MCLANE
MIDDLETON

ADAM M. DUMVILLE
Direct Dial: 603.230.4414
Email: adam.dumville@mclane.com
Admitted in NH and MA
11 South Main Street, Suite 500
Concord, NH 03301
T 603.226.0400
F 603.230.4448

Via Electronic Mail and Hand Delivery

December 1, 2016

New Hampshire Site Evaluation Committee
Pamela G. Monroe, Administrator
21 South Fruit Street, Suite 10
Concord, NH 03301

Re: SEC Docket No. 2015-04: Public Service Company of New Hampshire d/b/a Eversource Energy for a New 115 kV Transmission Line from Madbury Substation to Portsmouth Substation – *Characterization of Sediment Quality Along Little Bay Crossing, Durham to Newington, NH.*

Dear Ms. Monroe:

Enclosed for filing in the above-captioned docket, please find a report completed by Normandeau Associates on behalf of the Applicant in support of their Application for a Certificate of Site and Facility, titled *Characterization of Sediment Quality Along Little Bay Crossing, Durham to Newington, NH.*

Please contact me directly should you have any questions.

Sincerely,

Adam M. Dumville

AMD:
Enclosure

cc: Distribution List (via e-mail)
Dori Wiggin, NH Department of Environmental Services (via e-mail)
Owen David, NH Department of Environmental Services (via e-mail)

NORMANDEAU ASSOCIATES
Environmental Consultants

Public Service of New Hampshire
Seacoast Reliability Project

Characterization of Sediment Quality Along Little Bay Crossing

Durham to Newington, NH

Presented To:
Public Service Company of New Hampshire
780 North Commercial Street
Manchester, NH 03101

Submitted:
December 1, 2016

Submitted By:
Normandeau Associates, Inc.
25 Nashua Road
Bedford, NH 03110

www.normandeau.com

Table of Contents

Page

List of Tables

Page

List of Figures

Page

Executive Summary

Public Service Company of New Hampshire d/b/a Eversource Energy (PSNH) is proposing to construct a new 115 kilovolt (kV) transmission line between the existing Madbury and Portsmouth substations. The Seacoast Reliability Project (SRP) would be located in the Towns of Madbury, Durham and Newington as well as the City of Portsmouth, in Strafford and Rockingham Counties, New Hampshire. The 12.9-mile long project would begin at the existing PSNH Madbury Substation in Madbury, traversing Durham, crossing approximately 0.9 miles of Little Bay via an underwater cable into Newington, and then continuing east before ending in Portsmouth. The entire project lies within existing electric corridor on land, and a mapped cable corridor across Little Bay. The proposed cable installation methods in Little Bay include jet plowing and hand jetting, and will necessarily disturb sediments and suspe101nd them into the water column.

Previous testing of surface sediments by USEPA indicated that sediment quality in Little Bay is good. However, in response to concerns regarding the potential increased exposure risk resulting from the dispersal of possible sediment-borne contaminants in the Great Bay system, Eversource conducted sediment testing along the cable route. Sediments along the proposed cable crossing were sampled to the planned burial depth where possible using a vibratory sampler. At several locations, the presence of stiff, naturally occuring clay ("native" or "parent" material) several feet below the substrate surface prevented penetration of the sampler to the full planned depth. In shallow portions of the route where cable burial is planned to be 3.5 feet, four-foot deep cores were collected, homogenized, and analyzed for chemical constituents. Where the cable will cross the channel, burial will be to 8 feet. When cores penetrated greater than 4 feet, the upper 4 feet of sediments was separated from the lower section and the two portions were analyzed separately.

All samples were analyzed for typical dredge material analytes (grain size, total organic carbon (TOC), a suite of metals, specific PAHs, and specific PCBs) as well as total petroleum hydrocarbons (TPH), dioxins/furans, and perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). Results were compared to existing data on sediment contaminants in Little Bay and to available screening criteria that were developed based on biological responses to exposure. Grain size, TOC, metal, PAH, and PCB concentrations had all been studied in Little Bay during the US EPA National Coastal Condition Assessment (NCCA) program. Results of the site-specific survey were consistent with the NCCA data and were all below levels of environmental concern with the exception of arsenic. Arsenic was slightly higher than the lowest screening level value, but within the range of concentrations observed in Little Bay in the NCCA program. The NCCA program also included bioassay testing and determined that exposure to sediments from Little Bay resulted in no significant difference in mortality compared to reference sediments.

TPH, PFOA, and PFOS results all fell below detection limits in every sample. Dioxins/furans occurred in most samples but at very low levels, never exceeding the screening guidelines. As discussed in Appendix A, the results of the sediment testing were examined in the context of ecological risk. This analysis concluded that there is no potential for ecological effects from constituents of potential concern in the sediments that will be disturbed during cable installation, including metals, PAHs, PCBs, PFCs, dioxins and furans.

Grain size data were consistent with the values used during the sediment plume modeling that predicted the potential to exposure Great Bay Estuary resources to suspended sediments during cable installation using jet plow and hand jetting. Coupled with the high quality of the sediments in terms of contaminants, this consistency indicates that impacts to bay resources as a result of cable installation will be minimal.

1.0 Introduction

Public Service Company of New Hampshire d/b/a Eversource Energy (PSNH) is proposing to construct a new 115 kilovolt (kV) transmission line between their existing Madbury and Portsmouth substations to enhance the electric reliability in the seacoast region. The Seacoast Reliability Project (SRP) would be located in the Towns of Madbury, Durham and Newington as well as the City of Portsmouth, in Strafford and Rockingham Counties, New Hampshire. The SRP is proposed to be approximately 12.9 miles long including a 0.9-mile crossing under Little Bay (Figure 1). The cable crossing will directly affect a corridor approximately 90 feet wide within a charted Cable Area approximately 1,000 feet wide.

The SRP will cross under Little Bay by being buried 3.5-8 feet in the substrate using jet plow and hand jet technology. For this crossing, the transmission line will be necessarily split into three cables to maintain the required transmissivity for the reliability project.

Sediments along the route for the SRP submarine cables across Little Bay will be fluidized during installation via jet plow technology. Some of this material will be suspended and transported away from the cable route as modeled by RPS ASA (2015). The model predicts that sediments will remain in the water column for a limited duration (up to several hours) before being redeposited and that the exposure of sensitive receptors (e.g., shellfish beds; aquaculture facilities; eelgrass) will be limited at most, although Eversource acknowledges that conditions during installation may differ somewhat from the assumptions used in the modeling. In order to gain a more complete understanding of the potential exposure risk to natural resources, Normandeau tested the sediments along the route for contaminants.

Normandeau has been the lead environmental consultant for Eversource for the SRP since 2013. Normandeau has been responsible for characterizing environmental conditions and evaluating impacts from construction and operation of the SRP. Normandeau's staff have extensive experience sampling marine sediments and interpreting results of contaminant testing. GEI contributed to the development of testing requirements and interpretation of the results through their expertise in ecological risk assessment and sediment remedial investigations.

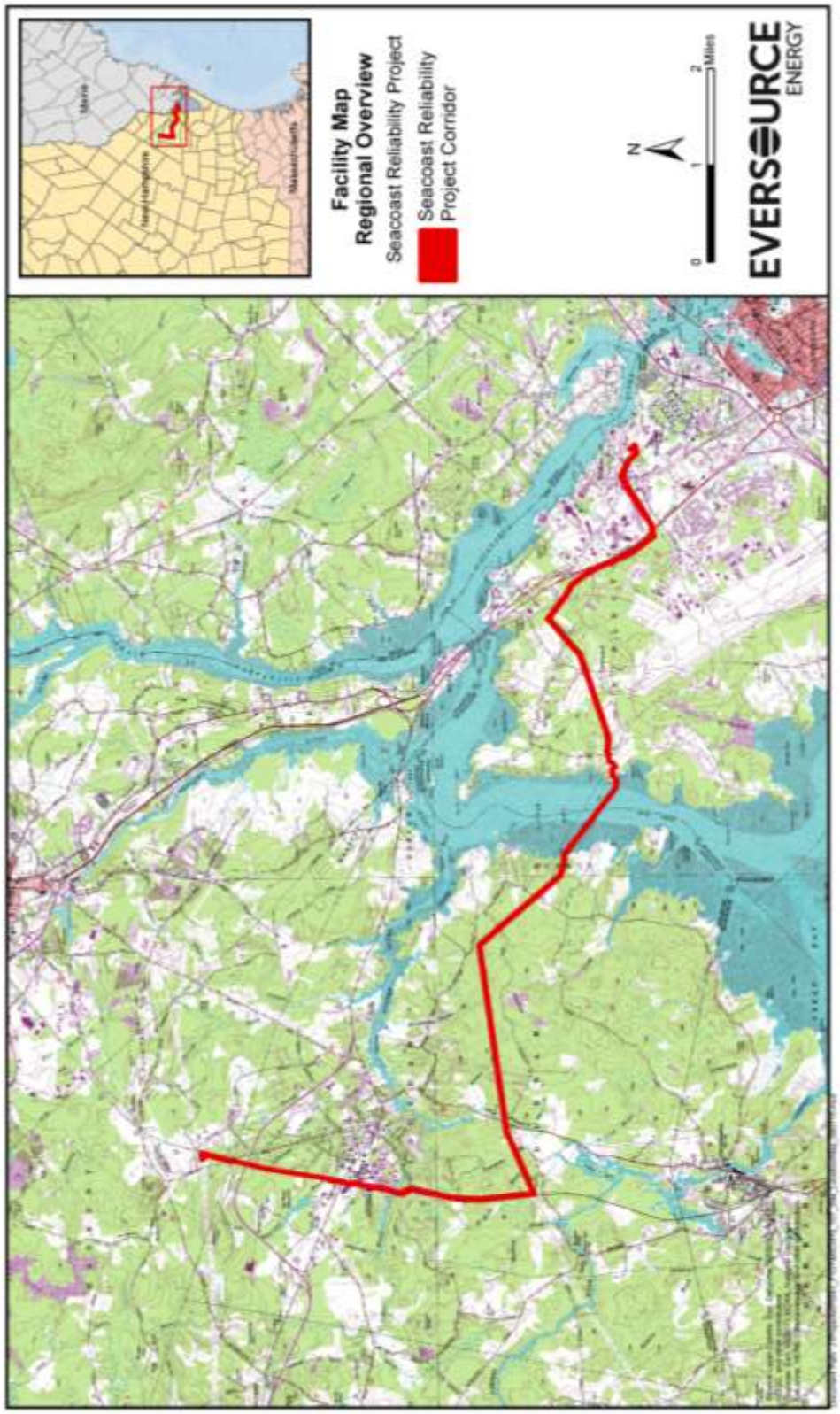


Figure 1. Seacoast Reliability Project Location Map.

2.0 Methods

This section describes the methods used to investigate estuarine sediments along the Little Bay crossing. The sampling and testing plan were provided to USACE and NH DES for concurrence prior to collection of sediments.

2.1 Sediment Collection

Twelve sampling locations were allocated along the cable corridor (Figure 2) in proportion to the two cable burial depths (3.5 ft. and 8 ft.) with the goal of collecting sediment cores to the full burial depth at each location. Collections were made using a Rossfelder Model P-3, low frequency vibro-percussive vibracore. Coring tubes were 3-inch diameter semi-rigid Cellulose Acetate Butyrate (CAB) tubes with disposable stainless steel core catchers riveted to the tube. The use of CAB tubes allows samples to be collected without an outer housing or core barrel that needs to be decontaminated between sample locations. At each sampling location, up to three attempts were made to achieve collection of a full length core.

Sampling locations were documented using a Trimble GeoXT GPS with an accuracy of <1-meter.

In areas where the cable will be buried to 3.5 ft, the uppermost 4 ft portion of each core was characterized. In areas where cable burial will be 8 ft., the core was divided into upper (top 4 ft) and lower segments. Each core was examined for evidence of stratification within each segment to determine whether further separation for chemical testing was necessary. No stratification was evident so no additional subsampling was done. Each segment identified for chemical analysis was placed into a disposable aluminum container, homogenized with disposable aluminum utensils and then subsamples were placed into containers provided by the analytical laboratories. Separate equipment was used for homogenizing each sample to eliminate the risk of cross-contamination.

2.2 Sample Handling and Analysis

Samples were stored in containers provided by the laboratories on wet ice until delivery to the analytical laboratory. Each sediment sample was tested for the parameters shown on Table 1 which were taken from the recommended testing limits outlined in the Regional Implementation Manual (RIM; U.S. EPA and U.S. Army corps of Engineers 2004), a document that delineates how estuarine and marine sediments being proposed for dredging and aquatic disposal should be tested for contaminants. In addition to the parameters required by the RIM, samples were tested for total petroleum hydrocarbon (TPH) in response to a request by NHDES; dioxins/furans in response to concern that these compounds had been detected in the past in the estuary and tributaries; and, perfluoro compounds (PFCs) in response to concern that contaminants occurring in groundwater at the adjacent Pease Superfund site could have been transported to the estuary. Results were compared to available regulatory criteria or guidelines as described in Section 3.2.

GEI reviewed the results in the context of ecological risk. Their analytical approach is described in Appendix A1.

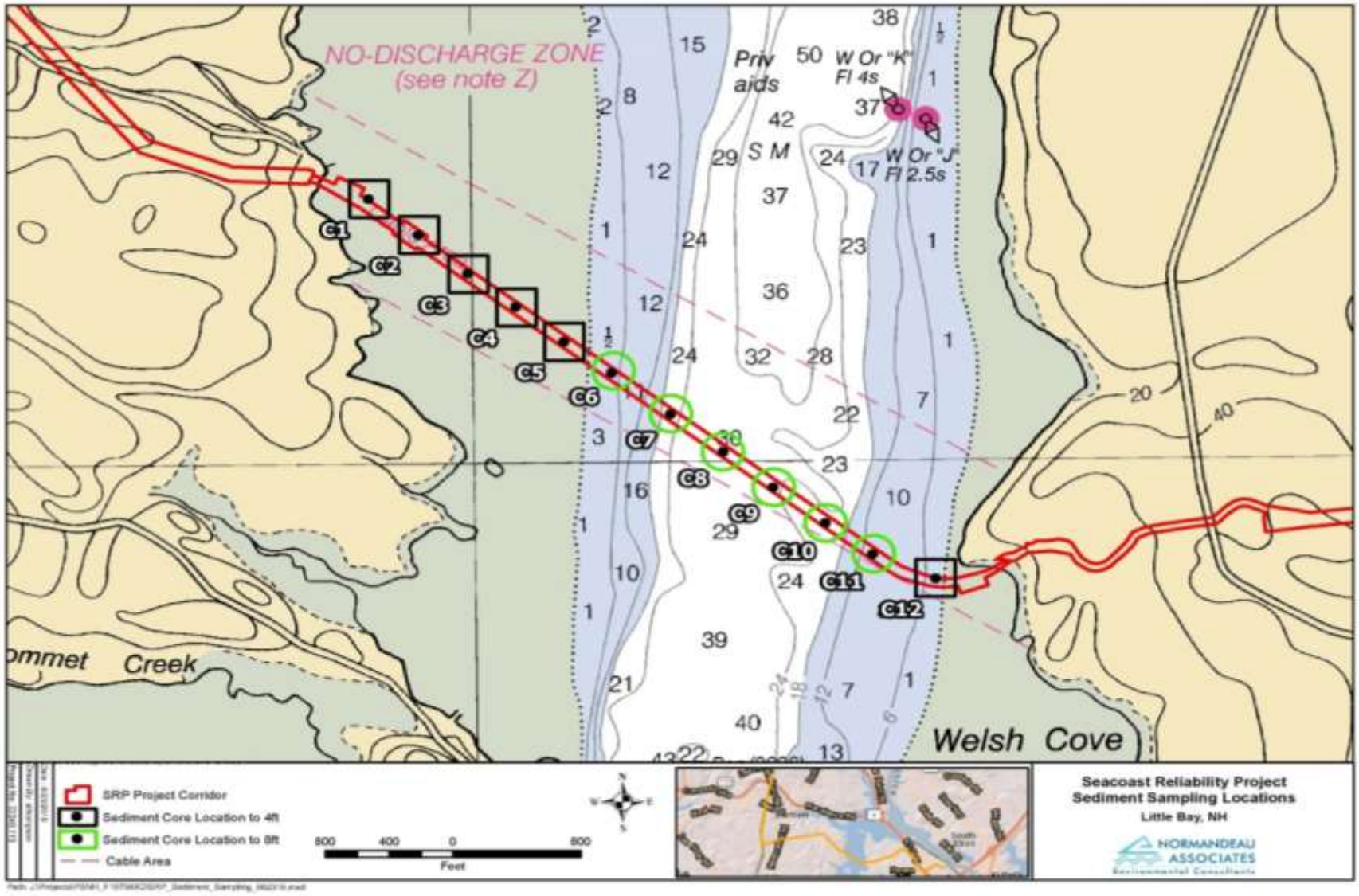


Figure 2. Sediment Sampling Locations

Table 1. Proposed sampling parameters,testing limits and analytical methods for sediments along SRP cable route in Little Bay.

Analytical Laboratory	Parameter	RIM Testing Limit (dry weight)	Analytical Method
Alpha Analytical	Arsenic	0.4 ppm	6020A
	Cadmium	0.07 ppm	6020A
	Chromium	0.5 ppm	6020A
	Copper	0.5 ppm	6020A
	Lead	0.5 ppm	6020A
	Mercury	0.02 ppm	EPA 7474
	Nickel	0.5 ppm	6020A
	Zinc	1.0 ppm	6020A
	Polycyclic Aromatic Hydrocarbons (PAHs)	10 ppb	8270D-SIM
	Polychlorinated Biphenyls (PCBs)	1 ppb	8270D-SIM
	Total Organic Carbon	0.1%	9060A
	Percent Water	1.0%	2540G
	Grain Size Distribution – wet sieve	Sieve Nos. 4, 10, 40, 60, 200	ASTM D422
	Total Petroleum Hydrocarbons	10,000 ppm[a]	8015C
Cape Fear Analytical	Dioxins/Furans	1 ppt (tetra), 5 ppt (octa)[b]	EPA 1613B
Vista Analytical	Perflouro Compounds (PFCs)	6 ppb[b]	Modified EPA 537

[a]NH DES criterion for remediation of contaminated soils

[b]no regulatory criteria available; recommendation by GEI based on ecorisk evaluation (Appendix A)

3.0 Results

3.1 Field Characterization of Sediment Cores

Sediment boring logs are provided in Appendix B and are summarized in Table 2.

Table 2. Qualitative description of sediments along cable route from vibracore collections, September 2016.

Zone	Station	Penetration Depth	Core Recovery Actual/Planned	Sediment Description
Tidal Flat (west)	C-1	51″	50″/48″	Fine grained saturated clay with trace sand, uniform throughout
	C-2	60″	59″/48″	
	C-3	60″	58″/48″	
	C-4	58″	55″/48″	
	C-5	55″	54″/48″	
Western Slope	C-6	66″	63″/96″	Upper 48″: fine grained saturated clay with trace sand, uniform throughout
				Below 48″: fine grained saturated clay with trace sand, uniform throughout
Channel	C-7	60″	55″/96″	Upper 12″: saturated clay with sand, uniform throughout
				Below 12″: fine grained saturated clay, uniform throughout
	C-8	38″	36″/96″	Upper 19″: uniform fine sand
				Below 19″: uniform saturated clay
	C-9	15″	14″/96″	Upper 9″: medium sand
				Below 9″: uniform saturated clay with sand
	C-10	24″	23″/96″	Fine sand, uniform
Eastern Slope	C-11	94″	89″/96″	Upper 14″: silt with sand
				Below 14″: uniform saturated clay
Welsh Cove	C-12	37″	36″/48″	Uniform saturated clay with sand

The planned sampling depth of four feet was achieved at Stations C-1, C-2, C-3, C-4, and C-5. At Station C-12, the corer penetrated to just over 3 feet because of the density of the clay substrate. It was not possible to collect the full planned length of eight foot cores at Stations C-6 through C-10, likely because of the density of the underlying clay substrate at these stations. Retrieval at C-11 was close to the planned length of eight feet.

Cores from Stations C-6, C-7, and C-11 were split into upper (top four feet) and lower (below four feet) segments for physical and chemical analyses.

3.2 Analytical Results

Complete analytical laboratory results are provided in Appendix A. Review of the laboratory report showed that each of the analytical laboratories involved used the requested methods and met the appropriate detection limits. Quality control testing (matrix spike [MS] and matrix spike duplicates [MSD], equipment blanks) results were within acceptable ranges for most analytes. Although the MS/MSD for some compounds are outside of control limits, the laboratory control sample and duplicate can be relied upon to demonstrate accuracy in the results. Additional discussion of analytical quality control testing is included in Appendix A1.

Analysis of grain size, TOC, metals, PAHs, and PCBs is typically required for dredging projects. Additional analytes were included in this assessment to address potential local concerns:

- Total petroleum hydrocarbon - Requested by DES
- Dioxins/furans – Surface Water Quality Status data (EPA 2008) indicated that dioxins were present in portions of the upper Great Bay Estuary and tributaries
- PFCs – present in groundwater at Pease

3.2.1 Physical Characteristics

Grain size and TOC results are provided in Table 3. As previous information has indicated, sediments along the western tidal flat (Stations C-1 thorugh C-5) and the western slope of the channel (Station C-6) were primarily fine grained (70-90% silt + clay particles). Within the channel (Stations C-7 through C-10) and the eastern channel slope (Station C-11), sediments contained higher proportions of sand (34-92%). Sediments at Station C12 were about 49% fines. These grain size conditions were consistent with the values reported in Normadeau (2016) and used for the sediment plume modeling in RPS ASA (2016).

TOC provides an indication of the organic content of the sediments that is a combination of both naturally occurring compounds (e.g., from decomposition of organisms) and organic pollutants. TOC was highest (>1%) in the sediments on the western tidal flat and western slope, consistent with the higher proportion of fine-grained sediments. With one exception (C-8), TOC was <1%. These relatively low values suggest low likelihood of highly elevated organic contamination.

3.3 Metals

Inorganic metals in marine sediments can occur naturally at low levels or at elevated levels as a result of anthropogenic sources (U.S. EPA 2007a). Concentrations of metals along the cable route are shown in Table 4 in comparison to the Effects Range-Low (ER-L) and Effects-Range Median (ER-M) screening levels used by NOAA (2008). ER-L and ER-M values were derived for a wide range of inorganic and organic chemicals by examining biological responses to different chemical concentrations. ER-Ls are defined as the 10^{th} percentile value on an ordered list of concentrations in sediment found in the literature that co-occur with any biological effect. Concentrations lower than the ER-L value represent a minimal-effects range in which biological effects would rarely be observed. ER-M values are defined as the 50^{th} percentile concentration; biological effects are possible at environmental concentrations falling between the ER-L and ER-M values (NOAA 2008).

Arsenic concentrations ranged from 6.06 to 11.7 mg/kg, similar to the values previously observed in surface sediments in Little Bay during US EPA's National Coastal Condition Assessment program (Figure 3) where concentrations averaged 6.66 mg/kg and ranged from 2 to 10.8 mg/kg. In 2016, when deep sediments are included, the average concentration along the cable route was 8.35 mg/kg, slightly higher than ER-L level (8.2 mg/kg) but well below the ER-M value (70 mg/kg). When only the upper layer is considered, the average arsenic concentration was 7.99 mg/kg, below the ER-L. Spatially, arsenic levels exceeded the ER-L at Stations C-1 through C-4, C-6 (both upper and lower layers), and the lower layer at C-11. Arsenic is a naturally occurring metal in New England sediments and the range

observed along the cable route is not uncommon. As Ayotte et al. (2012) discussed, weathering of bedrock in southeastern New Hampshire has contributed arsenic to groundwater so it is reasonable to assume that the same process could be a natural source of arsenic to the estuary sediments. Given that the arsenic concentrations found along the cable route are mostly below or only slightly above the ER-L, it is likely that these concentrations reflect local natural background levels.

No other metal tested occurred at levels higher than the ER-L and the range of concentrations in the 2016 fell within the range observed by US EPA.

Figure 3. National Coastal Condition Assessment Sampling Locations, 2000-2010. Source: http://www.epa.gov/emap/nca/html/data/index.html

3.4 Organic Compounds

3.4.1 Polycyclic Aromatic Hydrocarbons (PAHs)

PAHs are frequently found in marine sediments. Typical routes of entry are petroleum spills or air emissions of combustion by-products (Appendix A1). PAHs were below the detection limit in both layers at Station C-6, the lower layer at Stations C-7 and C-11, and the upper layer at Stationc C-9 and C-10 (Table 5). Low concentrations of one or more PAHs were present in the remaining samples, (Table 5). Medium (MMW) and high molecular weight (HMW) PAHs were observed more frequently than low molecular weight (LMW) PAHs. Total PAH concentrations ranged from 50-211 ng/g compared to 229-1479 ng/g in the NCCA Little Bay samples. Similarly, total LMW PAHs ranged from 18-53 ng/g compared to 23-270 ng/g in the NCCA samples; total HNW PAHs ranged from 23-144 ng/g compared to NCCA's 191-1038 ng/g.

Along the proposed cable route, total PAH, total LMW PAH, and total HMW PAH concentrations were each more than an order of magnitude lower than the respective ER-Ls, indicating that PAHs are unlikely to have detrimental effects on the biology of the Little Bay sediments.

3.4.2 Polychlorinated Byphenyls (PCBs)

PCBs have not been used in the US since the late 1970s but they are extremely stable compounds and persist in the environment (Appendix A2). PCBs were not detected in most samples with the exception of the deeper layer at Station C-7 (Table 6). The USACE Regional Implementation Manual protocol requires that total PCBs be estimated by doubling the sum of 18 specific PCB congeners, using one half the method detection limit (MDL) for congeners whose values were below the MDL. Using this approach, the total PCBs in samples from along the cable route ranged from 10.6 to 15.1 ug/kg. Of note is that the one sample that contained detectable levels of any PCB congeners fell in the middle of that range. This range of concentrations is higher than that observed in the NCCA data (0 to 7.5 ug/kg), but that may be an artifact of the summation using half the detection limit. Concentrations in both data sets are below the ER-L for total PCBs.

3.4.3 Total Petroleum Hydrocarbons (TPH)

As described in Appendix A1, TPHs include a wide variety of hydrocarbon compounds. The RIM does not require testing for TPH, but NH DES requested this analysis. NH DES encountered an unexpected pocket of petroleum-contaminated sediments in one of the tributaries to Great Bay on a previous project, and felt that it could serve as an indicator of a similar condition along the cable route. Detection limits for TPH ranged from 39 to 54 mg/kg (ppm). TPH was not detected in any sample (Table 7). NH DES has established a clean-up criterion for contaminated soils of 10,000 mg/kg (ppm; or 10×10^6 µg/kg). Concentrations of TPH in Little Bay sediments along the cable route were more than two orders of magnitude below that standard. While NH DES's clean-up criterion is not based on ecological risk, GEI pointed out (Appendix A1) that PAHs are typically the TPH components with the highest toxicity. As PAHs were well below levels of concern, it is unlikely that any other component of TPH would be of ecological concern either.

3.4.4 Dioxins/Furans

Dioxins and furans are widespread in the environment because a major source of these compounds is combustion and they are often distributed through atmospheric transport. Along the cable route, one to four dioxin/furan compounds were detected in most samples (Table 8). The most commonly occurring compound was 1,2,3,4,6,7,8,9-OCDD, a breakdown product of other dioxin compounds; it was present in 11 of the 15 samples. NOAA's SQuiRTs tables do not provide screening values for total dioxins/furans in marine sediments. The Canadian Council for the Ministers of the Environment (2004) have, however, established a Toxicity Equivalency (TEQ) value of 0.85 ng/kg that was developed using a similar approach to ER-L. The TEQ for a sample is a weighted toxicity value calculated by multiplying the concentration of individual dioxin/furan compounds by their relative (compared to the most toxic compound 2,3,7,8-TCDD) toxicity (the toxicity equivalency factor or TEF) and summing over all compounds. The compound that had the highest concentration in samples along the cable route, 1,2,3,4,6,7,8,9-OCDD has the lowest TEF of the dioxin compounds (DioxinFacts.org, 2016). When calculated based on only the detected compounds (ND=0), total concentrations of dioxin/furans were below the TEQ in all samples.

3.4.5 Perfluorooctanoic acid (PFOA) and Perfluorooctane sulfonate (PFOS)

PFOA and PFOS have been reported in groundwater at Pease Air Force Base. Given that there is a potential hydrologic link to the project area via groundwater and tributaries, there is a concern that these compounds could have accumulated in sediments or porewater along the cable route. Neither compound occurred above detection limits (1.83 to 2.00 ng/kg) in any sample collected in September 2016 (Table 9). There are no US screening criteria available for these compounds. There are no other data available from the Great Bay estuary for comparison. GEI evaluated existing data and aqueous criteria for PFOA/PFOS in Appendix A2 and concluded that the European proposed Probable No Effect Concentration (PNEC) of 6.7 μg/kg in marine sediments is very protective. It is unlikely that sediment-borne PFOA or PFOS poses a risk to organisms in the vicinity of the cable crossing in Little Bay.

4.0 Conclusions

Sediments were collected in September 2016 along the planned cable route in Little Bay to be tested for chemical constituents that are indicative of anthropogenic pollution. These constituents included contaminants typically associated with industrialized marine harbors (metals, PAHs, PCBs) as well as total petroleum hydrocarbons, dioxins/furans, and perfluoro compounds that are not typically tested for in projects disturbing sediments, but could occur in the Project area due to surrounding conditions. Testing was conducted following established analytical protocols. Several important observations emerged.

- Sediment grain size to cable burial depth observed in 2016 is consistent with the information used to conduct the sediment plume modeling predicting the behavior of sediments suspended during the cable installation

- Metals were present in all samples, but concentrations were below NOAA screening criteria (ER-L) for sediment concentrations indicative of biological effects, with the exception of arsenic
- Arsenic levels in several samples slightly exceeded the NOAA ER-L screening criterion but were well below the ER-M criterion, so by definition, has the possibility of having a biological effect. However, arsenic levels fell within the range of concentrations found in Little Bay by USEPA between 2000 and 2010, for which bioassay testing indicated no adverse biological effects.
- Concentrations of PAH compounds were low or below detection limits and total PAH concentrations were lower than observed by USEPA within Little Bay. Total PAH, total LMW PAH, and total HMW PAH concentrations were below NOAA screening criteria (ER-L).
- Concentrations of PCB congeners were low or below detection limits. No previous data are available for PCBs in Little Bay, but total PCB concentrations were uniformly below NOAA screening criteria (ER-L).
- Dioxins/furans were present in low concentrations in many samples. The TEQ provides a weighted summation of dioxins/furans representing a potential toxicity level. Although neither NH nor US have developed guidelines for dioxins/furans, the Canadian Council for the Ministers of the Environment (2004) has. Concentrations of dioxins/furans along the cable route were all below the Canadian TEQ ND=0 guidelines.
- Perfluoro compounds were below detection limits in all samples and are below the proposed European PNEC.

GEI evaluated the sediment chemistry results in terms of potential ecological risk. This analysis is incorporated as Appendix A. GEI determined that all of the analytes except arsenic uniformly occurred at levels below concentrations identified as likely to cause toxic effects in marine sediments. Arsenic was only slightly above the lowest screening criterion (ER-L) and was consistent with levels reported elsewhere in Little Bay. GEI concluded, therefore, that dispersion of sediments into other areas of Little Bay would pose no ecological risk.

In 2007, USEPA (2007b) characterized sediment quality in Little Bay as "good" (the highest rating possible) based on a combination of sediment chemistry and bioassay testing that revealed no significant mortality among test organisms exposed to bay sediments. Given that contaminant levels are within the ranges observed by USEPA, it can be concluded that the quality of sediments along the cable route also meet the EPA characterization as good.

Table 3. Physical characteristics of sediments along the SRP cable route in Little Bay

Station	C1	C2	C3	C4	C5	C6	C6	C7	C7	C8	C9	C10	C11	C11	C12	NCAA Range
Depth (inches)	0-48	0-48	0-48	0-48	0-48	0-48	48-61	0-48	48-54	0-48	0-48	0-48	0-48	48-89	0-48	
Grain Size																
% Total Gravel	0.2	0.2	0.1	0	0.6	0.2	0	0.1	0	0.6	2.3	0.1	1.1	0	2.2	
% Coarse Sand	1.5	1.4	0.7	3.2	2	1.3	0.6	0.7	0.1	0.4	3.4	0.4	1.7	1.3	2.1	
% Medium Sand	3.4	4.7	2.3	7.1	4	4	2.9	4.3	7.3	8.8	31.6	1.7	5.9	4.3	7.1	
% Fine Sand	6	8	8.2	16.3	24.3	13.1	5.9	44.9	36.7	66	34	91.6	35.8	12.6	39.2	
% Total Fines	88.9	85.7	88.7	73.4	69.1	81.4	90.6	50	55.9	24.2	28.7	6.2	55.5	81.8	49.4	
Total Organic Carbon (mean %)	1.635	1.54	1.38	1.165	1.11	1.165	1.28	0.718	0.661	1.057	0.10	0.194	0.795	0.936	0.531	***0.55-2.35***
Moisture %	41.3	38.9	36.9	35.1	31.7	32.4	35.3	28	29.1	29.7	18.3	21.1	31.4	33.2	24.6	

Table 4. Concentration (mg/kg [ppm]) of metals in sediments along the SRP cable route in Little Bay

Station	C1	C2	C3	C4	C5	C6	C6	C7	C7	C8	C9	C10	C11	C11	C12	ER-L	ER-M	NCCA Range
Depth (inches)	0-48	0-48	0-48	0-48	0-48	0-48	48-61	0-48	48-54	0-48	0-48	0-48	0-48	48-89	0-48			
Arsenic, Total	**10.7**	**10.4**	**9.94**	**8.54**	7.05	**9.14**	**11.7**	7.17	6.88	6.56	6.4	6.56	7.39	**10.8**	6.06	***8.2***	***70***	***2-10.8***
Cadmium, Total	0.187	0.188	0.185	0.154	0.157	0.13	0.112	0.064	0.057	0.114	0.022	0.035	0.082	0.083	0.089	***1.2***	***960***	***0.12-0.325***
Chromium, Total	36.9	29.9	32.5	22.2	20.6	22.4	25.4	16.7	18	13.7	17.4	10.9	22.8	22.7	16.8	***81***	***370***	***21-95***
Copper, Total	10.5	9.54	9.79	7.49	6.61	9.15	10.2	6.02	7.35	6.04	7.64	2.46	8.19	9.21	5.51	***31***	***270***	***4-16.8***
Lead, Total	11.7	7.49	8.36	5.13	4.8	6.03	5.46	4.07	3.91	4.4	5.39	2.88	9.39	4.8	4.6	***46.7***	***218***	***22.2-43.4***
Mercury, Total	0.033	0.025	0.041	<0.017	0.016	<0.018	<0.021	<0.017	<0.015	<0.014	<0.013	<0.015	<0.018	<0.017	0.019	***0.15***	***0.71***	***0.04-0.149***
Nickel, Total	17.9	17.2	15.8	14.1	12.7	15.6	18.2	11.5	13.2	9.43	13.2	6.17	14.1	16.5	10.7	***20.9***	***51.6***	***6-18.9***
Zinc, Total	58.2	54.6	52	43.3	52.8	47.2	54.2	34.5	38.6	36.2	44.7	30.9	45.6	49.3	26.8	***150***	***410***	***28-82.5***

ER-L = Effects Range Low = 10th percentile on an ordered list of concentrations in sediment found in the literature that co-occur with any biological effect; concentrations lower than the ER-L value represent a minimal-effects range in which effects would be rarely observed

ER-M = effects Range Median = 50th percentile; concentrations equal to and above the ER-L, but below the ER-M represent a possible-effects range

Table 5. Concentration (µg/kg [ppb]) of Polycyclic Aromatic Hydrocarbons (PAHs) along the SRP cable route in Little Bay

Station	C1	C2	C3	C4	C5	C6	C6	C7	C7	C8	C9	C10	C11	C11	C12	ER-L	ER-M	NCCA Range
Depth (inches)	0-48	0-48	0-48	0-48	0-48	0-48	48-61	0-48	48-54	0-48	0-48	0-48	0-48	48-89	0-48			
Naphthalene	<8.37	<7.88	<7.63	<7.13	<7.22	<7.37	<7.6	<6.51	<7.04	<6.76	<5.87	<6.25	<7.21	<6.85	<6.48	***160***	***2,100***	
Acenaphthylene	<8.37	<7.88	<7.63	<7.13	<7.22	<7.37	<7.6	<6.51	<7.04	11	<5.87	<6.25	<7.21	<6.85	<6.48	***44***	***640***	
Acenaphthene	<8.37	<7.88	18.4	<7.13	<7.22	<7.37	27.5	<6.51	<7.04	11	<5.87	<6.25	<7.21	<6.85	<6.48	***16***	***500***	
Fluorene	<8.37	<7.88	<7.63	<7.13	<7.22	<7.37	<7.6	<6.51	<7.04	13	<5.87	<6.25	<7.21	<6.85	6.75	***19***	***540***	
Phenanthrene	8.4	<7.88	13.5	<7.13	<7.22	<7.37	<7.6	6.97	<7.04	9.37	<5.87	<6.25	10.7	<6.85	11.9	***240***	***1,500***	
Anthracene	<8.37	<7.88	9.28	<7.13	<7.22	<7.37	<7.6	<6.51	<7.04	<6.76	<5.87	<6.25	<7.21	<6.85	<6.48	***85.3***	***245***	
Fluoranthene	17.4	10.4	39.4	8.65	12.8	<7.37	<7.6	18.9	<7.04	10.1	<5.87	<6.25	20.4	<6.85	19.7	***600***	***5,100***	
Pyrene	16.4	11.7	36.6	8.86	11.8	<7.37	<7.6	17.9	<7.04	10.2	<5.87	<6.25	28.6	<6.85	20.7	***665***	***2,600***	
Benz(a)anthracene	9.65	<7.88	19.8	<7.13	9.22	<7.37	<7.6	17.2	<7.04	<6.76	<5.87	<6.25	16.4	<6.85	14.1	***261***	***1,600***	
Chrysene	9.46	<7.88	21.4	<7.13	7.71	<7.37	<7.6	15.5	<7.04	<6.76	<5.87	<6.25	14.8	<6.85	14.8	***384***	***2,800***	
Benzo(b) fluoranthene	11.6	<7.88	22.6	<7.13	7.35	<7.37	<7.6	10.8	<7.04	<6.76	<5.87	<6.25	19.6	<6.85	13.8	***na***	***na***	
Benzo(k) fluoranthene	10.2	<7.88	20.2	<7.13	<7.22	<7.37	<7.6	12.6	<7.04	<6.76	<5.87	<6.25	19	<6.85	13.8	***na***	***na***	
Benzo(a) pyrene	11.6	<7.88	23.4	<7.13	8.55	<7.37	<7.6	15.3	<7.04	<6.76	<5.87	<6.25	22.6	<6.85	16.8	***430***	***1,600***	
Indeno(1,2,3-cd) Pyrene	9.3	<7.88	16.5	<7.13	<7.22	<7.37	<7.6	7.44	<7.04	<6.76	<5.87	<6.25	18.8	<6.85	11.4	***na***	***na***	
Dibenz(a,h) anthracene	<8.37	<7.88	<7.63	<7.13	<7.22	<7.37	<7.6	<6.51	<7.04	<6.76	<5.87	<6.25	<7.21	<6.85	<6.48	***63.4***	***260***	
Benzo(ghi) perylene	9.2	<7.88	16	<7.13	<7.22	<7.37	<7.6	6.67	<7.04	<6.76	<5.87	<6.25	19.3	<6.85	11	***na***	***na***	
Total PAHs*	**138.32**	**77.26**	**272.34**	**67.42**	**93.53**	**58.96**	**84.5**	**148.81**	**56.32**	**98.47**	**46.96**	**50**	**211.83**	**54.8**	**170.95**	***4,022***	***44,792***	***229.26-1,479.4***
Total LMW PAHs	**29.325**	**23.64**	**52.625**	**21.39**	**21.66**	**22.11**	**46.5**	**23.245**	**21.12**	**51.13**	**17.61**	**18.75**	**28.725**	**20.55**	**31.61**	***552***	***3,160***	***23.4-270***
Total MMW PAHs	**33.8**	**22.1**	**76**	**17.51**	**24.6**	**7.37**	**7.6**	**36.8**	**7.04**	**20.3**	**5.87**	**6.25**	**49**	**6.85**	**40.4**	***na***	***na***	
Total HMW PAHs	**75.195**	**31.52**	**143.715**	**28.52**	**47.27**	**29.48**	**30.4**	**88.765**	**28.16**	**27.04**	**23.48**	**25**	**134.105**	**27.4**	**98.94**	***1,700***	***9,600***	***191.1-1,029.7***

*total PAHs calculated using half of detection limit

na = not available

Table 6. Concentration (µg/kg [ppb]) of Polychlorinated Biphenyls (PCBs) in sediments along the SRP cable route in Little Bay

Station	C1	C2	C3	C4	C5	C6	C6	C7	C7	C8	C9	C10	C11	C11	C12	ER-L	ER-M
Depth (inches)	0-48	0-48	0-48	0-48	0-48	0-48	48-61	0-48	48-54	0-48	0-48	0-48	0-48	48-89	0-48		
Cl2-BZ#8*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	1.1	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl3-BZ#18*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	1.16	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl3-BZ#28*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl4-BZ#44*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl4-BZ#49	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl4-BZ#52*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl4-BZ#66*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl5-BZ#87	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl5-BZ#101*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl5-BZ#105*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl5-BZ#118*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl6-BZ#128*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl6-BZ#138*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl6-BZ#153*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl7-BZ#170*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl7-BZ#180*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl7-BZ#183	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl7-BZ#184	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl7-BZ#187*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl8-BZ#195*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl9-BZ#206*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Cl10-BZ#209*	<0.837	<0.788	<0.763	<0.713	<0.722	<0.737	<0.76	<0.651	<0.704	<0.676	<0.587	<0.625	<0.721	<0.685	<0.648		
Total PCBs*	**15.066**	**14.184**	**13.734**	**12.834**	**12.996**	**13.266**	**13.68**	**11.718**	**13.524**	**12.168**	**10.566**	**11.25**	**12.978**	**12.33**	**11.664**	**22.7**	**180**

* Per the RIM, total PCBs are to be estimated based on the following: Total = 2 X [sum of 18 NOAA summation congeners indicated with a *]. For values below the MDL, use one half the MDL; for values between the MDL and the RL use estimated values.

Table 7. Concentration (mg/kg [ppm]) of Total Petroleum Hydrocarbons (TPH) in sediments along the SRP cable route in Little Bay

Station	C1	C2	C3	C4	C5	C6	C6	C7	C7	C8	C9	C10	C11	C11	C12
Depth (inches)	0-48	0-48	0-48	0-48	0-48	0-48	48-61	0-48	48-54	0-48	0-48	0-48	0-48	48-89	0-48
TPH															
TPH mg/kg (ppm)[a]	<53.5	<54	<51.8	<50.5	<48.4	<48.7	<53.2	<45.9	<45.9	<47	<39	<41.1	<47.8	<43.6	<47.8

[a]Alpha Analytical reported the data as µg/kg (parts per billion); data converted to mg/kg (parts per million to conform with NHDES criterion

Table 9. Concentration (ng/g [ppb]) of Perfluorooctanoic acid (PFOA) and Perfluorooctane sulfonate (PFOS) in sediments along the SRP cable route in Little Bay

Station	C1	C2	C3	C4	C5	C6	C6	C7	C7	C8	C9	C10	C11	C11	C12
Depth (inches)	0-48	0-48	0-48	0-48	0-48	0-48	48-61	0-48	48-54	0-48	0-48	0-48	0-48	48-89	0-48
PFOA (ng/g)	<1.91	<1.91	<1.94	<1.92	<1.94	<2.00	<1.93	<1.95	<1.87	<1.85	<1.97	<1.83	<1.95	<1.95	<1.98
PFOS (ng/g)	<1.91	<1.91	<1.94	<1.92	<1.94	<2.00	<1.93	<1.95	<1.87	<1.85	<1.97	<1.83	<1.95	<1.95	<1.98

Table 8. Concentration (pg/g [pptr]) of Dioxins/Furans in sediments along the SRP cable route in Little Bay

Station	C1	C2	C3	C4	C5	C6	C6	C7	C7	C8	C9	C10	C11	C11	C12
Depth (inches)	0-48	0-48	0-48	0-48	0-48	0-48	48-61	0-48	48-54	0-48	0-48	0-48	0-48	48-89	0-48
2,3,7,8-TCDD	<0.972	<0.952	<0.942	<0.934	<0.942	<0.949	<0.937	<0.932	<0.912	<0.896	<0.913	<0.966	< 0.93	<0.943	<0.981
1,2,3,7,8-PeCDD	<4.86	<4.76	<4.71	<4.67	<4.71	<4.74	<4.68	<4.66	<4.56	<4.48	<4.57	<4.83	< 4.65	<4.72	<4.91
1,2,3,4,7,8-HxCDD	<4.86	<4.76	<4.71	<4.67	<4.71	<4.74	<4.68	<4.66	<4.56	<4.48	<4.57	<4.83	< 4.65	<4.72	<4.91
1,2,3,6,7,8-HxCDD	<4.86	<4.76	<4.71	<4.67	<4.71	<4.74	<4.68	<4.66	<4.56	<4.48	<4.57	<4.83	< 4.65	<4.72	<4.91
1,2,3,7,8,9-HxCDD	<4.86	<4.76	<4.71	<4.67	<4.71	<4.74	<4.68	<4.66	<4.56	<4.48	<4.57	<4.83	< 4.65	<4.72	<4.91
1,2,3,4,6,7,8-HpCDD	7.41	<4.76	<4.71	<4.67	5.54	<4.74	<4.68	<4.66	<4.56	<4.48	<4.57	8.87	11.6	<4.72	30.5
1,2,3,4,6,7,8,9-OCDD	84.9	<33.7	<9.42	30.7	62.7	98.2	<9.37	<36.9	60.6	23.0	14.8	135	334	35.0	410
2,3,7,8-TCDF	<0.972	<0.952	<0.942	<0.934	<0.942	<0.949	<0.937	<0.932	<0.912	<0.896	<0.913	<0.966	< 0.93	<0.943	<0.981
1,2,3,7,8-PeCDF	<4.86	<4.76	<4.71	<4.67	<4.71	<4.74	<4.68	<4.66	<4.56	<4.48	<4.57	<4.83	< 4.65	<4.72	<4.91
2,3,4,7,8-PeCDF	<4.86	<4.76	<4.71	<4.67	<4.71	<4.74	<4.68	<4.66	<4.56	<4.48	<4.57	<4.83	< 4.65	<4.72	<4.91
1,2,3,4,7,8-HxCDF	<4.86	<4.76	<4.71	<4.67	<4.71	<4.74	<4.68	<4.66	<4.56	<4.48	<4.57	<4.83	< 4.65	<4.72	<4.91
1,2,3,6,7,8-HxCDF	<4.86	<4.76	<4.71	<4.67	<4.71	< 4.74	< 4.68	< 4.66	< 4.56	< 4.48	< 4.57	< 4.83	< 4.65	< 4.72	< 4.91
2,3,4,6,7,8-HxCDF	<4.86	<4.76	<4.71	<4.67	<4.71	< 4.74	< 4.68	< 4.66	< 4.56	< 4.48	< 4.57	< 4.83	< 4.65	< 4.72	< 4.91
1,2,3,7,8,9-HxCDF	<4.86	<4.76	<4.71	<4.67	<4.71	< 4.74	< 4.68	< 4.66	< 4.56	< 4.48	< 4.57	< 4.83	< 4.65	< 4.72	< 4.91
1,2,3,4,6,7,8-HpCDF	<4.86	<4.76	<4.71	<4.67	<4.71	< 4.74	< 4.68	< 4.66	< 4.56	< 4.48	< 4.57	< 4.83	< 4.65	< 4.72	7.19
1,2,3,4,7,8,9-HpCDF	<4.86	<4.76	<4.71	<4.67	<4.71	< 4.74	< 4.68	< 4.66	< 4.56	< 4.48	< 4.57	< 4.83	< 4.65	< 4.72	< 4.91
1,2,3,4,6,7,8,9-OCDF	< 9.72	< 9.52	< 9.42	< 9.34	< 9.42	< 9.49	< 9.37	< 9.32	< 9.12	< 8.96	< 9.13	< 9.66	< 9.30	< 9.43	15.7
Total Tetrachlorodibenzo-p-dioxin	< 0.972	< 0.952	< 0.942	< 0.934	< 0.942	< 0.949	< 0.937	< 0.932	< 0.912	< 0.896	< 0.913	0.97	< 0.93	< 0.943	< 0.981
Total Pentachlorodibenzo-p-dioxin	< 4.86	< 4.76	< 4.71	< 4.67	< 4.71	< 4.74	< 4.68	< 4.66	< 4.56	< 4.48	< 4.57	< 4.83	< 4.65	< 4.72	< 4.91
Total Hexachlorodibenzo-p-dioxin	< 4.86	< 4.76	< 4.71	< 4.67	< 4.71	< 4.74	< 4.68	< 4.66	< 4.56	< 4.48	< 4.57	< 4.83	5.77	< 4.72	16.4
Total Heptachlorodibenzo-p-dioxin	17.7	< 4.76	< 4.71	< 4.67	13.2	5.28	< 4.68	< 4.66	< 4.56	< 4.48	< 4.57	26.9	41.4	< 4.72	81.6
Total Tetrachlorodibenzofuran	< 0.972	< 0.952	< 0.942	< 0.934	< 0.942	< 0.949	< 0.937	< 0.932	< 0.912	< 0.896	< 0.913	< 0.966	< 0.93	< 0.943	< 0.981
Total Pentachlorodibenzofuran	< 4.86	< 4.76	< 4.71	< 4.67	< 4.71	< 4.74	< 4.68	< 4.66	< 4.56	< 4.48	< 4.57	< 4.83	< 4.65	< 4.72	< 4.91
Total Hexachlorodibenzofuran	< 4.86	< 4.76	< 4.71	< 4.67	< 4.71	< 4.74	< 4.68	< 4.66	< 4.56	< 4.48	< 4.57	< 4.83	< 4.65	< 4.72	< 4.91
Total Heptachlorodibenzofuran	< 4.86	< 4.76	< 4.71	< 4.67	< 4.71	< 4.74	< 4.68	< 4.66	< 4.56	< 4.48	< 4.57	< 4.83	< 4.65	< 4.72	17.3
TEQ WHO2005 ND=0[a]	**0.0995**	**0.0101**	**0.00**	**0.00921**	**0.0743**	**0.0295**	**0.00**	**0.0111**	**0.0182**	**0.00689**	**0.00445**	**0.129**	**0.217**	**0.0105**	**0.504**
TEQ WHO2005 ND=0.5[b]	**5.62**	**5.44**	**5.37**	**5.33**	**5.42**	**5.44**	**5.34**	**5.33**	**5.22**	**5.12**	**5.21**	**5.61**	**5.50**	**5.39**	**6.05**

[a]TEQ ND=0 is a weighted toxicity value calculated by multiplying the concentration of individual dioxin/furan compounds detected in the sample by their relative (compared to the most toxic compound 2,3,7,8-TCDD) toxicity (the toxicity equivalency factor or TEF) and summing over all compounds detected.

[b]TEQ ND=0.5 is a weighted toxicity value calculated by multiplying the concentration of individual dioxin/furan compounds in the sample by their relative (compared to the most toxic compound 2,3,7,8-TCDD) toxicity (the toxicity equivalency factor or TEF) and summing over all compounds detected, using one half of the detection limit as the concentration for compounds not detected.

5.0 References

Ayotte, J.D., Cahillane, Matthew, Hayes, Laura, and Robinson, K.W., 2012, Estimated probability of arsenic in groundwater from bedrock aquifers in New Hampshire, 2011: U.S. Geological Survey Scientific Investigations Report 2012–5156, 25 p., at http://pubs.usgs.gov/sir/2012/5156/.

Canadian Council for the Ministers of the Environment. 2004. Canadian Sediment Quality Guidelines for the Protection of Aquatic Life. Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans (PCDD/Fs). Ceqg-rcqe.ccme.ca/download/en/245.

DioxinFacts.org. 2016. TEQ vs. TM-17. Accessed at: http://dioxinfacts.org/tri_dioxin_data/teq_tm17/index.html

NOAA. 2008. SQuiRTs Screening Quick Reference Tables. Access at: http://response.restoration.noaa.gov/sites/default/files/SQuiRTs.pdf

Normandeau. 2016. Public Service of New Hampshire Seacoast Reliability Project Madbury, Durham, Newington & Portsmouth, NH Natural Resources.

RPS ASA 2016. Modeling Sediment Dispersion from Cable Burial for Seacoast Reliability Project, Little Bay, New Hampshire. Prepared for Normandeau Associates, Inc, Bedford, NH. Prepared by RPS ASA, 55 Village Square Drive, South Kingstown, RI.

PREP (Piscataqua Regional Estuaries Partnership). 2012. Environmental Data Report. Technical Support Document for the 2013 State of Our Estuaries Report. 287 p.

PREP (Piscataqua Regional Estuaries Partnership). 2013. State of Our Estuaries 2013. 48 p.

Trowbridge, P. 2009. Environmental Indicators Report. Piscataqua Region Estuaries Partnership. 174 p.

U.S. EPA (U.S. Environmental Protection Agency). 2007a. Framework for Metals Risk Assessment. EPA 120/R-07/001, March 2007

U.S. EPA. 2007b. National Estuary Program Coastal Condition Report. Chapter 3: Northeast National Estuary Program Coastal Condition, New Hampshire Estuaries Program. 6 p.

U.S. EPA. 2008. Surface Water Quality Status (September 2008), Greenland, NH. http://www.greenland-nh.com/Documents/Hazard%20Mitigation%20Documents/Map4_Greenland_NH.pdf

U.S. EPA New England and U.S. Army Corps of Engineers, New England District. 2004. Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters. 54 p.

Appendices

Appendix A: Ecological Risk Analysis

Appendix A1 - Technical Memorandum

Review of ecological risk implications of SRP sediment analytical data

Executive Summary

This memorandum provides an opinion on whether potential remobilization of sediment from the planned activities may be of an ecological concern to the benthic biota of Little Bay, New Hampshire, based on the results of the Characterization of Sediment Quality of which this memorandum is an appendix.

Based on the reported sediment chemical concentrations in the data set, it is our scientific opinion that there is no potential for ecological effects from constituents of potential concern in the sediment including PAHs, PCBs, PFCs, dioxins and furans, and metals. The only metal which slightly exceeds the strictest screening criteria is arsenic, but its distribution appears within the range of naturally occurring arsenic in the area, and remobilization would not result in any appreciable increase in concentrations or potential adverse effects.

We conclude that the planned activities would have negligible impact to Little Bay biota from the perspective of potential ecological toxic impacts.

1. Introduction

This Technical Memorandum presents an ecological evaluation of the results of the *Characterization of Sediment Quality Along Little Bay Crossing* (hereafter "Characterization Report") conducted as part of the Public Service Company of New Hampshire Seacoast Reliability Project. The goal of the review is to provide a brief summary review focused on potential ecological risks associated with the sediment data.

This review is an initial screening level review which means that the site data are compared to the most stringent applicable and relevant screening criteria. If the media concentrations do not exceed the screening criteria, it can be concluded there is no cause for further concern. If the media concentrations do exceed the screening criteria, it is necessary to consider the distribution and frequency of exceedances, as well as comparing the observed values to typical or background values to determine if there is any potential for unacceptably increased risk. If such potential is found site specific evaluations of nature and extent may be called

GEI Consultants, Inc.
2625 Redwing Road, Suite 370. Fort Collins, CO 80526
970.224.7342 fax: 303.662.8757
www.geiconsultants.com

for, applying site specific ecological risk data. This review focuses on the initial screening-level evaluation only.

2. Measured Sediment Concentrations

The sediment samples considered in this review are summarized in Table 2 of the Characterization Report. Table 1 of the same report presents the analytes considered. Samples were collected from the 0 to 48-inch depth interval for all locations along the transect, while additional samples at the depth interval > 48 inches were collected at 3 locations with sufficient penetration (C6 on the western slope, C7 in the channel, and C11 on the eastern slope).

Results are presented in Tables 3 (physical characteristics), Table 4 (metals), Table 5 (PAHs), Table 6 (PCBs), Table 7 (TPH), Table 8 (dioxins and furans), and Table 9 (PFOA and PFOS).

Data qualifiers were identified in the laboratory data report. Most of the qualifiers are related to the sample matrix spike(MS)/matrix spike duplicate (MSD). The recovery or precision issues in the MS/MSD are likely attributable to non-homogeneity in the sample matrix. Although the MS/MSD for some compounds are outside of control limits, the laboratory control sample and duplicate can be relied upon to demonstrate accuracy in the results. The laboratory data report can be found Appendix C of the Characterization Report.

3. Conceptual Site Model

An important first step for any risk evaluation is to develop a conceptual site model (CSM) to better focus the analysis. A CSM is a logical framework to summarize the expected movement of potential toxicants and the subsequent exposures to these toxicants by biota. For this evaluation, the CSM assumes:

- Potential chemical constituents of concern may be present in the sediment in the path of the planned excavation
- The planned activity will result in a remobilization of sediment. Chemical constituents contained in the sediment may be redeposited within or outside of the footprint of the excavation
- This evaluation does not review the modeled transport of sediment but considers the reported concentrations in sediment versus ecological benchmarks

- From an ecological standpoint, the relevant portion of the estuarine sediments of concern to this risk evaluation is the biologically active zone of the sediment column. The biologically active zone is typically defined by the availability of oxygen for biological activity, and generally comprises the top 12 inches or less. Deeper sediments generally are not biologically available unless they are brought to the surface by disturbances. As the project will potentially cause remobilization of such deeper sediment, all sediment from all depths should be considered in this evaluation.

- The primary exposures of ecological concern are benthic macroinvertebrates which inhabit the surface sediments in Little Bay. These organisms include animals that feed on or in the sediment and either ingest or directly contact sediment. In addition, sedentary filter-feeding organisms such as oysters could potentially be exposed to contaminants adsorbed to sediment particles mobilized during cable installation

- The constituents of potential concern include substances that may be naturally occurring or contaminants from anthropogenic activities (USEPA 2007). Naturally occurring toxicants such as metals are ubiquitous at low concentrations, and are not necessarily contaminants unless anthropogenic activities have increased their concentrations above both background levels and toxicological levels of concern. Organic constituents of potential concern are generally but not always of anthropogenic origin. For this evaluation the following groups were considered: PAHs, dioxins and furans, PCBs, TPH and PFCs.

4. Ecotoxicological Review

The primary basis of our review was the comparison of sediment chemical concentrations to published sediment quality "guidelines" or "criteria." Sediment criteria generally consist of two concentrations or levels, the lowest of which represents a low level screening value which denotes a "safe" level, and the highest of which is a probable or median effect level denoting concentrations above which ecological risk is likely. In the grey zone in between the threshold and probable effect level site specific considerations of background levels, bioavailability and sensitivity of the local biota will determine if there is any ecological concern.

In general, there are few jurisdictions with promulgated sediment criteria. Sediment evaluations therefore are based on readily available benchmarks for various effects derived from scientific data by agencies and scientists. For many potential contaminants there are generally accepted benchmarks with applicability in the US (e.g., metals, PAHs, PCBs). However, for others no consensus values have been developed, and comparison criteria need to be developed from review of the scientific literature (e.g., PFCs). For some, such as TPH there are little data available and the potential risk from TPH needs to be evaluated through other means.

4.1 Metals

Metals are a natural component of rock and soil, but environmental media may be enriched from discharges or deposition from many anthropogenic sources. The sediment Characterization Report compared the observed metals values to the marine Effects Range Low (ER-L) and Effects Range – Median (ER-M) values originally developed by Long and Morgan (1990) for NOAA and recommended for use by NOAA, USGS, and EPA for marine and estuarine sediments. Many states and several EPA regions have adopted these values as guidelines and benchmarks for marine sediment. As noted in the sediment Characterization Report, the ER-L is the concentration below which there is less than 10% chance to see an adverse effect a "threshold effect" value), while the ER-M is the concentration at which there is a 50% chance to see adverse effects (a "probable effect" value).

All samples for the evaluated metals in sediment are well below their threshold levels (ER-L) and of no further ecological concern except in the case of arsenic. In the case of arsenic, about half of the samples exceed the ER-L threshold value by small amounts, although none approach the ER-M probable effect value. Arsenic is discussed further in Section 4.1.1.

Table 1 Evaluation of metals

	Threshold Effect ER-L	Probable Effect ER-M	Maximum detected value	Conclusion
Arsenic	8.2 mg/kg	70 mg/kg	11.7 mg/kg	See below
Cadmium	1.2 mg/kg	4.2 mg/kg	0.19 mg/kg	No concern
Chromium	81 mg/kg	370 mg/kg	36.9 mg/kg	No concern
Copper	31 mg/kg	270 mg/kg	10.5 mg/kg	No concern
Lead	46.7 mg/kg	218 mg/kg	11.7 mg/kg	No concern
Mercury	0.15 mg/kg	0.71 mg/kg	0.04 mg/kg	No concern
Nickel	20.9 mg/kg	51.6 mg/kg	18.2 mg/kg	No concern
Zinc	150 mg/kg	410 mg/kg	58.2 mg/kg	No concern

4.1.1 Further evaluation of arsenic

Some arsenic results exceeded the threshold level ER-L, and as a result arsenic cannot be fully eliminated from further consideration based on screening alone.

