---	0.00077	U		0.00095	U		0.0013	U		0.00087	U		0.001	U					0.00099	U		0.0011	U		0.0011	U	
Total PCBs	0.0021	0.01	0.13	1	0.0021	U		0.0041			0.0025	U		0.0016	J		0.002	U					0.0032	J		0.0021	U		0.0022	U	
Phenols (µg/kg DW)																															
Phenol	2.3	15	420	1,200	170	J		1000			630			680			550						490			64	J		1400	J	
2-Methylphenol	0.98	15	63	63	17	U		21	U		27	U		19	U		19	U					21	U		23	U		130	U	
3- and 4-Methylphenol	1.5	20	670	670	460			400	J F1	J H02 L	170	J		410			390						480			670			840	J	
2,4-Dimethylphenol	1.5	10	29	29	27	U		33	U		42	U		29	U		29	U					32	U		35	U		200	U	
Pentachlorophenol	13.2	45	360	690	230	U		290	U F1	U	370	U		260	U		260	U					280	U		310	U		1800	U	
Benzyl alcohol	7.7	50	57	73	140	U		170	U F1	R H03 L	210	U		150	U		150	U					160	U		180	U		1000	U	
Benzoic acid	57.9	200	650	650	1000	U		1300	U		1600	U		1100	U		1100	U					1200	U		1400	U		7700	U	
Dioxin/Furan Congeners (ng/kg DW)																															
2,3,7,8-TCDD	---	1	---	---							1.8	J														1.3	J				
1,2,3,7,8-PeCDD	---	5	---	---							4.6	J														3.4	J				
1,2,3,4,7,8-HxCDD	---	5	---	---							5.4	J B	J													4.4	J B	J			
1,2,3,6,7,8-HxCDD	---	5	---	---							9.8	J														8.2	J				
1,2,3,7,8,9-HxCDD	---	5	---	---							13	J														11	J				
1,2,3,4,6,7,8-HpCDD	---	5	---	---							140	B														120	B				
OCDD	---	10	---	---							1200	B														1000	B				
2,3,7,8-TCDF	---	1	---	---							9.7															7.3					
1,2,3,7,8-PeCDF	---	5	---	---							6	J B	J													4.9	J B	J			
2,3,4,7,8-PeCDF	---	5	---	---							4.3	J														3.4	J				
1,2,3,4,7,8-HxCDF	---	5	---	---							11	J														10	J				
1,2,3,6,7,8-HxCDF	---	5	---	---							3.5	J														3.1	J				
1,2,3,7,8,9-HxCDF	---	5	---	---							0.63	J B	U F01													0.58	J B	U F01			
2,3,4,6,7,8-HxCDF	---	5	---	---							2.2	J														1.7	J				
1,2,3,4,6,7,8-HpCDF	---	5	---	---							27	B														26	B				
1,2,3,4,7,8,9-HpCDF	---	5	---	---							1	J B	J													1.3	J B	J			
OCDF	---	10	---	---							29	B														23	J B	J			
Total TEQ (ND = 0)	---	---	---	---							15.4															12.2					

Exceeds SCO | Exceeds CSL

Blue italicized value : Indicates that the toxic level is unknown but is above the concentration shown.

Table B-2. Blakely Harbor Chemistry Results - Dry Weight

Parameter	Sediment		Marine Sediment AETs		BH2-08-S	Q	VQ	BH2-09-S	Q	VQ	BH2-10-S	Q	VQ	BH2-11-S	Q	VQ	BH2-12-S	Q	VQ	BH2-13-S	Q	VQ	BH2-14-S	Q	VQ	BH2-15-S	Q	VQ	BH2-16-S	Q	VQ	BH2-17-S	Q	VQ
	MDL	RL	SCO	CSL																														
Conventionals																																		
Total Solids (%)	---	0.1	---	---	60.5			61			74.1			32.2			34.5			34.2			40.5			64.8			31			33.1		
Total Volatile Solids (%)	---	0.1	---	---	6.5			9.1			1.7			7			6.7			8.7			6.4			3.3			9.5			6.6		
Total Organic Carbon (%)	0.004	0.2	---	---	5.3			9.8			1.1			13			15			15			8.4			3.2			22			13		
Total Sulfides (mg/kg)	5.63	10	---	---	8.6	U		21			53			320			1100			140			570			8.7	U		790			740		
Ammonia (mg/kg)	10	125	---	---	25	J B	J	75	J B	J	13	U		52	J		28	U		27	U		24	U		14	U		31	U		27	U	
Grain Size (% fines)	---	0.1	---	---	11.1			24.5			11			43.1			28.2			43.3			43.6			12.1			46.4			44.3		
Metals (mg/kg DW)																																		
Arsenic	0.05	0.25	57	93	8.3	B		11	B		3.8	B		15			16			16			15	B		13			22			17	B	
Cadmium	0.039	0.2	5.1	6.7	0.33			0.4			0.16			1.4			1.2			1.7			1.7			0.79			2.2			2.5		
Chromium	0.32	0.25	260	270	12	B		12	B		8.9	B	J D05 L	19			15			21			18	B		10			22			21	B	
Copper	0.11	0.5	390	390	46			84			7.9			56			56			58			47			11			64			64		
Lead	0.024	0.25	450	530	120	B		170	B		14	B		120			95			110			87	B		20			140			140	B	
Mercury	0.002	0.02	0.41	0.59	0.045			0.092			0.019	J		0.1			0.08			0.18			0.12			0.072			0.21			0.23		
Silver	0.01	0.1	6.1	6.1	0.096	J		0.12			0.037	J		0.28			0.14	J		0.22			0.17			0.06	J		0.27			0.23		
Zinc	0.81	2.5	410	960	60			72			21			140			62			82			100			37			100			460		
Organics																																		
Low Molecular Polycyclic Aromatic Hydrocarbons (LPAH) (µg/kg DW)																																		
Naphthalene	0.5	2.5	2,100	2,100	37	U		40	U		25	J		66	J		42	J		330			220			48	J		1000			170		
Acenaphthylene	0.5	2.5	1,300	1,300	130	J		66	J		15	J		47	J		64	J		110	J		120			21	J		150	J		130		
Acenaphthene	0.5	2.5	500	500	59	J		130	J		20	J		56	J		62	J		430			370			25	J		2500			260		
Fluorene	0.5	2.5	540	540	130	J		140	J		22	J		73	J		87	J		490			430			42	J		1800			270		
Phenanthrene	1.2	6	1,500	1,500	1700			1700			170			680			830			4100			3500			260			14000			2100		
Anthracene	0.5	2.5	960	960	490			430			48			180			230			870			880			89			3300			620		
2-Methylnaphthalene	0.88	5	670	670	66	U		70	U		10	U		51	U		46	U		130	J		100	J		25	U		570			64	J	
Total LPAH	---	---	5,200	5,200	2509			2466			300			1102			1315			6460			5620			485			23320			3614		
High Molecular Polycyclic Aromatic Hydrocarbons (HPAH) (µg/kg DW)																																		
Fluoranthene	0.5	2.5	1,700	2,500	2900			2300			180			1000	B		1100	B		3800	B		3900			360	B		11000	B		2500		
Pyrene	0.64	6	2,600	3,300	3000			2500			210			1100			1200			4200			4400			420			12000			3100		
Benz[a]anthracene	0.5	2.5	1,300	1,600	1200			970			81			440			540			1600			1700			160			5000			1400		
Chrysene	1.3	6	1,400	2,800	1100			960			80			420			530			1600			1700			180			4900			1500		
Benzofluoranthenes	1.4	15	3,200	3,600	490	J		350	J		25	J		250	J		190	J		530	J		590	J		66	J		1600			540	J	
Benzo(a)pyrene	1.3	6	1,600	1,600	1000			820			73			420			430			1400			1500			130	J		3900			1200		
Indeno(1,2,3-c,d)pyrene	0.5	4	600	690	720			550			56			320			300			860			870			120			2200			750		
Dibenzo(a,h)anthracene	1.2	5	230	230	160	J		130	J		14	U		83	J		64	J		200	J		180	J		34	U		380			130	J	
Benzo(g,h,i)perylene	0.9	6	670	720	650			450	J		41	J		110	J		220	J		780			810			81	J		2000			630		
Total HPAH	---	---	12,000	17,000	11220			9030			746			4143			4574			14970			15650			1517			42980			11750		
Chlorinated Hydrocarbons (µg/kg DW)																																		
1,4-Dichlorobenzene	0.83	5	110	110	62	U		66	U		9.6	U		48	U		44	U		48	U		38	U		24	U		53	U		41	U	
1,2-Dichlorobenzene	1.2	5	35	50	90	U		95	U		14	U		69	U		63	U		70	U		55	U		34	U		77	U		59	U	
1,2,4-Trichlorobenzene	0.6	5	31	51	45	U		48	U		6.9	U		35	U		32	U		35	U		28	U		17	U		39	U		29	U	
Hexachlorobenzene	1.5	5	22	70	110	U		120	U		17	U		86	U		79	U		87	U		69	U		43	U		96	U		73	U	
Phthalates (µg/kg DW)																																		
Dimethyl phthalate	1.3	15	71	160	97	U		100	U		15	U		75	U		68	U		76	U		60	U		37	U		84	U		64	U	
Diethyl phthalate	7.5	150	200	***1,200***	570	U		600	U		88	U		440	U		400	U		440	U		350	U		220	U		490	U		370	U	
Di-n-butyl phthalate	5.7	50	1,400	1,400	430	U		450	U		66	U		330	U		300	U		330	U		260	U		160	U		370	U		280	U	
Butyl benzyl phthalate	5.1	20	63	900	380	U		400	U		69	J B	J	290	U		270	U		300	U		230	J B	J	140	U		330	U		290	J B	J
Bis(2-ethylhexyl)phthalate	7.1	60	1,300	1,900	530	U		560	U		82	U		410	U		370	U		410	U		600	J B	J	200	U		460	U		350	U	
Di-n-octyl phthalate	5.7	15	6,200	6,200	430	U		450	U		66	U		380	J B	J	350	J B	J	330	U		260	U		160	U		370	U		320	J	