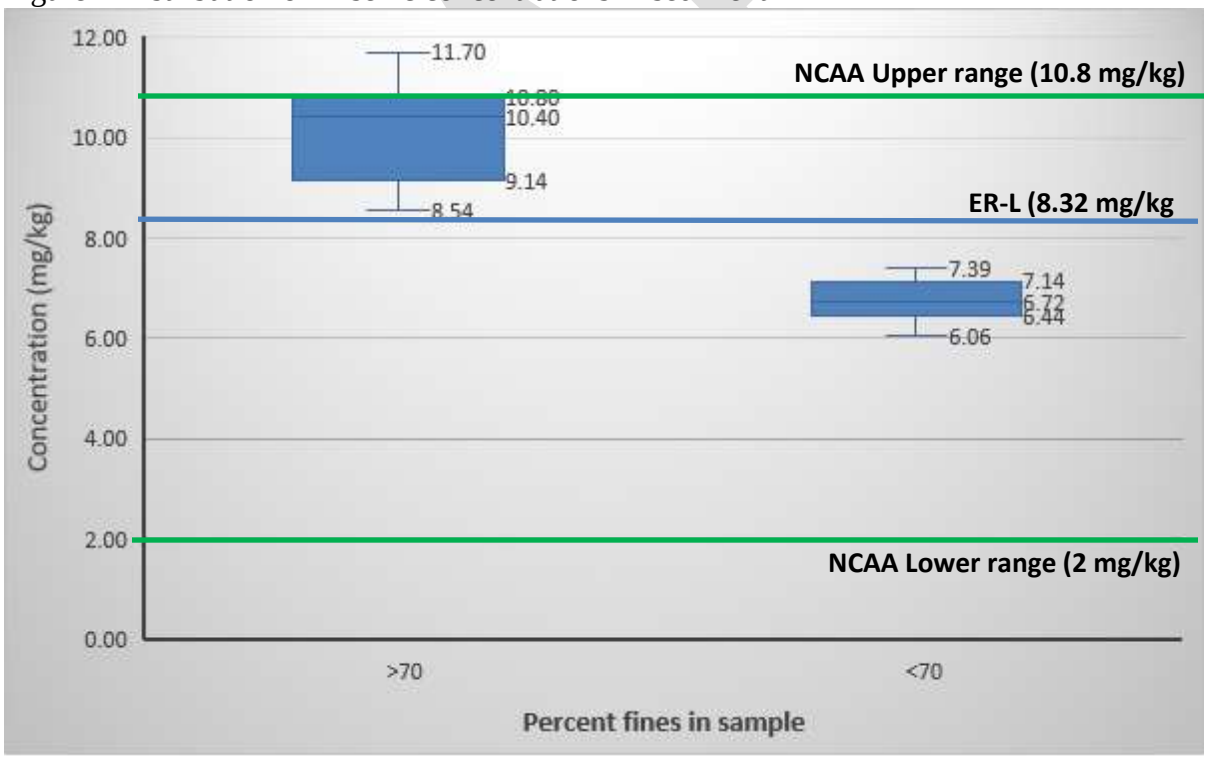
Arsenic concentrations ranged from 6.1 to 11.7 mg/kg. Almost half (47%) exceeded the ER-L of 8.2. The average for all arsenic was 8.35, almost coincident with the ER-L.

Figure 1 presents a diagram of the distribution of samples in relation to (a) the ER-L and (b) the US EPA National Coastal Condition Assessment program (NCAA) range of typical values for Little Bay. The samples are divided in two groups – one group showing those samples with > 70 % fines, i.e. the very silty ones, and (b) one group with samples of <70% fines, i.e. less silty samples.

The diagram shows that the exceedances of the arsenic are entirely in the high (i.e. >70%) fines sediment. This suggests that unconsolidated sediment has a slightly higher arsenic content than the coarser material.

The range of arsenic values reported by NCAA in surface sediments is 2 to 10.8 mg/kg. All the SRP samples except one are within this range and, thus, are considered to be consistent with typical or background values. The single sample that exceeds the range, at 11.7 mg/kg, is the deeper sample at C6. Because the bulk of the samples are within the typical ranges that pertain throughout Little Bay per the NCAA, there is little or no potential for redistribution of these sediments significantly increasing surface concentrations or in other ways resulting in surface sediment conditions being different from the current. Therefore, we conclude that the arsenic present in the samples is consistent with typical values for the area, do not represent levels of concern, and of no further concern to ecological receptors present in Little Bay.

Figure 1 Distribution of Arsenic concentrations in sediment



The numbers on the box diagram indicate concentrations for the maximum value, the 75th percentile, the mean, the 25th percentile and the minimum value, respectively.

4.2 PAHs

PAHs originate from either petrogenic (i.e., hydrocarbons and petroleum) or pyrogenic (i.e. byproducts of combustion) sources. Some PAHs can be produced naturally from burning and some biological processes, but the bulk of the of PAHs in the environment are the result of anthropogenic discharges, spills, or deposition. PAHs (and other neutral organics) in aquatic systems are considered to have an additive mode of action to aquatic biota where the effect of a mixture is the additive effect of each component, which is based on the so-called "narcosis model" (USEPA 2003). Therefore, PAH benchmarks are defined for summed groups of PAHs. There are benchmarks for total PAHs (the sum of all the PAHs), as well as for the sum of the lighter PAHs (the low molecular weight PAHs, or LMW PAH) and for the heavier PAHs (the high molecular weight PAHs, or HMW PAHs). There are (ER-L) and (ER-M) values for these categories, which were applied in the Characterization Report:

Table 2 Evaluation of PAHs

	Threshold Effect ER-L	Probable Effect ER-M	Maximum detected value	Conclusion
LMW PAHs	552 µg/kg	3,160 µg/kg	53 µg/kg	No concern
HMW PAHs	1,700 µg/kg	9,600 µg/kg	144 µg/kg	No concern
Total PAHs	4,022 µg/kg	44,792 µg/kg	272 µg/kg	No concern

There are also ER-L and ER-M for individual PAHs which were presented in the report as well, although these are of lower reliability due to the additive effect of PAHs which typically occur as mixtures.

Trace levels of a number of PAHs were detected in many samples. This is not unusual in areas adjacent to areas of anthropogenic activities, where PAHs may derive from hydrocarbon spills and releases and via deposition of pyrogenic PAHs from emissions to air from burning of fuels.

All PAHs are well below their threshold effect levels, and thus are of no further ecological concern.

4.3 PCBs

PCBs are anthropogenic contaminants previously in widespread industrial uses, most prominently in electrical transformers. Their use has been discontinued but residual contamination still exists. This value sums the detected congeners and assumes that non-detected congeners are present at ½ their detection limit. This implies that even if no PCBs are actually detected, there will be an assumption of some low level presence. As noted in the Characterization Report, only one sample had detected PCBs (C7 had detections of PCB 8 and 18). Otherwise all were non-detect.

There are established ER-L and ER-M values for total PCBs, which were used in the sediment Characterization Report. The sum of detected and non-detected congeners is well below of the threshold value and thus of no further concern.

Table 3 Evaluation of PCBs

	Threshold Effect ER-L	Probable Effect ER-M	Maximum value (including non-detects)	Conclusion
Total PCBs	22.7 µg/kg	180 µg/kg	15.1 µg/kg	No concern

4.4 TPH

Total Petroleum Hydrocarbons is a measure of the mixture of up to hundreds of hydrocarbons that make up petroleum products. The chemical composition of these mixtures vary depending on the source of the TPH. For example, light hydrocarbons like gasoline has a very different profile than heavier hydrocarbons such as heating oil. Therefore, it is difficult to define concentration levels for screening, as toxicity is highly dependent on chemical composition. For this reason, no toxicologically-based sediment screening level for TPH is available.

To indirectly address TPH, a common approach is to consider the content of components of known toxicity in the TPH, such as the PAHs. PAHs are usually present in TPH mixtures. If PAHs are not a concern (as concluded in Section 4.3), then it is unlikely that TPH is of any ecological concern at this site. No TPH was detected, and the PAHs are well below their levels of concern. Therefore, we conclude that TPH is of no further ecological concern.

4.5 Dioxins and Furans

Dioxins and furans are persistent and bioaccumulative substances that are an unwanted by-product of some industrial processes such as pesticide manufacturing and chlorine bleaching They also can derive from combustion from anthropogenic sources as well as natural sources such as forest fires and volcanic eruptions, Dioxins and furans exist as various congeners of different levels of chlorination. The most toxic and bioavailable dioxin is 2,3,7,8-tetrachloro dibenzodioxin (2,3,7,8-TCDD). Dioxins and furans with more chlorines are less toxic and available, although they tend to be more persistent in the environment.

To address the differences in toxicity, a toxicity equivalency factor (TEF) is applied to each congener. The TEF (WHO 2005) converts each congener concentration to a 2,3,7,8-TCDD toxic equivalent, and the resulting sum of dioxins are expressed as TCDD Toxic Equivalents (TEQ). For example, OCDD has a toxicity 1/1000 of that of 2,3,7,8-TCDD thereby resulting in much lower TEQs.

There are no ER-L or ER-M values for dioxins and furans in common usage in the US. To provide a basis for ecological evaluation, this evaluation considers the equivalent Canadian criteria (CCME 2004). Canada has developed values analogous to the ER-L and ER-M using similar principles which are encoded in Canadian regulations. These values are the ISQG (Interim Sediment Quality Guideline) and PEL (Probable Effect Level) which are analogous to the ER-L and ER-M, and based on Canadian regulatory precedent should be considered as conservative values.

Table 5 Evaluation of dioxins and furans

	Threshold Effect Canada ISQG	Probable Effect Canada PEL	Maximum TEQ	Conclusion
TEQ (detects only)	0.85 ng/kg	21.5 ng/kg	0.5 ng/kg	No concern
TEQ (ND at ½ detection limit)			6.1 ng/kg	See discussion below

The dioxin and furan results are reported in two ways:

- The TEQ calculated from detected congeners only. This sum assumes non-detected congeners are absent. This will underestimate the total, as several other congeners are likely to be present at sub-detection limit levels
- The TEQ calculated from detected congeners plus non-detected congeners assumed to be present at ½ their reported detection limit. This will overestimate the total, as one would in real world samples not expect to see all or even most congeners present as high as ½ the DL

Consequently, the true TEQ is likely much closer to the TEQ based on detects only, rather than to the ND= ½ detection limit assumption.

In the Little Bay samples detected dioxins and furans consist almost entirely of hepta- and octachlorinated dioxins and furans. Samples dominated by these highly chlorinated and recalcitrant forms indicate residual degraded dioxins/furans. Their equivalent TEQs are low (maximum observed concentration at 0.5 ng/kg), however, and do not translate into toxic amounts. When all congeners are assumed to be present at ½ their detection limits the apparent concentration jumps to 6.1 ng/kg at location C12, which is above the threshold level, although below the probable effect level (PEL). This is largely due to the higher toxicity factors for the tetra- and penta-chloro dioxins and furans which are least likely to be present. Even a sample with no detected dioxins and furans, such as location C3 has a non-detected TEQ of 5.3 ng/kg which exceeds the threshold screening level (ISQG) but is still well below the PEL.

The detection limits reported for this study are consistent with standard detection limits for dioxin and furan chemical analysis in soil and sediment, and are viewed as adequate to draw conclusions about analytical data.

Considering the above, the true TEQ is likely slightly higher than the reported TEQ based on ND=0, but would not approach the TEQ implied by assuming all non-detects are present at ½ their detection limit. Therefore, we conclude that there is no further concern from dioxins and furans in these sediments.

4.6 PFCs

PFCs are persistent and bioaccumulative, and have been detected in environmental media and tissues even in remote areas far from locations of their use. PFCs are industrial chemicals used in paper and textile treatment, production of fluoropolymers, cosmetics and insecticides formulations. A primary use has been in fire-fighting foams. They enter the environment via direct and indirect emission sources such as manufacturing processes, leaching from commercial products containing PFCs, and releases to water bodies.

In the present case it is known that PFCs have been used at nearby facilities, and those facilities may have been a source to potential impacts to water and sediment in Little Bay. Analysis of the two most prominent PFCs, PFOA (perfluorooctanoic acid) and PFOS (perfluorooctanesulfonate) was therefore conducted on the sediment samples collected from Little Bay.

The fate, transport and toxicity of PFCs remains poorly understood, and applicable benchmarks for evaluation of waters and especially sediment are not widely adopted or developed. To allow a preliminary evaluation of any detected PFCs in these samples, a review of scientific literature with a focus on the toxicity of PFCs to sediment-dwelling organisms was conducted for this evaluation and is included as Appendix A2.

There are few sediment based sediment quality criteria in existence for PFCs, such as the UK proposed values presented here. Our review revealed that some jurisdictions (e.g. Canada) do not think it possible to derive a reliable sediment benchmark. This is because the polar and surfactant-like properties of PFCs point to a preference to partitioning to the water phase within the pore water/sediment system, and to migrate relatively freely in and out of the sediment compartment. However, the bulk sediment analysis conducted on the sediment captures the presence of PFCs even if present in the pore water phase, although the exact partitioning factor is unclear. The benchmarks used in this evaluation incorporate the partitioning between pore water and sediment for typical sediments.

The review in Appendix A2 identified a threshold level for marine sediment of 6.7 µg/kg and 67 µg/kg for freshwater sediment for PFOS. This value was adopted by several European jurisdictions as benchmarks. The sediment values are uncertain yet conservative and were derived from water based toxicity data and extrapolated to sediment assuming the "worst case" observed partitioning to sediment from water.

The large difference between the benchmarks for marine and freshwater sediment is due to the variable results of the limited toxicity data that are currently available. One group of

organisms, the marine and estuarine mysid shrimp, appear more sensitive to PFOS than other organisms resulting in a lower threshold value.

Most of the available toxicity literature focuses on PFOS. PFOA is considered considerably less toxic, and certainly less bioaccumulative and separate benchmarks for it have not been reviewed.

Because these benchmarks are high level indicators of potential concern and not well established, as a secondary line of evidence Appendix A2 reviewed "typical" concentrations in sediment around the world. There are no readily available data from the NE Atlantic coastal region, and examples were derived from coastal and inland water studies in Asia, Europe, Canada, and the US. This review suggests that concentrations < 2 – 3 µg/kg can be considered typical of sediment in populated areas, while concentrations > 10 µg/kg are usually only observed in areas of evident impact such as harbors and polluted lakes.

Table 6 Evaluation of PFCs

	Toxicity threshold, preliminary (Denmark and UK)	Concentrations in sediments worldwide (see App. C2)	Maximum value in Little Bay samples	Conclusion
PFOS	6.7 µg/kg (marine) (67 µg/kg in other areas)	< 2-3 µg/kg – typical >10 µg/kg - impacted	< 2 µg/kg	No concern
PFOA	Likely > 10 times higher than PFOS (based on water toxicity)		< 2 µg/kg	No concern

There were no detections of PFOA or PFOS in any sample. The detection limits are all < 2 µg/kg, which is below the preliminary screening benchmark and lower than typical sediment values. Therefore, because PFCs were not detected using methods with sufficiently low detection limits with respect to ecological effects data, we conclude that there is no potential for ecological effects from PFCs in these sediments.

5. Summary

This memorandum provides an opinion on whether potential remobilization of sediment from the planned activities may be of an ecological concern to the biota of Little Bay, New Hampshire, based on the results of the Characterization of Sediment Quality of which this memorandum is an appendix.

Based on the reported sediment chemical concentrations in the data set, it is our scientific opinion that there is no potential for ecological effects from constituents of potential concern in the sediment including PAHs, PCBs, PFCs, dioxins and furans, and metals. The only metal which slightly exceeds the strictest screening criteria is arsenic, but its distribution appears within the range of naturally occurring arsenic in the area, and remobilization would not result in any appreciable increase in concentrations or potential adverse effects.

We conclude that the planned activities would have negligible impact to Little Bay from the perspective of potential ecological toxic impacts.

6. References

CCME 2004. Canadian Sediment Quality Guidelines for the Protection of Aquatic Life. Polychlorinated Dibenzo-p-dioxins and Polychlorinated dibenzofurans (PCDD/Fs). Canadian Council of Ministers of the Environment.

Long E.R., L.G. Morgan, 1990. The Potential for Biological Effects of Sediment-Sorbed Contaminants Tested in the National Status and Trends Program. NOAA Technical Memorandum NOS OMA 52. National Oceanic and Atmospheric Administration. Seattle, Washington. 1990

USEPA 2003. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. EPA-600-R-02-013, November 2003

USEPA 2007. Framework for Metals Risk Assessment. EPA 120/R-07/001, March 2007

Appendix A2 - Technical Memorandum

PFOA and PFOS in sediment

Executive Summary

In the absence of established criteria for the screening of perfluorinated compounds (PFCs) such as perfluorooctanoic acid (*PFOA) and* perfluorooctane sulfonate (*PFOS) in sediment, we conducted a literature review of existing scientific data on (a) the typical values observed in natural sediment worldwide, and (b) thresholds of ecological toxicity of sediment-associated PFCs. Sufficient information is available to provide a preliminary interpretation of sediment concentrations of potential ecological concern. These values are sufficient to screen out areas of no concern, but are subject to substantial uncertainties that need to be considered if the values are exceeded.*

The following evaluation benchmarks are suggested as values to determine if there could be a potential concern. The aquatic toxicity of PFOA is at minimum 10 times lower than for PFOS, and sediment benchmarks would be expected to be commensurately higher than for PFOS.

	Limit	***Concentrations***	***Comments***
Sediment typical concentrations (PFOS and PFOA)	*Consistent with typical background in developed areas*	*< 4 µg/kg*	*Even remote areas often have measurable concentrations, usually but not always < 1 µg/kg*
	Some impact likely present	*> 10 µg/kg*	*Frequently measured in harbors and polluted lakes and rivers*
	Significant impact likely present	*> 100 µg/kg*	*Observed near PFC manufacture and release locations*
Sediment Toxicity Benchmark (PFOS)	*Lowest (strictest) Probable No Effect Concentration (PNEC)*	*6.7 µg/kg PFOS*	*Recommended value in UK and Denmark in marine areas, based on the most sensitive marine organism*
	Alternate PNEC	*67 µg/kg PFOS*	*Recommended value in UK and Denmark for freshwater sediment. In line with toxicity for most organisms*

GEI Consultants, Inc.
2625 Redwing Road, Suite 370. Fort Collins, CO 80526
970.224.7342 fax: 303.662.8757
www.geiconsultants.com

1. Introduction

This memorandum presents a high level summary of the occurrence and ecotoxicity of perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) in sediment, the two most prevalent perfluorinated compounds (PFCs), in support of the evaluation of potential impacts resulting from aspects of the Eversource Energy Seacoast Reliability Project (SRP) in Little Bay. The need is founded on the fact that established sediment criteria are lacking for these and other PFCs.

Our objective is to provide a high level framework for interpreting concentrations of PFCs that may be present in sediment, and that may end up being mobilized by the planned SRP activities. To this end it focuses on two issues: (1) What information is available on expected concentrations in sediment based on studies elsewhere, and (2) What information is available on expected ecotoxicity of sediment associated PFCs. This information could be applied as an initial comparison standard to any site specific data.

PFCs are industrial chemicals that are widely distributed and persistent in the environment. For over 50 years, they have been used in numerous applications including paper and textile treatment, production of fluoropolymers, cosmetics, and insecticide formulations. A primary use has been in fire-fighting foams. They enter the environment via direct and indirect emission sources such as manufacturing processes, leaching from commercial products containing PFCs, and releases to water bodies.

This evaluation focuses on both PFOA and PFOS. These two are the most prevalent of the PFCs, partly due to their more common use and also because biogeochemical processes often end up producing particularly PFOA as a breakdown product. Typically PFOA and PFOS together form the overwhelming bulk of the PFCs present, although the relative contribution of PFOA and PFOS across all media varies widely for reasons that do not appear to be clearly elucidated.

2. Measured Sediment Concentrations

No data specific to the area or even region appear to be available. To provide a framework and context for concentrations that could reasonably be expected, a literature search was done. While actual data are limited, many studies have been conducted worldwide over the last decades evaluating PFCs in sediment. Some of these are summarized here in order to provide a framework for what concentrations of PFOA and PFOS might be expected in the local environment.

Note that sediment concentrations discussed here are sometimes reported in the literature as dry weight (dw), sometimes as wet weight (ww), and sometimes the source does not specify which one. The benchmarks will be presented on a dry weight basis. Where data are reported

as wet weight, the corresponding dry weight in silty sediment can be roughly approximated as twice the wet weight (i.e., the water content of silty sediment is around 50 percent, while sandy sediment has lower water content).

Table 1 – Typical PFC sediment concentrations

Geography	Comments	Sources
Marine and estuarine sediments – US (Charleston, Sarasota, SB Bay, Port St Lucie	PFOA=0.06-0.63 µg/kg ww (but up to 10.7 in Port St Lucie); PFOS= nd – 3.1 µg/kg ww	Houde et al. 2006, Higgins et al. 2006, 3M 2001
Marine and estuarine sediments - other	In undisturbed tidal flats in Japan: PFOA= up to 1.1 µg/kg ww PFOS=up to 0.14 µg/kg ww In Barcelona Harbor 8-12 µg/kg ww PFOA Baltic Sea: PFOS=0.02-2.4 µg/kg; PFOA: 0.06-1.6 µg/kg	Alzaga et al. 2005, Nakata et al. 2006. Nakata et al. in Japan also evaluated co-located biota and found high elevations in lugworms but minimal uptake in clams. Theobald et al. 2011
FW sediments – Great Lakes	L. Ontario up to 12 µg/kg dw PFOS in recent sediment (mean 10 µg/kg), but dropping to <1 in sediments dated to 1980 or before. Other Great Lakes have lower concentrations (0.9 to 2.2 µg/kg) PFOS. Harbors were similar.	EC 2013
FW sediments – Canadian lakes	In most cases PFOS < 1 µg/kg, but 2 µg/kg at a lake in an industrial area.	EC 2013
FW sediments – US cities	Measured values across multiple sites 0.2 – 0.8 µg/kg. Streams in SF Bay have range of nd-0.23 µg/kg PFOA and nd-1.3 µg/kg PFOS.	3M 2001
International surveys	PFOA: 2.0 – 3.1 µg/kg in Europe Netherlands: nd-24 µg/kg dw PFOA, nd-47 µg/kg dw PFOS Scandinavia: nd up to 392 µg/kg PFOA and nd up to 892 PFOS.	James et al. 2009 Schrap et al. 2004 Kallenborn et al. 2005. These elevated values may be associated with industrial outfalls
3M facility, Tennessee	Near outfall: PFOA mean 2740 µg/kg,	3M 2001

R.	up to 13300 µg/kg. At other locations: Mean <0.5-3.5, ranging up to 9.1 µg/kg	Co-located studies on fish and clams indicated elevated concentrations in fish, but not in clams.

A review of the selected reports above allows the following conclusions:

- Trace levels of PFOA and PFOS are almost ubiquitous in sediment. In fact, studies in Canadian Arctic lakes distant from sources (Stock et al. 2007) have revealed elevated concentrations (surprisingly, up to 85 µg/kg dw) although more typically are <1 µg/kg dw). Measurable concentrations may be expected in most sediments, especially in urbanized areas. The presence of trace levels of PFCs in sediment is not necessarily an indication of site related contamination.

- Data from marine / estuarine environments is fairly limited. Open water and tidal flat samples were found to be 1 µg/kg (for PFOA and PFOS both) or less in tidal flats in Japan, and up to 2.4 µg/kg ww in the Baltic Sea which is a heavily industrialized region. In US harbors we see concentrations typically at 1 µg/kg or less, but ranging up to 3.1 µg/kg ww PFOS in San Francisco Bay.

- Available freshwater data is more extensive. The Great Lakes are fairly well studied and have PFOS concentrations ranging from 0.9 to 2.2 µg/kg. However, L. Ontario is an outlier, with concentrations ranging up to 12 µg/kg. In US rivers and lakes observed concentrations typically are the <2 µg/kg range.

- Heavily impacted sediments do exist. In Europe concentrations in the hundreds of ppb have been reported for both PFOS and PFOA in Scandinavia, and up to 24 µg/kg PFOA and 47 µg/kg PFOS in the Netherlands. Studies conducted at the 3M PFC manufacturing facility in Decatur show sediment concentrations near the outfall averaging 2,740 µg/kg PFOS but ranging as high as 13,400 µg/kg. However, other areas nearby in the Tennessee River do not exceed 9.1 µg/kg PFOS and average in the <0.5 to 2.4 µg/kg range.

To summarize the limited amount of available data it is reasonable to consider that PFOS or PFOA concentrations around 1-3 µg/kg ww (which translates into approximately 2-5 µg/kg dw) can probably be considered normal and consistent with area wide contamination in today's world. Sediments impacted by PFCs would be expected to present concentrations exceeding 10 µg/kg. Heavily impacted sites will have values in the hundreds of ppb.

This brief and high level survey provides a conceptual framework for interpretation of sediment PFOA and PFOS data. It does not address issues related to the stability or mobility

of these materials in the sediment. Co-located data collected world-wide indicates a strong correlation between sediment and surface water, implying considerable sediment to water interchange. This is consistent with the chemical characteristics of the PFCs, which are polar and have surfactant properties, which reduces the affinity of PFCs to partition to the sediment compartment.

3. Ecotoxicological Sediment Evaluation Criteria

3.1 Existing Criteria

There are few established sediment criteria for protection of ecological resources, none in the USA.

Norway currently has a marine sediment Probable No Effect Concentration (PNEC) of 15 mg/kg for PFOA and 6.7 mg/kg for PFOS. Norway is considering a drastic reduction to a PNEC of 2 µg/kg for PFOS, which would establish a limit close to typical anthropogenic background. It is unclear how these were derived.

Denmark and the UK (EA 2004**)** have issued a proposed PNEC of **67 µg/kg** for freshwater sediment and **6.7 µg/kg** for marine sediment, extrapolating to sediment from water only PNECs of 25 µg/L for freshwater and 2.5 µg/L for marine water. PNECs are calculated using highly conservative assumptions, and therefore are expected to be generally protective. This is based on available aquatic chronic data for fish, invertebrates and plants, converted to sediment basis by applying a K_d=8.7 l/kg. Zareitelabad et al. (2013) reports sediment K_d values for PFOS around 7.4-7.5 in US sediment, but ranging from 0.1 to 10 for PFOA indicating different fate dynamics. Note that PFCs are not expected to follow organic carbon equilibrium partitioning (i.e., based on K_{ow} and K_{oc} as is the case for non-polar organics) so the partitioning coefficient K_d needs to be an empirical sediment to water partitioning value. The reason for the much lower benchmark in marine situations is the high ecotoxicological sensitivity of (marine) mysid shrimp, which show an apparent sensitivity to PFCs an order of magnitude higher than other organisms.

Canada and the EU both conclude there is insufficient information to derive sediment criteria from the water criteria. The EU notes that the adsorption and desorption of PFCs from sediment to/from water is rapid and not governed by organic carbon. Adsorption/desorption is also considered independent of inorganic composition. Conditions for equilibrium are therefore unknown and a PNEC is not achievable.

As a preliminary screening value either the European marine preliminary PNEC (**6.7 µg/kg**) or the freshwater preliminary PNEC (**67 µg/kg**) can be applied, keeping in mind the large

uncertainty resulting from assumptions when converting aquatic toxicity endpoints to a sediment value.

3.2 Ecotoxicology

There is only limited toxicological data for sediment biota. Most data for aquatic organisms is based on water exposures. The consensus of these studies is that PFOS and PFOA have low acute toxicities, and reported environmental concentrations except in extreme cases should not be a concern. Chronic toxicities (for fish and aquatic invertebrates) from a small set of studies underlie a lot of the development of criteria for PFOS and PFOA in all jurisdictions.

- For fish the standard No Observed Effect Concentration (NOEC) value is about 300 µg/L (fathead minnows, UK EA 2004). No marine fish data are available.
- For invertebrates the standard NOEC for PFOS is about 7000 µg/L for freshwater Daphnids (UK EA 2004), but the much lower value of 250 µg/L for marine Mysid shrimp (OECD, 2002) which results in the lower marine standard.
- For plants the NOECs are higher: >3200 µg/L for marine phytoplankton, and around 3500 µg/L for freshwater macrophytes (*Myriophyllum*, Hanson et al. 2005)

The PFOS NOEC for Mysids of 250 µg/L, the lowest empirical measurement, has then been converted using European methodologies to PNECs, is **36 µg/L,** applying appropriate safety factors (EC 2011).

PFOA is generally considered much less toxic than PFOS, with equivalent toxicities at least an order of magnitude higher. NOEC values were reported in OECD (2006) as 12,500 µg/L for algae, 20,000 µg/L for *Daphnia*, and 40,000 µg/L for fish. No information has been found specific to Mysid shrimp.

A study by Yang et al. (2014) determined a suggested chronic criterion based on USEPA procedures of 250 µg/L for PFOS and 3,520 µg/L for PFOA. This indicates that the relative aquatic toxicity of PFOS is at more than 10 times higher than for PFOS.
An independent point of comparison can be made from chronic values (ChV) derived from EcoSAR v.11.10 (EPA 2010), a quantitative structure activity relationship (QSAR) analysis procedure from the Office of Pollution Prevention and Toxics (OPPT) of the EPA. This program calculates on the basis of the characteristics of the compounds ChVs for mysids. These are 54 µg/L for PFOA and 117 µg/L for PFOS. For freshwater Daphnia the corresponding ChV are 1,485 µg/L for PFOA and 3,181 µg/L for PFOS. These values are in broad alignment with the empirical data.

As a result of the physicochemical characteristics of PFOS and PFOA they tend to partition to the water phase, i.e., to both the pore water and the overlying surface water. The mechanisms of partitioning are poorly understood. However, a bulk sediment measurement

for PFCs will include both the mass of PFCs existing in the pore water phase as well as the mass adsorbed to sediment, so will capture the total content of the "bulk sediment" water/sediment system.

The proposed PNEC values for PFOS in sediment are based on measurement in bulk sediment, although they were originally derived from assumed porewater exposure which then is backcalculated to bulk sediment using the estimated sediment to pore water partitioning coefficients. As a result, the sediment PNEC proposed here is representative of the total exposure in sediment, whether to the porewater or the sediment fractions.

3.2.1 Oysters

Oysters are a particular concern for the area as there are oyster farms in the bay. There are limited toxicity data for oysters. Only one direct toxicity test was found, which reported an acute toxicity EC50 of >3000 µg/L (Wildlife International 2000 cited in OECD 2002). Applying a safety factor of 100 the NOEC would be >30 µg/L, or commensurate with the previously described conservative screening level for water, suggesting the sediment value is also protective of oysters

Jeon et al (2010) evaluated bioaccumulation in Pacific oysters and found bioaccumulation factors (BAFs) from all sources to oyster tissue on the order of 10 for PFOA and 100 for PFOS at low salinities (10 ppt), increasing to 20 and 250 respectively at high salinity (34 ppt) when exposed to 10 µg/L PFOS or PFOA in water and to food items (algae) cultured in PFOS or PFOA. Most of the increase in uptake (80-90%) was due to uptake from diet, with direct water bioconcentration factors (BCFs, i.e. direct uptake from the water column) on the order of 1 – 3 for PFOA and 25 to 80 for PFOS[1]. Bioaccumulation potential for PFOS is clearly more significant than for PFOA. These uptake factors suggest that oysters accumulate from their filter feeding– and could result in relatively elevated tissue concentrations from lower water concentrations. This may be a concern for consumption of oysters. Tissue concentrations in oysters have been measured; in Chesapeake Bay PFOS values from 42 to 1225 µg/kg dw have been found, indicating significant exposure is present (Giesy et al., 2001, Kannan et al 2002). However, So et al. (2006) found low levels in Japanese oysters (<1 to 4 ppb PFOA and 0.6 – 3.8 ppb dw PFOS).

4. Summary

PFCs in sediment are little understood, and subject to considerable uncertainty. Little or no ecotoxicological work in sediment exists. Conclusions about sediment are extrapolated from

[1] BAFs and BCFs are expressed as unitless values indicating the concentration multiplier in tissue relative to the media.

aquatic toxicity data using assumptions about partitioning between sediment and water. As a preliminary sediment screening level based on the scientific literature the following limits for PFOS are suggested. For PFOA the estimated toxicity is at least an order of magnitude lower based on aquatic toxicity differences, but confidence in a corresponding sediment benchmark is low due to the limited understanding of sediment partitioning. However, they are subject to significant uncertainty;

- Lowest limit: 6.7 µg/kg dw PFOS in marine sediment. This is almost certainly overprotective
- Alternate limit; the freshwater sediment level of 67 µg/kg dw, while still uncertain, is more in line with most toxicity data.
- For PFOA, preliminary suggested values would be at least 10 times higher, although there is low confidence in this estimate due to the uncertainties about partitioning behavior in sediment and the lack of specific sediment values in the literature.

However, the properties of PFOS and PFOA indicate that their key mode of action is from water (and diet) exposure and not through sediment exposure, and further that there is significant interchange between sediment and surface water resulting in correlated concentrations. The lowest water PNEC is conservatively set at 36 µg/L for PFOS, although empirical toxicity NOECs are >250 µg/L (for PFOA limits are considerably higher). These limits are reasonable as preliminary screening values for surface water.

For comparative purposes, and independent of toxicity thresholds, a review of 'typical' concentrations of PFOA and PFOS in sediment world-wide (there being limited regional data) indicates as a starting point of comparison:

- Sediment with less than 4 µg/kg are broadly consistent with anthropogenic background in populated areas – and even some remote regions. PFCs at sub-ppb level are generally detectable in even pristine areas.
- Sediment with >10 µg/kg are indicators of some impact – as seen in some harbors, and polluted lakes and rivers.
- Sediment with >100 µg/kg are associated with locations of industrial manufacture or release of PFCs.
- The relative contribution of PFOS and PFOA to the total PFCs varies considerably, and no pattern emerges.

This information is intended to provide a preliminary interpretive framework for data emerging from site monitoring and sampling.

5. References

3M, 2003. Environmental and Health Assessment of Perfluoroocane sulfonic acid and its. salts. Prepared by 3M Company, with J Moore (Hollyhouse Inc.), J Rodericks and D

Turnbull (Environ Corp.) and W Warren-Hicks and Colleagues (The Cadmus Group, Inc.). August 2003.

Alzaga, R., Salgado-Petinal, C., Jover, E., Bayona, J.M. 2005. Development of a Procedure for the Determination of Perfluorocarboxylic Acids in Sediments by Pressurized Fluid Extraction, Headspace Solid-Phase Microextraction Followed by Gas Chromatographic-Mass Spectrometric Determination. *J. Chrom.* **1083**, 1-6.

Norges Miljodirektorat 2012. PNEC verdier for PFC. Miljodirektoratets veileder TA-3001/2012

Environment Canada, 2013. Perfluorooctane Sulfonate in the Canadian Environment. Environmental Monitoring and Surveillance in Support of the Chemicals Management Plan. En14-96/2013E-PDF

Giesy, J. and K. Kannan 2001. Perfluorooctanesulfonate and related fluorochemicals in oyster, *Crassostrea virginica*, from the Gulf of Mexico and Chesapeake Bay. Prepared for 3M, St. Paul, MN. Cited in OECD, 2002.

Hanson, M., P. Sibley, R. Brain, S. Mabury, and K. Solomon. 2005. Microcosm evaluation of the toxicity and risk to aquatic macrophytes from perfluorooctane sulfonic acids. *Arch. Environm. Contam. Toxicol*. 48: 329-337.

Houde, M., J. Martin, R. Letcher, R. Solomon, and K. Muir. 2006. Biological Monitoring of polyrfluoroalkyl substances, a review. *Environ. Sci. Technol*. 40: 3463-3473

Higgins, C. and R. Luthy. 2006. Modeling sorption of anionic surfactants onto sediment materials, an a priori approach for perfluoroalkyl surfactants and linear alkylobenzene sulfonates. *Environ. Sci. Technol*. 41: 3254-3261.

James A., V. Bonnomet, A. Morin, and B. Fribourg-Blanc. 2009. Implementation of requirements on Priority substances within the Context of the Water Framework Directive. Contract N° 07010401/2008/508122/ADA/D2. Prioritisation process: Monitoring-based ranking., INERIS / IOW: 58.

Jeon, J., K. Kannan, H. Lim, H. Moon, J. Ra, and S. Kim, 2010. Bioaccumulation of Perfluorochemicals in Pacific Oyster under Different Salinity Gradients. *Environ. Sci. Technol*. 44: 2695-2701

Kallenborn R, Berger U, Järnberg U, Dam M, Glesne O, Hedlund B, et al. Perfluorinated alkylated substances (PFAS) in the Nordic environment. Nordic Council of Ministers; 2004.

Kannan, K and Giesy, JP (2002). Global distribution and bioaccumulation of perfluorinated hydrocarbons. Organohalogen Compounds, **59**, 267-270

Nakata, H., Kannan, K., Nasu, T., Cho, H.S., Takemura, A. 2006. Perfluorinated Contamnants in Sediments and Aquatic Organisms Collected from the Shallow Water and Tidal Flat Areas of the Ariake Sea, Japan: Environmental Fate of Perfluorooctane Sulfonate in Aquatic Ecosystems. *Environ. Sci. Technol.* **40**, 4916-4921.

OECD, 2002. Hazard Assessment of Perfluorooctane Sulfonate (PFOS) and its salts. Environment Directorate Joint Meeting of the Chemicals Committee and the Working Party on Chemicals, Pesticides and Biotechnology, ENV/JM/RD(2002)17/FINAL, 21-Nov-2002.

Schrap, S., J.Pijnenburg, and R. Geerding. 2004. Geperfluoreerde verbindingen in Nederlands oppervlaktewater. Lelystad, the Netherlands: RIZA/RIKZ. Report no. RIZA-rapport 2004.025

So M., S. Taniyasu S, P. Lam, G. Zheng, J. Giesy, and N. Yamashita. 2006. Alkaline Digestion and Solid Phase Extraction Method for Perfluorinated Compounds in Mussels and Oysters from South China and Japan. *Archiv. Environ. Contam. Toxicol.* 50:240-248

Theobald, N., Caliebe, C., Gerwinski, W., Huhnerfuss, H., Lepom, P., 2012. Occurrence of perfluorinated organic acids in the North and Baltic Seas. Part 2: distribution in sediments. Environmental science and pollution research international 19, 313-324.

UK EA, 2004. Environmental Risk Evaluation Report: Perluorooctane sulphonate (PFOS). Prepared for the United Kingdom Environment Agency by D. Brooke, A. Footitt and T. Nwaogu, ISBN 978-1-84911-124-9

USEPA, 2011. ECOlogical Structure-Activity Relationship Model (ECOSAR) Class Program, v. 1.1. June 2011.

Yang, S., RF. Xu, F. Wu, S. Wang and B. Zheng. Development of PFOS and PFOA criteria for the protection of freshwater aquatic life in China. *Sci. Total Environment* 470-471: 677-683.

Zairetalabad, P., J.Siemens, M.Hamer, and W. Amelung. 2013. Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) in surface water, sediments, soils and wastewater – A review of on concentrations and distribution coefficients. *Chemosphere* 91 (2013): 725-732.

Appendix B: Vibracore Boring Logs

Attachment B

NORMANDEAU ASSOCIATES™
ENVIRONMENTAL CONSULTANTS

rev:11/08

FIELD DATA SHEET

Project Name:	**Eversource: Seacost Reliability Project**		**Proj. #: 22860.006**
Site Name:	**Little Bay**		**Task #: 05**
City:	**Newington**	**State: NH**	**Date: 09/20/16**

Field Team Leader(s): JBS
Field Team Safety Coordinator: **JBS**
Field Crew: CJR, BJA, AT
Arrival & Departure Times: **12:52-13:05**
Station ID #: **C-1**
Weather: (Clear) Cloudy Rain Other _____
Photos: Y (N) Roll No./Exposure No.: NA
Wind Conditions (Speed/Direction): **5MPH SOUTH**

FIELD DATA

Water Depth: **2.8** ft. Tide: Ebb (Flood) Low Slack High Slack Other _____
PID: **N/A** Redox Potential: **N/A** pH: **N/A** H^2O Temp.: **N/A** Air Temp.: **NA**

SAMPLE/PUSH #1

Core ID#: **C-1** Coring Time: **12:58** Penetration Depth: **51"** Core Recovery: **50"**
Sample Method: Ponar / (Vibracore) / Piston Core / Manual Coring Material: (CAB) / Aluminum / SS Core Diameter (OD): 2" (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

SAMPLE/PUSH #2

Core ID#: _____ Coring Time: _____ Penetration Depth: _____ft. Core Recovery: _____ft
Sample Method: Ponar / Vibracore / Piston Core / Manual Coring Material: CAB / Aluminum / SS Core Diameter (OD): 2" 3" 4"
Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: Y N

SAMPLE/PUSH #3

Core ID#: _____ Coring Time: _____ Penetration Depth: _____ft. Core Recovery: _____ft
Sample Method: Ponar / Vibracore / Piston Core / Manual Coring Material: CAB / Aluminum / SS Core Diameter (OD): 2" 3" 4"
Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: Y N

DGPS DATA

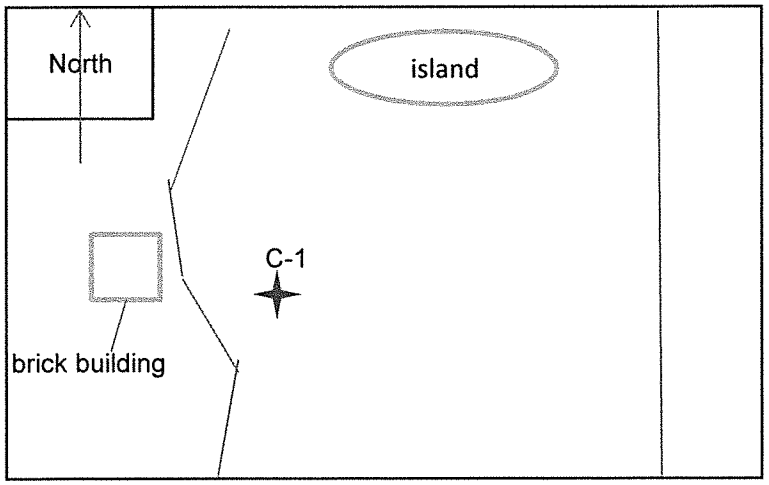
Operator: JBS
File Name: **C-1-1**
Lat / N: **43.10493072**
Lon / E: **70.86884827**
PDOP or SVs: **10**

Coordinate Units: (Lat/Lon) US Survey Feet
Datum: WGS84 (Y) N Other _____
Proj.: N/A
GPS Serial #: 88951-00 Geo XH

COMMENTS / NOTES

Ft. Tube Used=5'

Preparer's Initial: JBS



QC: KCM 11/2/16

Attachment B

NORMANDEAU ASSOCIATES™
ENVIRONMENTAL CONSULTANTS

rev:11/08

FIELD DATA SHEET

Project Name:	**Eversource: Seacost Reliability Project**		**Proj. #: 22860.006**
Site Name:	**Little Bay**		**Task #: 05**
City:	**Newington**	**State: NH**	**Date: 09/20/16**

Field Team Leader(s): JBS
Field Team Safety Coordinator: **JBS**
Field Crew: CJR, BJA, AT
Arrival & Departure Times: **13:10-13:25**
Station ID #: **C-2**
Weather: (Clear) Cloudy Rain Other _____
Photos: Y (N) Roll No./Exposure No.: NA
Wind Conditions (Speed/Direction): **5MPH SOUTH**

FIELD DATA

Water Depth: 3.1 ft. Tide: Ebb (Flood) Low Slack High Slack Other _____
PID: **N/A** Redox Potential: **N/A** pH: **N/A** H^2O Temp.: **N/A** Air Temp.: **NA**

SAMPLE/PUSH #1

Core ID#: **C-2** Coring Time: **13:05** Penetration Depth: **60"** Core Recovery: **59"**
Sample Method: Ponar / (Vibracore) / Piston Core / Manual Coring Material: (CAB) / Aluminum / SS Core Diameter (OD): 2" (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

SAMPLE/PUSH #2

Core ID#: _____ Coring Time: _____ Penetration Depth: _____ft. Core Recovery: _____ft
Sample Method: Ponar / Vibracore / Piston Core / Manual Coring Material: CAB / Aluminum / SS Core Diameter (OD): 2" 3" 4"
Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: Y N

SAMPLE/PUSH #3

Core ID#: _____ Coring Time: _____ Penetration Depth: _____ft. Core Recovery: _____ft
Sample Method: Ponar / Vibracore / Piston Core / Manual Coring Material: CAB / Aluminum / SS Core Diameter (OD): 2" 3" 4"
Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: Y N

DGPS DATA

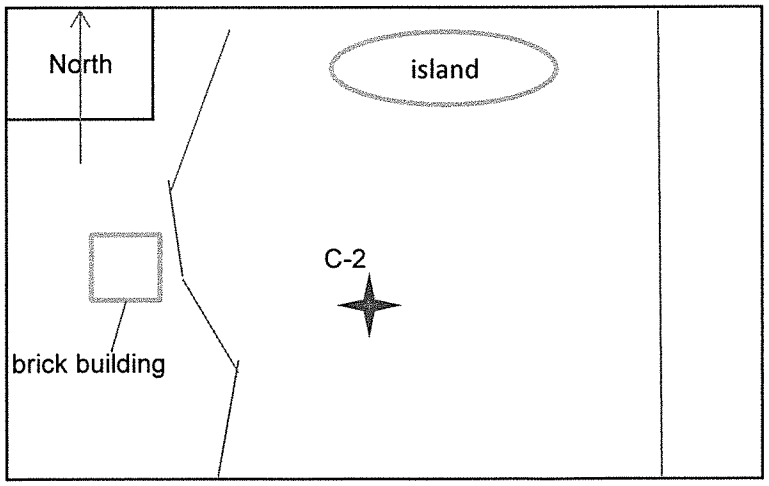
Operator: JBS
File Name: **C-2-1**
(Lat) / Lon N: **43.10425851**
Lon / E: **70.86798955**
PDOP or SVs: **10**

Coordinate Units: (Lat/Lon) US Survey Feet
Datum: WGS84 (Y) N Other _____
Proj.: N/A
GPS Serial #: 88951-00 Geo XH

COMMENTS / NOTES

Ft. Tube Used=5'

Preparer's Initial: JBS



QC'd KCM 11/21/16

Attachment B

NORMANDEAU ASSOCIATES™
ENVIRONMENTAL CONSULTANTS

rev:11/08

FIELD DATA SHEET

Project Name:	**Eversource: Seacost Reliability Project**	**Proj. #: 22860.006**
Site Name:	**Little Bay**	**Task #: 05**
City:	**Newington State: NH**	**Date: 09/20/16**

Field Team Leader(s): JBS
Field Team Safety Coordinator: **JBS**
Field Crew: CJR, BJA, AT
Arrival & Departure Times: **13:30-13:45**
Station ID #: **C-3**
Weather: Clear   Cloudy   Rain   Other ______
Photos: Y   N   Roll No./Exposure No.: NA
Wind Conditions (Speed/Direction): **5-10 MPH SOUTH**

FIELD DATA

Water Depth: **4.0** ft.   Tide: Ebb   Flood   Low Slack   High Slack   Other ______

PID: **N/A**   Redox Potential: **N/A**   pH: **N/A** H^2O Temp.: **N/A**   Air Temp.: **NA**

SAMPLE/PUSH #1

Core ID#: **C-3**   Coring Time: **13:36**   Penetration Depth: **60"**   Core Recovery: **58"**

Sample Method: Ponar / Vibracore / Piston Core / Manual   Coring Material: CAB / Aluminum / SS   Core Diameter (OD): 2" 3" 4"

Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA   Sampling Equipment Deconned or Replaced: Y N

SAMPLE/PUSH #2

Core ID#: ______   Coring Time: ______   Penetration Depth: ______ft.   Core Recovery: ______ft

Sample Method: Ponar / Vibracore / Piston Core / Manual   Coring Material: CAB / Aluminum / SS   Core Diameter (OD): 2" 3" 4"

Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA   Sampling Equipment Deconned or Replaced: Y N

SAMPLE/PUSH #3

Core ID#: ______   Coring Time: ______   Penetration Depth: ______ft.   Core Recovery: ______ft

Sample Method: Ponar / Vibracore / Piston Core / Manual   Coring Material: CAB / Aluminum / SS   Core Diameter (OD): 2" 3" 4"

Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA   Sampling Equipment Deconned or Replaced: Y N

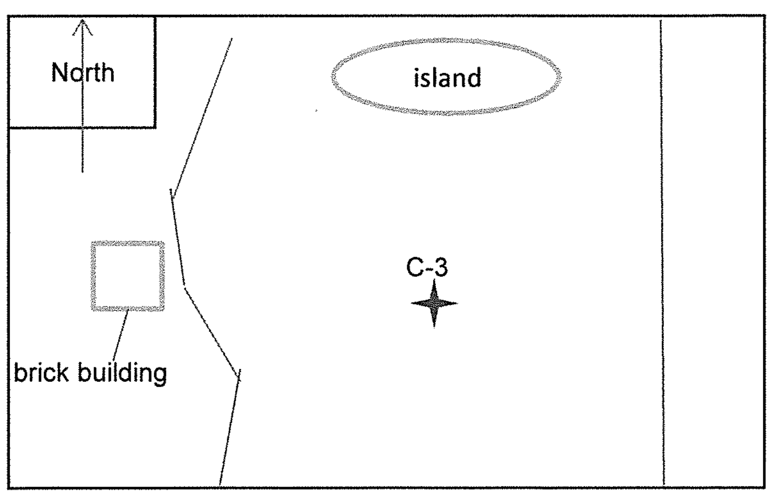
DGPS DATA

Operator: JBS
Coordinate Units: Lat/Lon   US Survey Feet
File Name: **C-3-1**
Datum: WGS84   Y   N   Other ______
Lat / N: **43.10365618**
Proj.: N/A
Lon / E: **70.86676674**
GPS Serial #: 88951-00 Geo XH
PDOP or SVs: 9

COMMENTS / NOTES

Ft. Tube Used=5'

Preparer's Initial: JBS



QC'd Kem

Attachment B

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

rev:11/08

FIELD DATA SHEET

Project Name:	**Eversource: Seacost Reliability Project**		**Proj. #: 22860.006**
Site Name:	**Little Bay**		**Task #: 05**
City:	**Newington**	**State: NH**	**Date: 09/20/16**

Field Team Leader(s): JBS
Field Team Safety Coordinator: **JBS**
Field Crew: CJR, BJA, AT
Arrival & Departure Times: **14:00-14:15**
Station ID #: **C-4**
Weather: (Clear) Cloudy Rain Other _____
Photos: Y (N) Roll No./Exposure No.: NA
Wind Conditions (Speed/Direction): **5-10 MPH SOUTH**

FIELD DATA

Water Depth: **4.1** ft. Tide: Ebb (Flood) Low Slack High Slack Other _____
PID: **N/A** Redox Potential: **N/A** pH: **N/A** H^2O Temp.: **N/A** Air Temp.: **NA**

SAMPLE/PUSH #1

Core ID#: **C-4** Coring Time: **14:03** Penetration Depth: **58"** Core Recovery: **55"**
Sample Method: Ponar (Vibracore) / Piston Core / Manual Coring Material: (CAB) / Aluminum / SS Core Diameter (OD): 2 (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

SAMPLE/PUSH #2

Core ID#: _____ Coring Time: _____ Penetration Depth: _____ft. Core Recovery: _____ft
Sample Method: Ponar / Vibracore / Piston Core / Manual Coring Material: CAB / Aluminum / SS Core Diameter (OD): 2" 3" 4"
Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: Y N

SAMPLE/PUSH #3

Core ID#: _____ Coring Time: _____ Penetration Depth: _____ft. Core Recovery: _____ft
Sample Method: Ponar / Vibracore / Piston Core / Manual Coring Material: CAB / Aluminum / SS Core Diameter (OD): 2" 3" 4"
Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: Y N

DGPS DATA

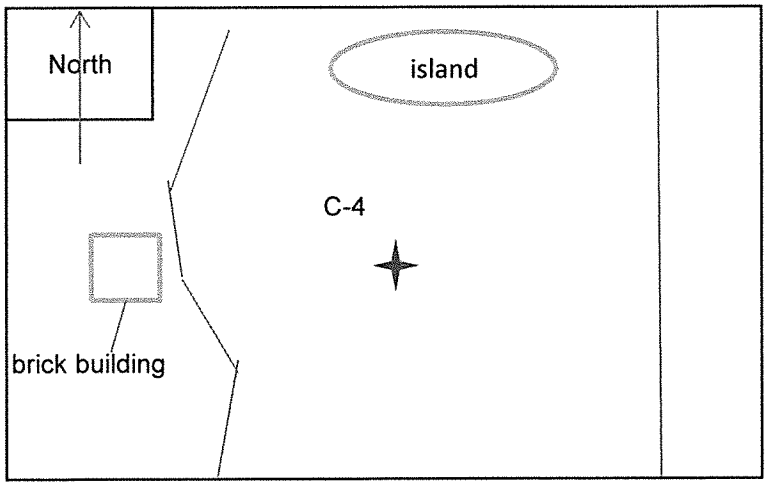
Operator: JBS
File Name: **C-4-1**
Lat / N: **43.10300157**
Lon / E: **70.86564414**
PDOP or SVs: **9**

Coordinate Units: (Lat/Lon) US Survey Feet
Datum: WGS84 (Y) N Other _____
Proj.: N/A
GPS Serial #: 88951-00 Geo XH

COMMENTS / NOTES

Ft. Tube Used=5'

Preparer's Initial: JBS



QC3 KCM 11/21/16

Attachment B

NORMANDEAU ASSOCIATES™
ENVIRONMENTAL CONSULTANTS

rev:11/08

FIELD DATA SHEET

Project Name:	**Eversource: Seacost Reliability Project**		**Proj. #: 22860.006**
Site Name:	**Little Bay**		**Task #: 05**
City:	**Newington**	**State: NH**	**Date: 09/21/16**

Field Team Leader(s): JBS
Field Team Safety Coordinator: **JBS**
Field Crew: CJR, BJA, AT
Arrival & Departure Times: **08:25-08:40**
Station ID #: **C-5**
Weather: **Clear** (circled) Cloudy Rain Other
Photos: Y **N** (circled) Roll No./Exposure No.: NA
Wind Conditions (Speed/Direction): **5-10 MPH WEST**

FIELD DATA

Water Depth: **3.7** ft.
Tide: **Ebb** (circled) Flood Low Slack High Slack Other

PID: **N/A** Redox Potential: **N/A** pH: **N/A** H^2O Temp.: **N/A** Air Temp.: **NA**

SAMPLE/PUSH #1

Core ID#: **C-5** Coring Time: **08:35** Penetration Depth: **55"** Core Recovery: **54"**

Sample Method: Ponar / **Vibracore** (circled) / Piston Core / Manual
Coring Material: **CAB** (circled) / Aluminum / SS
Core Diameter (OD): 2" **3"** (circled) 4"

Vibracore Type: **Rossfelder** (circled) / PVL / Portable Clamp-on / NA
Sampling Equipment Deconned or Replaced: **Y** (circled) N

SAMPLE/PUSH #2

Core ID#: ___ Coring Time: ___ Penetration Depth: ___ft. Core Recovery: ___ft

Sample Method: Ponar / Vibracore / Piston Core / Manual
Coring Material: CAB / Aluminum / SS
Core Diameter (OD): 2" 3" 4"

Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA
Sampling Equipment Deconned or Replaced: Y N

SAMPLE/PUSH #3

Core ID#: ___ Coring Time: ___ Penetration Depth: ___ft. Core Recovery: ___ft

Sample Method: Ponar / Vibracore / Piston Core / Manual
Coring Material: CAB / Aluminum / SS
Core Diameter (OD): 2" 3" 4"

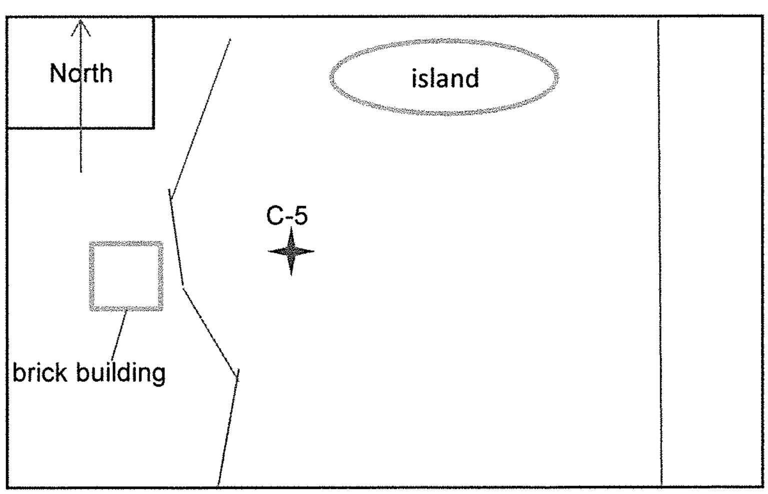
Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA
Sampling Equipment Deconned or Replaced: Y N

(Sample/Push #2 and #3 struck through)

DGPS DATA

Operator: JBS
Coordinate Units: **Lat/Lon** (circled) US Survey Feet
File Name: **C-5-1**
Datum: WGS84 **Y** (circled) N Other
Lat (circled) / N: **43.10232222**
Proj.: N/A
Lon (circled) / E: **70.86451256**
GPS Serial #: 88951-00 Geo XH
PDOP or **SVs** (circled): **9**

COMMENTS / NOTES



Ft. Tube Used=5'

Preparer's Initial: JBS

QCB Kcm
11/21/16

Attachment B

NORMANDEAU ASSOCIATES™
ENVIRONMENTAL CONSULTANTS

rev:11/08

FIELD DATA SHEET

Project Name:	**Eversource: Seacost Reliability Project**		**Proj. #: 22860.006**
Site Name:	**Little Bay**		**Task #: 05**
City:	**Newington**	**State: NH**	**Date: 09/20/16**

Field Team Leader(s): JBS
Field Team Safety Coordinator: **JBS**
Field Crew: CJR, BJA, AT
Arrival & Departure Times: **10:00-11:15**
Station ID #: **C-6**
Weather: (Clear) Cloudy Rain Other _____
Photos: Y (N) Roll No./Exposure No.: NA
Wind Conditions (Speed/Direction): **N/A**

FIELD DATA

Water Depth: **9.4** ft. Tide: (Ebb) Flood Low Slack High Slack Other _____
PID: **N/A** Redox Potential: **N/A** pH: **N/A** H^2O Temp.: **N/A** Air Temp.: **NA**

SAMPLE/PUSH #1

Core ID#: **C-6** Coring Time: **10:10** Penetration Depth: **66"** Core Recovery: **63"**
Sample Method: Ponar (Vibracore) / Piston Core / Manual Coring Material: (CAB) / Aluminum / SS Core Diameter (OD): 2" (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

SAMPLE/PUSH #2

Core ID#: **C-6** Coring Time: **10:35** Penetration Depth: **54"** Core Recovery: **50"**
Sample Method: Ponar (Vibracore) / Piston Core / Manual Coring Material: (CAB) / Aluminum / SS Core Diameter (OD): 2" (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

SAMPLE/PUSH #3

Core ID#: **C-6** Coring Time: **10:52** Penetration Depth: **30"** Core Recovery: **26"**
Sample Method: Ponar (Vibracore) / Piston Core / Manual Coring Material: (CAB) / Aluminum / SS Core Diameter (OD): 2" (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

DGPS DATA

Operator: JBS
File Name: **C-6-1**
(Lat) / N: **43.10173482**
(Lon) / E: **70.86341289**
PDOP or (SVs): **11**

Coordinate Units: (Lat/Lon) US Survey Feet
Datum: WGS84 (Y) N Other _____
Proj.: N/A
GPS Serial #: 88951-00 Geo XH

COMMENTS / NOTES

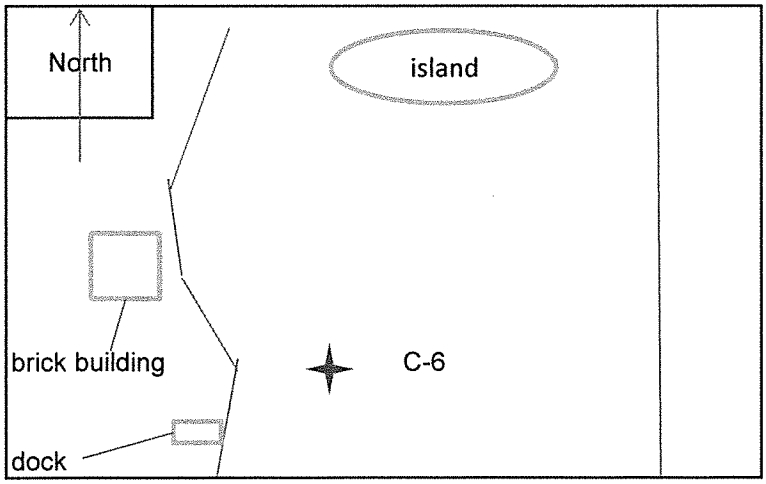
C-6-2 N:43.10174205
W: 70.86338039

C-6-3 N: 43.10168208
W: 70.86340234

Used Push #1 for sample

Ft. Tube Used=9'

Preparer's Initial: JBS



QC'd KCM 11/21/16

Attachment B

NORMANDEAU ASSOCIATES™
ENVIRONMENTAL CONSULTANTS

rev:11/08

FIELD DATA SHEET

Project Name:	**Eversource: Seacost Reliability Project**		**Proj. #: 22860.006**
Site Name:	**Little Bay**		**Task #: 05**
City:	**Newington**	**State: NH**	**Date: 09/20/16**

Field Team Leader(s): JBS
Field Team Safety Coordinator: **JBS**
Field Crew: CJR, BJA, AT
Arrival & Departure Times: **11:55-12:35**
Station ID #: **C-7**
Weather: (Clear) Cloudy Rain Other _____
Photos: Y (N) Roll No./Exposure No.: NA
Wind Conditions (Speed/Direction): **N/A**

FIELD DATA

Water Depth: **20.0** ft. Tide: Ebb (Flood) Low Slack High Slack Other _____
PID: **N/A** Redox Potential: **N/A** pH: **N/A** H^2O Temp.: **N/A** Air Temp.: **NA**

SAMPLE/PUSH #1

Core ID#: **C-7** Coring Time: **12:02** Penetration Depth: **60"** Core Recovery: **55"**
Sample Method: Ponar (Vibracore) / Piston Core / Manual Coring Material: (CAB) / Aluminum / SS Core Diameter (OD): 2 (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

SAMPLE/PUSH #2

Core ID#: **C-7** Coring Time: **12:10** Penetration Depth: **15"** Core Recovery: **12"**
Sample Method: Ponar (Vibracore) / Piston Core / Manual Coring Material: (CAB) / Aluminum / SS Core Diameter (OD): 2 (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

SAMPLE/PUSH #3

Core ID#: **C-7** Coring Time: **12:19** Penetration Depth: **58"** Core Recovery: **54"**
Sample Method: Ponar (Vibracore) / Piston Core / Manual Coring Material: (CAB) / Aluminum / SS Core Diameter (OD): 2 (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

DGPS DATA

Operator: JBS
File Name: **C-7-1**
(Lat) / N: **43.10111579**
Lon / E: **70.86251317**
PDOP or (SVs): **9**

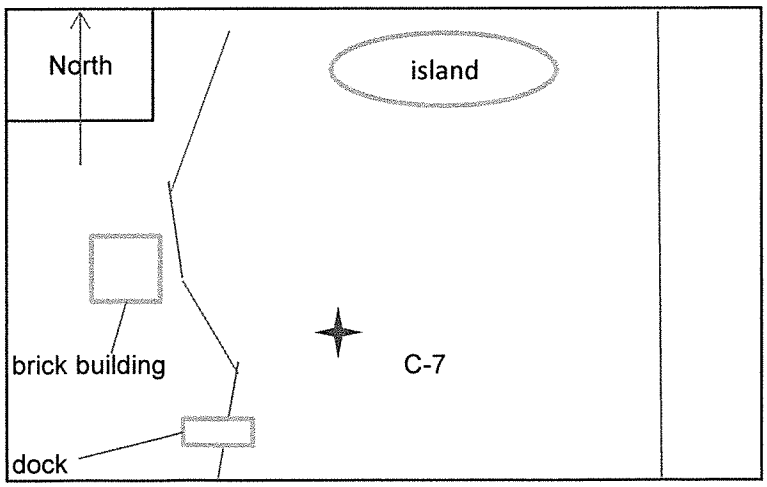
Coordinate Units: (Lat/Lon) US Survey Feet
Datum: WGS84 (Y) N Other _____
Proj.: N/A
GPS Serial #: 88951-00 Geo XH

COMMENTS / NOTES

Saved Push # 1 & 3 for sampling but only used #1 for sampling

Ft. Tube Used=16'

Preparer's Initial: JBS



QC's Kcm 11/21/16

Attachment B

NORMANDEAU ASSOCIATES™
ENVIRONMENTAL CONSULTANTS

rev:11/08

FIELD DATA SHEET

Project Name:	**Eversource: Seacost Reliability Project**		**Proj. #: 22860.006**
Site Name:	**Little Bay**		**Task #: 05**
City:	**Newington**	**State: NH**	**Date: 09/21/16**

Field Team Leader(s): JBS
Field Team Safety Coordinator: **JBS**
Field Crew: CJR, BJA, AT
Arrival & Departure Times: **09:30-10:30**
Station ID #: **C-8**
Weather: (Clear) Cloudy Rain Other _____
Photos: Y (N) Roll No./Exposure No.: NA
Wind Conditions (Speed/Direction): **5-10 MPH WEST**

FIELD DATA

Water Depth: **31.0** ft. Tide: Ebb Flood (Low Slack) High Slack Other _____
PID: **N/A** Redox Potential: **N/A** pH: **N/A** H^2O Temp.: **N/A** Air Temp.: **NA**

SAMPLE/PUSH #1

Core ID#: **C-8** Coring Time: **09:45** Penetration Depth: **0"** Core Recovery: **0"**
Sample Method: Ponar (Vibracore) / Piston Core / Manual Coring Material (CAB) / Aluminum / SS Core Diameter (OD): 2" (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

SAMPLE/PUSH #2

Core ID#: **C-8** Coring Time: **09:55** Penetration Depth: **0"** Core Recovery: **0"**
Sample Method: Ponar (Vibracore) / Piston Core / Manual Coring Material (CAB) / Aluminum / SS Core Diameter (OD): 2" (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

SAMPLE/PUSH #3

Core ID#: **C-8** Coring Time: **10:05** Penetration Depth: **0"** Core Recovery: **0"**
Sample Method: Ponar (Vibracore) / Piston Core / Manual Coring Material (CAB) / Aluminum / SS Core Diameter (OD): 2" (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

DGPS DATA

Operator: JBS
File Name: **C-8-1**
(Lat) / N: **43.10015022**
Lon / E: **70.86068765**
PDOP or SVs: **8**

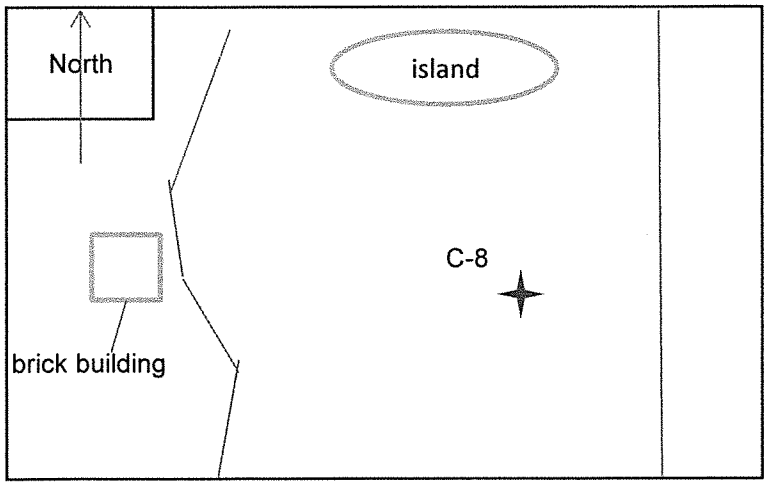
Coordinate Units: (Lat/Lon) US Survey Feet
Datum: WGS84 (Y) N Other _____
Proj.: N/A
GPS Serial #: 88951-00 Geo XH

COMMENTS / NOTES

Push 1 layed over due to hard bottom
Push 2 layed over due to hard bottom
Push 3 layed over due to hard bottom

Ft. Tube Used=24'

Preparer's Initial: JBS



QC'd KCM 11/21/16

Attachment B

NORMANDEAU ASSOCIATES™
ENVIRONMENTAL CONSULTANTS

rev:11/08

FIELD DATA SHEET

Project Name:	**Eversource: Seacost Reliability Project**	**Proj. #: 22860.006**
Site Name:	**Little Bay**	**Task #: 05**
City:	**Newington State: NH**	**Date: 09/21/16**

Field Team Leader(s): JBS
Field Team Safety Coordinator: **JBS**
Field Crew: CJR, BJA, AT
Arrival & Departure Times: **12:45-13:15**
Station ID #: **C-8**
Weather: Clear Cloudy Rain Other
Photos: Y N Roll No./Exposure No.: NA
Wind Conditions (Speed/Direction): **5-10 MPH NW**

FIELD DATA

Water Depth: **33.4** ft. Tide: Ebb Flood Low Slack High Slack Other

PID: **N/A** Redox Potential: **N/A** pH: **N/A** H^2O Temp.: **N/A** Air Temp.: **NA**

SAMPLE/PUSH #4

Core ID#: **C-8** Coring Time: **12:50** Penetration Depth: **12"** Core Recovery: **10"**

Sample Method: Ponar / Vibracore / Piston Core / Manual Coring Material: CAB / Aluminum / SS Core Diameter (OD): 2" 3" 4"

Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: Y N

SAMPLE/PUSH #5

Core ID#: **C-8** Coring Time: **13:00** Penetration Depth: **38"** Core Recovery: **36"**

Sample Method: Ponar / Vibracore / Piston Core / Manual Coring Material: CAB / Aluminum / SS Core Diameter (OD): 2" 3" 4"

Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: Y N

SAMPLE/PUSH #3

Core ID#: Coring Time: Penetration Depth: Core Recovery:

Sample Method: Ponar / Vibracore / Piston Core / Manual Coring Material: CAB / Aluminum / SS Core Diameter (OD): 2" 3" 4"

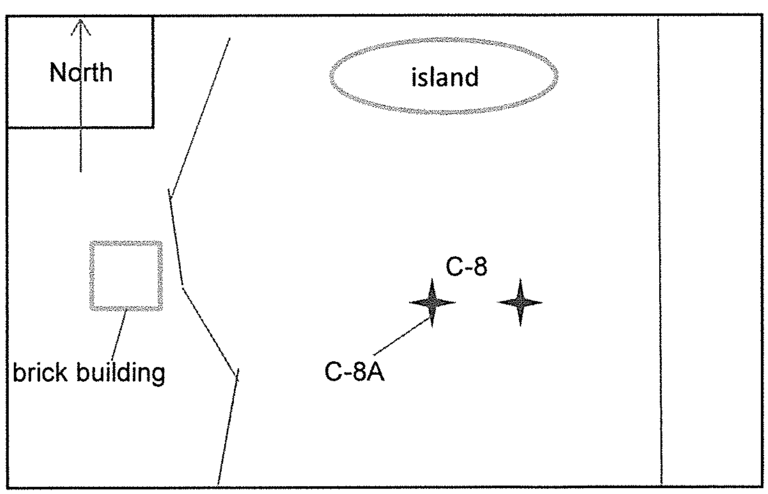
Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: Y N

DGPS DATA

Operator: JBS
Coordinate Units: Lat/Lon US Survey Feet
File Name: **C-8-1a**
Datum: WGS84 Y N Other
Lat / N: **43.10045758**
Proj.: N/A
Lon / E: **70.86138433**
GPS Serial #: 88951-00 Geo XH
PDOP or SVs: **10**

COMMENTS / NOTES

Re-located C-8 per Sarah B.



Ft. Tube Used=16' TOTAL USED AT C-8= 40'

Preparer's Initial: JBS

QC3 RCM 11/21/16

Attachment B

NORMANDEAU ASSOCIATES™
ENVIRONMENTAL CONSULTANTS

rev:11/08

FIELD DATA SHEET

Project Name:	**Eversource: Seacost Reliability Project**		**Proj. #: 22860.006**
Site Name:	**Little Bay**		**Task #: 05**
City:	**Newington**	**State: NH**	**Date: 09/21/16**

Field Team Leader(s): JBS
Field Team Safety Coordinator: **JBS**
Field Crew: CJR, BJA, AT
Arrival & Departure Times: **11:25-11:50**
Station ID #: **C-9**
Weather: (Clear) Cloudy Rain Other _____
Photos: Y (N) Roll No./Exposure No.: NA
Wind Conditions (Speed/Direction): **10-15 MPH WEST**

FIELD DATA

Water Depth: **29.0** ft. Tide: Ebb Flood (Low Slack) High Slack Other _____
PID: **N/A** Redox Potential: **N/A** pH: **N/A** H^2O Temp.: **N/A** Air Temp.: **NA**

SAMPLE/PUSH #1

Core ID#: **C-9** Coring Time: **11:35** Penetration Depth: **0"** Core Recovery: **0"**
Sample Method: Ponar / (Vibracore) / Piston Core / Manual Coring Material (CAB) / Aluminum / SS Core Diameter (OD): 2" (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

SAMPLE/PUSH #2

Core ID#: **C-9** Coring Time: **11:40** Penetration Depth: **0"** Core Recovery: **0"**
Sample Method: Ponar / (Vibracore) / Piston Core / Manual Coring Material (CAB) / Aluminum / SS Core Diameter (OD): 2" (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

SAMPLE/PUSH #3

Core ID#: **C-9** Coring Time: **11:45** Penetration Depth: **15"** Core Recovery: **14"**
Sample Method: Ponar / (Vibracore) / Piston Core / Manual Coring Material (CAB) / Aluminum / SS Core Diameter (OD): 2" (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

DGPS DATA

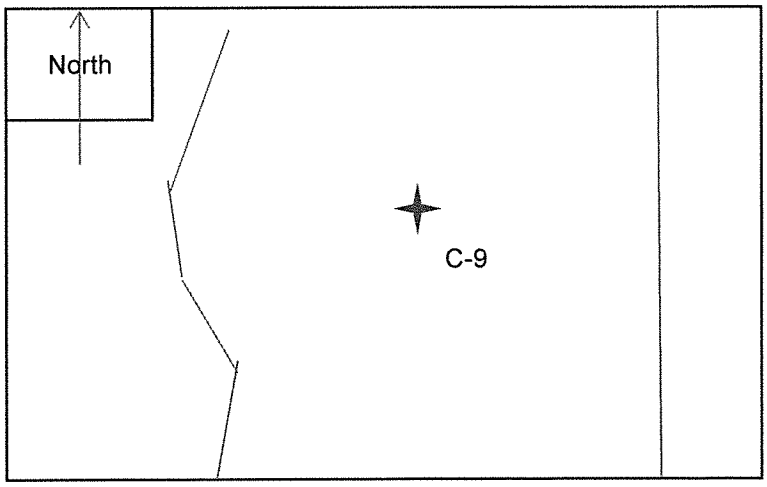
Operator: JBS
File Name: **C-9-1**
(Lat) / N: **43.09932377**
(Lon) / E: **70.85934893**
PDOP or (SVs): **10**

Coordinate Units: (Lat/Lon) US Survey Feet
Datum: WGS84 (Y) N Other _____
Proj.: N/A
GPS Serial #: 88951-00 Geo XH

COMMENTS / NOTES

Ft. Tube Used=8'

Preparer's Initial: JBS



QC's KCM 11/21/16

Attachment B

NORMANDEAU ASSOCIATES™
ENVIRONMENTAL CONSULTANTS

rev:11/08

FIELD DATA SHEET

Project Name:	**Eversource: Seacost Reliability Project**		**Proj. #: 22860.006**
Site Name:	**Little Bay**		**Task #: 05**
City:	**Newington**	**State: NH**	**Date: 09/21/16**

Field Team Leader(s): JBS
Field Team Safety Coordinator: **JBS**
Field Crew: CJR, BJA, AT
Arrival & Departure Times: **12:05-12:27**
Station ID #: **C-10**
Weather: (Clear) Cloudy Rain Other _____
Photos: Y (N) Roll No./Exposure No.: NA
Wind Conditions (Speed/Direction): **10-15 MPH NW**

FIELD DATA

Water Depth: **18.5** ft. Tide: Ebb (Flood) Low Slack High Slack Other _____
PID: **N/A** Redox Potential: **N/A** pH: **N/A** H^2O Temp.: **N/A** Air Temp.: **NA**

SAMPLE/PUSH #4

Core ID#: **C-10** Coring Time: **12:15** Penetration Depth: **14"** Core Recovery: **13"**
Sample Method: Ponar / (Vibracore) / Piston Core / Manual Coring Material: (CAB) / Aluminum / SS Core Diameter (OD): 2" (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

SAMPLE/PUSH #5

Core ID#: **C-10** Coring Time: **12:20** Penetration Depth: **24"** Core Recovery: **23"**
Sample Method: Ponar / (Vibracore) / Piston Core / Manual Coring Material: (CAB) / Aluminum / SS Core Diameter (OD): 2" (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

SAMPLE/PUSH #3

Core ID#: _____ Coring Time: _____ Penetration Depth: _____ Core Recovery: _____
Sample Method: Ponar / Vibracore / Piston Core / Manual Coring Material: CAB / Aluminum / SS Core Diameter (OD): 2" 3" 4"
Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: Y N

DGPS DATA

Operator: JBS
File Name: **C-10-1**
(Lat) / N: **43.09852463**
(Lon) / E: **70.85790776**
PDOP or (SVs): **9**

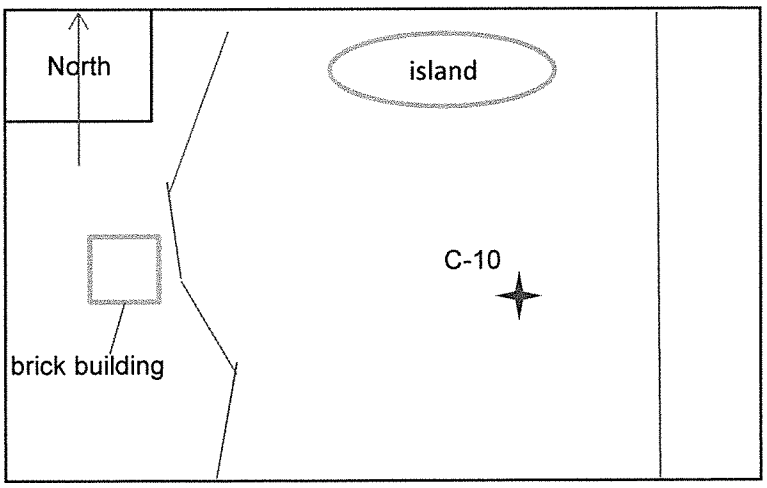
Coordinate Units: (Lat/Lon) US Survey Feet
Datum: WGS84 (Y) N Other _____
Proj.: N/A
GPS Serial #: 88951-00 Geo XH

COMMENTS / NOTES

Hard refusal on both pushes

Ft. Tube Used=8'

Preparer's Initial: JBS



QC3 KCM 11/21/16

Attachment B

NORMANDEAU ASSOCIATES™
ENVIRONMENTAL CONSULTANTS

rev:11/08

FIELD DATA SHEET

Project Name:	**Eversource: Seacost Reliability Project**		**Proj. #: 22860.006**
Site Name:	**Little Bay**		**Task #: 05**
City:	**Newington**	**State: NH**	**Date: 09/21/16**

Field Team Leader(s): JBS
Field Team Safety Coordinator: **JBS**
Field Crew: CJR, BJA, AT
Arrival & Departure Times: **08:56-09:15**
Station ID #: **C-11**
Weather: (Clear) Cloudy Rain Other _____
Photos: Y (N) Roll No./Exposure No.: NA
Wind Conditions (Speed/Direction): **5-10 MPH WEST**

FIELD DATA

Water Depth: **13.5** ft. Tide: (Ebb) Flood Low Slack High Slack Other _____
PID: **N/A** Redox Potential: **N/A** pH: **N/A** H^2O Temp.: **N/A** Air Temp.: **NA**

SAMPLE/PUSH #1

Core ID#: **C-11** Coring Time: **09:03** Penetration Depth: **94"** Core Recovery: **89"**
Sample Method: Ponar / (Vibracore) / Piston Core / Manual Coring Material: (CAB) / Aluminum / SS Core Diameter (OD): 2" (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

SAMPLE/PUSH #2

Core ID#: _____ Coring Time: _____ Penetration Depth: _____ft. Core Recovery: _____ft
Sample Method: Ponar / Vibracore / Piston Core / Manual Coring Material: CAB / Aluminum / SS Core Diameter (OD): 2" 3" 4"
Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: Y N

SAMPLE/PUSH #3

Core ID#: _____ Coring Time: _____ Penetration Depth: _____ft. Core Recovery: _____ft
Sample Method: Ponar / Vibracore / Piston Core / Manual Coring Material: CAB / Aluminum / SS Core Diameter (OD): 2" 3" 4"
Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: Y N

DGPS DATA

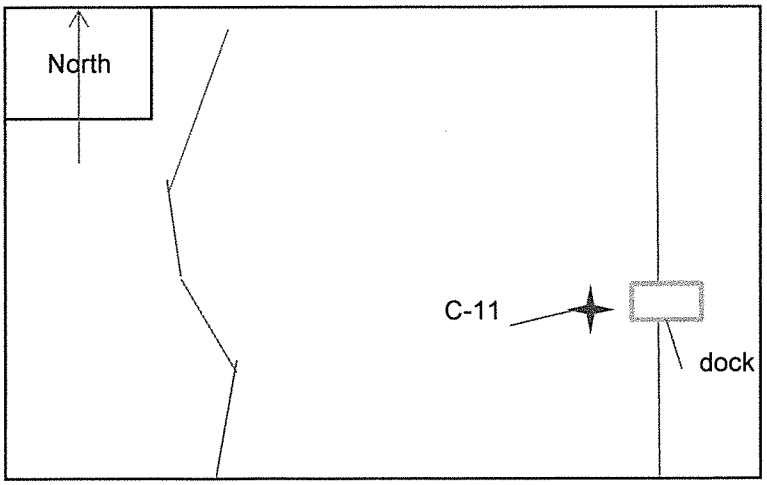
Operator: JBS
File Name: **C-11-1**
Lat / N: **43.09780746**
Lon / E: **70.85660320**
PDOP or SVs: **10**

Coordinate Units: (Lat/Lon) US Survey Feet
Datum: WGS84 (Y) N Other _____
Proj.: N/A
GPS Serial #: 88951-00 Geo XH

COMMENTS / NOTES

Ft. Tube Used=9'

Preparer's Initial: JBS



QC's Rem 11/21/16

Attachment B

NORMANDEAU ASSOCIATES™
ENVIRONMENTAL CONSULTANTS

rev:11/08

FIELD DATA SHEET

Project Name:	**Eversource: Seacost Reliability Project**		**Proj. #: 22860.006**
Site Name:	**Little Bay**		**Task #: 05**
City:	**Newington**	**State: NH**	**Date: 09/21/16**

Field Team Leader(s): JBS
Field Team Safety Coordinator: **JBS**
Field Crew: CJR, BJA, AT
Arrival & Departure Times: **08:41-08:50**
Station ID #: **C-12**
Weather: (Clear) Cloudy Rain Other _____
Photos: Y (N) Roll No./Exposure No.: NA
Wind Conditions (Speed/Direction): **5-10 MPH WEST**

FIELD DATA

Water Depth: **2.6** ft. Tide: (Ebb) Flood Low Slack High Slack Other _____
PID: **N/A** Redox Potential: **N/A** pH: **N/A** H^2O Temp.: **N/A** Air Temp.: **NA**

SAMPLE/PUSH #1

Core ID#: **C-12** Coring Time: **08:44** Penetration Depth: **37"** Core Recovery: **36"**
Sample Method: Ponar / (Vibracore) / Piston Core / Manual Coring Material: (CAB) / Aluminum / SS Core Diameter (OD): 2" (3") 4"
Vibracore Type: (Rossfelder) / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: (Y) N

SAMPLE/PUSH #2

Core ID#: _____ Coring Time: _____ Penetration Depth: _____ft. Core Recovery: _____ft
Sample Method: Ponar / Vibracore / Piston Core / Manual Coring Material: CAB / Aluminum / SS Core Diameter (OD): 2" 3" 4"
Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: Y N

SAMPLE/PUSH #3

Core ID#: _____ Coring Time: _____ Penetration Depth: _____ft. Core Recovery: _____ft
Sample Method: Ponar / Vibracore / Piston Core / Manual Coring Material: CAB / Aluminum / SS Core Diameter (OD): 2" 3" 4"
Vibracore Type: Rossfelder / PVL / Portable Clamp-on / NA Sampling Equipment Deconned or Replaced: Y N

DGPS DATA

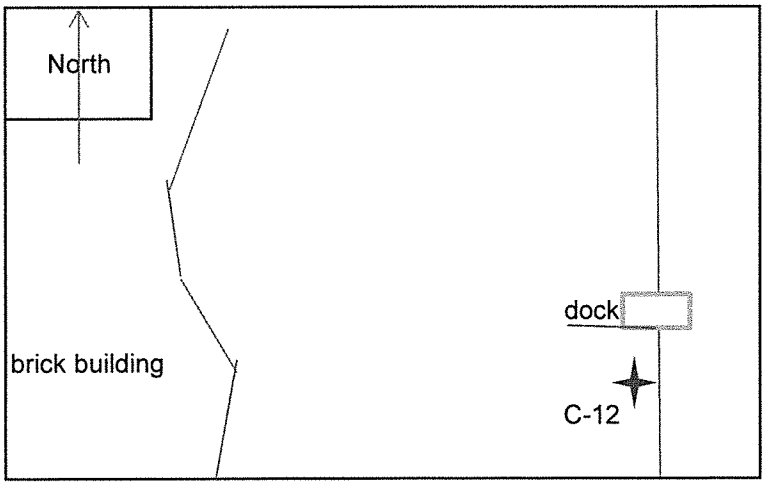
Operator: JBS
File Name: **C-12-1**
(Lat) / N: **43.09762305**
(Lon) / E: **70.85488882**
PDOP or (SVs): **9**

Coordinate Units: (Lat/Lon) US Survey Feet
Datum: WGS84 (Y) N Other _____
Proj.: N/A
GPS Serial #: 88951-00 Geo XH

COMMENTS / NOTES

Ft. Tube Used=5'

Preparer's Initial: JBS



QC's Kcm 11/21/16

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

PROJECT NUMBER:	BORING NUMBER	
22860.006 Task 5	C-1	SHEET _1_ OF _1_

Soil Boring Log

PROJECT : Eversource: Seacoast Reliability Project LOCATION : Newington, NH
ELEVATION : NA DRILLING CONTRACTOR : Normandeau
DRILLING METHOD AND EQUIPMENT USED : Vibracore
WATER LEVELS 2.8 START : 12:52 END : 13:05 LOGGER : JBS

DEPTH BELOW SURFACE (IN)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
0					medium density gley 1 4/10Y medium plasticity wet	some shells in top 12"
12					cohesive uniform throughout	
24					trace sand fine grained	
36					fat clay	
48	4'	50"				

NAI-Boring Log Form-6/05

QC's Rem 11/21/16

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

PROJECT NUMBER:	BORING NUMBER	
22860.006 Task 5	C-2	SHEET _1_ OF _1_

Soil Boring Log

PROJECT : Eversource: Seacoast Reliability Project — LOCATION : Newington, NH
ELEVATION : NA — DRILLING CONTRACTOR : Normandeau
DRILLING METHOD AND EQUIPMENT USED : Vibracore
WATER LEVELS 3.1 — START : 13:10 — END : 13:25 — LOGGER : JBS

DEPTH BELOW SURFACE (IN)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
0					stiff density gley 1 4/10Y high plasticity wet	some shells in top 12"
12					cohesive uniform throughout	
24					trace sand fine grained	
36					fat clay	
48	4'	59"				

NAI-Boring Log Form-6/05

QC'd Kcm 11/21/16

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

PROJECT NUMBER:	BORING NUMBER	
22860.006 Task 5	C-3	SHEET _1_ OF _1_

Soil Boring Log

PROJECT : Eversource: Seacoast Reliability Project — LOCATION : Newington, NH

ELEVATION : NA — DRILLING CONTRACTOR : Normandeau

DRILLING METHOD AND EQUIPMENT USED : Vibracore

WATER LEVELS 4 — START : 13:30 — END : 13:45 — LOGGER : JBS

DEPTH BELOW SURFACE (IN)	INTERVAL (FT)	RECOVERY (IN) #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
0				stiff density gley 1 4/10Y high plasticity wet	some shells in top 12"
12				cohesive uniform throughout	
24				trace sand fine grained	
36				fat clay	
48	4'	58"			

NAI-Boring Log Form-6/05

QC'd KCM 11/21/16

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

PROJECT NUMBER:	BORING NUMBER	
22860.006 Task 5	C-4	SHEET _1_ OF _1_

Soil Boring Log

PROJECT : Eversource: Seacoast Reliability Project LOCATION : Newington, NH
ELEVATION : NA DRILLING CONTRACTOR : Normandeau
DRILLING METHOD AND EQUIPMENT USED : Vibracore
WATER LEVELS 4.1 START : 14:00 END : 14:15 LOGGER : JBS

DEPTH BELOW SURFACE (IN)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
0					stiff density gley 1 4/10Y high plasticity wet	some shells in top 12"
12					cohesive uniform throughout	
24					trace sand fine grained	
36					fat clay	
48	4'	55"				

NAI-Boring Log Form-6/05

QC3 Kcm 11/21/16

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

PROJECT NUMBER:	BORING NUMBER	
22860.006 Task 5	C-5	SHEET _1_ OF _1_

Soil Boring Log

PROJECT : Eversource: Seacoast Reliability Project LOCATION : Newington, NH

ELEVATION : NA DRILLING CONTRACTOR : Normandeau

DRILLING METHOD AND EQUIPMENT USED : Vibracore

WATER LEVELS 3.7 START : 8:25 END : 08:40 LOGGER : JBS

DEPTH BELOW SURFACE (IN)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
0					stiff density gley 1 4/10Y medium plasticity wet	some shells in top 12"
12					cohesive uniform throughout	
24					trace sand fine grained	
36					fat clay	
48	4'	54"				

NAI-Boring Log Form-6/05

QC: KCM 11/21/16

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

PROJECT NUMBER:	BORING NUMBER	
22860.006 Task 5	C-6	SHEET _1_ OF _1_

Soil Boring Log

PROJECT : Eversource: Seacoast Reliability Project — LOCATION : Newington, NH
ELEVATION : NA — DRILLING CONTRACTOR : Normandeau
DRILLING METHOD AND EQUIPMENT USED : Vibracore
WATER LEVELS 9.4 — START : 10:00 — END : 11:15 — LOGGER : JBS

DEPTH BELOW SURFACE (IN)	INTERVAL (FT)	RECOVERY (IN) #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
0				stiff density gley 1 4/10Y high plasticity wet	some shells in top 12"
12				cohesive uniform throughout	
24				trace sand fine grained	
36				fat clay	
48					
				SAME AS ABOVE	
63		63"			

NAI-Boring Log Form-6/05

QC 8 Ken 11/21/16

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

PROJECT NUMBER:	BORING NUMBER	
22860.006 Task 5	C-7	SHEET _1_ OF _1_

Soil Boring Log

PROJECT : Eversource: Seacoast Reliability Project LOCATION : Newington, NH
ELEVATION : NA DRILLING CONTRACTOR : Normandeau
DRILLING METHOD AND EQUIPMENT USED : Vibracore
WATER LEVELS 20 START : 11:55 END : 12:35 LOGGER : JBS

DEPTH BELOW SURFACE (IN)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
0					medium density gley 1 4/10Y low plasticity wet, cohesive uniform fat clay w/ sand	some shells in top 12"
12					stiff density gley 1 4/10Y high plasticity wet cohesive uniform throughout fine grained fat clay	
54		54				

QC's KCM 11/21/16

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

PROJECT NUMBER:	BORING NUMBER	
22860.006 Task 5	C-8	SHEET _1_ OF _1_

Soil Boring Log

PROJECT : Eversource: Seacoast Reliability Project LOCATION : Newington, NH
ELEVATION : NA DRILLING CONTRACTOR : Normandeau
DRILLING METHOD AND EQUIPMENT USED : Vibracore
WATER LEVELS 33.4 START : 12:45 END : 13:15 LOGGER : JBS

DEPTH BELOW SURFACE (IN)	INTERVAL (FT)	RECOVERY (IN) #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
0				stiff density gley 1 2.5/N fine sand non plastic wet non-cohesive uniform fine sand	some shells in top 6"
19					
				stiff density gley 1 4/10Y high plasticity wet cohesive uniform fat clay	
36		36"			

NAI-Boring Log Form-6/05

QC's kem 11/21/16

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

PROJECT NUMBER:	BORING NUMBER	
22860.006 Task 5	C-9	SHEET _1_ OF _1_

Soil Boring Log

PROJECT : Eversource: Seacoast Reliability Project LOCATION : Newington, NH
ELEVATION : NA DRILLING CONTRACTOR : Normandeau
DRILLING METHOD AND EQUIPMENT USED : Vibracore
WATER LEVELS 29 START : 11:25 END : 11:50 LOGGER : JBS

DEPTH BELOW SURFACE (IN)	INTERVAL (FT)	RECOVERY (IN) #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
0				stiff density gley 1 2.5/N medium sand non plastic wet non-cohesive	
9				stiff density gley 1 5/N low plasticity wet cohesive uniform fat clay w/sand	
14		14"			

NAI-Boring Log Form-6/05

QC3 KCM 11/21/16

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

PROJECT NUMBER:	BORING NUMBER	
22860.006 Task 5	C-10	SHEET _1_ OF _1_

Soil Boring Log

PROJECT : Eversource: Seacoast Reliability Project LOCATION : Newington, NH

ELEVATION : NA DRILLING CONTRACTOR : Normandeau

DRILLING METHOD AND EQUIPMENT USED : Vibracore

WATER LEVELS 18.5 START : 12:05 END : 12:27 LOGGER : JBS

DEPTH BELOW SURFACE (IN)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
0					stiff density fine sand gley 1 3/10Y non plastic wet non-cohesive uniform	
23		23"				

NAI-Boring Log Form-6/05

QC's Kcm 11/21/16

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

PROJECT NUMBER:	BORING NUMBER	
22860.006 Task 5	C-11	SHEET _1_ OF _1_

Soil Boring Log

PROJECT : Eversource: Seacoast Reliability Project LOCATION : Newington, NH
ELEVATION : NA DRILLING CONTRACTOR : Normandeau
DRILLING METHOD AND EQUIPMENT USED : Vibracore
WATER LEVELS 13.5 START : 8:56 END : 09:15 LOGGER : JBS

DEPTH BELOW SURFACE (IN)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
0					soft density gley 1 4/10Y low plasticity wet cohesive	some shells top 12"
14					silt w/ sand	
					stiff density gley 1 4/10Y high plasticity wet cohesive uniform fat clay	
89		89"				

NAI-Boring Log Form-6/05

QC'd KLM 11/21/16

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

PROJECT NUMBER:	BORING NUMBER	
22860.006 Task 5	C-12	SHEET _1_ OF _1_

Soil Boring Log

PROJECT : Eversource: Seacoast Reliability Project LOCATION : Newington, NH

ELEVATION : NA DRILLING CONTRACTOR : Normandeau

DRILLING METHOD AND EQUIPMENT USED : Vibracore

WATER LEVELS 2.6 START : 8:41 END : 08:50 LOGGER : JBS

DEPTH BELOW SURFACE (IN)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION.
0						some shells top 12"
					very stiff density gley 1 4/10Y wet medium plasticity cohesive uniform fat clay w/ sand	
36		36"				

NAI-Boring Log Form-6/05

QC's Kcm 11/21/16

Appendix C: Analytical Results

ANALYTICAL REPORT

Lab Number:	L1629727
Client:	Normandeau Associates 25 Nashua Rd. Bedford, NH 03110
ATTN:	Ann Pembroke
Phone:	(603) 637-1169
Project Name:	SRP
Project Number:	23840.003
Report Date:	10/27/16

Certifications & Approvals: NY (11627), CT (PH-0141), NH (2206), NJ NELAP (MA015), RI (LAO00299), ME (MA00030), PA (68-02089), VA (460194), LA NELAP (03090), FL (E87814), TX (T104704419), WA (C954), USFWS (Permit #LE2069641), USDA (Permit #P330-11-00109), US Army Corps of Engineers.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1629727-01	C-6 (0-48)	SEDIMENT	LITTLE BAY	09/20/16 10:10	09/20/16
L1629727-02	C-7 (0-48)	SEDIMENT	LITTLE BAY	09/20/16 12:02	09/20/16
L1629727-03	C-1	SEDIMENT	LITTLE BAY	09/20/16 12:58	09/20/16
L1629727-04	C-2	SEDIMENT	LITTLE BAY	09/20/16 13:05	09/20/16
L1629727-05	C-3	SEDIMENT	LITTLE BAY	09/20/16 13:36	09/20/16
L1629727-06	C-4	SEDIMENT	LITTLE BAY	09/20/16 14:05	09/20/16
L1629727-07	C-6 (48-61)	SEDIMENT	LITTLE BAY	09/20/16 10:10	09/20/16
L1629727-08	C-7 (48-54)	SEDIMENT	LITTLE BAY	09/20/16 12:02	09/20/16
L1629727-09	C-5	SEDIMENT	LITTLE BAY	09/21/16 08:35	09/21/16
L1629727-10	C-8	SEDIMENT	LITTLE BAY	09/21/16 13:00	09/21/16
L1629727-11	C-9	SEDIMENT	LITTLE BAY	09/21/16 11:45	09/21/16
L1629727-12	C-10	SEDIMENT	LITTLE BAY	09/21/16 12:20	09/21/16
L1629727-13	C-11 (0-48)	SEDIMENT	LITTLE BAY	09/21/16 09:03	09/21/16
L1629727-14	C-12	SEDIMENT	LITTLE BAY	09/21/16 08:44	09/21/16
L1629727-15	C-11 (48-89)	SEDIMENT	LITTLE BAY	09/21/16 09:03	09/21/16

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: SRP **Lab Number:** L1629727
Project Number: 23840.003 **Report Date:** 10/27/16

Case Narrative (continued)

Report Reissue

This report replaces the report issued on October 25, 2016. The project name has been revised.

Report Submission

The analysis of Dioxin by 1631B was subcontracted to Cape Fear Analytical in Wilmington NC. A copy of the laboratory report is included as an addendum.

The analysis of PFOA/PFOS was subcontracted to Vista Analytical Lab, El Dorado Hills, CA. A copy of the laboratory report is included as an addendum.

Please note: The subcontracted data is only available in PDF format and is not available electronically.

Semivolatile Organics

The WG937275-4 SRM recoveries, are outside the acceptance criteria for CL6-BZ#128 (164%).
The WG937275-6/-7 MS/MSD recoveries, performed on L1629727-01, are outside the acceptance criteria for Naphthalene (39%/40%), Acenaphthylene (42%/43%), Acenaphthene (45%/45%), Fluorene (47%/47%), Phenanthrene (49%/49%), Anthracene (45%/46%), Fluoranthene (50% MS only), Pyrene (48%/48%) and CL3-BZ#18 (49%/49%).

Petroleum Hydrocarbon Quantitation

WG938023-1: A Matrix Spike and Matrix Spike Duplicate were prepared with the sample batch, however, the native sample was not available for reporting; therefore, the matrix spike and Matrix Spike Duplicate results could not be reported.

Total Organic Carbon

The WG940886-4/-5 MS/MSD RPD for Total Organic Carbon (Rep2) (47%), performed on L1629727-01, is above the acceptance criteria.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Elizabeth Porta

Title: Technical Director/Representative Date: 10/27/16

ORGANICS

SEMIVOLATILES

Project Name: SRP **Lab Number:** L1629727

Project Number: 23840.003 **Report Date:** 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-01
Client ID: C-6 (0-48)
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 10/24/16 15:55
Analyst: MS
Percent Solids: 68%

Date Collected: 09/20/16 10:10
Date Received: 09/20/16
Field Prep: Not Specified
Extraction Method: EPA 3570
Extraction Date: 09/29/16 18:28
Cleanup Method: EPA 3630
Cleanup Date: 10/09/16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	7.37	--	1
Acenaphthylene	ND		ug/kg	7.37	--	1
Acenaphthene	ND		ug/kg	7.37	--	1
Fluorene	ND		ug/kg	7.37	--	1
Phenanthrene	ND		ug/kg	7.37	--	1
Anthracene	ND		ug/kg	7.37	--	1
Fluoranthene	ND		ug/kg	7.37	--	1
Pyrene	ND		ug/kg	7.37	--	1
Benz(a)anthracene	ND		ug/kg	7.37	--	1
Chrysene	ND		ug/kg	7.37	--	1
Benzo(b)fluoranthene	ND		ug/kg	7.37	--	1
Benzo(k)fluoranthene	ND		ug/kg	7.37	--	1
Benzo(a)pyrene	ND		ug/kg	7.37	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	7.37	--	1
Dibenz(a,h)anthracene	ND		ug/kg	7.37	--	1
Benzo(ghi)perylene	ND		ug/kg	7.37	--	1
Cl2-BZ#8	ND		ug/kg	0.737	--	1
Cl3-BZ#18	ND		ug/kg	0.737	--	1
Cl3-BZ#28	ND		ug/kg	0.737	--	1
Cl4-BZ#44	ND		ug/kg	0.737	--	1
Cl4-BZ#49	ND		ug/kg	0.737	--	1
Cl4-BZ#52	ND		ug/kg	0.737	--	1
Cl4-BZ#66	ND		ug/kg	0.737	--	1
Cl5-BZ#87	ND		ug/kg	0.737	--	1
Cl5-BZ#101	ND		ug/kg	0.737	--	1
Cl5-BZ#105	ND		ug/kg	0.737	--	1
Cl5-BZ#118	ND		ug/kg	0.737	--	1
Cl6-BZ#128	ND		ug/kg	0.737	--	1
Cl6-BZ#138	ND		ug/kg	0.737	--	1
Cl6-BZ#153	ND		ug/kg	0.737	--	1

Project Name: SRP **Lab Number:** L1629727

Project Number: 23840.003 **Report Date:** 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-01 Date Collected: 09/20/16 10:10

Client ID: C-6 (0-48) Date Received: 09/20/16

Sample Location: LITTLE BAY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl7-BZ#170	ND		ug/kg	0.737	--	1
Cl7-BZ#180	ND		ug/kg	0.737	--	1
Cl7-BZ#183	ND		ug/kg	0.737	--	1
Cl7-BZ#184	ND		ug/kg	0.737	--	1
Cl7-BZ#187	ND		ug/kg	0.737	--	1
Cl8-BZ#195	ND		ug/kg	0.737	--	1
Cl9-BZ#206	ND		ug/kg	0.737	--	1
Cl10-BZ#209	ND		ug/kg	0.737	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	47		30-150
Pyrene-d10	54		30-150
Benzo(b)fluoranthene-d12	56		30-150
DBOB	58		30-150
BZ 198	61		30-150

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-02
Client ID: C-7 (0-48)
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 10/24/16 17:57
Analyst: MS
Percent Solids: 72%

Date Collected: 09/20/16 12:02
Date Received: 09/20/16
Field Prep: Not Specified
Extraction Method: EPA 3570
Extraction Date: 09/29/16 18:28
Cleanup Method: EPA 3630
Cleanup Date: 10/09/16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	6.51	--	1
Acenaphthylene	ND		ug/kg	6.51	--	1
Acenaphthene	ND		ug/kg	6.51	--	1
Fluorene	ND		ug/kg	6.51	--	1
Phenanthrene	6.97		ug/kg	6.51	--	1
Anthracene	ND		ug/kg	6.51	--	1
Fluoranthene	18.9		ug/kg	6.51	--	1
Pyrene	17.9		ug/kg	6.51	--	1
Benz(a)anthracene	17.2		ug/kg	6.51	--	1
Chrysene	15.5		ug/kg	6.51	--	1
Benzo(b)fluoranthene	10.8		ug/kg	6.51	--	1
Benzo(k)fluoranthene	12.6		ug/kg	6.51	--	1
Benzo(a)pyrene	15.3		ug/kg	6.51	--	1
Indeno(1,2,3-cd)Pyrene	7.44		ug/kg	6.51	--	1
Dibenz(a,h)anthracene	ND		ug/kg	6.51	--	1
Benzo(ghi)perylene	6.67		ug/kg	6.51	--	1
Cl2-BZ#8	ND		ug/kg	0.651	--	1
Cl3-BZ#18	ND		ug/kg	0.651	--	1
Cl3-BZ#28	ND		ug/kg	0.651	--	1
Cl4-BZ#44	ND		ug/kg	0.651	--	1
Cl4-BZ#49	ND		ug/kg	0.651	--	1
Cl4-BZ#52	ND		ug/kg	0.651	--	1
Cl4-BZ#66	ND		ug/kg	0.651	--	1
Cl5-BZ#87	ND		ug/kg	0.651	--	1
Cl5-BZ#101	ND		ug/kg	0.651	--	1
Cl5-BZ#105	ND		ug/kg	0.651	--	1
Cl5-BZ#118	ND		ug/kg	0.651	--	1
Cl6-BZ#128	ND		ug/kg	0.651	--	1
Cl6-BZ#138	ND		ug/kg	0.651	--	1
Cl6-BZ#153	ND		ug/kg	0.651	--	1

Project Name: SRP **Lab Number:** L1629727

Project Number: 23840.003 **Report Date:** 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-02 Date Collected: 09/20/16 12:02

Client ID: C-7 (0-48) Date Received: 09/20/16

Sample Location: LITTLE BAY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl7-BZ#170	ND		ug/kg	0.651	--	1
Cl7-BZ#180	ND		ug/kg	0.651	--	1
Cl7-BZ#183	ND		ug/kg	0.651	--	1
Cl7-BZ#184	ND		ug/kg	0.651	--	1
Cl7-BZ#187	ND		ug/kg	0.651	--	1
Cl8-BZ#195	ND		ug/kg	0.651	--	1
Cl9-BZ#206	ND		ug/kg	0.651	--	1
Cl10-BZ#209	ND		ug/kg	0.651	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	48		30-150
Pyrene-d10	60		30-150
Benzo(b)fluoranthene-d12	63		30-150
DBOB	60		30-150
BZ 198	63		30-150

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-03
Client ID: C-1
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 10/24/16 18:27
Analyst: MS
Percent Solids: 59%

Date Collected: 09/20/16 12:58
Date Received: 09/20/16
Field Prep: Not Specified
Extraction Method: EPA 3570
Extraction Date: 09/29/16 18:28
Cleanup Method: EPA 3630
Cleanup Date: 10/09/16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	8.37	--	1
Acenaphthylene	ND		ug/kg	8.37	--	1
Acenaphthene	ND		ug/kg	8.37	--	1
Fluorene	ND		ug/kg	8.37	--	1
Phenanthrene	8.40		ug/kg	8.37	--	1
Anthracene	ND		ug/kg	8.37	--	1
Fluoranthene	17.4		ug/kg	8.37	--	1
Pyrene	16.4		ug/kg	8.37	--	1
Benz(a)anthracene	9.65		ug/kg	8.37	--	1
Chrysene	9.46		ug/kg	8.37	--	1
Benzo(b)fluoranthene	11.6		ug/kg	8.37	--	1
Benzo(k)fluoranthene	10.2		ug/kg	8.37	--	1
Benzo(a)pyrene	11.6		ug/kg	8.37	--	1
Indeno(1,2,3-cd)Pyrene	9.30		ug/kg	8.37	--	1
Dibenz(a,h)anthracene	ND		ug/kg	8.37	--	1
Benzo(ghi)perylene	9.20		ug/kg	8.37	--	1
Cl2-BZ#8	ND		ug/kg	0.837	--	1
Cl3-BZ#18	ND		ug/kg	0.837	--	1
Cl3-BZ#28	ND		ug/kg	0.837	--	1
Cl4-BZ#44	ND		ug/kg	0.837	--	1
Cl4-BZ#49	ND		ug/kg	0.837	--	1
Cl4-BZ#52	ND		ug/kg	0.837	--	1
Cl4-BZ#66	ND		ug/kg	0.837	--	1
Cl5-BZ#87	ND		ug/kg	0.837	--	1
Cl5-BZ#101	ND		ug/kg	0.837	--	1
Cl5-BZ#105	ND		ug/kg	0.837	--	1
Cl5-BZ#118	ND		ug/kg	0.837	--	1
Cl6-BZ#128	ND		ug/kg	0.837	--	1
Cl6-BZ#138	ND		ug/kg	0.837	--	1
Cl6-BZ#153	ND		ug/kg	0.837	--	1

Project Name: SRP **Lab Number:** L1629727

Project Number: 23840.003 **Report Date:** 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-03 Date Collected: 09/20/16 12:58

Client ID: C-1 Date Received: 09/20/16

Sample Location: LITTLE BAY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl7-BZ#170	ND		ug/kg	0.837	--	1
Cl7-BZ#180	ND		ug/kg	0.837	--	1
Cl7-BZ#183	ND		ug/kg	0.837	--	1
Cl7-BZ#184	ND		ug/kg	0.837	--	1
Cl7-BZ#187	ND		ug/kg	0.837	--	1
Cl8-BZ#195	ND		ug/kg	0.837	--	1
Cl9-BZ#206	ND		ug/kg	0.837	--	1
Cl10-BZ#209	ND		ug/kg	0.837	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	35		30-150
Pyrene-d10	46		30-150
Benzo(b)fluoranthene-d12	48		30-150
DBOB	46		30-150
BZ 198	45		30-150

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-04
Client ID: C-2
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 10/24/16 18:57
Analyst: MS
Percent Solids: 61%

Date Collected: 09/20/16 13:05
Date Received: 09/20/16
Field Prep: Not Specified
Extraction Method: EPA 3570
Extraction Date: 09/29/16 18:28
Cleanup Method: EPA 3630
Cleanup Date: 10/09/16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	7.88	--	1
Acenaphthylene	ND		ug/kg	7.88	--	1
Acenaphthene	ND		ug/kg	7.88	--	1
Fluorene	ND		ug/kg	7.88	--	1
Phenanthrene	ND		ug/kg	7.88	--	1
Anthracene	ND		ug/kg	7.88	--	1
Fluoranthene	10.4		ug/kg	7.88	--	1
Pyrene	11.7		ug/kg	7.88	--	1
Benz(a)anthracene	ND		ug/kg	7.88	--	1
Chrysene	ND		ug/kg	7.88	--	1
Benzo(b)fluoranthene	ND		ug/kg	7.88	--	1
Benzo(k)fluoranthene	ND		ug/kg	7.88	--	1
Benzo(a)pyrene	ND		ug/kg	7.88	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	7.88	--	1
Dibenz(a,h)anthracene	ND		ug/kg	7.88	--	1
Benzo(ghi)perylene	ND		ug/kg	7.88	--	1
Cl2-BZ#8	ND		ug/kg	0.788	--	1
Cl3-BZ#18	ND		ug/kg	0.788	--	1
Cl3-BZ#28	ND		ug/kg	0.788	--	1
Cl4-BZ#44	ND		ug/kg	0.788	--	1
Cl4-BZ#49	ND		ug/kg	0.788	--	1
Cl4-BZ#52	ND		ug/kg	0.788	--	1
Cl4-BZ#66	ND		ug/kg	0.788	--	1
Cl5-BZ#87	ND		ug/kg	0.788	--	1
Cl5-BZ#101	ND		ug/kg	0.788	--	1
Cl5-BZ#105	ND		ug/kg	0.788	--	1
Cl5-BZ#118	ND		ug/kg	0.788	--	1
Cl6-BZ#128	ND		ug/kg	0.788	--	1
Cl6-BZ#138	ND		ug/kg	0.788	--	1
Cl6-BZ#153	ND		ug/kg	0.788	--	1

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-04
Client ID: C-2
Sample Location: LITTLE BAY
Date Collected: 09/20/16 13:05
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl7-BZ#170	ND		ug/kg	0.788	--	1
Cl7-BZ#180	ND		ug/kg	0.788	--	1
Cl7-BZ#183	ND		ug/kg	0.788	--	1
Cl7-BZ#184	ND		ug/kg	0.788	--	1
Cl7-BZ#187	ND		ug/kg	0.788	--	1
Cl8-BZ#195	ND		ug/kg	0.788	--	1
Cl9-BZ#206	ND		ug/kg	0.788	--	1
Cl10-BZ#209	ND		ug/kg	0.788	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	45		30-150
Pyrene-d10	54		30-150
Benzo(b)fluoranthene-d12	57		30-150
DBOB	54		30-150
BZ 198	56		30-150

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-05
Client ID: C-3
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 10/24/16 19:27
Analyst: MS
Percent Solids: 63%

Date Collected: 09/20/16 13:36
Date Received: 09/20/16
Field Prep: Not Specified
Extraction Method: EPA 3570
Extraction Date: 09/29/16 18:28
Cleanup Method: EPA 3630
Cleanup Date: 10/09/16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	7.63	--	1
Acenaphthylene	ND		ug/kg	7.63	--	1
Acenaphthene	18.4		ug/kg	7.63	--	1
Fluorene	ND		ug/kg	7.63	--	1
Phenanthrene	13.5		ug/kg	7.63	--	1
Anthracene	9.28		ug/kg	7.63	--	1
Fluoranthene	39.4		ug/kg	7.63	--	1
Pyrene	36.6		ug/kg	7.63	--	1
Benz(a)anthracene	19.8		ug/kg	7.63	--	1
Chrysene	21.4		ug/kg	7.63	--	1
Benzo(b)fluoranthene	22.6		ug/kg	7.63	--	1
Benzo(k)fluoranthene	20.2		ug/kg	7.63	--	1
Benzo(a)pyrene	23.4		ug/kg	7.63	--	1
Indeno(1,2,3-cd)Pyrene	16.5		ug/kg	7.63	--	1
Dibenz(a,h)anthracene	ND		ug/kg	7.63	--	1
Benzo(ghi)perylene	16.0		ug/kg	7.63	--	1
Cl2-BZ#8	ND		ug/kg	0.763	--	1
Cl3-BZ#18	ND		ug/kg	0.763	--	1
Cl3-BZ#28	ND		ug/kg	0.763	--	1
Cl4-BZ#44	ND		ug/kg	0.763	--	1
Cl4-BZ#49	ND		ug/kg	0.763	--	1
Cl4-BZ#52	ND		ug/kg	0.763	--	1
Cl4-BZ#66	ND		ug/kg	0.763	--	1
Cl5-BZ#87	ND		ug/kg	0.763	--	1
Cl5-BZ#101	ND		ug/kg	0.763	--	1
Cl5-BZ#105	ND		ug/kg	0.763	--	1
Cl5-BZ#118	ND		ug/kg	0.763	--	1
Cl6-BZ#128	ND		ug/kg	0.763	--	1
Cl6-BZ#138	ND		ug/kg	0.763	--	1
Cl6-BZ#153	ND		ug/kg	0.763	--	1

Project Name: SRP **Lab Number:** L1629727

Project Number: 23840.003 **Report Date:** 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-05 Date Collected: 09/20/16 13:36

Client ID: C-3 Date Received: 09/20/16

Sample Location: LITTLE BAY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl7-BZ#170	ND		ug/kg	0.763	--	1
Cl7-BZ#180	ND		ug/kg	0.763	--	1
Cl7-BZ#183	ND		ug/kg	0.763	--	1
Cl7-BZ#184	ND		ug/kg	0.763	--	1
Cl7-BZ#187	ND		ug/kg	0.763	--	1
Cl8-BZ#195	ND		ug/kg	0.763	--	1
Cl9-BZ#206	ND		ug/kg	0.763	--	1
Cl10-BZ#209	ND		ug/kg	0.763	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	44		30-150
Pyrene-d10	55		30-150
Benzo(b)fluoranthene-d12	57		30-150
DBOB	54		30-150
BZ 198	58		30-150

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-06
Client ID: C-4
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 10/24/16 19:57
Analyst: MS
Percent Solids: 65%

Date Collected: 09/20/16 14:05
Date Received: 09/20/16
Field Prep: Not Specified
Extraction Method: EPA 3570
Extraction Date: 09/29/16 18:28
Cleanup Method: EPA 3630
Cleanup Date: 10/09/16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	7.13	--	1
Acenaphthylene	ND		ug/kg	7.13	--	1
Acenaphthene	ND		ug/kg	7.13	--	1
Fluorene	ND		ug/kg	7.13	--	1
Phenanthrene	ND		ug/kg	7.13	--	1
Anthracene	ND		ug/kg	7.13	--	1
Fluoranthene	8.65		ug/kg	7.13	--	1
Pyrene	8.86		ug/kg	7.13	--	1
Benz(a)anthracene	ND		ug/kg	7.13	--	1
Chrysene	ND		ug/kg	7.13	--	1
Benzo(b)fluoranthene	ND		ug/kg	7.13	--	1
Benzo(k)fluoranthene	ND		ug/kg	7.13	--	1
Benzo(a)pyrene	ND		ug/kg	7.13	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	7.13	--	1
Dibenz(a,h)anthracene	ND		ug/kg	7.13	--	1
Benzo(ghi)perylene	ND		ug/kg	7.13	--	1
Cl2-BZ#8	ND		ug/kg	0.713	--	1
Cl3-BZ#18	ND		ug/kg	0.713	--	1
Cl3-BZ#28	ND		ug/kg	0.713	--	1
Cl4-BZ#44	ND		ug/kg	0.713	--	1
Cl4-BZ#49	ND		ug/kg	0.713	--	1
Cl4-BZ#52	ND		ug/kg	0.713	--	1
Cl4-BZ#66	ND		ug/kg	0.713	--	1
Cl5-BZ#87	ND		ug/kg	0.713	--	1
Cl5-BZ#101	ND		ug/kg	0.713	--	1
Cl5-BZ#105	ND		ug/kg	0.713	--	1
Cl5-BZ#118	ND		ug/kg	0.713	--	1
Cl6-BZ#128	ND		ug/kg	0.713	--	1
Cl6-BZ#138	ND		ug/kg	0.713	--	1
Cl6-BZ#153	ND		ug/kg	0.713	--	1

Project Name: SRP **Lab Number:** L1629727

Project Number: 23840.003 **Report Date:** 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-06 Date Collected: 09/20/16 14:05

Client ID: C-4 Date Received: 09/20/16

Sample Location: LITTLE BAY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl7-BZ#170	ND		ug/kg	0.713	--	1
Cl7-BZ#180	ND		ug/kg	0.713	--	1
Cl7-BZ#183	ND		ug/kg	0.713	--	1
Cl7-BZ#184	ND		ug/kg	0.713	--	1
Cl7-BZ#187	ND		ug/kg	0.713	--	1
Cl8-BZ#195	ND		ug/kg	0.713	--	1
Cl9-BZ#206	ND		ug/kg	0.713	--	1
Cl10-BZ#209	ND		ug/kg	0.713	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	65		30-150
Pyrene-d10	77		30-150
Benzo(b)fluoranthene-d12	81		30-150
DBOB	78		30-150
BZ 198	76		30-150

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-07
Client ID: C-6 (48-61)
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 10/24/16 20:27
Analyst: MS
Percent Solids: 65%

Date Collected: 09/20/16 10:10
Date Received: 09/20/16
Field Prep: Not Specified
Extraction Method: EPA 3570
Extraction Date: 09/29/16 18:28
Cleanup Method: EPA 3630
Cleanup Date: 10/09/16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	7.60	--	1
Acenaphthylene	ND		ug/kg	7.60	--	1
Acenaphthene	27.5		ug/kg	7.60	--	1
Fluorene	ND		ug/kg	7.60	--	1
Phenanthrene	ND		ug/kg	7.60	--	1
Anthracene	ND		ug/kg	7.60	--	1
Fluoranthene	ND		ug/kg	7.60	--	1
Pyrene	ND		ug/kg	7.60	--	1
Benz(a)anthracene	ND		ug/kg	7.60	--	1
Chrysene	ND		ug/kg	7.60	--	1
Benzo(b)fluoranthene	ND		ug/kg	7.60	--	1
Benzo(k)fluoranthene	ND		ug/kg	7.60	--	1
Benzo(a)pyrene	ND		ug/kg	7.60	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	7.60	--	1
Dibenz(a,h)anthracene	ND		ug/kg	7.60	--	1
Benzo(ghi)perylene	ND		ug/kg	7.60	--	1
Cl2-BZ#8	ND		ug/kg	0.760	--	1
Cl3-BZ#18	ND		ug/kg	0.760	--	1
Cl3-BZ#28	ND		ug/kg	0.760	--	1
Cl4-BZ#44	ND		ug/kg	0.760	--	1
Cl4-BZ#49	ND		ug/kg	0.760	--	1
Cl4-BZ#52	ND		ug/kg	0.760	--	1
Cl4-BZ#66	ND		ug/kg	0.760	--	1
Cl5-BZ#87	ND		ug/kg	0.760	--	1
Cl5-BZ#101	ND		ug/kg	0.760	--	1
Cl5-BZ#105	ND		ug/kg	0.760	--	1
Cl5-BZ#118	ND		ug/kg	0.760	--	1
Cl6-BZ#128	ND		ug/kg	0.760	--	1
Cl6-BZ#138	ND		ug/kg	0.760	--	1
Cl6-BZ#153	ND		ug/kg	0.760	--	1

Project Name: SRP **Lab Number:** L1629727

Project Number: 23840.003 **Report Date:** 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-07 Date Collected: 09/20/16 10:10

Client ID: C-6 (48-61) Date Received: 09/20/16

Sample Location: LITTLE BAY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl7-BZ#170	ND		ug/kg	0.760	--	1
Cl7-BZ#180	ND		ug/kg	0.760	--	1
Cl7-BZ#183	ND		ug/kg	0.760	--	1
Cl7-BZ#184	ND		ug/kg	0.760	--	1
Cl7-BZ#187	ND		ug/kg	0.760	--	1
Cl8-BZ#195	ND		ug/kg	0.760	--	1
Cl9-BZ#206	ND		ug/kg	0.760	--	1
Cl10-BZ#209	ND		ug/kg	0.760	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	59		30-150
Pyrene-d10	81		30-150
Benzo(b)fluoranthene-d12	86		30-150
DBOB	77		30-150
BZ 198	79		30-150

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-08
Client ID: C-7 (48-54)
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 10/24/16 20:58
Analyst: MS
Percent Solids: 71%

Date Collected: 09/20/16 12:02
Date Received: 09/20/16
Field Prep: Not Specified
Extraction Method: EPA 3570
Extraction Date: 09/29/16 18:28
Cleanup Method: EPA 3630
Cleanup Date: 10/09/16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	7.04	--	1
Acenaphthylene	ND		ug/kg	7.04	--	1
Acenaphthene	ND		ug/kg	7.04	--	1
Fluorene	ND		ug/kg	7.04	--	1
Phenanthrene	ND		ug/kg	7.04	--	1
Anthracene	ND		ug/kg	7.04	--	1
Fluoranthene	ND		ug/kg	7.04	--	1
Pyrene	ND		ug/kg	7.04	--	1
Benz(a)anthracene	ND		ug/kg	7.04	--	1
Chrysene	ND		ug/kg	7.04	--	1
Benzo(b)fluoranthene	ND		ug/kg	7.04	--	1
Benzo(k)fluoranthene	ND		ug/kg	7.04	--	1
Benzo(a)pyrene	ND		ug/kg	7.04	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	7.04	--	1
Dibenz(a,h)anthracene	ND		ug/kg	7.04	--	1
Benzo(ghi)perylene	ND		ug/kg	7.04	--	1
Cl2-BZ#8	1.10		ug/kg	0.704	--	1
Cl3-BZ#18	1.16		ug/kg	0.704	--	1
Cl3-BZ#28	ND		ug/kg	0.704	--	1
Cl4-BZ#44	ND		ug/kg	0.704	--	1
Cl4-BZ#49	ND		ug/kg	0.704	--	1
Cl4-BZ#52	ND		ug/kg	0.704	--	1
Cl4-BZ#66	ND		ug/kg	0.704	--	1
Cl5-BZ#87	ND		ug/kg	0.704	--	1
Cl5-BZ#101	ND		ug/kg	0.704	--	1
Cl5-BZ#105	ND		ug/kg	0.704	--	1
Cl5-BZ#118	ND		ug/kg	0.704	--	1
Cl6-BZ#128	ND		ug/kg	0.704	--	1
Cl6-BZ#138	ND		ug/kg	0.704	--	1
Cl6-BZ#153	ND		ug/kg	0.704	--	1

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-08
Client ID: C-7 (48-54)
Sample Location: LITTLE BAY
Date Collected: 09/20/16 12:02
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl7-BZ#170	ND		ug/kg	0.704	--	1
Cl7-BZ#180	ND		ug/kg	0.704	--	1
Cl7-BZ#183	ND		ug/kg	0.704	--	1
Cl7-BZ#184	ND		ug/kg	0.704	--	1
Cl7-BZ#187	ND		ug/kg	0.704	--	1
Cl8-BZ#195	ND		ug/kg	0.704	--	1
Cl9-BZ#206	ND		ug/kg	0.704	--	1
Cl10-BZ#209	ND		ug/kg	0.704	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	59		30-150
Pyrene-d10	74		30-150
Benzo(b)fluoranthene-d12	77		30-150
DBOB	73		30-150
BZ 198	75		30-150

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-09
Client ID: C-5
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 10/24/16 21:28
Analyst: MS
Percent Solids: 68%