Table B-2. Blakely Harbor Chemistry Results - Dry Weight

Parameter	Sediment		Marine Sediment AETs		BH2-08-S	Q	VQ	BH2-09-S	Q	VQ	BH2-10-S	Q	VQ	BH2-11-S	Q	VQ	BH2-12-S	Q	VQ	BH2-13-S	Q	VQ	BH2-14-S	Q	VQ	BH2-15-S	Q	VQ	BH2-16-S	Q	VQ	BH2-17-S	Q	VQ
	MDL	RL	SCO	CSL																														
Miscellaneous Extractables (µg/kg DW)																																		
Dibenzofuran	0.59	15	540	540	44	U		47	U		11	J		34	U		31	U		240	J		150	J		17	U		770	J		94	J	
Hexachlorobutadiene	1.5	5	11	120	110	U		120	U		17	U		86	U		79	U		87	U		69	U		43	U		96	U		73	U	
N-Nitrosodiphenylamine	0.8	6	28	40	60	U		63	U		9.2	U		46	U		42	U		46	U		37	U		23	U		72	J		39	U	
PCB Aroclors (mg/kg DW)																																		
PCB-aroclor 1016	0.0021	0.01	---	---	0.0011	U		0.001	U		0.00093	U		0.0021	U		0.0018	U		0.002	U		0.0018	U		0.00098	U		0.0021	U		0.002	U	
PCB-aroclor 1221	0.0021	0.01	---	---	0.0014	U		0.0013	U		0.0012	U		0.0027	U		0.0023	U		0.0025	U		0.0023	U		0.0013	U		0.0027	U		0.0025	U	
PCB-aroclor 1232	0.0021	0.01	---	---	0.0014	U		0.0013	U		0.0012	U		0.0027	U		0.0023	U		0.0025	U		0.0023	U		0.0013	U		0.0027	U		0.0025	U	
PCB-aroclor 1242	0.0021	0.01	---	---	0.00072	U		0.00067	U		0.00062	U		0.0014	U		0.0012	U		0.0013	U		0.0012	U		0.00065	U		0.0014	U		0.0013	U	
PCB-aroclor 1248	0.0021	0.01	---	---	0.00053	U		0.00049	U		0.00045	U		0.001	U		0.00088	U		0.00096	U		0.00086	U		0.00047	U		0.001	U		0.00095	U	
PCB-aroclor 1254	0.0021	0.01	---	---	0.0012	U		0.0078	P	J K01 L	0.001	U	Uj C05 L	0.0022	U		0.0022	J		0.003	J		0.0034	J	J C05	0.001	J p	J M08	0.0022	U		0.0062	J C05 L	
PCB-aroclor 1260	0.0021	0.01	---	---	0.0011	U		0.0011	U		0.00097	U		0.0022	U		0.0019	U		0.002	U		0.0018	U		0.001	U		0.0022	U		0.002	U	
PCB-aroclor 1262	0.0021	0.01	---	---	0.00069	U		0.00065	U		0.00059	U		0.0013	U		0.0011	U		0.0012	U		0.0011	U		0.00062	U		0.0013	U		0.0012	U	
PCB-aroclor 1268	0.0021	0.01	---	---	0.00072	U		0.00067	U		0.00062	U		0.0014	U		0.0012	U		0.0013	U		0.0012	U		0.00065	U		0.0014	U		0.0013	U	
Total PCBs	0.0021	0.01	0.13	1	0.0014	U		0.0078	P		0.0016	J		0.0027	U		0.0022	J		0.003	J		0.0034	J		0.001	J p		0.0027	U		0.0062		
Phenols (µg/kg DW)																																		
Phenol	2.3	15	420	1,200	630	J		1400			510			130	U		120	U		130	U		660	J		65	U		150	U		1000		
2-Methylphenol	0.98	15	63	63	73	U		78	U		11	U		56	U		51	U		57	U		45	U		28	U		63	U		48	U	
3- and 4-Methylphenol	1.5	20	670	670	110	U		120	U		130	J		86	U		79	U		87	U		620	J		43	U		96	U		700	J	
2,4-Dimethylphenol	1.5	10	29	29	110	U		120	U		17	U		86	U	UJ P02 L	79	U	UJ P02 L	87	U	UJ P02 L	69	U		43	U	UJ P01 L	96	U	UJ P02 L	73	U	
Pentachlorophenol	13.2	45	360	690	990	U		1000	U		150	U		760	U		690	U		770	U		610	U		370	U		850	U		650	U	
Benzyl alcohol	7.7	50	57	73	580	U		610	U		89	U		440	U		400	U		450	U		350	U		220	U		490	U		380	U	
Benzoic acid	57.9	200	650	650	4300	U		4600	U		670	U		3300	U		3000	U		3400	U		2700	U		1600	U		3700	U		2800	U	
Dioxin/Furan Congeners (ng/kg DW)																																		
2,3,7,8-TCDD	---	1	---	---	0.17	U		0.43	J q	J																			1.8	J				
1,2,3,7,8-PeCDD	---	5	---	---	0.55	J		0.98	J																				3.9	J				
1,2,3,4,7,8-HxCDD	---	5	---	---	0.8	J B	J	1.2	J B	J																			4.4	J B	J			
1,2,3,6,7,8-HxCDD	---	5	---	---	1.4	J		2.3	J																				8.6	J				
1,2,3,7,8,9-HxCDD	---	5	---	---	1.7	J		3	J																				10	J				
1,2,3,4,6,7,8-HpCDD	---	5	---	---	24	B		34	B																				95	B				
OCDD	---	10	---	---	260	B		300	B																				780	B				
2,3,7,8-TCDF	---	1	---	---	1.5	J		3.2																					8.6					
1,2,3,7,8-PeCDF	---	5	---	---	1.2	J B	J	2.2	J B	J																			4.8	J B	J			
2,3,4,7,8-PeCDF	---	5	---	---	0.95	J		2.9	J																				4.1	J				
1,2,3,4,7,8-HxCDF	---	5	---	---	1.9	J		2.7	J																				8.7	J				
1,2,3,6,7,8-HxCDF	---	5	---	---	0.7	J		2.2	J																				3	J				
1,2,3,7,8,9-HxCDF	---	5	---	---	0.26	J B	U F01	0.41	J B	U F01																			1.1	J B	J			
2,3,4,6,7,8-HxCDF	---	5	---	---	0.61	J		1.8	J																				2.1	J				
1,2,3,4,6,7,8-HpCDF	---	5	---	---	5.5	J B	J	15	B																				21	B				
1,2,3,4,7,8,9-HpCDF	---	5	---	---	0.37	J B	U F01	0.68	J B	J																			2.3	J B	J			
OCDF	---	10	---	---	17	B		12	J B	U F01																			26	J B	J			
Total TEQ (ND = 0)	---	---	---	---	2.1			4.6																					13.1					
			Exceeds SCO	Exceeds CSL																														