Date Collected: 09/21/16 08:35
Date Received: 09/21/16
Field Prep: Not Specified
Extraction Method: EPA 3570
Extraction Date: 09/29/16 18:30
Cleanup Method: EPA 3630
Cleanup Date: 10/09/16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	7.22	--	1
Acenaphthylene	ND		ug/kg	7.22	--	1
Acenaphthene	ND		ug/kg	7.22	--	1
Fluorene	ND		ug/kg	7.22	--	1
Phenanthrene	ND		ug/kg	7.22	--	1
Anthracene	ND		ug/kg	7.22	--	1
Fluoranthene	12.8		ug/kg	7.22	--	1
Pyrene	11.8		ug/kg	7.22	--	1
Benz(a)anthracene	9.22		ug/kg	7.22	--	1
Chrysene	7.71		ug/kg	7.22	--	1
Benzo(b)fluoranthene	7.35		ug/kg	7.22	--	1
Benzo(k)fluoranthene	ND		ug/kg	7.22	--	1
Benzo(a)pyrene	8.55		ug/kg	7.22	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	7.22	--	1
Dibenz(a,h)anthracene	ND		ug/kg	7.22	--	1
Benzo(ghi)perylene	ND		ug/kg	7.22	--	1
Cl2-BZ#8	ND		ug/kg	0.722	--	1
Cl3-BZ#18	ND		ug/kg	0.722	--	1
Cl3-BZ#28	ND		ug/kg	0.722	--	1
Cl4-BZ#44	ND		ug/kg	0.722	--	1
Cl4-BZ#49	ND		ug/kg	0.722	--	1
Cl4-BZ#52	ND		ug/kg	0.722	--	1
Cl4-BZ#66	ND		ug/kg	0.722	--	1
Cl5-BZ#87	ND		ug/kg	0.722	--	1
Cl5-BZ#101	ND		ug/kg	0.722	--	1
Cl5-BZ#105	ND		ug/kg	0.722	--	1
Cl5-BZ#118	ND		ug/kg	0.722	--	1
Cl6-BZ#128	ND		ug/kg	0.722	--	1
Cl6-BZ#138	ND		ug/kg	0.722	--	1
Cl6-BZ#153	ND		ug/kg	0.722	--	1

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-09
Client ID: C-5
Sample Location: LITTLE BAY
Date Collected: 09/21/16 08:35
Date Received: 09/21/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl7-BZ#170	ND		ug/kg	0.722	--	1
Cl7-BZ#180	ND		ug/kg	0.722	--	1
Cl7-BZ#183	ND		ug/kg	0.722	--	1
Cl7-BZ#184	ND		ug/kg	0.722	--	1
Cl7-BZ#187	ND		ug/kg	0.722	--	1
Cl8-BZ#195	ND		ug/kg	0.722	--	1
Cl9-BZ#206	ND		ug/kg	0.722	--	1
Cl10-BZ#209	ND		ug/kg	0.722	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	53		30-150
Pyrene-d10	65		30-150
Benzo(b)fluoranthene-d12	69		30-150
DBOB	62		30-150
BZ 198	66		30-150

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-10
Client ID: C-8
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 10/24/16 21:58
Analyst: MS
Percent Solids: 70%

Date Collected: 09/21/16 13:00
Date Received: 09/21/16
Field Prep: Not Specified
Extraction Method: EPA 3570
Extraction Date: 09/29/16 18:30
Cleanup Method: EPA 3630
Cleanup Date: 10/09/16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	6.76	--	1
Acenaphthylene	11.0		ug/kg	6.76	--	1
Acenaphthene	11.0		ug/kg	6.76	--	1
Fluorene	13.0		ug/kg	6.76	--	1
Phenanthrene	9.37		ug/kg	6.76	--	1
Anthracene	ND		ug/kg	6.76	--	1
Fluoranthene	10.1		ug/kg	6.76	--	1
Pyrene	10.2		ug/kg	6.76	--	1
Benz(a)anthracene	ND		ug/kg	6.76	--	1
Chrysene	ND		ug/kg	6.76	--	1
Benzo(b)fluoranthene	ND		ug/kg	6.76	--	1
Benzo(k)fluoranthene	ND		ug/kg	6.76	--	1
Benzo(a)pyrene	ND		ug/kg	6.76	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	6.76	--	1
Dibenz(a,h)anthracene	ND		ug/kg	6.76	--	1
Benzo(ghi)perylene	ND		ug/kg	6.76	--	1
Cl2-BZ#8	ND		ug/kg	0.676	--	1
Cl3-BZ#18	ND		ug/kg	0.676	--	1
Cl3-BZ#28	ND		ug/kg	0.676	--	1
Cl4-BZ#44	ND		ug/kg	0.676	--	1
Cl4-BZ#49	ND		ug/kg	0.676	--	1
Cl4-BZ#52	ND		ug/kg	0.676	--	1
Cl4-BZ#66	ND		ug/kg	0.676	--	1
Cl5-BZ#87	ND		ug/kg	0.676	--	1
Cl5-BZ#101	ND		ug/kg	0.676	--	1
Cl5-BZ#105	ND		ug/kg	0.676	--	1
Cl5-BZ#118	ND		ug/kg	0.676	--	1
Cl6-BZ#128	ND		ug/kg	0.676	--	1
Cl6-BZ#138	ND		ug/kg	0.676	--	1
Cl6-BZ#153	ND		ug/kg	0.676	--	1

Project Name: SRP **Lab Number:** L1629727

Project Number: 23840.003 **Report Date:** 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-10 Date Collected: 09/21/16 13:00

Client ID: C-8 Date Received: 09/21/16

Sample Location: LITTLE BAY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl7-BZ#170	ND		ug/kg	0.676	--	1
Cl7-BZ#180	ND		ug/kg	0.676	--	1
Cl7-BZ#183	ND		ug/kg	0.676	--	1
Cl7-BZ#184	ND		ug/kg	0.676	--	1
Cl7-BZ#187	ND		ug/kg	0.676	--	1
Cl8-BZ#195	ND		ug/kg	0.676	--	1
Cl9-BZ#206	ND		ug/kg	0.676	--	1
Cl10-BZ#209	ND		ug/kg	0.676	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	73		30-150
Pyrene-d10	84		30-150
Benzo(b)fluoranthene-d12	88		30-150
DBOB	92		30-150
BZ 198	90		30-150

Project Name: SRP **Lab Number:** L1629727

Project Number: 23840.003 **Report Date:** 10/27/16

SAMPLE RESULTS

Lab ID:	L1629727-11	Date Collected:	09/21/16 11:45
Client ID:	C-9	Date Received:	09/21/16
Sample Location:	LITTLE BAY	Field Prep:	Not Specified
Matrix:	Sediment	Extraction Method:	EPA 3570
Analytical Method:	105,8270D-SIM/680(M)	Extraction Date:	09/29/16 18:30
Analytical Date:	10/24/16 22:28	Cleanup Method:	EPA 3630
Analyst:	MS	Cleanup Date:	10/09/16
Percent Solids:	82%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	5.87	--	1
Acenaphthylene	ND		ug/kg	5.87	--	1
Acenaphthene	ND		ug/kg	5.87	--	1
Fluorene	ND		ug/kg	5.87	--	1
Phenanthrene	ND		ug/kg	5.87	--	1
Anthracene	ND		ug/kg	5.87	--	1
Fluoranthene	ND		ug/kg	5.87	--	1
Pyrene	ND		ug/kg	5.87	--	1
Benz(a)anthracene	ND		ug/kg	5.87	--	1
Chrysene	ND		ug/kg	5.87	--	1
Benzo(b)fluoranthene	ND		ug/kg	5.87	--	1
Benzo(k)fluoranthene	ND		ug/kg	5.87	--	1
Benzo(a)pyrene	ND		ug/kg	5.87	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	5.87	--	1
Dibenz(a,h)anthracene	ND		ug/kg	5.87	--	1
Benzo(ghi)perylene	ND		ug/kg	5.87	--	1
Cl2-BZ#8	ND		ug/kg	0.587	--	1
Cl3-BZ#18	ND		ug/kg	0.587	--	1
Cl3-BZ#28	ND		ug/kg	0.587	--	1
Cl4-BZ#44	ND		ug/kg	0.587	--	1
Cl4-BZ#49	ND		ug/kg	0.587	--	1
Cl4-BZ#52	ND		ug/kg	0.587	--	1
Cl4-BZ#66	ND		ug/kg	0.587	--	1
Cl5-BZ#87	ND		ug/kg	0.587	--	1
Cl5-BZ#101	ND		ug/kg	0.587	--	1
Cl5-BZ#105	ND		ug/kg	0.587	--	1
Cl5-BZ#118	ND		ug/kg	0.587	--	1
Cl6-BZ#128	ND		ug/kg	0.587	--	1
Cl6-BZ#138	ND		ug/kg	0.587	--	1
Cl6-BZ#153	ND		ug/kg	0.587	--	1

Project Name: SRP **Lab Number:** L1629727

Project Number: 23840.003 **Report Date:** 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-11 Date Collected: 09/21/16 11:45

Client ID: C-9 Date Received: 09/21/16

Sample Location: LITTLE BAY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl7-BZ#170	ND		ug/kg	0.587	--	1
Cl7-BZ#180	ND		ug/kg	0.587	--	1
Cl7-BZ#183	ND		ug/kg	0.587	--	1
Cl7-BZ#184	ND		ug/kg	0.587	--	1
Cl7-BZ#187	ND		ug/kg	0.587	--	1
Cl8-BZ#195	ND		ug/kg	0.587	--	1
Cl9-BZ#206	ND		ug/kg	0.587	--	1
Cl10-BZ#209	ND		ug/kg	0.587	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	61		30-150
Pyrene-d10	80		30-150
Benzo(b)fluoranthene-d12	85		30-150
DBOB	81		30-150
BZ 198	86		30-150

Project Name: SRP **Lab Number:** L1629727

Project Number: 23840.003 **Report Date:** 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-12
Client ID: C-10
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 10/24/16 22:59
Analyst: MS
Percent Solids: 79%

Date Collected: 09/21/16 12:20
Date Received: 09/21/16
Field Prep: Not Specified
Extraction Method: EPA 3570
Extraction Date: 09/29/16 18:30
Cleanup Method: EPA 3630
Cleanup Date: 10/09/16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	6.25	--	1
Acenaphthylene	ND		ug/kg	6.25	--	1
Acenaphthene	ND		ug/kg	6.25	--	1
Fluorene	ND		ug/kg	6.25	--	1
Phenanthrene	ND		ug/kg	6.25	--	1
Anthracene	ND		ug/kg	6.25	--	1
Fluoranthene	ND		ug/kg	6.25	--	1
Pyrene	ND		ug/kg	6.25	--	1
Benz(a)anthracene	ND		ug/kg	6.25	--	1
Chrysene	ND		ug/kg	6.25	--	1
Benzo(b)fluoranthene	ND		ug/kg	6.25	--	1
Benzo(k)fluoranthene	ND		ug/kg	6.25	--	1
Benzo(a)pyrene	ND		ug/kg	6.25	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	6.25	--	1
Dibenz(a,h)anthracene	ND		ug/kg	6.25	--	1
Benzo(ghi)perylene	ND		ug/kg	6.25	--	1
Cl2-BZ#8	ND		ug/kg	0.625	--	1
Cl3-BZ#18	ND		ug/kg	0.625	--	1
Cl3-BZ#28	ND		ug/kg	0.625	--	1
Cl4-BZ#44	ND		ug/kg	0.625	--	1
Cl4-BZ#49	ND		ug/kg	0.625	--	1
Cl4-BZ#52	ND		ug/kg	0.625	--	1
Cl4-BZ#66	ND		ug/kg	0.625	--	1
Cl5-BZ#87	ND		ug/kg	0.625	--	1
Cl5-BZ#101	ND		ug/kg	0.625	--	1
Cl5-BZ#105	ND		ug/kg	0.625	--	1
Cl5-BZ#118	ND		ug/kg	0.625	--	1
Cl6-BZ#128	ND		ug/kg	0.625	--	1
Cl6-BZ#138	ND		ug/kg	0.625	--	1
Cl6-BZ#153	ND		ug/kg	0.625	--	1

Project Name: SRP **Lab Number:** L1629727

Project Number: 23840.003 **Report Date:** 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-12 Date Collected: 09/21/16 12:20

Client ID: C-10 Date Received: 09/21/16

Sample Location: LITTLE BAY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl7-BZ#170	ND		ug/kg	0.625	--	1
Cl7-BZ#180	ND		ug/kg	0.625	--	1
Cl7-BZ#183	ND		ug/kg	0.625	--	1
Cl7-BZ#184	ND		ug/kg	0.625	--	1
Cl7-BZ#187	ND		ug/kg	0.625	--	1
Cl8-BZ#195	ND		ug/kg	0.625	--	1
Cl9-BZ#206	ND		ug/kg	0.625	--	1
Cl10-BZ#209	ND		ug/kg	0.625	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	56		30-150
Pyrene-d10	77		30-150
Benzo(b)fluoranthene-d12	83		30-150
DBOB	77		30-150
BZ 198	81		30-150

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-13
Client ID: C-11 (0-48)
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 10/24/16 23:30
Analyst: MS
Percent Solids: 69%

Date Collected: 09/21/16 09:03
Date Received: 09/21/16
Field Prep: Not Specified
Extraction Method: EPA 3570
Extraction Date: 09/29/16 18:30
Cleanup Method: EPA 3630
Cleanup Date: 10/09/16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	7.21	--	1
Acenaphthylene	ND		ug/kg	7.21	--	1
Acenaphthene	ND		ug/kg	7.21	--	1
Fluorene	ND		ug/kg	7.21	--	1
Phenanthrene	10.7		ug/kg	7.21	--	1
Anthracene	ND		ug/kg	7.21	--	1
Fluoranthene	20.4		ug/kg	7.21	--	1
Pyrene	28.6		ug/kg	7.21	--	1
Benz(a)anthracene	16.4		ug/kg	7.21	--	1
Chrysene	14.8		ug/kg	7.21	--	1
Benzo(b)fluoranthene	19.6		ug/kg	7.21	--	1
Benzo(k)fluoranthene	19.0		ug/kg	7.21	--	1
Benzo(a)pyrene	22.6		ug/kg	7.21	--	1
Indeno(1,2,3-cd)Pyrene	18.8		ug/kg	7.21	--	1
Dibenz(a,h)anthracene	ND		ug/kg	7.21	--	1
Benzo(ghi)perylene	19.3		ug/kg	7.21	--	1
Cl2-BZ#8	ND		ug/kg	0.721	--	1
Cl3-BZ#18	ND		ug/kg	0.721	--	1
Cl3-BZ#28	ND		ug/kg	0.721	--	1
Cl4-BZ#44	ND		ug/kg	0.721	--	1
Cl4-BZ#49	ND		ug/kg	0.721	--	1
Cl4-BZ#52	ND		ug/kg	0.721	--	1
Cl4-BZ#66	ND		ug/kg	0.721	--	1
Cl5-BZ#87	ND		ug/kg	0.721	--	1
Cl5-BZ#101	ND		ug/kg	0.721	--	1
Cl5-BZ#105	ND		ug/kg	0.721	--	1
Cl5-BZ#118	ND		ug/kg	0.721	--	1
Cl6-BZ#128	ND		ug/kg	0.721	--	1
Cl6-BZ#138	ND		ug/kg	0.721	--	1
Cl6-BZ#153	ND		ug/kg	0.721	--	1

Project Name: SRP **Lab Number:** L1629727

Project Number: 23840.003 **Report Date:** 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-13 Date Collected: 09/21/16 09:03

Client ID: C-11 (0-48) Date Received: 09/21/16

Sample Location: LITTLE BAY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl7-BZ#170	ND		ug/kg	0.721	--	1
Cl7-BZ#180	ND		ug/kg	0.721	--	1
Cl7-BZ#183	ND		ug/kg	0.721	--	1
Cl7-BZ#184	ND		ug/kg	0.721	--	1
Cl7-BZ#187	ND		ug/kg	0.721	--	1
Cl8-BZ#195	ND		ug/kg	0.721	--	1
Cl9-BZ#206	ND		ug/kg	0.721	--	1
Cl10-BZ#209	ND		ug/kg	0.721	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	55		30-150
Pyrene-d10	71		30-150
Benzo(b)fluoranthene-d12	75		30-150
DBOB	72		30-150
BZ 198	76		30-150

Project Name: SRP **Lab Number:** L1629727

Project Number: 23840.003 **Report Date:** 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-14
Client ID: C-12
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 10/25/16 00:00
Analyst: MS
Percent Solids: 75%

Date Collected: 09/21/16 08:44
Date Received: 09/21/16
Field Prep: Not Specified
Extraction Method: EPA 3570
Extraction Date: 09/29/16 18:30
Cleanup Method: EPA 3630
Cleanup Date: 10/09/16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	6.48	--	1
Acenaphthylene	ND		ug/kg	6.48	--	1
Acenaphthene	ND		ug/kg	6.48	--	1
Fluorene	6.75		ug/kg	6.48	--	1
Phenanthrene	11.9		ug/kg	6.48	--	1
Anthracene	ND		ug/kg	6.48	--	1
Fluoranthene	19.7		ug/kg	6.48	--	1
Pyrene	20.7		ug/kg	6.48	--	1
Benz(a)anthracene	14.1		ug/kg	6.48	--	1
Chrysene	14.8		ug/kg	6.48	--	1
Benzo(b)fluoranthene	13.8		ug/kg	6.48	--	1
Benzo(k)fluoranthene	13.8		ug/kg	6.48	--	1
Benzo(a)pyrene	16.8		ug/kg	6.48	--	1
Indeno(1,2,3-cd)Pyrene	11.4		ug/kg	6.48	--	1
Dibenz(a,h)anthracene	ND		ug/kg	6.48	--	1
Benzo(ghi)perylene	11.0		ug/kg	6.48	--	1
Cl2-BZ#8	ND		ug/kg	0.648	--	1
Cl3-BZ#18	ND		ug/kg	0.648	--	1
Cl3-BZ#28	ND		ug/kg	0.648	--	1
Cl4-BZ#44	ND		ug/kg	0.648	--	1
Cl4-BZ#49	ND		ug/kg	0.648	--	1
Cl4-BZ#52	ND		ug/kg	0.648	--	1
Cl4-BZ#66	ND		ug/kg	0.648	--	1
Cl5-BZ#87	ND		ug/kg	0.648	--	1
Cl5-BZ#101	ND		ug/kg	0.648	--	1
Cl5-BZ#105	ND		ug/kg	0.648	--	1
Cl5-BZ#118	ND		ug/kg	0.648	--	1
Cl6-BZ#128	ND		ug/kg	0.648	--	1
Cl6-BZ#138	ND		ug/kg	0.648	--	1
Cl6-BZ#153	ND		ug/kg	0.648	--	1

Project Name: SRP **Lab Number:** L1629727

Project Number: 23840.003 **Report Date:** 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-14 Date Collected: 09/21/16 08:44

Client ID: C-12 Date Received: 09/21/16

Sample Location: LITTLE BAY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl7-BZ#170	ND		ug/kg	0.648	--	1
Cl7-BZ#180	ND		ug/kg	0.648	--	1
Cl7-BZ#183	ND		ug/kg	0.648	--	1
Cl7-BZ#184	ND		ug/kg	0.648	--	1
Cl7-BZ#187	ND		ug/kg	0.648	--	1
Cl8-BZ#195	ND		ug/kg	0.648	--	1
Cl9-BZ#206	ND		ug/kg	0.648	--	1
Cl10-BZ#209	ND		ug/kg	0.648	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	49		30-150
Pyrene-d10	69		30-150
Benzo(b)fluoranthene-d12	75		30-150
DBOB	71		30-150
BZ 198	76		30-150

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-15
Client ID: C-11 (48-89)
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 10/25/16 00:30
Analyst: MS
Percent Solids: 67%

Date Collected: 09/21/16 09:03
Date Received: 09/21/16
Field Prep: Not Specified
Extraction Method: EPA 3570
Extraction Date: 09/29/16 18:30
Cleanup Method: EPA 3630
Cleanup Date: 10/09/16

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Naphthalene	ND		ug/kg	6.85	--	1
Acenaphthylene	ND		ug/kg	6.85	--	1
Acenaphthene	ND		ug/kg	6.85	--	1
Fluorene	ND		ug/kg	6.85	--	1
Phenanthrene	ND		ug/kg	6.85	--	1
Anthracene	ND		ug/kg	6.85	--	1
Fluoranthene	ND		ug/kg	6.85	--	1
Pyrene	ND		ug/kg	6.85	--	1
Benz(a)anthracene	ND		ug/kg	6.85	--	1
Chrysene	ND		ug/kg	6.85	--	1
Benzo(b)fluoranthene	ND		ug/kg	6.85	--	1
Benzo(k)fluoranthene	ND		ug/kg	6.85	--	1
Benzo(a)pyrene	ND		ug/kg	6.85	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	6.85	--	1
Dibenz(a,h)anthracene	ND		ug/kg	6.85	--	1
Benzo(ghi)perylene	ND		ug/kg	6.85	--	1
Cl2-BZ#8	ND		ug/kg	0.685	--	1
Cl3-BZ#18	ND		ug/kg	0.685	--	1
Cl3-BZ#28	ND		ug/kg	0.685	--	1
Cl4-BZ#44	ND		ug/kg	0.685	--	1
Cl4-BZ#49	ND		ug/kg	0.685	--	1
Cl4-BZ#52	ND		ug/kg	0.685	--	1
Cl4-BZ#66	ND		ug/kg	0.685	--	1
Cl5-BZ#87	ND		ug/kg	0.685	--	1
Cl5-BZ#101	ND		ug/kg	0.685	--	1
Cl5-BZ#105	ND		ug/kg	0.685	--	1
Cl5-BZ#118	ND		ug/kg	0.685	--	1
Cl6-BZ#128	ND		ug/kg	0.685	--	1
Cl6-BZ#138	ND		ug/kg	0.685	--	1
Cl6-BZ#153	ND		ug/kg	0.685	--	1

Project Name: SRP **Lab Number:** L1629727

Project Number: 23840.003 **Report Date:** 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-15 Date Collected: 09/21/16 09:03

Client ID: C-11 (48-89) Date Received: 09/21/16

Sample Location: LITTLE BAY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab						
Cl7-BZ#170	ND		ug/kg	0.685	--	1
Cl7-BZ#180	ND		ug/kg	0.685	--	1
Cl7-BZ#183	ND		ug/kg	0.685	--	1
Cl7-BZ#184	ND		ug/kg	0.685	--	1
Cl7-BZ#187	ND		ug/kg	0.685	--	1
Cl8-BZ#195	ND		ug/kg	0.685	--	1
Cl9-BZ#206	ND		ug/kg	0.685	--	1
Cl10-BZ#209	ND		ug/kg	0.685	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	51		30-150
Pyrene-d10	64		30-150
Benzo(b)fluoranthene-d12	70		30-150
DBOB	64		30-150
BZ 198	66		30-150

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Method Blank Analysis
Batch Quality Control

Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 10/24/16 13:01
Analyst: MS

Extraction Method: EPA 3570
Extraction Date: 09/29/16 18:28
Cleanup Method: EPA 3630
Cleanup Date: 10/09/16

Parameter	Result	Qualifier	Units	RL	MDL
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab for sample(s): 01-15 Batch: WG937275-1					
Naphthalene	ND		ug/kg	5.00	--
Acenaphthylene	ND		ug/kg	5.00	--
Acenaphthene	ND		ug/kg	5.00	--
Fluorene	ND		ug/kg	5.00	--
Phenanthrene	ND		ug/kg	5.00	--
Anthracene	ND		ug/kg	5.00	--
Fluoranthene	ND		ug/kg	5.00	--
Pyrene	ND		ug/kg	5.00	--
Benz(a)anthracene	ND		ug/kg	5.00	--
Chrysene	ND		ug/kg	5.00	--
Benzo(b)fluoranthene	ND		ug/kg	5.00	--
Benzo(k)fluoranthene	ND		ug/kg	5.00	--
Benzo(a)pyrene	ND		ug/kg	5.00	--
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	5.00	--
Dibenz(a,h)anthracene	ND		ug/kg	5.00	--
Benzo(ghi)perylene	ND		ug/kg	5.00	--
Cl2-BZ#8	ND		ug/kg	0.500	--
Cl3-BZ#18	ND		ug/kg	0.500	--
Cl3-BZ#28	ND		ug/kg	0.500	--
Cl4-BZ#44	ND		ug/kg	0.500	--
Cl4-BZ#49	ND		ug/kg	0.500	--
Cl4-BZ#52	ND		ug/kg	0.500	--
Cl4-BZ#66	ND		ug/kg	0.500	--
Cl5-BZ#87	ND		ug/kg	0.500	--
Cl5-BZ#101	ND		ug/kg	0.500	--
Cl5-BZ#105	ND		ug/kg	0.500	--
Cl5-BZ#118	ND		ug/kg	0.500	--
Cl6-BZ#128	ND		ug/kg	0.500	--
Cl6-BZ#138	ND		ug/kg	0.500	--

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Method Blank Analysis
Batch Quality Control

Analytical Method: 105,8270D-SIM/680(M)
Analytical Date: 10/24/16 13:01
Analyst: MS

Extraction Method: EPA 3570
Extraction Date: 09/29/16 18:28
Cleanup Method: EPA 3630
Cleanup Date: 10/09/16

Parameter	Result	Qualifier	Units	RL	MDL
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab for sample(s): 01-15 Batch: WG937275-1					
Cl6-BZ#153	ND		ug/kg	0.500	--
Cl7-BZ#170	ND		ug/kg	0.500	--
Cl7-BZ#180	ND		ug/kg	0.500	--
Cl7-BZ#183	ND		ug/kg	0.500	--
Cl7-BZ#184	ND		ug/kg	0.500	--
Cl7-BZ#187	ND		ug/kg	0.500	--
Cl8-BZ#195	ND		ug/kg	0.500	--
Cl9-BZ#206	ND		ug/kg	0.500	--
Cl10-BZ#209	ND		ug/kg	0.500	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	58		30-150
Pyrene-d10	77		30-150
Benzo(b)fluoranthene-d12	85		30-150
DBOB	66		30-150
BZ 198	71		30-150

Lab Control Sample Analysis

Batch Quality Control

Project Name: SRP

Project Number: 23840.003

Lab Number: L1629727

Report Date: 10/27/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-15 Batch: WG937275-2 WG937275-3								
Naphthalene	54		59		50-120	9		30
Acenaphthylene	58		64		50-120	10		30
Acenaphthene	63		68		50-120	8		30
Fluorene	68		73		50-120	7		30
Phenanthrene	72		76		50-120	5		30
Anthracene	67		71		50-120	6		30
Fluoranthene	75		80		50-120	6		30
Pyrene	72		76		50-120	5		30
Benz(a)anthracene	77		81		50-120	5		30
Chrysene	79		83		50-120	5		30
Benzo(b)fluoranthene	86		91		50-120	6		30
Benzo(k)fluoranthene	83		88		50-120	6		30
Benzo(a)pyrene	81		85		50-120	5		30
Indeno(1,2,3-cd)Pyrene	84		85		50-120	1		30
Dibenz(a,h)anthracene	79		84		50-120	6		30
Benzo(ghi)perylene	81		85		50-120	5		30
Cl2-BZ#8	73		77		50-120	5		30
Cl3-BZ#18	74		76		50-120	3		30
Cl3-BZ#28	77		80		50-120	4		30
Cl4-BZ#44	83		86		50-120	4		30
Cl4-BZ#49	80		82		50-120	2		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: SRP

Project Number: 23840.003

Lab Number: L1629727

Report Date: 10/27/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-15 Batch: WG937275-2 WG937275-3								
Cl4-BZ#52	81		83		50-120	2		30
Cl4-BZ#66	83		85		50-120	2		30
Cl5-BZ#87	82		85		50-120	4		30
Cl5-BZ#101	82		84		50-120	2		30
Cl5-BZ#105	82		85		50-120	4		30
Cl5-BZ#118	82		84		50-120	2		30
Cl6-BZ#128	82		84		50-120	2		30
Cl6-BZ#138	82		84		50-120	2		30
Cl6-BZ#153	82		85		50-120	4		30
Cl7-BZ#170	84		86		50-120	2		30
Cl7-BZ#180	81		84		50-120	4		30
Cl7-BZ#183	78		80		50-120	3		30
Cl7-BZ#184	79		82		50-120	4		30
Cl7-BZ#187	80		82		50-120	2		30
Cl8-BZ#195	81		83		50-120	2		30
Cl9-BZ#206	81		86		50-120	6		30
Cl10-BZ#209	84		90		50-120	7		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: SRP

Project Number: 23840.003

Lab Number: L1629727

Report Date: 10/27/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-15 Batch: WG937275-2 WG937275-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Methylnaphthalene-d10	60		64		30-150
Pyrene-d10	80		83		30-150
Benzo(b)fluoranthene-d12	88		92		30-150
DBOB	73		78		30-150
BZ 198	79		84		30-150

Matrix Spike Analysis
Batch Quality Control

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG937275-6 WG937275-7 QC Sample: L1629727-01 Client ID: C-6 (0-48)												
Naphthalene	ND	369	143	**39**	Q	145	**40**	Q	50-120	1		30
Acenaphthylene	ND	369	156	**42**	Q	157	**43**	Q	50-120	1		30
Acenaphthene	ND	369	165	**45**	Q	165	**45**	Q	50-120	0		30
Fluorene	ND	369	172	**47**	Q	172	**47**	Q	50-120	0		30
Phenanthrene	ND	369	179	**49**	Q	179	**49**	Q	50-120	0		30
Anthracene	ND	369	167	**45**	Q	168	**46**	Q	50-120	1		30
Fluoranthene	ND	369	184	**50**	Q	185	51		50-120	1		30
Pyrene	ND	369	178	**48**	Q	176	**48**	Q	50-120	1		30
Benz(a)anthracene	ND	369	196	53		192	52		50-120	2		30
Chrysene	ND	369	187	51		187	51		50-120	0		30
Benzo(b)fluoranthene	ND	369	191	52		191	52		50-120	0		30
Benzo(k)fluoranthene	ND	369	210	57		210	57		50-120	0		30
Benzo(a)pyrene	ND	369	198	54		198	54		50-120	0		30
Indeno(1,2,3-cd)Pyrene	ND	369	207	56		210	57		50-120	1		30
Dibenz(a,h)anthracene	ND	369	197	53		195	53		50-120	1		30
Benzo(ghi)perylene	ND	369	198	54		198	54		50-120	0		30
Cl2-BZ#8	ND	73.8	37.4	51		36.9	50		50-120	1		30
Cl3-BZ#18	ND	73.8	36.3	**49**	Q	35.7	**49**	Q	50-120	2		30
Cl3-BZ#28	ND	73.8	38.1	52		38.0	52		50-120	0		30
Cl4-BZ#44	ND	73.8	40.9	55		39.8	54		50-120	3		30
Cl4-BZ#49	ND	73.8	38.6	52		37.7	52		50-120	2		30

Matrix Spike Analysis
Batch Quality Control

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG937275-6 WG937275-7 QC Sample: L1629727-01 Client ID: C-6 (0-48)												
Cl4-BZ#52	ND	73.8	40.3	55		39.3	54		50-120	3		30
Cl4-BZ#66	ND	73.8	40.5	55		39.3	54		50-120	3		30
Cl5-BZ#87	ND	73.8	40.1	54		38.8	53		50-120	3		30
Cl5-BZ#101	ND	73.8	39.1	53		38.9	53		50-120	1		30
Cl5-BZ#105	ND	73.8	40.0	54		39.1	53		50-120	2		30
Cl5-BZ#118	ND	73.8	39.0	53		38.3	52		50-120	2		30
Cl6-BZ#128	ND	73.8	40.4	55		39.3	54		50-120	3		30
Cl6-BZ#138	ND	73.8	40.7	55		39.3	54		50-120	4		30
Cl6-BZ#153	ND	73.8	39.4	53		38.4	52		50-120	3		30
Cl7-BZ#170	ND	73.8	43.0	58		41.2	56		50-120	4		30
Cl7-BZ#180	ND	73.8	38.6	52		38.6	53		50-120	0		30
Cl7-BZ#183	ND	73.8	37.4	51		36.9	50		50-120	1		30
Cl7-BZ#184	ND	73.8	38.8	53		37.6	51		50-120	3		30
Cl7-BZ#187	ND	73.8	40.8	55		39.1	53		50-120	4		30
Cl8-BZ#195	ND	73.8	41.9	57		40.4	55		50-120	4		30
Cl9-BZ#206	ND	73.8	40.1	54		39.1	53		50-120	3		30
Cl10-BZ#209	ND	73.8	42.3	57		40.3	55		50-120	5		30

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	42		43		30-150

Matrix Spike Analysis
Batch Quality Control

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits

RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG937275-6 WG937275-7 QC Sample: L1629727-01 Client ID: C-6 (0-48)

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
BZ 198	56		51		30-150
Benzo(b)fluoranthene-d12	55		56		30-150
DBOB	54		53		30-150
Pyrene-d10	53		53		30-150

Lab Duplicate Analysis
Batch Quality Control

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab (0-48)	Associated sample(s): 01-15	QC Batch ID: WG937275-5		QC Sample: L1629727-01		Client ID: C-6
Naphthalene	ND	ND	ug/kg	NC		30
Acenaphthylene	ND	ND	ug/kg	NC		30
Acenaphthene	ND	ND	ug/kg	NC		30
Fluorene	ND	ND	ug/kg	NC		30
Phenanthrene	ND	ND	ug/kg	NC		30
Anthracene	ND	ND	ug/kg	NC		30
Fluoranthene	ND	ND	ug/kg	NC		30
Pyrene	ND	ND	ug/kg	NC		30
Benz(a)anthracene	ND	ND	ug/kg	NC		30
Chrysene	ND	ND	ug/kg	NC		30
Benzo(b)fluoranthene	ND	ND	ug/kg	NC		30
Benzo(k)fluoranthene	ND	ND	ug/kg	NC		30
Benzo(a)pyrene	ND	ND	ug/kg	NC		30
Indeno(1,2,3-cd)Pyrene	ND	ND	ug/kg	NC		30
Dibenz(a,h)anthracene	ND	ND	ug/kg	NC		30
Benzo(ghi)perylene	ND	ND	ug/kg	NC		30
Cl2-BZ#8	ND	ND	ug/kg	NC		30
Cl3-BZ#18	ND	ND	ug/kg	NC		30
Cl3-BZ#28	ND	ND	ug/kg	NC		30

Lab Duplicate Analysis
Batch Quality Control

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab (0-48)	Associated sample(s): 01-15	QC Batch ID: WG937275-5	QC Sample: L1629727-01	Client ID: C-6	
Cl4-BZ#44	ND	ND	ug/kg	NC	30
Cl4-BZ#49	ND	ND	ug/kg	NC	30
Cl4-BZ#52	ND	ND	ug/kg	NC	30
Cl4-BZ#66	ND	ND	ug/kg	NC	30
Cl5-BZ#87	ND	ND	ug/kg	NC	30
Cl5-BZ#101	ND	ND	ug/kg	NC	30
Cl5-BZ#105	ND	ND	ug/kg	NC	30
Cl5-BZ#118	ND	ND	ug/kg	NC	30
Cl6-BZ#128	ND	ND	ug/kg	NC	30
Cl6-BZ#138	ND	ND	ug/kg	NC	30
Cl6-BZ#153	ND	ND	ug/kg	NC	30
Cl7-BZ#170	ND	ND	ug/kg	NC	30
Cl7-BZ#180	ND	ND	ug/kg	NC	30
Cl7-BZ#183	ND	ND	ug/kg	NC	30
Cl7-BZ#184	ND	ND	ug/kg	NC	30
Cl7-BZ#187	ND	ND	ug/kg	NC	30
Cl8-BZ#195	ND	ND	ug/kg	NC	30
Cl9-BZ#206	ND	ND	ug/kg	NC	30
Cl10-BZ#209	ND	ND	ug/kg	NC	30

Lab Duplicate Analysis
Batch Quality Control

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
RIM PAHs/PCB Congeners by GC/MS - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG937275-5 QC Sample: L1629727-01 Client ID: C-6 (0-48)					

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
2-Methylnaphthalene-d10	47		48		30-150
Pyrene-d10	54		56		30-150
Benzo(b)fluoranthene-d12	56		58		30-150
DBOB	58		57		30-150
BZ 198	61		56		30-150

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG937275-4

Parameter	% Recovery	Qual	QC Criteria
Phenanthrene	65		40-140
Fluoranthene	68		40-140
Pyrene	57		40-140
Benz(a)anthracene	66		40-140
Chrysene	84		40-140
Benzo(b)fluoranthene	71		40-140
Benzo(k)fluoranthene	117		40-140
Benzo(a)pyrene	59		40-140
Indeno(1,2,3-cd)Pyrene	69		40-140
Dibenz(a,h)anthracene	113		40-140
Benzo(ghi)perylene	69		40-140
Cl2-BZ#8	68		40-140
Cl3-BZ#18	89		40-140
Cl3-BZ#28	43		40-140
Cl4-BZ#44	86		40-140
Cl4-BZ#49	78		40-140
Cl4-BZ#52	69		40-140
Cl4-BZ#66	59		40-140
Cl5-BZ#87	87		40-140
Cl5-BZ#101	81		40-140
Cl5-BZ#105	76		40-140
Cl5-BZ#118	77		40-140
Cl6-BZ#128	164	Q	40-140
Cl6-BZ#138	85		40-140
Cl6-BZ#153	64		40-140
Cl7-BZ#170	95		40-140
Cl7-BZ#180	72		40-140
Cl7-BZ#183	68		40-140
Cl7-BZ#187	83		40-140
Cl9-BZ#206	89		40-140
Cl10-BZ#209	94		40-140
2-Methylnaphthalene-d10 (Surrogate)	62		30-150
Pyrene-d10 (Surrogate)	83		30-150
Benzo(b)fluoranthene-d12 (Surrogate)	80		30-150
DBOB (Surrogate)	74		30-150
BZ 198 (Surrogate)	93		30-150

PETROLEUM HYDROCARBONS

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-01
Client ID: C-6 (0-48)
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 1,8015C(M)
Analytical Date: 10/03/16 13:47
Analyst: DG
Percent Solids: 68%

Date Collected: 09/20/16 10:10
Date Received: 09/20/16
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 10/02/16 12:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	48700	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	102		40-140

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-02
Client ID: C-7 (0-48)
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 1,8015C(M)
Analytical Date: 10/03/16 14:20
Analyst: DG
Percent Solids: 72%

Date Collected: 09/20/16 12:02
Date Received: 09/20/16
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 10/02/16 12:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	45900	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	82		40-140

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-03
Client ID: C-1
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 1,8015C(M)
Analytical Date: 10/03/16 14:52
Analyst: DG
Percent Solids: 59%

Date Collected: 09/20/16 12:58
Date Received: 09/20/16
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 10/02/16 12:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	53500	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	84		40-140

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-04
Client ID: C-2
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 1,8015C(M)
Analytical Date: 10/03/16 15:25
Analyst: DG
Percent Solids: 61%

Date Collected: 09/20/16 13:05
Date Received: 09/20/16
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 10/02/16 12:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	54000	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	82		40-140

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-05
Client ID: C-3
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 1,8015C(M)
Analytical Date: 10/03/16 15:57
Analyst: DG
Percent Solids: 63%

Date Collected: 09/20/16 13:36
Date Received: 09/20/16
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 10/02/16 12:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	51800	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	87		40-140

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-06
Client ID: C-4
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 1,8015C(M)
Analytical Date: 10/03/16 15:25
Analyst: DG
Percent Solids: 65%

Date Collected: 09/20/16 14:05
Date Received: 09/20/16
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 10/02/16 12:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	50500	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	81		40-140

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-07
Client ID: C-6 (48-61)
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 1,8015C(M)
Analytical Date: 10/04/16 18:26
Analyst: SR
Percent Solids: 65%

Date Collected: 09/20/16 10:10
Date Received: 09/20/16
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 10/03/16 16:32

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	53200	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	90		40-140

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-08
Client ID: C-7 (48-54)
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 1,8015C(M)
Analytical Date: 10/04/16 18:58
Analyst: SR
Percent Solids: 71%

Date Collected: 09/20/16 12:02
Date Received: 09/20/16
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 10/03/16 16:32

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	45900	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	83		40-140

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-09
Client ID: C-5
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 1,8015C(M)
Analytical Date: 10/03/16 21:32
Analyst: DG
Percent Solids: 68%

Date Collected: 09/21/16 08:35
Date Received: 09/21/16
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 10/03/16 09:04

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	48400	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	95		40-140

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-10
Client ID: C-8
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 1,8015C(M)
Analytical Date: 10/03/16 22:36
Analyst: DG
Percent Solids: 70%

Date Collected: 09/21/16 13:00
Date Received: 09/21/16
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 10/03/16 09:04

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	47000	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	96		40-140

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-11
Client ID: C-9
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 1,8015C(M)
Analytical Date: 10/03/16 23:09
Analyst: DG
Percent Solids: 82%

Date Collected: 09/21/16 11:45
Date Received: 09/21/16
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 10/03/16 09:04

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	39000	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	95		40-140

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-12
Client ID: C-10
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 1,8015C(M)
Analytical Date: 10/03/16 23:41
Analyst: DG
Percent Solids: 79%

Date Collected: 09/21/16 12:20
Date Received: 09/21/16
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 10/03/16 09:04

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	41100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	98		40-140

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-13
Client ID: C-11 (0-48)
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 1,8015C(M)
Analytical Date: 10/04/16 00:14
Analyst: DG
Percent Solids: 69%

Date Collected: 09/21/16 09:03
Date Received: 09/21/16
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 10/03/16 09:04

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	47800	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	91		40-140

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-14
Client ID: C-12
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 1,8015C(M)
Analytical Date: 10/04/16 00:46
Analyst: DG
Percent Solids: 75%

Date Collected: 09/21/16 08:44
Date Received: 09/21/16
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 10/03/16 09:04

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	43600	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	92		40-140

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-15
Client ID: C-11 (48-89)
Sample Location: LITTLE BAY
Matrix: Sediment
Analytical Method: 1,8015C(M)
Analytical Date: 10/04/16 01:19
Analyst: DG
Percent Solids: 67%

Date Collected: 09/21/16 09:03
Date Received: 09/21/16
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 10/03/16 09:04

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH	ND		ug/kg	47800	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	94		40-140

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015C(M)
Analytical Date: 10/03/16 12:09
Analyst: DG

Extraction Method: EPA 3546
Extraction Date: 10/02/16 12:28

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01-06 Batch: WG938023-1					
TPH	ND		ug/kg	31600	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	80		40-140

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015C(M)
Analytical Date: 10/03/16 20:27
Analyst: DG

Extraction Method: EPA 3546
Extraction Date: 10/03/16 09:04

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 09-15 Batch: WG938163-1					
TPH	ND		ug/kg	32300	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	99		40-140

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015C(M)
Analytical Date: 10/04/16 10:59
Analyst: DG

Extraction Method: EPA 3546
Extraction Date: 10/03/16 16:32

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 07-08 Batch: WG938314-1					
TPH	ND		ug/kg	32600	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	75		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: SRP

Project Number: 23840.003

Lab Number: L1629727

Report Date: 10/27/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-06 Batch: WG938023-2								
TPH	88		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	75				40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: SRP

Project Number: 23840.003

Lab Number: L1629727

Report Date: 10/27/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 09-15 Batch: WG938163-2								
TPH	99		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	86				40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: SRP

Project Number: 23840.003

Lab Number: L1629727

Report Date: 10/27/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 07-08 Batch: WG938314-2								
TPH	86		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	82				40-140

Matrix Spike Analysis
Batch Quality Control

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-06 QC Batch ID: WG938023-3 WG938023-4 QC Sample: L1629727-01 Client ID: C-6 (0-48)												
TPH	ND	194000	195000	101		176000	93		40-140	10		40

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
o-Terphenyl	99		92		40-140

METALS

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-01
Client ID: C-6 (0-48)
Sample Location: LITTLE BAY
Matrix: Sediment
Percent Solids: 68%

Date Collected: 09/20/16 10:10
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	9.14		mg/kg	0.047	--	2	10/11/16 15:00	10/13/16 14:10	EPA 3050B	1,6020A	DB
Cadmium, Total	0.130		mg/kg	0.019	--	2	10/11/16 15:00	10/13/16 14:10	EPA 3050B	1,6020A	DB
Chromium, Total	22.4		mg/kg	0.186	--	2	10/11/16 15:00	10/13/16 14:10	EPA 3050B	1,6020A	DB
Copper, Total	9.15		mg/kg	0.186	--	2	10/11/16 15:00	10/13/16 14:10	EPA 3050B	1,6020A	DB
Lead, Total	6.03		mg/kg	0.279	--	10	10/11/16 15:00	10/13/16 15:02	EPA 3050B	1,6020A	DB
Mercury, Total	ND		mg/kg	0.018	--	5	10/11/16 14:49	10/13/16 14:14	EPA 7474	1,7474	LC
Nickel, Total	15.6		mg/kg	0.093	--	2	10/11/16 15:00	10/13/16 14:10	EPA 3050B	1,6020A	DB
Zinc, Total	47.2		mg/kg	0.930	--	2	10/11/16 15:00	10/13/16 14:10	EPA 3050B	1,6020A	DB

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-02
Client ID: C-7 (0-48)
Sample Location: LITTLE BAY
Matrix: Sediment
Percent Solids: 72%

Date Collected: 09/20/16 12:02
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	7.17		mg/kg	0.035	--	2	10/11/16 15:00	10/13/16 14:26	EPA 3050B	1,6020A	DB
Cadmium, Total	0.064		mg/kg	0.014	--	2	10/11/16 15:00	10/13/16 14:26	EPA 3050B	1,6020A	DB
Chromium, Total	16.7		mg/kg	0.140	--	2	10/11/16 15:00	10/13/16 14:26	EPA 3050B	1,6020A	DB
Copper, Total	6.02		mg/kg	0.140	--	2	10/11/16 15:00	10/13/16 14:26	EPA 3050B	1,6020A	DB
Lead, Total	4.07		mg/kg	0.042	--	2	10/11/16 15:00	10/13/16 14:26	EPA 3050B	1,6020A	DB
Mercury, Total	ND		mg/kg	0.017	--	5	10/11/16 14:49	10/13/16 14:24	EPA 7474	1,7474	LC
Nickel, Total	11.5		mg/kg	0.070	--	2	10/11/16 15:00	10/13/16 14:26	EPA 3050B	1,6020A	DB
Zinc, Total	34.5		mg/kg	0.701	--	2	10/11/16 15:00	10/13/16 14:26	EPA 3050B	1,6020A	DB

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-03
Client ID: C-1
Sample Location: LITTLE BAY
Matrix: Sediment
Percent Solids: 59%

Date Collected: 09/20/16 12:58
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	10.7		mg/kg	0.046	--	2	10/11/16 15:00	10/13/16 14:28	EPA 3050B	1,6020A	DB
Cadmium, Total	0.187		mg/kg	0.018	--	2	10/11/16 15:00	10/13/16 14:28	EPA 3050B	1,6020A	DB
Chromium, Total	36.9		mg/kg	0.183	--	2	10/11/16 15:00	10/13/16 14:28	EPA 3050B	1,6020A	DB
Copper, Total	10.5		mg/kg	0.183	--	2	10/11/16 15:00	10/13/16 14:28	EPA 3050B	1,6020A	DB
Lead, Total	11.7		mg/kg	0.275	--	10	10/11/16 15:00	10/13/16 15:12	EPA 3050B	1,6020A	DB
Mercury, Total	0.033		mg/kg	0.022	--	5	10/11/16 14:49	10/13/16 14:34	EPA 7474	1,7474	LC
Nickel, Total	17.9		mg/kg	0.092	--	2	10/11/16 15:00	10/13/16 14:28	EPA 3050B	1,6020A	DB
Zinc, Total	58.2		mg/kg	0.916	--	2	10/11/16 15:00	10/13/16 14:28	EPA 3050B	1,6020A	DB

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-04
Client ID: C-2
Sample Location: LITTLE BAY
Matrix: Sediment
Percent Solids: 61%

Date Collected: 09/20/16 13:05
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	10.4		mg/kg	0.049	--	2	10/11/16 15:00	10/13/16 14:30	EPA 3050B	1,6020A	DB
Cadmium, Total	0.188		mg/kg	0.020	--	2	10/11/16 15:00	10/13/16 14:30	EPA 3050B	1,6020A	DB
Chromium, Total	29.9		mg/kg	0.195	--	2	10/11/16 15:00	10/13/16 14:30	EPA 3050B	1,6020A	DB
Copper, Total	9.54		mg/kg	0.195	--	2	10/11/16 15:00	10/13/16 14:30	EPA 3050B	1,6020A	DB
Lead, Total	7.49		mg/kg	0.058	--	2	10/11/16 15:00	10/13/16 14:30	EPA 3050B	1,6020A	DB
Mercury, Total	0.025		mg/kg	0.018	--	5	10/11/16 14:49	10/13/16 14:37	EPA 7474	1,7474	LC
Nickel, Total	17.2		mg/kg	0.097	--	2	10/11/16 15:00	10/13/16 14:30	EPA 3050B	1,6020A	DB
Zinc, Total	54.6		mg/kg	0.974	--	2	10/11/16 15:00	10/13/16 14:30	EPA 3050B	1,6020A	DB

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-05
Client ID: C-3
Sample Location: LITTLE BAY
Matrix: Sediment
Percent Solids: 63%

Date Collected: 09/20/16 13:36
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	9.94		mg/kg	0.048	--	2	10/11/16 15:00	10/13/16 14:33	EPA 3050B	1,6020A	DB
Cadmium, Total	0.185		mg/kg	0.019	--	2	10/11/16 15:00	10/13/16 14:33	EPA 3050B	1,6020A	DB
Chromium, Total	32.5		mg/kg	0.193	--	2	10/11/16 15:00	10/13/16 14:33	EPA 3050B	1,6020A	DB
Copper, Total	9.79		mg/kg	0.193	--	2	10/11/16 15:00	10/13/16 14:33	EPA 3050B	1,6020A	DB
Lead, Total	8.36		mg/kg	0.058	--	2	10/11/16 15:00	10/13/16 14:33	EPA 3050B	1,6020A	DB
Mercury, Total	0.041		mg/kg	0.019	--	5	10/11/16 14:49	10/13/16 14:48	EPA 7474	1,7474	LC
Nickel, Total	15.8		mg/kg	0.097	--	2	10/11/16 15:00	10/13/16 14:33	EPA 3050B	1,6020A	DB
Zinc, Total	52.0		mg/kg	0.966	--	2	10/11/16 15:00	10/13/16 14:33	EPA 3050B	1,6020A	DB

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-06
Client ID: C-4
Sample Location: LITTLE BAY
Matrix: Sediment
Percent Solids: 65%

Date Collected: 09/20/16 14:05
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	8.54		mg/kg	0.045	--	2	10/11/16 15:00	10/13/16 14:35	EPA 3050B	1,6020A	DB
Cadmium, Total	0.154		mg/kg	0.018	--	2	10/11/16 15:00	10/13/16 14:35	EPA 3050B	1,6020A	DB
Chromium, Total	22.2		mg/kg	0.181	--	2	10/11/16 15:00	10/13/16 14:35	EPA 3050B	1,6020A	DB
Copper, Total	7.49		mg/kg	0.181	--	2	10/11/16 15:00	10/13/16 14:35	EPA 3050B	1,6020A	DB
Lead, Total	5.13		mg/kg	0.054	--	2	10/11/16 15:00	10/13/16 14:35	EPA 3050B	1,6020A	DB
Mercury, Total	ND		mg/kg	0.017	--	5	10/11/16 14:49	10/13/16 14:51	EPA 7474	1,7474	LC
Nickel, Total	14.1		mg/kg	0.091	--	2	10/11/16 15:00	10/13/16 14:35	EPA 3050B	1,6020A	DB
Zinc, Total	43.3		mg/kg	0.906	--	2	10/11/16 15:00	10/13/16 14:35	EPA 3050B	1,6020A	DB

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-07
Client ID: C-6 (48-61)
Sample Location: LITTLE BAY
Matrix: Sediment
Percent Solids: 65%

Date Collected: 09/20/16 10:10
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	11.7		mg/kg	0.048	--	2	10/11/16 15:00	10/13/16 14:37	EPA 3050B	1,6020A	DB
Cadmium, Total	0.112		mg/kg	0.019	--	2	10/11/16 15:00	10/13/16 14:37	EPA 3050B	1,6020A	DB
Chromium, Total	25.4		mg/kg	0.192	--	2	10/11/16 15:00	10/13/16 14:37	EPA 3050B	1,6020A	DB
Copper, Total	10.2		mg/kg	0.192	--	2	10/11/16 15:00	10/13/16 14:37	EPA 3050B	1,6020A	DB
Lead, Total	5.46		mg/kg	0.058	--	2	10/11/16 15:00	10/13/16 14:37	EPA 3050B	1,6020A	DB
Mercury, Total	ND		mg/kg	0.021	--	5	10/11/16 14:49	10/13/16 14:53	EPA 7474	1,7474	LC
Nickel, Total	18.2		mg/kg	0.096	--	2	10/11/16 15:00	10/13/16 14:37	EPA 3050B	1,6020A	DB
Zinc, Total	54.2		mg/kg	0.960	--	2	10/11/16 15:00	10/13/16 14:37	EPA 3050B	1,6020A	DB

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-08
Client ID: C-7 (48-54)
Sample Location: LITTLE BAY
Matrix: Sediment
Percent Solids: 71%

Date Collected: 09/20/16 12:02
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	6.88		mg/kg	0.044	--	2	10/11/16 15:00	10/13/16 14:39	EPA 3050B	1,6020A	DB
Cadmium, Total	0.057		mg/kg	0.018	--	2	10/11/16 15:00	10/13/16 14:39	EPA 3050B	1,6020A	DB
Chromium, Total	18.0		mg/kg	0.177	--	2	10/11/16 15:00	10/13/16 14:39	EPA 3050B	1,6020A	DB
Copper, Total	7.35		mg/kg	0.177	--	2	10/11/16 15:00	10/13/16 14:39	EPA 3050B	1,6020A	DB
Lead, Total	3.91		mg/kg	0.053	--	2	10/11/16 15:00	10/13/16 14:39	EPA 3050B	1,6020A	DB
Mercury, Total	ND		mg/kg	0.015	--	5	10/11/16 14:49	10/13/16 14:56	EPA 7474	1,7474	LC
Nickel, Total	13.2		mg/kg	0.089	--	2	10/11/16 15:00	10/13/16 14:39	EPA 3050B	1,6020A	DB
Zinc, Total	38.6		mg/kg	0.887	--	2	10/11/16 15:00	10/13/16 14:39	EPA 3050B	1,6020A	DB

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-09
Client ID: C-5
Sample Location: LITTLE BAY
Matrix: Sediment
Percent Solids: 68%

Date Collected: 09/21/16 08:35
Date Received: 09/21/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	7.05		mg/kg	0.038	--	2	10/11/16 15:00	10/13/16 14:41	EPA 3050B	1,6020A	DB
Cadmium, Total	0.157		mg/kg	0.015	--	2	10/11/16 15:00	10/13/16 14:41	EPA 3050B	1,6020A	DB
Chromium, Total	20.6		mg/kg	0.152	--	2	10/11/16 15:00	10/13/16 14:41	EPA 3050B	1,6020A	DB
Copper, Total	6.61		mg/kg	0.152	--	2	10/11/16 15:00	10/13/16 14:41	EPA 3050B	1,6020A	DB
Lead, Total	4.80		mg/kg	0.046	--	2	10/11/16 15:00	10/13/16 14:41	EPA 3050B	1,6020A	DB
Mercury, Total	0.016		mg/kg	0.016	--	5	10/11/16 14:49	10/13/16 14:58	EPA 7474	1,7474	LC
Nickel, Total	12.7		mg/kg	0.076	--	2	10/11/16 15:00	10/13/16 14:41	EPA 3050B	1,6020A	DB
Zinc, Total	52.8		mg/kg	0.759	--	2	10/11/16 15:00	10/13/16 14:41	EPA 3050B	1,6020A	DB

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-10
Client ID: C-8
Sample Location: LITTLE BAY
Matrix: Sediment
Percent Solids: 70%

Date Collected: 09/21/16 13:00
Date Received: 09/21/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	6.56		mg/kg	0.039	--	2	10/11/16 15:00	10/13/16 14:43	EPA 3050B	1,6020A	DB
Cadmium, Total	0.114		mg/kg	0.016	--	2	10/11/16 15:00	10/13/16 14:43	EPA 3050B	1,6020A	DB
Chromium, Total	13.7		mg/kg	0.156	--	2	10/11/16 15:00	10/13/16 14:43	EPA 3050B	1,6020A	DB
Copper, Total	6.04		mg/kg	0.156	--	2	10/11/16 15:00	10/13/16 14:43	EPA 3050B	1,6020A	DB
Lead, Total	4.40		mg/kg	0.047	--	2	10/11/16 15:00	10/13/16 14:43	EPA 3050B	1,6020A	DB
Mercury, Total	ND		mg/kg	0.014	--	5	10/11/16 14:49	10/13/16 15:01	EPA 7474	1,7474	LC
Nickel, Total	9.43		mg/kg	0.078	--	2	10/11/16 15:00	10/13/16 14:43	EPA 3050B	1,6020A	DB
Zinc, Total	36.2		mg/kg	0.782	--	2	10/11/16 15:00	10/13/16 14:43	EPA 3050B	1,6020A	DB

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-11
Client ID: C-9
Sample Location: LITTLE BAY
Matrix: Sediment
Percent Solids: 82%

Date Collected: 09/21/16 11:45
Date Received: 09/21/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	6.40		mg/kg	0.040	--	2	10/11/16 15:00	10/13/16 14:45	EPA 3050B	1,6020A	DB
Cadmium, Total	0.022		mg/kg	0.016	--	2	10/11/16 15:00	10/13/16 14:45	EPA 3050B	1,6020A	DB
Chromium, Total	17.4		mg/kg	0.161	--	2	10/11/16 15:00	10/13/16 14:45	EPA 3050B	1,6020A	DB
Copper, Total	7.64		mg/kg	0.161	--	2	10/11/16 15:00	10/13/16 14:45	EPA 3050B	1,6020A	DB
Lead, Total	5.39		mg/kg	0.048	--	2	10/11/16 15:00	10/13/16 14:45	EPA 3050B	1,6020A	DB
Mercury, Total	ND		mg/kg	0.013	--	5	10/11/16 14:49	10/13/16 15:03	EPA 7474	1,7474	LC
Nickel, Total	13.2		mg/kg	0.081	--	2	10/11/16 15:00	10/13/16 14:45	EPA 3050B	1,6020A	DB
Zinc, Total	44.7		mg/kg	0.805	--	2	10/11/16 15:00	10/13/16 14:45	EPA 3050B	1,6020A	DB

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-12
Client ID: C-10
Sample Location: LITTLE BAY
Matrix: Sediment
Percent Solids: 79%

Date Collected: 09/21/16 12:20
Date Received: 09/21/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	6.56		mg/kg	0.032	--	2	10/11/16 15:00	10/13/16 14:53	EPA 3050B	1,6020A	DB
Cadmium, Total	0.035		mg/kg	0.013	--	2	10/11/16 15:00	10/13/16 14:53	EPA 3050B	1,6020A	DB
Chromium, Total	10.9		mg/kg	0.129	--	2	10/11/16 15:00	10/13/16 14:53	EPA 3050B	1,6020A	DB
Copper, Total	2.46		mg/kg	0.129	--	2	10/11/16 15:00	10/13/16 14:53	EPA 3050B	1,6020A	DB
Lead, Total	2.88		mg/kg	0.039	--	2	10/11/16 15:00	10/13/16 14:53	EPA 3050B	1,6020A	DB
Mercury, Total	ND		mg/kg	0.015	--	5	10/11/16 14:49	10/13/16 15:06	EPA 7474	1,7474	LC
Nickel, Total	6.17		mg/kg	0.064	--	2	10/11/16 15:00	10/13/16 14:53	EPA 3050B	1,6020A	DB
Zinc, Total	30.9		mg/kg	0.643	--	2	10/11/16 15:00	10/13/16 14:53	EPA 3050B	1,6020A	DB

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-13
Client ID: C-11 (0-48)
Sample Location: LITTLE BAY
Matrix: Sediment
Percent Solids: 69%

Date Collected: 09/21/16 09:03
Date Received: 09/21/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	7.39		mg/kg	0.048	--	2	10/11/16 15:00	10/13/16 14:55	EPA 3050B	1,6020A	DB
Cadmium, Total	0.082		mg/kg	0.019	--	2	10/11/16 15:00	10/13/16 14:55	EPA 3050B	1,6020A	DB
Chromium, Total	22.8		mg/kg	0.190	--	2	10/11/16 15:00	10/13/16 14:55	EPA 3050B	1,6020A	DB
Copper, Total	8.19		mg/kg	0.190	--	2	10/11/16 15:00	10/13/16 14:55	EPA 3050B	1,6020A	DB
Lead, Total	9.39		mg/kg	0.057	--	2	10/11/16 15:00	10/13/16 14:55	EPA 3050B	1,6020A	DB
Mercury, Total	ND		mg/kg	0.018	--	5	10/11/16 14:49	10/13/16 15:08	EPA 7474	1,7474	LC
Nickel, Total	14.1		mg/kg	0.095	--	2	10/11/16 15:00	10/13/16 14:55	EPA 3050B	1,6020A	DB
Zinc, Total	45.6		mg/kg	0.953	--	2	10/11/16 15:00	10/13/16 14:55	EPA 3050B	1,6020A	DB

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-14
Client ID: C-12
Sample Location: LITTLE BAY
Matrix: Sediment
Percent Solids: 75%

Date Collected: 09/21/16 08:44
Date Received: 09/21/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	6.06		mg/kg	0.038	--	2	10/11/16 15:00	10/13/16 14:57	EPA 3050B	1,6020A	DB
Cadmium, Total	0.089		mg/kg	0.015	--	2	10/11/16 15:00	10/13/16 14:57	EPA 3050B	1,6020A	DB
Chromium, Total	16.8		mg/kg	0.151	--	2	10/11/16 15:00	10/13/16 14:57	EPA 3050B	1,6020A	DB
Copper, Total	5.51		mg/kg	0.151	--	2	10/11/16 15:00	10/13/16 14:57	EPA 3050B	1,6020A	DB
Lead, Total	4.60		mg/kg	0.045	--	2	10/11/16 15:00	10/13/16 14:57	EPA 3050B	1,6020A	DB
Mercury, Total	0.019		mg/kg	0.013	--	5	10/11/16 14:49	10/13/16 15:35	EPA 7474	1,7474	LC
Nickel, Total	10.7		mg/kg	0.075	--	2	10/11/16 15:00	10/13/16 14:57	EPA 3050B	1,6020A	DB
Zinc, Total	26.8		mg/kg	0.754	--	2	10/11/16 15:00	10/13/16 14:57	EPA 3050B	1,6020A	DB

Project Name: SRP
Lab Number: L1629727
Project Number: 23840.003
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-15
Client ID: C-11 (48-89)
Sample Location: LITTLE BAY
Matrix: Sediment
Percent Solids: 67%

Date Collected: 09/21/16 09:03
Date Received: 09/21/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Arsenic, Total	10.8		mg/kg	0.038	--	2	10/11/16 15:00	10/13/16 14:59	EPA 3050B	1,6020A	DB
Cadmium, Total	0.083		mg/kg	0.015	--	2	10/11/16 15:00	10/13/16 14:59	EPA 3050B	1,6020A	DB
Chromium, Total	22.7		mg/kg	0.150	--	2	10/11/16 15:00	10/13/16 14:59	EPA 3050B	1,6020A	DB
Copper, Total	9.21		mg/kg	0.150	--	2	10/11/16 15:00	10/13/16 14:59	EPA 3050B	1,6020A	DB
Lead, Total	4.80		mg/kg	0.045	--	2	10/11/16 15:00	10/13/16 14:59	EPA 3050B	1,6020A	DB
Mercury, Total	ND		mg/kg	0.017	--	5	10/11/16 14:49	10/13/16 15:44	EPA 7474	1,7474	LC
Nickel, Total	16.5		mg/kg	0.075	--	2	10/11/16 15:00	10/13/16 14:59	EPA 3050B	1,6020A	DB
Zinc, Total	49.3		mg/kg	0.752	--	2	10/11/16 15:00	10/13/16 14:59	EPA 3050B	1,6020A	DB

Project Name: SRP
Project Number: 23840.003
Lab Number: L1629727
Report Date: 10/27/16

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-15 Batch: WG940944-1										
Arsenic, Total	ND		mg/kg	0.050	--	2	10/11/16 15:00	10/13/16 14:03	1,6020A	DB
Cadmium, Total	ND		mg/kg	0.020	--	2	10/11/16 15:00	10/13/16 14:03	1,6020A	DB
Chromium, Total	ND		mg/kg	0.200	--	2	10/11/16 15:00	10/13/16 14:03	1,6020A	DB
Copper, Total	ND		mg/kg	0.200	--	2	10/11/16 15:00	10/13/16 14:03	1,6020A	DB
Lead, Total	ND		mg/kg	0.060	--	2	10/11/16 15:00	10/13/16 14:03	1,6020A	DB
Nickel, Total	ND		mg/kg	0.100	--	2	10/11/16 15:00	10/13/16 14:03	1,6020A	DB
Zinc, Total	ND		mg/kg	1.00	--	2	10/11/16 15:00	10/13/16 14:03	1,6020A	DB

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-15 Batch: WG940945-1										
Mercury, Total	ND		mg/kg	0.013	--	5	10/11/16 14:49	10/13/16 14:09	1,7474	LC

Prep Information

Digestion Method: EPA 7474

Lab Control Sample Analysis

Batch Quality Control

Project Name: SRP

Project Number: 23840.003

Lab Number: L1629727

Report Date: 10/27/16

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-15 Batch: WG940944-2 SRM Lot Number: D091-540								
Arsenic, Total	98		-		80-121	-		20
Cadmium, Total	94		-		83-117	-		20
Chromium, Total	88		-		80-119	-		20
Copper, Total	102		-		82-117	-		20
Lead, Total	89		-		82-118	-		20
Nickel, Total	102		-		83-117	-		20
Zinc, Total	97		-		82-118	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-15 Batch: WG940945-2 SRM Lot Number: D091-540								
Mercury, Total	108		-		72-128	-		20

Matrix Spike Analysis
Batch Quality Control

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG940944-4 WG940944-5 QC Sample: L1629727-01 Client ID: C-6 (0-48)												
Arsenic, Total	9.14	187	192	98		190	98		75-125	1		20
Cadmium, Total	0.130	93.6	94.1	100		93.0	101		75-125	1		20
Chromium, Total	22.4	187	205	98		205	99		75-125	0		20
Copper, Total	9.15	187	199	101		197	102		75-125	1		20
Lead, Total	6.03	187	200	104		175	92		75-125	13		20
Nickel, Total	15.6	187	209	103		206	104		75-125	1		20
Zinc, Total	47.2	187	217	91		223	96		75-125	3		20
Total Metals - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG940945-4 WG940945-5 QC Sample: L1629727-01 Client ID: C-6 (0-48)												
Mercury, Total	ND	0.906	0.772	85		0.778	85		80-120	1		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG940944-3 QC Sample: L1629727-01 Client ID: C-6 (0-48)						
Arsenic, Total	9.14	9.41	mg/kg	3		20
Cadmium, Total	0.130	0.130	mg/kg	0		20
Chromium, Total	22.4	22.7	mg/kg	1		20
Copper, Total	9.15	9.52	mg/kg	4		20
Nickel, Total	15.6	16.6	mg/kg	6		20
Zinc, Total	47.2	47.7	mg/kg	1		20
Total Metals - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG940944-3 QC Sample: L1629727-01 Client ID: C-6 (0-48)						
Lead, Total	6.03	6.27	mg/kg	4		20
Total Metals - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG940945-3 QC Sample: L1629727-01 Client ID: C-6 (0-48)						
Mercury, Total	ND	ND	mg/kg	NC		20

INORGANICS
&
MISCELLANEOUS

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-01
Client ID: C-6 (0-48)
Sample Location: LITTLE BAY
Matrix: Sediment

Date Collected: 09/20/16 10:10
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.16		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
Total Organic Carbon (Rep2)	1.17		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
RIM Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.200		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Coarse Sand	1.30		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Medium Sand	4.00		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Fine Sand	13.1		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Total Fines	81.4		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
General Chemistry - Mansfield Lab										
Solids, Total	67.6		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP
Moisture	32.4		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-02
Client ID: C-7 (0-48)
Sample Location: LITTLE BAY
Matrix: Sediment

Date Collected: 09/20/16 12:02
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	0.682		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
Total Organic Carbon (Rep2)	0.754		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
RIM Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.100		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Coarse Sand	0.700		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Medium Sand	4.30		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Fine Sand	44.9		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Total Fines	50.0		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
General Chemistry - Mansfield Lab										
Solids, Total	72.0		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP
Moisture	28.0		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-03
Client ID: C-1
Sample Location: LITTLE BAY
Matrix: Sediment

Date Collected: 09/20/16 12:58
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.63		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
Total Organic Carbon (Rep2)	1.64		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
RIM Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.200		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Coarse Sand	1.50		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Medium Sand	3.40		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Fine Sand	6.00		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Total Fines	88.9		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
General Chemistry - Mansfield Lab										
Solids, Total	58.7		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP
Moisture	41.3		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-04
Client ID: C-2
Sample Location: LITTLE BAY
Matrix: Sediment

Date Collected: 09/20/16 13:05
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.52		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
Total Organic Carbon (Rep2)	1.56		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
RIM Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.200		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Coarse Sand	1.40		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Medium Sand	4.70		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Fine Sand	8.00		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Total Fines	85.7		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
General Chemistry - Mansfield Lab										
Solids, Total	61.1		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP
Moisture	38.9		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-05
Client ID: C-3
Sample Location: LITTLE BAY
Matrix: Sediment

Date Collected: 09/20/16 13:36
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.41		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
Total Organic Carbon (Rep2)	1.35		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
RIM Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.100		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Coarse Sand	0.700		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Medium Sand	2.30		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Fine Sand	8.20		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Total Fines	88.7		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
General Chemistry - Mansfield Lab										
Solids, Total	63.1		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP
Moisture	36.9		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-06
Client ID: C-4
Sample Location: LITTLE BAY
Matrix: Sediment

Date Collected: 09/20/16 14:05
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.22		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
Total Organic Carbon (Rep2)	1.11		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
RIM Grain Size Analysis - Mansfield Lab										
% Total Gravel	ND		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Coarse Sand	3.20		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Medium Sand	7.10		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Fine Sand	16.3		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Total Fines	73.4		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
General Chemistry - Mansfield Lab										
Solids, Total	64.9		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP
Moisture	35.1		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-07
Client ID: C-6 (48-61)
Sample Location: LITTLE BAY
Matrix: Sediment

Date Collected: 09/20/16 10:10
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.29		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
Total Organic Carbon (Rep2)	1.27		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
RIM Grain Size Analysis - Mansfield Lab										
% Total Gravel	ND		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Coarse Sand	0.600		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Medium Sand	2.90		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Fine Sand	5.90		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Total Fines	90.6		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
General Chemistry - Mansfield Lab										
Solids, Total	64.7		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP
Moisture	35.3		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-08
Client ID: C-7 (48-54)
Sample Location: LITTLE BAY
Matrix: Sediment

Date Collected: 09/20/16 12:02
Date Received: 09/20/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	0.647		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
Total Organic Carbon (Rep2)	0.674		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
RIM Grain Size Analysis - Mansfield Lab										
% Total Gravel	ND		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Coarse Sand	0.100		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Medium Sand	7.30		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Fine Sand	36.7		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Total Fines	55.9		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
General Chemistry - Mansfield Lab										
Solids, Total	70.9		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP
Moisture	29.1		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-09
Client ID: C-5
Sample Location: LITTLE BAY
Matrix: Sediment

Date Collected: 09/21/16 08:35
Date Received: 09/21/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	1.17		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
Total Organic Carbon (Rep2)	1.05		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
RIM Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.600		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Coarse Sand	2.00		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Medium Sand	4.00		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Fine Sand	24.3		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Total Fines	69.1		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
General Chemistry - Mansfield Lab										
Solids, Total	68.3		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP
Moisture	31.7		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-10
Client ID: C-8
Sample Location: LITTLE BAY
Matrix: Sediment

Date Collected: 09/21/16 13:00
Date Received: 09/21/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	0.974		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
Total Organic Carbon (Rep2)	1.14		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
RIM Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.600		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Coarse Sand	0.400		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Medium Sand	8.80		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Fine Sand	66.0		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Total Fines	24.2		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
General Chemistry - Mansfield Lab										
Solids, Total	70.3		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP
Moisture	29.7		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-11
Client ID: C-9
Sample Location: LITTLE BAY
Matrix: Sediment

Date Collected: 09/21/16 11:45
Date Received: 09/21/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	0.105		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
Total Organic Carbon (Rep2)	0.095		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
RIM Grain Size Analysis - Mansfield Lab										
% Total Gravel	2.30		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Coarse Sand	3.40		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Medium Sand	31.6		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Fine Sand	34.0		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Total Fines	28.7		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
General Chemistry - Mansfield Lab										
Solids, Total	81.7		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP
Moisture	18.3		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-12
Client ID: C-10
Sample Location: LITTLE BAY
Matrix: Sediment

Date Collected: 09/21/16 12:20
Date Received: 09/21/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	0.197		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
Total Organic Carbon (Rep2)	0.191		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
RIM Grain Size Analysis - Mansfield Lab										
% Total Gravel	0.100		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Coarse Sand	0.400		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Medium Sand	1.70		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Fine Sand	91.6		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Total Fines	6.20		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
General Chemistry - Mansfield Lab										
Solids, Total	78.9		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP
Moisture	21.1		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-13
Client ID: C-11 (0-48)
Sample Location: LITTLE BAY
Matrix: Sediment

Date Collected: 09/21/16 09:03
Date Received: 09/21/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	0.768		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
Total Organic Carbon (Rep2)	0.822		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
RIM Grain Size Analysis - Mansfield Lab										
% Total Gravel	1.10		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Coarse Sand	1.70		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Medium Sand	5.90		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Fine Sand	35.8		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Total Fines	55.5		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
General Chemistry - Mansfield Lab										
Solids, Total	68.6		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP
Moisture	31.4		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-14
Client ID: C-12
Sample Location: LITTLE BAY
Matrix: Sediment

Date Collected: 09/21/16 08:44
Date Received: 09/21/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	0.569		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
Total Organic Carbon (Rep2)	0.493		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
RIM Grain Size Analysis - Mansfield Lab										
% Total Gravel	2.20		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Coarse Sand	2.10		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Medium Sand	7.10		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Fine Sand	39.2		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Total Fines	49.4		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
General Chemistry - Mansfield Lab										
Solids, Total	75.4		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP
Moisture	24.6		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

SAMPLE RESULTS

Lab ID: L1629727-15
Client ID: C-11 (48-89)
Sample Location: LITTLE BAY
Matrix: Sediment

Date Collected: 09/21/16 09:03
Date Received: 09/21/16
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab										
Total Organic Carbon (Rep1)	0.947		%	0.010	--	1	-	10/11/16 13:10	1,9060A	AR
Total Organic Carbon (Rep2)	0.924		%	0.010	--	1	-	10/11/16 13:10	1,9060A	AR
RIM Grain Size Analysis - Mansfield Lab										
% Total Gravel	ND		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Coarse Sand	1.30		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Medium Sand	4.30		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Fine Sand	12.6		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
% Total Fines	81.8		%	0.100	NA	1	-	10/12/16 10:08	12,D422	AR
General Chemistry - Mansfield Lab										
Solids, Total	66.8		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP
Moisture	33.2		%	0.100	--	1	-	10/05/16 14:25	121,2540G	SP

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Organic Carbon - Mansfield Lab for sample(s): 01-14 Batch: WG940886-1										
Total Organic Carbon (Rep1)	ND		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
Total Organic Carbon (Rep2)	ND		%	0.010	--	1	-	10/10/16 09:20	1,9060A	CM
Total Organic Carbon - Mansfield Lab for sample(s): 15 Batch: WG941002-1										
Total Organic Carbon (Rep1)	ND		%	0.010	--	1	-	10/11/16 11:19	1,9060A	AR
Total Organic Carbon (Rep2)	ND		%	0.010	--	1	-	10/11/16 11:19	1,9060A	AR

Matrix Spike Analysis
Batch Quality Control

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Organic Carbon - Mansfield Lab Associated sample(s): 01-14 (0-48) QC Batch ID: WG940886-4 WG940886-5 QC Sample: L1629727-01 Client ID: C-6												
Total Organic Carbon (Rep1)	1.16	0.723	1.94	108		2.08	109		75-125	7		25
Total Organic Carbon (Rep2)	1.17	0.641	1.84	104		2.96	105		75-125	**47**	Q	25
Total Organic Carbon - Mansfield Lab Associated sample(s): 15 QC Batch ID: WG941002-4 WG941002-5 QC Sample: L1629586-20 Client ID: MS Sample												
Total Organic Carbon (Rep1)	0.196	0.715	0.942	104		0.852	104		75-125	10		25
Total Organic Carbon (Rep2)	0.199	0.622	0.839	103		0.996	104		75-125	17		25

Lab Duplicate Analysis
Batch Quality Control

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG939164-1 QC Sample: L1629727-01 Client ID: C-6 (0-48)						
Solids, Total	67.6	66.2	%	2		10
Moisture	32.4	33.8	%	4		10
Total Organic Carbon - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG940886-3 QC Sample: L1629727-01 Client ID: C-6 (0-48)						
Total Organic Carbon (Rep1)	1.16	1.10	%	5		25
Total Organic Carbon (Rep2)	1.17	1.20	%	3		25
Total Organic Carbon - Mansfield Lab Associated sample(s): 15 QC Batch ID: WG941002-3 QC Sample: L1629586-20 Client ID: DUP Sample						
Total Organic Carbon (Rep1)	0.196	0.203	%	4		25
Total Organic Carbon (Rep2)	0.199	0.215	%	8		25
RIM Grain Size Analysis - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG941283-1 QC Sample: L1629727-01 Client ID: C-6 (0-48)						
% Total Gravel	0.200	ND	%	NC		25
% Coarse Sand	1.30	1.30	%	0		25
% Medium Sand	4.00	3.10	%	25		25
% Fine Sand	13.1	11.5	%	13		25
% Total Fines	81.4	84.1	%	3		25

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG940886-2

Parameter	% Recovery	Qual	QC Criteria
Total Organic Carbon (Rep1)	86		75-125
Total Organic Carbon (Rep2)	90		75-125

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

S.R.M. Standard Quality Control

Standard Reference Material (SRM): WG941002-2

Parameter	% Recovery	Qual	QC Criteria
Total Organic Carbon (Rep1)	101		75-125
Total Organic Carbon (Rep2)	88		75-125

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: 09/21/2016 02:24

Cooler Information Custody Seal

Cooler	
A	Absent
B	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1629727-01A	Vial MeOH preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)
L1629727-01B	Vial water preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)
L1629727-01C	Vial water preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)
L1629727-01D	Glass 120ml/4oz unpreserved	A	N/A	4.1	Y	Absent	A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-PREP-3050:1T(180)
L1629727-01E	Plastic 8oz unpreserved for Grai	A	N/A	4.1	Y	Absent	A2-RIMHYDRO-CSAND(),A2-RIMHYDRO-MSAND(),A2-RIMHYDRO-TFINE(),A2-RIMHYDRO-TGRAVEL(),A2-RIMHYDRO-FSAND()
L1629727-01F	Glass 60ml unpreserved split	A	N/A	4.1	Y	Absent	HOLD-EPH(14),TPH-DRO-D(14)
L1629727-01G	Amber 120ml unpreserved	A	N/A	4.1	Y	Absent	SUB-DIOXIN-1613B(365)
L1629727-01H	Amber 120ml unpreserved	A	N/A	4.1	Y	Absent	A2-SUB()
L1629727-02A	Vial MeOH preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)
L1629727-02B	Vial water preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)
L1629727-02C	Vial water preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)

*Values in parentheses indicate holding time in days

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1629727-02D	Glass 120ml/4oz unpreserved	A	N/A	4.1	Y	Absent	A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-PREP-3050:1T(180)
L1629727-02E	Plastic 8oz unpreserved for Grai	A	N/A	4.1	Y	Absent	A2-RIMHYDRO-CSAND(),A2-RIMHYDRO-MSAND(),A2-RIMHYDRO-TFINE(),A2-RIMHYDRO-TGRAVEL(),A2-RIMHYDRO-FSAND()
L1629727-02F	Glass 60ml unpreserved split	A	N/A	4.1	Y	Absent	HOLD-EPH(14),TPH-DRO-D(14)
L1629727-02G	Amber 120ml unpreserved	A	N/A	4.1	Y	Absent	SUB-DIOXIN-1613B(365)
L1629727-02H	Amber 120ml unpreserved	A	N/A	4.1	Y	Absent	A2-SUB()
L1629727-03A	Vial MeOH preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)
L1629727-03B	Vial water preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)
L1629727-03C	Vial water preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)
L1629727-03D	Glass 120ml/4oz unpreserved	A	N/A	4.1	Y	Absent	A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-PREP-3050:1T(180)
L1629727-03E	Plastic 8oz unpreserved for Grai	A	N/A	4.1	Y	Absent	A2-RIMHYDRO-CSAND(),A2-RIMHYDRO-MSAND(),A2-RIMHYDRO-TFINE(),A2-RIMHYDRO-TGRAVEL(),A2-RIMHYDRO-FSAND()
L1629727-03F	Glass 60ml unpreserved split	A	N/A	4.1	Y	Absent	HOLD-EPH(14),TPH-DRO-D(14)
L1629727-03G	Amber 120ml unpreserved	A	N/A	4.1	Y	Absent	SUB-DIOXIN-1613B(365)
L1629727-03H	Amber 120ml unpreserved	A	N/A	4.1	Y	Absent	A2-SUB()
L1629727-04A	Vial MeOH preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)
L1629727-04B	Vial water preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)
L1629727-04C	Vial water preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)

*Values in parentheses indicate holding time in days

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1629727-04D	Glass 120ml/4oz unpreserved	A	N/A	4.1	Y	Absent	A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-PREP-3050:1T(180)
L1629727-04E	Plastic 8oz unpreserved for Grai	A	N/A	4.1	Y	Absent	A2-RIMHYDRO-CSAND(),A2-RIMHYDRO-MSAND(),A2-RIMHYDRO-TFINE(),A2-RIMHYDRO-TGRAVEL(),A2-RIMHYDRO-FSAND()
L1629727-04F	Glass 60ml unpreserved split	A	N/A	4.1	Y	Absent	HOLD-EPH(14),TPH-DRO-D(14)
L1629727-04G	Amber 120ml unpreserved	A	N/A	4.1	Y	Absent	SUB-DIOXIN-1613B(365)
L1629727-04H	Amber 120ml unpreserved	A	N/A	4.1	Y	Absent	A2-SUB()
L1629727-05A	Vial MeOH preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)
L1629727-05B	Vial water preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)
L1629727-05C	Vial water preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)
L1629727-05D	Glass 120ml/4oz unpreserved	A	N/A	4.1	Y	Absent	A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-PREP-3050:1T(180)
L1629727-05E	Plastic 8oz unpreserved for Grai	A	N/A	4.1	Y	Absent	A2-RIMHYDRO-CSAND(),A2-RIMHYDRO-MSAND(),A2-RIMHYDRO-TFINE(),A2-RIMHYDRO-TGRAVEL(),A2-RIMHYDRO-FSAND()
L1629727-05F	Glass 60ml unpreserved split	A	N/A	4.1	Y	Absent	HOLD-EPH(14),TPH-DRO-D(14)
L1629727-05G	Amber 120ml unpreserved	A	N/A	4.1	Y	Absent	SUB-DIOXIN-1613B(365)
L1629727-05H	Amber 120ml unpreserved	A	N/A	4.1	Y	Absent	A2-SUB()
L1629727-06A	Vial MeOH preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)
L1629727-06B	Vial water preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)
L1629727-06C	Vial water preserved	A	N/A	4.1	Y	Absent	HOLD-8260(14)

*Values in parentheses indicate holding time in days

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1629727-06D	Glass 120ml/4oz unpreserved	A	N/A	4.1	Y	Absent	A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-PREP-3050:1T(180)
L1629727-06E	Plastic 8oz unpreserved for Grai	A	N/A	4.1	Y	Absent	A2-RIMHYDRO-CSAND(),A2-RIMHYDRO-MSAND(),A2-RIMHYDRO-TFINE(),A2-RIMHYDRO-TGRAVEL(),A2-RIMHYDRO-FSAND()
L1629727-06F	Glass 60ml unpreserved split	A	N/A	4.1	Y	Absent	HOLD-EPH(14),TPH-DRO-D(14)
L1629727-06G	Amber 120ml unpreserved	A	N/A	4.1	Y	Absent	SUB-DIOXIN-1613B(365)
L1629727-06H	Amber 120ml unpreserved	A	N/A	4.1	Y	Absent	A2-SUB()
L1629727-07D	Glass 120ml/4oz unpreserved	A	N/A	4.1	Y	Absent	A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-PREP-3050:1T(180)
L1629727-07E	Plastic 8oz unpreserved for Grai	A	N/A	4.1	Y	Absent	A2-RIMHYDRO-CSAND(),A2-RIMHYDRO-MSAND(),A2-RIMHYDRO-TFINE(),A2-RIMHYDRO-TGRAVEL(),A2-RIMHYDRO-FSAND()
L1629727-07F	Glass 60ml unpreserved split	A	N/A	4.1	Y	Absent	HOLD-EPH(14),TPH-DRO-D(14)
L1629727-07G	Amber 120ml unpreserved	A	N/A	4.1	Y	Absent	SUB-DIOXIN-1613B(365)
L1629727-07H	Amber 120ml unpreserved	A	N/A	4.1	Y	Absent	A2-SUB()
L1629727-08D	Glass 120ml/4oz unpreserved	A	N/A	4.1	Y	Absent	A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-PREP-3050:1T(180)

*Values in parentheses indicate holding time in days

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1629727-08E	Plastic 8oz unpreserved for Grai	A	N/A	4.1	Y	Absent	A2-RIMHYDRO-CSAND(),A2-RIMHYDRO-MSAND(),A2-RIMHYDRO-TFINE(),A2-RIMHYDRO-TGRAVEL(),A2-RIMHYDRO-FSAND()
L1629727-08F	Glass 60ml unpreserved split	A	N/A	4.1	Y	Absent	HOLD-EPH(14),TPH-DRO-D(14)
L1629727-08G	Amber 120ml unpreserved	A	N/A	4.1	Y	Absent	SUB-DIOXIN-1613B(365)
L1629727-08H	Amber 120ml unpreserved	A	N/A	4.1	Y	Absent	A2-SUB()
L1629727-09A	Vial MeOH preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-09B	Vial water preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-09C	Vial water preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-09D	Glass 60ml unpreserved split	B	N/A	4.7	Y	Absent	HOLD-EPH(14),TPH-DRO-D(14)
L1629727-09E	Glass 120ml/4oz unpreserved	B	N/A	4.7	Y	Absent	A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-PREP-3050:1T(180)
L1629727-09F	Amber 120ml unpreserved	B	N/A	4.7	Y	Absent	A2-SUB()
L1629727-09G	Amber 120ml unpreserved	B	N/A	4.7	Y	Absent	SUB-DIOXIN-1613B(365)
L1629727-09H	Plastic 8oz unpreserved for Grai	B	N/A	4.7	Y	Absent	A2-RIMHYDRO-CSAND(),A2-RIMHYDRO-MSAND(),A2-RIMHYDRO-TFINE(),A2-RIMHYDRO-TGRAVEL(),A2-RIMHYDRO-FSAND()
L1629727-10A	Vial MeOH preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-10B	Vial water preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-10C	Vial water preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-10D	Glass 60ml unpreserved split	B	N/A	4.7	Y	Absent	HOLD-EPH(14),TPH-DRO-D(14)
L1629727-10E	Glass 120ml/4oz unpreserved	B	N/A	4.7	Y	Absent	A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-PREP-3050:1T(180)

*Values in parentheses indicate holding time in days

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1629727-10F	Amber 120ml unpreserved	B	N/A	4.7	Y	Absent	A2-SUB()
L1629727-10G	Amber 120ml unpreserved	B	N/A	4.7	Y	Absent	SUB-DIOXIN-1613B(365)
L1629727-10H	Plastic 8oz unpreserved for Grai	B	N/A	4.7	Y	Absent	A2-RIMHYDRO-CSAND(),A2-RIMHYDRO-MSAND(),A2-RIMHYDRO-TFINE(),A2-RIMHYDRO-TGRAVEL(),A2-RIMHYDRO-FSAND()
L1629727-11A	Vial MeOH preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-11B	Vial water preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-11C	Vial water preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-11D	Glass 60ml unpreserved split	B	N/A	4.7	Y	Absent	HOLD-EPH(14),TPH-DRO-D(14)
L1629727-11E	Glass 120ml/4oz unpreserved	B	N/A	4.7	Y	Absent	A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-PREP-3050:1T(180)
L1629727-11F	Amber 120ml unpreserved	B	N/A	4.7	Y	Absent	A2-SUB()
L1629727-11G	Amber 120ml unpreserved	B	N/A	4.7	Y	Absent	SUB-DIOXIN-1613B(365)
L1629727-11H	Plastic 8oz unpreserved for Grai	B	N/A	4.7	Y	Absent	A2-RIMHYDRO-CSAND(),A2-RIMHYDRO-MSAND(),A2-RIMHYDRO-TFINE(),A2-RIMHYDRO-TGRAVEL(),A2-RIMHYDRO-FSAND()
L1629727-12A	Vial MeOH preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-12B	Vial water preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-12C	Vial water preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-12D	Glass 60ml unpreserved split	B	N/A	4.7	Y	Absent	HOLD-EPH(14),TPH-DRO-D(14)
L1629727-12E	Glass 120ml/4oz unpreserved	B	N/A	4.7	Y	Absent	A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-PREP-3050:1T(180)
L1629727-12F	Amber 120ml unpreserved	B	N/A	4.7	Y	Absent	A2-SUB()

*Values in parentheses indicate holding time in days

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1629727-12G	Amber 120ml unpreserved	B	N/A	4.7	Y	Absent	SUB-DIOXIN-1613B(365)
L1629727-12H	Plastic 8oz unpreserved for Grai	B	N/A	4.7	Y	Absent	A2-RIMHYDRO-CSAND(),A2-RIMHYDRO-MSAND(),A2-RIMHYDRO-TFINE(),A2-RIMHYDRO-TGRAVEL(),A2-RIMHYDRO-FSAND()
L1629727-13A	Vial MeOH preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-13B	Vial water preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-13C	Vial water preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-13D	Glass 60ml unpreserved split	B	N/A	4.7	Y	Absent	HOLD-EPH(14),TPH-DRO-D(14)
L1629727-13E	Glass 120ml/4oz unpreserved	B	N/A	4.7	Y	Absent	A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-PREP-3050:1T(180)
L1629727-13F	Amber 120ml unpreserved	B	N/A	4.7	Y	Absent	A2-SUB()
L1629727-13G	Amber 120ml unpreserved	B	N/A	4.7	Y	Absent	SUB-DIOXIN-1613B(365)
L1629727-13H	Plastic 8oz unpreserved for Grai	B	N/A	4.7	Y	Absent	A2-RIMHYDRO-CSAND(),A2-RIMHYDRO-MSAND(),A2-RIMHYDRO-TFINE(),A2-RIMHYDRO-TGRAVEL(),A2-RIMHYDRO-FSAND()
L1629727-14A	Vial MeOH preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-14B	Vial water preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-14C	Vial water preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-14D	Glass 60ml unpreserved split	B	N/A	4.7	Y	Absent	HOLD-EPH(14),TPH-DRO-D(14)
L1629727-14E	Glass 120ml/4oz unpreserved	B	N/A	4.7	Y	Absent	A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-PREP-3050:1T(180)
L1629727-14F	Amber 120ml unpreserved	B	N/A	4.7	Y	Absent	A2-SUB()
L1629727-14G	Amber 120ml unpreserved	B	N/A	4.7	Y	Absent	SUB-DIOXIN-1613B(365)

*Values in parentheses indicate holding time in days

Project Name: SRP
Project Number: 23840.003

Lab Number: L1629727
Report Date: 10/27/16

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1629727-14H	Plastic 8oz unpreserved for Grai	B	N/A	4.7	Y	Absent	A2-RIMHYDRO-CSAND(),A2-RIMHYDRO-MSAND(),A2-RIMHYDRO-TFINE(),A2-RIMHYDRO-TGRAVEL(),A2-RIMHYDRO-FSAND()
L1629727-15A	Vial MeOH preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-15B	Vial water preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-15C	Vial water preserved	B	N/A	4.7	Y	Absent	HOLD-8260(14)
L1629727-15D	Glass 60ml unpreserved split	B	N/A	4.7	Y	Absent	HOLD-EPH(14),TPH-DRO-D(14)
L1629727-15E	Glass 120ml/4oz unpreserved	B	N/A	4.7	Y	Absent	A2-PB-6020T(180),A2-RIM-PAH/PCBCONG(14),A2-MOISTURE-2540(7),A2-NI-6020T(180),A2-ZN-6020T(180),A2-HG-7474T(28),A2-CR-6020T(180),A2-TS(7),A2-AS-6020T(180),A2-CD-6020T(180),A2-PREP-3050:2T(180),A2-TOC-9060-2REPS(28),A2-CU-6020T(180),A2-PREP-3050:1T(180)
L1629727-15F	Amber 120ml unpreserved	B	N/A	4.7	Y	Absent	A2-SUB()
L1629727-15G	Amber 120ml unpreserved	B	N/A	4.7	Y	Absent	SUB-DIOXIN-1613B(365)
L1629727-15H	Plastic 8oz unpreserved for Grai	B	N/A	4.7	Y	Absent	A2-RIMHYDRO-CSAND(),A2-RIMHYDRO-MSAND(),A2-RIMHYDRO-TFINE(),A2-RIMHYDRO-TGRAVEL(),A2-RIMHYDRO-FSAND()

*Values in parentheses indicate holding time in days

Project Name:	SRP	**Lab Number:**	L1629727
Project Number:	23840.003	**Report Date:**	10/27/16

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

A	- Spectra identified as "Aldol Condensation Product".
B	- The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the

Report Format: Data Usability Report

Project Name:	SRP	**Lab Number:**	L1629727
Project Number:	23840.003	**Report Date:**	10/27/16

Data Qualifiers

reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name:	SRP	**Lab Number:**	L1629727
Project Number:	23840.003	**Report Date:**	10/27/16

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

12 Annual Book of ASTM Standards. (American Society for Testing and Materials) ASTM International.

105 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IIIA, 1997 in conjunction with NOAA Technical Memorandum NMFS-NWFSC-59: Extraction, Cleanup and GC/MS Analysis of Sediments and Tissues for Organic Contaminants, March 2004 and the Determination of Pesticides and PCBs in Water and Oil/Sediment by GC/MS: Method 680, EPA 01A0005295, November 1985.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

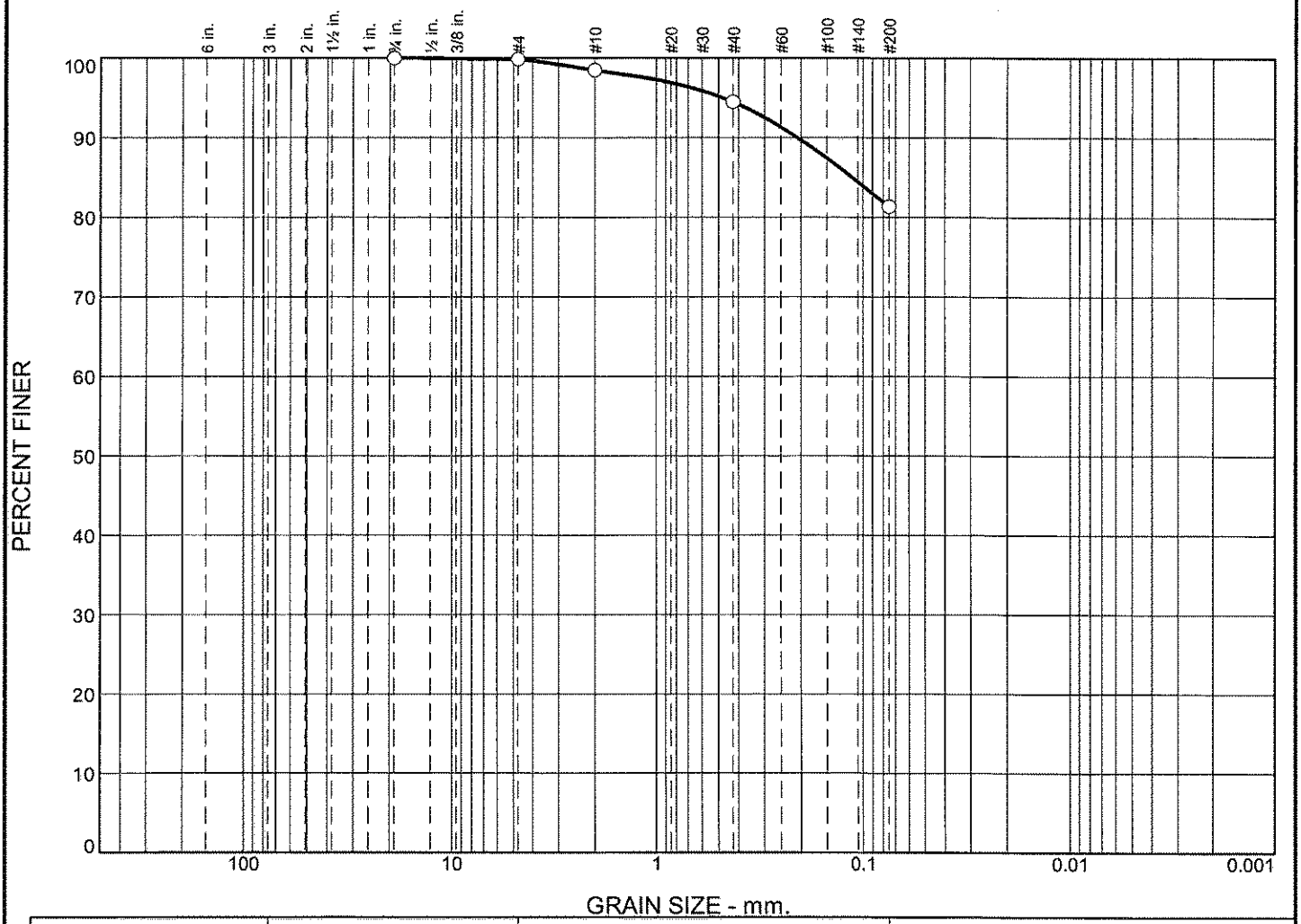
Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

ASTM D422-63

GRAIN SIZE ANALYSIS

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.2	1.3	4.0	13.1	81.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1131							

Material Description	USCS	AASHTO
○		

Project No. **Client:**

Project:

○ **Source of Sample:** C-6 0-48 **Sample Number:** L1629727-01

Alpha Analytical

Mansfield, MA

Remarks:

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/17/2016

Location: C-6 0-48

Sample Number: L1629727-01

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 88.20
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
88.20	0.00	3/4"	0.00	0.00	100.0
		#4	0.15	0.00	99.8
		#10	1.20	0.00	98.5
		#40	3.51	0.00	94.5
		#200	11.58	0.00	81.4

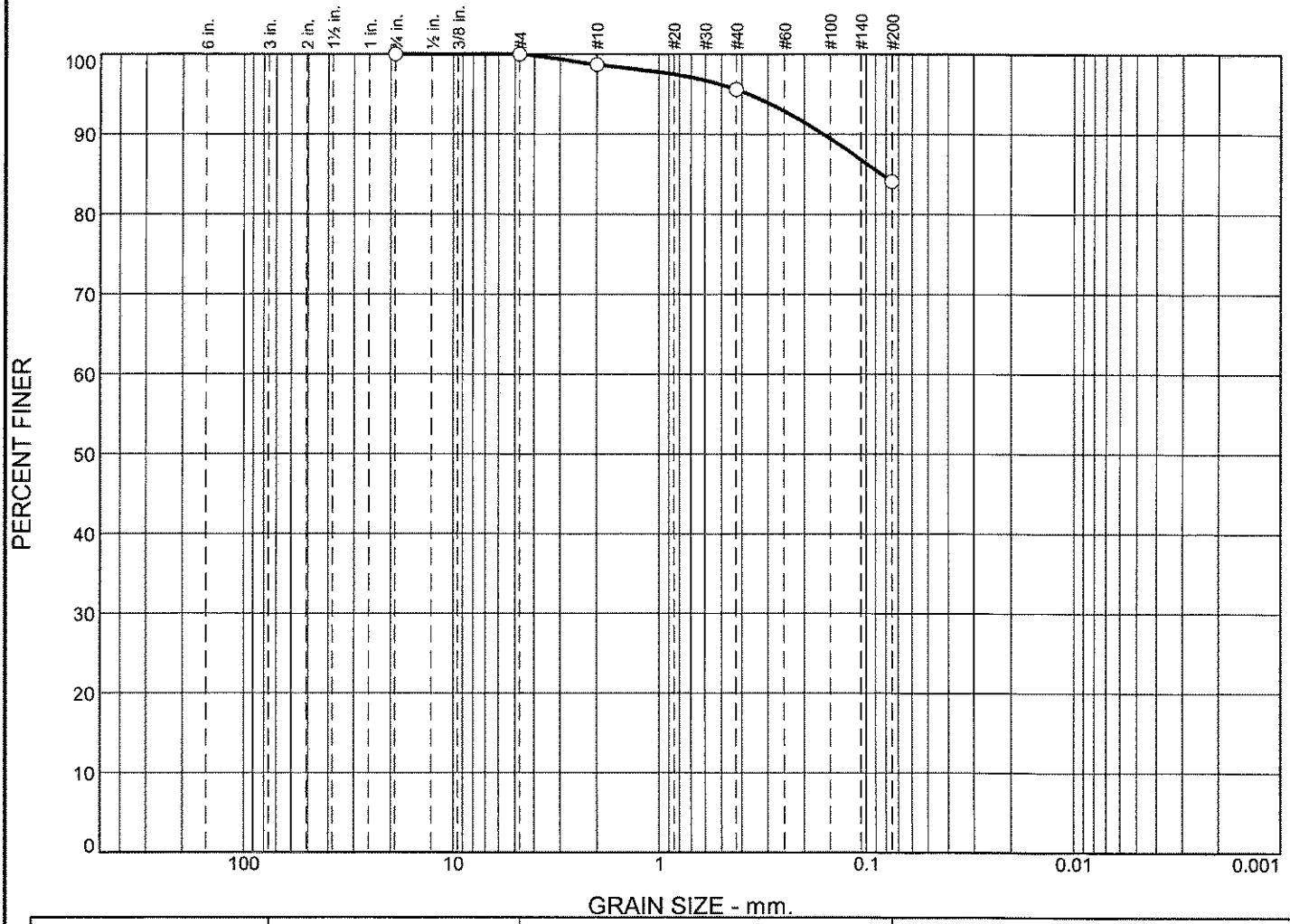
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.2	0.2	1.3	4.0	13.1	18.4			81.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
							0.1131	0.2082	0.4750

Fineness Modulus
0.28

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	1.3	3.1	11.5	84.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.0840							

	Material Description	USCS	AASHTO
○			

Project No. **Client:**

Project:

○ **Source of Sample:** C-6 0-48 **Sample Number:** WG941283-1

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/17/2016

Location: C-6 0-48

Sample Number: WG941283-1

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 88.39
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
88.39	0.00	3/4"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	1.17	0.00	98.7
		#40	2.74	0.00	95.6
		#200	10.14	0.00	84.1

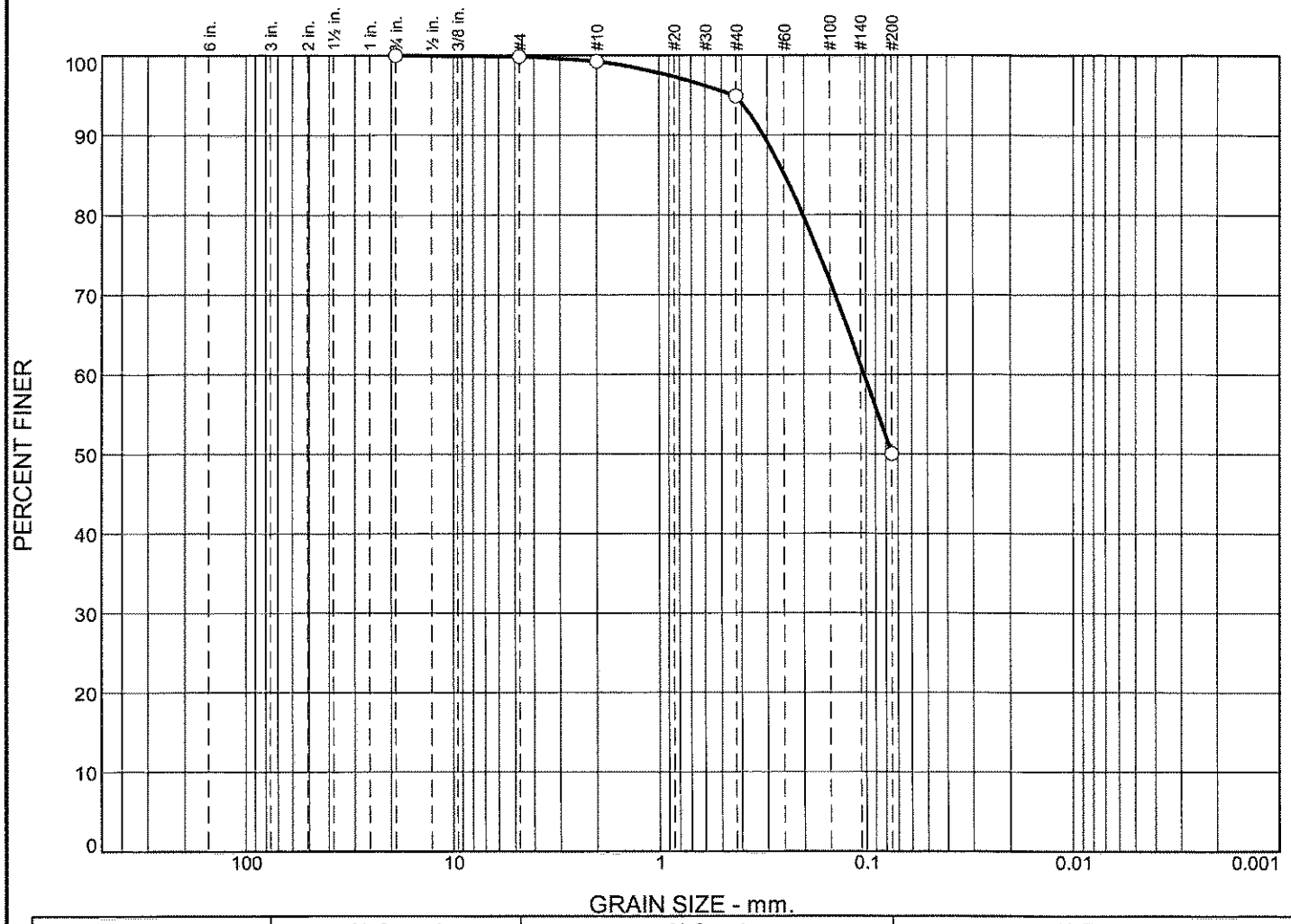
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	1.3	3.1	11.5	15.9			84.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
							0.0840	0.1619	0.3717

Fineness Modulus
0.23

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.1	0.7	4.3	44.9	50.0	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2482	0.1023						

Material Description	USCS	AASHTO
○		

Project No. **Client:**

Project:

○ **Source of Sample:** C-7 0-48 **Sample Number:** L1629727-02

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/17/2016

Location: C-7 0-48

Sample Number: L1629727-02

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 127.22
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
127.22	0.00	3/4"	0.00	0.00	100.0
		#4	0.19	0.00	99.9
		#10	0.77	0.00	99.2
		#40	5.55	0.00	94.9
		#200	57.05	0.00	50.0

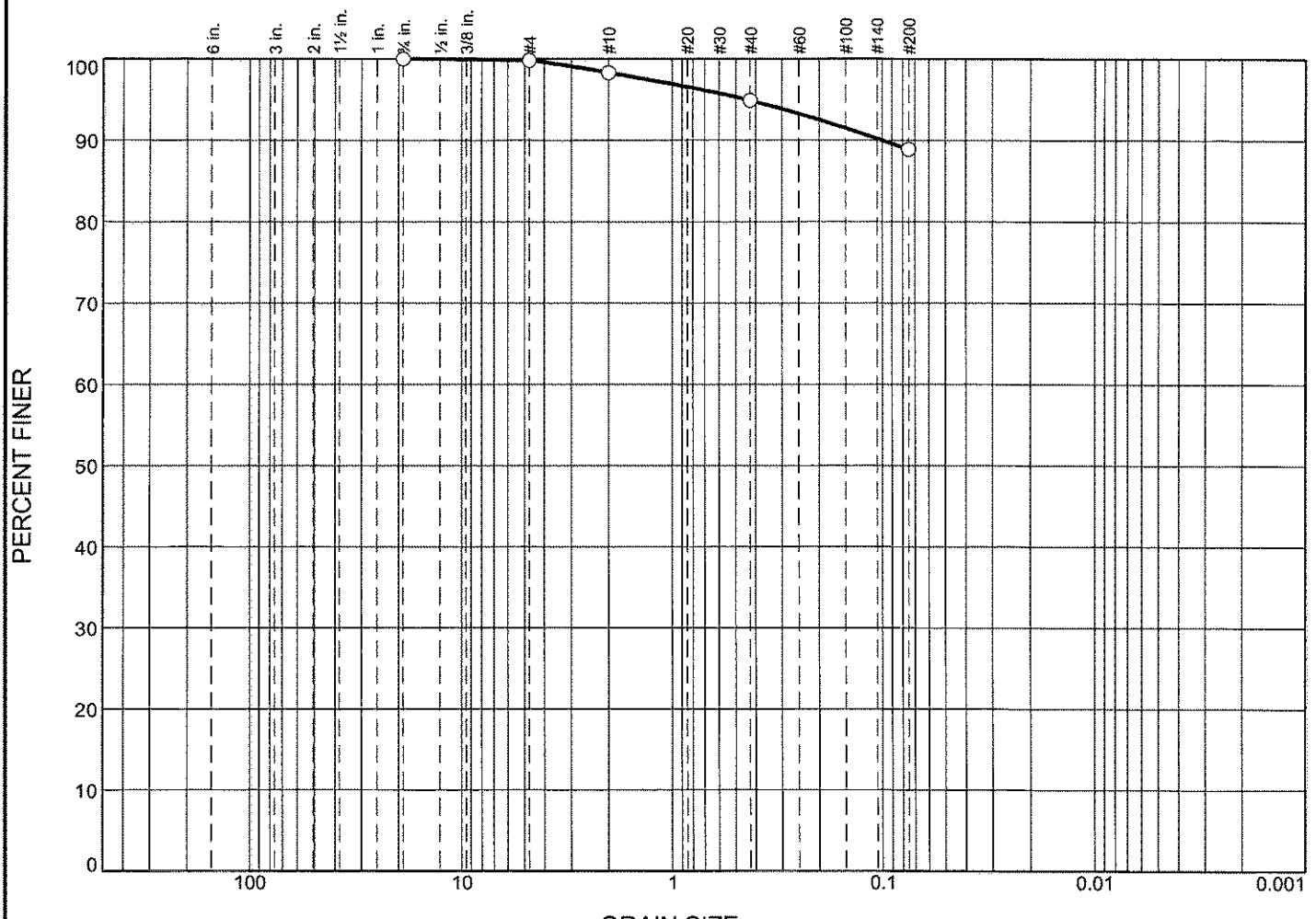
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.1	0.1	0.7	4.3	44.9	49.9			50.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
					0.1023	0.2025	0.2482	0.3143	0.4372

Fineness Modulus
0.46

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.2	1.5	3.4	6.0	88.9	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○										

	Material Description	USCS	AASHTO
○			

Project No. **Client:**

Project:

○ **Source of Sample:** C-1 **Sample Number:** L1629727-03

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/17/2016

Location: C-1

Sample Number: L1629727-03

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 97.83
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
97.83	0.00	3/4"	0.00	0.00	100.0
		#4	0.18	0.00	99.8
		#10	1.50	0.00	98.3
		#40	3.32	0.00	94.9
		#200	5.85	0.00	88.9

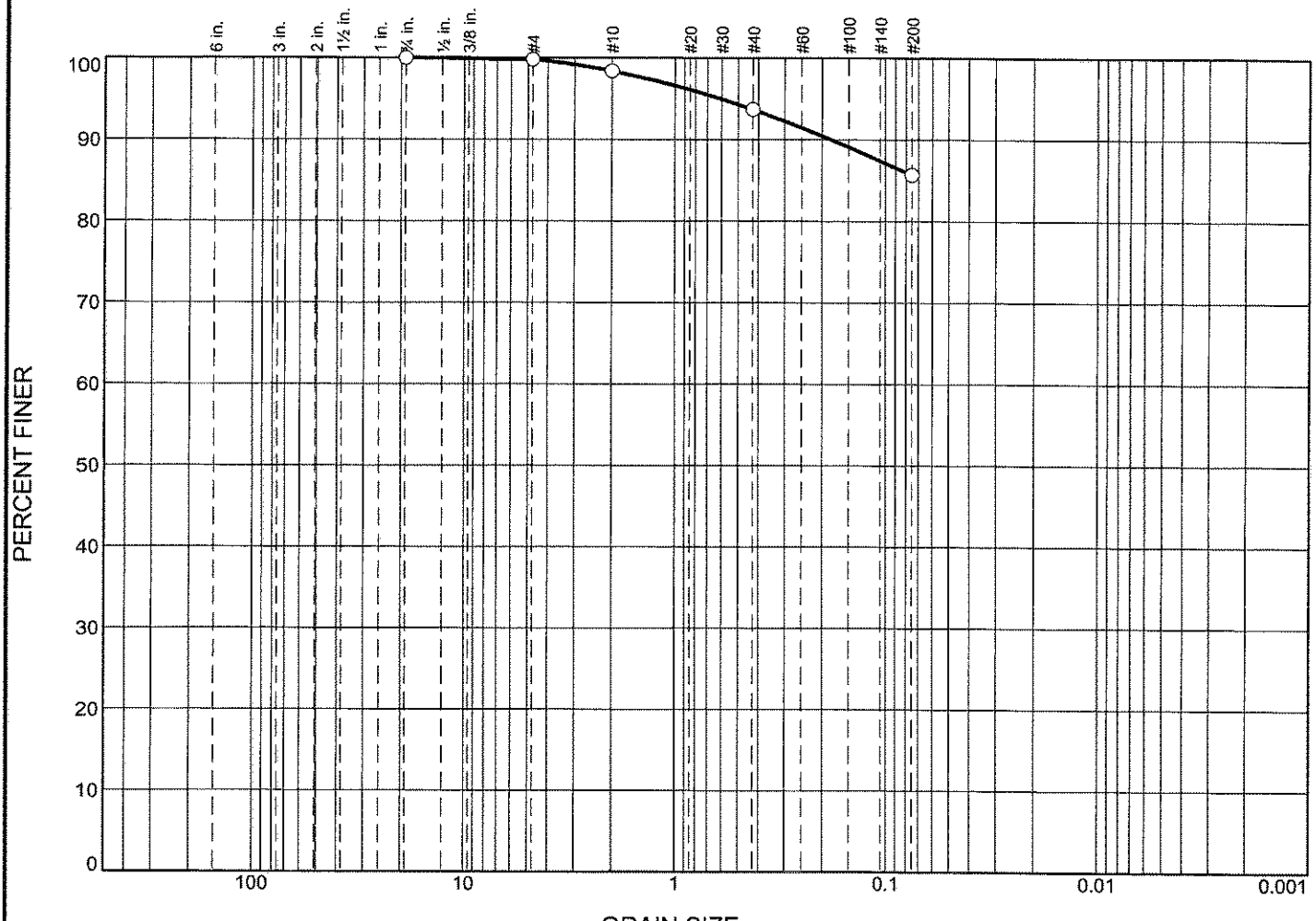
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.2	0.2	1.5	3.4	6.0	10.9			88.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
								0.1000	0.4427

Fineness Modulus
0.23

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.2	1.4	4.7	8.0	85.7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○										

	Material Description	USCS	AASHTO
○			

Project No. **Client:**

Project:

○ **Source of Sample:** C-2 **Sample Number:** L1629727-04

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/17/2016

Location: C-2

Sample Number: L1629727-04

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 104.95
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
104.95	0.00	3/4"	0.00	0.00	100.0
		#4	0.22	0.00	99.8
		#10	1.48	0.00	98.4
		#40	4.91	0.00	93.7
		#200	8.39	0.00	85.7

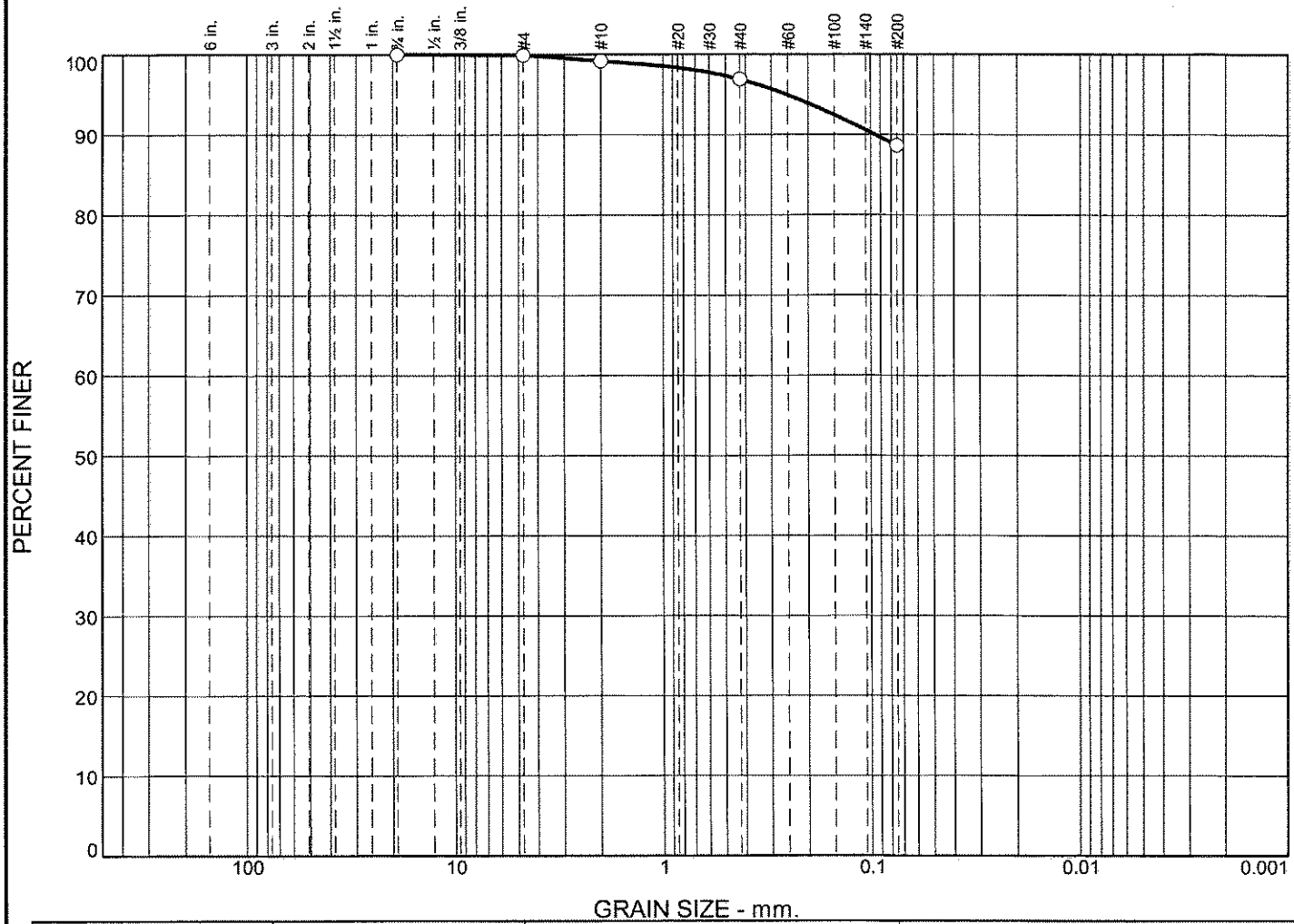
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.2	0.2	1.4	4.7	8.0	14.1			85.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
								0.1811	0.6037

Fineness Modulus
0.28

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.1	0.7	2.3	8.2	88.7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○										

	Material Description	USCS	AASHTO
○			

Project No. **Client:**

Project:

○ **Source of Sample:** C-3 **Sample Number:** L1629727-05

Alpha Analytical

Mansfield, MA

Remarks:

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/17/2016

Location: C-3

Sample Number: L1629727-05

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 105.87
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
105.87	0.00	3/4"	0.00	0.00	100.0
		#4	0.11	0.00	99.9
		#10	0.76	0.00	99.2
		#40	2.41	0.00	96.9
		#200	8.73	0.00	88.7

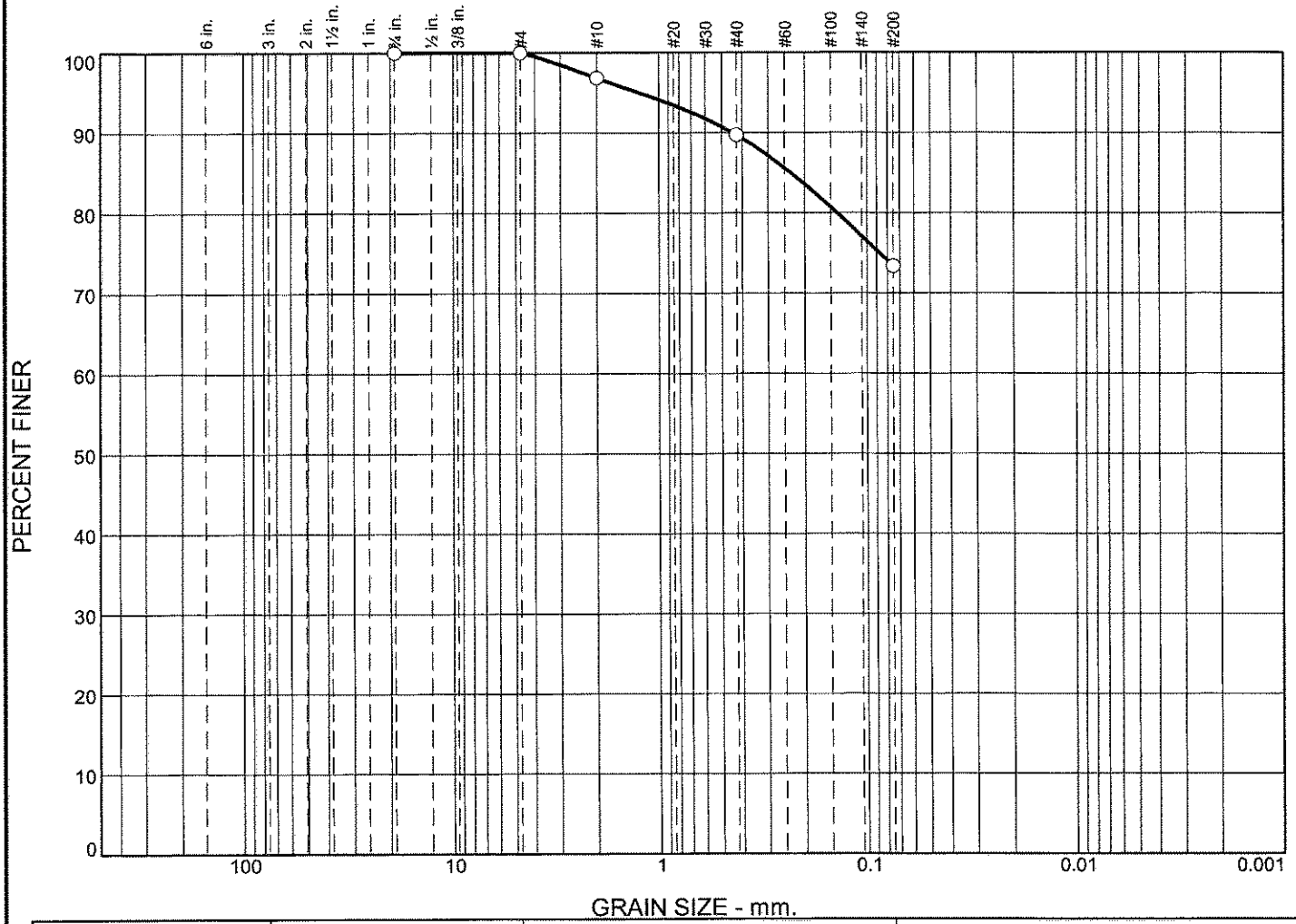
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.1	0.1	0.7	2.3	8.2	11.2			88.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
								0.0952	0.2536

Fineness Modulus
0.16

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	3.2	7.1	16.3	73.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2343							

	Material Description	USCS	AASHTO
○			

Project No. **Client:**

Project:

○ **Source of Sample:** C-4 **Sample Number:** L1629727-06

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/17/2016

Location: C-4

Sample Number: L1629727-06

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 102.81
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
102.81	0.00	3/4"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	3.25	0.00	96.8
		#40	7.31	0.00	89.7
		#200	16.80	0.00	73.4