Table B-2. Blakely Harbor Chemistry Results - Dry Weight

Parameter	Sediment		Marine Sediment AETs		BH2-18-S	Q	VQ	BH2-18-D	Q	VQ	BH2-19-S	Q	VQ	BH2-20-S	Q	VQ	BH2-21-S	Q	VQ	BH2-22-S	Q	VQ	BH2-23-S	Q	VQ	BH2-24-S	Q	VQ	BH2-25-S	Q	VQ	BH2-25-D	Q	VQ	BH2-25-T	Q	VQ
	MDL	RL	SCO	CSL																																		
Conventionals																																						
Total Solids (%)	---	0.1	---	---	48.1						75.2			29.1			49.6			47.6			75.9			57			46.4			46.1			46		
Total Volatile Solids (%)	---	0.1	---	---	4.5						1.4			7.7			4.7			5.4			1.5			3.7			4.9			4.6			4.9		
Total Organic Carbon (%)	0.004	0.2	---	---	4.7						0.59			17			4.2			7.1			0.45			3.7			5.6			5.8			5.9		
Total Sulfides (mg/kg)	5.63	10	---	---	11	U					6.8	U		17	U		11	U		160			21			54			41			100			190		
Ammonia (mg/kg)	10	125	---	---	18	U					13	U		33	U		19	U		18	U		12	U		15	U		19	U		19	U		20	U	
Grain Size (% fines)	---	0.1	---	---	33.1						7			39.5			21.3			36			14.5			30.3			49.1			48.9			48.4		
Metals (mg/kg DW)																																						
Arsenic	0.05	0.25	57	93	14	B					4	B		24	B		13	B		18	B		4	B		10			13			14					
Cadmium	0.039	0.2	5.1	6.7	1.4						0.15	J		2.8			1.2			1.8			0.18			1.3			1.8			1.7					
Chromium	0.32	0.25	260	270	21	B					9.1	B		19	B		17	B		20	B		12	B		17			27			26					
Copper	0.11	0.5	390	390	140						6.1			55			50			170			14			41			67			67					
Lead	0.024	0.25	450	530	140	B					11	B		110	B		640	B		500	B		11	B		120			260			210					
Mercury	0.002	0.02	0.41	0.59	0.38						0.016	J		2.2			0.2			0.62			0.014	J		0.21			0.74			0.81					
Silver	0.01	0.1	6.1	6.1	0.24						0.027	J		0.25			0.14			0.2			0.033	J		0.14			0.25			0.25					
Zinc	0.81	2.5	410	960	110						29			110			130			210			29			180			150			150					
Organics																																						
Low Molecular Polycyclic Aromatic Hydrocarbons (LPAH) (µg/kg DW)																																						
Naphthalene	0.5	2.5	2,100	2,100	210	J					12	U		200	J		87	J		250			12	U		64			93	J		86	J				
Acenaphthylene	0.5	2.5	1,300	1,300	110	J					12	U		110	J		49	U		270			12	U		37	J		60	J		62	J				
Acenaphthene	0.5	2.5	500	500	310						12	U		110	J		49	U		540			12	U		35	J		78	J		64	J				
Fluorene	0.5	2.5	540	540	300						12	U		160	J		84	J		530			12	U		38	J		82	J		96	J				
Phenanthrene	1.2	6	1,500	1,500	2700						29	U		1100			550	J		4600			29	U		370			650			730					
Anthracene	0.5	2.5	960	960	600						12	U		320	J		49	U		1100			12	U		84			170			190					
2-Methylnaphthalene	0.88	5	670	670	95	J					21	U		140	U		86	U		130	J		21	U		16	J		39	J		37	U				
Total LPAH	---	---	5,200	5,200	4325						29	U		2000			721			7420			29	U		644			1172			1228					
High Molecular Polycyclic Aromatic Hydrocarbons (HPAH) (µg/kg DW)																																						
Fluoranthene	0.5	2.5	1,700	2,500	3100						56	J		1800			1100			4900			42	J		520	B		910	B		1200	B				
Pyrene	0.64	6	2,600	3,300	3600						52	J		1800			1200			5700			42	J		540			1100			1300					
Benz[a]anthracene	0.5	2.5	1,300	1,600	1300						26	J		740			480			2500			14	J		210			440			620					
Chrysene	1.3	6	1,400	2,800	1400						31	U		760	J		520	J		2200			31	U		190			410			640					
Benzofluoranthenes	1.4	15	3,200	3,600	600	J					34	U		330	J		590	J		1100	J		34	U		85	J		230	J		300	J				
Benzo(a)pyrene	1.3	6	1,600	1,600	1100						31	U		710	J		400	J		2000			31	U		210			430			580					
Indeno(1,2,3-c,d)pyrene	0.5	4	600	690	740						12	U		540	J		330	J		1400			12	U		160			300			360					
Dibenzo(a,h)anthracene	1.2	5	230	230	170	J					29	U		190	U		120	U		310	J		29	U		42	J		85	J		73	J				
Benzo(g,h,i)perylene	0.9	6	670	720	550	J					22	U		420	J		210	J		1100			22	U		130			240			320					
Total HPAH	---	---	12,000	17,000	12560						134			7100			4830			21210			98			2087			4145			5393					
Chlorinated Hydrocarbons (µg/kg DW)																																						
1,4-Dichlorobenzene	0.83	5	110	110	81	U					20	U		130	U		81	U		78	U		20	U		14	U		33	U		35	U				
1,2-Dichlorobenzene	1.2	5	35	50	120	U					29	U		190	U		120	U		110	U		29	U		20	U		48	U		51	U				
1,2,4-Trichlorobenzene	0.6	5	31	51	59	U					14	U		95	U		59	U		56	U		14	U		10	U		24	U		25	U				
Hexachlorobenzene	1.5	5	22	70	150	U					36	U		240	U		150	U		140	U		36	U		25	U		60	U		64	U				
Phthalates (µg/kg DW)																																						
Dimethyl phthalate	1.3	15	71	160	130	U					31	U		200	U		130	U		120	U		31	U		22	U		52	U		55	U				
Diethyl phthalate	7.5	150	200	*1,200*	750	U					180	U		1200	U		740	U		710	U		180	U		130	U		300	U		320	U				
Di-n-butyl phthalate	5.7	50	1,400	1,400	560	U					140	U		900	U		560	U		540	U		140	U		97	U		230	U		240	U				
Butyl benzyl phthalate	5.1	20	63	900	510	J B	J				120	U		800	U		500	U		480	U		120	U		86	U		200	U		220	U				
Bis(2-ethylhexyl)phthalate	7.1	60	1,300	1,900	700	U					170	U		1100	U		690	U		670	U		170	U		120	U		280	U		300	U				
Di-n-octyl phthalate	5.7	15	6,200	6,200	560	U					140	U		900	U		560	U		540	U		140	U		97	U		230	U		240	U				

Table B-2. Blakely Harbor Chemistry Results - Dry Weight

Parameter	Sediment		Marine Sediment AETs		BH2-18-S	Q	VQ	BH2-18-D	Q	VQ	BH2-19-S	Q	VQ	BH2-20-S	Q	VQ	BH2-21-S	Q	VQ	BH2-22-S	Q	VQ	BH2-23-S	Q	VQ	BH2-24-S	Q	VQ	BH2-25-S	Q	VQ	BH2-25-D	Q	VQ	BH2-25-T	Q	VQ
	MDL	RL	SCO	CSL																																		
Miscellaneous Extractables (µg/kg DW)																																						
Dibenzofuran	0.59	15	540	540	120	J					14	U		93	U		58	U		150	J		14	U		24	J		31	J		26	J				
Hexachlorobutadiene	1.5	5	11	120	150	U					36	U		240	U		150	U		140	U		36	U		25	U		60	U		64	U				
N-Nitrosodiphenylamine	0.8	6	28	40	79	U					19	U		130	U		78	U		75	U		19	U		14	U		32	U		34	U				
PCB Aroclors (mg/kg DW)																																						
PCB-aroclor 1016	0.0021	0.01	---	---	0.0014	U					0.00082	U		0.0025	U		0.0013	U		0.0015	U		0.00081	U		0.0011	U	UJ G02 L	0.0016	U		0.0015	U				
PCB-aroclor 1221	0.0021	0.01	---	---	0.0017	U					0.001	U		0.0032	U		0.0017	U		0.0019	U		0.001	U		0.0014	U	UJ G02 L	0.002	U		0.002	U				
PCB-aroclor 1232	0.0021	0.01	---	---	0.0017	U					0.001	U		0.0032	U		0.0017	U		0.0019	U		0.001	U		0.0014	U	UJ G02 L	0.002	U		0.002	U				
PCB-aroclor 1242	0.0021	0.01	---	---	0.0009	U					0.00054	U		0.0017	U		0.00089	U		0.00096	U		0.00054	U		0.00075	U	UJ G02 L	0.001	U		0.001	U				
PCB-aroclor 1248	0.0021	0.01	---	---	0.00066	U					0.0004	U		0.0012	U		0.00065	U		0.00071	U		0.00039	U		0.00055	U	UJ G02 L	0.00076	U		0.00075	U				
PCB-aroclor 1254	0.0021	0.01	---	---	0.0014	U					0.00087	U		0.0085	p	J M08	0.0027	J p	J M08	0.0024	J p	J M08	0.00086	U		0.0012	U	UJ G02 L	0.007			0.0048					
PCB-aroclor 1260	0.0021	0.01	---	---	0.0014	U					0.00085	U		0.0026	U		0.0014	U		0.0015	U		0.00084	U		0.0012	U	UJ G02 L	0.0016	U		0.0016	U				
PCB-aroclor 1262	0.0021	0.01	---	---	0.00086	U					0.00052	U		0.0016	U		0.00086	U		0.00093	U		0.00051	U		0.00072	U		0.00099	U		0.00098	U				
PCB-aroclor 1268	0.0021	0.01	---	---	0.0009	U					0.00054	U		0.0017	U		0.00089	U		0.00096	U		0.00054	U		0.00075	U		0.001	U		0.001	U				
Total PCBs	0.0021	0.01	0.13	1	0.0017	U					0.001	U		0.0085	p		0.0027	J p		0.0024	J p		0.001	U		0.0014	U		0.007			0.0048					
Phenols (µg/kg DW)																																						
Phenol	2.3	15	420	1,200	230	U					270	J		670	J		530	J		790	J		210	J		39	U		92	U		98	U				
2-Methylphenol	0.98	15	63	63	96	U					23	U		150	U		96	U		92	U		24	U		17	U		39	U		42	U				
3- and 4-Methylphenol	1.5	20	670	670	150	U					95	J		1900	J		650	J		1200	J		46	J		25	U		60	U		64	U				
2,4-Dimethylphenol	1.5	10	29	29	150	U					36	U		240	U		150	U		140	U		36	U		25	U	UJ P02 L	60	U	UJ P02 L	64	U	UJ P02 L			
Pentachlorophenol	13.2	45	360	690	1300	U					320	U		2100	U		1300	U		1200	U		320	U		220	U		530	U		560	U				
Benzyl alcohol	7.7	50	57	73	760	U					180	U		1200	U		750	U		720	U		190	U		130	U		310	U		330	U				
Benzoic acid	57.9	200	650	650	5700	U					1400	U		9100	U		5700	U		5400	U		1400	U		980	U		2300	U		2500	U				
Dioxin/Furan Congeners (ng/kg DW)																																						
2,3,7,8-TCDD	---	1	---	---	0.36	U		0.66	J q	J							0.69	J																				
1,2,3,7,8-PeCDD	---	5	---	---	1.2	J q	J	1.3	J								1.1	J																				
1,2,3,4,7,8-HxCDD	---	5	---	---	1.9	J B	J	1.5	J B	J							1.5	J B	J																			
1,2,3,6,7,8-HxCDD	---	5	---	---	6.8	J		3.5	J								3.1	J																				
1,2,3,7,8,9-HxCDD	---	5	---	---	7.6	J		4.3	J								4.3	J																				
1,2,3,4,6,7,8-HpCDD	---	5	---	---	54	B		40	B								48	B																				
OCDD	---	10	---	---	370	B		350	B								410	B																				
2,3,7,8-TCDF	---	1	---	---	1.5	J q		3.2	0								3.1																					
1,2,3,7,8-PeCDF	---	5	---	---	1.7	J B	J	2.5	J B	J							2	J B	J																				
2,3,4,7,8-PeCDF	---	5	---	---	1.6	J		2.2	J								2.4	J																				
1,2,3,4,7,8-HxCDF	---	5	---	---	2.9	J		4.6	J								4.5	J																				
1,2,3,6,7,8-HxCDF	---	5	---	---	1.2	J		2	J								1.8	J																				
1,2,3,7,8,9-HxCDF	---	5	---	---	0.44	J B q	U F01	0.38	J q B	U F01							0.4	J B	U F01																				
2,3,4,6,7,8-HxCDF	---	5	---	---	0.94	J		1.2	J								1.5	J																				
1,2,3,4,6,7,8-HpCDF	---	5	---	---	7.2	J B	J	8.3	J B	J							9.2	J B	J																				
1,2,3,4,7,8,9-HpCDF	---	5	---	---	0.75	J B	J	0.65	J B	J							0.57	J B	J																				
OCDF	---	10	---	---	12	J B	U F01	11	J B	U F01							15	J B	J																				
Total TEQ (ND = 0)	---	---	---	---	4.7			5.3									5.3																					
			Exceeds SCO	Exceeds CSL																																		