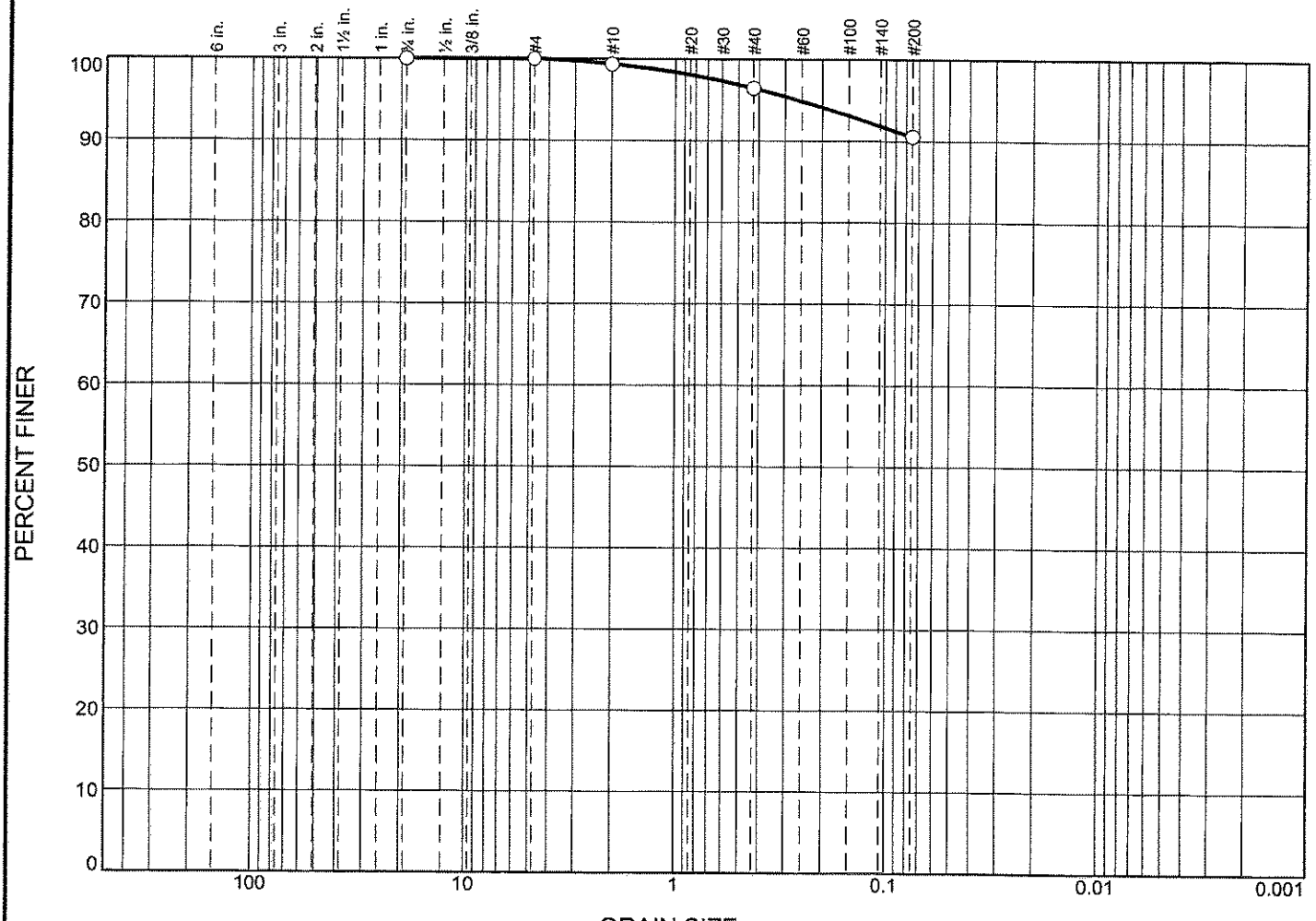
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	3.2	7.1	16.3	26.6			73.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
						0.1399	0.2343	0.4428	1.2439

Fineness Modulus
0.48

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.6	2.9	5.9	90.6	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○										

Material Description	USCS	AASHTO
○		

Project No. **Client:**

Project:

○ **Source of Sample:** C-6 48-61 **Sample Number:** L1629727-07

Alpha Analytical

Mansfield, MA

Remarks:

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/17/2016

Location: C-6 48-61

Sample Number: L1629727-07

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 103.37
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
103.37	0.00	3/4"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	0.67	0.00	99.4
		#40	2.99	0.00	96.5
		#200	6.09	0.00	90.6

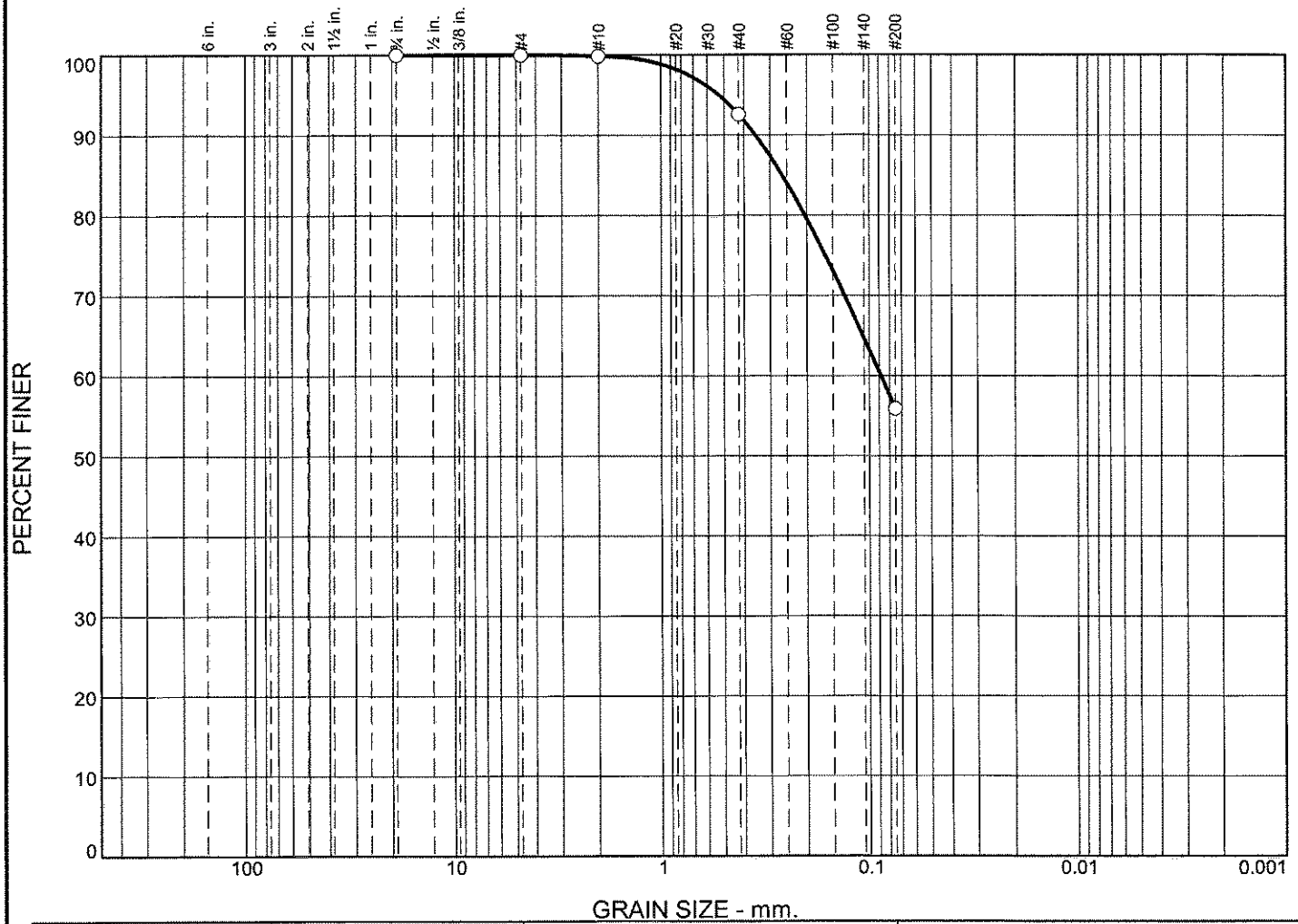
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.6	2.9	5.9	9.4			90.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
									0.2601

Fineness Modulus
0.16

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.1	7.3	36.7	55.9	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2633	0.0882						

	Material Description	USCS	AASHTO
○			

Project No. **Client:**

Project:

○ **Source of Sample:** C-7 48-54 **Sample Number:** L1629727-08

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/17/2016

Location: C-7 48-54

Sample Number: L1629727-08

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 140.11
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
140.11	0.00	3/4"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	0.20	0.00	99.9
		#40	10.21	0.00	92.6
		#200	51.42	0.00	55.9

Fractional Components

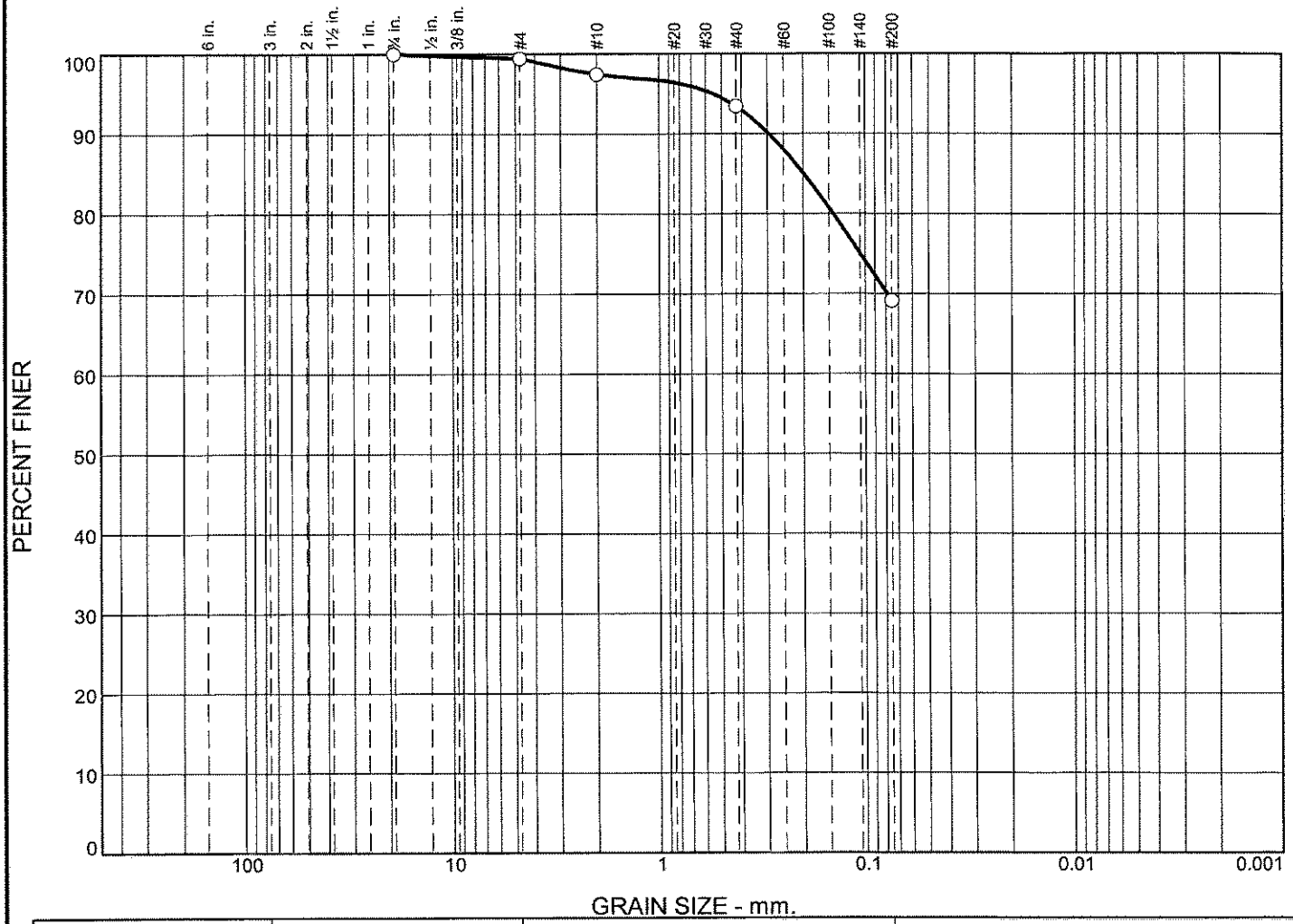
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	7.3	36.7	44.1			55.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
					0.0882	0.2049	0.2633	0.3533	0.5298

Fineness Modulus
0.44

Alpha Analytical

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.6	2.0	4.0	24.3	69.1	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1992							

	Material Description	USCS	AASHTO
○			

Project No. **Client:**

Project:

○ **Source of Sample:** C-5 **Sample Number:** L1629727-09

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/17/2016

Location: C-5

Sample Number: L1629727-09

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 109.80
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
109.80	0.00	3/4"	0.00	0.00	100.0
		#4	0.65	0.00	99.4
		#10	2.17	0.00	97.4
		#40	4.39	0.00	93.4
		#200	26.70	0.00	69.1

Fractional Components

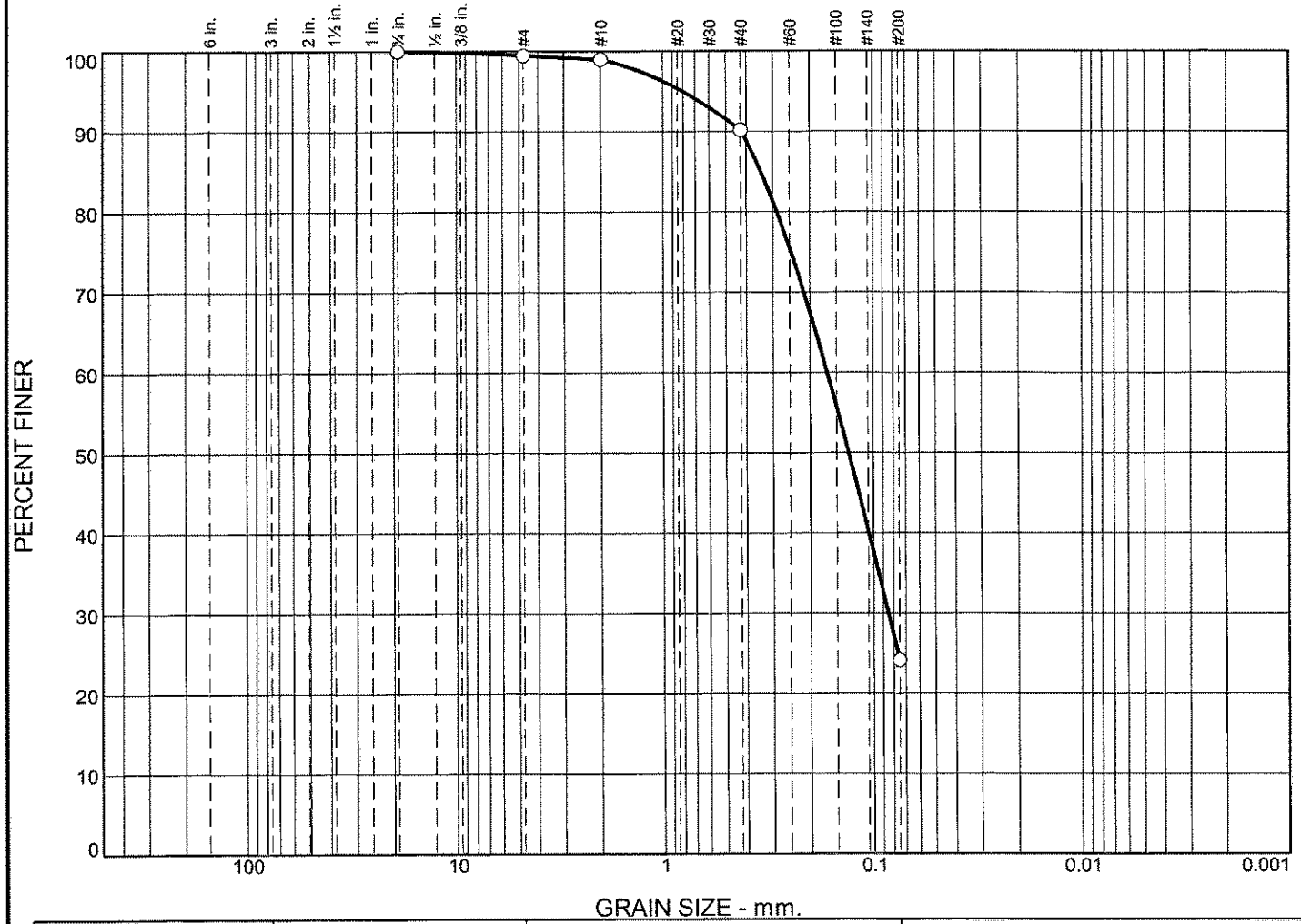
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.6	0.6	2.0	4.0	24.3	30.3			69.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
						0.1431	0.1992	0.2948	0.5494

Fineness Modulus
0.40

Alpha Analytical

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.6	0.4	8.8	66.0	24.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3417	0.1664	0.1317	0.0850				

Material Description	USCS	AASHTO
○		

Project No. **Client:**

Project:

○ **Source of Sample:** C-8 **Sample Number:** L1629727-10

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/17/2016

Location: C-8

Sample Number: L1629727-10

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 110.68
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
110.68	0.00	3/4"	0.00	0.00	100.0
		#4	0.63	0.00	99.4
		#10	0.52	0.00	99.0
		#40	9.74	0.00	90.2
		#200	73.04	0.00	24.2

Fractional Components

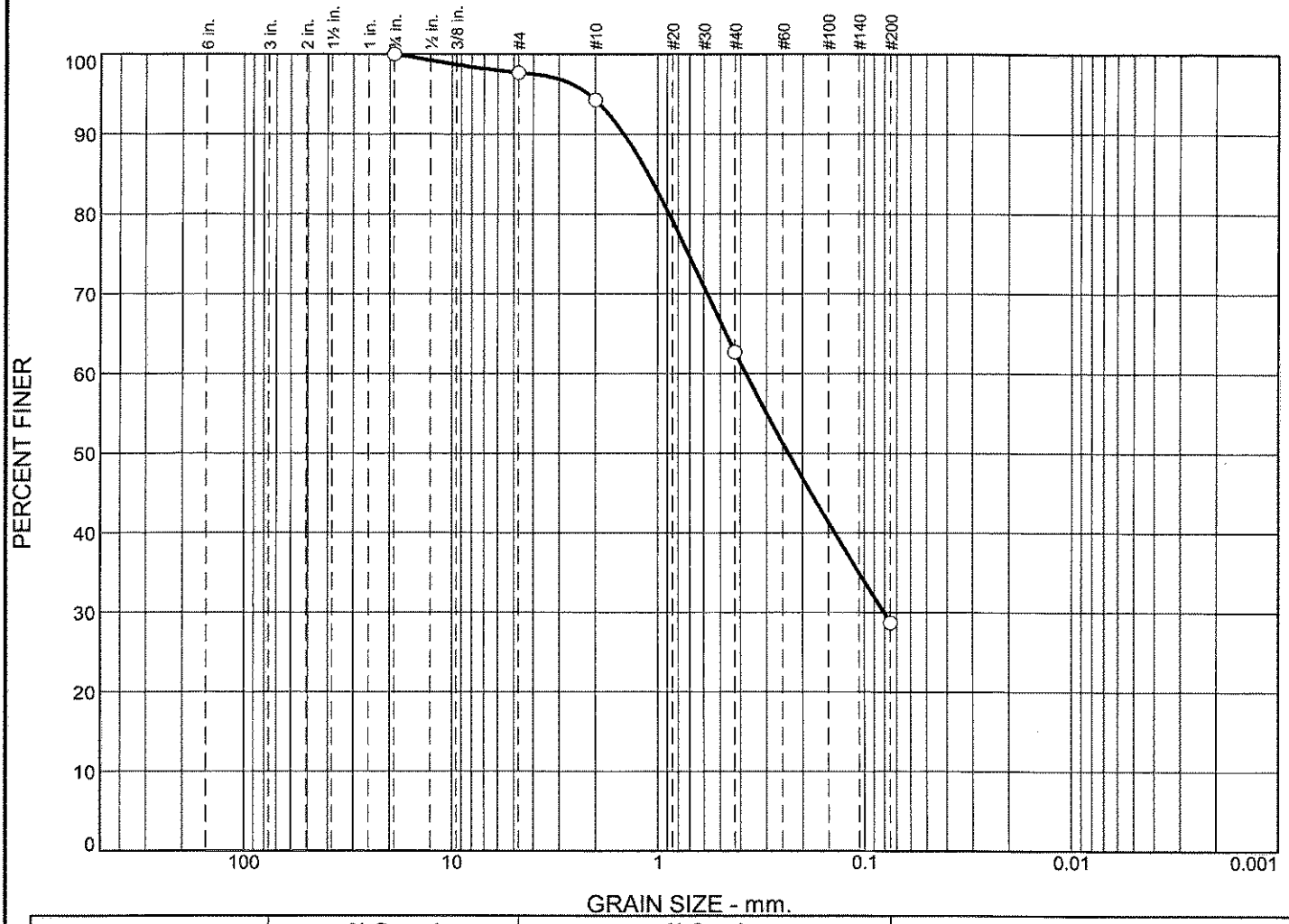
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.6	0.6	0.4	8.8	66.0	75.2			24.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0850	0.1317	0.1664	0.2874	0.3417	0.4217	0.8015

Fineness Modulus
0.75

Alpha Analytical

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.3	3.4	31.6	34.0	28.7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_C	C_U
○			1.1136	0.3773	0.2354	0.0807				

	Material Description	USCS	AASHTO
○			

Project No. **Client:**

Project:

○ **Source of Sample:** C-9 **Sample Number:** L1629727-11

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/17/2016

Location: C-9

Sample Number: L1629727-11

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 130.73
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
130.73	0.00	3/4"	0.00	0.00	100.0
		#4	3.02	0.00	97.7
		#10	4.47	0.00	94.3
		#40	41.26	0.00	62.7
		#200	44.46	0.00	28.7

Fractional Components

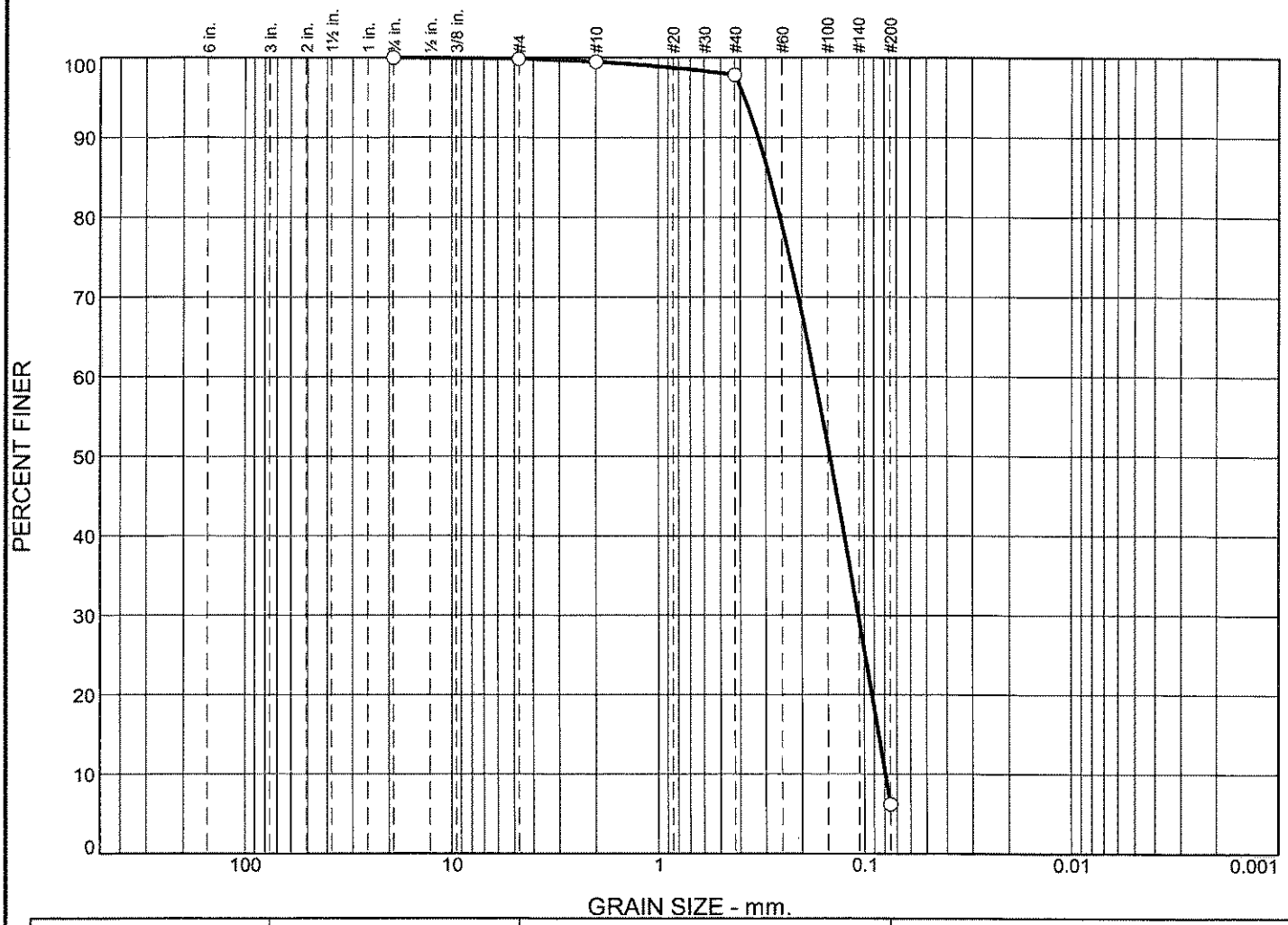
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.3	2.3	3.4	31.6	34.0	69.0			28.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0807	0.2354	0.3773	0.8828	1.1136	1.4588	2.1608

Fineness Modulus
1.55

Alpha Analytical

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.1	0.4	1.7	91.6	6.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2866	0.1735	0.1465	0.1070	0.0854	0.0793	0.83	2.19

	Material Description	USCS	AASHTO
○			

Project No. **Client:**

Project:

○ **Source of Sample:** C-10 **Sample Number:** L1629727-12

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/17/2016

Location: C-10

Sample Number: L1629727-12

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 123.33
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
123.33	0.00	3/4"	0.00	0.00	100.0
		#4	0.18	0.00	99.9
		#10	0.47	0.00	99.5
		#40	2.03	0.00	97.8
		#200	112.98	0.00	6.2

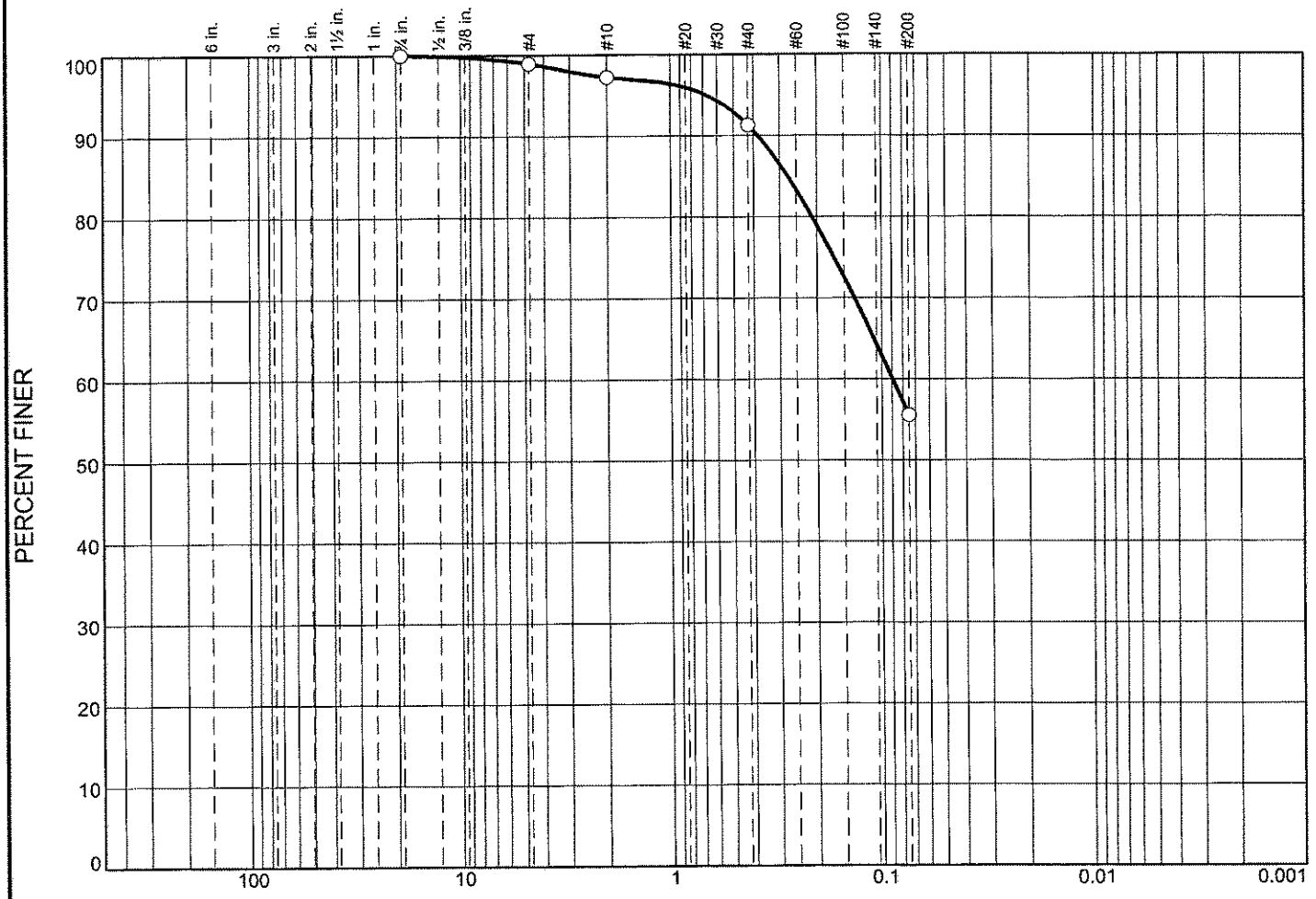
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.1	0.1	0.4	1.7	91.6	93.7			6.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0793	0.0854	0.0920	0.1070	0.1465	0.1735	0.2554	0.2866	0.3264	0.3812

Fineness Modulus	C_u	C_c
0.65	2.19	0.83

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	1.1	1.7	5.9	35.8	55.5	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.2753	0.0895						

	Material Description	USCS	AASHTO
○			

Project No. **Client:**

Project:

○ **Source of Sample:** C-11 0-48 **Sample Number:** L1629727-13

Alpha Analytical

Mansfield, MA

Remarks:

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/17/2016

Location: C-11 0-48

Sample Number: L1629727-13

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 121.22
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
121.22	0.00	3/4"	0.00	0.00	100.0
		#4	1.29	0.00	98.9
		#10	2.07	0.00	97.2
		#40	7.19	0.00	91.3
		#200	43.34	0.00	55.5

Fractional Components

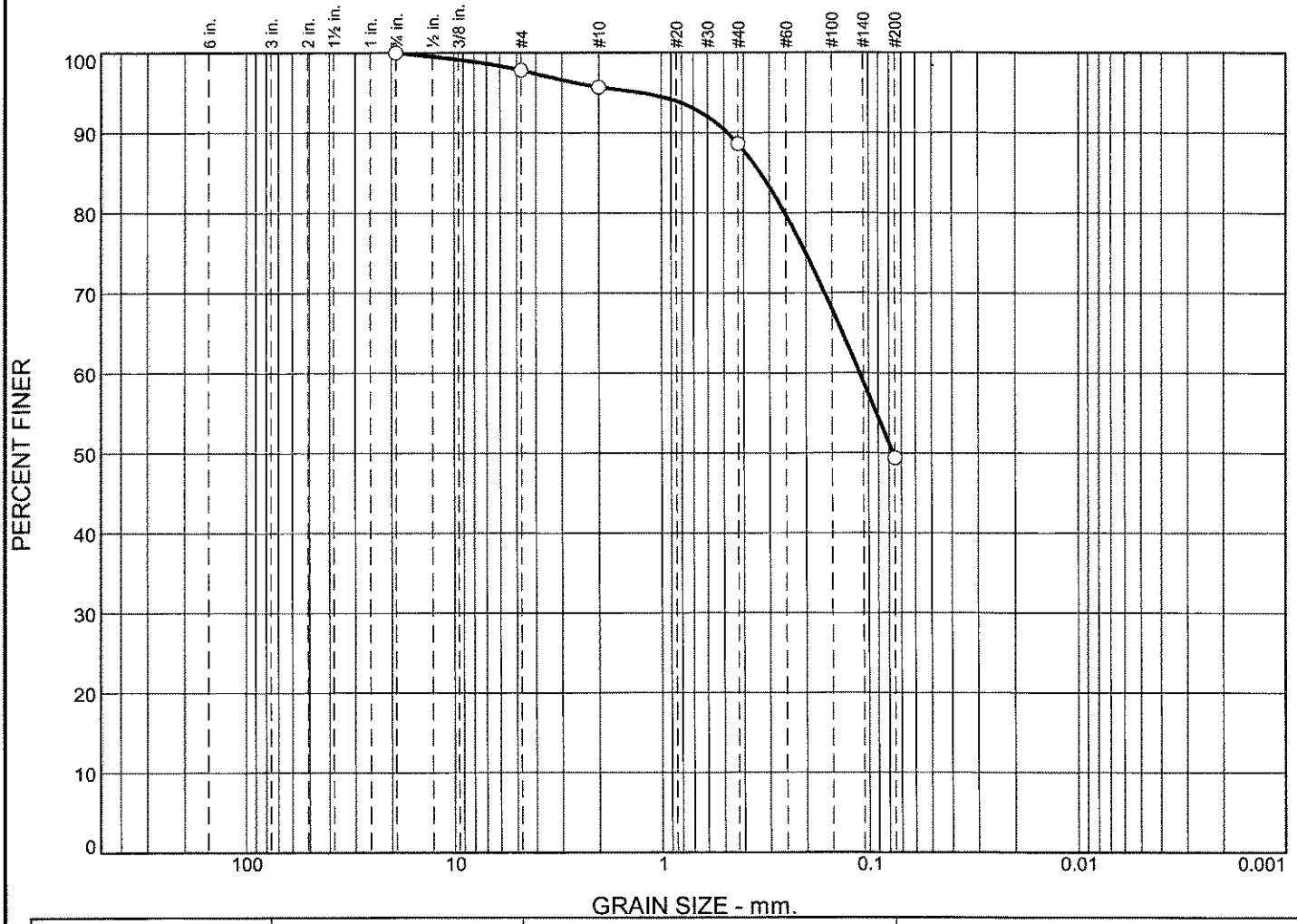
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.1	1.1	1.7	5.9	35.8	43.4			55.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
					0.0895	0.2113	0.2753	0.3820	0.6739

Fineness Modulus
0.54

Alpha Analytical

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	2.2	2.1	7.1	39.2	49.4	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.3325	0.1106	0.0767					

	Material Description	USCS	AASHTO
○			

Project No. **Client:**

Project:

○ **Source of Sample:** C-12 **Sample Number:** L1629727-14

Remarks:

Alpha Analytical

Mansfield, MA

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/17/2016

Location: C-12

Sample Number: L1629727-14

Sieve Test Data

Post #200 Wash Test Weights (grams): **Dry Sample and Tare =** 142.17
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
142.17	0.00	3/4"	0.00	0.00	100.0
		#4	3.10	0.00	97.8
		#10	3.02	0.00	95.7
		#40	10.09	0.00	88.6
		#200	55.75	0.00	49.4

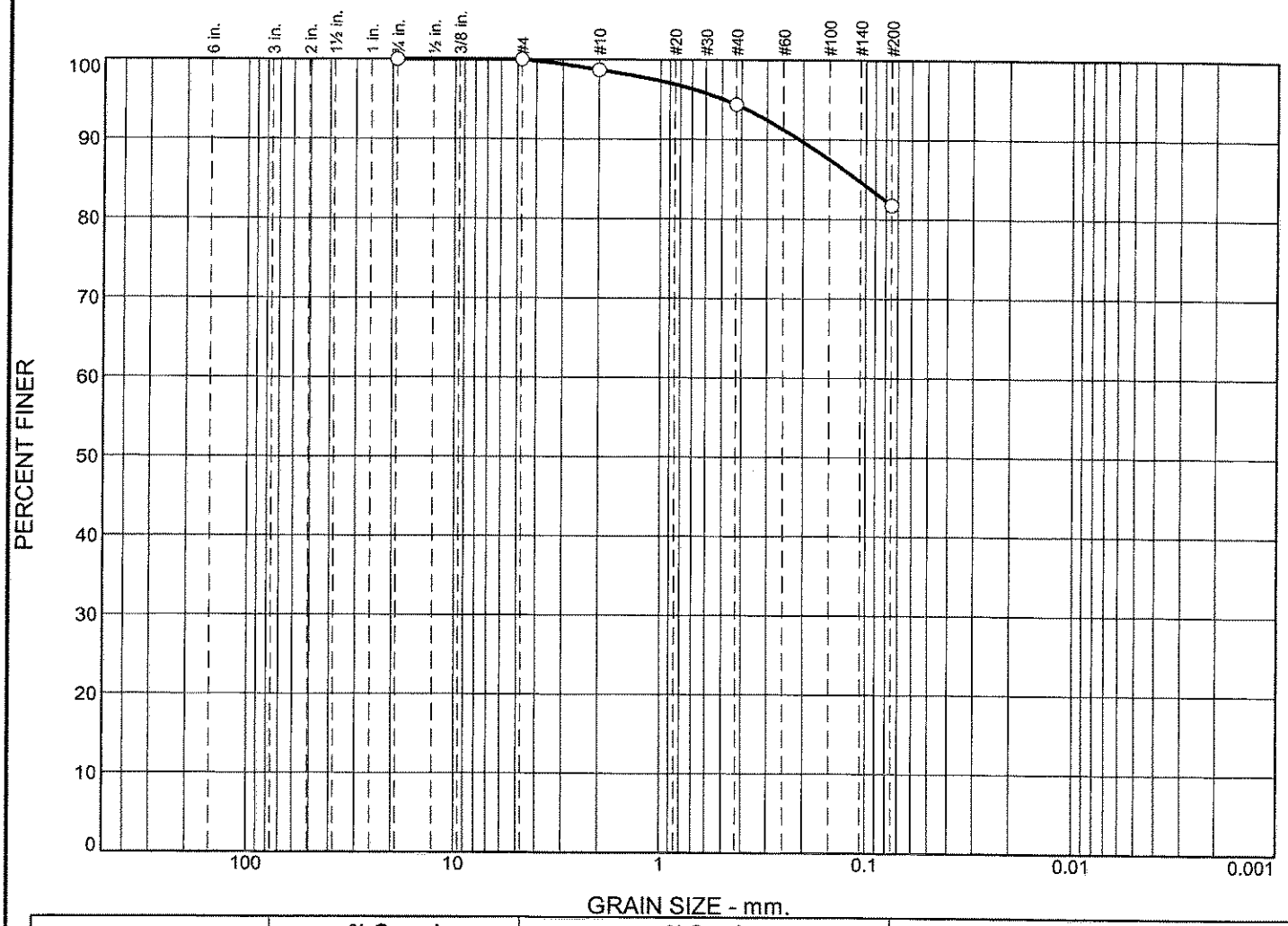
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.2	2.2	2.1	7.1	39.2	48.4			49.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0767	0.1106	0.2536	0.3325	0.4794	1.2650

Fineness Modulus
0.69

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	1.3	4.3	12.6	81.8	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			0.1102							

Material Description	USCS	AASHTO
○		

Project No. **Client:**

Project:

○ **Source of Sample:** C-11 48-89 **Sample Number:** L1629727-15

Alpha Analytical

Mansfield, MA

Remarks:

Figure

GRAIN SIZE DISTRIBUTION TEST DATA

10/17/2016

Location: C-11 48-89

Sample Number: L1629727-15

Sieve Test Data

Post #200 Wash Test Weights (grams): Dry Sample and Tare = 121.51
Tare Wt. = 0.00
Minus #200 from wash = 0.0%

Dry Sample and Tare (grams)	Tare (grams)	Sieve Opening Size	Weight Retained (grams)	Sieve Weight (grams)	Percent Finer
121.51	0.00	3/4"	0.00	0.00	100.0
		#4	0.00	0.00	100.0
		#10	1.60	0.00	98.7
		#40	5.23	0.00	94.4
		#200	15.33	0.00	81.8

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	1.3	4.3	12.6	18.2			81.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
							0.1102	0.2086	0.4863

Fineness Modulus
0.28

Alpha Analytical

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: NPW and SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
EPA 9012B: NPW: Total Cyanide
EPA 9050A: NPW: Specific Conductance
SM3500: NPW: Ferrous Iron
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.
SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility
SM 2540D: TSS
EPA 3005A NPW
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: ***EPA 3050B***

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF**.

Mansfield Facility:

Drinking Water
EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1** Hg.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL

8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220

320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Date Rec'd in Lab: 9/20/16

ALPHA Job #: L1629727

Client Information

Client: Normandeau Associates

Address: 25 Nashua Rd, Bedford NH 03110

Phone: 603-637-1158

Email: Sallen@normandeau.com

Additional Project Information: Call for any questions

Project Information

Project Name: SRP

Project Location: Little Bay

Project #: 23840.003

Project Manager: Sarah Allen

ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due:

Report Information - Data Deliverables

☐ ADEx ☒ EMAIL

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☐ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods

☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)

☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)

☐ Yes ☐ No NPDES RGP

☐ Other State /Fed Program ______ Criteria ______

ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☒ PCB ☐ PEST; TPH: ☐ Quant Only ☐ Fingerprint

SAMPLE INFO — Filtration: ☐ Field ☐ Lab to do; Preservation: ☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	VOC	SVOC	METALS	METALS	EPH	VPH	PCB	TPH	Sample Comments	TOTAL # BOTTLES
29727-01, 07	C-6	9/20	1010		JBS		2	2	2	2	2	2	2	0-48, 48-61	14
02, 08	C-7	9/20	1202		JBS		2	2	2	2	2	2	2	0-48, 48-54	14
03	C-1	9/20	1258		JBS		1	1	1	1	1	1	1		7
04	C-2	9/20	1305		JBS		1	1	1	1	1	1	1		7
05	C-3	9/20	1336		JBS		1	1	1	1	1	1	1		7
06	C-4	9/20	1403		JBS		1	1	1	1	1	1	1		7

Container Type

Preservative

Container Type: P= Plastic, A= Amber glass, V= Vial, G= Glass, B= Bacteria cup, C= Cube, O= Other, E= Encore, D= BOD Bottle

Preservative: A= None, B= HCl, C= HNO_3, D= H_2SO_4, E= NaOH, F= MeOH, G= $NaHSO_4$, H = $Na_2S_2O_3$, I= Ascorbic Acid, J = NH_4Cl, K= Zn Acetate, O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
[illegible signature]	9/20 1645	[illegible signature] AAL	9-20-16 1645
J. [illegible] AAL	9-20-16 1830	[illegible signature]	[illegible]

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side

FORM NO: 01-01 (rev. 12-Mar-2012)

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL

8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Date Rec'd in Lab: 09/22/16

ALPHA Job #: L1629727

Client Information

Client: Normandeau Associates
Address: 25 Nashua Rd
Bedford NH 03110
Phone: 603-637-1158
Email: sallen@normandeau.com

Project Information

Project Name: SRP
Project Location: Little Bay
Project #: 23840.003
Project Manager: Sarah Allen
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due:

Report Information - Data Deliverables

☐ ADEx ☒ EMAIL

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☐ Yes ☐ No MA MCP Analytical Methods
☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

Additional Project Information:
Call with any questions

ANALYSIS

VOC: ☐ 8260 ☐ 624 ☐ 524.2
SVOC: ☐ ABN ☐ PAH
METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15
METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13
EPH: ☐ Ranges & Targets ☐ Ranges Only
VPH: ☐ Ranges & Targets ☐ Ranges Only
☐ PCB ☐ PEST
TPH: ☐ Quant Only ☐ Fingerprint
DIOXIN

SAMPLE INFO
Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	Sample Comments	TOTAL # BOTTLES
29727-09	C-5	9/21	0835		JBS		7
-10	C-8	9/21	1300		JBS		7
-11	C-9	9/21	1145		JBS		7
-12	C-10	9/21	1220		JBS		7
-13	C-11 0-48	9/21	0903		JBS		7
-14	C-12	9/21	0844		JBS		7
-15	C-11 48-89	9/21	0903		JBS		7

Container Type	
Preservative	

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H= $Na_2S_2O_3$
I= Ascorbic Acid
J= NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Andrew Thorpe	9/21 1600		9/21/16 1600
	9/21/16 17:50		9/21/16 1750

All samples submitted are subject to Alpha's Terms and Conditions
See reverse side

FORM NO. 01-01 (rev. 12-Mar-2012)

Table II-1: Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
1. Was the report signed by the responsible applicant approved representative?	Yes
2. Were the methods for sampling, chemical and biological testing described in the Sampling and Analysis Plan (SAP) and the Laboratory QA Plan (LQAP) followed?	Yes
3. If not, were deviations documented?	N/A
4. Was the SAP approved by the New England District?	Yes
5. Did the applicant use a laboratory with a LQAP on file at the New England District?	Yes
6. Did the samples adequately represent the physical/chemical variability in the dredging area?	Yes
7. Were the correct stations sampled (include the precision of the navigation method used)?	Yes
8. Were the preservation and storage requirements in Chapter 8 of the EPA/Corps QA/QC Manual (EPA/USACE 1995) and EPA (2001d) followed?	Yes
9. Were the samples properly labeled?	Yes
10. Were all the requested data included?	Yes
11. Were the reporting limits met?	Yes
12. Were the chain-of-custody forms properly processed?	Yes
13. Were the method blanks run and were the concentration below the acceptance criteria?	Yes
14. Was the MDL study performed on each matrix (with this data submission) or within the last 12 months?	Yes
15. Were the SRM/CRM analyses within acceptance criteria?	No – see narrative
16. Were the matrix spike/matrix spike duplicates run at the required frequency and was the percent recovery/RPD within the acceptance criteria?	No – see narrative
17. Were the duplicate samples analyzed and were the RPDs within the required acceptance criteria?	Yes
18. For each analytical fraction of organic compounds, were recoveries for the internal standard within the acceptance criteria?	Yes
19. Were surrogate recoveries within the required acceptance criteria?	Yes

Table II-1 (*Continued*): Completeness Checklist

Quality Assurance/Quality Control Questions	Yes/No? Comments?
20. Were corrective action forms provided for all non-conforming data?	**Yes**
21. Were all the species-specific test conditions in Appendix V met?	
22. Were the test-specific age requirements met for each test species?	
23. Was the bulk physical/chemical testing performed on the sediments/composites that were biologically tested?	
24. Were the mortality acceptance criteria met for the water column and sediment toxicity tests?	
25. Were the test performance requirements in Table 11.3 of EPA (1994a) met?	

Table II-2: Quality Control Summary for Analyses of Polyaromatic Hydrocarbons (PAHs) and other base-neutrals in Sediment and Tissue Matrices

Method Reference Number: 8270C

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift (± 15 % D)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	No	WG937275-6 MS naphthalene (38.7%), acenaphthylene (42.3%), acenaphthene (44.7%), fluorene (46.6%), phenanthrene (48.5%), anthracene (45.2%), fluoranthene (49.9%), pyrene (48.2%) and cl3-bz#18 (49.2%). WG937275-7 MS naphthalene (39.6%), acenaphthylene (42.9%), acenaphthene (45.1%), fluorene (47%), phenanthrene (48.9%), anthracene (45.9%), pyrene (48.1%)	In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of	Yes		In Data Package

	field samples (RPD < 30%)			
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package
Internal Standard Areas	Within 50 to 200% of internal standards in continuing calibration check	Yes		Retained at Lab

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Table II-3: Quality Control Summary for the Analyses of Pesticides in Sediment, Tissue, and Water Matrices

Method Reference Number: 8081B

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)			Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)			Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)			Retained at Lab
Continuing Calibration	Every 20 injections (± 15 % D)			Retained at Lab
Standard Reference Materials	Within the limits provided by vendor			In Data Package
Method Blank	No target analytes > RL			In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)			In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)			In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Table II-4: Quality Control Summary for Analyses of Polychlorinated Biphenyls (PCB Congeners) in Sediment, Tissue, and Water Matrices

Method Reference Number: 8270C

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)	Yes		Retained at Lab
Continuing Calibration	Every 20 injections (± 15 % D)	Yes		Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	No	cl6-bz#128 (164%)	In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)	No	WG937275-6 MS cl3-bz#18 (49.2%) WG937275-7 MS cl3-bz#18 (48.7%).	In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Table II-5: Quality Control Summary for Analyses of Metals in Sediments, Tissue, and Water Matrices

Method Reference Numbers: Various Reference Numbers

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Linear Range Determination for ICP	Performed Quarterly	Yes		Retained at Lab
Initial Calibration for AA, Hg	Performed Daily (Correlation Coefficient ≥0.995)	Yes		Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)	Yes		Retained at Lab and On file at USACoE-NED
Initial Calibration Verification/ Continuing Calibration Verification	Hg: 80 to 120% recovery Other metals: 90 to 110% recovery	Yes		Retained at Lab
Initial Calibration Blank/ Continuing Calibration Blank	No target analytes > Instrument Detection Limit (IDL)	No	Results >3x IDL noted, on file at lab	Retained at Lab
Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Method Blank	No target analytes > RL	Yes		In Data Package
Sample Spike/ Sample Duplicate	One set per group of field samples. Must contain all target analytes. Recovery Limits (75 to 125%; RPD < 20% or < 35%)	Yes		In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Table II-6: Quality Control Summary for Analyses of other Organic Chemicals not listed in Sediment, Tissue, and Water Matrices

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Initial Calibration	Must be performed prior to the analysis of any QC sample or field sample (<20 % RSD for each compound)			Retained at Lab
Calculation of Method Detection Limits (MDLs)	For each matrix, analyzed once per 12 month period (see Section 5.2 for MDL procedure)			In Data Package
Calibration Verification (Second Source)	Once, after initial calibration (80 to 120% recovery of each compound)			Retained at Lab
Continuing Calibration	At the beginning of every 12 hour shift (± 15 % D)			Retained at Lab
Standard Reference Materials	Within the limits provided by vendor			In Data Package
Method Blank	No target analytes > RL			In Data Package
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One set (MS/MSD) per group of field samples. Must contain all target analytes. (Recovery Limits 50 to 120%; RPD <30%)			In Data Package
Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 30%)			In Data Package
Surrogate Recoveries	Calculate % recovery (30 to 150% recovery)			In Data Package
Internal Standard Areas (if applicable)	Within 50 to 200% of internal standards in continuing calibration check			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Table II-7: Quality Control Summary for Analyses of Sediment Grain Size and Total Organic Carbon

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Grain Size: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD < 25%)	Yes		In Data Package
Total Organic Carbon: Standard Reference Materials	Within the limits provided by vendor	Yes		In Data Package
Total Organic Carbon: Analytical Replicates	Analyze one sample in duplicate for each group of field samples (RPD <30%)	Yes		In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Table II-8: Quality Control Summary for Biological Toxicity Testing only

Method Reference Numbers:

Quality Control (QC) Element	Acceptance Criteria*	Criteria Met? Yes/No	List results outside criteria (Cross-reference results table in data report)	Location of Results (Retained at Lab or in Data Package)
Test condition requirements for each species: Temperature, Salinity, pH, D.O., Ammonia (Total, Un-ionized)	Test conditions within the requirements specified for each species			In Data Package
Test species age	Age/health within guidelines for each species (Appendix V)			In Data Package
Bulk physical/chemical analyses (If required by the Sampling plan)	Required? If so, performed? Yes or No			In Data Package
Water column toxicity test: Control mortality Control abnormality	 < 10% mean < 30% mussel/oyster; < 40% clam larvae, < 30% sea urchin larvae			In Data Package
Sediment toxicity test: Control mortality Compliance with applicable test acceptability requirements in Table 11.3 (EPA 1994a)	 < 10% mean (no chamber >20%) See EPA (1994a) Section 9; Table 11.3			In Data Package

* The Quality Control Acceptance Criteria are general guidelines. If alternate criteria are used, they must be documented in this table.

Reference:

Regional Implementation Manual for the Evaluation of Dredged Material Proposed for Disposal in New England Waters, U.S. EPA and U.S. Army Corps of Engineers, New England District, April 2004.

October 13, 2016

Vista Work Order No. 1601237

Ms. Liz Porta
Alpha Analytical Laboratory
8 Walkup Drive
Westborough, MA 01581

Dear Ms. Porta,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on September 27, 2016. This sample set was analyzed on a rush turn-around time, under your Project Name 'L1629727'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Karen Lopez for

Martha Maier
Laboratory Director

Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Work Order No. 1601237
Case Narrative

Sample Condition on Receipt:

Fifteen aqueous samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology. As directed, the sample IDs were confirmed for the following samples:

Sample C-8 (L1629727-10) collected 21-SEP-16 13:00
Sample C-9 (L1629727-11) collected 21-SEP-16 11:45

Analytical Notes:

Modified EPA Method 537

The samples were extracted and analyzed for PFOA and PFOS using Modified EPA Method 537. The results include both linear and branched isomers.

Holding Times

The samples were extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above the Reporting Limit. The OPR recoveries were within the method acceptance criteria.

The recoveries of all internal standards in the QC and field samples were within the acceptance criteria.

As requested, an MS/MSD was performed on sample "C-6 (0-48)".

TABLE OF CONTENTS

Sample Inventory Report

Vista Sample ID	Client Sample ID		Sampled	Received	Components/Containers
1601237-01	C-6 (0-48)	MS/MSD	20-Sep-16 10:10	27-Sep-16 10:06	HDPE Jar, 4 oz
1601237-02	C-7 (0-48)		20-Sep-16 12:02	27-Sep-16 10:06	HDPE Jar, 4 oz
1601237-03	C-1		20-Sep-16 12:58	27-Sep-16 10:06	HDPE Jar, 4 oz
1601237-04	C-2		20-Sep-16 13:05	27-Sep-16 10:06	HDPE Jar, 4 oz
1601237-05	C-3		20-Sep-16 13:36	27-Sep-16 10:06	HDPE Jar, 4 oz
1601237-06	C-4		20-Sep-16 14:05	27-Sep-16 10:06	HDPE Jar, 4 oz
1601237-07	C-6 (48-61)		20-Sep-16 10:10	27-Sep-16 10:06	HDPE Jar, 4 oz
1601237-08	C-7 (48-54)		20-Sep-16 12:02	27-Sep-16 10:06	HDPE Jar, 4 oz
1601237-09	C-5		21-Sep-16 08:35	27-Sep-16 10:06	HDPE Jar, 4 oz
1601237-10	C-9		21-Sep-16 13:00	27-Sep-16 10:06	HDPE Jar, 4 oz
1601237-11	C-9		21-Sep-16 11:45	27-Sep-16 10:06	HDPE Jar, 4 oz
1601237-12	C-10		21-Sep-16 12:20	27-Sep-16 10:06	HDPE Jar, 4 oz
1601237-13	C-11 (0-48)		21-Sep-16 09:03	27-Sep-16 10:06	HDPE Jar, 4 oz
1601237-14	C-12		21-Sep-16 08:44	27-Sep-16 10:06	HDPE Jar, 4 oz
1601237-15	C-11 (48-89)		21-Sep-16 09:03	27-Sep-16 10:06	HDPE Jar, 4 oz

ANALYTICAL RESULTS

Sample ID: Method Blank **VAL - PFAS**

Matrix:	Solid	QC Batch:	B6J0020	Lab Sample:	B6J0020-BLK1
Sample Size:	1.00 g	Date Extracted:	05-Oct-2016 15:22	Date Analyzed:	11-Oct-16 19:37 Column: BEH C18

Analyte	Conc. (ng/g)	RL	Qualifiers
PFOA	ND	2.00	
PFOS	ND	2.00	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C2-PFOA	99.0	60 - 150	
IS	13C8-PFOS	107	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: OPR **VAL - PFAS**

Matrix:	Solid	QC Batch:	B6J0020	Lab Sample:	B6J0020-BS1
Sample Size:	1.00 g	Date Extracted:	05-Oct-2016 15:22	Date Analyzed:	11-Oct-16 20:02 Column: BEH C18

Analyte	Amt Found (ng/g)	Spike Amt	%R	Limits
PFOA	9.68	10.0	96.8	70 - 130
PFOS	8.31	10.0	83.1	70 - 130

	Labeled Standard	%R	LCL-UCL
IS	13C2-PFOA	95.4	60 - 150
IS	13C8-PFOS	105	60 - 150

LCL-UCL - Lower control limit - upper control limit

Sample ID: C-6 (0-48) VAL - PFAS

Client Data		Sample Data		Laboratory Data			
Name:	Alpha Analytical Laboratory	Matrix:	Solid	Lab Sample:	1601237-01	Date Received:	27-Sep-2016 10:06
Project:	L1629727	Sample Size:	1.48 g	QC Batch:	B6J0020	Date Extracted:	05-Oct-2016 15:22
Date Collected:	20-Sep-2016 10:10	% Solids:	67.5	Date Analyzed:	11-Oct-16 20:53	Column:	BEH C18

Analyte	Conc. (ng/g)	RL	Qualifiers
PFOA	ND	2.00	
PFOS	ND	2.00	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C2-PFOA	92.1	60 - 150	
IS	13C8-PFOS	81.1	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Matrix Spike Results

VAL - PFAS

Source Client ID: C-6 (0-48)
Source LabNumber: 1601237-01
Matrix: Solid
Sample Size: 1.52/1.49 g

QC Batch: B6J0020
Date Extracted: 05-Oct-2016 15:22

Lab Sample: B6J0020-MS1/B6J0020-MSD1
Date Analyzed: 11-Oct-16 21:05 Column: BEH C18
11-Oct-16 21:18 Column: BEH C18

Analyte	Spike-MS (ng/g)	MS %R	MS Qual.	Spike-MSD (ng/g)	MSD %R	RPD	MSD Qual.	%R Limit	%RPD Limit
PFOA	9.75	108		9.94	93.9	14.0		70 - 130	25
PFOS	9.75	97.3		9.94	91.2	6.47		70 - 130	25

Labeled Standard		MS %R	MS Qualifiers	MSD %R	MS Qual.
IS	13C2-PFOA	92.0		101	
IS	13C8-PFOS	70.6		77.5	

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: C-7 (0-48) VAL - PFAS

Client Data		Sample Data		Laboratory Data			
Name:	Alpha Analytical Laboratory	Matrix:	Solid	Lab Sample:	1601237-02	Date Received:	27-Sep-2016 10:06
Project:	L1629727	Sample Size:	1.41 g	QC Batch:	B6J0020	Date Extracted:	05-Oct-2016 15:22
Date Collected:	20-Sep-2016 12:02	% Solids:	72.6	Date Analyzed:	11-Oct-16 21:31	Column:	BEH C18

Analyte	Conc. (ng/g)	RL	Qualifiers
PFOA	ND	1.95	
PFOS	ND	1.95	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C2-PFOA	93.1	60 - 150	
IS	13C8-PFOS	82.8	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: C-1 VAL - PFAS

Client Data

Name:	Alpha Analytical Laboratory
Project:	L1629727
Date Collected:	20-Sep-2016 12:58

Sample Data

Matrix:	Solid
Sample Size:	1.79 g
% Solids:	58.5

Laboratory Data

Lab Sample:	1601237-03	Date Received:	27-Sep-2016 10:06
QC Batch:	B6J0020	Date Extracted:	05-Oct-2016 15:22
Date Analyzed:	11-Oct-16 21:43 Column: BEH C18		

Analyte	Conc. (ng/g)	RL	Qualifiers
PFOA	ND	1.91	
PFOS	ND	1.91	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C2-PFOA	93.5	60 - 150	
IS	13C8-PFOS	90.7	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: C-2

VAL - PFAS

Client Data		Sample Data		Laboratory Data			
Name:	Alpha Analytical Laboratory	Matrix:	Solid	Lab Sample:	1601237-04	Date Received:	27-Sep-2016 10:06
Project:	L1629727	Sample Size:	1.70 g	QC Batch:	B6J0020	Date Extracted:	05-Oct-2016 15:22
Date Collected:	20-Sep-2016 13:05	% Solids:	61.8	Date Analyzed:	11-Oct-16 21:56	Column:	BEH C18

Analyte	Conc. (ng/g)	RL	Qualifiers
PFOA	ND	1.91	
PFOS	ND	1.91	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C2-PFOA	101	60 - 150	
IS	13C8-PFOS	80.6	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: C-3 — VAL - PFAS

Client Data		Sample Data		Laboratory Data			
Name:	Alpha Analytical Laboratory	Matrix:	Solid	Lab Sample:	1601237-05	Date Received:	27-Sep-2016 10:06
Project:	L1629727	Sample Size:	1.64 g	QC Batch:	B6J0020	Date Extracted:	05-Oct-2016 15:22
Date Collected:	20-Sep-2016 13:36	% Solids:	62.9	Date Analyzed:	11-Oct-16 22:08	Column:	BEH C18

Analyte	Conc. (ng/g)	RL	Qualifiers
PFOA	ND	1.94	
PFOS	ND	1.94	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C2-PFOA	97.0	60 - 150	
IS	13C8-PFOS	76.6	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: C-4 — VAL - PFAS

Client Data		Sample Data		Laboratory Data			
Name:	Alpha Analytical Laboratory	Matrix:	Solid	Lab Sample:	1601237-06	Date Received:	27-Sep-2016 10:06
Project:	L1629727	Sample Size:	1.58 g	QC Batch:	B6J0020	Date Extracted:	05-Oct-2016 15:22
Date Collected:	20-Sep-2016 14:05	% Solids:	65.9	Date Analyzed:	11-Oct-16 22:21	Column:	BEH C18

Analyte	Conc. (ng/g)	RL	Qualifiers
PFOA	ND	1.92	
PFOS	ND	1.92	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C2-PFOA	94.6	60 - 150	
IS	13C8-PFOS	78.6	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: C-6 (48-61) VAL - PFAS

Client Data		Sample Data		Laboratory Data			
Name:	Alpha Analytical Laboratory	Matrix:	Solid	Lab Sample:	1601237-07	Date Received:	27-Sep-2016 10:06
Project:	L1629727	Sample Size:	1.61 g	QC Batch:	B6J0020	Date Extracted:	05-Oct-2016 15:22
Date Collected:	20-Sep-2016 10:10	% Solids:	64.2	Date Analyzed:	11-Oct-16 22:34	Column:	BEH C18

Analyte	Conc. (ng/g)	RL	Qualifiers
PFOA	ND	1.93	
PFOS	ND	1.93	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C2-PFOA	97.6	60 - 150	
IS	13C8-PFOS	74.6	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: C-7 (48-54) VAL - PFAS

Client Data		Sample Data		Laboratory Data			
Name:	Alpha Analytical Laboratory	Matrix:	Solid	Lab Sample:	1601237-08	Date Received:	27-Sep-2016 10:06
Project:	L1629727	Sample Size:	1.50 g	QC Batch:	B6J0020	Date Extracted:	05-Oct-2016 15:22
Date Collected:	20-Sep-2016 12:02	% Solids:	71.5	Date Analyzed:	11-Oct-16 23:49	Column:	BEH C18

Analyte	Conc. (ng/g)	RL	Qualifiers
PFOA	ND	1.87	
PFOS	ND	1.87	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C2-PFOA	111	60 - 150	
IS	13C8-PFOS	90.4	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: C-5 VAL - PFAS

Client Data		Sample Data		Laboratory Data			
Name:	Alpha Analytical Laboratory	Matrix:	Solid	Lab Sample:	1601237-09	Date Received:	27-Sep-2016 10:06
Project:	L1629727	Sample Size:	1.51 g	QC Batch:	B6J0020	Date Extracted:	05-Oct-2016 15:22
Date Collected:	21-Sep-2016 8:35	% Solids:	68.4	Date Analyzed:	12-Oct-16 00:02	Column:	BEH C18

Analyte	Conc. (ng/g)	RL	Qualifiers
PFOA	ND	1.94	
PFOS	ND	1.94	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C2-PFOA	103	60 - 150	
IS	13C8-PFOS	81.1	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: C-8

VAL - PFAS

Client Data		Sample Data		Laboratory Data			
Name:	Alpha Analytical Laboratory	Matrix:	Solid	Lab Sample:	1601237-10	Date Received:	27-Sep-2016 10:06
Project:	L1629727	Sample Size:	1.46 g	QC Batch:	B6J0020	Date Extracted:	05-Oct-2016 15:22
Date Collected:	21-Sep-2016 13:00	% Solids:	74.2	Date Analyzed:	12-Oct-16 00:15	Column:	BEH C18

Analyte	Conc. (ng/g)	RL	Qualifiers
PFOA	ND	1.85	
PFOS	ND	1.85	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C2-PFOA	105	60 - 150	
IS	13C8-PFOS	85.9	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: C-9 — VAL - PFAS

Client Data		Sample Data		Laboratory Data			
Name:	Alpha Analytical Laboratory	Matrix:	Solid	Lab Sample:	1601237-11	Date Received:	27-Sep-2016 10:06
Project:	L1629727	Sample Size:	1.22 g	QC Batch:	B6J0020	Date Extracted:	05-Oct-2016 15:22
Date Collected:	21-Sep-2016 11:45	% Solids:	83.0	Date Analyzed:	12-Oct-16 00:27	Column:	BEH C18

Analyte	Conc. (ng/g)	RL	Qualifiers
PFOA	ND	1.97	
PFOS	ND	1.97	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C2-PFOA	108	60 - 150	
IS	13C8-PFOS	88.6	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: C-10 — VAL - PFAS

Client Data		Sample Data		Laboratory Data			
Name:	Alpha Analytical Laboratory	Matrix:	Solid	Lab Sample:	1601237-12	Date Received:	27-Sep-2016 10:06
Project:	L1629727	Sample Size:	1.34 g	QC Batch:	B6J0020	Date Extracted:	05-Oct-2016 15:22
Date Collected:	21-Sep-2016 12:20	% Solids:	81.5	Date Analyzed:	12-Oct-16 00:40	Column:	BEH C18

Analyte	Conc. (ng/g)	RL	Qualifiers
PFOA	ND	1.83	
PFOS	ND	1.83	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C2-PFOA	107	60 - 150	
IS	13C8-PFOS	75.0	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: C-11 (0-48) VAL - PFAS

Client Data		Sample Data		Laboratory Data			
Name:	Alpha Analytical Laboratory	Matrix:	Solid	Lab Sample:	1601237-13	Date Received:	27-Sep-2016 10:06
Project:	L1629727	Sample Size:	1.46 g	QC Batch:	B6J0020	Date Extracted:	05-Oct-2016 15:22
Date Collected:	21-Sep-2016 9:03	% Solids:	70.1	Date Analyzed:	12-Oct-16 00:53	Column:	BEH C18

Analyte	Conc. (ng/g)	RL	Qualifiers
PFOA	ND	1.95	
PFOS	ND	1.95	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C2-PFOA	111	60 - 150	
IS	13C8-PFOS	89.3	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: C-12

VAL - PFAS

Client Data		Sample Data		Laboratory Data			
Name:	Alpha Analytical Laboratory	Matrix:	Solid	Lab Sample:	1601237-14	Date Received:	27-Sep-2016 10:06
Project:	L1629727	Sample Size:	1.29 g	QC Batch:	B6J0020	Date Extracted:	05-Oct-2016 15:22
Date Collected:	21-Sep-2016 8:44	% Solids:	78.3	Date Analyzed:	12-Oct-16 01:05	Column:	BEH C18

Analyte	Conc. (ng/g)	RL	Qualifiers
PFOA	ND	1.98	
PFOS	ND	1.98	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C2-PFOA	110	60 - 150	
IS	13C8-PFOS	94.4	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: C-11 (48-89) VAL - PFAS

Client Data		Sample Data		Laboratory Data			
Name:	Alpha Analytical Laboratory	Matrix:	Solid	Lab Sample:	1601237-15	Date Received:	27-Sep-2016 10:06
Project:	L1629727	Sample Size:	1.48 g	QC Batch:	B6J0020	Date Extracted:	05-Oct-2016 15:22
Date Collected:	21-Sep-2016 9:03	% Solids:	69.3	Date Analyzed:	12-Oct-16 01:18	Column:	BEH C18

Analyte	Conc. (ng/g)	RL	Qualifiers
PFOA	ND	1.95	
PFOS	ND	1.95	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C2-PFOA	107	60 - 150	
IS	13C8-PFOS	81.3	60 - 150	

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

DATA QUALIFIERS & ABBREVIATIONS

B	**This compound was also detected in the method blank.**
D	**Dilution**
E	**The associated compound concentration exceeded the calibration range of the instrument.**
H	**Recovery and/or RPD was outside laboratory acceptance limits.**
I	**Chemical Interference**
J	**The amount detected is below the Reporting Limit/LOQ.**
*****	**See Cover Letter**
Conc.	**Concentration**
NA	**Not applicable**
ND	**Not Detected**
TEQ	**Toxic Equivalency**

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

CERTIFICATIONS

Accrediting Authority	Certificate Number
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2014022
Nevada Division of Environmental Protection	CA004132015-1
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-004
Pennsylvania Department of Environmental Protection	012
South Carolina Department of Health	87002001
Texas Commission on Environmental Quality	T104704189-15-6
Virginia Department of General Services	7923
Washington Department of Ecology	C584
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	**Method**
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23

MATRIX: Biological Tissue	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	**Method**
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537

MATRIX: Non-Potable Water	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	**Method**
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope	EPA 1613B

Dilution GC/HRMS	
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

SUB UPS: Vista Analytical –Eldorado Holls, CA

1601237, 7.0

CHAIN OF CUSTODY

PAGE 1 OF 2

ALPHA ANALYTICAL

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Project Information

Project Name:

Project Location: NJ

Project #:

Project Manager: Elizabeth Porta

ALPHA Quote #:

Client Information

Client: Alpha Analytical Lab

Address: 320 Forbes Blvd.

Mansfield, Ma 02048

Phone: 508-822-9300

Fax:

Email: subreports@alphalab.com,eporta@alphalab.com

☐ These samples have been Previously analyzed by Alpha

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Other Project Specific Requirements/Comments/Detection Limits:

Please include Alpha job #L1629727 on this report.

Date Rec'd in Lab:

ALPHA Job #: L1629727

Report Information Data Deliverables

☐ FAX ☒ EMAIL

☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program | Criteria

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

☐ Yes ☒ No Are MCP Analytical Methods Required?

☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☐ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	PFOA/PFOS												Sample Specific Comments
MS/MSD	C-6 (0-48)	9/20/16	10:10			☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	L1629727-01
	C-7 (0-48)	9/20/16	12:02			☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	L1629727-02
	C-1	9/20/16	12:58			☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	L1629727-03
	C-2	9/20/16	13:05			☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	L1629727-04
	C-3	9/20/16	13:36			☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	L1629727-05
	C-4	9/20/16	14:05			☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	L1629727-06
	C-6 (48-61)	9/20/16	10:10			☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	L1629727-07
	C-7 (48-54)	9/20/16	12:02			☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	L162972-08
	C-5	9/21/16	08:35			☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	L1629727-09
	C-9	9/21/16	13:00			☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	L1629727-10
						Container Type	A	-	-	-	-	-	-	-	-	-	-	-	
						Preservative	A	-	-	-	-	-	-	-	-	-	-	-	

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

FORM NO. 01-01(I) (rev. 30-JUL-07)

Relinquished By:	Date/Time	Received By:	Date/Time
	9/21/16 1700	UPS	
		MSparles	9-27-16 1012

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

SUB UPS: Vista Analytical –Eldorado Holls, CA

1601237, 7.0

CHAIN OF CUSTODY

PAGE 2 OF 2

ALPHA ANALYTICAL

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: Alpha Analytical Lab
Address: 320 Forbes Blvd.
Mansfield, Ma 02048
Phone: 508-822-9300
Fax:
Email: subreports@alphalab.com,eporta@alphalab.com

☐ These samples have been Previously analyzed by Alpha

Project Information

Project Name:
Project Location: NJ
Project #:
Project Manager: Elizabeth Porta
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Other Project Specific Requirements/Comments/Detection Limits:

Please include Alpha job #L1629727 on this report.

Date Rec'd in Lab:

ALPHA Job #: L1629727

Report Information Data Deliverables

☐ FAX ☒ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program | Criteria

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

☐ Yes ☒ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☐ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	PFOA/PFOS	Sample Specific Comments
	C-9	9/21/16	11:45			☒	L1629727-11
	C-10	9/21/16	12:20			☒	L1629727-12
	C-11 (0-48)	9/21/16	9:03			☒	L1629727-13
	C-12	9/21/16	8:44			☒	L1629727-14
	C-11 (48-89)	9/21/16	9:03			☒	L1629727-15
						☒	
						☒	
						☒	
						☒	
						☒	

Container Type	A	-	-	-	-	-	-	-	-	-	-	-
Preservative	A	-	-	-	-	-	-	-	-	-	-	-

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

FORM NO: 01-01(I) (rev. 30-JUL-07)

Relinquished By:	Date/Time	Received By:	Date/Time
	9/26/16 1700	UPS	
		USPRIORITY	9/27/16 1012

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

SAMPLE LOG-IN CHECKLIST

Vista Analytical Laboratory

Vista Project #: 1601237 **TAT** 14

Samples Arrival:	**Date/Time** 9/27/16 1006	**Initials:** MLS	**Location:** WR-2 **Shelf/Rack:** N/A
Logged In:	**Date/Time** 9/28/16 1620	**Initials:** SR	**Location:** WR-2 **Shelf/Rack:** F5

Delivered By:	FedEx	UPS	On Trac	DHL	Hand Delivered	Other
Preservation:	Ice	Blue Ice	Dry Ice	None		

Temp °C: 7.6	(uncorrected)	**Time:** 1025	**Thermometer ID:** ~~IR-1~~ DT-1 MLS 9/27/16
Temp °C: 7.0	(corrected)	**Probe used:** Yes☒ No☐	

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?	✓		
Shipping Documentation Present?	✓		
Airbill — Trk # 1Z 19E 18E 01 9424 7721	✓		
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present?	✓		
COC Anomaly/Sample Acceptance Form completed?	✓		

If Chlorinated or Drinking Water Samples, Acceptable Preservation?						✓
Preservation Documented:	$Na_2S_2O_3$	Trizma			Yes	No	NA
Shipping Container	Vista	Client	Retain	Return	Dispose		

Comments: Label ID: C-8
COC ID: C-9
Vista ID: 16001237-10

Chain of Custody Anomaly/Sample Acceptance Form

Vista Analytical Laboratory

Client: Alpha Analytical Laboratory
Contact: Liz Porta
Email: eporta@alphalab.com
Phone: (508) 844-4124

Workorder Number: 1601237
Date Received: 27-Sep-16 11:16
Documented by/date: S.Roughton 9/28/16

Please review the following information and complete the Client Authorization section. To comply with NELAC regulations, we must receive authorization before proceeding with sample analysis.

Thank you,

Martha Maier
mmaier@vista-analytical.com
916-673-1520

The following information or item is needed to proceed with analysis:

- ☐ Complete Chain-of-Custody
- ☐ Test Method Requested
- ☐ Analyte List Requested
- ☐ Other:
- ☐ Preservative
- ☐ Sample Identification
- ☐ Sample Collection Date and/or Time
- ☐ Collector's Name
- ☐ Sample Type
- ☐ Sample Location

The following anomalies were noted. Authorization is needed to proceed with analysis.

Temperature outside < 6°C Range — Samples Affected:

Temperature _____°C — Ice Present? Yes No Melted

- ☐ Sample ID Discrepancy
- ☐ Sample Holding Time Missed
- ☐ Custody Seals Broken
- ☐ Insufficient Sample Size
- ☐ Sample Container(s) Broken
- ☐ Incorrect Container Type

Comments:

Client Label ID: C-8
COC ID: C-9
Vista ID: 1601237-10

See page 2

Client Authorization

Proceed with Analysis: YES NO — Signature and Date Karen 10-13-16

Client Comments/Instructions C-8 collected on 9/21/16 13:00.
C-9 collected on 9/21/16 11:45.

Chain of Custody Anomaly/Sample Acceptance Form

Vista Analytical Laboratory

Alpha Analytical Laboratory
Liz Porta
eporta@alphalab.com
(508) 844-4124

Workorder Number: 1601237
Date Received: 27-Sep-16 11:16
Documented by/date: S.Roughton 9/28/16

Please review the following information and complete the Client Authorization section. To comply with NELAC regulations, we must receive authorization before proceeding with sample analysis.

Thank you,

Martha Maier
mmaier@vista-analytical.com
916-673-1520

[X] Sample IDs on Chain of Custody do not match Sample Container Labels

Chain of Custody ID	Container Label ID
C-9	C-8

Client Authorization

Proceed with Analysis: YES NO Signature and Date [signature] 10-13-16

Client Comments/Instructions _____

CFA | Cape Fear Analytical LLC
an affiliate of The GEL Group INC

3306 Kitty Hawk Road, Suite 120 Wilmington, NC 28405
P 910.795.0421

www.capefearanalytical.com

October 19, 2016

Ms. Elizabeth Porta
Alpha Analytical Laboratory
8 Walkup Drive
Westborough, Massachusetts 01581

Re: Dioxin and PCB Subcontract, Liz Porta PM
Work Order: 9822
SDG: L1629727

Dear Ms. Porta:

Cape Fear Analytical LLC (CFA) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on September 27, 2016. This original data report has been prepared and reviewed in accordance with CFA's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at 910-795-0421.

Sincerely,

Cynde Larkins

Cynde Larkins
Project Manager

Enclosures

SUB UPS: CAPE FEAR, NC

WO#9822

CHAIN OF CUSTODY

PAGE 1 OF 2

ALPHA ANALYTICAL

Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab:

ALPHA Job #: L1629727

Client Information

Client: Alpha Analytical Lab
Address: 320 Forbes Blvd.
Mansfield, Ma 02048
Phone: 508-822-9300
Fax:
Email: subreports@alphalab.com,eporta@alphalab.com

☐ These samples have been Previously analyzed by Alpha

Project Information

Project Name:
Project Location: NJ
Project #:
Project Manager: Elizabeth Porta
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Report Information — Data Deliverables

☐ FAX ☒ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program | Criteria

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

☐ Yes ☒ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

Please include Alpha job #L1629727 on this report.

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☐ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Dioxin 1631B	Sample Specific Comments	TOTAL # BOTTLES
MS/MSD	C-6 (0-48)	9/20/16	10:10	Sediment		☒	L1629727-01	1
	C-7 (0-48)	9/20/16	12:02			☒	L1629727-02	1
	C-1	9/20/16	12:58			☒	L1629727-03	1
	C-2	9/20/16	13:05			☒	L1629727-04	1
	C-3	9/20/16	13:36			☒	L1629727-05	1
	C-4	9/20/16	14:05			☒	L1629727-06	1
	C-6 (48-61)	9/20/16	10:10			☒	L1629727-07	1
	C-7 (48-54)	9/20/16	12:02			☒	L162972-08	1
	C-5	9/21/16	08:35			☒	L1629727-09	1
	C-9	9/21/16	13:00	V		☒	L1629727-10	1

Container Type	A	-	-	-	-	-	-	-	-	-	-	-	
Preservative	A	-	-	-	-	-	-	-	-	-	-	-	

Serial_No:10271613:37

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

FORM NO: 01-01(I) (rev. 30-JUL-07)

Relinquished By:	Date/Time	Received By:	Date/Time
UPS	9/26/16 1700	UPS	27Sep16 10:05

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

5.6°C

SUB UPS: CAPE FEAR, NC

WO# 9822

CHAIN OF CUSTODY

PAGE 2 OF 2

ALPHA ANALYTICAL
Westborough, MA TEL: 508-898-9220 FAX: 508-898-9193
Mansfield, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab:

ALPHA Job #: L1629727

Project Information

Project Name:

Project Location: NJ

Project #:

Project Manager: Elizabeth Porta

ALPHA Quote #:

Client Information

Client: Alpha Analytical Lab

Address: 320 Forbes Blvd.

Mansfield, Ma 02048

Phone: 508-822-9300

Fax:

Email: subreports@alphalab.com,eporta@alphalab.com

☐ These samples have been Previously analyzed by Alpha

Turn-Around Time

☒ Standard ☐ Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Report Information

☐ FAX ☐ ADEx

Data Deliverables

☒ EMAIL ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program | Criteria

MCP PRESUMPTIVE CERTAINTY-CT REASONABLE CONFIDENCE PROTOCOLS

☐ Yes ☒ No Are MCP Analytical Methods Required?

☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

Please include Alpha job #L1629727 on this report.

ANALYSIS

SAMPLE HANDLING
Filtration
☐ Done
☐ Not Needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Dioxin 1631B	Sample Specific Comments	TOTAL # BOTTLES
	C-9	9/21/16	11:45	Sediment		☒	L1629727-11	1
	C-10	9/21/16	12:20			☒	L1629727-12	1
	C-11 (0-48)	9/21/16	09:03			☒	L1629727-13	1
	C-12	9/21/16	08:44			☒	L1629727-14	1
	C-11 (48-89)	9/21/16	09:03			☒	L1629727-15	1
						☒		
						☒		
						☒		
						☒		
						☒		

Container Type: A
Preservative: A

Serial_No:10271613:37

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

FORM NO: 01-01(I) (rev. 30-JUL-07)

Relinquished By:	Date/Time	Received By:	Date/Time
	9/26/16 1700	UPS	

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Payment Terms.

SAMPLE RECEIPT CHECKLIST

Cape Fear Analytical

Client: ALDH	Work Order: 9822
Shipping Company: UPS	Date/Time Received: 27Sep2016 10:05 (MSD 27Sep16 10:26)

Suspected Hazard Information	Yes	NA	No
Shipped as DOT Hazardous?			✓
Samples identified as Foreign Soil?			✓

DOE Site Sample Packages	Yes	NA	No*
Screened <0.5 mR/hr?		4	✓
Samples < 2x background?			

* Notify RSO of any responses in this column immediately.

Air Sample Receipt Specifics	Yes	NA	No
Air sample in shipment?			✓

Air Witness: _____ Serial No:10271613:37

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: seals broken damaged container leaking container other(describe)
2	Chain of Custody documents included with shipment?	✓			
3	Samples requiring cold preservation within 0-6°C?	✓			Preservation Method: ice bags blue ice dry ice none other (describe) 5.6°C
4	Aqueous samples found to have visible solids?		✓		Sample IDs, containers affected:
5	Samples requiring chemical preservation at proper pH?		✓		Sample IDs, containers affected and pH observed: If preservative added, Lot#:
6	Samples requiring preservation have no residual chlorine?		✓		Sample IDs, containers affected: If preservative added, Lot#:
7	Samples received within holding time?	✓			Sample IDs, tests affected:
8	Sample IDs on COC match IDs on containers?			✓	Sample IDs, containers affected: Sample #10 is C-8 on container #11 is C-9 on container
9	Date & time of COC match date & time on containers?	✓			Sample IDs, containers affected:
10	Number of containers received match number indicated on COC?	✓			List type and number of containers / Sample IDs, containers affected: 1-4oz amber each
11	COC form is properly signed in relinquished/received sections?	✓			

Comments:

Checklist performed by: Initials: MJO Date: 27 Sep2016 CF-UD-F-7

High Resolution Dioxins and Furans Analysis

Case Narrative

HDOX Case Narrative
Alpha Analytical Laboratory (ALPH)
SDG L1629727
Work Order 9822

Method/Analysis Information

Product:	**Dioxins/Furans by EPA Method 1613B in Solids**
Analytical Method:	EPA Method 1613B
Extraction Method:	SW846 3540C
Analytical Batch Number:	33023
Clean Up Batch Number:	33022
Extraction Batch Number:	33021

Sample Analysis

The following samples were analyzed using the analytical protocol as established in Method 1613B:

Sample ID	Client ID
9822001	C-6 (0-48)
9822002	9822001(C-6 (0-48)) Matrix Spike (MS)
9822003	9822001(C-6 (0-48)) Matrix Spike Duplicate (MSD)
9822004	C-7 (0-48)
9822005	C-1
9822006	C-2
9822007	C-3
9822008	C-4
9822009	C-6 (48-61)
9822010	C-7 (48-54)
9822011	C-5
9822012	C-8
9822013	C-9
9822014	C-10
9822015	C-11(0-48)
9822016	C-12
9822017	C-11(48-89)
12017085	Method Blank (MB)
12017086	Laboratory Control Sample (LCS)
12017087	Laboratory Control Sample Duplicate (LCSD)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by Cape Fear Analytical LLC (CFA) as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with CF-OA-E-002 REV# 14.

Raw data reports are processed and reviewed by the analyst using the TargetLynx software package.

Calibration Information

Initial Calibration
All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification (CCV) Requirements
All associated calibration verification standard(s) (CCV) met the acceptance criteria.

Quality Control (QC) Information

Certification Statement
The test results presented in this document are certified to meet all requirements of the 2009 TNI Standard.

Method Blank (MB) Statement
The MB(s) analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
All surrogate recoveries were within the established acceptance criteria for this SDG.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

Laboratory Control Sample Duplicate (LCSD) Recovery
The LCSD spike recoveries met the acceptance limits.

LCS/LCSD Relative Percent Difference (RPD) Statement
The RPD(s) between the LCS and LCSD met the acceptance limits.

QC Sample Designation
Sample 9822001 (C-6 (0-48))- Batch 33023 was selected for analysis as the matrix spike and matrix spike duplicate.

Matrix Spike (MS) Recovery Statement
The MS recoveries were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement
One analyte recovered outside the acceptance limits. 9822003 (C-6 (0-48))- Batch 33023.

MS/MSD Relative Percent Difference (RPD) Statement
One RPD was outside the acceptance limits. 9822003 (C-6 (0-48))- Batch 33023.

Technical Information

Holding Time Specifications
CFA assigns holding times based on the associated methodology, which assigns the date and time from sample collection. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Nonconformance (NCR) Documentation
The following NCR was generated for this SDG: 646052 9822003 (C-6 (0-48))- Batch 33023.

Manual Integrations
Certain standards and QC samples required manual integrations to correctly position the baseline as set in the calibration standard injections. Where manual integrations were performed, copies of all manual integration peak profiles are included in the raw data section of this fraction. Manual integrations were required for data files in this SDG.

Sample preparation
No difficulties were encountered during sample preparation.

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted: Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also

includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Sample Data Summary

Cape Fear Analytical, LLC

3306 Kitty Hawk Road Suite 120, Wilmington, NC 28405 - (910) 795-0421 - www.capefearanalytical.com

Certificate of Analysis Report
for

ALPH001 Alpha Analytical Laboratory

Client SDG: L1629727 CFA Work Order: 9822

The Qualifiers in this report are defined as follows:

* A quality control analyte recovery is outside of specified acceptance criteria

** Analyte is a surrogate compound

U Analyte was analyzed for, but not detected above the specified detection limit.

Review/Validation

Cape Fear Analytical requires all analytical data to be verified by a qualified data reviewer.

The following data validator verified the information presented in this case narrative:

Signature:  **Name: Heather Patterson**

Date: 19 OCT 2016 **Title: Group Leader**

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822001**	**Date Collected:**	**09/20/2016 10:10**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**34.7**
Client ID:	**C-6 (0-48)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/17/2016 19:22**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-5**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**16.14 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD	U	.949	pg/g	0.949
40321-76-4	1,2,3,7,8-PeCDD	U	4.74	pg/g	4.74
39227-28-6	1,2,3,4,7,8-HxCDD	U	4.74	pg/g	4.74
57653-85-7	1,2,3,6,7,8-HxCDD	U	4.74	pg/g	4.74
19408-74-3	1,2,3,7,8,9-HxCDD	U	4.74	pg/g	4.74
35822-46-9	1,2,3,4,6,7,8-HpCDD	U	4.74	pg/g	4.74
3268-87-9	1,2,3,4,6,7,8,9-OCDD		98.2	pg/g	9.49
51207-31-9	2,3,7,8-TCDF	U	.949	pg/g	0.949
57117-41-6	1,2,3,7,8-PeCDF	U	4.74	pg/g	4.74
57117-31-4	2,3,4,7,8-PeCDF	U	4.74	pg/g	4.74
70648-26-9	1,2,3,4,7,8-HxCDF	U	4.74	pg/g	4.74
57117-44-9	1,2,3,6,7,8-HxCDF	U	4.74	pg/g	4.74
60851-34-5	2,3,4,6,7,8-HxCDF	U	4.74	pg/g	4.74
72918-21-9	1,2,3,7,8,9-HxCDF	U	4.74	pg/g	4.74
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	4.74	pg/g	4.74
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	4.74	pg/g	4.74
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	9.49	pg/g	9.49
41903-57-5	Total Tetrachlorodibenzo-p-dioxin	U	.949	pg/g	0.949
36088-22-9	Total Pentachlorodibenzo-p-dioxin	U	4.74	pg/g	4.74
34465-46-8	Total Hexachlorodibenzo-p-dioxin	U	4.74	pg/g	4.74
37871-00-4	Total Heptachlorodibenzo-p-dioxin		5.28	pg/g	4.74
30402-14-3	Total Tetrachlorodibenzofuran	U	.949	pg/g	0.949
30402-15-4	Total Pentachlorodibenzofuran	U	4.74	pg/g	4.74
55684-94-1	Total Hexachlorodibenzofuran	U	4.74	pg/g	4.74
38998-75-3	Total Heptachlorodibenzofuran	U	4.74	pg/g	4.74
3333-30-0	TEQ WHO2005 ND=0		0.0295	pg/g	
3333-30-1	TEQ WHO2005 ND=0.5		5.44	pg/g	

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		131	190	pg/g	69.2	(25%-164%)
13C-1,2,3,7,8-PeCDD		125	190	pg/g	65.9	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		126	190	pg/g	66.5	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		128	190	pg/g	67.4	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		117	190	pg/g	61.5	(23%-140%)
13C-OCDD		136	379	pg/g	35.7	(17%-157%)
13C-2,3,7,8-TCDF		129	190	pg/g	68.1	(24%-169%)
13C-1,2,3,7,8-PeCDF		119	190	pg/g	62.9	(24%-185%)
13C-2,3,4,7,8-PeCDF		116	190	pg/g	61.1	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		128	190	pg/g	67.3	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		129	190	pg/g	67.8	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		131	190	pg/g	69.2	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		129	190	pg/g	68.2	(29%-147%)

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822001**	**Date Collected:**	**09/20/2016 10:10**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**34.7**
Client ID:	**C-6 (0-48)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/17/2016 19:22**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-5**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**16.14 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1,2,3,4,6,7,8-HpCDF		106	190	pg/g	56.1	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		119	190	pg/g	62.8	(26%-138%)
37Cl-2,3,7,8-TCDD		14.3	19.0	pg/g	75.5	(35%-197%)

Comments:

U Analyte was analyzed for, but not detected above the specified detection limit.

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822004**	**Date Collected:**	**09/20/2016 12:02**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**31.5**
Client ID:	**C-7 (0-48)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/17/2016 21:43**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-8**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**15.66 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD	U	.932	pg/g	0.932
40321-76-4	1,2,3,7,8-PeCDD	U	4.66	pg/g	4.66
39227-28-6	1,2,3,4,7,8-HxCDD	U	4.66	pg/g	4.66
57653-85-7	1,2,3,6,7,8-HxCDD	U	4.66	pg/g	4.66
19408-74-3	1,2,3,7,8,9-HxCDD	U	4.66	pg/g	4.66
35822-46-9	1,2,3,4,6,7,8-HpCDD	U	4.66	pg/g	4.66
3268-87-9	1,2,3,4,6,7,8,9-OCDD		36.9	pg/g	9.32
51207-31-9	2,3,7,8-TCDF	U	.932	pg/g	0.932
57117-41-6	1,2,3,7,8-PeCDF	U	4.66	pg/g	4.66
57117-31-4	2,3,4,7,8-PeCDF	U	4.66	pg/g	4.66
70648-26-9	1,2,3,4,7,8-HxCDF	U	4.66	pg/g	4.66
57117-44-9	1,2,3,6,7,8-HxCDF	U	4.66	pg/g	4.66
60851-34-5	2,3,4,6,7,8-HxCDF	U	4.66	pg/g	4.66
72918-21-9	1,2,3,7,8,9-HxCDF	U	4.66	pg/g	4.66
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	4.66	pg/g	4.66
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	4.66	pg/g	4.66
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	9.32	pg/g	9.32
41903-57-5	Total Tetrachlorodibenzo-p-dioxin	U	.932	pg/g	0.932
36088-22-9	Total Pentachlorodibenzo-p-dioxin	U	4.66	pg/g	4.66
34465-46-8	Total Hexachlorodibenzo-p-dioxin	U	4.66	pg/g	4.66
37871-00-4	Total Heptachlorodibenzo-p-dioxin	U	4.66	pg/g	4.66
30402-14-3	Total Tetrachlorodibenzofuran	U	.932	pg/g	0.932
30402-15-4	Total Pentachlorodibenzofuran	U	4.66	pg/g	4.66
55684-94-1	Total Hexachlorodibenzofuran	U	4.66	pg/g	4.66
38998-75-3	Total Heptachlorodibenzofuran	U	4.66	pg/g	4.66
3333-30-0	TEQ WHO2005 ND=0		0.0111	pg/g	
3333-30-1	TEQ WHO2005 ND=0.5		5.33	pg/g	

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		146	186	pg/g	78.3	(25%-164%)
13C-1,2,3,7,8-PeCDD		138	186	pg/g	74.2	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		141	186	pg/g	75.6	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		130	186	pg/g	69.7	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		125	186	pg/g	67.1	(23%-140%)
13C-OCDD		143	373	pg/g	38.4	(17%-157%)
13C-2,3,7,8-TCDF		139	186	pg/g	74.4	(24%-169%)
13C-1,2,3,7,8-PeCDF		134	186	pg/g	72.0	(24%-185%)
13C-2,3,4,7,8-PeCDF		131	186	pg/g	70.2	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		139	186	pg/g	74.8	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		131	186	pg/g	70.3	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		138	186	pg/g	73.9	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		138	186	pg/g	74.0	(29%-147%)

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822004**	**Date Collected:**	**09/20/2016 12:02**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**31.5**
Client ID:	**C-7 (0-48)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/17/2016 21:43**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-8**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**15.66 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1,2,3,4,6,7,8-HpCDF		113	186	pg/g	60.7	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		128	186	pg/g	68.8	(26%-138%)
37Cl-2,3,7,8-TCDD		15.1	18.6	pg/g	80.9	(35%-197%)

Comments:

U Analyte was analyzed for, but not detected above the specified detection limit.

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822005**	**Date Collected:**	**09/20/2016 12:58**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**39.7**
Client ID:	**C-1**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/17/2016 22:30**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-9**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**17.05 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD	U	.972	pg/g	0.972
40321-76-4	1,2,3,7,8-PeCDD	U	4.86	pg/g	4.86
39227-28-6	1,2,3,4,7,8-HxCDD	U	4.86	pg/g	4.86
57653-85-7	1,2,3,6,7,8-HxCDD	U	4.86	pg/g	4.86
19408-74-3	1,2,3,7,8,9-HxCDD	U	4.86	pg/g	4.86
35822-46-9	1,2,3,4,6,7,8-HpCDD		7.41	pg/g	4.86
3268-87-9	1,2,3,4,6,7,8,9-OCDD		84.9	pg/g	9.72
51207-31-9	2,3,7,8-TCDF	U	.972	pg/g	0.972
57117-41-6	1,2,3,7,8-PeCDF	U	4.86	pg/g	4.86
57117-31-4	2,3,4,7,8-PeCDF	U	4.86	pg/g	4.86
70648-26-9	1,2,3,4,7,8-HxCDF	U	4.86	pg/g	4.86
57117-44-9	1,2,3,6,7,8-HxCDF	U	4.86	pg/g	4.86
60851-34-5	2,3,4,6,7,8-HxCDF	U	4.86	pg/g	4.86
72918-21-9	1,2,3,7,8,9-HxCDF	U	4.86	pg/g	4.86
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	4.86	pg/g	4.86
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	4.86	pg/g	4.86
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	9.72	pg/g	9.72
41903-57-5	Total Tetrachlorodibenzo-p-dioxin	U	.972	pg/g	0.972
36088-22-9	Total Pentachlorodibenzo-p-dioxin	U	4.86	pg/g	4.86
34465-46-8	Total Hexachlorodibenzo-p-dioxin	U	4.86	pg/g	4.86
37871-00-4	Total Heptachlorodibenzo-p-dioxin		17.7	pg/g	4.86
30402-14-3	Total Tetrachlorodibenzofuran	U	.972	pg/g	0.972
30402-15-4	Total Pentachlorodibenzofuran	U	4.86	pg/g	4.86
55684-94-1	Total Hexachlorodibenzofuran	U	4.86	pg/g	4.86
38998-75-3	Total Heptachlorodibenzofuran	U	4.86	pg/g	4.86
3333-30-0	TEQ WHO2005 ND=0		0.0995	pg/g	
3333-30-1	TEQ WHO2005 ND=0.5		5.62	pg/g	

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		110	194	pg/g	56.8	(25%-164%)
13C-1,2,3,7,8-PeCDD		109	194	pg/g	56.2	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		111	194	pg/g	57.3	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		115	194	pg/g	59.1	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		109	194	pg/g	56.1	(23%-140%)
13C-OCDD		135	389	pg/g	34.6	(17%-157%)
13C-2,3,7,8-TCDF		111	194	pg/g	57.3	(24%-169%)
13C-1,2,3,7,8-PeCDF		108	194	pg/g	55.7	(24%-185%)
13C-2,3,4,7,8-PeCDF		104	194	pg/g	53.7	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		116	194	pg/g	59.5	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		116	194	pg/g	59.5	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		118	194	pg/g	60.8	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		118	194	pg/g	60.6	(29%-147%)

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822005**	**Date Collected:**	**09/20/2016 12:58**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**39.7**
Client ID:	**C-1**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/17/2016 22:30**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-9**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**17.05 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1,2,3,4,6,7,8-HpCDF		102	194	pg/g	52.7	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		114	194	pg/g	58.6	(26%-138%)
37Cl-2,3,7,8-TCDD		13.6	19.4	pg/g	70.0	(35%-197%)

Comments:

U Analyte was analyzed for, but not detected above the specified detection limit.

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822006**	**Date Collected:**	**09/20/2016 13:05**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**38.9**
Client ID:	**C-2**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/17/2016 23:17**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-10**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**17.19 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD	U	.952	pg/g	0.952
40321-76-4	1,2,3,7,8-PeCDD	U	4.76	pg/g	4.76
39227-28-6	1,2,3,4,7,8-HxCDD	U	4.76	pg/g	4.76
57653-85-7	1,2,3,6,7,8-HxCDD	U	4.76	pg/g	4.76
19408-74-3	1,2,3,7,8,9-HxCDD	U	4.76	pg/g	4.76
35822-46-9	1,2,3,4,6,7,8-HpCDD	U	4.76	pg/g	4.76
3268-87-9	1,2,3,4,6,7,8,9-OCDD		33.7	pg/g	9.52
51207-31-9	2,3,7,8-TCDF	U	.952	pg/g	0.952
57117-41-6	1,2,3,7,8-PeCDF	U	4.76	pg/g	4.76
57117-31-4	2,3,4,7,8-PeCDF	U	4.76	pg/g	4.76
70648-26-9	1,2,3,4,7,8-HxCDF	U	4.76	pg/g	4.76
57117-44-9	1,2,3,6,7,8-HxCDF	U	4.76	pg/g	4.76
60851-34-5	2,3,4,6,7,8-HxCDF	U	4.76	pg/g	4.76
72918-21-9	1,2,3,7,8,9-HxCDF	U	4.76	pg/g	4.76
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	4.76	pg/g	4.76
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	4.76	pg/g	4.76
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	9.52	pg/g	9.52
41903-57-5	Total Tetrachlorodibenzo-p-dioxin	U	.952	pg/g	0.952
36088-22-9	Total Pentachlorodibenzo-p-dioxin	U	4.76	pg/g	4.76
34465-46-8	Total Hexachlorodibenzo-p-dioxin	U	4.76	pg/g	4.76
37871-00-4	Total Heptachlorodibenzo-p-dioxin	U	4.76	pg/g	4.76
30402-14-3	Total Tetrachlorodibenzofuran	U	.952	pg/g	0.952
30402-15-4	Total Pentachlorodibenzofuran	U	4.76	pg/g	4.76
55684-94-1	Total Hexachlorodibenzofuran	U	4.76	pg/g	4.76
38998-75-3	Total Heptachlorodibenzofuran	U	4.76	pg/g	4.76
3333-30-0	TEQ WHO2005 ND=0		0.0101	pg/g	
3333-30-1	TEQ WHO2005 ND=0.5		5.44	pg/g	

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		99.0	190	pg/g	52.0	(25%-164%)
13C-1,2,3,7,8-PeCDD		105	190	pg/g	54.9	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		116	190	pg/g	61.1	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		107	190	pg/g	56.3	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		110	190	pg/g	57.5	(23%-140%)
13C-OCDD		137	381	pg/g	35.9	(17%-157%)
13C-2,3,7,8-TCDF		98.3	190	pg/g	51.6	(24%-169%)
13C-1,2,3,7,8-PeCDF		102	190	pg/g	53.7	(24%-185%)
13C-2,3,4,7,8-PeCDF		98.8	190	pg/g	51.9	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		115	190	pg/g	60.1	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		108	190	pg/g	56.8	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		113	190	pg/g	59.3	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		113	190	pg/g	59.6	(29%-147%)

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822006**	**Date Collected:**	**09/20/2016 13:05**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**38.9**
Client ID:	**C-2**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/17/2016 23:17**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-10**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**17.19 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1,2,3,4,6,7,8-HpCDF		99.3	190	pg/g	52.2	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		114	190	pg/g	60.1	(26%-138%)
37Cl-2,3,7,8-TCDD		14.0	19.0	pg/g	73.3	(35%-197%)

Comments:

U Analyte was analyzed for, but not detected above the specified detection limit.

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822007**	**Date Collected:**	**09/20/2016 13:36**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**37.7**
Client ID:	**C-3**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 00:04**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-11**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**17.03 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD	U	.942	pg/g	0.942
40321-76-4	1,2,3,7,8-PeCDD	U	4.71	pg/g	4.71
39227-28-6	1,2,3,4,7,8-HxCDD	U	4.71	pg/g	4.71
57653-85-7	1,2,3,6,7,8-HxCDD	U	4.71	pg/g	4.71
19408-74-3	1,2,3,7,8,9-HxCDD	U	4.71	pg/g	4.71
35822-46-9	1,2,3,4,6,7,8-HpCDD	U	4.71	pg/g	4.71
3268-87-9	1,2,3,4,6,7,8,9-OCDD	U	9.42	pg/g	9.42
51207-31-9	2,3,7,8-TCDF	U	.942	pg/g	0.942
57117-41-6	1,2,3,7,8-PeCDF	U	4.71	pg/g	4.71
57117-31-4	2,3,4,7,8-PeCDF	U	4.71	pg/g	4.71
70648-26-9	1,2,3,4,7,8-HxCDF	U	4.71	pg/g	4.71
57117-44-9	1,2,3,6,7,8-HxCDF	U	4.71	pg/g	4.71
60851-34-5	2,3,4,6,7,8-HxCDF	U	4.71	pg/g	4.71
72918-21-9	1,2,3,7,8,9-HxCDF	U	4.71	pg/g	4.71
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	4.71	pg/g	4.71
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	4.71	pg/g	4.71
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	9.42	pg/g	9.42
41903-57-5	Total Tetrachlorodibenzo-p-dioxin	U	.942	pg/g	0.942
36088-22-9	Total Pentachlorodibenzo-p-dioxin	U	4.71	pg/g	4.71
34465-46-8	Total Hexachlorodibenzo-p-dioxin	U	4.71	pg/g	4.71
37871-00-4	Total Heptachlorodibenzo-p-dioxin	U	4.71	pg/g	4.71
30402-14-3	Total Tetrachlorodibenzofuran	U	.942	pg/g	0.942
30402-15-4	Total Pentachlorodibenzofuran	U	4.71	pg/g	4.71
55684-94-1	Total Hexachlorodibenzofuran	U	4.71	pg/g	4.71
38998-75-3	Total Heptachlorodibenzofuran	U	4.71	pg/g	4.71
3333-30-0	TEQ WHO2005 ND=0		0.00	pg/g	
3333-30-1	TEQ WHO2005 ND=0.5		5.37	pg/g	

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		117	188	pg/g	62.0	(25%-164%)
13C-1,2,3,7,8-PeCDD		117	188	pg/g	62.0	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		124	188	pg/g	66.0	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		117	188	pg/g	62.2	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		113	188	pg/g	60.1	(23%-140%)
13C-OCDD		139	377	pg/g	36.8	(17%-157%)
13C-2,3,7,8-TCDF		113	188	pg/g	60.2	(24%-169%)
13C-1,2,3,7,8-PeCDF		111	188	pg/g	58.9	(24%-185%)
13C-2,3,4,7,8-PeCDF		109	188	pg/g	57.6	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		122	188	pg/g	64.8	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		119	188	pg/g	63.1	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		122	188	pg/g	64.5	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		122	188	pg/g	64.5	(29%-147%)

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822007**	**Date Collected:**	**09/20/2016 13:36**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**37.7**
Client ID:	**C-3**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 00:04**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-11**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**17.03 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1,2,3,4,6,7,8-HpCDF		102	188	pg/g	54.2	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		114	188	pg/g	60.4	(26%-138%)
37Cl-2,3,7,8-TCDD		14.9	18.8	pg/g	78.9	(35%-197%)

Comments:

U Analyte was analyzed for, but not detected above the specified detection limit.

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822008**	**Date Collected:**	**09/20/2016 14:05**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**34**
Client ID:	**C-4**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 00:51**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-12**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**16.22 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD	U	.934	pg/g	0.934
40321-76-4	1,2,3,7,8-PeCDD	U	4.67	pg/g	4.67
39227-28-6	1,2,3,4,7,8-HxCDD	U	4.67	pg/g	4.67
57653-85-7	1,2,3,6,7,8-HxCDD	U	4.67	pg/g	4.67
19408-74-3	1,2,3,7,8,9-HxCDD	U	4.67	pg/g	4.67
35822-46-9	1,2,3,4,6,7,8-HpCDD	U	4.67	pg/g	4.67
3268-87-9	1,2,3,4,6,7,8,9-OCDD		30.7	pg/g	9.34
51207-31-9	2,3,7,8-TCDF	U	.934	pg/g	0.934
57117-41-6	1,2,3,7,8-PeCDF	U	4.67	pg/g	4.67
57117-31-4	2,3,4,7,8-PeCDF	U	4.67	pg/g	4.67
70648-26-9	1,2,3,4,7,8-HxCDF	U	4.67	pg/g	4.67
57117-44-9	1,2,3,6,7,8-HxCDF	U	4.67	pg/g	4.67
60851-34-5	2,3,4,6,7,8-HxCDF	U	4.67	pg/g	4.67
72918-21-9	1,2,3,7,8,9-HxCDF	U	4.67	pg/g	4.67
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	4.67	pg/g	4.67
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	4.67	pg/g	4.67
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	9.34	pg/g	9.34
41903-57-5	Total Tetrachlorodibenzo-p-dioxin	U	.934	pg/g	0.934
36088-22-9	Total Pentachlorodibenzo-p-dioxin	U	4.67	pg/g	4.67
34465-46-8	Total Hexachlorodibenzo-p-dioxin	U	4.67	pg/g	4.67
37871-00-4	Total Heptachlorodibenzo-p-dioxin	U	4.67	pg/g	4.67
30402-14-3	Total Tetrachlorodibenzofuran	U	.934	pg/g	0.934
30402-15-4	Total Pentachlorodibenzofuran	U	4.67	pg/g	4.67
55684-94-1	Total Hexachlorodibenzofuran	U	4.67	pg/g	4.67
38998-75-3	Total Heptachlorodibenzofuran	U	4.67	pg/g	4.67
3333-30-0	TEQ WHO2005 ND=0		0.00921	pg/g	
3333-30-1	TEQ WHO2005 ND=0.5		5.33	pg/g	

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		132	187	pg/g	70.5	(25%-164%)
13C-1,2,3,7,8-PeCDD		124	187	pg/g	66.2	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		129	187	pg/g	69.0	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		128	187	pg/g	68.7	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		117	187	pg/g	62.6	(23%-140%)
13C-OCDD		154	373	pg/g	41.2	(17%-157%)
13C-2,3,7,8-TCDF		128	187	pg/g	68.4	(24%-169%)
13C-1,2,3,7,8-PeCDF		116	187	pg/g	62.3	(24%-185%)
13C-2,3,4,7,8-PeCDF		115	187	pg/g	61.8	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		129	187	pg/g	69.3	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		127	187	pg/g	67.9	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		130	187	pg/g	69.8	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		129	187	pg/g	69.2	(29%-147%)

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822008**	**Date Collected:**	**09/20/2016 14:05**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**34**
Client ID:	**C-4**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 00:51**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-12**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**16.22 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1,2,3,4,6,7,8-HpCDF		105	187	pg/g	56.5	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		122	187	pg/g	65.5	(26%-138%)
37Cl-2,3,7,8-TCDD		14.3	18.7	pg/g	76.7	(35%-197%)

Comments:

U Analyte was analyzed for, but not detected above the specified detection limit.

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822009**	**Date Collected:**	**09/20/2016 10:10**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**35.4**
Client ID:	**C-6 (48-61)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 01:38**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-13**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**16.52 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD	U	.937	pg/g	0.937
40321-76-4	1,2,3,7,8-PeCDD	U	4.68	pg/g	4.68
39227-28-6	1,2,3,4,7,8-HxCDD	U	4.68	pg/g	4.68
57653-85-7	1,2,3,6,7,8-HxCDD	U	4.68	pg/g	4.68
19408-74-3	1,2,3,7,8,9-HxCDD	U	4.68	pg/g	4.68
35822-46-9	1,2,3,4,6,7,8-HpCDD	U	4.68	pg/g	4.68
3268-87-9	1,2,3,4,6,7,8,9-OCDD	U	9.37	pg/g	9.37
51207-31-9	2,3,7,8-TCDF	U	.937	pg/g	0.937
57117-41-6	1,2,3,7,8-PeCDF	U	4.68	pg/g	4.68
57117-31-4	2,3,4,7,8-PeCDF	U	4.68	pg/g	4.68
70648-26-9	1,2,3,4,7,8-HxCDF	U	4.68	pg/g	4.68
57117-44-9	1,2,3,6,7,8-HxCDF	U	4.68	pg/g	4.68
60851-34-5	2,3,4,6,7,8-HxCDF	U	4.68	pg/g	4.68
72918-21-9	1,2,3,7,8,9-HxCDF	U	4.68	pg/g	4.68
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	4.68	pg/g	4.68
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	4.68	pg/g	4.68
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	9.37	pg/g	9.37
41903-57-5	Total Tetrachlorodibenzo-p-dioxin	U	.937	pg/g	0.937
36088-22-9	Total Pentachlorodibenzo-p-dioxin	U	4.68	pg/g	4.68
34465-46-8	Total Hexachlorodibenzo-p-dioxin	U	4.68	pg/g	4.68
37871-00-4	Total Heptachlorodibenzo-p-dioxin	U	4.68	pg/g	4.68
30402-14-3	Total Tetrachlorodibenzofuran	U	.937	pg/g	0.937
30402-15-4	Total Pentachlorodibenzofuran	U	4.68	pg/g	4.68
55684-94-1	Total Hexachlorodibenzofuran	U	4.68	pg/g	4.68
38998-75-3	Total Heptachlorodibenzofuran	U	4.68	pg/g	4.68
3333-30-0	TEQ WHO2005 ND=0		0.00	pg/g	
3333-30-1	TEQ WHO2005 ND=0.5		5.34	pg/g	

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		135	187	pg/g	71.9	(25%-164%)
13C-1,2,3,7,8-PeCDD		129	187	pg/g	68.9	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		131	187	pg/g	69.9	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		133	187	pg/g	71.0	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		119	187	pg/g	63.6	(23%-140%)
13C-OCDD		143	375	pg/g	38.2	(17%-157%)
13C-2,3,7,8-TCDF		131	187	pg/g	69.8	(24%-169%)
13C-1,2,3,7,8-PeCDF		122	187	pg/g	65.4	(24%-185%)
13C-2,3,4,7,8-PeCDF		121	187	pg/g	64.5	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		133	187	pg/g	71.0	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		131	187	pg/g	69.7	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		134	187	pg/g	71.6	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		133	187	pg/g	70.8	(29%-147%)

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822009**	**Date Collected:**	**09/20/2016 10:10**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**35.4**
Client ID:	**C-6 (48-61)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 01:38**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-13**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**16.52 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1,2,3,4,6,7,8-HpCDF		111	187	pg/g	59.2	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		123	187	pg/g	65.6	(26%-138%)
37Cl-2,3,7,8-TCDD		14.5	18.7	pg/g	77.4	(35%-197%)

Comments:

U Analyte was analyzed for, but not detected above the specified detection limit.

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822010**	**Date Collected:**	**09/20/2016 12:02**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**26.4**
Client ID:	**C-7 (48-54)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 02:25**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-14**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**14.89 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD	U	.912	pg/g	0.912
40321-76-4	1,2,3,7,8-PeCDD	U	4.56	pg/g	4.56
39227-28-6	1,2,3,4,7,8-HxCDD	U	4.56	pg/g	4.56
57653-85-7	1,2,3,6,7,8-HxCDD	U	4.56	pg/g	4.56
19408-74-3	1,2,3,7,8,9-HxCDD	U	4.56	pg/g	4.56
35822-46-9	1,2,3,4,6,7,8-HpCDD	U	4.56	pg/g	4.56
3268-87-9	1,2,3,4,6,7,8,9-OCDD		60.6	pg/g	9.12
51207-31-9	2,3,7,8-TCDF	U	.912	pg/g	0.912
57117-41-6	1,2,3,7,8-PeCDF	U	4.56	pg/g	4.56
57117-31-4	2,3,4,7,8-PeCDF	U	4.56	pg/g	4.56
70648-26-9	1,2,3,4,7,8-HxCDF	U	4.56	pg/g	4.56
57117-44-9	1,2,3,6,7,8-HxCDF	U	4.56	pg/g	4.56
60851-34-5	2,3,4,6,7,8-HxCDF	U	4.56	pg/g	4.56
72918-21-9	1,2,3,7,8,9-HxCDF	U	4.56	pg/g	4.56
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	4.56	pg/g	4.56
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	4.56	pg/g	4.56
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	9.12	pg/g	9.12
41903-57-5	Total Tetrachlorodibenzo-p-dioxin	U	.912	pg/g	0.912
36088-22-9	Total Pentachlorodibenzo-p-dioxin	U	4.56	pg/g	4.56
34465-46-8	Total Hexachlorodibenzo-p-dioxin	U	4.56	pg/g	4.56
37871-00-4	Total Heptachlorodibenzo-p-dioxin	U	4.56	pg/g	4.56
30402-14-3	Total Tetrachlorodibenzofuran	U	.912	pg/g	0.912
30402-15-4	Total Pentachlorodibenzofuran	U	4.56	pg/g	4.56
55684-94-1	Total Hexachlorodibenzofuran	U	4.56	pg/g	4.56
38998-75-3	Total Heptachlorodibenzofuran	U	4.56	pg/g	4.56
3333-30-0	TEQ WHO2005 ND=0		0.0182	pg/g	
3333-30-1	TEQ WHO2005 ND=0.5		5.22	pg/g	

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		133	182	pg/g	73.2	(25%-164%)
13C-1,2,3,7,8-PeCDD		128	182	pg/g	70.1	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		134	182	pg/g	73.4	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		127	182	pg/g	69.9	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		116	182	pg/g	63.7	(23%-140%)
13C-OCDD		139	365	pg/g	38.0	(17%-157%)
13C-2,3,7,8-TCDF		131	182	pg/g	71.8	(24%-169%)
13C-1,2,3,7,8-PeCDF		122	182	pg/g	66.7	(24%-185%)
13C-2,3,4,7,8-PeCDF		119	182	pg/g	65.4	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		134	182	pg/g	73.4	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		130	182	pg/g	71.4	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		133	182	pg/g	72.7	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		133	182	pg/g	73.0	(29%-147%)

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822010**	**Date Collected:**	**09/20/2016 12:02**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**26.4**
Client ID:	**C-7 (48-54)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 02:25**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-14**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**14.89 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1,2,3,4,6,7,8-HpCDF		109	182	pg/g	60.0	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		123	182	pg/g	67.4	(26%-138%)
37Cl-2,3,7,8-TCDD		12.6	18.2	pg/g	68.9	(35%-197%)

Comments:

U Analyte was analyzed for, but not detected above the specified detection limit.

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822011**	**Date Collected:**	**09/21/2016 08:35**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**31.2**
Client ID:	**C-5**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 04:54**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a_2-2**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**15.43 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD	U	.942	pg/g	0.942
40321-76-4	1,2,3,7,8-PeCDD	U	4.71	pg/g	4.71
39227-28-6	1,2,3,4,7,8-HxCDD	U	4.71	pg/g	4.71
57653-85-7	1,2,3,6,7,8-HxCDD	U	4.71	pg/g	4.71
19408-74-3	1,2,3,7,8,9-HxCDD	U	4.71	pg/g	4.71
35822-46-9	1,2,3,4,6,7,8-HpCDD		5.54	pg/g	4.71
3268-87-9	1,2,3,4,6,7,8,9-OCDD		62.7	pg/g	9.42
51207-31-9	2,3,7,8-TCDF	U	.942	pg/g	0.942
57117-41-6	1,2,3,7,8-PeCDF	U	4.71	pg/g	4.71
57117-31-4	2,3,4,7,8-PeCDF	U	4.71	pg/g	4.71
70648-26-9	1,2,3,4,7,8-HxCDF	U	4.71	pg/g	4.71
57117-44-9	1,2,3,6,7,8-HxCDF	U	4.71	pg/g	4.71
60851-34-5	2,3,4,6,7,8-HxCDF	U	4.71	pg/g	4.71
72918-21-9	1,2,3,7,8,9-HxCDF	U	4.71	pg/g	4.71
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	4.71	pg/g	4.71
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	4.71	pg/g	4.71
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	9.42	pg/g	9.42
41903-57-5	Total Tetrachlorodibenzo-p-dioxin	U	.942	pg/g	0.942
36088-22-9	Total Pentachlorodibenzo-p-dioxin	U	4.71	pg/g	4.71
34465-46-8	Total Hexachlorodibenzo-p-dioxin	U	4.71	pg/g	4.71
37871-00-4	Total Heptachlorodibenzo-p-dioxin		13.2	pg/g	4.71
30402-14-3	Total Tetrachlorodibenzofuran	U	.942	pg/g	0.942
30402-15-4	Total Pentachlorodibenzofuran	U	4.71	pg/g	4.71
55684-94-1	Total Hexachlorodibenzofuran	U	4.71	pg/g	4.71
38998-75-3	Total Heptachlorodibenzofuran	U	4.71	pg/g	4.71
3333-30-0	TEQ WHO2005 ND=0		0.0743	pg/g	
3333-30-1	TEQ WHO2005 ND=0.5		5.42	pg/g	

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		126	188	pg/g	66.9	(25%-164%)
13C-1,2,3,7,8-PeCDD		117	188	pg/g	62.2	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		118	188	pg/g	62.7	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		119	188	pg/g	63.1	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		108	188	pg/g	57.2	(23%-140%)
13C-OCDD		124	377	pg/g	32.9	(17%-157%)
13C-2,3,7,8-TCDF		123	188	pg/g	65.4	(24%-169%)
13C-1,2,3,7,8-PeCDF		117	188	pg/g	62.1	(24%-185%)
13C-2,3,4,7,8-PeCDF		112	188	pg/g	59.2	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		120	188	pg/g	63.9	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		121	188	pg/g	64.4	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		119	188	pg/g	63.3	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		121	188	pg/g	64.0	(29%-147%)

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822011**	**Date Collected:**	**09/21/2016 08:35**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**31.2**
Client ID:	**C-5**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 04:54**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a_2-2**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**15.43 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1,2,3,4,6,7,8-HpCDF		100	188	pg/g	53.3	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		112	188	pg/g	59.2	(26%-138%)
37Cl-2,3,7,8-TCDD		13.6	18.8	pg/g	72.2	(35%-197%)

Comments:

U Analyte was analyzed for, but not detected above the specified detection limit.

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822012**	**Date Collected:**	**09/21/2016 13:00**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**29.3**
Client ID:	**C-8**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 05:40**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a_2-3**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**15.79 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD	U	.896	pg/g	0.896
40321-76-4	1,2,3,7,8-PeCDD	U	4.48	pg/g	4.48
39227-28-6	1,2,3,4,7,8-HxCDD	U	4.48	pg/g	4.48
57653-85-7	1,2,3,6,7,8-HxCDD	U	4.48	pg/g	4.48
19408-74-3	1,2,3,7,8,9-HxCDD	U	4.48	pg/g	4.48
35822-46-9	1,2,3,4,6,7,8-HpCDD	U	4.48	pg/g	4.48
3268-87-9	1,2,3,4,6,7,8,9-OCDD		23.0	pg/g	8.96
51207-31-9	2,3,7,8-TCDF	U	.896	pg/g	0.896
57117-41-6	1,2,3,7,8-PeCDF	U	4.48	pg/g	4.48
57117-31-4	2,3,4,7,8-PeCDF	U	4.48	pg/g	4.48
70648-26-9	1,2,3,4,7,8-HxCDF	U	4.48	pg/g	4.48
57117-44-9	1,2,3,6,7,8-HxCDF	U	4.48	pg/g	4.48
60851-34-5	2,3,4,6,7,8-HxCDF	U	4.48	pg/g	4.48
72918-21-9	1,2,3,7,8,9-HxCDF	U	4.48	pg/g	4.48
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	4.48	pg/g	4.48
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	4.48	pg/g	4.48
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	8.96	pg/g	8.96
41903-57-5	Total Tetrachlorodibenzo-p-dioxin	U	.896	pg/g	0.896
36088-22-9	Total Pentachlorodibenzo-p-dioxin	U	4.48	pg/g	4.48
34465-46-8	Total Hexachlorodibenzo-p-dioxin	U	4.48	pg/g	4.48
37871-00-4	Total Heptachlorodibenzo-p-dioxin	U	4.48	pg/g	4.48
30402-14-3	Total Tetrachlorodibenzofuran	U	.896	pg/g	0.896
30402-15-4	Total Pentachlorodibenzofuran	U	4.48	pg/g	4.48
55684-94-1	Total Hexachlorodibenzofuran	U	4.48	pg/g	4.48
38998-75-3	Total Heptachlorodibenzofuran	U	4.48	pg/g	4.48
3333-30-0	TEQ WHO2005 ND=0		0.00689	pg/g	
3333-30-1	TEQ WHO2005 ND=0.5		5.12	pg/g	

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		127	179	pg/g	70.7	(25%-164%)
13C-1,2,3,7,8-PeCDD		120	179	pg/g	66.8	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		122	179	pg/g	67.9	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		118	179	pg/g	66.0	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		110	179	pg/g	61.5	(23%-140%)
13C-OCDD		139	358	pg/g	38.9	(17%-157%)
13C-2,3,7,8-TCDF		124	179	pg/g	69.0	(24%-169%)
13C-1,2,3,7,8-PeCDF		118	179	pg/g	66.0	(24%-185%)
13C-2,3,4,7,8-PeCDF		113	179	pg/g	62.9	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		126	179	pg/g	70.4	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		125	179	pg/g	70.0	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		126	179	pg/g	70.4	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		128	179	pg/g	71.4	(29%-147%)

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822012**	**Date Collected:**	**09/21/2016 13:00**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**29.3**
Client ID:	**C-8**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 05:40**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a_2-3**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**15.79 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1,2,3,4,6,7,8-HpCDF		109	179	pg/g	60.7	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		118	179	pg/g	66.1	(26%-138%)
37Cl-2,3,7,8-TCDD		13.4	17.9	pg/g	74.9	(35%-197%)

Comments:

U Analyte was analyzed for, but not detected above the specified detection limit.