Table B-2. Blakely Harbor Chemistry Results - Dry Weight

Parameter	Sediment		Marine Sediment AETs		BH2-26-S	Q	VQ	BH2-27-S	Q	VQ	BH2-28-S	Q	VQ	BH2-29-S	Q	VQ	BH2-30-S	Q	VQ	BH2-31-S	Q	VQ	BH2-32-S	Q	VQ	BH2-33-S	Q	VQ	BH2-34-S	Q	VQ	BH2-35-S	Q	VQ
	MDL	RL	SCO	CSL																														
Conventionals																																		
Total Solids (%)	---	0.1	---	---	47.2			66.1			70.8			64.7			70.3			73.4			28.2			68.1			73.7			71.6		
Total Volatile Solids (%)	---	0.1	---	---	6.9			2.6			1.9			4			2.5			2.1			7			2.2			1.7			1.5		
Total Organic Carbon (%)	0.004	0.2	---	---	9			1.4			1			3.5			1.8			0.99			16			1.6			0.95			1		
Total Sulfides (mg/kg)	5.63	10	---	---	200			8	U		7.8	U		17			7.9	U		7.1	U		130			220			7.2	U		7.8	U	
Ammonia (mg/kg)	10	125	---	---	21	U		15	U		13	U		14	U		14	U		12	U		33	U		14	U		12	U		14	U	
Grain Size (% fines)	---	0.1	---	---	32.1			24.9			21.3			25.9			15.8			15.9			57.8			25.9			17.6			24.2		
Metals (mg/kg DW)																																		
Arsenic	0.05	0.25	57	93	19			8	B		4	B		8.2			8.8			5.5			22			7.4			4.1			4.5		
Cadmium	0.039	0.2	5.1	6.7	1.8			0.93			0.44			0.84			0.64			0.33			2.2			0.75			0.32			0.41		
Chromium	0.32	0.25	260	270	30			11	B		13	B		24			11			21			34			14			13			13		
Copper	0.11	0.5	390	390	80			13			15			46			12			17			86			14			13			12		
Lead	0.024	0.25	450	530	170			21	B		37	B		76			17			35			170			19			22			16		
Mercury	0.002	0.02	0.41	0.59	0.35			0.1			0.19			0.19			0.071			0.088			0.6			0.086			0.075	F1	J H01 H	0.062		
Silver	0.01	0.1	6.1	6.1	0.22			0.078	J		0.071	J		0.14			0.067	J		0.074	J		0.35			0.085	J		0.073	J		0.073	J	
Zinc	0.81	2.5	410	960	130			36			38			100			30			42			120			35			30			28		
Organics																																		
Low Molecular Polycyclic Aromatic Hydrocarbons (LPAH) (µg/kg DW)																																		
Naphthalene	0.5	2.5	2,100	2,100	100			13	U		15	J		38			13	J		28	J		3200			11	J		15	J F1	J H02 L	9.7	J	
Acenaphthylene	0.5	2.5	1,300	1,300	63	J		13	U		12	J		37			6.9	U		36	J		1100			7.7	J		9.8	J		8.3	J	
Acenaphthene	0.5	2.5	500	500	77	J		13	U		12	U		62			6.9	U		33	J		3600			6.9	U		7.6	J		6.8	U	
Fluorene	0.5	2.5	540	540	120			13	J		15	J		65			6.9	J		43	J		4200			9.8	J		11	J		7.7	J	
Phenanthrene	1.2	6	1,500	1,500	900			92	J		120	J		530			28	J		380			24000			78	J		93			47	J	
Anthracene	0.5	2.5	960	960	240			26	J		41	J		130			14	J		100			5500			27	J		36			17	J	
2-Methylnaphthalene	0.88	5	670	670	37	J		23	U		22	U		16	J		12	U		23	U		1500			12	U		11	U		12	U	
Total LPAH	---	---	5,200	5,200	1537			131			203			878			61.9			620			43100			133.5			172.4			89.7		
High Molecular Polycyclic Aromatic Hydrocarbons (HPAH) (µg/kg DW)																																		
Fluoranthene	0.5	2.5	1,700	2,500	1200	B		140			210			720	B		53	B		450	B		19000	B		150	B		170	F1 B	J H02 L	87	B	
Pyrene	0.64	6	2,600	3,300	1400			160			240			810			59	J		470			23000			160			190	F1	J H02 L	95		
Benz[a]anthracene	0.5	2.5	1,300	1,600	720			63	J		87			330			21	J		200			9200			72			93			36		
Chrysene	1.3	6	1,400	2,800	700			65	J		100	J		330			22	J		170			8900			59	J		110	F1	J H02 L	37	J	
Benzofluoranthenes	1.4	15	3,200	3,600	290	J		37	U		42	J		140	J		19	U		61	J		2900			26	J		110	J F1	J H02 L	19	U	
Benzo(a)pyrene	1.3	6	1,600	1,600	520			64	J		89	J		300			23	J		160			7400			64	J		76	J		32	J	
Indeno(1,2,3-c,d)pyrene	0.5	4	600	690	380			61	J		77	J		200			30	J		140			4000			55			55			33	J	
Dibenzo(a,h)anthracene	1.2	5	230	230	74	J		31	U		30	U		39	J		16	U		31	U		980			17	U		16	J		16	U	
Benzo(g,h,i)perylene	0.9	6	670	720	310			33	J		59	J		160			13	J		100	J		3500			43	J		43	J		22	J	
Total HPAH	---	---	12,000	17,000	5594			586			904			3029			221			1751			78880			629			863			342		
Chlorinated Hydrocarbons (µg/kg DW)																																		
1,4-Dichlorobenzene	0.83	5	110	110	34	U		22	U		21	U		12	U		11	U		22	U		58	U		11	U		11	J F2 F	UJ H02 L	11	U	
1,2-Dichlorobenzene	1.2	5	35	50	49	U		31	U		30	U		18	U		16	U		31	U		84	U		17	U		16	U F1	UJ H02 L	16	U	
1,2,4-Trichlorobenzene	0.6	5	31	51	24	U		16	U		15	U		8.8	U		8.2	U		16	U		42	U		8.3	U		7.8	U F1	UJ H02 L	8.1	U	
Hexachlorobenzene	1.5	5	22	70	61	U		39	U		37	U		22	U		21	U		39	U		110	U		21	U		20	U		20	U	
Phthalates (µg/kg DW)																																		
Dimethyl phthalate	1.3	15	71	160	53	U		34	U		32	U		19	U		18	U		34	U		91	U		18	U		17	U		18	U	
Diethyl phthalate	7.5	150	200	*1,200*	310	U		200	U		190	U		110	U		100	U		200	U		530	U		100	U		99	U		100	U	
Di-n-butyl phthalate	5.7	50	1,400	1,400	230	U		150	U		140	U		83	U		78	U		150	U		400	U		79	U		74	U F1	U	77	U	
Butyl benzyl phthalate	5.1	20	63	900	210	U		130	U		130	U		75	U		70	U		130	U		360	U		70	U		67	U F1	U	69	U	
Bis(2-ethylhexyl)phthalate	7.1	60	1,300	1,900	290	U		190	U		180	U		100	U		97	U		190	U		500	U		98	U		93	U F1	U	96	U	
Di-n-octyl phthalate	5.7	15	6,200	6,200	230	U		150	U		140	U		83	U		78	JB		150	U		400	U		89	J B	J	74	U F1	U	77	U	

Table B-2. Blakely Harbor Chemistry Results - Dry Weight

Parameter	Sediment		Marine Sediment AETs		BH2-26-S	Q	VQ	BH2-27-S	Q	VQ	BH2-28-S	Q	VQ	BH2-29-S	Q	VQ	BH2-30-S	Q	VQ	BH2-31-S	Q	VQ	BH2-32-S	Q	VQ	BH2-33-S	Q	VQ	BH2-34-S	Q	VQ	BH2-35-S	Q	VQ
	MDL	RL	SCO	CSL																														
Miscellaneous Extractables (µg/kg DW)																																		
Dibenzofuran	0.59	15	540	540	33	J		15	U		15	U		19	J		8.1	U		17	J		820	J		8.1	U		7.7	U		8	U	
Hexachlorobutadiene	1.5	5	11	120	61	U		39	U		37	U		22	U		21	U		39	U		110	U		21	U		20	U F1	UJ H02 L	20	U	
N-Nitrosodiphenylamine	0.8	6	28	40	32	U		21	U		20	U		12	U		11	U		21	U		89	J		11	U		10	U		11	U	
PCB Aroclors (mg/kg DW)																																		
PCB-aroclor 1016	0.0021	0.01	---	---	0.0015	U		0.00098	U		0.00086	U		0.0011	U		0.00095	U		0.00096	U		0.0025	U		0.001	U		0.00099	J F1 R	U	0.00099	U	
PCB-aroclor 1221	0.0021	0.01	---	---	0.0019	U		0.0013	U		0.0011	U		0.0014	U		0.0012	U		0.0012	U		0.0032	U		0.0013	U		0.0013	U		0.0013	U	
PCB-aroclor 1232	0.0021	0.01	---	---	0.0019	U		0.0013	U		0.0011	U		0.0014	U		0.0012	U		0.0012	U		0.0032	U		0.0013	U		0.0013	U		0.0013	U	
PCB-aroclor 1242	0.0021	0.01	---	---	0.00099	U		0.00065	U		0.00057	U		0.00073	U		0.00063	U		0.00064	U		0.0016	U		0.00069	U		0.00065	U		0.00066	U	
PCB-aroclor 1248	0.0021	0.01	---	---	0.00073	U		0.00048	U		0.00042	U		0.00053	U		0.00046	U		0.00047	U		0.0012	U		0.00051	U		0.00048	U		0.00048	U	
PCB-aroclor 1254	0.0021	0.01	---	---	0.0069			0.001	U		0.00091	U		0.0033			0.001	J		0.001	U		0.0054	J		0.0013	J		0.0011	U		0.0011	U	
PCB-aroclor 1260	0.0021	0.01	---	---	0.0016	U		0.001	U		0.00089	U		0.0011	U		0.00099	U		0.001	U		0.0026	U		0.0011	U		0.001	U		0.001	U	
PCB-aroclor 1262	0.0021	0.01	---	---	0.00095	U		0.00062	U		0.00054	U		0.0007	U		0.0006	U		0.00061	U		0.0016	U		0.00066	U		0.00063	U		0.00063	U	
PCB-aroclor 1268	0.0021	0.01	---	---	0.00099	U		0.00065	U		0.00057	U		0.00073	U		0.00063	U		0.00064	U		0.0016	U		0.00069	U		0.00065	U		0.00066	U	
Total PCBs	0.0021	0.01	0.13	1	0.0069			0.0013	U		0.0011	U		0.0033			0.001	J		0.0012	U		0.0054	J		0.0013	J		0.0013	U		0.0013	U	
Phenols (µg/kg DW)																																		
Phenol	2.3	15	420	1,200	93	U		560			57	U		34	U		32	U		60	U		160	U		32	U		30	U F1	U	31	U	
2-Methylphenol	0.98	15	63	63	40	U		26	U		24	U		14	U		13	U		26	U		69	U		14	U		13	U		13	U	
3- and 4-Methylphenol	1.5	20	670	670	61	U		450	J		85	J		22	U		21	U		39	U		110	U		21	U		20	U F1	U	20	U	
2,4-Dimethylphenol	1.5	10	29	29	61	U	UJ P02 L	39	U		37	U		22	U	UJ P02 L	21	U	UJ P02 L	39	U	UJ P02 L	110	U	UJ P02 L	21	U	UJ P02 L	20	U	UJ P02 L	20	U	UJ P02 L
Pentachlorophenol	13.2	45	360	690	530	U		340	U		330	U		190	U		180	U		350	U		930	U		180	U		170	U		180	U	
Benzyl alcohol	7.7	50	57	73	310	U		200	U		190	U		110	U		110	U		200	U		540	U		110	U		100	U F1	R H03 L	100	U	
Benzoic acid	57.9	200	650	650	2300	U		1500	U		1400	U		850	U		790	U		1500	U		4100	U		800	U		760	U		790	U	
Dioxin/Furan Congeners (ng/kg DW)																																		
2,3,7,8-TCDD	---	1	---	---																0.13	J q	J												
1,2,3,7,8-PeCDD	---	5	---	---																0.31	J q	J												
1,2,3,4,7,8-HxCDD	---	5	---	---																0.55	J B	U F01												
1,2,3,6,7,8-HxCDD	---	5	---	---																0.94	J													
1,2,3,7,8,9-HxCDD	---	5	---	---																1.2	J													
1,2,3,4,6,7,8-HpCDD	---	5	---	---																17	B													
OCDD	---	10	---	---																170	B													
2,3,7,8-TCDF	---	1	---	---																1	J													
1,2,3,7,8-PeCDF	---	5	---	---																0.43	J B	J												
2,3,4,7,8-PeCDF	---	5	---	---																0.36	J													
1,2,3,4,7,8-HxCDF	---	5	---	---																0.71	J													
1,2,3,6,7,8-HxCDF	---	5	---	---																0.3	J													
1,2,3,7,8,9-HxCDF	---	5	---	---																0.22	J q B	U F01												
2,3,4,6,7,8-HxCDF	---	5	---	---																0.22	J													
1,2,3,4,6,7,8-HpCDF	---	5	---	---																2.5	J B	J												
1,2,3,4,7,8,9-HpCDF	---	5	---	---																0.24	J B	U F01												
OCDF	---	10	---	---																5.9	J B	U F01												
Total TEQ (ND = 0)	---	---	---	---																1.2														
			Exceeds SCO	Exceeds CSL																														

Table B-2. Blakely Harbor Chemistry Results - Dry Weight

Parameter	Sediment		Marine Sediment AETs		BH2-36-S	Q	VQ	BH2-37-S	Q	VQ	BH2-38-S	Q	VQ	BH2-39-S	Q	VQ	BH2-40-S	Q	VQ
	MDL	RL	SCO	CSL															
Conventionals																			
Total Solids (%)	---	0.1	---	---	72.2			31.5			65.5			69.7			70.8		
Total Volatile Solids (%)	---	0.1	---	---	0.24			7.1			1.9			1.7			1.4		
Total Organic Carbon (%)	0.004	0.2	---	---	0.85			13			1.4			1			0.79		
Total Sulfides (mg/kg)	5.63	10	---	---	7.6	U		500			7.9	U		7.5	U		7.6	U	
Ammonia (mg/kg)	10	125	---	---	12	U		29	U		14	U		13	U		12	U	
Grain Size (% fines)	---	0.1	---	---	25.3			52.4			40.8			23.9			27.4		
Metals (mg/kg DW)																			
Arsenic	0.05	0.25	57	93	4.2			22			5.7			4.3			4.1		
Cadmium	0.039	0.2	5.1	6.7	0.28			1.7			0.58			0.33			0.34		
Chromium	0.32	0.25	260	270	14			34			20			14			16		
Copper	0.11	0.5	390	390	13			110			23			13			12		
Lead	0.024	0.25	450	530	20			200			32			16			14		
Mercury	0.002	0.02	0.41	0.59	0.069			0.57			0.36			0.063			0.057		
Silver	0.01	0.1	6.1	6.1	0.069	J		0.39			0.12			0.077	J		0.071	J	
Zinc	0.81	2.5	410	960	31			130			49			32			31		
Organics																			
Low Molecular Polycyclic Aromatic Hydrocarbons (LPAH) (µg/kg DW)																			
Naphthalene	0.5	2.5	2,100	2,100	9.1	J		120	J		11	J		13	U		6.7	U	
Acenaphthylene	0.5	2.5	1,300	1,300	10	J		120	J		14	J		13	U		7	J	
Acenaphthene	0.5	2.5	500	500	7	J		120	J		18	J		13	U		6.7	U	
Fluorene	0.5	2.5	540	540	12	J		180			29	J		13	U		9.1	J	
Phenanthrene	1.2	6	1,500	1,500	83			1400			130			55	J		56	J	
Anthracene	0.5	2.5	960	960	28	J		450			50			21	J		16	J	
2-Methylnaphthalene	0.88	5	670	670	12	U		66	J		13	U		24	U		12	U	
Total LPAH	---	---	5,200	5,200	149.1			2456			252			76			88.1		
High Molecular Polycyclic Aromatic Hydrocarbons (HPAH) (µg/kg DW)																			
Fluoranthene	0.5	2.5	1,700	2,500	120	B		2600	B		300	B		92	B		89	B	
Pyrene	0.64	6	2,600	3,300	160			2700			260			97	J		98		
Benz[a]anthracene	0.5	2.5	1,300	1,600	66			1400			130			40	J		38		
Chrysene	1.3	6	1,400	2,800	68	J		1600			130			38	J		42	J	
Benzofluoranthenes	1.4	15	3,200	3,600	26	J		560	J		63	J		38	U		21	J	
Benzo(a)pyrene	1.3	6	1,600	1,600	54	J		1400			110			45	J		40	J	
Indeno(1,2,3-c,d)pyrene	0.5	4	600	690	51	J		770			75			47	J		38	J	
Dibenzo(a,h)anthracene	1.2	5	230	230	16	U		280	J		21	J		32	U		16	U	
Benzo(g,h,i)perylene	0.9	6	670	720	36	J		790			56	J		24	J		19	J	
Total HPAH	---	---	12,000	17,000	581			12100			1145			383			385		
Chlorinated Hydrocarbons (µg/kg DW)																			
1,4-Dichlorobenzene	0.83	5	110	110	11	U		50	U		12	U		22	U		11	U	
1,2-Dichlorobenzene	1.2	5	35	50	16	U		73	U		18	U		32	U		16	U	
1,2,4-Trichlorobenzene	0.6	5	31	51	7.9	U		36	U		8.9	U		16	U		8	U	
Hexachlorobenzene	1.5	5	22	70	20	U		91	U		22	U		40	U		20	U	
Phthalates (µg/kg DW)																			
Dimethyl phthalate	1.3	15	71	160	17	U		79	U		19	U		35	U		17	U	
Diethyl phthalate	7.5	150	200	***1,200***	100	U		460	U		110	U		200	U		100	U	
Di-n-butyl phthalate	5.7	50	1,400	1,400	75	U		350	U		84	U		150	U		76	U	
Butyl benzyl phthalate	5.1	20	63	900	67	U		310	U		75	U		140	U		68	U	
Bis(2-ethylhexyl)phthalate	7.1	60	1,300	1,900	94	U		430	U		100	U		190	U		94	U	
Di-n-octyl phthalate	5.7	15	6,200	6,200	75	U		350	U		96	J B	J	150	U		87	J B	J

Table B-2. Blakely Harbor Chemistry Results - Dry Weight

Parameter	Sediment		Marine Sediment AETs		BH2-36-S	Q	VQ	BH2-37-S	Q	VQ	BH2-38-S	Q	VQ	BH2-39-S	Q	VQ	BH2-40-S	Q	VQ
	MDL	RL	SCO	CSL															
Miscellaneous Extractables (µg/kg DW)																			
Dibenzofuran	0.59	15	540	540	7.8	U		74	J		14	J		16	U		7.8	U	
Hexachlorobutadiene	1.5	5	11	120	20	U		91	U		22	U		40	U		20	U	
N-Nitrosodiphenylamine	0.8	6	28	40	11	U		49	U		12	U		22	U		11	U	
PCB Aroclors (mg/kg DW)																			
PCB-aroclor 1016	0.0021	0.01	---	---	0.00098	U		0.0021	U		0.001	U		0.00097	U		0.0009	U	
PCB-aroclor 1221	0.0021	0.01	---	---	0.0013	U		0.0027	U		0.0013	U		0.0012	U		0.0012	U	
PCB-aroclor 1232	0.0021	0.01	---	---	0.0013	U		0.0027	U		0.0013	U		0.0012	U		0.0012	U	
PCB-aroclor 1242	0.0021	0.01	---	---	0.00065	U		0.0014	U		0.00069	U		0.00064	U		0.0006	U	
PCB-aroclor 1248	0.0021	0.01	---	---	0.00048	U		0.001	U		0.0005	U		0.00047	U		0.00044	U	
PCB-aroclor 1254	0.0021	0.01	---	---	0.0011	U		0.0056			0.0053			0.0016	J		0.0015	J	
PCB-aroclor 1260	0.0021	0.01	---	---	0.001	U		0.0022	U		0.0011	U		0.001	U		0.00094	U	
PCB-aroclor 1262	0.0021	0.01	---	---	0.00063	U		0.0013	U		0.00066	U		0.00062	U		0.00057	U	
PCB-aroclor 1268	0.0021	0.01	---	---	0.00065	U		0.0014	U		0.00069	U		0.00064	U		0.0006	U	
Total PCBs	0.0021	0.01	0.13	1	0.0013	U		0.0056			0.0053			0.0016	J		0.0015	J	
Phenols (µg/kg DW)																			
Phenol	2.3	15	420	1,200	270			2300			190	J		250	J		31	U	
2-Methylphenol	0.98	15	63	63	13	U		60	U		14	U		26	U		13	U	
3- and 4-Methylphenol	1.5	20	670	670	190	J		1500			250	J		160	J		20	U	
2,4-Dimethylphenol	1.5	10	29	29	20	U	UJ P02 L	91	U	UJ P02 L	22	U	UJ P02 L	40	U	UJ P02 L	20	U	UJ P02 L
Pentachlorophenol	13.2	45	360	690	170	U		800	U		190	U		350	U		180	U	
Benzyl alcohol	7.7	50	57	73	100	U		470	U		110	U		210	U		100	U	
Benzoic acid	57.9	200	650	650	770	U		3500	U		860	U		1600	U		770	U	
Dioxin/Furan Congeners (ng/kg DW)																			
2,3,7,8-TCDD	---	1	---	---				0.49	J q	J				0.16	J				
1,2,3,7,8-PeCDD	---	5	---	---				1.7	J					0.35	J				
1,2,3,4,7,8-HxCDD	---	5	---	---				2.1	J B	J				0.55	J q B	U F01			
1,2,3,6,7,8-HxCDD	---	5	---	---				5.9	J					1.2	J				
1,2,3,7,8,9-HxCDD	---	5	---	---				5.3	J					1.4	J				
1,2,3,4,6,7,8-HpCDD	---	5	---	---				100	B					22	B				
OCDD	---	10	---	---				920	B					250	B				
2,3,7,8-TCDF	---	1	---	---				4						0.96	J				
1,2,3,7,8-PeCDF	---	5	---	---				2.1	J B	J				0.52	J B	J			
2,3,4,7,8-PeCDF	---	5	---	---				2.6	J					0.36	J				
1,2,3,4,7,8-HxCDF	---	5	---	---				4.7	J					0.7	J				
1,2,3,6,7,8-HxCDF	---	5	---	---				1.9	J					0.24	J q	J			
1,2,3,7,8,9-HxCDF	---	5	---	---				0.57	J B	U F01				0.33	J B	U F01			
2,3,4,6,7,8-HxCDF	---	5	---	---				1.4	J					0.18	J q	J			
1,2,3,4,6,7,8-HpCDF	---	5	---	---				17	B					2.6	J B	J			
1,2,3,4,7,8,9-HpCDF	---	5	---	---				0.73	J q B	J				0.19	J q B	U F01			
OCDF	---	10	---	---				31	B					6	J B	U F01			
Total TEQ (ND = 0)	---	---	---	---				7.0						1.4					
			Exceeds SCO	Exceeds CSL															

Appendix C. Laboratory Analytical Report

Submitted Electronically on DVD

Appendix D. Data Validation Report

APPENDIX D

DATA VALIDATION REPORT

BLAKELY HARBOR PARK SEDIMENT INVESTIGATION

INTRODUCTION

A comprehensive quality assurance/quality control (QA/QC) program was followed by Leidos and NewFields during the Blakely Harbor Park Sediment Investigation to ensure that analytical results and the decisions based on these results are representative of the environmental conditions.

LABORATORY QUALITY CONTROL ASSESSMENT

The analytical data generated during the investigation underwent a quality assurance review and data validation. Validation conducted by Leidos included a minimum of Stage 2b validation for all SMS chemical data and Stage 4 validation for the dioxin/furan congener data. Validation was conducted using most recent EPA (USEPA 2005, 2008, 2009, and 2010), and PSEP (PTI 1989) guidelines. In addition, data were verified based on guidelines and specifications in the Blakely Harbor Park Sediment Investigation SAP/QAPP (Leidos and NewFields 2019). All samples were submitted to Eurofins TestAmerica, Seattle, and results were submitted in three sample delivery groups (SDGs): 280-125895-1, 580-87377-1, and 580-87377-2.

DATA VALIDATON SUMMARY

The following summary provides the information necessary to determine data usability for decision-making. The data were verified and validated and the qualifiers described below were applied to data as appropriate. Results that were rejected (R) were not used for decision-making. Results that were qualified as non-detect (U) or estimated (J or UJ) for various reasons during the validation process encountered minor analytical problems, but are considered fully usable for decision-making. The validation summary presented below is limited to QA/QC outliers that resulted in qualification of the data during the validation process. If outliers did not result in qualification of the data (e.g. high recoveries with non-detect values require no data validation qualifiers), then they are not discussed as these instances did not impact data usability.

The following data validation qualifiers were applied to the results as dictated by QC outliers:

- *U* — The analyte was analyzed for but was not detected above the reported sample quantitation limit. These results are qualitatively acceptable.
- *J* — The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. These results are qualitatively acceptable but considered as estimates.
- *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. These results are qualitatively acceptable but considered as estimates.
- *R* — The sample results were rejected due to serious deficiencies in the ability to analyze the sample and meet QC criteria. The presence or absence of the analyte cannot be verified.

The following methods were used for sample analysis of the samples collected during the Blakely Harbor Park Sediment Investigation:

Analytical Name	Analytical Method
Total Solids	ASTM D2216
Total Volatile Solids	EPA 160.4
Ammonia Nitrogen	EPA 350.1
Grain Size	PSEP Plumb
Metals (As, Ad, Cr, Cu, Pb, Ni, Se, Ag, Zn)	SW 6020A/B
Metals (Hg)	SW 7470A/7471B
Total Organic Carbon	SW 9060
Sulfide	SW 9034
PCB Aroclors	SW 8082A
SVOCs	SW 8270D
Dioxins/Furans	EPA 1613B

Table 1 (provided at the end of this section) provides a summary of data that were qualified as a result of the validation and indicates the validation qualifiers, reason codes, and potential bias applied to the data. Reason code definitions are provided at the end of Table 1. The following items (as applicable) have been addressed during the validation review:

- Sample custody and sample receipt, integrity, and preservation
- Sample handling and preparation
- Sample holding times
- Sample dilutions
- Blanks
- Instrument performance checks
- Initial and continuing calibrations
- Initial and continuing calibration blanks
- MS/MSDs
- LCS and/or LCSDs
- Laboratory duplicates
- Serial dilutions
- Post-digestion spikes
- Surrogate and labeled compound recovery
- Internal standards

GENERAL DATA PACKAGE COMMENTS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative with a few minor exceptions. All samples were received in good condition, properly preserved, and at the appropriate temperature.

GENERAL DATA VALIDATION COMMENTS

All analytical data received from the laboratory underwent some sort of data verification and/or data validation. Total solids, total volatile solids, ammonia nitrogen, and grain size underwent EPA Stage 1 (EPA1) verification and validation. EPA1 requires all samples be checked for completeness of results and adherence to all sample receipt condition checks.

Metals, mercury, total organic carbon (TOC), sulfide, PCB Aroclors, and SVOCs underwent EPA Stage 2B (EPA2B) verification and validation. EPA2B requires all of EPA1 plus review of method QC summary forms plus instrument QC forms and preparation logs. Dioxins/furans underwent EPA Stage 4 (EPA4) verification and validation. EPA4 requires all of EPA1, EPA2B, and review of the raw data

necessary to recalculate sample results (including recalculations of a subset of sample results), standard traceability logs, and the review of data necessary to qualitatively evaluate the results (e.g., instrument chromatograms and spectra).

The following discussion only includes results that received data validation qualifiers and reason codes during the data validation and verification process. All items listed above were reviewed during the validation process; however, if one of the items listed above was found to be acceptable (e.g., initial calibration results), then it is not discussed below.

Total Solids, Total Volatile Solids, Ammonia Nitrogen and Grain Size

No data were qualified due to the data validation process. Overall completeness for total solids, total volatile solids, ammonia nitrogen, and grain size data was excellent at 100% and all data are considered fully usable for decision-making.

Semivolatile Organic Compounds (SVOCs) Data Usability Assessment

Three SVOC results were qualified as estimated (J/UJ) because the continuing calibration verification (CCV) was below SW 8270D method acceptance limits as shown in Table 1 with reason code C05 L. Two SVOC results were qualified as non-detect (U) due to laboratory method blank contamination as shown in Table 1 with reason code F01. Nine SVOC results were qualified as estimated (J) due to MS/MSD recoveries above the upper control limit (UCL) as shown in Table 1 with reason code H01 H. Seventeen SVOC results were qualified as estimated (J/UJ) due to MS/MSD recoveries below the lower control limit (LCL) as shown in Table 1 with reason code H02 L. Two SVOC results were qualified as rejected (R) due to MS/MSD recoveries below 10% for benzyl alcohol in samples BH2-02-S and BH2-34-S as shown in Table 1 with reason code H03 L. Seven SVOC results were qualified as estimated (J) due to MS/MSD relative percent differences (RPDs) that exceeded the allowable limit as shown in Table 1 with reason code H04. Six SVOC results were qualified as estimated (J/UJ) due to LCS recoveries above the UCL as shown in Table 1 with reason code P01 H. Twenty-one SVOC results were qualified as estimated (UJ) due to LCS recoveries below the LCL as shown in Table 1 with reason code P02 L.

All SVOC sample extracts required dilutions ranging from 10X, 20X, and 50X prior to analysis due to sample matrix interferences or the high level of target and non-target compounds in the sample. The chromatograms were examined to determine if the samples warranted the dilutions performed by the laboratory. It was observed that a type of background interference was introducing a large number of peaks, resembling a “humpogram” which is often associated with some form of waste oil. Thus, it was determined that the dilutions were necessary. Even some samples with relatively low TOC results were found to have matrix interference that could possibly be due to oil or wood waste.

Results that were qualified as estimated (J/UJ) for various reasons encountered minor analytical problems, but are considered fully usable for decision-making. Results qualified as rejected (R) encountered serious analytical deficiencies and are not considered usable for decision-making. The overall completeness for SVOC data was excellent at 99.9%, and exceeded the completeness goal of 95%.

Polychlorinated Biphenyl (PCB) Aroclor Data Usability Assessment

Ten PCB results were qualified as estimated (J/UJ) due to CCV recoveries below the LCL as shown in Table 1 with reason code G02 L. Seven PCB results were qualifies as estimated (UJ) due to surrogate recoveries below the LCL as shown in Table 1 with reason code G02 L. Four PCB results were qualified as estimated (J) due to internal standard area counts below the LCL as shown in Table 1 with reason code K01 L. Four PCB results were qualified as estimated (J) because the RPD values between the two PCB columns exceeded 40%. All PCB data are considered fully usable for decision-making. The overall completeness for the PCB data was excellent at 100%.

Dioxin/Furan Data Usability Assessment

Twenty low-level dioxin/furan results were qualified as non-detect (U) due to laboratory method blank contamination as shown in Table 1 with reason code F01. All dioxin/furan data were considered usable for decision-making and the overall completeness was excellent at 100%.

Metals and Mercury Data Usability Assessment

Seven chromium results were qualified as estimated (J) due to CCV recoveries below the LCL as shown in Table 1 with reason code D05 L. One mercury result was qualified as estimated (J) due to MS/MSD recoveries above the UCL as shown in Table 1 with reason code H01 H. All metals and mercury data are considered fully usable for decision-making. The overall completeness for metals and mercury data was excellent at 100%.

Total Organic Carbon (TOC) Data Usability Assessment

No TOC data were qualified during the data validation process. All TOC data are considered fully usable for decision-making and the completeness was excellent at 100%.

Sulfide Data Usability Assessment

Two sulfide results were qualified as estimated (J/UJ) due to MS/MSD recoveries below the LCL as shown in Table 1 with reason code H02 L. These estimated data points are considered fully usable for decision-making. Overall completeness for sulfide data was excellent at 100%.

Table 1 – Blakely Harbor Qualified Data

Sample ID	Analytical Parameter	Result	Result Units	Analytical Method	Data Validation Qualifier	Data Validation Reason Code
BH2-06-S	Chromium	28	mg/Kg	SW6020A	J	D05 L
BH2-09-S	PCB-Aroclor 1254	0.0078	mg/Kg	SW8082A	J	K01 L
BH2-20-S	PCB-Aroclor 1254	0.0085	mg/Kg	SW8082A	J	M08
BH2-21-S	PCB-Aroclor 1254	0.0027	mg/Kg	SW8082A	J	M08
BH2-22-S	PCB-Aroclor 1254	0.0024	mg/Kg	SW8082A	J	M08
BH2-17-S	PCB-Aroclor 1254	0.0062	mg/Kg	SW8082A	J	C05 L
BH2-14-S	Carbazole	46	ug/Kg	SW8270D	J	P01 H
BH2-14-S	PCB-Aroclor 1254	0.0034	mg/Kg	SW8082A	J	C05 L
BH2-07-S	PCB-Aroclor 1254	0.0019	mg/Kg	SW8082A	UJ	C05 L
BH2-03-S	PCB-Aroclor 1254	0.0021	mg/Kg	SW8082A	UJ	C05 L
BH2-03-S	Chromium	27	mg/Kg	SW6020A	J	D05 L
BH2-02-S	1,2,4-Trichlorobenzene	13	ug/Kg	SW8270D	UJ	H02 L
BH2-02-S	1,2-Dichlorobenzene	26	ug/Kg	SW8270D	UJ	H02 L
BH2-02-S	1,4-Dichlorobenzene	18	ug/Kg	SW8270D	UJ	H02 L
BH2-02-S	2-Methylnaphthalene	20	ug/Kg	SW8270D	J	H02 L
BH2-02-S	m,p-Cresol (2:1 ratio)	400	ug/Kg	SW8270D	J	H02 L
BH2-02-S	Anthracene	51	ug/Kg	SW8270D	J	H01 H
BH2-02-S	Benz[a]anthracene	130	ug/Kg	SW8270D	J	H01 H, H04 H
BH2-02-S	Benzo(a)pyrene	100	ug/Kg	SW8270D	J	H01 H, H04 H
BH2-02-S	Benzo(ghi)perylene	73	ug/Kg	SW8270D	J	H01 H, H04 H
BH2-02-S	Benzofluoranthene	150	ug/Kg	SW8270D	J	H01 H, H04 H
BH2-02-S	Benzyl Alcohol	170	ug/Kg	SW8270D	R	H03 L
BH2-02-S	Chrysene	120	ug/Kg	SW8270D	J	H02 L, H04 H
BH2-02-S	Dibenzo(a,h)anthracene	26	ug/Kg	SW8270D	J	H04 H
BH2-02-S	Fluoranthene	310	ug/Kg	SW8270D	J	H01 H, H04 H
BH2-02-S	Hexachlorobutadiene	33	ug/Kg	SW8270D	UJ	H02 L
BH2-02-S	Indeno(1,2,3-cd)pyrene	84	ug/Kg	SW8270D	J	H01 H
BH2-02-S	Naphthalene	180	ug/Kg	SW8270D	J	H02 L
BH2-02-S	Phenanthrene	190	ug/Kg	SW8270D	J	H01 H
BH2-02-S	Pyrene	330	ug/Kg	SW8270D	J	H01 H
BH2-02-S	PCB-Aroclor 1254	0.0041	mg/Kg	SW8082A	J	K01 L, C05 L
BH2-01-S	PCB-Aroclor 1254	0.0012	mg/Kg	SW8082A	UJ	C05 L
BH2-01-S	Chromium	19	mg/Kg	SW6020A	J	D05 L

Sample ID	Analytical Parameter	Result	Result Units	Analytical Method	Data Validation Qualifier	Data Validation Reason Code
BH2-05-S	PCB-Aroclor 1254	0.0032	mg/Kg	SW8082A	J	K01 L, C05 L
BH2-05-S	Chromium	20	mg/Kg	SW6020A	J	D05 L
BH2-04-S	PCB-Aroclor 1254	0.0016	mg/Kg	SW8082A	J	K01 L, C05 L
BH2-04-S	Chromium	20	mg/Kg	SW6020A	J	D05 L
BH2-04-D	PCB-Aroclor 1254	0.0017	mg/Kg	SW8082A	UJ	C05 L
BH2-04-D	Chromium	22	mg/Kg	SW6020A	J	D05 L
BH2-10-S	PCB-Aroclor 1254	0.0010	mg/Kg	SW8082A	UJ	C05 L
BH2-10-S	Chromium	8.9	mg/Kg	SW6020A	J	D05 L
BH2-11-S	2,4-Dimethylphenol	86	ug/Kg	SW8270D	UJ	P02 L
BH2-13-S	2,4-Dimethylphenol	87	ug/Kg	SW8270D	UJ	P02 L
BH2-15-S	2,4-Dimethylphenol	43	ug/Kg	SW8270D	UJ	P02 L
BH2-15-S	PCB-Aroclor 1254	0.0010	mg/Kg	SW8082A	J	M08
BH2-12-S	2,4-Dimethylphenol	79	ug/Kg	SW8270D	UJ	P02 L
BH2-40-S	2,4-Dimethylphenol	20	ug/Kg	SW8270D	UJ	P02 L
BH2-39-S	2,4-Dimethylphenol	40	ug/Kg	SW8270D	UJ	P02 L
BH2-38-S	2,4-Dimethylphenol	22	ug/Kg	SW8270D	UJ	P02 L
BH2-37-S	2,4-Dimethylphenol	91	ug/Kg	SW8270D	UJ	P02 L
BH2-36-S	2,4-Dimethylphenol	20	ug/Kg	SW8270D	UJ	P02 L
BH2-35-S	2,4-Dimethylphenol	20	ug/Kg	SW8270D	UJ	P02 L
BH2-34-S	1,2,4-Trichlorobenzene	7.8	ug/Kg	SW8270D	UJ	H02 L
BH2-34-S	1,2-Dichlorobenzene	16	ug/Kg	SW8270D	UJ	H02 L
BH2-34-S	1,4-Dichlorobenzene	11	ug/Kg	SW8270D	UJ	H02 L
BH2-34-S	2,4-Dimethylphenol	20	ug/Kg	SW8270D	UJ	P02 L
BH2-34-S	Benzofluoranthene	110	ug/Kg	SW8270D	J	H02 L
BH2-34-S	Benzyl Alcohol	100	ug/Kg	SW8270D	R	H03 L
BH2-34-S	Chrysene	110	ug/Kg	SW8270D	J	H02 L
BH2-34-S	Fluoranthene	170	ug/Kg	SW8270D	J	H02 L
BH2-34-S	Hexachlorobutadiene	20	ug/Kg	SW8270D	UJ	H02 L
BH2-34-S	Naphthalene	15	ug/Kg	SW8270D	J	H02 L
BH2-34-S	Pyrene	190	ug/Kg	SW8270D	J	H02 L
BH2-34-S	Mercury	0.075	mg/Kg	SW7471A	J	H01 H
BH2-33-S	2,4-Dimethylphenol	21	ug/Kg	SW8270D	UJ	P02 L
BH2-32-S	2,4-Dimethylphenol	110	ug/Kg	SW8270D	UJ	P02 L
BH2-32-S	Carbazole	1000	ug/Kg	SW8270D	J	P01 H
BH2-31-S	2,4-Dimethylphenol	39	ug/Kg	SW8270D	UJ	P02 L

Sample ID	Analytical Parameter	Result	Result Units	Analytical Method	Data Validation Qualifier	Data Validation Reason Code
BH2-30-S	2,4-Dimethylphenol	21	ug/Kg	SW8270D	UJ	P02 L
BH2-29-S	2,4-Dimethylphenol	22	ug/Kg	SW8270D	UJ	P02 L
BH2-26-S	2,4-Dimethylphenol	61	ug/Kg	SW8270D	UJ	P02 L
BH2-25-S	2,4-Dimethylphenol	60	ug/Kg	SW8270D	UJ	P02 L
BH2-25-D	2,4-Dimethylphenol	64	ug/Kg	SW8270D	UJ	P02 L
BH2-24-S	2,4-Dimethylphenol	25	ug/Kg	SW8270D	UJ	P02 L
BH2-24-S	PCB-Aroclor 1016	0.0011	mg/Kg	SW8082A	UJ	G02 L
BH2-24-S	PCB-Aroclor 1221	0.0014	mg/Kg	SW8082A	UJ	G02 L
BH2-24-S	PCB-Aroclor 1232	0.0014	mg/Kg	SW8082A	UJ	G02 L
BH2-24-S	PCB-Aroclor 1242	0.00075	mg/Kg	SW8082A	UJ	G02 L
BH2-24-S	PCB-Aroclor 1248	0.00055	mg/Kg	SW8082A	UJ	G02 L
BH2-24-S	PCB-Aroclor 1254	0.0012	mg/Kg	SW8082A	UJ	G02 L
BH2-24-S	PCB-Aroclor 1260	0.0012	mg/Kg	SW8082A	UJ	G02 L
BH2-16-S	2,4-Dimethylphenol	96	ug/Kg	SW8270D	UJ	P02 L
BH2-15-ER	Benzyl Alcohol	2.6	ug/L	SW8270D	UJ	P01 H, F01
BH2-15-ER	Benzoic Acid	1.5	ug/L	SW8270D	J	C05 L, P08
BH2-15-ER	Di(2-ethylhexyl) phthalate	12	ug/L	SW8270D	J	P01 H
BH2-16-ER	Benzoic Acid	0.81	ug/L	SW8270D	UJ	C05 L
BH2-16-ER	Di(2-ethylhexyl) phthalate	10	ug/L	SW8270D	J	P01 H
BH2-16-RB	Benzyl Alcohol	0.87	ug/L	SW8270D	UJ	P01 H, F01
BH2-16-RB	Benzoic Acid	0.81	ug/L	SW8270D	UJ	C05 L
BH2-06-S	Sulfide	39	mg/Kg	SW9034	J	H02 L
BH2-2-S	Sulfide	9.5	mg/Kg	SW9034	UJ	H02 L
BH2-06-S	1,2,3,7,8,9-HxCDF	0.58	pg/g	EPA1613B	U	F01
BH2-09-S	1,2,3,7,8,9-HxCDF	0.41	pg/g	EPA1613B	U	F01
BH2-09-S	OCDF	12	pg/g	EPA1613B	U	F01
BH2-08-S	1,2,3,7,8,9-HxCDF	0.26	pg/g	EPA1613B	U	F01
BH2-08-S	1,2,3,4,7,8,9-HpCDF	0.37	pg/g	EPA1613B	U	F01
BH2-21-S	1,2,3,7,8,9-HxCDF	0.40	pg/g	EPA1613B	U	F01
BH2-18-S	1,2,3,7,8,9-HxCDF	0.44	pg/g	EPA1613B	U	F01
BH2-18-S	OCDF	12	pg/g	EPA1613B	U	F01
BH2-18-D	1,2,3,7,8,9-HxCDF	0.38	pg/g	EPA1613B	U	F01
BH2-18-D	OCDF	11	pg/g	EPA1613B	U	F01
BH2-03-S	1,2,3,7,8,9-HxCDF	0.63	pg/g	EPA1613B	U	F01
BH2-39-S	1,2,3,4,7,8-HxCDD	0.55	pg/g	EPA1613B	U	F01

Sample ID	Analytical Parameter	Result	Result Units	Analytical Method	Data Validation Qualifier	Data Validation Reason Code
BH2-39-S	1,2,3,7,8,9-HxCDF	0.33	pg/g	EPA1613B	U	F01
BH2-39-S	1,2,3,4,7,8,9-HpCDF	0.19	pg/g	EPA1613B	U	F01
BH2-39-S	OCDF	6.0	pg/g	EPA1613B	U	F01
BH2-37-S	1,2,3,7,8,9-HxCDF	0.57	pg/g	EPA1613B	U	F01
BH2-31-S	1,2,3,4,7,8-HxCDD	0.55	pg/g	EPA1613B	U	F01
BH2-31-S	1,2,3,7,8,9-HxCDF	0.22	pg/g	EPA1613B	U	F01
BH2-31-S	1,2,3,4,7,8,9-HpCDF	0.24	pg/g	EPA1613B	U	F01
BH2-31-S	OCDF	5.9	pg/g	EPA1613B	U	F01

Bias Code Definitions

Bias Codes	Definition
H	Bias in the sample result is believed to be high.
L	Bias in the sample result is believed to be low.

Reason Code Definitions

Reason Codes	Definition
C05	Continuing calibration % difference was not acceptable (Organics).
D05	CCV recovery was below the lower control limit (Inorganics).
F01	Sample data were qualified as a result of the method blank.
G02	Surrogate chemical recovery was below the lower control limit.
H01	MS/MSD recovery was above the upper control limit.
H02	MS/MSD recovery was below the lower control limit.
H03	MS/MSD recovery was <10%.
H04	MS/MSD pairs exceed the RPD limit.
K01	Internal Standard Area counts were outside the control limits.
M08	The RPD between the two pesticide/PCB column checks was >40%.
P01	LCS recovery was above the upper control limit.
P02	LCS recovery was below the lower control limit.
P08	Professional judgment was used to qualify the data due to high LCS/LCSD RPD value.