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822013**	**Date Collected:**	**09/21/2016 11:45**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**17.9**
Client ID:	**C-9**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 06:27**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a_2-4**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**13.34 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD	U	.913	pg/g	0.913
40321-76-4	1,2,3,7,8-PeCDD	U	4.57	pg/g	4.57
39227-28-6	1,2,3,4,7,8-HxCDD	U	4.57	pg/g	4.57
57653-85-7	1,2,3,6,7,8-HxCDD	U	4.57	pg/g	4.57
19408-74-3	1,2,3,7,8,9-HxCDD	U	4.57	pg/g	4.57
35822-46-9	1,2,3,4,6,7,8-HpCDD	U	4.57	pg/g	4.57
3268-87-9	1,2,3,4,6,7,8,9-OCDD		14.8	pg/g	9.13
51207-31-9	2,3,7,8-TCDF	U	.913	pg/g	0.913
57117-41-6	1,2,3,7,8-PeCDF	U	4.57	pg/g	4.57
57117-31-4	2,3,4,7,8-PeCDF	U	4.57	pg/g	4.57
70648-26-9	1,2,3,4,7,8-HxCDF	U	4.57	pg/g	4.57
57117-44-9	1,2,3,6,7,8-HxCDF	U	4.57	pg/g	4.57
60851-34-5	2,3,4,6,7,8-HxCDF	U	4.57	pg/g	4.57
72918-21-9	1,2,3,7,8,9-HxCDF	U	4.57	pg/g	4.57
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	4.57	pg/g	4.57
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	4.57	pg/g	4.57
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	9.13	pg/g	9.13
41903-57-5	Total Tetrachlorodibenzo-p-dioxin	U	.913	pg/g	0.913
36088-22-9	Total Pentachlorodibenzo-p-dioxin	U	4.57	pg/g	4.57
34465-46-8	Total Hexachlorodibenzo-p-dioxin	U	4.57	pg/g	4.57
37871-00-4	Total Heptachlorodibenzo-p-dioxin	U	4.57	pg/g	4.57
30402-14-3	Total Tetrachlorodibenzofuran	U	.913	pg/g	0.913
30402-15-4	Total Pentachlorodibenzofuran	U	4.57	pg/g	4.57
55684-94-1	Total Hexachlorodibenzofuran	U	4.57	pg/g	4.57
38998-75-3	Total Heptachlorodibenzofuran	U	4.57	pg/g	4.57
3333-30-0	TEQ WHO2005 ND=0		0.00445	pg/g	
3333-30-1	TEQ WHO2005 ND=0.5		5.21	pg/g	

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		131	183	pg/g	71.5	(25%-164%)
13C-1,2,3,7,8-PeCDD		125	183	pg/g	68.2	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		132	183	pg/g	72.2	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		123	183	pg/g	67.3	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		114	183	pg/g	62.3	(23%-140%)
13C-OCDD		134	365	pg/g	36.7	(17%-157%)
13C-2,3,7,8-TCDF		130	183	pg/g	71.0	(24%-169%)
13C-1,2,3,7,8-PeCDF		119	183	pg/g	65.2	(24%-185%)
13C-2,3,4,7,8-PeCDF		118	183	pg/g	64.8	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		130	183	pg/g	71.4	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		126	183	pg/g	68.9	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		127	183	pg/g	69.6	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		129	183	pg/g	70.7	(29%-147%)

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822013**	**Date Collected:**	**09/21/2016 11:45**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**17.9**
Client ID:	**C-9**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 06:27**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a_2-4**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**13.34 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1,2,3,4,6,7,8-HpCDF		104	183	pg/g	57.1	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		121	183	pg/g	66.2	(26%-138%)
37Cl-2,3,7,8-TCDD		13.2	18.3	pg/g	72.4	(35%-197%)

Comments:

U Analyte was analyzed for, but not detected above the specified detection limit.

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822014**	**Date Collected:**	**09/21/2016 12:20**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**20.8**
Client ID:	**C-10**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 07:15**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a_2-5**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**13.07 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD	U	.966	pg/g	0.966
40321-76-4	1,2,3,7,8-PeCDD	U	4.83	pg/g	4.83
39227-28-6	1,2,3,4,7,8-HxCDD	U	4.83	pg/g	4.83
57653-85-7	1,2,3,6,7,8-HxCDD	U	4.83	pg/g	4.83
19408-74-3	1,2,3,7,8,9-HxCDD	U	4.83	pg/g	4.83
35822-46-9	1,2,3,4,6,7,8-HpCDD		8.87	pg/g	4.83
3268-87-9	1,2,3,4,6,7,8,9-OCDD		135	pg/g	9.66
51207-31-9	2,3,7,8-TCDF	U	.966	pg/g	0.966
57117-41-6	1,2,3,7,8-PeCDF	U	4.83	pg/g	4.83
57117-31-4	2,3,4,7,8-PeCDF	U	4.83	pg/g	4.83
70648-26-9	1,2,3,4,7,8-HxCDF	U	4.83	pg/g	4.83
57117-44-9	1,2,3,6,7,8-HxCDF	U	4.83	pg/g	4.83
60851-34-5	2,3,4,6,7,8-HxCDF	U	4.83	pg/g	4.83
72918-21-9	1,2,3,7,8,9-HxCDF	U	4.83	pg/g	4.83
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	4.83	pg/g	4.83
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	4.83	pg/g	4.83
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	9.66	pg/g	9.66
41903-57-5	Total Tetrachlorodibenzo-p-dioxin		0.970	pg/g	0.966
36088-22-9	Total Pentachlorodibenzo-p-dioxin	U	4.83	pg/g	4.83
34465-46-8	Total Hexachlorodibenzo-p-dioxin	U	4.83	pg/g	4.83
37871-00-4	Total Heptachlorodibenzo-p-dioxin		26.9	pg/g	4.83
30402-14-3	Total Tetrachlorodibenzofuran	U	.966	pg/g	0.966
30402-15-4	Total Pentachlorodibenzofuran	U	4.83	pg/g	4.83
55684-94-1	Total Hexachlorodibenzofuran	U	4.83	pg/g	4.83
38998-75-3	Total Heptachlorodibenzofuran	U	4.83	pg/g	4.83
3333-30-0	TEQ WHO2005 ND=0		0.129	pg/g	
3333-30-1	TEQ WHO2005 ND=0.5		5.61	pg/g	

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		143	193	pg/g	74.2	(25%-164%)
13C-1,2,3,7,8-PeCDD		140	193	pg/g	72.3	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		147	193	pg/g	76.2	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		135	193	pg/g	70.0	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		126	193	pg/g	65.4	(23%-140%)
13C-OCDD		147	386	pg/g	38.1	(17%-157%)
13C-2,3,7,8-TCDF		143	193	pg/g	74.2	(24%-169%)
13C-1,2,3,7,8-PeCDF		132	193	pg/g	68.2	(24%-185%)
13C-2,3,4,7,8-PeCDF		132	193	pg/g	68.2	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		146	193	pg/g	75.5	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		137	193	pg/g	70.7	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		142	193	pg/g	73.7	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		142	193	pg/g	73.6	(29%-147%)

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822014**	**Date Collected:**	**09/21/2016 12:20**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**20.8**
Client ID:	**C-10**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 07:15**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a_2-5**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**13.07 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1,2,3,4,6,7,8-HpCDF		118	193	pg/g	60.9	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		131	193	pg/g	67.7	(26%-138%)
37Cl-2,3,7,8-TCDD		14.2	19.3	pg/g	73.2	(35%-197%)

Comments:

U Analyte was analyzed for, but not detected above the specified detection limit.

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822015**	**Date Collected:**	**09/21/2016 09:03**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**31.4**
Client ID:	**C-11(0-48)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 08:02**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a_2-6**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**15.68 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD	U	.93	pg/g	0.930
40321-76-4	1,2,3,7,8-PeCDD	U	4.65	pg/g	4.65
39227-28-6	1,2,3,4,7,8-HxCDD	U	4.65	pg/g	4.65
57653-85-7	1,2,3,6,7,8-HxCDD	U	4.65	pg/g	4.65
19408-74-3	1,2,3,7,8,9-HxCDD	U	4.65	pg/g	4.65
35822-46-9	1,2,3,4,6,7,8-HpCDD		11.6	pg/g	4.65
3268-87-9	1,2,3,4,6,7,8,9-OCDD		334	pg/g	9.30
51207-31-9	2,3,7,8-TCDF	U	.93	pg/g	0.930
57117-41-6	1,2,3,7,8-PeCDF	U	4.65	pg/g	4.65
57117-31-4	2,3,4,7,8-PeCDF	U	4.65	pg/g	4.65
70648-26-9	1,2,3,4,7,8-HxCDF	U	4.65	pg/g	4.65
57117-44-9	1,2,3,6,7,8-HxCDF	U	4.65	pg/g	4.65
60851-34-5	2,3,4,6,7,8-HxCDF	U	4.65	pg/g	4.65
72918-21-9	1,2,3,7,8,9-HxCDF	U	4.65	pg/g	4.65
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	4.65	pg/g	4.65
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	4.65	pg/g	4.65
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	9.3	pg/g	9.30
41903-57-5	Total Tetrachlorodibenzo-p-dioxin	U	.93	pg/g	0.930
36088-22-9	Total Pentachlorodibenzo-p-dioxin	U	4.65	pg/g	4.65
34465-46-8	Total Hexachlorodibenzo-p-dioxin		5.77	pg/g	4.65
37871-00-4	Total Heptachlorodibenzo-p-dioxin		41.4	pg/g	4.65
30402-14-3	Total Tetrachlorodibenzofuran	U	.93	pg/g	0.930
30402-15-4	Total Pentachlorodibenzofuran	U	4.65	pg/g	4.65
55684-94-1	Total Hexachlorodibenzofuran	U	4.65	pg/g	4.65
38998-75-3	Total Heptachlorodibenzofuran	U	4.65	pg/g	4.65
3333-30-0	TEQ WHO2005 ND=0		0.217	pg/g	
3333-30-1	TEQ WHO2005 ND=0.5		5.50	pg/g	

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		137	186	pg/g	73.6	(25%-164%)
13C-1,2,3,7,8-PeCDD		131	186	pg/g	70.6	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		140	186	pg/g	75.3	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		133	186	pg/g	71.5	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		122	186	pg/g	65.4	(23%-140%)
13C-OCDD		140	372	pg/g	37.7	(17%-157%)
13C-2,3,7,8-TCDF		135	186	pg/g	72.7	(24%-169%)
13C-1,2,3,7,8-PeCDF		129	186	pg/g	69.2	(24%-185%)
13C-2,3,4,7,8-PeCDF		125	186	pg/g	67.0	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		139	186	pg/g	74.7	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		134	186	pg/g	71.9	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		138	186	pg/g	74.0	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		138	186	pg/g	74.1	(29%-147%)

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822015**	**Date Collected:**	**09/21/2016 09:03**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**31.4**
Client ID:	**C-11(0-48)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 08:02**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a_2-6**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**15.68 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1,2,3,4,6,7,8-HpCDF		109	186	pg/g	58.8	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		126	186	pg/g	67.5	(26%-138%)
37Cl-2,3,7,8-TCDD		11.7	18.6	pg/g	62.6	(35%-197%)

Comments:

U Analyte was analyzed for, but not detected above the specified detection limit.

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822016**	**Date Collected:**	**09/21/2016 08:44**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**22.7**
Client ID:	**C-12**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 08:49**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a_2-7**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**13.18 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD	U	.981	pg/g	0.981
40321-76-4	1,2,3,7,8-PeCDD	U	4.91	pg/g	4.91
39227-28-6	1,2,3,4,7,8-HxCDD	U	4.91	pg/g	4.91
57653-85-7	1,2,3,6,7,8-HxCDD	U	4.91	pg/g	4.91
19408-74-3	1,2,3,7,8,9-HxCDD	U	4.91	pg/g	4.91
35822-46-9	1,2,3,4,6,7,8-HpCDD		30.5	pg/g	4.91
3268-87-9	1,2,3,4,6,7,8,9-OCDD		410	pg/g	9.81
51207-31-9	2,3,7,8-TCDF	U	.981	pg/g	0.981
57117-41-6	1,2,3,7,8-PeCDF	U	4.91	pg/g	4.91
57117-31-4	2,3,4,7,8-PeCDF	U	4.91	pg/g	4.91
70648-26-9	1,2,3,4,7,8-HxCDF	U	4.91	pg/g	4.91
57117-44-9	1,2,3,6,7,8-HxCDF	U	4.91	pg/g	4.91
60851-34-5	2,3,4,6,7,8-HxCDF	U	4.91	pg/g	4.91
72918-21-9	1,2,3,7,8,9-HxCDF	U	4.91	pg/g	4.91
67562-39-4	1,2,3,4,6,7,8-HpCDF		7.19	pg/g	4.91
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	4.91	pg/g	4.91
39001-02-0	1,2,3,4,6,7,8,9-OCDF		15.7	pg/g	9.81
41903-57-5	Total Tetrachlorodibenzo-p-dioxin	U	.981	pg/g	0.981
36088-22-9	Total Pentachlorodibenzo-p-dioxin	U	4.91	pg/g	4.91
34465-46-8	Total Hexachlorodibenzo-p-dioxin		16.4	pg/g	4.91
37871-00-4	Total Heptachlorodibenzo-p-dioxin		81.6	pg/g	4.91
30402-14-3	Total Tetrachlorodibenzofuran	U	.981	pg/g	0.981
30402-15-4	Total Pentachlorodibenzofuran	U	4.91	pg/g	4.91
55684-94-1	Total Hexachlorodibenzofuran	U	4.91	pg/g	4.91
38998-75-3	Total Heptachlorodibenzofuran		17.3	pg/g	4.91
3333-30-0	TEQ WHO2005 ND=0		0.504	pg/g	
3333-30-1	TEQ WHO2005 ND=0.5		6.05	pg/g	

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		133	196	pg/g	67.8	(25%-164%)
13C-1,2,3,7,8-PeCDD		128	196	pg/g	65.0	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		133	196	pg/g	68.0	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		123	196	pg/g	62.4	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		118	196	pg/g	59.9	(23%-140%)
13C-OCDD		144	392	pg/g	36.7	(17%-157%)
13C-2,3,7,8-TCDF		129	196	pg/g	65.8	(24%-169%)
13C-1,2,3,7,8-PeCDF		122	196	pg/g	62.2	(24%-185%)
13C-2,3,4,7,8-PeCDF		121	196	pg/g	61.7	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		131	196	pg/g	66.8	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		126	196	pg/g	64.3	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		129	196	pg/g	65.8	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		131	196	pg/g	66.7	(29%-147%)

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822016**	**Date Collected:**	**09/21/2016 08:44**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**22.7**
Client ID:	**C-12**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 08:49**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a_2-7**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**13.18 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1,2,3,4,6,7,8-HpCDF		110	196	pg/g	56.1	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		122	196	pg/g	62.0	(26%-138%)
37Cl-2,3,7,8-TCDD		15.4	19.6	pg/g	78.3	(35%-197%)

Comments:

U Analyte was analyzed for, but not detected above the specified detection limit.

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822017**	**Date Collected:**	**09/21/2016 09:03**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**33.1**
Client ID:	**C-11(48-89)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 09:36**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a_2-8**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**15.85 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD	U	.943	pg/g	0.943
40321-76-4	1,2,3,7,8-PeCDD	U	4.72	pg/g	4.72
39227-28-6	1,2,3,4,7,8-HxCDD	U	4.72	pg/g	4.72
57653-85-7	1,2,3,6,7,8-HxCDD	U	4.72	pg/g	4.72
19408-74-3	1,2,3,7,8,9-HxCDD	U	4.72	pg/g	4.72
35822-46-9	1,2,3,4,6,7,8-HpCDD	U	4.72	pg/g	4.72
3268-87-9	1,2,3,4,6,7,8,9-OCDD		35.0	pg/g	9.43
51207-31-9	2,3,7,8-TCDF	U	.943	pg/g	0.943
57117-41-6	1,2,3,7,8-PeCDF	U	4.72	pg/g	4.72
57117-31-4	2,3,4,7,8-PeCDF	U	4.72	pg/g	4.72
70648-26-9	1,2,3,4,7,8-HxCDF	U	4.72	pg/g	4.72
57117-44-9	1,2,3,6,7,8-HxCDF	U	4.72	pg/g	4.72
60851-34-5	2,3,4,6,7,8-HxCDF	U	4.72	pg/g	4.72
72918-21-9	1,2,3,7,8,9-HxCDF	U	4.72	pg/g	4.72
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	4.72	pg/g	4.72
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	4.72	pg/g	4.72
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	9.43	pg/g	9.43
41903-57-5	Total Tetrachlorodibenzo-p-dioxin	U	.943	pg/g	0.943
36088-22-9	Total Pentachlorodibenzo-p-dioxin	U	4.72	pg/g	4.72
34465-46-8	Total Hexachlorodibenzo-p-dioxin	U	4.72	pg/g	4.72
37871-00-4	Total Heptachlorodibenzo-p-dioxin	U	4.72	pg/g	4.72
30402-14-3	Total Tetrachlorodibenzofuran	U	.943	pg/g	0.943
30402-15-4	Total Pentachlorodibenzofuran	U	4.72	pg/g	4.72
55684-94-1	Total Hexachlorodibenzofuran	U	4.72	pg/g	4.72
38998-75-3	Total Heptachlorodibenzofuran	U	4.72	pg/g	4.72
3333-30-0	TEQ WHO2005 ND=0		0.0105	pg/g	
3333-30-1	TEQ WHO2005 ND=0.5		5.39	pg/g	

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		125	189	pg/g	66.3	(25%-164%)
13C-1,2,3,7,8-PeCDD		124	189	pg/g	65.7	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		134	189	pg/g	70.9	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		128	189	pg/g	68.0	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		119	189	pg/g	62.8	(23%-140%)
13C-OCDD		140	377	pg/g	37.0	(17%-157%)
13C-2,3,7,8-TCDF		123	189	pg/g	65.2	(24%-169%)
13C-1,2,3,7,8-PeCDF		119	189	pg/g	63.3	(24%-185%)
13C-2,3,4,7,8-PeCDF		119	189	pg/g	63.1	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		132	189	pg/g	70.1	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		135	189	pg/g	71.5	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		136	189	pg/g	72.1	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		129	189	pg/g	68.2	(29%-147%)

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822017**	**Date Collected:**	**09/21/2016 09:03**	**Matrix:**	**SOIL**
Client Sample:	**1613B Soil**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**33.1**
Client ID:	**C-11(48-89)**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/18/2016 09:36**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a_2-8**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**15.85 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1,2,3,4,6,7,8-HpCDF		111	189	pg/g	59.0	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		124	189	pg/g	65.5	(26%-138%)
37Cl-2,3,7,8-TCDD		12.9	18.9	pg/g	68.6	(35%-197%)

Comments:

U Analyte was analyzed for, but not detected above the specified detection limit.

Quality Control Summary

Hi-Res Dioxins/Furans

Surrogate Recovery Report

SDG Number: L1629727

Matrix Type: SOLID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
12017086	LCS for batch 33021	13C-2,3,7,8-TCDD		78.0	(20%-175%)
		13C-1,2,3,7,8-PeCDD		72.5	(21%-227%)
		13C-1,2,3,4,7,8-HxCDD		77.5	(21%-193%)
		13C-1,2,3,6,7,8-HxCDD		71.7	(25%-163%)
		13C-1,2,3,4,6,7,8-HpCDD		67.3	(22%-166%)
		13C-OCDD		41.1	(13%-199%)
		13C-2,3,7,8-TCDF		74.2	(22%-152%)
		13C-1,2,3,7,8-PeCDF		69.1	(21%-192%)
		13C-2,3,4,7,8-PeCDF		66.8	(13%-328%)
		13C-1,2,3,4,7,8-HxCDF		75.2	(19%-202%)
		13C-1,2,3,6,7,8-HxCDF		74.8	(21%-159%)
		13C-2,3,4,6,7,8-HxCDF		75.5	(22%-176%)
		13C-1,2,3,7,8,9-HxCDF		75.2	(17%-205%)
		13C-1,2,3,4,6,7,8-HpCDF		63.3	(21%-158%)
		13C-1,2,3,4,7,8,9-HpCDF		68.4	(20%-186%)
		37Cl-2,3,7,8-TCDD		80.1	(31%-191%)
12017087	LCSD for batch 33021	13C-2,3,7,8-TCDD		70.5	(20%-175%)
		13C-1,2,3,7,8-PeCDD		67.1	(21%-227%)
		13C-1,2,3,4,7,8-HxCDD		70.6	(21%-193%)
		13C-1,2,3,6,7,8-HxCDD		63.8	(25%-163%)
		13C-1,2,3,4,6,7,8-HpCDD		60.3	(22%-166%)
		13C-OCDD		35.9	(13%-199%)
		13C-2,3,7,8-TCDF		68.2	(22%-152%)
		13C-1,2,3,7,8-PeCDF		63.3	(21%-192%)
		13C-2,3,4,7,8-PeCDF		63.1	(13%-328%)
		13C-1,2,3,4,7,8-HxCDF		67.4	(19%-202%)
		13C-1,2,3,6,7,8-HxCDF		67.4	(21%-159%)
		13C-2,3,4,6,7,8-HxCDF		68.2	(22%-176%)
		13C-1,2,3,7,8,9-HxCDF		68.5	(17%-205%)
		13C-1,2,3,4,6,7,8-HpCDF		56.0	(21%-158%)
		13C-1,2,3,4,7,8,9-HpCDF		61.2	(20%-186%)
		37Cl-2,3,7,8-TCDD		74.3	(31%-191%)
12017085	MB for batch 33021	13C-2,3,7,8-TCDD		78.1	(25%-164%)
		13C-1,2,3,7,8-PeCDD		73.7	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		73.7	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		71.7	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		68.4	(23%-140%)
		13C-OCDD		41.1	(17%-157%)
		13C-2,3,7,8-TCDF		75.9	(24%-169%)
		13C-1,2,3,7,8-PeCDF		69.8	(24%-185%)
		13C-2,3,4,7,8-PeCDF		69.1	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		74.9	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		72.9	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		75.2	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		76.7	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		62.8	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		69.2	(26%-138%)
		37Cl-2,3,7,8-TCDD		82.5	(35%-197%)
9822001	C-6 (0-48)	13C-2,3,7,8-TCDD		69.2	(25%-164%)

Surrogate Recovery Report

SDG Number: L1629727

Matrix Type: SOLID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
9822001	C-6 (0-48)	13C-1,2,3,7,8-PeCDD		65.9	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		66.5	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		67.4	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		61.5	(23%-140%)
		13C-OCDD		35.7	(17%-157%)
		13C-2,3,7,8-TCDF		68.1	(24%-169%)
		13C-1,2,3,7,8-PeCDF		62.9	(24%-185%)
		13C-2,3,4,7,8-PeCDF		61.1	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		67.3	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		67.8	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		69.2	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		68.2	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		56.1	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		62.8	(26%-138%)
		37Cl-2,3,7,8-TCDD		75.5	(35%-197%)
9822002	C-6 (0-48) MS	13C-2,3,7,8-TCDD		72.8	(25%-164%)
		13C-1,2,3,7,8-PeCDD		69.9	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		73.2	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		66.6	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		63.4	(23%-140%)
		13C-OCDD		40.3	(17%-157%)
		13C-2,3,7,8-TCDF		72.0	(24%-169%)
		13C-1,2,3,7,8-PeCDF		66.9	(24%-185%)
		13C-2,3,4,7,8-PeCDF		65.1	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		72.0	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		68.9	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		70.7	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		70.4	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		59.6	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		67.4	(26%-138%)
		37Cl-2,3,7,8-TCDD		66.1	(35%-197%)
9822003	C-6 (0-48) MSD	13C-2,3,7,8-TCDD		76.5	(25%-164%)
		13C-1,2,3,7,8-PeCDD		72.3	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		75.7	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		75.3	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		70.0	(23%-140%)
		13C-OCDD		44.3	(17%-157%)
		13C-2,3,7,8-TCDF		75.7	(24%-169%)
		13C-1,2,3,7,8-PeCDF		69.7	(24%-185%)
		13C-2,3,4,7,8-PeCDF		67.9	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		76.0	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		75.1	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		76.2	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		77.2	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		65.4	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		71.9	(26%-138%)
		37Cl-2,3,7,8-TCDD		76.4	(35%-197%)
9822004	C-7 (0-48)	13C-2,3,7,8-TCDD		78.3	(25%-164%)
		13C-1,2,3,7,8-PeCDD		74.2	(25%-181%)

Surrogate Recovery Report

SDG Number: L1629727

Matrix Type: SOLID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
9822004	C-7 (0-48)	13C-1,2,3,4,7,8-HxCDD		75.6	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		69.7	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		67.1	(23%-140%)
		13C-OCDD		38.4	(17%-157%)
		13C-2,3,7,8-TCDF		74.4	(24%-169%)
		13C-1,2,3,7,8-PeCDF		72.0	(24%-185%)
		13C-2,3,4,7,8-PeCDF		70.2	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		74.8	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		70.3	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		73.9	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		74.0	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		60.7	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		68.8	(26%-138%)
		37Cl-2,3,7,8-TCDD		80.9	(35%-197%)
9822005	C-1	13C-2,3,7,8-TCDD		56.8	(25%-164%)
		13C-1,2,3,7,8-PeCDD		56.2	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		57.3	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		59.1	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		56.1	(23%-140%)
		13C-OCDD		34.6	(17%-157%)
		13C-2,3,7,8-TCDF		57.3	(24%-169%)
		13C-1,2,3,7,8-PeCDF		55.7	(24%-185%)
		13C-2,3,4,7,8-PeCDF		53.7	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		59.5	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		59.5	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		60.8	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		60.6	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		52.7	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		58.6	(26%-138%)
		37Cl-2,3,7,8-TCDD		70.0	(35%-197%)
9822006	C-2	13C-2,3,7,8-TCDD		52.0	(25%-164%)
		13C-1,2,3,7,8-PeCDD		54.9	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		61.1	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		56.3	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		57.5	(23%-140%)
		13C-OCDD		35.9	(17%-157%)
		13C-2,3,7,8-TCDF		51.6	(24%-169%)
		13C-1,2,3,7,8-PeCDF		53.7	(24%-185%)
		13C-2,3,4,7,8-PeCDF		51.9	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		60.1	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		56.8	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		59.3	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		59.6	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		52.2	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		60.1	(26%-138%)
		37Cl-2,3,7,8-TCDD		73.3	(35%-197%)
9822007	C-3	13C-2,3,7,8-TCDD		62.0	(25%-164%)
		13C-1,2,3,7,8-PeCDD		62.0	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		66.0	(32%-141%)

Surrogate Recovery Report

SDG Number: L1629727

Matrix Type: SOLID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
9822007	C-3	13C-1,2,3,6,7,8-HxCDD		62.2	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		60.1	(23%-140%)
		13C-OCDD		36.8	(17%-157%)
		13C-2,3,7,8-TCDF		60.2	(24%-169%)
		13C-1,2,3,7,8-PeCDF		58.9	(24%-185%)
		13C-2,3,4,7,8-PeCDF		57.6	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		64.8	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		63.1	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		64.5	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		64.5	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		54.2	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		60.4	(26%-138%)
		37Cl-2,3,7,8-TCDD		78.9	(35%-197%)
9822008	C-4	13C-2,3,7,8-TCDD		70.5	(25%-164%)
		13C-1,2,3,7,8-PeCDD		66.2	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		69.0	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		68.7	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		62.6	(23%-140%)
		13C-OCDD		41.2	(17%-157%)
		13C-2,3,7,8-TCDF		68.4	(24%-169%)
		13C-1,2,3,7,8-PeCDF		62.3	(24%-185%)
		13C-2,3,4,7,8-PeCDF		61.8	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		69.3	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		67.9	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		69.8	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		69.2	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		56.5	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		65.5	(26%-138%)
		37Cl-2,3,7,8-TCDD		76.7	(35%-197%)
9822009	C-6 (48-61)	13C-2,3,7,8-TCDD		71.9	(25%-164%)
		13C-1,2,3,7,8-PeCDD		68.9	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		69.9	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		71.0	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		63.6	(23%-140%)
		13C-OCDD		38.2	(17%-157%)
		13C-2,3,7,8-TCDF		69.8	(24%-169%)
		13C-1,2,3,7,8-PeCDF		65.4	(24%-185%)
		13C-2,3,4,7,8-PeCDF		64.5	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		71.0	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		69.7	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		71.6	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		70.8	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		59.2	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		65.6	(26%-138%)
		37Cl-2,3,7,8-TCDD		77.4	(35%-197%)
9822010	C-7 (48-54)	13C-2,3,7,8-TCDD		73.2	(25%-164%)
		13C-1,2,3,7,8-PeCDD		70.1	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		73.4	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		69.9	(28%-130%)

Surrogate Recovery Report

SDG Number: L1629727

Matrix Type: SOLID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
9822010	C-7 (48-54)	13C-1,2,3,4,6,7,8-HpCDD		63.7	(23%-140%)
		13C-OCDD		38.0	(17%-157%)
		13C-2,3,7,8-TCDF		71.8	(24%-169%)
		13C-1,2,3,7,8-PeCDF		66.7	(24%-185%)
		13C-2,3,4,7,8-PeCDF		65.4	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		73.4	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		71.4	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		72.7	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		73.0	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		60.0	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		67.4	(26%-138%)
		37Cl-2,3,7,8-TCDD		68.9	(35%-197%)
9822011	C-5	13C-2,3,7,8-TCDD		66.9	(25%-164%)
		13C-1,2,3,7,8-PeCDD		62.2	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		62.7	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		63.1	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		57.2	(23%-140%)
		13C-OCDD		32.9	(17%-157%)
		13C-2,3,7,8-TCDF		65.4	(24%-169%)
		13C-1,2,3,7,8-PeCDF		62.1	(24%-185%)
		13C-2,3,4,7,8-PeCDF		59.2	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		63.9	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		64.4	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		63.3	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		64.0	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		53.3	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		59.2	(26%-138%)
		37Cl-2,3,7,8-TCDD		72.2	(35%-197%)
9822012	C-8	13C-2,3,7,8-TCDD		70.7	(25%-164%)
		13C-1,2,3,7,8-PeCDD		66.8	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		67.9	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		66.0	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		61.5	(23%-140%)
		13C-OCDD		38.9	(17%-157%)
		13C-2,3,7,8-TCDF		69.0	(24%-169%)
		13C-1,2,3,7,8-PeCDF		66.0	(24%-185%)
		13C-2,3,4,7,8-PeCDF		62.9	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		70.4	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		70.0	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		70.4	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		71.4	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		60.7	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		66.1	(26%-138%)
		37Cl-2,3,7,8-TCDD		74.9	(35%-197%)
9822013	C-9	13C-2,3,7,8-TCDD		71.5	(25%-164%)
		13C-1,2,3,7,8-PeCDD		68.2	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		72.2	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		67.3	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		62.3	(23%-140%)

Surrogate Recovery Report

SDG Number: L1629727

Matrix Type: SOLID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
9822013	C-9	13C-OCDD		36.7	(17%-157%)
		13C-2,3,7,8-TCDF		71.0	(24%-169%)
		13C-1,2,3,7,8-PeCDF		65.2	(24%-185%)
		13C-2,3,4,7,8-PeCDF		64.8	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		71.4	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		68.9	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		69.6	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		70.7	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		57.1	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		66.2	(26%-138%)
		37Cl-2,3,7,8-TCDD		72.4	(35%-197%)
9822014	C-10	13C-2,3,7,8-TCDD		74.2	(25%-164%)
		13C-1,2,3,7,8-PeCDD		72.3	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		76.2	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		70.0	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		65.4	(23%-140%)
		13C-OCDD		38.1	(17%-157%)
		13C-2,3,7,8-TCDF		74.2	(24%-169%)
		13C-1,2,3,7,8-PeCDF		68.2	(24%-185%)
		13C-2,3,4,7,8-PeCDF		68.2	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		75.5	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		70.7	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		73.7	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		73.6	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		60.9	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		67.7	(26%-138%)
		37Cl-2,3,7,8-TCDD		73.2	(35%-197%)
9822015	C-11(0-48)	13C-2,3,7,8-TCDD		73.6	(25%-164%)
		13C-1,2,3,7,8-PeCDD		70.6	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		75.3	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		71.5	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		65.4	(23%-140%)
		13C-OCDD		37.7	(17%-157%)
		13C-2,3,7,8-TCDF		72.7	(24%-169%)
		13C-1,2,3,7,8-PeCDF		69.2	(24%-185%)
		13C-2,3,4,7,8-PeCDF		67.0	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		74.7	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		71.9	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		74.0	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		74.1	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		58.8	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		67.5	(26%-138%)
		37Cl-2,3,7,8-TCDD		62.6	(35%-197%)
9822016	C-12	13C-2,3,7,8-TCDD		67.8	(25%-164%)
		13C-1,2,3,7,8-PeCDD		65.0	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		68.0	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		62.4	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		59.9	(23%-140%)
		13C-OCDD		36.7	(17%-157%)

Hi-Res Dioxins/Furans

Surrogate Recovery Report

SDG Number: L1629727

Matrix Type: SOLID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
9822016	C-12	13C-2,3,7,8-TCDF		65.8	(24%-169%)
		13C-1,2,3,7,8-PeCDF		62.2	(24%-185%)
		13C-2,3,4,7,8-PeCDF		61.7	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		66.8	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		64.3	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		65.8	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		66.7	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		56.1	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		62.0	(26%-138%)
		37Cl-2,3,7,8-TCDD		78.3	(35%-197%)
9822017	C-11(48-89)	13C-2,3,7,8-TCDD		66.3	(25%-164%)
		13C-1,2,3,7,8-PeCDD		65.7	(25%-181%)
		13C-1,2,3,4,7,8-HxCDD		70.9	(32%-141%)
		13C-1,2,3,6,7,8-HxCDD		68.0	(28%-130%)
		13C-1,2,3,4,6,7,8-HpCDD		62.8	(23%-140%)
		13C-OCDD		37.0	(17%-157%)
		13C-2,3,7,8-TCDF		65.2	(24%-169%)
		13C-1,2,3,7,8-PeCDF		63.3	(24%-185%)
		13C-2,3,4,7,8-PeCDF		63.1	(21%-178%)
		13C-1,2,3,4,7,8-HxCDF		70.1	(26%-152%)
		13C-1,2,3,6,7,8-HxCDF		71.5	(26%-123%)
		13C-2,3,4,6,7,8-HxCDF		72.1	(28%-136%)
		13C-1,2,3,7,8,9-HxCDF		68.2	(29%-147%)
		13C-1,2,3,4,6,7,8-HpCDF		59.0	(28%-143%)
		13C-1,2,3,4,7,8,9-HpCDF		65.5	(26%-138%)
		37Cl-2,3,7,8-TCDD		68.6	(35%-197%)

* Recovery outside Acceptance Limits
# Column to be used to flag recovery values
D Sample Diluted

Hi-Res Dioxins/Furans

Quality Control Summary
Spike Recovery Report

SDG Number: L1629727 **Sample Type:** Laboratory Control Sample

Client ID: LCS for batch 33021 **Matrix:** SOIL

Lab Sample ID: 12017086

Instrument: HRP763 **Analysis Date:** 10/17/2016 17:01 **Dilution:** 1

Analyst: CLP **Prep Batch ID:** 33021

Batch ID: 33023

CAS No.		Parmname	Amount Added pg/g	Spike Conc. pg/g	Recovery %	Acceptance Limits
1746-01-6	LCS	2,3,7,8-TCDD	20.0	20.9	105	67-158
40321-76-4	LCS	1,2,3,7,8-PeCDD	100	96.9	96.9	70-142
39227-28-6	LCS	1,2,3,4,7,8-HxCDD	100	99.6	99.6	70-164
57653-85-7	LCS	1,2,3,6,7,8-HxCDD	100	96.4	96.4	76-134
19408-74-3	LCS	1,2,3,7,8,9-HxCDD	100	100	100	64-162
35822-46-9	LCS	1,2,3,4,6,7,8-HpCDD	100	106	106	70-140
3268-87-9	LCS	1,2,3,4,6,7,8,9-OCDD	200	200	100	78-144
51207-31-9	LCS	2,3,7,8-TCDF	20.0	20.1	100	75-158
57117-41-6	LCS	1,2,3,7,8-PeCDF	100	110	110	80-134
57117-31-4	LCS	2,3,4,7,8-PeCDF	100	100	100	68-160
70648-26-9	LCS	1,2,3,4,7,8-HxCDF	100	101	101	72-134
57117-44-9	LCS	1,2,3,6,7,8-HxCDF	100	99.0	99	84-130
60851-34-5	LCS	2,3,4,6,7,8-HxCDF	100	101	101	70-156
72918-21-9	LCS	1,2,3,7,8,9-HxCDF	100	105	105	78-130
67562-39-4	LCS	1,2,3,4,6,7,8-HpCDF	100	110	110	82-122
55673-89-7	LCS	1,2,3,4,7,8,9-HpCDF	100	110	110	78-138
39001-02-0	LCS	1,2,3,4,6,7,8,9-OCDF	200	235	117	63-170

Quality Control Summary
Spike Recovery Report

SDG Number: L1629727 **Sample Type:** Laboratory Control Sample Duplicate
Client ID: LCSD for batch 33021 **Matrix:** SOIL
Lab Sample ID: 12017087
Instrument: HRP763 **Analysis Date:** 10/17/2016 17:48 **Dilution:** 1
Analyst: CLP **Prep Batch ID:** 33021
Batch ID: 33023

CAS No.		Parmname	Amount Added pg/g	Spike Conc. pg/g	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
1746-01-6	LCSD	2,3,7,8-TCDD	20.0	20.5	102	67-158	2.05	0-20
40321-76-4	LCSD	1,2,3,7,8-PeCDD	100	97.8	97.8	70-142	0.974	0-20
39227-28-6	LCSD	1,2,3,4,7,8-HxCDD	100	99.9	99.9	70-164	0.279	0-20
57653-85-7	LCSD	1,2,3,6,7,8-HxCDD	100	97.1	97.1	76-134	0.649	0-20
19408-74-3	LCSD	1,2,3,7,8,9-HxCDD	100	97.8	97.8	64-162	2.21	0-20
35822-46-9	LCSD	1,2,3,4,6,7,8-HpCDD	100	105	105	70-140	1.36	0-20
3268-87-9	LCSD	1,2,3,4,6,7,8,9-OCDD	200	195	97.3	78-144	2.85	0-20
51207-31-9	LCSD	2,3,7,8-TCDF	20.0	19.8	99	75-158	1.40	0-20
57117-41-6	LCSD	1,2,3,7,8-PeCDF	100	111	111	80-134	1.14	0-20
57117-31-4	LCSD	2,3,4,7,8-PeCDF	100	100	100	68-160	0.0359	0-20
70648-26-9	LCSD	1,2,3,4,7,8-HxCDF	100	102	102	72-134	0.721	0-20
57117-44-9	LCSD	1,2,3,6,7,8-HxCDF	100	98.2	98.2	84-130	0.880	0-20
60851-34-5	LCSD	2,3,4,6,7,8-HxCDF	100	100	100	70-156	0.368	0-20
72918-21-9	LCSD	1,2,3,7,8,9-HxCDF	100	103	103	78-130	1.75	0-20
67562-39-4	LCSD	1,2,3,4,6,7,8-HpCDF	100	108	108	82-122	2.50	0-20
55673-89-7	LCSD	1,2,3,4,7,8,9-HpCDF	100	107	107	78-138	2.52	0-20
39001-02-0	LCSD	1,2,3,4,6,7,8,9-OCDF	200	236	118	63-170	0.400	0-20

Hi-Res Dioxins/Furans

Quality Control Summary
Spike Recovery Report

SDG Number: L1629727
Client ID: C-6 (0-48) MS
Lab Sample ID: 9822002
Instrument: HRP763
Analyst: CLP

Sample Type: Matrix Spike
Matrix: SOIL
%Moisture: 34.7
Analysis Date: 10/17/2016 20:09
Prep Batch ID: 33021
Batch ID: 33023

Dilution: 1

CAS No.		Parmname	Amount Added pg/g		Spike Conc. pg/g	Recovery %	Acceptance Limits
1746-01-6	MS	2,3,7,8-TCDD	19.0	U	18.6	98	70-130
40321-76-4	MS	1,2,3,7,8-PeCDD	95.0	U	87.4	92	70-130
39227-28-6	MS	1,2,3,4,7,8-HxCDD	95.0	U	90.1	94.8	70-130
57653-85-7	MS	1,2,3,6,7,8-HxCDD	95.0	U	87.7	92.3	70-130
19408-74-3	MS	1,2,3,7,8,9-HxCDD	95.0	U	89.9	94.6	70-130
35822-46-9	MS	1,2,3,4,6,7,8-HpCDD	95.0	U	98.4	104	70-130
3268-87-9	MS	1,2,3,4,6,7,8,9-OCDD	190		263	86.5	70-130
51207-31-9	MS	2,3,7,8-TCDF	19.0	U	17.9	94	70-130
57117-41-6	MS	1,2,3,7,8-PeCDF	95.0	U	98.3	103	70-130
57117-31-4	MS	2,3,4,7,8-PeCDF	95.0	U	89.3	94	70-130
70648-26-9	MS	1,2,3,4,7,8-HxCDF	95.0	U	89.2	93.8	70-130
57117-44-9	MS	1,2,3,6,7,8-HxCDF	95.0	U	90.3	95	70-130
60851-34-5	MS	2,3,4,6,7,8-HxCDF	95.0	U	89.1	93.8	70-130
72918-21-9	MS	1,2,3,7,8,9-HxCDF	95.0	U	94.8	99.7	70-130
67562-39-4	MS	1,2,3,4,6,7,8-HpCDF	95.0	U	98.8	104	70-130
55673-89-7	MS	1,2,3,4,7,8,9-HpCDF	95.0	U	97.3	102	70-130
39001-02-0	MS	1,2,3,4,6,7,8,9-OCDF	190	U	218	114	70-130

Hi-Res Dioxins/Furans

Quality Control Summary
Spike Recovery Report

SDG Number: L1629727 **Sample Type:** Matrix Spike Duplicate
Client ID: C-6 (0-48) MSD **Matrix:** SOIL
Lab Sample ID: 9822003 **%Moisture:** 34.7
Instrument: HRP763 **Analysis Date:** 10/17/2016 20:56 **Dilution:** 1
Analyst: CLP **Prep Batch ID:** 33021
Batch ID: 33023

CAS No.		Parmname	Amount Added pg/g		Spike Conc. pg/g	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
1746-01-6	MSD	2,3,7,8-TCDD	18.9	U	19.8	105	70-130	5.92	0-20
40321-76-4	MSD	1,2,3,7,8-PeCDD	94.5	U	89.4	94.6	70-130	2.27	0-20
39227-28-6	MSD	1,2,3,4,7,8-HxCDD	94.5	U	94.4	99.9	70-130	4.72	0-20
57653-85-7	MSD	1,2,3,6,7,8-HxCDD	94.5	U	85.5	90.4	70-130	2.57	0-20
19408-74-3	MSD	1,2,3,7,8,9-HxCDD	94.5	U	90.8	96.1	70-130	0.985	0-20
35822-46-9	MSD	1,2,3,4,6,7,8-HpCDD	94.5	U	117	124	70-130	17.6	0-20
3268-87-9	MSD	1,2,3,4,6,7,8,9-OCDD	189		1060	510 *	70-130	121 *	0-20
51207-31-9	MSD	2,3,7,8-TCDF	18.9	U	18.4	97.2	70-130	2.77	0-20
57117-41-6	MSD	1,2,3,7,8-PeCDF	94.5	U	100	106	70-130	2.00	0-20
57117-31-4	MSD	2,3,4,7,8-PeCDF	94.5	U	90.3	95.6	70-130	1.13	0-20
70648-26-9	MSD	1,2,3,4,7,8-HxCDF	94.5	U	93.8	99.3	70-130	5.07	0-20
57117-44-9	MSD	1,2,3,6,7,8-HxCDF	94.5	U	91.4	96.7	70-130	1.14	0-20
60851-34-5	MSD	2,3,4,6,7,8-HxCDF	94.5	U	91.7	97	70-130	2.79	0-20
72918-21-9	MSD	1,2,3,7,8,9-HxCDF	94.5	U	94.7	100	70-130	0.0987	0-20
67562-39-4	MSD	1,2,3,4,6,7,8-HpCDF	94.5	U	99.8	106	70-130	1.05	0-20
55673-89-7	MSD	1,2,3,4,7,8,9-HpCDF	94.5	U	99.6	105	70-130	2.29	0-20
39001-02-0	MSD	1,2,3,4,6,7,8,9-OCDF	189	U	215	114	70-130	1.17	0-20

Method Blank Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Matrix:**	**SOIL**
Client ID:	**MB for batch 33021**	**Instrument ID:**	**HRP763**	**Data File:**	**b17oct16a-4**
Lab Sample ID:	**12017085**	**Prep Date:**	**16-OCT-16**	**Analyzed:**	**10/17/16 18:35**
Column:					

This method blank applies to the following samples and quality control samples:

	Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01	LCS for batch 33021	12017086	b17oct16a-2	10/17/16	1701
02	LCSD for batch 33021	12017087	b17oct16a-3	10/17/16	1748
03	C-6 (0-48)	9822001	b17oct16a-5	10/17/16	1922
04	C-6 (0-48) MS	9822002	b17oct16a-6	10/17/16	2009
05	C-6 (0-48) MSD	9822003	b17oct16a-7	10/17/16	2056
06	C-7 (0-48)	9822004	b17oct16a-8	10/17/16	2143
07	C-1	9822005	b17oct16a-9	10/17/16	2230
08	C-2	9822006	b17oct16a-10	10/17/16	2317
09	C-3	9822007	b17oct16a-11	10/18/16	0004
10	C-4	9822008	b17oct16a-12	10/18/16	0051
11	C-6 (48-61)	9822009	b17oct16a-13	10/18/16	0138
12	C-7 (48-54)	9822010	b17oct16a-14	10/18/16	0225
13	C-5	9822011	b17oct16a_2-2	10/18/16	0454
14	C-8	9822012	b17oct16a_2-3	10/18/16	0540
15	C-9	9822013	b17oct16a_2-4	10/18/16	0627
16	C-10	9822014	b17oct16a_2-5	10/18/16	0715
17	C-11(0-48)	9822015	b17oct16a_2-6	10/18/16	0802
18	C-12	9822016	b17oct16a_2-7	10/18/16	0849
19	C-11(48-89)	9822017	b17oct16a_2-8	10/18/16	0936

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**12017085**			**Matrix:**	**SOIL**
Client Sample:	**QC for batch 33021**				
Client ID:	**MB for batch 33021**			**Prep Basis:**	**As Received**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/17/2016 18:35**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-4**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**10 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD	U	1	pg/g	1.00
40321-76-4	1,2,3,7,8-PeCDD	U	5	pg/g	5.00
39227-28-6	1,2,3,4,7,8-HxCDD	U	5	pg/g	5.00
57653-85-7	1,2,3,6,7,8-HxCDD	U	5	pg/g	5.00
19408-74-3	1,2,3,7,8,9-HxCDD	U	5	pg/g	5.00
35822-46-9	1,2,3,4,6,7,8-HpCDD	U	5	pg/g	5.00
3268-87-9	1,2,3,4,6,7,8,9-OCDD	U	10	pg/g	10.0
51207-31-9	2,3,7,8-TCDF	U	1	pg/g	1.00
57117-41-6	1,2,3,7,8-PeCDF	U	5	pg/g	5.00
57117-31-4	2,3,4,7,8-PeCDF	U	5	pg/g	5.00
70648-26-9	1,2,3,4,7,8-HxCDF	U	5	pg/g	5.00
57117-44-9	1,2,3,6,7,8-HxCDF	U	5	pg/g	5.00
60851-34-5	2,3,4,6,7,8-HxCDF	U	5	pg/g	5.00
72918-21-9	1,2,3,7,8,9-HxCDF	U	5	pg/g	5.00
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	5	pg/g	5.00
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	5	pg/g	5.00
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	10	pg/g	10.0
41903-57-5	Total Tetrachlorodibenzo-p-dioxin	U	1	pg/g	1.00
36088-22-9	Total Pentachlorodibenzo-p-dioxin	U	5	pg/g	5.00
34465-46-8	Total Hexachlorodibenzo-p-dioxin	U	5	pg/g	5.00
37871-00-4	Total Heptachlorodibenzo-p-dioxin	U	5	pg/g	5.00
30402-14-3	Total Tetrachlorodibenzofuran	U	1	pg/g	1.00
30402-15-4	Total Pentachlorodibenzofuran	U	5	pg/g	5.00
55684-94-1	Total Hexachlorodibenzofuran	U	5	pg/g	5.00
38998-75-3	Total Heptachlorodibenzofuran	U	5	pg/g	5.00
3333-30-0	TEQ WHO2005 ND=0		0.00	pg/g	
3333-30-1	TEQ WHO2005 ND=0.5		5.70	pg/g	

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		156	200	pg/g	78.1	(25%-164%)
13C-1,2,3,7,8-PeCDD		147	200	pg/g	73.7	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		147	200	pg/g	73.7	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		143	200	pg/g	71.7	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		137	200	pg/g	68.4	(23%-140%)
13C-OCDD		164	400	pg/g	41.1	(17%-157%)
13C-2,3,7,8-TCDF		152	200	pg/g	75.9	(24%-169%)
13C-1,2,3,7,8-PeCDF		140	200	pg/g	69.8	(24%-185%)
13C-2,3,4,7,8-PeCDF		138	200	pg/g	69.1	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		150	200	pg/g	74.9	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		146	200	pg/g	72.9	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		150	200	pg/g	75.2	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		153	200	pg/g	76.7	(29%-147%)

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**12017085**			**Matrix:**	**SOIL**
Client Sample:	**QC for batch 33021**				
Client ID:	**MB for batch 33021**			**Prep Basis:**	**As Received**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/17/2016 18:35**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-4**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**10 g**		

CAS No.	Parmname	Qual	Result	Units	PQL

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-1,2,3,4,6,7,8-HpCDF		126	200	pg/g	62.8	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		138	200	pg/g	69.2	(26%-138%)
37Cl-2,3,7,8-TCDD		16.5	20.0	pg/g	82.5	(35%-197%)

Comments:

U Analyte was analyzed for, but not detected above the specified detection limit.

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**12017086**			**Matrix:**	**SOIL**
Client Sample:	**QC for batch 33021**				
Client ID:	**LCS for batch 33021**			**Prep Basis:**	**As Received**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/17/2016 17:01**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-2**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**10 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD		20.9	pg/g	1.00
40321-76-4	1,2,3,7,8-PeCDD		96.9	pg/g	5.00
39227-28-6	1,2,3,4,7,8-HxCDD		99.6	pg/g	5.00
57653-85-7	1,2,3,6,7,8-HxCDD		96.4	pg/g	5.00
19408-74-3	1,2,3,7,8,9-HxCDD		100	pg/g	5.00
35822-46-9	1,2,3,4,6,7,8-HpCDD		106	pg/g	5.00
3268-87-9	1,2,3,4,6,7,8,9-OCDD		200	pg/g	10.0
51207-31-9	2,3,7,8-TCDF		20.1	pg/g	1.00
57117-41-6	1,2,3,7,8-PeCDF		110	pg/g	5.00
57117-31-4	2,3,4,7,8-PeCDF		100	pg/g	5.00
70648-26-9	1,2,3,4,7,8-HxCDF		101	pg/g	5.00
57117-44-9	1,2,3,6,7,8-HxCDF		99.0	pg/g	5.00
60851-34-5	2,3,4,6,7,8-HxCDF		101	pg/g	5.00
72918-21-9	1,2,3,7,8,9-HxCDF		105	pg/g	5.00
67562-39-4	1,2,3,4,6,7,8-HpCDF		110	pg/g	5.00
55673-89-7	1,2,3,4,7,8,9-HpCDF		110	pg/g	5.00
39001-02-0	1,2,3,4,6,7,8,9-OCDF		235	pg/g	10.0

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		156	200	pg/g	78.0	(20%-175%)
13C-1,2,3,7,8-PeCDD		145	200	pg/g	72.5	(21%-227%)
13C-1,2,3,4,7,8-HxCDD		155	200	pg/g	77.5	(21%-193%)
13C-1,2,3,6,7,8-HxCDD		143	200	pg/g	71.7	(25%-163%)
13C-1,2,3,4,6,7,8-HpCDD		135	200	pg/g	67.3	(22%-166%)
13C-OCDD		165	400	pg/g	41.1	(13%-199%)
13C-2,3,7,8-TCDF		148	200	pg/g	74.2	(22%-152%)
13C-1,2,3,7,8-PeCDF		138	200	pg/g	69.1	(21%-192%)
13C-2,3,4,7,8-PeCDF		134	200	pg/g	66.8	(13%-328%)
13C-1,2,3,4,7,8-HxCDF		150	200	pg/g	75.2	(19%-202%)
13C-1,2,3,6,7,8-HxCDF		150	200	pg/g	74.8	(21%-159%)
13C-2,3,4,6,7,8-HxCDF		151	200	pg/g	75.5	(22%-176%)
13C-1,2,3,7,8,9-HxCDF		150	200	pg/g	75.2	(17%-205%)
13C-1,2,3,4,6,7,8-HpCDF		127	200	pg/g	63.3	(21%-158%)
13C-1,2,3,4,7,8,9-HpCDF		137	200	pg/g	68.4	(20%-186%)
37Cl-2,3,7,8-TCDD		16.0	20.0	pg/g	80.1	(31%-191%)

Comments:

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**12017087**			**Matrix:**	**SOIL**
Client Sample:	**QC for batch 33021**				
Client ID:	**LCSD for batch 33021**			**Prep Basis:**	**As Received**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/17/2016 17:48**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-3**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**10 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD		20.5	pg/g	1.00
40321-76-4	1,2,3,7,8-PeCDD		97.8	pg/g	5.00
39227-28-6	1,2,3,4,7,8-HxCDD		99.9	pg/g	5.00
57653-85-7	1,2,3,6,7,8-HxCDD		97.1	pg/g	5.00
19408-74-3	1,2,3,7,8,9-HxCDD		97.8	pg/g	5.00
35822-46-9	1,2,3,4,6,7,8-HpCDD		105	pg/g	5.00
3268-87-9	1,2,3,4,6,7,8,9-OCDD		195	pg/g	10.0
51207-31-9	2,3,7,8-TCDF		19.8	pg/g	1.00
57117-41-6	1,2,3,7,8-PeCDF		111	pg/g	5.00
57117-31-4	2,3,4,7,8-PeCDF		100	pg/g	5.00
70648-26-9	1,2,3,4,7,8-HxCDF		102	pg/g	5.00
57117-44-9	1,2,3,6,7,8-HxCDF		98.2	pg/g	5.00
60851-34-5	2,3,4,6,7,8-HxCDF		100	pg/g	5.00
72918-21-9	1,2,3,7,8,9-HxCDF		103	pg/g	5.00
67562-39-4	1,2,3,4,6,7,8-HpCDF		108	pg/g	5.00
55673-89-7	1,2,3,4,7,8,9-HpCDF		107	pg/g	5.00
39001-02-0	1,2,3,4,6,7,8,9-OCDF		236	pg/g	10.0

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		141	200	pg/g	70.5	(20%-175%)
13C-1,2,3,7,8-PeCDD		134	200	pg/g	67.1	(21%-227%)
13C-1,2,3,4,7,8-HxCDD		141	200	pg/g	70.6	(21%-193%)
13C-1,2,3,6,7,8-HxCDD		128	200	pg/g	63.8	(25%-163%)
13C-1,2,3,4,6,7,8-HpCDD		121	200	pg/g	60.3	(22%-166%)
13C-OCDD		143	400	pg/g	35.9	(13%-199%)
13C-2,3,7,8-TCDF		136	200	pg/g	68.2	(22%-152%)
13C-1,2,3,7,8-PeCDF		127	200	pg/g	63.3	(21%-192%)
13C-2,3,4,7,8-PeCDF		126	200	pg/g	63.1	(13%-328%)
13C-1,2,3,4,7,8-HxCDF		135	200	pg/g	67.4	(19%-202%)
13C-1,2,3,6,7,8-HxCDF		135	200	pg/g	67.4	(21%-159%)
13C-2,3,4,6,7,8-HxCDF		136	200	pg/g	68.2	(22%-176%)
13C-1,2,3,7,8,9-HxCDF		137	200	pg/g	68.5	(17%-205%)
13C-1,2,3,4,6,7,8-HpCDF		112	200	pg/g	56.0	(21%-158%)
13C-1,2,3,4,7,8,9-HpCDF		122	200	pg/g	61.2	(20%-186%)
37Cl-2,3,7,8-TCDD		14.9	20.0	pg/g	74.3	(31%-191%)

Comments:

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822002**	**Date Collected:**	**09/20/2016 10:10**	**Matrix:**	**SOIL**
Client Sample:	**MS for 9822001 (C-6 (0-48))**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**34.7**
Client ID:	**C-6 (0-48) MS**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/17/2016 20:09**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-6**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**16.11 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD		18.6	pg/g	0.950
40321-76-4	1,2,3,7,8-PeCDD		87.4	pg/g	4.75
39227-28-6	1,2,3,4,7,8-HxCDD		90.1	pg/g	4.75
57653-85-7	1,2,3,6,7,8-HxCDD		87.7	pg/g	4.75
19408-74-3	1,2,3,7,8,9-HxCDD		89.9	pg/g	4.75
35822-46-9	1,2,3,4,6,7,8-HpCDD		98.4	pg/g	4.75
3268-87-9	1,2,3,4,6,7,8,9-OCDD		263	pg/g	9.50
51207-31-9	2,3,7,8-TCDF		17.9	pg/g	0.950
57117-41-6	1,2,3,7,8-PeCDF		98.3	pg/g	4.75
57117-31-4	2,3,4,7,8-PeCDF		89.3	pg/g	4.75
70648-26-9	1,2,3,4,7,8-HxCDF		89.2	pg/g	4.75
57117-44-9	1,2,3,6,7,8-HxCDF		90.3	pg/g	4.75
60851-34-5	2,3,4,6,7,8-HxCDF		89.1	pg/g	4.75
72918-21-9	1,2,3,7,8,9-HxCDF		94.8	pg/g	4.75
67562-39-4	1,2,3,4,6,7,8-HpCDF		98.8	pg/g	4.75
55673-89-7	1,2,3,4,7,8,9-HpCDF		97.3	pg/g	4.75
39001-02-0	1,2,3,4,6,7,8,9-OCDF		218	pg/g	9.50

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		138	190	pg/g	72.8	(25%-164%)
13C-1,2,3,7,8-PeCDD		133	190	pg/g	69.9	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		139	190	pg/g	73.2	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		127	190	pg/g	66.6	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		121	190	pg/g	63.4	(23%-140%)
13C-OCDD		153	380	pg/g	40.3	(17%-157%)
13C-2,3,7,8-TCDF		137	190	pg/g	72.0	(24%-169%)
13C-1,2,3,7,8-PeCDF		127	190	pg/g	66.9	(24%-185%)
13C-2,3,4,7,8-PeCDF		124	190	pg/g	65.1	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		137	190	pg/g	72.0	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		131	190	pg/g	68.9	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		134	190	pg/g	70.7	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		134	190	pg/g	70.4	(29%-147%)
13C-1,2,3,4,6,7,8-HpCDF		113	190	pg/g	59.6	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		128	190	pg/g	67.4	(26%-138%)
37Cl-2,3,7,8-TCDD		12.6	19.0	pg/g	66.1	(35%-197%)

Comments:

Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary

SDG Number:	**L1629727**	**Client:**	**ALPH001**	**Project:**	**ALPH00416**
Lab Sample ID:	**9822003**	**Date Collected:**	**09/20/2016 10:10**	**Matrix:**	**SOIL**
Client Sample:	**MSD for MS for 9822001 (C-6 (0-**	**Date Received:**	**09/27/2016 12:00**	**%Moisture:**	**34.7**
Client ID:	**C-6 (0-48) MSD**			**Prep Basis:**	**Dry Weight**
Batch ID:	**33023**	**Method:**	**EPA Method 1613B**		
Run Date:	**10/17/2016 20:56**	**Analyst:**	**CLP**	**Instrument:**	**HRP763**
Data File:	**b17oct16a-7**			**Dilution:**	**1**
Prep Batch:	**33021**	**Prep Method:**	**SW846 3540C**		
Prep Date:	**16-OCT-16**	**Prep Aliquot:**	**16.2 g**		

CAS No.	Parmname	Qual	Result	Units	PQL
1746-01-6	2,3,7,8-TCDD		19.8	pg/g	0.945
40321-76-4	1,2,3,7,8-PeCDD		89.4	pg/g	4.73
39227-28-6	1,2,3,4,7,8-HxCDD		94.4	pg/g	4.73
57653-85-7	1,2,3,6,7,8-HxCDD		85.5	pg/g	4.73
19408-74-3	1,2,3,7,8,9-HxCDD		90.8	pg/g	4.73
35822-46-9	1,2,3,4,6,7,8-HpCDD		117	pg/g	4.73
3268-87-9	1,2,3,4,6,7,8,9-OCDD		1060	pg/g	9.45
51207-31-9	2,3,7,8-TCDF		18.4	pg/g	0.945
57117-41-6	1,2,3,7,8-PeCDF		100	pg/g	4.73
57117-31-4	2,3,4,7,8-PeCDF		90.3	pg/g	4.73
70648-26-9	1,2,3,4,7,8-HxCDF		93.8	pg/g	4.73
57117-44-9	1,2,3,6,7,8-HxCDF		91.4	pg/g	4.73
60851-34-5	2,3,4,6,7,8-HxCDF		91.7	pg/g	4.73
72918-21-9	1,2,3,7,8,9-HxCDF		94.7	pg/g	4.73
67562-39-4	1,2,3,4,6,7,8-HpCDF		99.8	pg/g	4.73
55673-89-7	1,2,3,4,7,8,9-HpCDF		99.6	pg/g	4.73
39001-02-0	1,2,3,4,6,7,8,9-OCDF		215	pg/g	9.45

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		145	189	pg/g	76.5	(25%-164%)
13C-1,2,3,7,8-PeCDD		137	189	pg/g	72.3	(25%-181%)
13C-1,2,3,4,7,8-HxCDD		143	189	pg/g	75.7	(32%-141%)
13C-1,2,3,6,7,8-HxCDD		142	189	pg/g	75.3	(28%-130%)
13C-1,2,3,4,6,7,8-HpCDD		132	189	pg/g	70.0	(23%-140%)
13C-OCDD		167	378	pg/g	44.3	(17%-157%)
13C-2,3,7,8-TCDF		143	189	pg/g	75.7	(24%-169%)
13C-1,2,3,7,8-PeCDF		132	189	pg/g	69.7	(24%-185%)
13C-2,3,4,7,8-PeCDF		128	189	pg/g	67.9	(21%-178%)
13C-1,2,3,4,7,8-HxCDF		144	189	pg/g	76.0	(26%-152%)
13C-1,2,3,6,7,8-HxCDF		142	189	pg/g	75.1	(26%-123%)
13C-2,3,4,6,7,8-HxCDF		144	189	pg/g	76.2	(28%-136%)
13C-1,2,3,7,8,9-HxCDF		146	189	pg/g	77.2	(29%-147%)
13C-1,2,3,4,6,7,8-HpCDF		124	189	pg/g	65.4	(28%-143%)
13C-1,2,3,4,7,8,9-HpCDF		136	189	pg/g	71.9	(26%-138%)
37Cl-2,3,7,8-TCDD		14.4	18.9	pg/g	76.4	(35%-197%)

Comments: