

FINAL

Newark Bay Study Area

**Sediment Quality Triad and
Porewater Field Report**

Baseline Human Health and
Ecological Risk Assessment

Glenn Springs Holdings, Inc.

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Revision 1

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Acronyms and Abbreviations

BERA	baseline ecological risk assessment
BHHERA	baseline human health and ecological risk assessment
BHHRA	baseline human health risk assessment
°C	degrees Celsius
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	constituent of potential concern
COPEC	constituent of potential ecological concern
DI	deionized
L	liter
NBSA	Newark Bay Study Area
NY/NJ	New York/New Jersey
NYC/LI	New York City/Long Island
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCDDs/PCDFs	polychlorinated dibenzo- <i>p</i> -dioxins/polychlorinated dibenzofurans
PE	polyethylene
PID	photoionization detector
POM	polyoxymethylene
PPE	personal protective equipment
PQL	project quantitation limit
Problem Formulation	Final Newark Bay Study Area Problem Formulation
QA/QC	quality assurance/quality control
SOP	standard operating procedure
SQT	sediment quality triad
SQT Field Report	Sediment Quality Triad and Porewater Field Report
SQT QAPP	Sediment Quality Triad and Porewater Sampling and Analysis Quality Assurance Project Plan
Tierra	Tierra Solutions, Inc.
USCG	United States Coast Guard
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

1. Introduction

This Sediment Quality Triad and Porewater Field Report (SQT Field Report) documents the field activities associated with implementation of the Sediment Quality Triad and Porewater Sampling and Analysis Quality Assurance Project Plan (SQT QAPP; Tierra Solutions, Inc. [Tierra] 2015b) in the Newark Bay Study Area (NBSA), as approved by the United States Environmental Protection Agency (USEPA) on September 3, 2015. The SQT QAPP field program was performed in September 2015. Pursuant to an Administrative Order on Consent under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA Index 02-2004-2010; USEPA 2004), Glenn Springs Holdings, Inc. is conducting a Remedial Investigation/Feasibility Study, on behalf of Occidental Chemical Corporation (the successor to Diamond Shamrock Chemicals Company [formerly known as Diamond Alkali Company]), for the NBSA.

The SQT QAPP program involved collecting sediment samples for the following analyses:

- Sediment chemistry for constituents of potential concern (COPCs) and constituents of potential ecological concern (COPECs) that include a suite of organic and inorganic analytes.
- Sediment toxicity testing in a laboratory using surface sediment collected during the SQT QAPP field program and laboratory-supplied standard amphipod test species *Leptocheirus plumulosus*. Survival and growth were measured in the toxicity tests.
- Benthic invertebrate community analyses using surface sediment collected during the SQT QAPP field program. Specimens were counted and identified from bulk surface sediment samples.
- Sediment bioaccumulation testing in a laboratory using surface sediment collected during the SQT QAPP field program and laboratory-supplied polychaete test species *Nereis virens*. Tissue samples of the polychaete were analyzed for COPECs.
- Porewater chemistry collected from surface sediment ex-situ in the laboratory. Porewater samples were directly analyzed using dialysis bags for inorganics (metals, mercury, methyl mercury, dissolved organic carbon, ammonia, and total sulfide); and indirectly analyzed using passive samplers for a select group of organic COPECs for which porewater/solids partitioning coefficients have been experimentally determined and reported in the literature. These include polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), pesticides, and polychlorinated dibenzo-*p*-dioxins/polychlorinated dibenzofurans (PCDDs/PCDFs).

The data collected during the SQT QAPP field program will be used in the baseline human health and ecological risk assessment (BHHERA) for the following purposes:

1. SQT data to support the baseline ecological risk assessment (BERA). The sediment quality triad (SQT) assessment is an effects-based, weight-of-evidence approach used to evaluate risks to benthic invertebrate communities using three primary lines of evidence: 1) sediment chemistry, 2) sediment

toxicity, and 3) benthic invertebrate community metrics. The SQT method incorporates a combination of both quantitative and qualitative analyses to identify if there are apparent cause-and-effect relationships between sediment and/or porewater chemistry and other SQT components. The approach provides information needed to identify degraded conditions and assess impacts of pollution-induced effects on benthic invertebrates.

2. Bioaccumulation data and porewater data as additional lines of evidence to support the BERA.
3. Surface sediment chemistry analyses to support the BHHRA.

To support the NBSA BERA, two additional lines of evidence, or measurement endpoints, were added to the SQT to help better assess potential chemical-specific toxicological effects and bioaccumulation in benthic invertebrates: laboratory bioaccumulation testing and ex-situ porewater passive sampling. The bioaccumulation study will provide data on the direct uptake of various chemical contaminants through the analysis of tissue samples by a representative invertebrate organism—the polychaete worm (*Nereis virens*)—that lives in the sediments of the NBSA. This tissue data will be used to help assess risks to invertebrates, and will also be used to model trophic transfer of chemicals to upper trophic level wildlife receptors (e.g., birds and mammals).

The second additional line of evidence is the collection of porewater chemistry data using passive samplers deployed in NBSA sediments in the laboratory (i.e., ex-situ). Passive samplers will provide information to estimate the dissolved-phase porewater concentrations of some contaminants in NBSA sediment. The dissolved-phase concentration is a useful measure of the amount of a contaminant that is bioavailable to infaunal benthic invertebrates. Passive sampler data collected under the SQT QAPP supports the following objectives of the BERA:

1. Estimate the bioavailable fraction of non-polar organic COPECs (i.e., uptake of dissolved fraction of compounds) in ex-situ test sediment. Polyethylene (PE) and polyoxymethylene (POM) passive samplers will be used to add this additional line of evidence for non-polar organic compounds.
2. Estimate the bioavailable fraction of metals/inorganic COPECs (i.e., uptake of dissolved fraction of chemicals) in ex-situ test sediment. Diffusion samplers (i.e., dialysis bags) will be used to add this additional line of evidence for inorganic COPECs.
3. Evaluate exposure-response relationships between the biological measures of effect (i.e., laboratory toxicity tests and benthic community impairment metrics) of the SQT tests and various measures of chemistry in the NBSA sediment samples (i.e., bulk sediment and porewater passive sampler chemistry).

Sediment samples were also collected from shoreline locations where human access is possible/likely to assess the potential human health hazard and risk of chemicals from the dermal contact and incidental ingestion exposure routes. Some of these sediment samples were collected from the sample locations as

intertidal area samples for the SQT evaluation, and some were additional, non-SQT samples from other target shoreline locations.

1.1 Newark Bay Study Area

Newark Bay, part of the New York/New Jersey (NY/NJ) Harbor Estuary, is located between the shores of Newark and Elizabeth to the west, Jersey City and Bayonne to the east, the confluence of the Passaic and Hackensack Rivers to the north, and Staten Island to the south. Newark Bay is linked to Upper New York Bay by the Kill van Kull and to the Raritan Bay by the Arthur Kill (Figure 1). Figure 2 provides an aerial photograph demarcating local landmarks, bay reaches, and navigation channels.

The NBSA is situated within one of the most urbanized and industrialized areas in the United States and is known to be contaminated with a number of chemicals, including, but not limited to, PCBs, PAHs, pesticides, herbicides, volatile organic compounds (VOCs), semivolatile organic compounds, PCDDs/PCDFs, and metals (National Oceanic and Atmospheric Administration 1995; USEPA 1998).

The majority of the NBSA shoreline consists of commercial, developed, or abandoned properties. Information from the Reconnaissance Survey in September 2013 indicates that a majority of the shoreline (66%) consists of bulkhead and riprap (Tierra 2015a). Residential and recreational areas are located along the waterfront in many of these bulkhead and riprap areas, particularly along the eastern shoreline. Four new residential areas have been proposed for development (Tierra 2013).

1.2 Investigative Approach

The data collected pursuant to the SQT QAPP (Tierra 2015b) will be used for developing the BERA, and to partially support the BHHRA. Benthic invertebrate tissue and the co-located sediment data collected under the SQT QAPP will be used in the BERA as input parameters to a food web model, which will estimate dietary exposure of upper trophic level ecological receptors (i.e., birds and mammals) to COPECs. Surface sediment data will also be compared to appropriate toxicity benchmarks to qualitatively evaluate potential ecological risks to aquatic plants, fish, and reptiles in the NBSA. Data collected from other sampling efforts in the NBSA will also be used, in conjunction with the data collected under the SQT QAPP, to support the BHHRA. For example, fish and shellfish tissue data collected in 2014, 2015, and 2016 as part of the tissue sampling efforts described in the *Crab and Clam Sampling and Analysis Quality Assurance Project Plan* (Tierra 2014a) and *Fish Sampling and Analysis Quality Assurance Project Plan* (Tierra 2014b), and sediment data collected in 2014 co-located with the softshell clam collection locations, will also be used to evaluate potential ecological and human health risks from exposure to chemicals in the NBSA. The ex-situ porewater analytical data will also be used to evaluate the potential narcotic effect of PAHs and pesticides on benthic organisms using the sum Toxic Unit approach, as described in USEPA (2012) and USEPA (2003a).

The primary sample type collected as part of the SQT QAPP sampling event was sediment, which was collected from locations in the Intertidal Areas, Subtidal Flat areas, and Transitional Slope areas of the NBSA (Figure 3). Surface sediment samples were collected from approximately the top 6 inches

(approximately 15 centimeters) for chemical analysis, toxicity testing, benthic community analyses, and bioaccumulation testing. Sediment was also collected and shipped to the University of Maryland Baltimore County for ex-situ deployment of passive samplers to collect information about the dissolved-phase porewater concentrations of contaminants in NBSA sediment. The dissolved-phase concentration is a useful measure of the amount of a contaminant that is bioavailable to infaunal benthic invertebrates. Sediment used in the passive sampler tests was collected from the same stations as those identified for the SQT evaluation.

The bioaccumulation tests were performed using surface sediment samples collected during the SQT QAPP field program and laboratory-supplied polychaete worms. At the conclusion of the bioaccumulation test, tissue samples of the polychaete worm were analyzed for a subset of chemical parameters as described in the SQT QAPP (Tierra 2015b).

1.2.1 Baseline Ecological Risk Assessment

The data collected pursuant to the SQT QAPP, in conjunction with additional sediment and tissue data collected under the other NBSA risk assessment Quality Assurance Project Plans (i.e., sediment data collected in 2014 co-located with the softshell clam collection locations and fish, crab, and clam tissue data collected in 2014, 2015, and 2016), will collectively support the BERA in evaluating the assessment endpoints for plant, benthic invertebrate, fish, bird, and mammal populations. These assessment endpoints and their associated risk questions were established in the Final Newark Bay Study Area Problem Formulation (Problem Formulation; Tierra 2013) and were re-stated in the SQT QAPP (Tierra 2015b).

1.2.2 Baseline Human Health Risk Assessment

Sediment data collected during the SQT QAPP field sampling effort, as well as sediment data collected in 2014 co-located with the softshell clam collection locations, will be used to support the BHHRA by assessing the potential human health hazard and risk of chemicals from the dermal contact and incidental ingestion exposure routes. Potential surface sediment exposure scenarios are presented in the human health conceptual site model included in the Problem Formulation (Tierra 2013).

1.3 Sampling Rationale

The SQT QAPP field program was developed pursuant to a USEPA-approved Technical Memorandum (Arcadis 2015a) entitled *Risk Assessment Field Sampling and Analysis Program – Newark Bay Study Area*. A random, stratified, gridded sample design was based on the size (areal extent) of the portion of the zone available for sampling, as described in the SQT QAPP (Tierra 2015b). A sediment sample size of 30 was determined, statistically, to be adequate to evaluate relationships among chemical concentrations, amphipod survival, and the various benthic metrics in the NBSA. Using Systat® 12.0, a sample size of 29 was calculated as the minimum size necessary to detect a significant correlation coefficient when the true correlation is 0.5 or greater, with 95% confidence and 80% power. By way of comparison, a sample size of 28 was used to collect SQT samples from each sub-basin in the NY/NJ Harbor Estuary by USEPA's

Regional Environmental Monitoring and Assessment Program (USEPA 2003b). As such, the proposed sample size of 30 is consistent with that utilized by USEPA in the past within Newark Bay.

For logistical purposes only, the NBSA was divided into three geographic zones: Newark Bay North, Newark Bay Central, and Newark Bay South. The 30 sampling stations were randomly placed within each geographic zone to generally provide even spatial distribution of sediment sampling locations. Thirteen stations were located in Newark Bay North, seven stations were located in Newark Bay Central, and 10 stations were located in Newark Bay South (Figure 3). Newark Bay also contains several geomorphic areas, three of which have been identified as important for sampling considerations: Intertidal Areas, Subtidal Flats, and Transitional Slopes¹. Nine of the 30 stations were located in the Intertidal Areas, 18 were located in the Subtidal Flats (including three stations located in the formerly dredged area in Newark Bay North), and three stations were located in the Transitional Slopes (Figure 3).

SQT analyses and porewater chemistry analyses were conducted at the 30 stations. Bioaccumulation tests were conducted at a subset of eight stations (three stations in the Subtidal Flats, one station in the Transitional Slopes, and four stations in the Intertidal Areas).

The table below provides a summary of the numbers of samples and associated analyses for the SQT, additional lines of evidence to support the BERA, and BHHRA analyses and numbers of stations.

Proposed Analysis	Number of Subtidal Flat Stations*	Number of Transitional Slope Stations	Number of Intertidal Stations	Total Number of Sampling Stations
SQT Analyses				
Sediment Chemistry (BHHRA)	18**	3	9***	30
Toxicity Testing with <i>L. plumulosus</i> (10-day)	18	3	9	30
Toxicity Testing with <i>L. plumulosus</i> (28-day)	18	3	9	30
Benthic Invertebrate Community Analysis	18	3	9	30
Additional Lines of Evidence to Support the BERA				
Bioaccumulation Study (<i>N. virens</i>)	3	1	4	8
Porewater Chemistry	18	3	9	30
Additional sediment chemistry for BHHRA	--	--	13	13

Notes:

* Includes formerly dredged areas in Newark Bay North.

** 3 of these subtidal stations are being used to support the BHHRA.

*** 7 of these intertidal stations are being used to support the BHHRA.

¹ Refer to the Problem Formulation (Tierra 2013) for detailed descriptions of the geographic and geomorphic areas.

1.4 Quality Assurance/Quality Control Program

Field and laboratory quality assurance/quality control (QA/QC) procedures were performed according to, and consistent with, the protocols described in the SQT QAPP (Tierra 2015b). QA/QC samples were collected to evaluate the precision, accuracy, representativeness, completeness, and comparability of both field and laboratory procedures. Data were generated using methods designed to confirm that the data collected are of sufficient quantity and quality to meet the Assessment Endpoints noted in Section 1.2.1. Two types of QC checks (field and laboratory) were used to evaluate the data quality. Field and laboratory QA procedures, as outlined in the field and laboratory standard operating procedures (SOPs) of the SQT QAPP, were followed to document proper sample handling and tracking. The field QA/QC program that was used is described in Section 2.9.3 of this SQT Field Report.

2. Field Activities

The SQT QAPP field program was conducted in accordance with the SQT QAPP (Tierra 2015b) and included the following field activities:

- Sampling pre-mobilization activities
- Sampling mobilization activities
- Sediment, benthic invertebrate, and surface water collection (surface water was not a targeted sampling matrix, surface water was collected and used in the field facility for the shipment of sediment for porewater analyses)
- Sediment transport and storage
- Sample processing
- Sample handling, preservation, and shipment to laboratories
- Sample identification and tracking
- Management of field data
- Field activity assessment

These field activities are described below.

2.1 Sampling Pre-Mobilization Activities

Prior to initiating sediment collection activities, a series of pre-mobilization activities were completed. These activities included permitting, sediment sample location utility clearance, field readiness review, and collection of a Teflon®-liner field blank sample. These activities are described below.

2.1.1 Permitting

The SQT QAPP field activities did not require obtaining permits, but did require notification of the project scope to the United States Coast Guard (USCG) Local Notice to Mariners. The USCG was notified by letter on September 3, 2015.

2.1.2 Grab Sample Location Utility Clearance

Utilities located near sediment sampling locations were identified with assistance from NJ One Call and New York City/Long Island (NYC/LI) One Call. NJ and NYC/LI One Call identified 46 companies as potentially having underground utilities near the proposed SQT QAPP sampling locations. These companies were contacted to confirm if the proposed sampling locations were near their respective subsurface utilities.

Three proposed sampling stations (153, 167, and 173) were relocated prior to implementing the SQT QAPP field program due to their proximity to identified utilities. Location 153 was moved approximately 75 feet north parallel to the shoreline, location 167 was moved approximately 20 feet south along the shoreline, and location 173 was moved approximately 20 feet south along the shoreline. Each of these new sampling locations remained within the proposed geomorphic areas from the SQT QAPP and were approved by USEPA. A summary of changes is provided in Table 1. The USEPA-approved Protocol Modification Form documenting these sampling location changes is provided in Appendix A.

Prior to sampling at stations 149, 150, 167, 172, 176, and 178, utility representatives requested notification the day before sampling so they could observe sampling activities. Utility representatives were contacted the day before sampling at these stations.

2.1.3 Readiness Review

In accordance with the SQT QAPP (Tierra 2015b), a readiness review was conducted on August 27, 2015. This readiness review was conducted to review the details of SQT field activities, including pre-mobilization and mobilization activities and sample collection and processing. Representatives from Tierra, Arcadis, and FTS were present during the readiness review.

2.1.4 Teflon®-Liner Pre-Program Field Blank Collection

Teflon® liners were used to line the 5-gallon plastic buckets used to hold and ship sediment collected from each sampling station. The liners were used to provide a barrier and eliminate contact between the plastic 5-gallon buckets and the collected sediment. The liners provided protection from potential cross-contamination due to possible leaching of COPCs/COPECs from the plastic buckets into the sediment. Prior to use, a field blank was collected on August 6, 2015 to confirm the Teflon® liners were clean (i.e., void of any chemical contaminants), and therefore, appropriate for use. COPCs/COPECs were not detected above the project quantitation limits (PQLs) in the field blank, indicating the Teflon® liners would not be a source of cross-contamination. The Teflon®-liner pre-program field blank analytical results are provided in Appendix B.

2.2 Sampling Mobilization Activities

Following pre-mobilization, Arcadis began mobilization procedures for SQT QAPP sampling. The mobilization activities included equipment decontamination, processing area setup, and vessel mobilization. These activities are described below.

2.2.1 Equipment Decontamination

In accordance with SOP No. 3 – Decontamination of the SQT QAPP (Tierra 2015b), sediment collection and sample processing equipment were decontaminated on September 9, 2015 at the 80 Lister Avenue facility in Newark, New Jersey. The decontamination procedures included an Alconox scrub, followed by a tap water rinse, followed by a nitric acid rinse, followed by a deionized (DI) water rinse, followed by a methanol rinse, followed by a hexane rinse, and finally, followed by a DI water rinse. This decontamination process was continued throughout sediment collection activities. Section 2.9.3.1 describes the collection of field blanks associated with this decontamination procedure.

2.2.2 Processing Area Mobilization

A processing area was set up at the 80 Lister Avenue facility in Newark, New Jersey on September 9, 2015. For health and safety purposes, an area immediately outside the facility served as the exclusion zone, where sediment processing and sampling activities were conducted. The contamination reduction zone, including personal protective equipment (PPE) and chemical storage, was located between the exclusion zone and the garage door leading to the facility. Additional PPE and chemicals were stored in the designated decontamination area within the facility. The facility contained a walk-in refrigerator (temperature controlled to 4 degrees Celsius [°C]) for bulk sediment and surface water storage. Sediment samples for chemistry analysis were stored in coolers within the walk-in refrigerator during processing activities, prior to being shipped to their respective laboratories.

2.2.3 Sampling Vessel Mobilization

On September 9, 2015, Arcadis mobilized a sampling vessel to the NBSA. The vessel was a 26-foot pontoon boat, equipped with (among other standard marine equipment) the following or equivalent instrumentation and equipment: a real-time kinematic differential global positioning system; HYPACK Max marine survey positioning software; petite PONAR dredges (6-inch); standard PONAR dredges (9-inch); 5-gallon plastic buckets; Teflon® liners for 5-gallon buckets; and large coolers for sediment, surface water, and benthic invertebrate sample storage. The Arcadis sampling vessel was launched daily from the Passaic River Yacht Club in Kearny, New Jersey.

2.3 Sediment, Benthic Invertebrate, and Surface Water Collection

In accordance with the procedures outlined in the SQT QAPP (Tierra 2015b), sediment and benthic invertebrate samples were collected using grab sampling techniques, and surface water was collected using a peristaltic pump. Surface water was collected to provide overlying water for the sediment to be used in the porewater tests. These activities are described below.

2.3.1 Sediment Collection

Sediment grab samples were collected from 43 stations over 13 days (September 13 to 17, September 20 to 24, and September 28 to 30, 2015). Sample stations were located in accordance with SOP No. 1 – Locating Sample Points Using Global Positioning System and SOP No. 2 – Positioning of the SQT QAPP (Tierra 2015b). The original locations of stations 140, 143, 145, 160, 176, 177, and 178 were field adjusted/moved due to lack of sufficient recoverable sediment at the proposed locations (see Table 1), as required per the SQT QAPP. These revised sampling station locations were discussed with and verbally approved by USEPA in the field. Coordinates of the final sampling stations are provided in Table 2, and the final sediment sampling stations are shown on Figure 3.

Sediment grab samples were collected in accordance with SOP No. 6 – Sediment Sample Collection of the SQT QAPP (Tierra 2015b). Following positioning over the grab sample locations, sediment was collected using a petite PONAR dredge (6 inches by 6 inches) lowered by hand to the sediment surface. If insufficient recovery was encountered using the petite PONAR dredge, a standard PONAR dredge (9 inches by 9 inches) was used. Table 2 includes the PONAR size used for each sample location. Multiple attempts were needed at each location to collect sufficient sediment mass for the planned laboratory analyses. Surface sediment collection forms are provided in Appendix C.

The first sediment grab sample retrieved from each location was emptied into a decontaminated stainless steel bowl, and chemistry samples were collected using a decontaminated stainless steel spoon for laboratory analysis of VOCs, acid volatile sulfide/simultaneously extracted metals, and total extractable petroleum hydrocarbons- (TEPH-) purgeables, as described in SOP No. 6 – Sediment Sample Collection of the SQT QAPP (Tierra 2015b). This sediment was not composited or homogenized with the rest of the collected sediment. After this first sediment grab sample was collected, a series of additional grab samples were collected at each station to obtain sufficient sediment mass to perform the remaining sediment chemistry analyses, sediment toxicity testing, benthic invertebrate collection, bioaccumulation testing (as necessary), and ex-situ porewater passive sampling. This sediment was placed directly into Teflon®-lined 5-gallon plastic buckets from the petite PONAR dredge. However, if the standard sized PONAR was used, sediment grabs were first emptied into a decontaminated stainless steel bowl and then transferred into the Teflon®-lined bucket to avoid ripping the liner with the dredge. Each Teflon®-lined bucket was filled approximately three-quarters full of sediment, each liner was sealed with electrical tape, lids were placed on each bucket, and the buckets were labeled prior to storage in the on-board coolers filled with ice. The amount of bulk sediment needed at each location varied depending on the planned analyses/tests. Table 3 shows the analyses/tests conducted at each sampling station.

There was one deviation from the SQT QAPP (Tierra 2015b) recorded during sediment collection activities. Section 2.2 of SOP No. 6 – Sediment Sample Collection of the SQT QAPP (Tierra 2015b) does not provide an acceptable percent recovery value for a grab sample. As such, an acceptable percent recovery of the grab sampler was defined as approximately 3 inches (or 50 percent penetration with the 6-inch PONAR). If hard bottom or an unacceptable percent recovery was encountered at a sampling location, the field crew probed the sediment bottom around the targeted location (no more than 500 feet from the target

coordinates) to locate a more suitable sampling location. If no suitable location could be located, Tierra contacted USEPA to suggest an alternate sampling location. The USEPA-approved Protocol Modification Form for this deviation is provided in Appendix A.

2.3.2 Benthic Invertebrate Collection

Three discrete grab samples were collected from each of the 30 SQT sampling stations for benthic invertebrate community analysis using a petite PONAR dredge or a standard PONAR dredge, depending on sediment recovery at each sampling location. Table 2 lists the PONAR size used at each sampling location. Vessel positioning and sediment collection are described in Section 2.3.1. Each of the three grab samples were sieved immediately and independently after collection, as described in SOP No. 6 – Sediment Sample Collection of the SQT QAPP (Tierra 2015b). The contents of each sieved grab sample were photographed, placed in appropriately labelled sample containers, preserved with isopropyl alcohol, and sealed as described in SOP No. 5 – Containers, Preservation, Handling, and Tracking of Samples for Analysis and SOP No. 6 – Sediment Sample Collection of the SQT QAPP. These samples were not homogenized. Appendix D contains photographs of the benthic invertebrate samples collected at each sampling station.

There was one deviation from the SQT QAPP (Tierra 2015b) recorded during benthic invertebrate sample collection. Worksheet #19-5 indicated that two 1-gallon Ziploc freezer bags (or equivalent) would be used as the containers for the benthic invertebrate community assessment; however, the laboratory conducting the benthic invertebrate community assessment sent 1-liter plastic bottles for the samples. As such, 1-liter plastic bottles were used to collect the benthic invertebrate community samples. The USEPA-approved Protocol Modification Form for this deviation is provided in Appendix A.

2.3.3 Surface Water Collection

Approximately 70 gallons of surface water were collected using a peristaltic pump and Teflon® tubing from one location in northern Newark Bay for use in the ex-situ porewater passive sampling study. The surface water was collected in Teflon®-lined 5-gallon buckets. Approximately 20 gallons of surface water was collected on September 13, 2015, approximately 20 gallons was collected on September 14, 2015, and approximately 30 gallons was collected on September 28, 2015. The surface water was collected from the mid-depth of the water column at the sampling location. The surface water collection location is shown on Figure 3.

2.3.4 Surface Water Quality Measurements

Surface water quality measurements were recorded in the field notebook at each sampling station in accordance with SOP No. 7 – Measuring Surface Water Quality of the SQT QAPP (Tierra 2015b). Surface water quality parameters recorded during SQT sampling activities include temperature, conductivity, salinity, dissolved oxygen, pH, and oxidation reduction potential. The measurements are provided in Table 4.

2.4 Sample Transport and Storage

Samples were transported and stored in accordance with the procedures outlined in SOP No. 6 – Sediment Sample Collection of the SQT QAPP (Tierra 2015b). During sediment collection activities, sediment was stored on the vessel in Teflon®-lined 5-gallon buckets stored in large coolers filled with ice. To maintain the appropriate storage temperature, the ice in the coolers was replaced daily. At the end of each sampling day, the coolers containing the 5-gallon buckets were unloaded from the vessel and transported from the marina to the 80 Lister Avenue facility in Newark for storage in a walk-in refrigerator maintained at 4°C for subsequent processing.

Field-preserved benthic invertebrate samples were stored on the vessel in dedicated coolers without ice. At the end of each sampling day, the coolers were unloaded from the vessel and transported from the marina to the 80 Lister Avenue facility for storage in a dedicated area of the facility. Refrigeration of these samples was not required, as per the SQT QAPP (Tierra 2015b).

2.5 Sediment Processing and Sample Collection

Sediment was processed over 13 days (September 14 to 18, September 21 to 25, and September 29 to October 1, 2015) in accordance with SOP No. 5 – Containers, Preservation, Handling, and Tracking of Samples for Analysis and SOP No. 6 – Sediment Sample Collection of the SQT QAPP (Tierra 2015b). Sediment collected from each sampling location was processed the day after collection. Additional details are provided below.

2.5.1 Procedures Used for Sample Collection

Prior to sample preparation, the bulk sediment samples from each sampling station were homogenized in a large decontaminated stainless steel mechanical mixer in accordance with SOP No. 6 – Sediment Sample Collection of the SQT QAPP (Tierra 2015b). Sediment samples were mixed until textural, color, and moisture homogeneity were achieved. The mechanical mixer was decontaminated between sampling stations as described in SOP No. 3 – Decontamination of the SQT QAPP (Tierra 2015b). Once homogenized, the appropriate amount of sediment for each analysis was placed in appropriately labeled sample containers, as described in the SQT QAPP. Sediment for chemistry analysis was transferred from the mixer into a decontaminated stainless steel bowl and then transferred into the appropriate sample jars using decontaminated stainless steel spoons. Sediment for toxicity, bioaccumulation, and porewater analyses was transferred directly from the mixer into the appropriate sample containers. For sampling locations where sediment was collected for chemistry analysis only, sediment was mixed in a Teflon®-lined 5-gallon bucket using a large decontaminated stainless steel spoon until homogeneity was achieved, and then the sediment was transferred into the appropriate sample jars using decontaminated stainless steel spoons.

Sediment sample redox conditions likely changed during homogenization in the mechanical mixer, in comparison to the in-situ conditions. As described in the USEPA-approved QAPP (Tierra 2015b), the

homogenized samples in the 5-gallon buckets used for analysis of metals and other inorganics were allowed to sit for two weeks prior to the start of the porewater study to re-establish redox conditions since most dissolved inorganics and metals are redox sensitive. The potential impacts of changes in redox conditions on the ex-situ porewater analytical results will be discussed in the risk assessment's uncertainty analysis.

During sample processing, one Surface Sediment Sample Processing Form was completed for each sampling location. A visual description of each sample was recorded on the Surface Sediment Sample Processing Form during sample collection both prior to and after homogenization using the mechanical mixer. In addition, a photograph of each sample was taken after homogenization. Photographs of each sample are provided in Appendix D and the Surface Sediment Sample Processing Forms are provided in Appendix E.

There was one deviation from the SQT QAPP (Tierra 2015b) recorded during analytical chemistry sample processing activities. Section 2.2 of SOP No. 6 – Sediment Sample Collection of the SQT QAPP (Tierra 2015b) states "Collect a small aliquot (approximately 1 ounce) of sediment representative of the quality encountered during sampling activities"; however, continuous air monitoring was conducted within the sample processing area during sample processing activities; therefore, a separate photoionization detector (PID) headspace screening was not necessary. As such, PID headspace screening was not conducted during sediment sample collection activities. The USEPA-approved Protocol Modification Form for this deviation is provided in Appendix A.

2.5.1.1 Sediment Chemistry

For sediment chemistry analyses, the appropriate amount of homogenized sediment for each analysis, as described in the SQT QAPP (Tierra 2015b), was placed in appropriately labeled sample containers. Once filled, each container was sealed and stored for shipment to the laboratory at the end of the sampling day.

2.5.1.2 Toxicity and Bioaccumulation Testing

For the 22 out of 30 stations where only toxicity testing was conducted (no bioaccumulation testing), one Teflon®-lined 5-gallon plastic bucket was prepared for each station. Approximately 1.5 gallons of homogenized sediment was placed in each 5-gallon bucket. For the eight stations where both toxicity and bioaccumulation testing were conducted, two Teflon®-lined 5-gallon plastic buckets were prepared for each station. Approximately 4 gallons of homogenized sediment were placed in each 5-gallon bucket.

Once the 5-gallon buckets were filled, air was squeezed out of the Teflon® liner, the top of the Teflon® liner was secured with electrical tape, and the bucket was sealed and stored in the walk-in refrigerator for shipment to the laboratory.

2.5.1.3 Porewater Passive Sampling

For ex-situ porewater passive sampling, one 5-gallon plastic bucket was prepared for each station. Approximately 4 gallons of homogenized sediment were placed in each 5-gallon bucket. The remaining space in each bucket (approximately 1 gallon) was then filled with site surface water. In addition to the 5-gallon plastic bucket, a 1-gallon plastic bucket was prepared for each sampling station. Approximately 1 gallon of homogenized sediment was placed in each 1-gallon bucket. Site surface water was not placed in this 1-gallon bucket. A 1-liter (L) amber glass bottle was filled with approximately 0.8-L of homogenized sediment for each sampling station. Once filled, each bucket and each 1-L amber glass bottle was sealed and stored in the walk-in refrigerator for transport to the laboratory.

In addition to sediment, six Teflon®-lined 5-gallon plastic buckets were filled with approximately 23 gallons of site surface water for use in the ex-situ porewater passive sampling program. Once filled, the top of the Teflon® liner in each bucket was secured with electrical tape, and each bucket was sealed and stored in the walk-in refrigerator for shipment to the laboratory.

2.5.2 United States Environmental Protection Agency Split Samples

2.5.2.1 Sediment Chemistry

Five split samples were collected for sediment chemistry analysis. Arcadis personnel filled the USEPA-provided sample jars with sediment to at least the required minimum sample mass and provided the jars to USEPA oversight personnel for handling, preservation, and shipment to laboratories. Split sample details are presented in Table 5.

2.5.2.2 Toxicity and Bioaccumulation Testing

Five split samples were collected for toxicity testing and two split samples were collected for bioaccumulation testing. Arcadis filled sample containers with sediment to at least the required minimum sample mass and transported the sample containers to the laboratories for testing. Split sample details are presented in Table 5.

2.5.2.3 Porewater Passive Sampling

Four split samples were collected for porewater passive sampling chemical analysis. Arcadis and University of Maryland Baltimore County personnel filled the USEPA-provided sample jars with porewater from the dialysis bags, or PE/POM strips, and shipped the samples to the laboratories as instructed by USEPA. Split sample details are presented in Table 5.

2.5.3 Investigation-Derived Waste

Investigation-derived waste was managed in accordance with SOP No. 4 – Management and Disposal of Residuals of the SQT QAPP (Tierra 2015b). Drums were used to collect leftover sediment, used PPE, trash, and aqueous waste generated during sediment collection and processing activities. Sediment, PPE, and trash were placed in drums for storage and shipped off-site for disposal. Aqueous waste was placed in drums for treatment at the on-site water treatment system, which is capable of treating aqueous, investigation-derived wastes that result from sediment processing and decontamination activities.

2.6 Sample Handling, Preservation, and Shipment to Laboratories

2.6.1 Analytical Chemistry Samples

Sediment samples for analytical chemistry analysis were handled, preserved, and shipped to laboratories in accordance with SOP No. 5 – Containers, Preservation, Handling, and Tracking of Samples for Analysis of the SQT QAPP (Tierra 2015b). Following placement of sediment in jars, jar lids were secured and jar labels were sealed with clear tape. Sample jars were then placed in appropriately sized bubble-wrap and sealed inside plastic Ziploc® bags. Sealed and wrapped jars were placed in padded coolers filled with ice. Trip blanks, where required, and temperature blanks were placed in coolers as per SOP No. 5 – Containers, Preservation, Handling and Tracking of Samples for Analysis of the SQT QAPP. Coolers were appropriately sealed with signed custody seals prior to shipment to, or pickup by, the analytical laboratories.

The deviations from the SQT QAPP (Tierra 2015b) recorded during analytical chemistry sample handling activities are described below.

- Worksheet #19-1, Preservation Requirements for mercury. The preservative (BrCl) needed for mercury field blanks could not be shipped because it is a hazardous liquid; therefore, mercury samples were preserved upon arrival at the laboratory and not in the field.
- Worksheet #19-1, Containers (Number and Type) for mercury. Smaller bottles (250 milliliter) were provided for mercury samples than those listed in Worksheet #19-1. It was confirmed with the laboratory that the change in bottle size was intended and the smaller volume would still provide the volume required to meet the PQLs.
- Worksheet #19-1, Containers (Number and Type) for phosphorus/nitrogen and ammonia. Labels applied to the phosphorus/nitrogen and ammonia sample bottles were inadvertently switched during sample processing activities. This was corrected and all jars were labeled correctly for the remainder of the program.
- Worksheet #19-2, Containers (number and type) for sediment samples. The jar size listed on the sample labels was incorrect, some 12 ounce jars were labeled as 8 ounce jars. This was corrected and all jars were labeled correctly for the remainder of the program.

The USEPA-approved Protocol Modification Form for these deviations is provided in Appendix A.

2.6.2 Benthic Invertebrate Samples

Benthic invertebrate samples were handled and preserved in accordance with SOP No. 5 – Containers, Preservation, Handling, and Tracking of Samples for Analysis of the SQT QAPP (Tierra 2015b). Following collection, the contents of each sieved grab sample were placed in laboratory-cleaned 1-L Nalgene sample containers, preserved with isopropyl alcohol, sealed, and stored in dedicated coolers without ice. Refrigeration of these samples was not required. Benthic invertebrate samples were picked up by the laboratory on September 30, 2015.

2.6.3 Toxicity and Bioaccumulation Samples

Sediment samples for toxicity and bioaccumulation tests were handled, preserved, and shipped to laboratories in accordance with SOP No. 5 – Containers, Preservation, Handling, and Tracking of Samples for Analysis of the SQT QAPP (Tierra 2015b). Following placement of sediment in Teflon®-lined plastic buckets, air was squeezed out of the Teflon® liner, the top of the Teflon® liner was secured with electrical tape, and the bucket was sealed and stored in the walk-in refrigerator for shipment to the laboratory. Toxicity and bioaccumulation samples were picked up by the laboratory on September 23, 2015 and October 1, 2015.

2.6.4 Porewater Passive Sampling

Sediment samples and surface water for porewater passive sampling were handled, preserved, and shipped to laboratories in accordance with SOP No. 5 – Containers, Preservation, Handling, and Tracking of Samples for Analysis of the SQT QAPP (Tierra 2015b). Following placement of sediment and surface water in sample containers, each bucket and each 1-L amber glass bottle was sealed and stored in the walk-in refrigerator for transport to the laboratory. Sediment and surface water for the porewater passive sampling study were transported to the laboratory via refrigerated truck on October 1, 2015.

2.7 Sample Identification and Tracking

Samples were identified and tracked using the nomenclature, conventions, and procedures described in SOP No. 5 – Containers, Preservation, Handling, and Tracking of Samples for Analysis of the SQT QAPP (Tierra 2015b). Prescribed custody procedures were followed, with shipping receipts acting as documentation of custody during sample shipment.

Upon receipt, laboratory personnel inspected samples for integrity, agreement with chain-of-custody forms, and for evidence of tampering during shipment. Laboratory personnel also verified that the shipping container temperatures were within the acceptable range. Laboratory internal chain-of-custody procedures were followed, as outlined in the SQT QAPP.

2.8 Management of Field Data

Field documentation was completed in accordance with SOP No. 8 – Documenting Field Activities and SOP No. 9 – Data Management of the SQT QAPP (Tierra 2015b). Pertinent field data, including weather conditions, air temperature, field personnel, field equipment, field equipment calibration, health and safety documentation, utility clearance, sample collection, sample coordinates, and processing were recorded in daily logbooks and on field forms. Surface Sediment Collection Forms are provided in Appendix C and Surface Sediment Processing Forms are included in Appendix E.

2.9 Field Activity Assessments

2.9.1 Internal Field Audits

In accordance with the SQT QAPP (Tierra 2015b), Arcadis personnel performed an internal field audit. The field audit was performed on September 16, 2015. The audit evaluated SQT QAPP tasks, including sample processing, transport, and storage; sample handling, preservation, and shipment; data collection and management; and project documentation.

Observations and audit findings were documented in a summary memorandum (Arcadis 2015b) and provided to the Quality Assurance Officer. Corrective actions were verified and documented by project personnel in the field audit summary memorandum (Arcadis 2015b).

2.9.2 Field Quality Assurance/Quality Control Program

Field QC samples were submitted to the laboratory from the field. Two types of field QC samples were used: blanks (field and trip blanks) and field duplicates.

2.9.2.1 Field Blanks

Field blanks were used to monitor potential contamination present on field equipment. Such contamination, if present, can be a result of ineffective decontamination. Two sets of equipment were used for sampling and processing to accommodate the collection of sediment and processing of samples on alternating days. Following each sample collection and processing event, pieces of equipment (both used and unused) belonging to the equipment set that was assigned to that day were decontaminated in accordance with SOP No. 3 – Decontamination of the SQT QAPP (Tierra 2015b). A field blank was collected following decontamination. The field blank samples were collected using laboratory-supplied DI water (or hexane for dioxins/furans) and analyzed for the analytes listed in Worksheet #15-1 of the SQT QAPP. One set of equipment was used throughout one sample collection and processing event so that the field blank corresponded to one set of samples.

2.9.2.2 *Trip Blanks*

Trip blanks were submitted for VOC, mercury, and methylmercury analyses only. The trip blanks were obtained from the analytical laboratories and carried with the field sample bottles during shipment from the sediment processing area to the laboratories.

2.9.2.3 *Field Duplicates*

Field duplicates were processed at a frequency of one field duplicate per 20 field samples per matrix and per analytical method. Field duplicates were prepared by transferring an aliquot of a given sediment homogenate into two separate sets of sample containers. The duplicate pair was then submitted “blind” to the laboratory. These blind samples were noted in a logbook and given a unique sample number that did not indicate to the laboratory that the sample was a QC check. Field duplicate information is provided in Table 3.

3. References

- Arcadis. 2015a. Final Technical Memorandum: Risk Assessment Field Sampling and Analysis Program – Newark Bay Study Area. November.
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- Tierra. 2014a. Newark Bay Study Area Crab and Clam Sampling and Analysis Quality Assurance Project Plan. Tierra Solutions, Inc. East Brunswick, New Jersey. Revision 3a. August.
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Tables

Table 1
Summary of Changes to Sampling Station Locations During SQT Sampling Activities

Station	Target Station Location as per the SQT QAPP		USEPA-Approved Sample Location		Reason for Location Change
	Northing (NAD83)	Easting (NAD83)	Northing (NAD83)	Easting (NAD83)	
140	672244	598110	686503	599390	Refusal on rocks and clay
143	667683	595195	668400	595258	Refusal on rocks and clay
145	664638	593252	665489	593617	Refusal on rocks and clay
153	663086	587950	663689	587675	Moved due to proximity to utilities
160	678863	595986	678968	595729	Refusal on rocks and clay
167	677862	600220	677867	600221	Moved due to proximity to utilities
173	663349	591874	662628	591214	Moved due to proximity to utilities
176	659504	587266	659960	584955	Refusal on rocks and clay
177	660071	578784	659787	579784	Refusal on rocks and clay
178	659930	590417	660174	590293	Refusal on rocks and clay

Notes:

NAD83 = North American Datum of 1983, New Jersey State Plane in feet

SQT = sediment quality triad

USEPA = United States Environmental Protection Agency

Table 2
SQT Sampling Stations

Station	Date Sediment Collected ¹	PONAR Used To Collect Sediment ²	Northing (NAD83)	Easting (NAD83)	Geographic Area	Sampled Geomorphic Area
136	9/14/2015	Petite	681135	601799	North	Intertidal Area
137	9/14/2015	Petite	680935	600448	North	Subtidal Flats
138	9/14/2015	Petite	679668	599218	North	Subtidal Flats
139	9/15/2015	Petite	674973	597445	North	Subtidal Flats
140	9/29/2015	Petite	686503	599390	North	Intertidal Area
141	9/16/2015	Petite	670947	595954	Central	Subtidal Flats
142	9/28/2015	Standard	670005	596486	Central	Intertidal Area
143	9/29/2015	Petite	668400	595258	Central	Subtidal Flats
144	9/17/2015	Petite	666937	592990	Central	Subtidal Flats
145	9/29/2015	Petite	665489	593617	Central	Subtidal Flats
146	9/21/2015	Standard	660460	589829	South	Transitional Slopes
147	9/21/2015	Petite	657473	588745	South	Intertidal Area
148	9/21/2015	Petite	657978	587445	South	Subtidal Flats
149	9/22/2015	Standard	659186	583305	South	Intertidal Area
150	9/22/2015	Petite	659366	585546	South	Transitional Slopes
151	9/20/2015	Petite	661397	582469	South	Subtidal Flats
152	9/29/2015	Standard	663446	584459	South	Intertidal Area
153	9/23/2015	Petite	663689	587675	South	Subtidal Flats
154	9/20/2015	Standard	663935	585937	South	Subtidal Flats
155	9/20/2015	Standard	665442	586321	South	Intertidal Area
156	9/17/2015	Petite	669963	593889	Central	Transitional Slopes
157	9/16/2015	Petite	674688	593261	Central	Subtidal Flats
158	9/24/2015	Standard	675427	596016	North	Subtidal Flats
159	9/24/2015	Standard	676931	595916	North	Navigation Channels
160	9/28/2015	Standard	678968	595729	North	Intertidal Area
161	9/15/2015	Petite	680822	596884	North	Subtidal Flats
162	9/21/2015	Petite	681975	598454	North	Navigation Channels
163	9/22/2015	Petite	683444	598470	North	Navigation Channels
164	9/13/2015	Petite	686860	600335	North	Intertidal Area
165	9/13/2015	Petite	683469	600942	North	Subtidal Flats
166	9/13/2015	Petite	684599	601798	North	NA
167	9/14/2015	Petite	677867	600221	North	NA
168	9/15/2015	Petite	677071	599928	North	NA
169	9/15/2015	Petite	675559	599355	North	NA
170	9/16/2015	Petite	669350	595489	Central	NA
171	9/17/2015	Petite	668454	595309	Central	NA
172	9/23/2015	Petite	664204	592141	Central	NA
173	9/23/2015	Petite	662628	591214	South	NA
174	9/20/2015	Petite	661860	590655	South	NA
175	9/21/2015	Petite	658096	590879	South	NA
176	9/23/2015	Petite	659960	584955	South	NA
177	9/29/2015	Petite	659787	579784	South	NA
178	9/23/2015	Petite	660174	590293	South	NA
Surface Water ³	9/13/2015; 9/14/2015; 9/28/2015	NA	685568	601084	NA	NA

Notes:

¹Sample processing was completed the day after sediment collection. The sample date on sample bottles and chain of custody forms is the processing date.

²Petite PONAR measures 6 inches square and a standard PONAR measures 9 inches square.

³Surface water was not a targeted sampling matrix. Surface water was collected and used in the field facility for the shipment of sediment for porewater analyses.

NA = not applicable

NAD83 = North American Datum of 1983, New Jersey State Plane in feet

SQT = sediment quality triad

Table 3
Sampling Detail

Station	Date Sediment Collected ¹	Date Samples Processed ¹	Sediment Chemistry	Toxicity	Porewater Chemistry	Bioaccumulation Test using <i>N. virens</i>	BHHRA Sediment Chemistry	Notes
136	9/14/2015	9/15/2015	X	X	X	X	X	
137	9/14/2015	9/15/2015	X	X	X			
138	9/14/2015	9/15/2015	X	X	X	X		
139	9/15/2015	9/16/2015	X	X	X			
140	9/29/2015	9/30/2015	X	X	X		X	
141	9/16/2015	9/17/2015	X	X	X	X		
142	9/28/2015	9/29/2015	X	X	X		X	
143	9/29/2015	9/30/2015	X	X	X		X	
144	9/17/2015	9/18/2015	X	X	X			
145	9/29/2015	9/30/2015	X	X	X		X	
146	9/21/2015	9/22/2015	X	X	X	X		
147	9/21/2015	9/22/2015	X FD, MS/MSD	X	X FD	X		Collected field duplicates for chemistry and porewater (NB03SEDDUP-04)
148	9/21/2015	9/22/2015	X	X	X			
149	9/22/2015	9/23/2015	X	X	X	X FD, MS/MSD	X	Collected field duplicate for bioaccumulation (NB03SEDDUP-05)
150	9/22/2015	9/23/2015	X	X	X			
151	9/20/2015	9/21/2015	X	X FD	X			Collected field duplicate for toxicity (NB03SEDDUP-02)
152	9/29/2015	9/30/2015	X FD, MS/MSD	X	X FD, MS/MSD			Collected field duplicate for chemistry and porewater (NB03SEDDUP-06)
153	9/23/2015	9/24/2015	X	X	X MS/MSD			
154	9/20/2015	9/21/2015	X	X FD	X			Collected field duplicate for toxicity (NB03SEDDUP-03)
155	9/20/2015	9/21/2015	X	X	X		X	
156	9/17/2015	9/18/2015	X	X	X			
157	9/16/2015	9/17/2015	X	X	X			
158	9/24/2015	9/25/2015	X	X	X			
159	9/24/2015	9/25/2015	X	X	X			
160	9/28/2015	9/29/2015	X	X	X	X	X	
161	9/15/2015	9/16/2015	X	X	X	X	X	
162	9/21/2015	9/22/2015	X	X	X			
163	9/22/2015	9/23/2015	X	X	X			
164	9/13/2015	9/14/2015	X	X	X		X	
165	9/13/2015	9/14/2015	X	X	X			
166	9/13/2015	9/14/2015					X	

Table 3
Sampling Detail

Station	Date Sediment Collected ¹	Date Samples Processed ¹	Sediment Chemistry	Toxicity	Porewater Chemistry	Bioaccumulation Test using <i>N. virens</i>	BHHRA Sediment Chemistry	Notes
167	9/14/2015	9/15/2015					X	
168	9/15/2015	9/16/2015					X FD, MS/MSD	Collected field duplicate for sediment chemistry (NB03SEDDUP-01)
169	9/15/2015	9/16/2015					X	
170	9/16/2015	9/17/2015					X	
171	9/17/2015	9/18/2015					X	
172	9/23/2015	9/24/2015					X	
173	9/23/2015	9/24/2015					X	
174	9/20/2015	9/21/2015					X	
175	9/21/2015	9/22/2015					X	
176	9/23/2015	9/24/2015					X	
177	9/29/2015	9/30/2015					X	
178	9/23/2015	9/24/2015					X	

Notes:

¹Sample processing was completed the day after sediment collection. The sample date on sample bottles and chain of custody forms is the processing date.

BHHRA = baseline human health risk assessment

FD = field duplicate

MS/MSD = matrix spike/matrix spike duplicate

Table 4
Surface Water Quality Measurements

Station	Date Measured	Water Depth (feet)	Depth (feet below water surface)	Temperature (°C)	Conductivity (μS/cm)	Salinity (ppt)	Dissolved Oxygen (mg/L)	pH (SU)	ORP (mV)
North Zone									
136	9/14/2015	7.5	1.0	21.76	31.94	20.06	5.85	7.70	14.2
			2.0	22.34	34.62	20.52	5.84	7.70	17.3
			3.0	22.42	35.28	21.47	5.80	7.69	17.8
			4.0	22.43	35.49	22.15	5.69	7.68	17.5
			5.0	22.43	35.52	22.34	5.65	7.68	17.4
			6.0	22.40	35.59	22.40	5.67	7.68	17.6
137	9/14/2015	6.8	1.0	23.19	35.91	22.67	6.44	7.60	-22.3
			2.0	23.21	35.92	22.68	6.31	7.65	-16.7
			3.0	23.22	35.92	22.69	6.16	7.67	-13.5
			4.0	23.21	35.91	22.68	6.04	7.68	-10.8
			5.0	23.23	35.94	22.70	5.95	7.69	-5.8
138	9/14/2015	11.4	1.0	23.11	37.23	23.60	6.81	7.76	41.6
			2.0	23.11	37.22	23.60	6.34	7.75	31.2
			3.0	23.12	37.32	23.67	6.18	7.74	28.5
			4.0	23.64	38.37	24.39	5.70	7.71	26.0
			5.0	23.70	38.39	24.41	5.65	7.71	25.5
			6.0	23.71	38.42	24.43	5.61	7.71	25.2
			7.0	23.24	38.46	24.46	5.46	7.70	25.2
			8.0	23.75	38.49	24.48	5.39	7.70	26.0
			9.0	23.79	38.54	24.51	5.29	7.69	26.1
			10.0	23.81	38.56	24.52	5.25	7.68	25.2
139	9/15/2015	10.7	1.0	23.15	36.66	23.19	6.17	7.60	-11.2
			2.0	23.28	36.84	23.37	5.96	7.64	-9.6
			3.0	23.62	37.93	24.10	6.08	7.68	-7.4
			4.0	23.65	38.23	24.33	5.94	7.69	-6.3
			5.0	23.61	38.37	24.40	5.82	7.69	-5.4
			6.0	23.58	38.40	24.43	5.81	7.69	-4.8
			7.0	23.56	38.46	24.46	5.71	7.69	-4.3
			8.0	23.55	38.48	24.47	5.54	7.68	-4.0
			9.0	23.55	38.48	24.48	5.50	7.68	-3.9
			10.0	23.55	38.49	24.48	5.45	7.60	-4.0
140	9/16/2015	6.0	1.0	23.11	37.36	23.69	7.02	7.51	53.1
			2.0	23.08	37.37	23.70	7.54	6.26	38.6
			3.0	23.08	37.36	23.69	5.97	7.59	24.1
			4.0	23.09	37.37	23.70	5.71	7.61	17.4
			5.0	23.04	37.37	23.70	5.49	7.62	13.5
140	9/29/2015	4.2	2.1	21.45	34.68	21.85	5.77	8.00	6.9
158	9/17/2015	13.9	2.0	23.85	37.57	23.77	5.47	7.55	121.1
			7.0	23.84	38.07	24.19	5.94	7.57	134.1
			11.9	23.82	38.57	24.53	8.26	7.59	155.1
158	9/24/2015	12.7	1.0	21.89	38.36	24.42	6.82	7.94	10.3
			6.4	21.90	38.36	24.41	7.02	8.03	5.4
			10.7	21.86	38.33	24.40	7.01	8.19	1.6
159	9/24/2015	37.6	1.0	21.87	37.36	23.71	6.72	7.63	117.0
			18.8	22.03	37.91	24.09	6.45	7.63	118.1
			35.6	22.15	38.48	24.50	6.57	7.62	122.2

Table 4 - Surface Water Quality Measurements_Rev1

Table 4
Surface Water Quality Measurements

Station	Date Measured	Water Depth (feet)	Depth (feet below water surface)	Temperature (°C)	Conductivity (μS/cm)	Salinity (ppt)	Dissolved Oxygen (mg/L)	pH (SU)	ORP (mV)
160	9/15/2015	4.0	1.0	22.85	36.71	23.27	5.84	7.05	4.0
			2.0	23.24	37.42	23.77	5.22	7.29	1.2
			3.0	23.29	37.71	23.95	5.20	7.45	-0.4
160	9/28/2015	3.4	1.7	21.15	37.31	23.70	5.95	7.92	12.0
161	9/15/2015	6.5	1.0	23.35	34.79	21.91	5.35	7.43	-7.6
			2.0	23.57	35.89	22.77	5.07	7.48	-6.2
			3.0	23.60	36.22	22.89	5.05	7.50	-5.8
			4.0	23.61	36.42	23.05	5.01	7.52	-5.1
			5.0	23.61	36.56	23.14	4.97	7.53	-4.3
162	9/21/2015	23.0	1.0	23.01	36.19	22.85	5.74	7.67	105.9
			11.5	23.05	36.71	23.23	5.49	7.66	100.4
			21.0	23.11	37.35	23.74	5.47	7.60	82.7
163	9/16/2015	30.6	1.0	23.90	35.85	22.63	5.57	7.36	72.4
			15.3	23.91	36.79	23.29	5.66	7.38	73.4
			28.6	23.95	36.89	23.35	7.27	7.37	76.7
163	9/22/2015	30.1	1.0	22.51	36.25	22.88	6.00	7.64	148.7
			15.1	22.44	37.11	23.52	5.92	7.65	157.4
			28.1	22.42	37.24	23.62	5.62	7.66	157.0
164	9/13/2015	6.4	1.0	24.61	37.07	NR	5.00	7.65	-32.8
			2.0	24.61	38.18	NR	4.94	7.66	-31.1
			3.0	24.56	38.21	NR	4.89	7.66	-29.9
			4.0	24.56	38.22	NR	4.88	7.66	-29.6
			5.0	24.56	38.22	NR	4.83	7.66	-29.9
			6.0	24.56	38.22	NR	4.80	7.66	-27.7
164	9/21/2015	8.0	1.0	NR	NR	23.39	NR	NR	NR
			4.0	NR	NR	24.32	NR	NR	NR
			6.0	NR	NR	24.29	NR	NR	NR
165	9/13/2015	6.0	1.0	24.87	37.60	NR	6.15	7.73	-50.6
			2.0	24.87	37.62	NR	5.76	7.71	-46.1
			3.0	24.84	37.65	NR	5.55	7.70	-46.2
			4.0	24.81	37.69	NR	5.43	7.70	-46.2
			5.0	24.79	37.71	NR	5.33	7.69	-45.0
165	9/21/2015	9.0	1.0	NR	NR	23.65	NR	NR	NR
			4.5	NR	NR	23.68	NR	NR	NR
			7.0	NR	NR	23.68	NR	NR	NR
166	9/13/2015	4.5	1.0	25.12	31.98	NR	6.01	7.72	-47.7
			2.0	24.82	36.18	NR	5.79	7.67	-66.4
			3.0	24.57	37.40	NR	5.56	7.67	-65.1
			4.0	24.68	37.98	NR	5.54	7.67	-57.3
166	9/21/2015	7.5	1.0	NR	NR	23.15	NR	NR	NR
			3.8	NR	NR	23.33	NR	NR	NR
			5.5	NR	NR	23.50	NR	NR	NR
167	9/14/2015	5.5	1.0	22.07	36.59	23.17	6.56	7.84	9.8
			2.0	22.07	36.58	23.16	6.34	7.79	13.1
			3.0	22.06	36.58	23.17	6.24	7.77	16.0
			4.0	22.06	36.58	23.16	6.18	7.76	17.2

Table 4 - Surface Water Quality Measurements_Rev1

Table 4
Surface Water Quality Measurements

Station	Date Measured	Water Depth (feet)	Depth (feet below water surface)	Temperature (°C)	Conductivity (μS/cm)	Salinity (ppt)	Dissolved Oxygen (mg/L)	pH (SU)	ORP (mV)
168	9/15/2015	7.3	1.0	22.66	36.22	22.90	6.14	7.48	-20.8
			2.0	22.62	36.19	22.89	5.77	7.53	-17.1
			3.0	22.67	36.31	22.97	5.60	7.55	-15.2
			4.0	22.90	36.75	23.29	5.38	7.56	-13.5
			5.0	23.35	37.53	23.84	5.19	7.57	-11.7
			6.0	23.44	37.74	23.96	5.12	7.57	-11.0
169	9/15/2015	7.4	1.0	23.29	36.34	22.95	6.41	7.21	23.3
			2.0	23.32	37.16	23.57	6.12	7.53	0.2
			3.0	23.28	37.40	23.74	5.85	7.57	-3.2
			4.0	23.28	37.52	23.80	5.70	7.62	-6.5
			5.0	23.27	37.53	23.81	5.59	7.64	-7.7
			6.0	23.27	37.55	23.83	5.56	7.65	-7.8
Central Zone									
141	9/16/2015	10.0	1.0	23.39	37.54	23.82	7.82	7.25	29.2
			2.0	23.41	37.57	23.84	6.92	7.48	23.4
			3.0	23.36	37.64	23.88	6.22	7.55	18.1
			4.0	23.31	37.69	23.94	6.37	7.59	15.5
			5.0	23.25	37.79	24.00	5.80	7.60	15.3
			6.0	23.16	37.90	24.08	5.64	7.61	14.9
			7.0	23.08	37.96	24.12	5.43	7.62	14.3
			8.0	23.07	37.96	24.12	5.38	7.62	13.9
			9.0	23.06	37.96	24.12	5.32	7.63	13.3
142	9/28/2015	6.6	1.0	21.04	37.79	24.02	7.52	7.97	12.0
			4.6	21.04	37.86	24.07	7.86	8.00	8.4
143	9/29/2015	8.4	1.0	21.88	39.25	24.99	6.32	8.10	-9.0
			6.4	21.80	39.84	25.46	6.41	8.14	-12.0
144	9/17/2015	12.6	1.0	23.39	37.38	23.72	6.21	7.56	47.1
			6.3	23.49	37.60	23.84	6.18	7.54	53.0
			11.6	23.52	37.78	23.97	6.56	7.46	66.6
145	9/29/2015	8.0	1.0	21.73	39.56	25.25	6.32	8.04	-4.5
			6.0	21.63	39.93	25.53	6.03	8.59	-9.0
156	9/17/2015	36.0	1.0	23.68	37.65	23.92	5.60	7.54	136.7
			18.0	23.69	38.24	24.29	5.80	7.56	128.9
			34.0	23.71	38.55	24.52	6.06	7.56	119.1
157	9/16/2015	9.6	1.0	24.22	37.79	23.98	7.54	7.60	29.1
			2.0	24.10	37.82	24.01	6.88	7.61	24.4
			3.0	23.87	37.93	24.08	6.52	7.62	20.7
			4.0	23.74	38.03	24.16	6.24	7.63	17.0
			5.0	23.70	38.10	24.23	6.06	7.63	15.4
			6.0	23.69	38.21	24.28	5.86	7.63	14.2
			7.0	23.68	38.22	24.29	5.76	7.63	13.7
			8.0	23.68	38.24	24.32	5.72	7.64	13.0

Table 4
Surface Water Quality Measurements

Station	Date Measured	Water Depth (feet)	Depth (feet below water surface)	Temperature (°C)	Conductivity (μS/cm)	Salinity (ppt)	Dissolved Oxygen (mg/L)	pH (SU)	ORP (mV)
170	9/16/2015	9.1	1.0	23.51	37.40	23.71	6.58	7.64	-13.8
			2.0	23.51	37.40	23.72	6.24	7.68	-8.5
			3.0	23.44	37.44	23.75	6.10	7.69	-7.6
			4.0	23.35	37.65	23.91	5.95	7.70	5.5
			5.0	23.28	37.79	24.00	5.88	7.70	-3.6
			6.0	23.30	37.85	24.04	5.84	7.71	-3.6
			7.0	23.27	37.88	24.06	5.76	7.71	-3.1
			8.0	23.26	37.88	24.05	5.69	7.71	-3.5
171	9/17/2015	8.0	2.0	23.64	37.84	24.02	6.33	7.57	47.9
			4.0	23.63	37.85	24.03	6.35	7.58	48.8
			6.0	23.66	37.90	24.06	6.42	7.59	51.5
172	9/23/2015	7.2	1.0	22.35	38.12	24.24	9.91	8.05	3.6
			5.2	21.91	38.17	24.27	11.76	8.04	0.5
South Zone									
146	9/21/2015	19.0	1.0	22.89	39.05	24.89	5.11	7.76	13.8
			9.5	22.87	39.08	24.91	5.00	7.78	8.8
			17.0	22.87	39.08	24.91	4.97	7.79	6.7
147	9/21/2015	11.1	1.0	22.64	38.68	24.63	6.11	7.79	21.6
			5.6	22.63	38.68	24.63	6.02	7.00	19.4
			9.1	22.63	38.69	24.64	6.00	7.83	13.9
148	9/21/2015	14.3	1.0	22.65	38.77	24.69	5.42	7.79	23.1
			7.2	22.66	38.78	24.70	5.47	7.79	21.8
			12.3	22.64	38.77	24.69	5.21	7.80	15.0
149	9/22/2015	2.4	1.2	21.82	38.67	24.63	7.12	7.96	24.0
150	9/22/2015	12.1	1.0	22.39	38.78	24.70	6.88	7.83	25.4
			6.1	29.40	38.77	24.70	6.80	7.83	23.2
			10.1	22.39	38.74	24.67	6.76	7.82	21.0
151	9/20/2015	10.2	1.0	23.52	39.01	24.85	6.74	7.69	23.9
			5.1	23.53	39.06	24.88	6.75	7.65	20.7
			8.2	23.49	39.11	24.91	6.85	7.50	13.5
152	9/29/2015	7.7	1.0	21.60	38.90	24.80	6.04	8.02	5.2
			5.7	21.60	38.95	24.03	5.85	8.06	2.5
153	9/23/2015	10.4	1.0	22.21	38.83	24.74	6.13	7.69	162.1
			8.4	22.18	38.74	24.73	6.86	7.56	175.5
154	9/20/2015	11.4	1.0	23.92	38.88	24.75	7.52	7.80	15.4
			5.7	23.87	38.95	24.80	7.53	7.81	15.4
			9.4	23.73	39.06	24.86	7.87	7.83	17.9
155	9/20/2015	3.3	1.7	23.57	38.81	24.71	10.50	7.77	36.9
173	9/23/2015	8.0	1.0	21.76	38.34	24.39	5.74	7.96	5.9
			6.0	21.84	38.52	24.52	6.02	8.00	7.3
174	9/20/2015	15.0	1.0	23.29	39.84	25.39	8.10	7.70	22.0
			7.5	23.22	40.02	25.56	8.75	7.71	18.1
			13.0	23.23	40.05	25.60	12.80	7.74	14.6
175	9/21/2015	10.2	1.0	22.92	38.82	24.72	7.39	7.39	11.5
			5.1	22.90	38.86	24.75	7.38	7.89	9.3
			8.2	22.89	38.94	24.81	7.46	7.92	6.7

Table 4
Surface Water Quality Measurements

Station	Date Measured	Water Depth (feet)	Depth (feet below water surface)	Temperature (°C)	Conductivity (μS/cm)	Salinity (ppt)	Dissolved Oxygen (mg/L)	pH (SU)	ORP (mV)
176	9/22/2015	6.5	3.3	22.56	38.83	24.73	6.88	8.00	5.3
176	9/23/2015	6.8	1.0	22.69	38.64	24.60	7.14	7.90	5.0
			4.8	22.48	38.74	24.67	8.07	7.96	0.3
177	9/23/2015	31.8	1.0	23.05	38.64	24.60	6.22	7.59	172.4
			15.9	22.99	38.72	24.64	6.25	7.59	171.8
			29.8	22.87	38.95	24.82	6.41	7.54	174.9
177	9/29/2015	4.5	2.3	23.23	39.08	24.91	5.23	8.18	-23.4
178	9/22/2015	11.0	1.0	22.33	38.87	24.76	7.20	7.95	9.8
			9.0	22.34	38.88	24.78	7.20	7.99	4.5
178	9/23/2015	8.2	1.0	22.07	38.61	24.59	5.37	7.92	1.0
			6.2	22.05	38.93	24.81	5.44	7.92	-3.3

Notes:

% = percent
°C = degrees Celsius
μS/cm = microSiemens per centimeter
mg/L = milligrams per liter
mV = millivolts
NR = not recorded
ppt = parts per trillion
SU = standard units

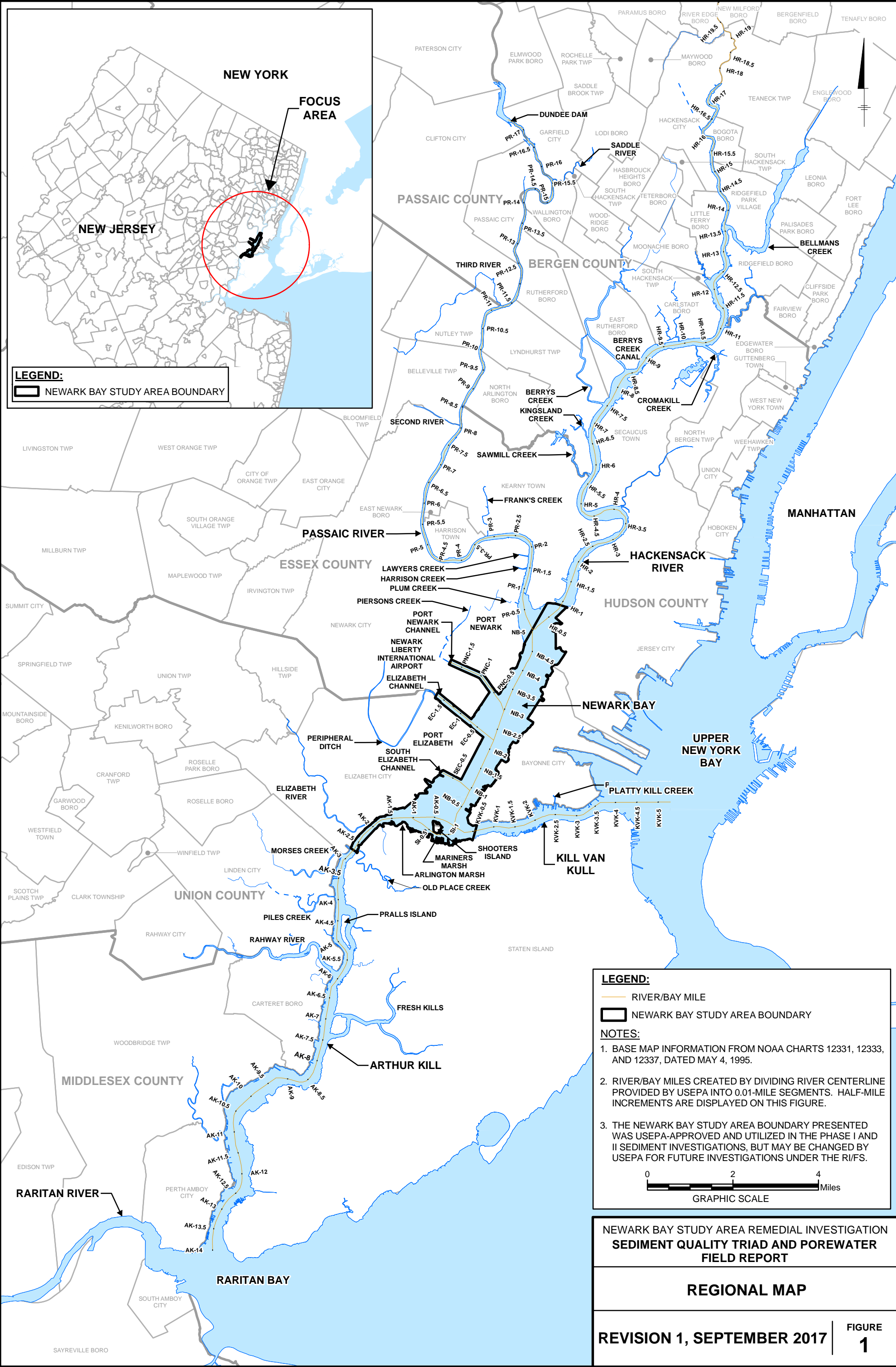
Table 5
USEPA Split Samples

Station	Tierra Sample ID	USEPA Sample ID	Date Processed	USEPA Split Sample Analyses				
				Sediment Chemistry	Porewater Chemistry	Toxicity	Bioaccumulation Test using <i>N. virens</i>	Notes
136	NB03SED-CHM136	NB03SED-CHM136-LB	9/15/2015	X				
161	NB03SED-BIO161; NB03SED-TOX161	B03SED-BIO161-LB; NB03SED-TOX161-LB	9/16/2015			X	X	
169	NB03SED-CHM169	NB03SED-CHM169-LB	9/16/2015	X				
141	NB03SED-BIO141	NB03SED-BIO141-LB	9/17/2015				X	
157	NB03SED-TOX157	NB03SED-TOX157-LB	9/17/2015			X		
144	NB03SED-TOX144	NB03SED-TOX144-LB	9/18/2015			X		
156	NB03SED-TOX156; NB03SED-POR156	NB03SED-TOX156-LB; NB03SED-POR156-LB	9/18/2015		X	X		USEPA only collected porewater split for organics analysis
154	NB03SED-CHM154	NB03SED-CHM154-LB	9/21/2015	X				
155	NB03SED-TOX155	NB03SED-TOX155-LB	9/21/2015			X		
163	NB03SED-CHM163; NB03SED-POR163	NB03SED-CHM163-LB; NB03SED-POR163-LB	9/23/2015	X	X			
153	NB03SED-POR153	NB03SED-POR153-LB	9/24/2015		X			USEPA only collected porewater split for metals analysis
173	NB03SED-CHM173	NB03SED-CHM173-LB	9/24/2015	X				
159	NB03SED-POR159	NB03SED-POR159-LB	9/25/2015		X			

Notes:

USEPA = United States Environmental Protection Agency

Figures



- LEGEND:**
- NAVIGATION CHANNEL
 - REACH BOUNDARY
 - PHASE I/PHASE II SI STUDY AREA BOUNDARY

- NOTES:**
- AERIAL PHOTOS DATED 2007 (NEW JERSEY GEOGRAPHIC INFORMATION NETWORK).
 - HORIZONTAL DATUM: NEW JERSEY STATE PLANE COORDINATE SYSTEM, NAD83
 - REACH BOUNDARIES DIGITIZED FROM NOAA NAUTICAL CHARTS 12337 22nd ED., NOVEMBER 15, 1997 AND 12333 32nd ED., OCTOBER 2002.

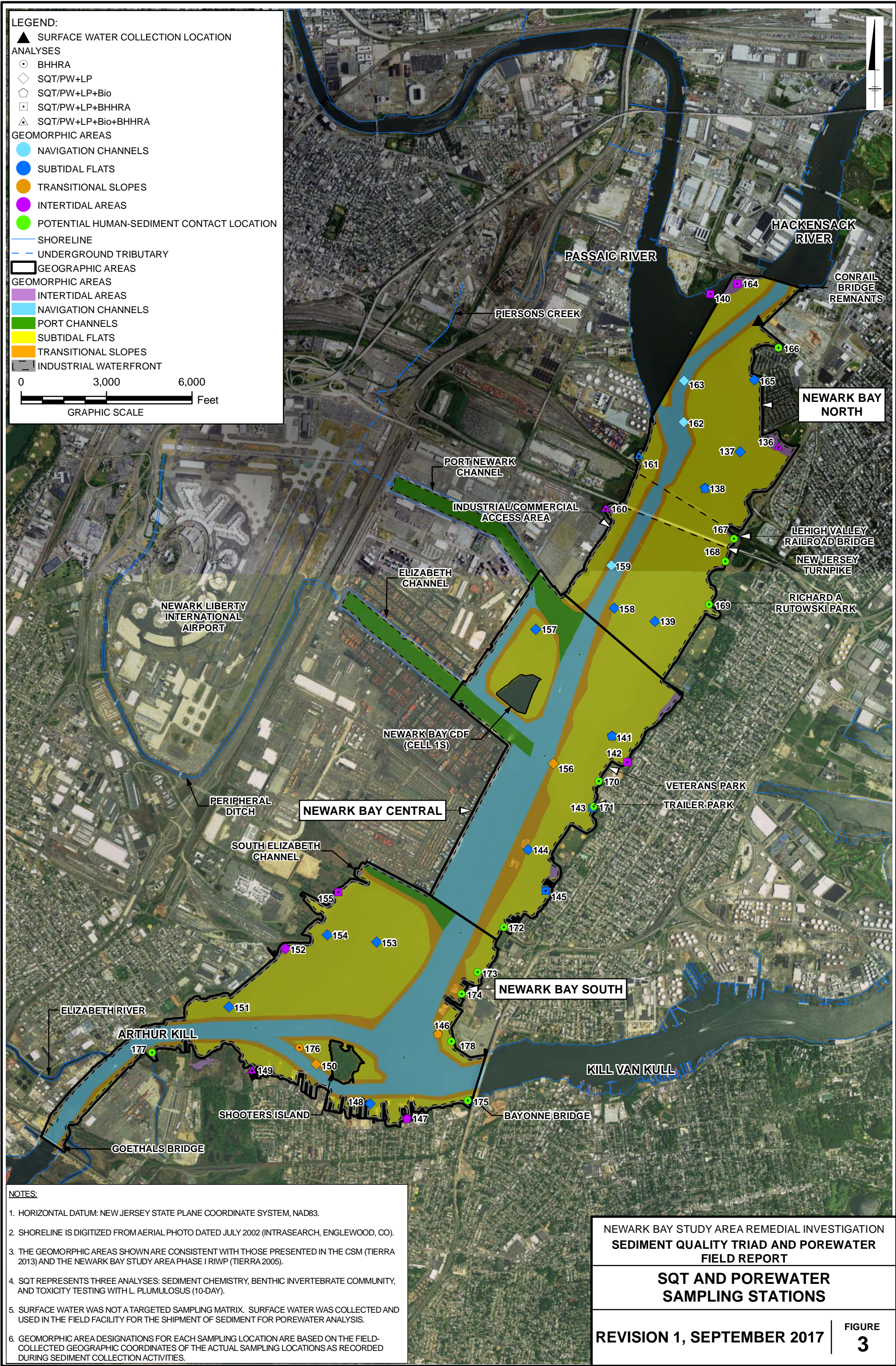


NEWARK BAY STUDY AREA REMEDIAL INVESTIGATION
SEDIMENT QUALITY TRIAD AND POREWATER
FIELD REPORT

REGIONAL FEATURES

REVISION 1, SEPTEMBER 2017

FIGURE
2



Appendix A

Protocol Modification Form

Project Name and Number: Newark Bay

Material to be Sampled: Sediment

Measurement Parameter: Benthic Invertebrate Community Assessment Sample Containers

Standard Procedure for Field Collection & Laboratory Analysis (cite reference):

Worksheet 19-5, "Containers (number and type)" for the benthic invertebrate community assessment.

Reason for Change in Field Procedure or Analysis Variation:

Worksheet 19-5 indicates that two 1-gallon Ziploc freezer bags (or equivalent) would be used as the containers for the benthic invertebrate community assessment; however, the laboratory conducting the benthic invertebrate community assessment (Normandeau Associates) sent 1-liter plastic bottles for the samples be collected in.

Variation from Field or Analytical Procedure:

1-liter plastic bottles will be used to collect the benthic invertebrate community assessment samples instead of 1-gallon Ziploc bags.

Special Equipment, Materials or Personnel Required:

1-liter plastic bottles will be provided to ARCADIS by Normandeau Associates

Initiator's Name: Clifford Firstenberg, Tierra Solutions Date: 9/17/15

Project Manager: Clifford Firstenberg, Tierra Solutions Date: 9/17/15

QA Manager: Angela Gatchie, Field & Technical Services Date: 9/17/15

USEPA Authority: Eugenia Naranjo Date: 10/1/15

Protocol Modification Form

Project Name and Number: Newark Bay

Material to be Sampled: Sediment

Measurement Parameter: Sediment sampling locations

Standard Procedure for Field Collection & Laboratory Analysis (cite reference):

Figure 1 and Table 1 of the Newark Bay Study Area Sediment Quality Triad and Porewater Sampling and Analysis Quality Assurance Project Plan, August 2015.

Reason for Change in Field Procedure or Analysis Variation:

Utility clearance activities resulted in the need to adjust three sediment sampling locations (153, 167, and 173) away from active utility lines in Newark Bay.

Variation from Field or Analytical Procedure:

Location 153 was moved approximately 75 feet north, parallel to the shoreline. The new sampling coordinates are: Northing – 663086, Easting – 587950.

Location 167 was moved approximately 20 feet south, along the shoreline. The new sampling coordinates are: Northing – 677862, Easting – 600220.

Location 173 was moved approximately 20 feet south, along the shoreline. The new sampling coordinates are: Northing – 663349, Easting – 591874.

Special Equipment, Materials or Personnel Required:

No additional special equipment, materials or personnel are required as a result of this change.

Initiator's Name: Clifford Firstenberg, Tierra Solutions Date: 9/17/15

Project Manager: Clifford Firstenberg, Tierra Solutions Date: 9/17/15

QA Manager: Angela Gatchie, Field & Technical Services Date: 9/17/15

USEPA Authority: Eugenia Naranjo Date: 10/1/15

Protocol Modification Form

Project Name and Number: Newark Bay

Material to be Sampled: Sediment

Measurement Parameter: PID headspace screening

Standard Procedure for Field Collection & Laboratory Analysis (cite reference):

SOP No. 6: Sediment Sample Collection, page 7 of 9.

Reason for Change in Field Procedure or Analysis Variation:

Section 2.2, 6 of SOP 6 states "Collect a small aliquot (approximately 1 ounce) of sediment representative of the quality encountered during sampling activities", however, continuous air monitoring will be conducted within the sample processing area during sample processing activities, therefore a separate PID headspace screening is not necessary.

Variation from Field or Analytical Procedure:

PID headspace screening, as described in Section 2.2, 6 of SOP No. 6, will not be conducted.

Special Equipment, Materials or Personnel Required:

No additional special equipment, materials or personnel are required as a result of this change.

Initiator's Name: Clifford Firstenberg, Tierra Solutions Date: 9/17/15

Project Manager: Clifford Firstenberg, Tierra Solutions Date: 9/17/15

QA Manager: Angela Gatchie, Field & Technical Services Date: 9/17/15

USEPA Authority: Eugenia Naranjo Date: 10/1/15

Protocol Modification Form

Project Name and Number: Newark Bay

Material to be Sampled: Sediment, Water (Field Blank)

Measurement Parameter: Sample Containers

Standard Procedure for Field Collection & Laboratory Analysis (cite reference):

1. Worksheet 19-1, "Preservation Requirements" for mercury

2. Worksheet 19-1, "Containers (number and type)" for mercury, phosphorous/nitrogen, and ammonia

3. Worksheet 19-2, "Containers (number and type)" for sediment samples

Reason for Change in Field Procedure or Analysis Variation:

1. The preservative (BrCl) needed for mercury field blanks could not be shipped because it is a hazardous liquid; therefore mercury samples will be preserved upon arrival at the laboratory. This was confirmed with the laboratory prior to implementation.

2. Smaller bottles were provided for mercury samples. It was confirmed with the lab that the change was intended and still provided the volume required to meet the PQOs. Labels for phosphorus/nitrogen and ammonia were inadvertently switched.

3. The jar size shown on sediment sample labels was incorrect.

Variation from Field or Analytical Procedure:

1. Mercury samples will be preserved once they arrive at the laboratory.

2. 250mL bottles will be used for mercury field blanks. Phosphorus/nitrogen and ammonia labels were switched on some of the bottles but will be used on the correct bottles going forward.

3. Some 12oz jars were labeled as 8oz jars; all jars will be labeled with the correct size going forward.

Special Equipment, Materials or Personnel Required:

None required

Initiator's Name: Clifford Firstenberg, Tierra Solutions Date: 11/30/15

Project Manager: Clifford Firstenberg, Tierra Solutions Date: 11/30/15

QA Manager: Angela Gatchie, Field & Technical Services Date: 11/30/15

USEPA Authority: Eugenia Naranjo Date: 12/6/15

Protocol Modification Form

Project Name and Number: Newark Bay

Material to be Sampled: Sediment

Measurement Parameter: Acceptable percent recovery for a grab sample.

Standard Procedure for Field Collection & Laboratory Analysis (cite reference):

SOP No. 6: Sediment Sample Collection, page 6 of 9.

Reason for Change in Field Procedure or Analysis Variation:

Section 2.2, 4.i of SOP 6 does not provide an acceptable percent recovery value for a grab sample.

Variation from Field or Analytical Procedure:

An acceptable percent recovery of the grab sampler will be approximately 3 inches (or 50 percent penetration with the 6-inch ponar). If hard bottom or an unacceptable percent recovery is encountered at a sampling location, the field crew will probe the sediment bottom around the targeted location (no more than 500 feet from the target coordinates) to locate a more suitable sampling location. If no suitable location can be located, Tierra will contact USEPA to suggest an alternative sampling location.

Special Equipment, Materials or Personnel Required:

No additional special equipment, materials or personnel are required as a result of this change.

Initiator's Name: Clifford Firstenberg, Tierra Solutions Date: 9/17/15

Project Manager: Clifford Firstenberg, Tierra Solutions Date: 11/30/15

QA Manager: Angela Gatchie, Field & Technical Services Date: 11/30/15

USEPA Authority: Eugenia Naranjo Date: 12/6/15

Appendix B

The analytical results provided in Appendix B are for the Teflon®-liner pre-program field blank collected as part of the sampling pre-mobilization activities. Refer to Section 2.1.4 for additional details.

Sample Description: NB3101FB Composite Water Sample INORG
SQT and Porewater Sampling and Analysis

LL Sample # WW 7996823
LL Group # 1582903
Account # 12798

Project Name: SQT and Porewater Sampling and Analysis

Collected: 08/06/2015 12:30 by JH

Tierra Solutions, Inc.

Floor 10

Submitted: 08/06/2015 18:30

Two Tower Center Boulevard

Reported: 11/11/2015 05:13

East Brunswick NJ 08816

NB31I SDG#: NB350-01FB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals					
	SW-846 6010C		mg/l	mg/l	
07070	Titanium in Water	7440-32-6	N.D.	0.0017	1
	SW-846 6020		mg/l	mg/l	
06023	Aluminum	7429-90-5	N.D.	0.0260	1
06024	Antimony	7440-36-0	N.D.	0.00033	1
06025	Arsenic	7440-38-2	N.D.	0.00054	1
06026	Barium	7440-39-3	N.D.	0.00092	1
06027	Beryllium	7440-41-7	N.D.	0.000071	1
06028	Cadmium	7440-43-9	N.D.	0.00023	1
06029	Calcium	7440-70-2	N.D.	0.0730	1
06031	Chromium	7440-47-3	N.D.	0.00070	1
06032	Cobalt	7440-48-4	N.D.	0.00010	1
06033	Copper	7440-50-8	N.D.	0.00040	1
06034	Iron	7439-89-6	N.D.	0.0230	1
06035	Lead	7439-92-1	N.D.	0.00013	1
06036	Magnesium	7439-95-4	N.D.	0.0170	1
06037	Manganese	7439-96-5	N.D.	0.00094	1
06039	Nickel	7440-02-0	N.D.	0.00094	1
06040	Potassium	7440-09-7	N.D.	0.0877	1
06041	Selenium	7782-49-2	N.D.	0.00050	1
06042	Silver	7440-22-4	N.D.	0.00011	1
06043	Sodium	7440-23-5	N.D.	0.0500	1
06045	Thallium	7440-28-0	N.D.	0.00015	1
06048	Vanadium	7440-62-2	N.D.	0.00022	1
06049	Zinc	7440-66-6	N.D.	0.0074	1
Wet Chemistry					
	EPA 351.2		mg/l	mg/l	
00217	Kjeldahl Nitrogen	n.a.	N.D.	0.50	1
	EPA 365.1		mg/l	mg/l	
00227	Total Phosphorus as P (water)	7723-14-0	N.D.	0.050	1
	EPA 415.1		mg/l	mg/l	
00273	Total Organic Carbon	n.a.	N.D.	0.50	1
	SW-846 9012A		mg/l	mg/l	
08255	Total Cyanide (water)	57-12-5	N.D.	0.0050	1
	EPA 350.3		mg/l	mg/l	
12677	Ammonia-Nitrogen	7664-41-7	N.D.	0.050	1
	SM 4500-H+ B-2000		Std. Units	Std. Units	
12152	pH	n.a.	9.5	0.010	1
The 40 CFR Part 136 requires that this analysis be performed immediately (within 15 minutes) upon sample collection. Because this was not possible, the result may not be used for reporting purposes.					
	SW-846 7196A		mg/l	mg/l	

Sample Description: NB3101FB Composite Water Sample INORG
SQT and Porewater Sampling and Analysis

LL Sample # WW 7996823
LL Group # 1582903
Account # 12798

Project Name: SQT and Porewater Sampling and Analysis

Collected: 08/06/2015 12:30 by JH

Tierra Solutions, Inc.

Floor 10

Submitted: 08/06/2015 18:30

Two Tower Center Boulevard

Reported: 11/11/2015 05:13

East Brunswick NJ 08816

NB31I SDG#: NB350-01FB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Wet Chemistry					
00276	Hexavalent Chromium	SW-846 7196A 18540-29-9	mg/l N.D.	mg/l 0.0070	1

General Sample Comments

State of New Jersey Lab Certification No. PA011

B (for Inorganic tests) = estimated value: The result is \geq the Method Detection Limit (MDL)
and $<$ the Limit of Quantitation (LOQ).

G (for Organic tests) = estimated value: The result is \geq the Method Detection Limit (MDL)
and $<$ the Limit of Quantitation (LOQ).

Note: LOQ = PQL

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07070	Titanium in Water	SW-846 6010C	1	152190635003	08/12/2015 01:27	Elaine F Stoltzfus	1
06023	Aluminum	SW-846 6020	1	152196050003A	08/12/2015 22:53	Mallory L Clark	1
06024	Antimony	SW-846 6020	1	152196050003A	08/12/2015 19:43	Mallory L Clark	1
06025	Arsenic	SW-846 6020	1	152196050003A	08/12/2015 19:43	Mallory L Clark	1
06026	Barium	SW-846 6020	1	152196050003D	08/12/2015 19:43	Mallory L Clark	1
06027	Beryllium	SW-846 6020	1	152196050003A	08/12/2015 19:43	Mallory L Clark	1
06028	Cadmium	SW-846 6020	1	152196050003A	08/12/2015 19:43	Mallory L Clark	1
06029	Calcium	SW-846 6020	1	152196050003B	08/12/2015 22:53	Mallory L Clark	1
06031	Chromium	SW-846 6020	1	152196050003A	08/12/2015 22:53	Mallory L Clark	1
06032	Cobalt	SW-846 6020	1	152196050003A	08/12/2015 19:43	Mallory L Clark	1
06033	Copper	SW-846 6020	1	152196050003A	08/12/2015 19:43	Mallory L Clark	1
06034	Iron	SW-846 6020	1	152196050003A	08/12/2015 22:53	Mallory L Clark	1
06035	Lead	SW-846 6020	1	152196050003A	08/12/2015 19:43	Mallory L Clark	1
06036	Magnesium	SW-846 6020	1	152196050003A	08/12/2015 22:53	Mallory L Clark	1
06037	Manganese	SW-846 6020	1	152196050003A	08/12/2015 22:53	Mallory L Clark	1
06039	Nickel	SW-846 6020	1	152196050003A	08/12/2015 19:43	Mallory L Clark	1
06040	Potassium	SW-846 6020	1	152196050003A	08/12/2015 22:53	Mallory L Clark	1
06041	Selenium	SW-846 6020	1	152196050003B	08/12/2015 19:43	Mallory L Clark	1
06042	Silver	SW-846 6020	1	152196050003A	08/12/2015 19:43	Mallory L Clark	1
06043	Sodium	SW-846 6020	1	152196050003A	08/12/2015 22:53	Mallory L Clark	1
06045	Thallium	SW-846 6020	1	152196050003A	08/12/2015 19:43	Mallory L Clark	1
06048	Vanadium	SW-846 6020	1	152196050003A	08/12/2015 22:53	Mallory L Clark	1
06049	Zinc	SW-846 6020	1	152196050003A	08/12/2015 19:43	Mallory L Clark	1
10635	ICP-WW, 3005A (tot rec) - U4	SW-846 3005A	1	152190635003	08/11/2015 09:20	Katlin N Cataldi	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	152196050003	08/11/2015 08:20	Katlin N Cataldi	1
00217	Kjeldahl Nitrogen	EPA 351.2	1	15223108101A	08/12/2015 12:31	Joseph E McKenzie	1

Sample Description: NB3101FB Composite Water Sample INORG
SQT and Porewater Sampling and Analysis

LL Sample # WW 7996823
LL Group # 1582903
Account # 12798

Project Name: SQT and Porewater Sampling and Analysis

Collected: 08/06/2015 12:30 by JH

Tierra Solutions, Inc.

Floor 10

Submitted: 08/06/2015 18:30

Two Tower Center Boulevard

Reported: 11/11/2015 05:13

East Brunswick NJ 08816

NB31I SDG#: NB350-01FB

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00227	Total Phosphorus as P (water)	EPA 365.1	1	15223109105A	08/12/2015 09:54	Joseph E McKenzie	1
00273	Total Organic Carbon	EPA 415.1	1	15224049505A	08/12/2015 23:26	James S Mathiot	1
08255	Total Cyanide (water)	SW-846 9012A	1	15224117101A	08/12/2015 14:24	David A Seavey	1
01460	Total Kjeldahl Nitrogen Digest	EPA 351.2	1	15223108101A	08/11/2015 16:40	Venia B McFadden	1
08263	Total Phos as P Prep (water)	EPA 365.1	1	15223109105A	08/11/2015 09:35	Nancy J Shoop	1
08256	Cyanide Water Distillation	SW-846 9012A	1	15224117101A	08/12/2015 08:45	Nancy J Shoop	1
12677	Ammonia-Nitrogen	EPA 350.3	1	15222005201A	08/10/2015 23:10	Michelle L Lalli	1
12152	pH	SM 4500-H+ B-2000	1	15223003102A	08/11/2015 17:29	Michele L Graham	1
00276	Hexavalent Chromium	SW-846 7196A	1	15219027601A	08/07/2015 10:25	Michelle L Lalli	1

Sample Description: NB3101FB Composite Water Sample ORG
SQT and Porewater Sampling and Analysis

LL Sample # WW 7996824
LL Group # 1582903
Account # 12798

Project Name: SQT and Porewater Sampling and Analysis

Collected: 08/06/2015 12:30 by JH

Tierra Solutions, Inc.

Floor 10

Submitted: 08/06/2015 18:30

Two Tower Center Boulevard

Reported: 11/11/2015 05:13

East Brunswick NJ 08816

NB310 SDG#: NB350-02FB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260B 25mL	ug/l	ug/l	
	purge				
02898	1,2-Dichlorobenzene	95-50-1	N.D.	1.0	1
02898	1,3-Dichlorobenzene	541-73-1	N.D.	1.0	1
02898	1,4-Dichlorobenzene	106-46-7	N.D.	1.0	1
02898	1,2,4-Trichlorobenzene	120-82-1	N.D.	1.0	1
GC/MS	Semivolatiles	SW-846 8270D	ug/l	ug/l	
13624	Acetophenone	98-86-2	N.D.	1	1
13624	Atrazine	1912-24-9	N.D.	5	1
13624	Benzaldehyde	100-52-7	N.D.	5	1
13624	Benidine	92-87-5	N.D.	62	1
13624	Benzoic acid	65-85-0	N.D.	15	1
13624	1,1'-Biphenyl	92-52-4	N.D.	1	1
13624	4-Bromophenyl-phenylether	101-55-3	N.D.	1	1
13624	Butylbenzylphthalate	85-68-7	N.D.	5	1
13624	Di-n-butylphthalate	84-74-2	N.D.	5	1
13624	Caprolactam	105-60-2	N.D.	15	1
13624	Carbazole	86-74-8	N.D.	1	1
13624	4-Chloro-3-methylphenol	59-50-7	N.D.	1	1
13624	4-Chloroaniline	106-47-8	N.D.	4	1
13624	bis(2-Chloroethoxy)methane	111-91-1	N.D.	1	1
13624	bis(2-Chloroethyl) ether	111-44-4	N.D.	1	1
13624	2-Chloronaphthalene	91-58-7	N.D.	1	1
13624	2-Chlorophenol	95-57-8	N.D.	1	1
13624	4-Chlorophenyl-phenylether	7005-72-3	N.D.	1	1
13624	2,2'-oxybis(1-Chloropropane)	108-60-1	N.D.	1	1
	Bis(2-chloroisopropyl) ether CAS #39638-32-9 and 2,2'-Oxybis(1-chloropropane) CAS #108-60-1 cannot be separated chromatographically. The reported result represents the combined total of both compounds.				
13624	Dibenzofuran	132-64-9	N.D.	1	1
13624	3,3'-Dichlorobenzidine	91-94-1	N.D.	5	1
13624	2,4-Dichlorophenol	120-83-2	N.D.	1	1
13624	Diethylphthalate	84-66-2	N.D.	5	1
13624	2,4-Dimethylphenol	105-67-9	N.D.	1	1
13624	Dimethylphthalate	131-11-3	N.D.	5	1
13624	4,6-Dinitro-2-methylphenol	534-52-1	N.D.	15	1
13624	2,4-Dinitrophenol	51-28-5	N.D.	31	1
13624	2,4-Dinitrotoluene	121-14-2	N.D.	5	1
13624	2,6-Dinitrotoluene	606-20-2	N.D.	1	1
13624	1,2-Diphenylhydrazine	122-66-7	N.D.	1	1
13624	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.	5	1
13624	Hexachlorobutadiene	87-68-3	N.D.	1	1
13624	Hexachlorocyclopentadiene	77-47-4	N.D.	15	1
13624	Hexachloroethane	67-72-1	N.D.	5	1
13624	Isophorone	78-59-1	N.D.	1	1
13624	2-Methylphenol	95-48-7	N.D.	1	1
13624	4-Methylphenol	106-44-5	N.D.	1	1
	3-Methylphenol and 4-methylphenol cannot be resolved under the chromatographic conditions used for sample analysis. The result reported for 4-methylphenol represents the combined total of both compounds.				

Sample Description: NB3101FB Composite Water Sample ORG
SQT and Porewater Sampling and Analysis

LL Sample # WW 7996824
LL Group # 1582903
Account # 12798

Project Name: SQT and Porewater Sampling and Analysis

Collected: 08/06/2015 12:30 by JH

Tierra Solutions, Inc.

Floor 10

Submitted: 08/06/2015 18:30

Two Tower Center Boulevard

Reported: 11/11/2015 05:13

East Brunswick NJ 08816

NB310 SDG#: NB350-02FB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270D	ug/l	ug/l	
13624	2-Nitroaniline	88-74-4	N.D.	1	1
13624	3-Nitroaniline	99-09-2	N.D.	1	1
13624	4-Nitroaniline	100-01-6	N.D.	1	1
13624	Nitrobenzene	98-95-3	N.D.	1	1
13624	2-Nitrophenol	88-75-5	N.D.	1	1
13624	4-Nitrophenol	100-02-7	N.D.	31	1
13624	N-Nitroso-di-n-propylamine	621-64-7	N.D.	1	1
13624	N-Nitrosodiphenylamine	86-30-6	N.D.	1	1
	N-nitrosodiphenylamine decomposes in the GC inlet forming diphenylamine. The result reported for N-nitrosodiphenylamine represents the combined total of both compounds.				
13624	Di-n-octylphthalate	117-84-0	N.D.	5	1
13624	Pentachlorophenol	87-86-5	N.D.	5	1
13624	Phenol	108-95-2	N.D.	1	1
13624	Pyridine	110-86-1	N.D.	5	1
13624	1,2,4,5-Tetrachlorobenzene	95-94-3	N.D.	1	1
13624	2,3,4,6-Tetrachlorophenol	58-90-2	N.D.	1	1
13624	2,4,5-Trichlorophenol	95-95-4	N.D.	1	1
13624	2,4,6-Trichlorophenol	88-06-2	N.D.	1	1
GC/MS	Semivolatiles	SW-846 8270D SIM	ug/l	ug/l	
	Modified				
10262	Acenaphthene	83-32-9	N.D.	0.05	1
10262	Acenaphthylene	208-96-8	N.D.	0.05	1
10262	Anthracene	120-12-7	N.D.	0.05	1
10262	Benzo(a)anthracene	56-55-3	N.D.	0.05	1
10262	Benzo(a)pyrene	50-32-8	N.D.	0.05	1
10262	Benzo(b)fluoranthene	205-99-2	N.D.	0.05	1
10262	Benzo(e)pyrene	192-97-2	N.D.	0.05	1
10262	Benzo(g,h,i)perylene	191-24-2	N.D.	0.05	1
10262	Benzo(k)fluoranthene	n.a.	N.D.	0.05	1
10262	C1-Benzanthrene/chrysenes	n.a.	N.D.	0.05	1
10262	C1-Fluoranthrenes/pyrenes	n.a.	N.D.	0.05	1
10262	C1-Fluorenes	n.a.	N.D.	0.05	1
10262	C1-Naphthalenes	n.a.	N.D.	0.05	1
10262	C1-Phenanthrenes/anthracenes	n.a.	N.D.	0.05	1
10262	C2-Benzanthrene/chrysenes	n.a.	N.D.	0.05	1
10262	C2-Fluoranthrenes/pyrenes	n.a.	N.D.	0.05	1
10262	C2-Fluorenes	n.a.	N.D.	0.05	1
10262	C2-Naphthalenes	n.a.	N.D.	0.05	1
10262	C2-Phenanthrenes/anthracenes	n.a.	N.D.	0.05	1
10262	C3-Benzanthrene/chrysenes	n.a.	N.D.	0.05	1
10262	C3-Fluoranthrenes/pyrenes	n.a.	N.D.	0.05	1
10262	C3-Fluorenes	n.a.	N.D.	0.05	1
10262	C3-Naphthalenes	n.a.	N.D.	0.05	1
10262	C3-Phenanthrenes/anthracenes	n.a.	N.D.	0.05	1
10262	C4-Benzanthrene/chrysenes	n.a.	N.D.	0.05	1
10262	C4-Naphthalenes	n.a.	N.D.	0.05	1
10262	C4-Phenanthrenes/anthracenes	n.a.	N.D.	0.05	1
10262	Chrysene	218-01-9	N.D.	0.05	1
10262	Dibenz(a,h)anthracene	53-70-3	N.D.	0.05	1

Sample Description: NB3101FB Composite Water Sample ORG
SQT and Porewater Sampling and Analysis

LL Sample # WW 7996824
LL Group # 1582903
Account # 12798

Project Name: SQT and Porewater Sampling and Analysis

Collected: 08/06/2015 12:30 by JH

Tierra Solutions, Inc.

Floor 10

Submitted: 08/06/2015 18:30

Two Tower Center Boulevard

Reported: 11/11/2015 05:13

East Brunswick NJ 08816

NB310 SDG#: NB350-02FB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS	Semivolatiles	SW-846 8270D SIM Modified	ug/l	ug/l	
10262	Fluoranthene	206-44-0	N.D.	0.05	1
10262	Fluorene	86-73-7	N.D.	0.05	1
10262	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.	0.05	1
10262	1-Methylnaphthalene	90-12-0	N.D.	0.05	1
10262	2-Methylnaphthalene	91-57-6	N.D.	0.05	1
10262	Naphthalene	91-20-3	N.D.	0.05	1
10262	Perylene	198-55-0	N.D.	0.05	1
10262	Phenanthrene	85-01-8	N.D.	0.05	1
10262	Pyrene	129-00-0	N.D.	0.05	1
GC	Volatiles	SW-846 8015B	ug/l	ug/l	
01635	TPH-GRO water C6-C10	n.a.	N.D.	50	1
Herbicides	SW-846 8151A	ug/l	ug/l		
10407	2,4-D	94-75-7	N.D.	0.52	1
10407	2,4-DB	94-82-6	N.D.	1.0	1
10407	2,4,5-T	93-76-5	N.D.	0.052	1
10407	2,4,5-TP	93-72-1	N.D.	0.052	1
Pesticides/PCBs	SW-846 8082	ug/l	ug/l		
12013	PCB-1016	12674-11-2	N.D.	0.0098	1
12013	PCB-1221	11104-28-2	N.D.	0.0098	1
12013	PCB-1232	11141-16-5	N.D.	0.0098	1
12013	PCB-1242	53469-21-9	N.D.	0.0098	1
12013	PCB-1248	12672-29-6	N.D.	0.0098	1
12013	PCB-1254	11097-69-1	N.D.	0.0098	1
12013	PCB-1260	11096-82-5	N.D.	0.0098	1
12013	PCB-1262	37324-23-5	N.D.	0.0098	1
12013	PCB-1268	11100-14-4	N.D.	0.0098	1
GC Petroleum	SW-846 8015B modified	ug/l	ug/l		
Hydrocarbons					
11554	n-Decane	124-18-5	N.D.	0.98	1
11554	n-Docosane	629-97-0	N.D.	0.98	1
11554	n-Dodecane	112-40-3	N.D.	0.98	1
11554	n-Dotriacontane	544-85-4	N.D.	0.98	1
11554	n-Eicosane	112-95-8	N.D.	0.98	1
11554	n-Heneicosane	629-94-7	N.D.	0.98	1
11554	n-Hentriacontane	630-04-6	N.D.	0.98	1
11554	n-Heptacosane	593-49-7	N.D.	0.98	1
11554	n-Heptadecane	629-78-7	N.D.	0.98	1
11554	n-Heptatriacontane	7194-84-5	N.D.	0.98	1
11554	n-Hexacosane	630-01-3	N.D.	0.98	1
11554	n-Hexadecane	544-76-3	N.D.	0.98	1
11554	n-Hexatriacontane	630-06-8	N.D.	0.98	1
11554	n-Nonacosane	630-03-5	N.D.	0.98	1
11554	n-Nonadecane	629-92-5	N.D.	0.98	1
11554	n-Nonane	111-84-2	N.D.	0.98	1

Sample Description: NB3101FB Composite Water Sample ORG
SQT and Porewater Sampling and Analysis

LL Sample # WW 7996824
LL Group # 1582903
Account # 12798

Project Name: SQT and Porewater Sampling and Analysis

Collected: 08/06/2015 12:30 by JH

Tierra Solutions, Inc.

Floor 10

Submitted: 08/06/2015 18:30

Two Tower Center Boulevard

Reported: 11/11/2015 05:13

East Brunswick NJ 08816

NB310 SDG#: NB350-02FB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC Petroleum		SW-846 8015B modified	ug/l	ug/l	
Hydrocarbons					
11554	n-Nonatriacontane	7194-86-7	N.D.	0.98	1
11554	n-Octacosane	630-02-4	N.D.	0.98	1
11554	n-Octadecane	593-45-3	N.D.	0.98	1
11554	n-Octatriacontane	7194-85-6	N.D.	0.98	1
11554	n-Pentacosane	629-99-2	N.D.	0.98	1
11554	n-Pentadecane	629-62-9	N.D.	0.98	1
11554	n-Pentatriacontane	630-07-9	N.D.	0.98	1
11554	Phytane	638-36-8	N.D.	0.98	1
11554	Pristane	1921-70-6	N.D.	0.98	1
11554	n-Tetracontane	4181-95-7	N.D.	0.98	1
11554	n-Tetracosane	646-31-1	N.D.	0.98	1
11554	n-Tetradecane	629-59-4	N.D.	0.98	1
11554	n-Tetratriacontane	14167-59-0	N.D.	0.98	1
11554	Total TPH (C9-C40)	n.a.	N.D.	98	1
11554	n-Triacontane	638-68-6	N.D.	0.98	1
11554	n-Tricosane	638-67-5	N.D.	0.98	1
11554	n-Tridecane	629-50-5	N.D.	0.98	1
11554	n-Tritriacontane	630-05-7	N.D.	0.98	1
11554	n-Undecane	1120-21-4	N.D.	0.98	1

Project defined QC acceptance limits are not met. All QC is compliant with the method defined criteria(50-150) except for nonane. Sufficient sample was not available to repeat the analysis.

Sample Description: NB3101FB Composite Water Sample ORG
SQT and Porewater Sampling and Analysis

LL Sample # WW 7996824
LL Group # 1582903
Account # 12798

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NB310 SDG#: NB350-02FB

CAT No.	Analysis Name	CAS Number	Result	MRL	Dilution Factor
Dioxins/Furans					
	EPA 1613B October 1994		pg/l	pg/l	
10915	2378-TCDD	1746-01-6	N.D.	1.99	1
10915	12378-PeCDD	40321-76-4	N.D.	9.93	1
10915	123478-HxCDD	39227-28-6	0.309 JBQ	9.93	1
10915	123678-HxCDD	57653-85-7	N.D.	9.93	1
10915	123789-HxCDD	19408-74-3	N.D.	9.93	1
10915	1234678-HpCDD	35822-46-9	0.819 JBQ	9.93	1
10915	OCDD	3268-87-9	N.D.	19.9	1
10915	2378-TCDF	51207-31-9	N.D.	1.99	1
10915	12378-PeCDF	57117-41-6	0.348 JBQ	9.93	1
10915	23478-PeCDF	57117-31-4	0.270 JBQ	9.93	1
10915	123478-HxCDF	70648-26-9	0.241 JB	9.93	1
10915	123678-HxCDF	57117-44-9	0.251 JBQ	9.93	1
10915	123789-HxCDF	72918-21-9	1.16 JB	9.93	1
10915	234678-HxCDF	60851-34-5	N.D.	9.93	1
10915	1234678-HpCDF	67562-39-4	0.271 JBQ	9.93	1
10915	1234789-HpCDF	55673-89-7	0.215 JBQ	9.93	1
10915	OCDF	39001-02-0	N.D.	19.9	1
PCB Congeners					
	EPA 1668A PCB Congeners		pg/l	pg/l	
13708	PCB1	2051-60-7	N.D.	20.0	1
13708	PCB10	33146-45-1	N.D.	49.9	1
13708	PCB103	60145-21-3	N.D.	49.9	1
13708	PCB104	56558-16-8	N.D.	49.9	1
13708	PCB105	32598-14-4	N.D.	49.9	1
13708	PCB106	70424-69-0	N.D.	49.9	1
13708	PCB107	70424-68-9	N.D.	49.9	1
13708	PCB108+124	n.a.	N.D.	99.8	1
13708	PCB11	2050-67-1	N.D.	99.8	1
13708	PCB110+115	n.a.	N.D.	99.8	1
13708	PCB111	39635-32-0	N.D.	49.9	1
13708	PCB112	74472-36-9	N.D.	49.9	1
13708	PCB114	74472-37-0	N.D.	49.9	1
13708	PCB118	31508-00-6	N.D.	99.8	1
13708	PCB12+13	n.a.	N.D.	49.9	1
13708	PCB120	68194-12-7	N.D.	49.9	1
13708	PCB121	56558-18-0	N.D.	49.9	1
13708	PCB122	76842-07-4	N.D.	49.9	1
13708	PCB123	65510-44-3	N.D.	49.9	1
13708	PCB126	57465-28-8	N.D.	49.9	1
13708	PCB127	39635-33-1	N.D.	49.9	1
13708	PCB128+166	n.a.	N.D.	99.8	1
13708	PCB129+138+163	n.a.	N.D.	200	1
13708	PCB130	52663-66-8	N.D.	49.9	1
13708	PCB131	61798-70-7	N.D.	49.9	1
13708	PCB132	38380-05-1	N.D.	49.9	1
13708	PCB133	35694-04-3	N.D.	49.9	1
13708	PCB134	52704-70-8	N.D.	99.8	1
13708	PCB135+151	n.a.	N.D.	99.8	1

Sample Description: NB3101FB Composite Water Sample ORG
SQT and Porewater Sampling and Analysis

LL Sample # WW 7996824
LL Group # 1582903
Account # 12798

Project Name: SQT and Porewater Sampling and Analysis

Collected: 08/06/2015 12:30 by JH

Tierra Solutions, Inc.

Floor 10

Submitted: 08/06/2015 18:30

Two Tower Center Boulevard

Reported: 11/11/2015 05:13

East Brunswick NJ 08816

NB310 SDG#: NB350-02FB

CAT No.	Analysis Name	CAS Number	Result	MRL	Dilution Factor
PCB Congeners		EPA 1668A PCB Congeners	pg/l	pg/l	
13708	PCB136	38411-22-2	N.D.	49.9	1
13708	PCB137	35694-06-5	N.D.	49.9	1
13708	PCB139+140	n.a.	N.D.	99.8	1
13708	PCB14	34883-41-5	N.D.	20.0	1
13708	PCB141	52712-04-6	N.D.	49.9	1
13708	PCB142	41411-61-4	N.D.	49.9	1
13708	PCB143	68194-15-0	N.D.	99.8	1
13708	PCB144	68194-14-9	N.D.	49.9	1
13708	PCB145	74472-40-5	N.D.	49.9	1
13708	PCB146	51908-16-8	N.D.	49.9	1
13708	PCB147+149	n.a.	N.D.	99.8	1
13708	PCB148	74472-41-6	N.D.	49.9	1
13708	PCB15	2050-68-2	N.D.	49.9	1
13708	PCB150	68194-08-1	N.D.	49.9	1
13708	PCB152	68194-09-2	N.D.	49.9	1
13708	PCB153+168	n.a.	N.D.	99.8	1
13708	PCB154	60145-22-4	N.D.	99.8	1
13708	PCB155	33979-03-2	N.D.	49.9	1
13708	PCB156+157	n.a.	N.D.	99.8	1
13708	PCB158	74472-42-7	N.D.	49.9	1
13708	PCB159	39635-35-3	N.D.	49.9	1
13708	PCB16	38444-78-9	N.D.	20.0	1
13708	PCB160	41411-62-5	N.D.	200	1
13708	PCB161	74472-43-8	N.D.	49.9	1
13708	PCB162	39635-34-2	N.D.	49.9	1
13708	PCB164	74472-45-0	N.D.	49.9	1
13708	PCB165	74472-46-1	N.D.	49.9	1
13708	PCB167	52663-72-6	N.D.	49.9	1
13708	PCB169	32774-16-6	N.D.	49.9	1
13708	PCB17	37680-66-3	N.D.	20.0	1
13708	PCB170	35065-30-6	N.D.	49.9	1
13708	PCB171+173	n.a.	N.D.	99.8	1
13708	PCB172	52663-74-8	N.D.	49.9	1
13708	PCB174	38411-25-5	N.D.	49.9	1
13708	PCB175	40186-70-7	N.D.	49.9	1
13708	PCB176	52663-65-7	N.D.	49.9	1
13708	PCB177	52663-70-4	N.D.	49.9	1
13708	PCB178	52663-67-9	N.D.	49.9	1
13708	PCB179	52663-64-6	N.D.	49.9	1
13708	PCB18+30	n.a.	N.D.	49.9	1
13708	PCB180+193	n.a.	N.D.	99.8	1
13708	PCB181	74472-47-2	N.D.	49.9	1
13708	PCB182	60145-23-5	N.D.	49.9	1
13708	PCB183+185	n.a.	N.D.	99.8	1
13708	PCB184	74472-48-3	N.D.	49.9	1
13708	PCB186	74472-49-4	N.D.	49.9	1
13708	PCB187	52663-68-0	N.D.	49.9	1
13708	PCB188	74487-85-7	N.D.	49.9	1
13708	PCB189	39635-31-9	N.D.	49.9	1
13708	PCB19	38444-73-4	N.D.	20.0	1

Sample Description: NB3101FB Composite Water Sample ORG
SQT and Porewater Sampling and Analysis

LL Sample # WW 7996824
LL Group # 1582903
Account # 12798

Project Name: SQT and Porewater Sampling and Analysis

Collected: 08/06/2015 12:30 by JH

Tierra Solutions, Inc.

Floor 10

Submitted: 08/06/2015 18:30

Two Tower Center Boulevard

Reported: 11/11/2015 05:13

East Brunswick NJ 08816

NB310 SDG#: NB350-02FB

CAT No.	Analysis Name	CAS Number	Result	MRL	Dilution Factor
PCB Congeners		EPA 1668A PCB Congeners	pg/l	pg/l	
13708	PCB190	41411-64-7	N.D.	49.9	1
13708	PCB191	74472-50-7	N.D.	49.9	1
13708	PCB192	74472-51-8	N.D.	49.9	1
13708	PCB194	35694-08-7	N.D.	49.9	1
13708	PCB195	52663-78-2	N.D.	49.9	1
13708	PCB196	42740-50-1	N.D.	49.9	1
13708	PCB197+200	n.a.	N.D.	99.8	1
13708	PCB198+199	n.a.	N.D.	99.8	1
13708	PCB2	2051-61-8	N.D.	20.0	1
13708	PCB20+28	n.a.	N.D.	49.9	1
13708	PCB201	40186-71-8	N.D.	49.9	1
13708	PCB202	2136-99-4	N.D.	99.8	1
13708	PCB203	52663-76-0	N.D.	49.9	1
13708	PCB204	74472-52-9	N.D.	49.9	1
13708	PCB205	74472-53-0	N.D.	49.9	1
13708	PCB206	40186-72-9	N.D.	49.9	1
13708	PCB207	52663-79-3	N.D.	49.9	1
13708	PCB208	52663-77-1	N.D.	49.9	1
13708	PCB209	2051-24-3	N.D.	49.9	1
13708	PCB21+33	n.a.	N.D.	49.9	1
13708	PCB22	38444-85-8	N.D.	20.0	1
13708	PCB23	55720-44-0	N.D.	20.0	1
13708	PCB24	55702-45-9	N.D.	20.0	1
13708	PCB25	55712-37-3	N.D.	20.0	1
13708	PCB26+29	n.a.	N.D.	49.9	1
13708	PCB27	38444-76-7	N.D.	20.0	1
13708	PCB3	2051-62-9	N.D.	49.9	1
13708	PCB31	16606-02-3	N.D.	49.9	1
13708	PCB32	38444-77-8	N.D.	20.0	1
13708	PCB34	37680-68-5	N.D.	20.0	1
13708	PCB35	37680-69-6	N.D.	20.0	1
13708	PCB36	38444-87-0	N.D.	20.0	1
13708	PCB37	38444-90-5	N.D.	20.0	1
13708	PCB38	53555-66-1	N.D.	20.0	1
13708	PCB39	38444-88-1	N.D.	20.0	1
13708	PCB4	13029-08-8	N.D.	49.9	1
13708	PCB40+71	n.a.	N.D.	99.8	1
13708	PCB41	52663-59-9	N.D.	99.8	1
13708	PCB42	36559-22-5	N.D.	49.9	1
13708	PCB43	70362-46-8	N.D.	49.9	1
13708	PCB44+47+65	n.a.	N.D.	99.8	1
13708	PCB45	70362-45-7	N.D.	49.9	1
13708	PCB46	41464-47-5	N.D.	20.0	1
13708	PCB48	70362-47-9	N.D.	49.9	1
13708	PCB49+69	n.a.	N.D.	99.8	1
13708	PCB5	16605-91-7	N.D.	20.0	1
13708	PCB50+53	n.a.	N.D.	99.8	1
13708	PCB51	68194-04-7	N.D.	49.9	1
13708	PCB52	35693-99-3	N.D.	49.9	1
13708	PCB54	15968-05-5	N.D.	49.9	1

Sample Description: NB3101FB Composite Water Sample ORG
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LL Sample # WW 7996824
LL Group # 1582903
Account # 12798

Project Name: SQT and Porewater Sampling and Analysis

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NB310 SDG#: NB350-02FB

CAT No.	Analysis Name	CAS Number	Result	MRL	Dilution Factor
PCB Congeners		EPA 1668A PCB Congeners	pg/l	pg/l	
13708	PCB55	74338-24-2	N.D.	49.9	1
13708	PCB56	41464-43-1	N.D.	49.9	1
13708	PCB57	70424-67-8	N.D.	49.9	1
13708	PCB58	41464-49-7	N.D.	49.9	1
13708	PCB59+62+75	n.a.	N.D.	99.8	1
13708	PCB6	25569-80-6	N.D.	20.0	1
13708	PCB60	33025-41-1	N.D.	49.9	1
13708	PCB61+70+74+76	n.a.	N.D.	200	1
13708	PCB63	74472-34-7	N.D.	49.9	1
13708	PCB64	52663-58-8	N.D.	49.9	1
13708	PCB66	32598-10-0	N.D.	49.9	1
13708	PCB67	73575-53-8	N.D.	49.9	1
13708	PCB68	73575-52-7	N.D.	49.9	1
13708	PCB7	33284-50-3	N.D.	20.0	1
13708	PCB72	41464-42-0	N.D.	49.9	1
13708	PCB73	74338-23-1	N.D.	49.9	1
13708	PCB77	32598-13-3	N.D.	49.9	1
13708	PCB78	70362-49-1	N.D.	49.9	1
13708	PCB79	41464-48-6	N.D.	49.9	1
13708	PCB8	34883-43-7	N.D.	49.9	1
13708	PCB80	33284-52-5	N.D.	49.9	1
13708	PCB81	70362-50-4	N.D.	49.9	1
13708	PCB82	52663-62-4	N.D.	49.9	1
13708	PCB83	60145-20-2	N.D.	99.8	1
13708	PCB84	52663-60-2	N.D.	20.0	1
13708	PCB85+116+117	n.a.	N.D.	99.8	1
13708	PCB86+87+97+109+119+125	n.a.	N.D.	200	1
13708	PCB88	55215-17-3	N.D.	49.9	1
13708	PCB89	73575-57-2	N.D.	49.9	1
13708	PCB9	34883-39-1	N.D.	20.0	1
13708	PCB90+101+113	n.a.	N.D.	200	1
13708	PCB91	68194-05-8	N.D.	49.9	1
13708	PCB92	52663-61-3	N.D.	49.9	1
13708	PCB93+100	n.a.	N.D.	200	1
13708	PCB94	73575-55-0	N.D.	49.9	1
13708	PCB95	38379-99-6	N.D.	200	1
13708	PCB96	73575-54-9	N.D.	49.9	1
13708	PCB98+102	n.a.	N.D.	200	1
13708	PCB99	38380-01-7	N.D.	99.8	1

The summation PCBs reported cannot be resolved under the chromatographic conditions used for sample analysis. The concentration(s) reported is the combined total of the PCBs and would be the maximum possible concentration for any individual PCB of interest.

Labeled Compounds	%Rec	Windows
13C12-2378-TCDD	75	25 - 164
13C12-12378-PeCDD	80	25 - 181
13C12-123478-HxCDD	85	32 - 141
13C12-123678-HxCDD	85	28 - 130
13C12-123789-HxCDD	77	28 - 130

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NB310 SDG#: NB350-02FB

CAT No.	Analysis Name	CAS Number	Result	MRL	Dilution Factor
Labeled Compounds					
		%Rec	Windows		
	13C12-1234678-HpCDD	77	23 - 140		
	13C12-OCDD	64	17 - 157		
	13C12-2378-TCDF	85	24 - 169		
	13C12-12378-PeCDF	88	24 - 185		
	13C12-23478-PeCDF	86	21 - 178		
	13C12-123478-HxCDF	92	26 - 152		
	13C12-123678-HxCDF	95	26 - 123		
	13C12-234678-HxCDF	93	28 - 136		
	13C12-123789-HxCDF	114	29 - 147		
	13C12-1234678-HpCDF	88	28 - 143		
	13C12-1234789-HpCDF	83	26 - 138		
	13C12-OCDF	69	17 - 157		
	13C12-PCB1	46	15 - 150		
	13C12-PCB3	45	15 - 150		
	13C12-PCB4	48	25 - 150		
	13C12-PCB15	48	25 - 150		
	13C12-PCB19	49	25 - 150		
	13C12-PCB28	53	30 - 135		
	13C12-PCB37	50	25 - 150		
	13C12-PCB54	60	25 - 150		
	13C12-PCB77	57	25 - 150		
	13C12-PCB81	56	25 - 150		
	13C12-PCB104	57	25 - 150		
	13C12-PCB105	64	25 - 150		
	13C12-PCB111	65	30 - 135		
	13C12-PCB114	65	25 - 150		
	13C12-PCB118	63	25 - 150		
	13C12-PCB123	62	25 - 150		
	13C12-PCB126	64	25 - 150		
	13C12-PCB155	64	25 - 150		
	13C12-PCB167	69	25 - 150		
	13C12-PCB169	68	25 - 150		
	13C12-PCB178	73	30 - 135		
	13C12-PCB188	63	25 - 150		
	13C12-PCB189	70	25 - 150		
	13C12-PCB202	67	25 - 150		
	13C12-PCB205	79	25 - 150		
	13C12-PCB206	74	25 - 150		
	13C12-PCB208	71	25 - 150		
	13C12-PCB209	72	25 - 150		
	13C12-PCB156+157	69	25 - 150		
	13C12-PCB8	62	25 - 150		
	13C12-PCB32	77	25 - 150		
	13C12-PCB31	62	25 - 150		
	13C12-PCB47	63	25 - 150		
	13C12-PCB95	99	25 - 150		
	13C12-PCB70	74	25 - 150		
	13C12-PCB60	78	25 - 150		

Sample Description: NB3101FB Composite Water Sample ORG
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LL Group # 1582903
Account # 12798

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Reported: 11/11/2015 05:13

East Brunswick NJ 08816

NB310 SDG#: NB350-02FB

CAT No.	Analysis Name	CAS Number	Result	MRL	Dilution Factor
Labeled Compounds					
	%Rec	Windows			
13C12-PCB85	74	25 - 150			
13C12-PCB133	77	25 - 150			
13C12-PCB141	91	25 - 150			
13C12-PCB127	77	25 - 150			
13C12-PCB128	87	25 - 150			
13C12-PCB162	94	25 - 150			
13C12-PCB180	94	25 - 150			

Dioxins/Furans Data Qualifiers:

<i>B</i>	<i>Detected in Method Blank</i>
<i>U</i>	<i>Undetected</i>
<i>J</i>	<i>Estimated concentration between Estimated Detection Limit and Minimum Level</i>
<i>E</i>	<i>Exceeds calibration range</i>
<i>C</i>	<i>Confirmed quantitation on secondary GC column</i>
<i>Q</i>	<i>EMPC - Estimated Maximum Possible Concentration</i>
<i>F</i>	<i>Interference is present</i>
<i>S</i>	<i>Saturation of detection signal</i>

Analytical Data

Client: Field & Technical Services LLC

Job Number: 200-29185-1

Sdg Number: NB350

Client Sample ID: NB3101FB

Lab Sample ID: 200-29185-1

Date Sampled: 08/06/2015 1230

Client Matrix: Water

Date Received: 08/07/2015 1010

Organotins/GC Organotins (GC/FPD)

Analysis Method:	Organotins/GC	Analysis Batch:	200-92704	Instrument ID:	CH2860.i
Prep Method:	3510C	Prep Batch:	200-92576	Initial Weight/Volume:	1030 mL
Dilution:	1.0			Final Weight/Volume:	1 mL
Analysis Date:	08/13/2015 1707			Injection Volume:	3 uL
Prep Date:	08/11/2015 1147			Result Type:	PRIMARY

Analyte	Result (ug/L)	Qualifier	RL	RL
Tetrabutyltin	0.049	U	0.049	0.049
Tributyltin	0.044	U	0.044	0.044
Dibutyltin	0.038	U *	0.038	0.038
Monobutyltin	0.60	U * cn	0.60	0.60

Surrogate	%Rec	Qualifier	Acceptance Limits
Triphenyltin	40		15 - 150

Sample ID: NB3101FB

EPA Method 1699

Client Data			Sample Data		Laboratory Data			
Name:	Tierra Solutions, Inc.		Matrix:	Aqueous	Lab Sample:	1500705-01	Date Received:	07-Aug-2015 9:08
Project:	Newark Bay Blank Sampling-SQT		Sample Size:	0.972 L	QC Batch:	B5H0052	Date Extracted:	10-Aug-2015 9:10
Date Collected:	06-Aug-2015 12:30				Date Analyzed:	12-Aug-15 01:28	Column:	ZB-50 Analyst: ANP
Analyte	Conc. (pg/L)	DL	EMPC	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
Hexachlorobenzene	7.19			J, B	IS 13C6-Hexachlorobenzene	70.1	5 - 120	
alpha-BHC	ND		1.59		IS 13C6-alpha-BHC	75.9	32 - 130	
Lindane (gamma-BHC)	ND		5.81		IS 13C6-Lindane (gamma-BHC)	82.8	11 - 120	
beta-BHC	ND	1.00			IS 13C6-beta-BHC	83.7	32 - 130	
delta-BHC	ND	0.749			IS 13C6-delta-BHC	84.8	36 - 137	
Heptachlor	ND	0.699			IS 13C10-Heptachlor	73.5	5 - 120	
Aldrin	ND		2.06		IS 13C12-Aldrin	79.5	5 - 120	
Oxychlordane	ND	1.65			IS 13C10-Oxychlordane	82.3	23 - 135	
cis-Heptachlor Epoxide	ND	1.21			IS 13C10-cis-Heptachlor Epoxide	80.6	27 - 137	
trans-Heptachlor Epoxide	ND	5.24			IS 13C10-trans-Chlordane (gamma)	82.7	21 - 132	
trans-Chlordane (gamma)	ND	1.53			IS 13C10-trans-Nonachlor	75.1	14 - 136	
trans-Nonachlor	ND	1.44			IS 13C9-Endosulfan I (alpha)	83.3	15 - 148	
cis-Chlordane (alpha)	ND	1.41			IS 13C12-2,4'-DDE	89.4	47 - 160	
Endosulfan I (alpha)	ND		11.7		IS 13C12-4,4'-DDE	76.6	47 - 160	
2,4'-DDE	ND	1.04			IS 13C12-Dieldrin	77.3	40 - 151	
4,4'-DDE	ND	1.58			IS 13C12-Endrin	73.6	35 - 155	
Dieldrin	5.46			J	IS 13C10-cis-Nonachlor	69.2	36 - 139	
Endrin	ND	1.40			IS 13C9-Endosulfan II (beta)	73.7	5 - 122	
cis-Nonachlor	ND	1.72			IS 13C12-2,4'-DDD	81.1	5 - 199	
Endosulfan II (beta)	ND	5.76			IS 13C12-2,4'-DDT	72.3	5 - 199	
2,4'-DDD	ND	1.58			IS 13C12-4,4'-DDD	72.8	5 - 120	
2,4'-DDT	ND	3.04			IS 13C12-4,4'-DDT	63.2	5 - 120	
4,4'-DDD	ND	1.88			IS 13C9-Endosulfan Sulfate	67.7	15 - 148	
4,4'-DDT	ND		6.58		IS 13C12-Methoxychlor	47.4	5 - 120	
Endosulfan Sulfate	ND	2.00			IS 13C10-Mirex	39.2	5 - 120	
4,4'-Methoxychlor	ND	4.61			IS 13C12-Endrin Aldehyde	59.2	15 - 148	
Mirex	ND	1.11			IS 13C12-Endrin Ketone	52.8	15 - 148	
Endrin Aldehyde	ND		13.1					
Endrin Ketone	ND	3.93						

DL - Sample specific estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL - Lower control limit - upper control limit

Appendix C

SURFACE SEDIMENT COLLECTION FORM

Project Name: NBSA Project no.: _____
 Date: 9-14-15 Weather: Clear To
 Sampling Method: PONAR Crew: PSD, AMB, JEM

GRAB DATA		Location ID: 136-1		Vessel Position Number: 1	
Latitude/Northing (Y): 681133.8			Longitude/Easting (X): 601817.9		
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	0845	7.3	6"	Y	Chem, BENTHIC
2	0848	↓	↓	↓	BENTHIC
3	0851	↓	↓	↓	BENTHIC
4	0853	↓	↓	↓	Eg bucket
5	0855	↓	↓	↓	Eg bucket

SAMPLE DATA		Sample ID:			
Analyses needed before homogenization (circle):		VOC	TEPH-Purgeables	AVS/SEM	Other:
Sediment type	Sediment color	Sediment odor		Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)	
cobble	brown surface	none	H ₂ S		
gravel	drab olive	slight	petroleum		
sand (F M C)	brown	moderate	other:		
silt	gray	strong			
clay	black				

Relinquished By: PSD Company: ARCADIS Date: 9/14 Time: 1600 ^{JH} 1500
 Accepted By: JH Company: ARCADIS Date: 9/14/15 Time: 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: POMAR Crew: AD, AMB, JEM

silt	gray	strong
clay	black	

Accepted By JH Company ARCADIS Date 11/17/15 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONTAC Crew: PSD, AMB, JEM

90 ARCADIS plus trank

Accepted By J Company AF-1015 Date 1/14/15 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONAR Crew: RD, AMB, JEN

clay	black		
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Accepted By SA Company ARIADIS Date 11/11/15 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONATC Crew: JD, AMIS, JEM

silt	gray	strong
clay	black	

Accepted By JH Company ARCADIS Date 11/17/13 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: POB/ATK Crew: ADAM B. JEN

[illegible]

SAMPLE DATA		Sample ID:	
Analyses needed before homogenization (circle):		VOC	TEPH-Purgeables
Sediment type	Sediment color	Sediment odor	AVS/SEM
cobble	brown surface	none	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
gravel	drab olive	slight	
sand (F M C)	brown	moderate	
silt	gray	strong	
clay	black		
		H ₂ S	
		petroleum	
		other:	

Accepted By JR Company ARCADIS Date 7/17/13 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONAR Crew: DJ D, AMB, JEM

Silt	gray	strong	
clay	black		

Accepted By J Company ARCADIS Date 9/14/15 Time 1300

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONAR Crew: PD, AMB, JEM

[illegible]Accepted By JH Company ARCADIS Date 7/1/15 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.SA Project no.: _____
Date: 9-14-15 Weather: 70° - CLEAR - WINDY
Sampling Method: PONAR Crew: PIO, AMB, JEM

[illegible]

Relinquished By PJD Company ARCADIS Date 9/14 Time ~~1600~~ 1500

Accepted By JH Company ARCADIS Date 9/14/15 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONAR Crew: PJD, AMB, JEM

clay	black		
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Accepted By JH Company ARCADIS Date 9/14/15 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PON HR Crew: W. D. AMES, J. D. M.

silt	gray	strong
clay	black	

Accepted By JH Company ARCADIS Date 9/17/13 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: POMF Crew: PSD, AMB, JEM

clay	black		
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Accepted By Jed Company ARCADIS Date 7/14/15 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONTIL Crew: 150, AMB, 3 EM

Sediment type	Sediment color	Sediment odor		Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	none	H ₂ S	
gravel	drab olive	slight	petroleum	
sand (F M C)	brown	moderate	other:	
silt	gray	strong		
clay	black			

Accepted By JH Company AIRCADIS Date 9/14/15 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONAR Crew: PJD, JGM, AMB

clay	black		
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Accepted By S. J. Company ARCHITECTS Date 11/11/15 Time 1:30

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A Project no.: B0009189-0044
Date: 9-15-15 Weather: SUNNY
Sampling Method: PONAR Crew: PSD, AAB, Jem

[illegible]

Relinquished By BO Company ARCADIS Date 9/15/15 Time 1100 500

Accepted By JH Company ARCADIS Date 9/15/15 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Project Name: N-B-S-A Project no.: B0009999.0044
 Date: 9-15-15 Weather: Sunny
 Sampling Method: POMAR Crew: PSD, AMB, JEM

GRAB DATA		Location ID: <u>139-2</u>		Vessel Position Number: <u>2</u>	
Latitude/Northing (Y): <u>674966.1</u>		Longitude/Easting (X): <u>597448.4</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	1228	10.3	6"	Y	5g bucket
2	1230	↓	↓	↓	↓
3	1232	↓	↓	↓	↓
4	1234	↓	↓	↓	↓
5	1236	↓	↓	↓	↓

SAMPLE DATA		Sample ID: <u>NA</u>	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type	Sediment color	Sediment odor	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	<u>none</u> H ₂ S	<u>clams</u>
gravel	drab olive	slight petroleum	
<u>sand (F M C)</u>	<u>brown</u>	moderate other:	
<u>silt</u>	gray	strong	
clay	black		

Relinquished By: PSD Company: ARCADIS Date: 9/15/15 Time: 1500
 Accepted By: JH Company: ARCADIS Date: 9/15/15 Time: 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONWAL Crew: PJ1, AM5, 3GM

silt	gray	strong
clay	black	

Accepted By J. [Signature] Company WREAR Date 11/27/13 Time 1:00

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONA/L Crew: F/D, AMB, JEM

sun	gray	strong
clay	black	

Accepted By JH Company AKRAM'S Date 11/12/15 Time 1:50

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONATC Crew: PSD, AMB, JEM

[illegible]

SAMPLE DATA		Sample ID: <u>NP</u>	
Analyses needed before homogenization (circle):		VOC	TEPH-Purgeables
		AVS/SEM	Other:
Sediment type	Sediment color	Sediment odor	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	<u>none</u>	H ₂ S
gravel	drab olive	slight	petroleum
<u>sand (F M C)</u>	<u>brown</u>	moderate	other:
<u>silt</u>	gray	strong	
clay	black		<u>clams</u>

Accepted By JH Company ARCADIS Date 9/15/15 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONAR Crew: PJD, AMB, JLN

Clay	Black		
on	to	shut	and

Accepted By JR Company ARCADIS Date 9/12/13 Time 1900

MOVED TO SURF SEDIMENTS

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater

Project no.: B0009989.0044

Date:

9/29/15

Weather:

overcast

Sampling Method: Ponar

Crew:

PJD, AMB, JEM

GRAB DATA		Location ID: 140		Vessel Position Number: 1	
Latitude/Northing (Y): 686510.0		Longitude/Easting (X): 599366.3			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	0748	4.5	4"	Y	chem-benthic
2	0750	↓	↓	↓	benthic
3	0752	↓	↓	↓	benthic
4	0754	↓	↓	↓	5g bucket
5	0756	↓	↓	↓	↓
140-2 N) 686498.3 E) 599357.3					
1	0758	4.7	4"	Y	5g bucket
2	0800	↓	↓	↓	↓
3	0802	↓	↓	↓	↓
4	0804	↓	↓	↓	↓
5	0806	↓	↓	↓	↓
140-3 0808 4.6 4" Y 5g bucket					
1	0810	↓	↓	↓	↓
2	0812	↓	↓	↓	↓
3	0814	↓	↓	↓	↓
4	0816	↓	↓	↓	↓
5	0818	↓	↓	↓	↓
N) 686508.2 E) 599362.6					
SAMPLE DATA		Sample ID: NB13 SED CTEM 140, NB13 SED COM, A, B, C			
Analyses needed before homogenization (circle): VOC TPH-Purgeables AVS/SEM Other:					
Sediment type	Sediment color	Sediment odor		Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)	
cobble	brown surface	none		H ₂ S	
gravel	drab olive	slight		petroleum	
sand (F M C)	brown	moderate		other:	
silt	gray	strong			
clay	black				

Relinquished By: PJD

Company: Arcadis

Date:

9/29/15

Time:

11:00 1515

Accepted By:

JH

Company:

ARCADIS

Date:

9/29/15

Time:

1515

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
 Date: 9/29/15 Weather: overcast
 Sampling Method: Ponar Crew: PJD, AMB, JEM

GRAB DATA		Location ID: <u>140-8</u>	Vessel Position Number: <u>7</u>		
Latitude/Northing (Y):		Longitude/Easting (X): <u>599417.3</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	0850	5.5	4	Y	5g bucket
2	0852	↓	↓	↓	↓
3	0854	↓	↓	↓	↓
4	0856	↓	↓	↓	↓
5	0858	↓	↓	↓	↓
<u>140-8</u>		<u>N) 686518.3</u>	<u>E) 599410.4</u>		
1	900	5.3	4	Y	5g bucket
2	902	↓	↓	↓	↓
3	904	↓	↓	↓	↓
4	906	↓	↓	↓	↓
5	908	↓	↓	↓	↓
<u>149-9</u>		<u>N) 686503.7</u>	<u>E) 599410.2</u>		
1	0910	5.3	4	Y	5g bucket
2	912	↓	↓	↓	↓
3	914	↓	↓	↓	↓
4	916	↓	↓	↓	↓
5	918	↓	↓	↓	↓
SAMPLE DATA		Sample ID: <u>N/A</u>			
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:					
Sediment type cobble gravel <u>sand (F M C)</u> <u>silt</u> clay	Sediment color brown surface drab olive <u>brown</u> gray black	Sediment odor <u>none</u> H ₂ S slight petroleum moderate other: strong	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)		

Relinquished By: PJD Company: Arcadis Date: 9/29/15 Time: 1400 1515
 Accepted By: JTH Company: ARCADIS Date: 9/29/15 Time: 1515

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
 Date: 9/29/15 Weather: overcast
 Sampling Method: Ponar Crew: PJD, AMB, JEM

GRAB DATA		Location ID: <u>140-10</u>		Vessel Position Number: <u>10</u>	
Latitude/Northing (Y): <u>686485.6</u>		Longitude/Easting (X): <u>599403.9</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	920	5.5	4	Y	5g bucket
2	922	↓	↓	↓	↓
3	924	↓	↓	↓	↓
4	926	↓	↓	↓	↓
5	928	↓	↓	↓	↓
<u>140-11 N) 686474.2 E) 599399.9</u>					
1	0930	6.1	4	Y	5g bucket
2	932	↓	↓	↓	↓
3	934	↓	↓	↓	↓
4	936	↓	↓	↓	↓
5	938	↓	↓	↓	↓
<u>140-12 N) 686461.5 E) 599389.8</u>					
1	0940	5.8	4	Y	5g bucket
2	942	↓	↓	↓	↓
3	944	↓	↓	↓	↓
4	946	↓	↓	↓	↓
5	948	↓	↓	↓	↓

SAMPLE DATA		Sample ID: <u>N/A</u>	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type cobble gravel <u>sand (F.M.C.)</u> silt clay	Sediment color brown surface drab olive <u>brown</u> gray black	Sediment odor <u>none</u> H ₂ S slight petroleum moderate other: strong	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)

Relinquished By PJD Company Arcadis Date 9/29/15 Time 1515
 Accepted By JH Company ARCADIS Date 9/29/15 Time 1515

Project Name: N.B.S.A Project no.: B0009989.0044
Date: 9-16-15 Weather: SUNNY
Sampling Method: PUMP Crew: PJO, AMB, JEM

Relinquished By PJO Company ARCADIS Date 9/16/15 Time 1600
Accepted By JH Company ARCADIS Date 9/16/15 Time 1600

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONAR Crew: (1), HMB, EM

[illegible]

SAMPLE DATA		Sample ID: NA	
Analyses needed before homogenization (circle):		VOC	TEPH-Purgeables
Sediment type		Sediment odor	
cobble	brown surface	none	H ₂ S
gravel	drab olive	slight	petroleum
sand (F M C)	brown	moderate	other:
silt	gray	strong	
clay	black		
		Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)	

Accepted By 34 Company AKRAM Date 11/10/15 Time 10:00

Relinquished By PJD Company ARCADIS Date 9/16/15 Time 1600
Accepted By JH Company ARCADIS Date 9/16/15 Time 1600

Project Name: N.B.S.A Project no.: B0009989.0044
Date: 9-16-15 Weather: Sunny
Sampling Method: Pond Crew: P10, Amb, Jem

[illegible]

SAMPLE DATA		Sample ID: NA	
Analyses needed before homogenization (circle):		VOC	TEPH-Purgeables
Sediment type		Sediment odor	
cobble	brown surface	none	H ₂ S
gravel	drab olive	slight	petroleum
sand (F M C)	brown	moderate	other:
silt	gray	strong	
clay	black		
		Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)	

Relinquished By [Signature] Company ARCADIS Date 11/14/13 Time 1000

Accepted By JH Company ARCADIS Date 9/16/15 Time 1600

[illegible]

Sample ID: NA

Relinquished By PSD Company ARCADIS Date 9/16/15 Time 1600
Accepted By JH Company ARCADIS Date 9/16/15 Time 1600

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A Project no.: B0009989.0044
 Date: 9-16-15 Weather: Sunny
 Sampling Method: PONAR Crew: PTD, AMB, JEM

GRAB DATA		Location ID: <u>141-7</u>		Vessel Position Number: <u>7</u>	
Latitude/Northing (Y): <u>670964.8</u>		Longitude/Easting (X): <u>595971.8</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
<u>1</u>	<u>0928</u>	<u>10.0</u>	<u>6"</u>	<u>Y</u>	<u>5g bucket</u>
<u>2</u>	<u>0930</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
<u>3</u>	<u>0932</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
<u>4</u>	<u>0934</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
<u>5</u>	<u>0936</u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

SAMPLE DATA		Sample ID: <u>NA</u>	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type cobble gravel <u>sand (F M C)</u> <u>silt</u> clay	Sediment color brown surface drab olive <u>brown</u> gray black	Sediment odor <u>none</u> H ₂ S slight petroleum moderate other: strong	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)

Relinquished By: PTD Company: ARCADIS Date: 9/16/15 Time: 1600
 Accepted By: JH Company: ARCADIS Date: 9/16/15 Time: 1600

Project Name: N.B.S.A Project no.: B0009984 0044
Date: 9-16-15 Weather: Sunny
Sampling Method: PONAR Crew: PIU, AMB, JEM

SAMPLE DATA		Sample ID: NA	
Analyses needed before homogenization (circle):		VOC	TEPH-Purgeables
Sediment type	Sediment color	Sediment odor	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	none	H ₂ S
gravel	drab olive	slight	petroleum
sand (F M C)	brown	moderate	other:
silt	gray	strong	
clay	black		

Relinquished By [Signature] Company INTELLIS Date 11/14/15 Time 1600
Accepted By [Signature] Company ARCADIS Date 9/16/15 Time 1600

SURFACE SEDIMENT COLLECTION FORM

Project Name: N-B.S.A Project no.: B0009989.0044
 Date: 9-16-15 Weather: Sunny
 Sampling Method: PONAR Crew: PTD, Amb, JEM

GRAB DATA		Location ID: <u>141-01</u>		Vessel Position Number: <u>9</u>	
Latitude/Northing (Y): <u>670990.8</u>		Longitude/Easting (X): <u>595982.3</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
<u>1</u>	<u>0948</u>	<u>10</u>	<u>6</u>	<u>Y</u>	<u>5g bucket</u>
<u>2</u>	<u>950</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
<u>3</u>	<u>0952</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
<u>4</u>	<u>954</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
<u>5</u>	<u>956</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>

SAMPLE DATA		Sample ID: <u>NA</u>	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type	Sediment color	Sediment odor	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	<u>none</u> H ₂ S	
gravel	drab olive	slight petroleum	
<u>sand (F M C)</u>	<u>brown</u>	moderate other:	
<u>silt</u>	gray	strong	
clay	black		

Relinquished By: JD Company: Arcadis Date: 9/16/15 Time: 1600
 Accepted By: JH Company: ARCADIS Date: 9/16/15 Time: 1600

* Moved as per EPA, Tienra

Title: SQT and Porewater Sampling and Analysis

Quality Assurance Project Plan

Revision Number: 2

Revision Date: August 2015

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater

Project no.: B0009989.0044

Date: 9/29/15

Weather: Overcast

Sampling Method: Ponar

Crew: PJD, AMB, JEM

GRAB DATA		Location ID: 142-1		Vessel Position Number: 1	
Latitude/Northing (Y): 669947.4		Longitude/Easting (X): 596463.2			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	0930	6.6	2"	Y	dem. benthic
2	0932	↓	↓	↓	benthic
3	0934	↓	↓	↓	benthic
4	0936	↓	↓	↓	5g bucket
5	0938	↓	↓	↓	5g bucket
142-2 N) 669961.3 E) 596487.5					
1	0940	6.3	2	Y	
2	0942	↓	0	N	
3	0944	↓	0	N	
4	0946	↓	2	Y	
5	0948	↓	2	Y	
142-3 N) 669979.4 E) 596430.3					
1	0950	6.7	2	Y	5g bucket
2	0952	↓	0	N	↓
3	0954	↓	2	Y	
4	0956	↓	2	Y	
5	0958	↓	2	Y	↓
SAMPLE DATA Sample ID: NBS-SEN-chem142 - NBS 550 & BM A, B, C					
Analyses needed before homogenization (circle): <input checked="" type="checkbox"/> VOC <input checked="" type="checkbox"/> TEPH-Purgeables <input checked="" type="checkbox"/> AMS/SEM Other:					
Sediment type	Sediment color	Sediment odor		Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)	
cobble	brown surface	none		H ₂ S petroleum other:	
gravel	drab olive	slight			
sand (F M C)	brown	moderate			
silt	gray	strong			
clay	black				

Relinquished By: PJD

Company: Arcadis

Date: 9/23/15 Time: 1700

Accepted By: JH

Company: ARCADIS

Date: 9/29/15 Time: 0715

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
 Date: 9/23/15 Weather: Overcast
 Sampling Method: Ponar Crew: PJD, AMB, JEM

GRAB DATA		Location ID: <u>142-4</u>	Vessel Position Number: <u>4</u>		
Latitude/Northing (Y): <u>669993.1</u>		Longitude/Easting (X): <u>596430.5</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	0953	6.7	2"	Y	5g bucket
2	1000	↓	0"	N	↓
3	1002	↓	2"	Y	↓
4	1004	↓	↓	↓	↓
5	1006	↓	↓	↓	↓
<u>142-5 N) (070015.2 (E) 596490.6</u>					
1	1008	6.3	2"	Y	5g bucket
2	1010	↓	↓	↓	↓
3	1012	↓	↓	↓	↓
4	1014	↓	↓	↓	↓
5	1016	↓	↓	↓	↓
<u>142-6</u>					
1	1018	6.3	2"	Y	5g bucket
2	1020	↓	↓	↓	↓
3	1022	↓	↓	↓	↓
4	1024	↓	↓	↓	↓
5	1026	↓	↓	↓	↓
6	1028	↓	↓	↓	↓

SAMPLE DATA		Sample ID: <u>NA</u>
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:		
Sediment type cobble gravel <u>sand (F M C)</u> silt clay	Sediment color brown surface drab olive <u>brown</u> gray black	Sediment odor <u>none</u> slight moderate strong H ₂ S petroleum other:
Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)		

Relinquished By PJD Company Arcadis Date 9/23/15 Time 1700
 Accepted By JH Company ARCADIS Date 9/29/15 Time 0715

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
 Date: 9/29/15 Weather: SUN
 Sampling Method: Ponar Crew: PJD, AMB, JEM

GRAB DATA		Location ID: <u>143-1</u>		Vessel Position Number: <u>1</u>	
Latitude/Northing (Y):				Longitude/Easting (X):	
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	1212	8.4	6"	Y	chem-benthic
2	1214	↓	↓	↓	benthic
3	1216	↓	↓	↓	benthic
4	1218	↓	↓	↓	5g bucket
5	1220	↓	↓	↓	5g bucket
<u>143-2 N) 668392.2 E) 59902.2</u>					
1	1222	8.4	6"	Y	5g bucket
2	1224	↓	↓	↓	↓
3	1226	↓	↓	↓	↓
4	1228	↓	↓	↓	↓
5	1230	↓	↓	↓	↓
<u>143-3 N) 668396.6 E) 599255.8</u>					
1	1232	8.5	6"	Y	5g bucket
2	1234	↓	↓	↓	↓
3	1236	↓	↓	↓	↓
4	1238	↓	↓	↓	↓
5	1240	↓	↓	↓	↓
SAMPLE DATA		Sample ID: <u>NB03-SED-CHEM-143, NB03-SED-COM A, B, C</u>			
Analyses needed before homogenization (circle): <u>VOC</u> <u>TEPH</u> <u>Purgeables</u> <u>AVS/SEM</u> Other: _____					
Sediment type	Sediment color	Sediment odor		Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)	
cobble	brown surface	none	H ₂ S		
gravel	drab olive	slight	petroleum		
sand (F M C)	brown	moderate	other:		
silt	gray	strong			
clay	black				

Relinquished By: PJD Company: Arcadis Date: 9/29/15 Time: 1700 1515
 Accepted By: JH Company: ARCADIS Date: 9/29/15 Time: 1515

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
 Date: 9/29/15 Weather: SUN
 Sampling Method: Ponar Crew: PJD, AMB, JEM

GRAB DATA		Location ID: <u>143-4</u>		Vessel Position Number: <u>4</u>	
Latitude/Northing (Y): <u>668407.6</u>		Longitude/Easting (X): <u>595243.1</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	1242	8.3	6"	Y	5g bucket
2	1244	↓	↓	↓	↓
3	1246	↓	↓	↓	↓
4	1248	↓	↓	↓	↓
5	1250	↓	↓	↓	↓
<u>143-5 N) 668414.9 E) 595231.7</u>					
1	1252	8.2	6"	Y	5g bucket
2	1254	↓	↓	↓	↓
3	1256	↓	↓	↓	↓
4	1258	↓	↓	↓	↓
5	1300	↓	↓	↓	↓

SAMPLE DATA		Sample ID: <u>NA</u>	
Analyses needed before homogenization (circle): VOC <input checked="" type="checkbox"/> TEPH-Purgeables <input type="checkbox"/> AVS/SEM <input type="checkbox"/> Other: <input type="checkbox"/>			
Sediment type cobble gravel <u>sand (F M C)</u> silt clay	Sediment color brown surface drab olive <u>brown</u> gray black	Sediment odor <u>none</u> slight moderate strong H ₂ S petroleum other:	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)

Relinquished By: PJD Company: Arcadis Date: 9/29/15 Time: 1300 1515
 Accepted By: JH Company: ARCADIS Date: 9/29/15 Time: 1515

Project Name: POW Project no.: 00001151-0049
Date: 9-17-15 Weather: overcast
Sampling Method: POW Crew: DJP, AMB, JAM

Relinquished By PJD Company ARCADIS Date 9/17/15 Time 1400
Accepted By JH Company ARCADIS Date 9/17/15 Time 1400

Relinquished By PJD Company Arcadis Date 9/17/15 Time 1400
Accepted By JH Company ARCADIS Date 9/17/15 Time 1400

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: Point Crew: MS, KMS, JSM

slit	slit	slit
clay	black	strong

Accepted By JH Company ARCADIS Date 9/17/15 Time 1400

[illegible]

Relinquished By PTD Company Arcadis Date 9/17/15 Time 1400
Accepted By JH Company ARCADIS Date 9/17/15 Time 1400

SURFACE SEDIMENT COLLECTION FORM

Project Name: NBSA Project no.: B0009999.0044
 Date: 9-17-15 Weather: overcast
 Sampling Method: POMAR Crew: PJD, AMB, Lem

GRAB DATA		Location ID: <u>144-6</u>		Vessel Position Number: <u>6</u>	
Latitude/Northing (Y): <u>666911.2</u>		Longitude/Easting (X): <u>592975.9</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
<u>1</u>	<u>0800</u>	<u>12.4</u>	<u>6"</u>	<u>Y</u>	<u>5g bucket</u>
<u>2</u>	<u>0802</u>	↓	↓	↓	↓
<u>3</u>	<u>0804</u>	↓	↓	↓	↓
<u>4</u>	<u>0806</u>	↓	↓	↓	↓
<u>5</u>	<u>0808</u>	↓	↓	↓	↓

SAMPLE DATA		Sample ID: <u>NA</u>	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type cobble gravel sand (F M C) <u>silt</u> clay	Sediment color brown surface drab olive brown gray <u>black</u>	Sediment odor none H ₂ S <u>slight</u> <u>petroleum</u> moderate other: strong	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheep, fauna, field duplicate, etc.) <u>SK2</u>

Relinquished By: PJD Company: Arcadis Date: 9/17/15 Time: 1400
 Accepted By: JA Company: ARCADIS Date: 9/17/15 Time: 1400

[illegible]

Relinquished By BSO Company Arcadis Date 9/17/15 Time 1400

Accepted By JH Company ARCADIS Date 9/17/15 Time 1400

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
 Date: 9/29/15 Weather: SUN
 Sampling Method: Ponar Crew: PJD, AMB, JEM

GRAB DATA		Location ID: <u>145-1</u>		Vessel Position Number: <u>1</u>	
Latitude/Northing (Y): <u>665166.1</u>		Longitude/Easting (X): <u>593647.9</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	1104	8.3	6"	Y	beutric-chem
2	1106	↓	↓	↓	beutric
3	1108	↓	↓	↓	beutric
4	1110	↓	↓	↓	5g bucket
5	1112	↓	↓	↓	↓
<u>145-2 N) 665473.3 E) 593633.9</u>					
1	1114	8.0	6"	Y	5g bucket
2	1116	↓	↓	↓	↓
3	1118	↓	↓	↓	↓
4	1120	↓	↓	↓	↓
5	1122	↓	↓	↓	↓
<u>145-3 N) 665484.4 E) 593621.5</u>					
1	1124	8.2	6"	Y	5g bucket
2	1126	↓	↓	↓	↓
3	1128	↓	↓	↓	↓
4	1130	↓	↓	↓	↓
5	1132	↓	↓	↓	↓

SAMPLE DATA		Sample ID: <u>NB03-SEP-chem-145-NB03-SEP CAN A,B,C</u>	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type	Sediment color	Sediment odor	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	none	
gravel	drab olive	slight	
sand (F M C)	brown	moderate	
silt	gray	strong	
clay	black		

Relinquished By: PJD Company: Arcadis Date: 9/29/15 Time: 1700 1515
 Accepted By: JH Company: ARCADIS Date: 9/29/15 Time: 1515

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
 Date: 9/29/15 Weather: SUN
 Sampling Method: Ponar Crew: PJD, AMB, JEM

GRAB DATA		Location ID:	Vessel Position Number:		
Latitude/Northing (Y): <u>665492.7</u>		Longitude/Easting (X): <u>593603.5</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	1134	8.0	6"	Y	5g bucket
2	1136	↓	↓	↓	↓
3	1138	↓	↓	↓	↓
4	1140	↓	↓	↓	↓
5	1142	↓	↓	↓	↓
145-5		N) 665500.9	E) 593587.9		
1	1144	7.9	6"	Y	5g bucket
2	1146	↓	↓	↓	↓
3	1148	↓	↓	↓	↓
4	1150	↓	↓	↓	↓
5	1152	↓	↓	↓	↓
145-6		N) 665502.0	E) 593602.4		
1	1154	8.0	6"	Y	5g bucket
2	1156	↓	↓	↓	↓
3	1158	↓	↓	↓	↓
4	1200	↓	↓	↓	↓
5	1202	↓	↓	↓	↓

SAMPLE DATA		Sample ID: <u>N/A</u>	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type cobble gravel <u>sand (F M C)</u> <u>silt</u> clay	Sediment color brown surface drab olive <u>brown</u> gray black	Sediment odor <u>none</u> slight moderate strong	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.) H ₂ S petroleum other:

Relinquished By: PJD Company: Arcadis Date: 9/29/15 Time: 17:15
 Accepted By: JH Company: ARCADIS Date: 9/29/15 Time: 1515

2-Time

Date 9/2/15 Time 1530

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
Date: 9/21/15 Weather: SUNNY
Sampling Method: Ponar Crew: PJD, AMB, JEM

Relinquished By PJD Company Arcadis Date 9/21/15 Time 7:00 1530

Accepted By JA Company ARCADIS Date 9/21/15 Time 1530

* Monitor 20' N. AWAY FROM UNDER H2O
COLLECTION FORM OBSTRUCTION

SURFACE SEDIMENT COLLECTION FORM

Crew: PJD, AMB, JEM

SAMPLE DATA		Sample ID: NB03-500-CHEM-KB, NB03 SED COM, A, B, C	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type	Sediment color	Sediment odor	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	none H ₂ S	
gravel	drab olive	slight petroleum	
sand (F M C)	brown	moderate other:	
silt	gray	strong	
clay	black		

Date 9/21/15 Time 1530

Date 9/2/15 Time 6:15

Relinquished By PJD Company Arcadis Date 9/21/15 Time 1700
Accepted By JH Company ARCADIS Date 9/21/15 Time 0715

9" ponar

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
 Date: 9/29/15 Weather: overcast
 Sampling Method: Ponar Crew: PJD, AMB, JEM

GRAB DATA		Location ID: <u>152-1</u>		Vessel Position Number: <u>1</u>	
Latitude/Northing (Y): <u>663460.2</u>		Longitude/Easting (X): <u>584444.4</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	0950	7.7	4"	Y	chem. benthic
2	0952	↓	↓	↓	benthic
3	0954	↓	↓	↓	benthic
4	0956	↓	↓	↓	5g bucket
5	0958	↓	↓	↓	5g bucket
<u>152-2 N) 663449.3 E) 58444.1</u>					
1	1000	8.0	4"	Y	5g bucket
2	1002	↓	↓	↓	↓
3	1004	↓	↓	↓	↓
4	1006	↓	↓	↓	↓
5	1008	↓	↓	↓	↓
<u>152-3 N) 663441.2 E) 584456.9</u>					
1	1010	8.1	4	Y	5g bucket
2	1012	↓	↓	↓	↓
3	1014	↓	↓	↓	↓
4	1016	↓	↓	↓	↓
5	1018	↓	↓	↓	↓
SAMPLE DATA		Sample ID: <u>NB03 SED COM 152, NB03 SED COM-A, B, C</u>			
Analyses needed before homogenization (circle): <u>FOC</u> <u>TEPH-Purgeables</u> <u>AVS/SEM</u> Other: _____					
Sediment type	Sediment color	Sediment odor		Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)	
cobble	brown surface	none		H ₂ S	
gravel	drab olive	slight		petroleum	
<u>sand (F M S)</u>	<u>brown</u>	moderate		other:	
silt	gray	strong			
clay	black				

Relinquished By: PJD Company: Arcadis Date: 9/29/15 Time: 1700 1515
 Accepted By: JH Company: ARCADIS Date: 9/29/15 Time: 1515

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
 Date: 9/29/15 Weather: overcast
 Sampling Method: Ponar Crew: PJD, AMB, JEM

GRAB DATA		Location ID: <u>152-4</u>		Vessel Position Number: <u>4</u>	
Latitude/Northing (Y): <u>663432.1</u>		Longitude/Easting (X): <u>584463.2</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	1020	8.3	4	Y	5g bucket
2	1022	↓	↓	↓	↓
3	1024	↓	↓	↓	↓
4	1026	↓	↓	↓	↓
5	1028	↓	↓	↓	↓
<u>152-5</u>		<u>N) 663429.4</u>	<u>4</u>	<u>E) 584473.9</u>	
1	1030	8.7	4	Y	5g bucket
2	1032	↓	↓	↓	↓
3	1034	↓	↓	↓	↓
4	1036	↓	↓	↓	↓
5	1038	↓	↓	↓	↓
<u>152-6</u>		<u>N) 663444.0</u>	<u>4</u>	<u>E) 584465.1</u>	
1	1040	8.0	4	Y	5g bucket
2	1042	↓	↓	↓	↓
3	1044	↓	↓	↓	↓
4	1046	↓	↓	↓	↓
5	1048	↓	↓	↓	↓

SAMPLE DATA		Sample ID: <u>N/A</u>	
Analyses needed before homogenization (circle):		VOC	TEPH-Purgeables
		AVS/SEM	Other:
Sediment type	Sediment color	Sediment odor	
cobble	brown surface	none	
gravel	drab olive	slight	
<u>sand (F M C)</u>	<u>brown</u>	moderate	
silt	gray	strong	
clay	black		
		H ₂ S	
		petroleum	
		other:	
Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)			

Relinquished By PJD Company Arcadis Date 9/29/15 Time 1700
 Accepted By JH Company ARCADIS Date 9/29/15 Time 1515

* MOVED location to
SEN. AREA

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
Date: 9/23/15 Weather: SUN
Sampling Method: Ponar Crew: PJD, AMB, JEM

Relinquished By PJD Company Arcadis Date 9/23/15 Time ~~1700~~ 1530

Accepted By JH Company ARCADIS Date 9/23/15 Time 1530

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
Date: 9/20/15 Weather: SUN, Windy
Sampling Method: Ponar Crew: PJD, AMB, JEM

Relinquished By PJD Company Arcadis Date 9/20/15 Time 1700
Accepted By [Signature] Company ARCADIS Date 9/20/15 Time 0715

Date 9/21/15 Time 0715

Project Name: NBSA Project no.: B0009989.0044
Date: 9-17-15 Weather: overcast
Sampling Method: Pond Crew: MD, AMB, Jeru

Relinquished By MS Company ~~MS~~ Arcadis Date 9/17/15 Time 1400

Accepted By JH Company ARCADIS Date 9/17/15 Time 1400

SURFACE SEDIMENT COLLECTION FORM

Project Name: NDSIT Project no.: B0009989.0047

Date: 9-17-15 Weather: Overcast

Sampling Method: 10 nar Crew: PID, AMB, JEM

GRAB DATA	Location ID: 56-2	Vessel Position Number: 2
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Latitude/Northing (Y): 669982.6 Longitude/Easting (X): 592818.4

Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
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1	0840	36.0	6'	Y	5g bucket
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2	08A2	1						
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3	0844								
---	------	--	--	--	--	--	--	--	--

4	0846	1				
←	0847			←		✓

5	0873	↓	↓	↓	↓
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SAMPLE DATA		COUNT ID: 157			

SAMPLE DATA	Sample ID: NA
Analyses needed before homogenization (circle):	VOC TERPH Purgeables AYS/SEM Other:

Analyses needed before homogenization (circle):		VOC	TEPH-Furageables	AVS/SEM	Other:
Sediment type	Sediment color	Sediment odor		Comments: (i.e. redox potential	

cobble	brown surface	none	H ₂ S	discontinuity, organic matter, wood debris, shell fragments, sheen,
--------	---------------	------	------------------	---

gravel	drab olive	slight	petroleum	fauna, field duplicate, etc.)
--------	------------	--------	-----------	-------------------------------

sand (F M C)	brown	moderate	other:
silt	gray	strong	

slit	gray	strong
clay	black	

Relinquished By YJS Company INCO Date 11/15 Time 1:00

Accepted By JH Company ARCADIS Date 11/11/15 Time 1700

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: 100m Crew: PIU, MMS, Jem

sil clay	gray black	strong
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Accepted By JH Company AKENDIS Date 11/11/13 Time 17:20

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.I.A Project no.: B0009989.0044
Date: 9-17-15 Weather: overcast
Sampling Method: Ponar Crew: PN, AMB, Jem

[illegible]

Relinquished By PJO Company Arcadis Date 9/17/15 Time 1400
Accepted By JH Company ARCADIS Date 9/17/15 Time 1400

SURFACE SEDIMENT COLLECTION FORM

Project Name: NBSA Project no.: 50009989.0044
Date: 9-17-15 Weather: Overcast
Sampling Method: PONAR Crew: PSD, AMB, Jem

[illegible]

Relinquished By PTO Company Arradis Date 9/17/15 Time 1400
Accepted By JH Company ARRADIS Date 9/17/15 Time 1400

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: Pond Crew: MD, AMB, JEM

slit	gray	strong
clay	black	

Accepted By JH Company ARGENTIS Date 11/7/13 Time 17:00

Project Name: N.B.S.A Project no.: B0009989.0044
Date: 2-16-15 Weather: Sunny
Sampling Method: PONAR Crew: PSO, AMB, JEM

[illegible]

SAMPLE DATA		Sample ID: NB03SED-CHM157, NB03SED-COM157, A, B, C	
Analyses needed before homogenization (circle): VOC TPH-Purgeables AVS/SEM Other:			
Sediment type	Sediment color	Sediment odor	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	none H ₂ S	
gravel	drab olive	slight petroleum	
sand (F M C)	brown	moderate other:	
silt	gray	strong	
clay	black		

Relinquished By PSD Company ARCADIS Date 9/16/15 Time 1600

Accepted By JH Company ARCADIS Date 9/16/15 Time 1600

SURFACE SEDIMENT COLLECTION FORM

Project Name: N-B.S.A Project no.: B0009989.0044
 Date: 9-16-15 Weather: Sunny
 Sampling Method: PONAR Crew: PJO, AMB, JEM

GRAB DATA		Location ID: <u>157-2</u>		Vessel Position Number: <u>2</u>	
Latitude/Northing (Y): <u>674697.6</u>			Longitude/Easting (X): <u>5932729</u>		
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	1246	10.4	6"	Y	By bucket
2	1248	↓	↓	↓	↓
3	1250	↓	↓	↓	↓
4	1252	↓	↓	↓	↓
5	1254	↓	↓	↓	↓

SAMPLE DATA		Sample ID: <u>NA</u>	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type	Sediment color	Sediment odor	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	<u>none</u> H ₂ S	
gravel	drab olive	slight petroleum	
<u>sand (F M C)</u>	<u>brown</u>	moderate other:	
<u>silt</u>	gray	strong	
clay	black		

Relinquished By: PJO Company: ARCADIS Date: 9/16/15 Time: 1600
 Accepted By: JH Company: ARCADIS Date: 9/16/15 Time: 1600

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: POVAR Crew: (7) AMB, JGM

[illegible]

SAMPLE DATA		Sample ID: NA	
Analyses needed before homogenization (circle):		VOC	TEPH-Purgeables
Sediment type		Sediment odor	
cobble	brown surface	none	H ₂ S
gravel	drab olive	slight	petroleum
sand (F M C)	brown	moderate	other:
silt	gray	strong	
clay	black		
		Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)	

Accepted By JH Company ARK (NW) Date 11/18/15 Time 1800

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A Project no.: B0009989.0044
 Date: 9-16-15 Weather: Sunny
 Sampling Method: POMAR Crew: PJO, AMB, JEM

GRAB DATA		Location ID: <u>157-S</u>		Vessel Position Number: <u>5</u>	
Latitude/Northing (Y): <u>624651.5</u>		Longitude/Easting (X): <u>593255.9</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	1316	9.8	6"	Y	Eq bracket
2	1318	↓	↓	↓	↓
3	1320	↓	↓	↓	↓
4	1322	↓	↓	↓	↓
5	1324	↓	↓	↓	↓

SAMPLE DATA		Sample ID: <u>NA</u>	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type	Sediment color	Sediment odor	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	<u>none</u> H ₂ S	
gravel	drab olive	slight petroleum	
<u>sand (F M C)</u>	<u>brown</u>	moderate other:	
<u>silt</u>	gray	strong	
clay	black		

Relinquished By PJO Company ARCADIS Date 9/16/15 Time 1600
 Accepted By JH Company ARCADIS Date 9/16/15 Time 1600

[illegible]

Sample ID: NA

Sediment type	Sediment color	Sediment odor	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	none	H ₂ S
gravel	drab olive	slight	petroleum
sand (F M C)	brown	moderate	other:
silt	gray	strong	
clay	black		

Accepted By _____ Company NKCAIIS Date 7/16/15 Time 1600

Relinquished By JH Company ARCADIS Date 9/16/15 Time 1600

Accepted By _____ Company ARCADIS Date 9/16/15 Time 1600

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A. SQT/Porewater

Project no.: B0009989.0044

Date: 9/24/15

Weather: Sun

Sampling Method: Ponar

Crew: PJD, AMB, JEM

GRAB DATA		Location ID: 158-1		Vessel Position Number: 129.9	
Latitude/Northing (Y): 675449.5434.1		Longitude/Easting (X): 595946.4			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	0730	12.2	48"	Y	chem. benthic
2	0732	↓	↓	↓	benthic
3	0734	↓	↓	↓	benthic
4	0736	↓	↓	↓	5g bucket
5	0738	↓	↓	↓	↓
158-2	N) 675428.9	E) 595996.9			
1	0740	12.2	4"	Y	5g bucket
2	0742	↓	↓	↓	↓
3	0744	↓	↓	↓	↓
4	0746	↓	↓	↓	↓
5	0748	↓	↓	↓	↓
158-3	N) 675432.7	E) 596010.4			
1	0750	11.6	4"	Y	5g bucket
2	0752	↓	↓	↓	↓
3	0754	↓	↓	↓	↓
4	0756	↓	↓	↓	↓
5	0758	↓	↓	↓	↓

SAMPLE DATA		Sample ID: N603 C60 158 CHAM		N603 SED COM, AMB, C	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:					
Sediment type	Sediment color	Sediment odor		Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)	
cobble	brown surface	none		H ₂ S	
gravel	drab olive	slight		petroleum	
sand (F M C)	brown	moderate		other:	
silt	gray	strong			
clay	black			Shells	

Relinquished By: PJD

Company: Arcadis

Date: 9/24/15

Time: 1400

1210

Accepted By: JH

Company: ARCADIS

Date: 9/24/15

Time: 1210

1210

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
 Date: 9/24/15 Weather: SUN
 Sampling Method: Ponar Crew: PJD, AMB, JEM

GRAB DATA		Location ID: <u>158-4</u>		Vessel Position Number:	
Latitude/Northing (Y): <u>675426.1</u>		Longitude/Easting (X): <u>596024.9</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	0800	11.6	4"	Y	5g bucket
2	0802	↓	↓	↓	↓
3	0804	↓	↓	↓	↓
4	0806	↓	↓	↓	↓
5	0808	↓	↓	↓	↓
<u>158-5 N) 675420.5 E) 596036.5</u>					
1	0810	11.6	4"	Y	5g bucket
2	0812	↓	↓	↓	↓
3	0814	↓	↓	↓	↓
4	0816	↓	↓	↓	↓
5	0818	↓	↓	↓	↓
<u>158-6 N) 675418.9 E) 596048.4</u>					
1	0820	11.4	4"	Y	5g bucket
2	0822	↓	↓	↓	↓
3	0824	↓	↓	↓	↓

SAMPLE DATA		Sample ID: <u>N/A</u>	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type cobble gravel <u>sand (F M C)</u> <u>silt</u> clay	Sediment color brown surface drab olive <u>brown</u> gray black	Sediment odor <u>none</u> slight moderate strong	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.) <u>Shells</u>

Relinquished By PJD Company Arcadis Date 9/24/15 Time 1210
 Accepted By JH Company ARCADIS Date 9/24/15 Time 1210

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater

Project no.: B0009989.0044

Date: 9/24/15

Weather: SW

Sampling Method: Ponar

Crew: PJD, AMB, JEM

GRAB DATA		Location ID: 159-1		Vessel Position Number: 1	
Latitude/Northing (Y):			Longitude/Easting (X):		
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	0930	37.1	64	Y	chem. benthic
2	0932				benthic
3	0934				benthic
4	0936				Sq bucket
5	0938				
159-2	N) 676933.7		E) 595930.0		
1	0940	37.8			
2	0942				
3	0944				
4	0946				
5	0948				
159-3	N) 646936.4		E) 595909.7		
1	0950	35	64	Y	Sq bucket
2	0952				
3	0954				
4	0956				
5	0958				

Skip 5th location current reasons

SAMPLE DATA		Sample ID: NB03 CHAM 500 159	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type	Sediment color	Sediment odor	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	none	H ₂ S
gravel	drab olive	slight	petroleum
sand (F M C)	brown	moderate	other:
silt	gray	strong	
clay	black		

Relinquished By PJD

Company Arcadis

Date 9/24/15 Time 1400 1210

Accepted By JH

Company ARCADIS

Date 9/24/15 Time 1210

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
 Date: 9/24/15 Weather: SN
 Sampling Method: Ponar Crew: PJD, AMB, JEM

GRAB DATA		Location ID: <u>159-4</u>		Vessel Position Number: <u>4</u>	
Latitude/Northing (Y): <u>676940.1</u>		Longitude/Easting (X): <u>595895.6</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	1000	32.6	6"	Y	5g moist
2	1002	↓	↓	↓	
3	1004	↓	↓	↓	
4	1006	↓	↓	↓	
5	1008	↓	↓	↓	
<u>159-5 N) 676937.7 E) 595878.1</u>					
1	1010	31.0	6"	Y	5g
2	1012	↓	↓	↓	
3	1014	↓	↓	↓	
4	1016	↓	↓	↓	
5	1018	↓	↓	↓	
<u>159-6 N) 676915.6 E) 595924.1</u>					
1	1020	37.0	6"	Y	
2	1022	↓	↓	↓	
3	1024	↓	↓	↓	
4	1026	↓	↓	↓	
5	1028	↓	↓	↓	
SAMPLE DATA		Sample ID: <u>N/A</u>			
Analyses needed before homogenization (circle): <u>VOC</u> <u>TEPH-Purgeables</u> AVS/SEM Other:					
Sediment type	Sediment color	Sediment odor		Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)	
cobble	brown surface	none			
gravel	drab olive	slight			
sand (F M C)	brown	moderate			
silt	gray	strong			
clay	black				

Relinquished By PJD Company Arcadis Date 9/24/15 Time 1210
 Accepted By JH Company ARCADIS Date 9/24/15 Time 1210

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
 Date: 9/24/15 Weather: SUN
 Sampling Method: Ponar Crew: PJD, AMB, JEM

GRAB DATA		Location ID: <u>159-7</u>		Vessel Position Number: <u>7</u>	
Latitude/Northing (Y): <u>676906.7</u>		Longitude/Easting (X): <u>595921.6</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	1030	36.8	6 ^a	Y	5g
2	1032	↓	↓	↓	↓
3	1034	↓	↓	↓	↓
4	1036	↓	↓	↓	↓
5	1038	↓	↓	↓	↓
<u>159-8 N) 676923.1 E) 595945.2</u>					
1	1040	37.6	6	Y	5g
2	1042	↓	↓	↓	↓
3	1044	↓	↓	↓	↓
4	1046	↓	↓	↓	↓
5	1048	↓	↓	↓	↓
<u>159-9 N) 676934.9 E) 595942.5</u>					
1	1050	37.0	6 ^a	Y	5g
2	1052	↓	↓	↓	↓
3	1054	↓	↓	↓	↓
4	1056	↓	↓	↓	↓
5	1058	↓	↓	↓	↓

SAMPLE DATA		Sample ID: <u>N/A</u>	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type cobble gravel <u>sand (F M C)</u> silt clay	Sediment color brown surface drab olive <u>brown</u> gray black	Sediment odor <u>none</u> slight moderate strong	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.) H ₂ S petroleum other:

Relinquished By PJD Company Arcadis Date 9/24/15 Time 1210
 Accepted By JH Company ARCADIS Date 9/24/15 Time 1210

Handwritten: *Mud to surface sediments

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
 Date: 9/28/15 Weather: overcast
 Sampling Method: Ponar Crew: PJD, AMB, JEM

GRAB DATA		Location ID: 678951.2 160		Vessel Position Number: 1	
Latitude/Northing (Y): 678951.2		Longitude/Easting (X): 595754.5			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	0800	4.2	4"	Y	chem-benthic
2	0802	↓	↓	↓	benthic
3	0804	↓	↓	↓	benthic
4	0806	↓	↓	↓	5g bucket
5	0808	↓	↓	↓	↓
160-2 N) 678961.6 E) 595741.2					
1	0810	3.9	4"	Y	5g bucket
2	0812	↓	↓	↓	↓
3	0814	↓	↓	↓	↓
4	0816	↓	↓	↓	↓
5	0818	↓	↓	↓	↓
0820					
160-3 N) 678968.4 E) 595730.9					
1	0820	3.8	4"	Y	5g bucket
2	0822	↓	↓	↓	↓
3	0824	↓	↓	↓	↓
4	0826	↓	↓	↓	↓
5	0828	↓	↓	↓	↓
SAMPLE DATA					
Sample ID: NB03 SED CHGM 160, NB03 SED CHGM, K,B,C					
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:					
Sediment type	Sediment color	Sediment odor		Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)	
cobble	brown surface	none		H ₂ S	
gravel	drab olive	slight		petroleum	
sand (F M C)	brown	moderate		other:	
silt	gray	strong			
clay	black			Organics	

Relinquished By: PJD Company: Arcadis Date: 9/28/15 Time: 1700
 Accepted By: JH Company: ARCADIS Date: 9/29/15 Time: 0715

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
 Date: 9/23/15 Weather: Overcast
 Sampling Method: Ponar Crew: PJD, AMB, JEM

GRAB DATA		Location ID: <u>160-4</u>		Vessel Position Number: <u>4</u>	
Latitude/Northing (Y): <u>678977.5</u>		Longitude/Easting (X): <u>595715.8</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	0830	4.0	4"	Y	Sg bucket
2	0832	↓	↓	↓	
3	0834	↓	↓	↓	
4	0836	↓	↓	↓	
5	0838	↓	↓	↓	
<u>160-5</u>		<u>N)</u>	<u>678982.7</u>	<u>E)</u>	<u>595703.1</u>
1	0840	3.9	4"	Y	Sg bucket
2	0842	↓	↓	↓	
3	0844	↓	↓	↓	
4	0846	↓	↓	↓	
5	0848	↓	↓	↓	

SAMPLE DATA		Sample ID: <u>N/A</u>	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type cobble gravel <u>sand (F M C)</u> <u>silt</u> <u>clay</u>	Sediment color brown surface drab olive <u>brown</u> gray <u>black</u>	Sediment odor <u>none</u> slight moderate strong	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.) <u>Organic</u>

Relinquished By: PJD Company: Arcadis Date: 9/23/15 Time: 1700
 Accepted By: JA Company: ARCADIS Date: 9/29/15 Time: 0715

Project Name: N.B.S.A Project no.: B009989.0044
Date: 9-15-15 Weather: SUNNY
Sampling Method: PONAR Crew: PJO, AMB, JEM

Relinquished By BJD Company ARCADIS Date 9/15/15 Time 1500

Accepted By JH Company ARCADIS Date 9/15/15 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A Project no.: B0009989.0044
 Date: 9-15-15 Weather: SUNNY
 Sampling Method: PONAR Crew: PJO, AMS, SEM

GRAB DATA		Location ID: <u>161-3</u>		Vessel Position Number: <u>3</u>	
Latitude/Northing (Y): <u>680824.5</u>		Longitude/Easting (X): <u>596865.1</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	0932	6.7	6"	Y	5g bucket
2	0934	↓	↓	↓	
3	0936	↓	↓	↓	
4	0938	↓	↓	↓	
5	0940	↓	↓	↓	

SAMPLE DATA		Sample ID:	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type	Sediment color	Sediment odor	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	<u>none</u> H ₂ S	<u>plastic bags</u>
gravel	drab olive	slight petroleum	
<u>sand (F M C)</u>	<u>brown</u>	moderate other:	
<u>silt</u>	gray	strong	
clay	black		

Relinquished By: PJO Company: ARCADIS Date: 9/15/15 Time: 1600
 Accepted By: JH Company: ARCADIS Date: 9/15/15 Time: 1500

SURFACE SEDIMENT COLLECTION FORM

Project Name: NBSA Project no.: 3009789.0044

Date: 9-18-15 Weather: SUNNY

Sampling Method: PONAR Crew: JD, AMS, JGM

[illegible]

SAMPLE DATA		Sample ID: <u>NA</u>	
Analyses needed before homogenization (circle):		VOC	TEPH-Purgeables
Sediment type	Sediment color	Sediment odor	Comments: (i.e., redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	<u>none</u>	H ₂ S
gravel	drab olive	slight	petroleum
<u>sand (F M G)</u>	<u>brown</u>	moderate	other:
<u>silt</u>	gray	strong	
clay	black		

Relinquished By 100 Company 100 Date 1/1/10 Time 10:00

Accepted By JAN Company NALCO Date 11/2/13 Time 1300

SURFACE SEDIMENT COLLECTION FORM

Project Name: NBSA Project no.: B009989.0044
 Date: 9-15-15 Weather: SUNNY
 Sampling Method: Powair Crew: PJD, AMB, JEM

GRAB DATA		Location ID: <u>161-5</u>		Vessel Position Number: <u>5</u>	
Latitude/Northing (Y): <u>680840.2</u>		Longitude/Easting (X): <u>596892.0</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
<u>1</u>	<u>0952</u>	<u>6</u>	<u>6</u>	<u>✓</u>	<u>5g bucket</u>
<u>2</u>	<u>0954</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
<u>3</u>	<u>0956</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
<u>4</u>	<u>0958</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
<u>5</u>	<u>1000</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>

SAMPLE DATA		Sample ID: <u>NA</u>	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type	Sediment color	Sediment odor	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	<u>none</u> H ₂ S	<u>plastic</u>
gravel	drab olive	slight petroleum	
<u>sand (F M C)</u>	<u>brown</u>	moderate other:	
<u>silt</u>	gray	strong	
clay	black		

Relinquished By: PJD Company: ARCADIS Date: 9/15/15 Time: 1000 500
 Accepted By: JH Company: ARCADIS Date: 9/15/15 Time: 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONAR Crew: PD, AMB, JEM

Sediment type	Sediment color	Sediment odor	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	none	H ₂ S
gravel	drab olive	slight	petroleum
sand (F M C)	brown	moderate	other:
silt	gray	strong	plastic
clay	black		

Accepted By JH Company ARCADIS Date 9/15/15 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A Project no.: B0009989-0044
Date: 9-15-15 Weather: SUNNY
Sampling Method: PANNA Crew: PJD, AMB, JCM

[illegible]

Relinquished By MD Company ARCADIS Date 9/15/15 Time 1600 1500

Accepted By JTH Company ARCADIS Date 9/15/15 Time 1500

Project Name: N.B.S.-A Project no.: B0009989.0044
Date: 9-15-15 Weather: SUNNY
Sampling Method: PONAR Crew: PSD, AMB, PSD

Relinquished By PJD Company ARCADIS Date 9/15/15 Time 1600 / 1500

Accepted By JH Company ARCADIS Date 9/15/15 Time 1500

Project Name: N.B.S.A Project no.: B0009989.0044
Date: 9-15-15 Weather: SUNNY
Sampling Method: PONAR Crew: PSD, AMB, JEM

Relinquished By PSD Company ARCADIS Date 9/15/15 Time ~~1400~~ 1500

Accepted By JH Company ARCADIS Date 9/15/15 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONATL Crew: PSD, KMB, JGM

[illegible]

SAMPLE DATA		Sample ID: NH	
Analyses needed before homogenization (circle):		VOC	TEPH-Purgeables
Sediment type	Sediment color	Sediment odor	AVS/SEM Other:
cobble	brown surface	none	H ₂ S
gravel	drab olive	slight	petroleum
sand (F M C)	brown	moderate	other:
silt	gray	strong	
clay	black		

Accepted By JIT Company NKRM/13 Date 11/7/13 Time 1500

[illegible]

Relinquished By PJD Company Arcadis Date 9/22/15 Time 7:00 ^{9/22/15}

Accepted By JH Company ARCADIS Date 9/22/15 Time 1005

[illegible]

Sample ID: NB03-STDCHM-164 & STDCHM-164A → C

Sediment type	Sediment color	Sediment odor		Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	none	H ₂ S	organics (shells)
gravel	drab olive	slight	petroleum	
sand (F M C)	brown	moderate	other:	
silt	gray	strong		
clay	black			

Relinquished By (Signature) Company ARCADIS Date 9/13 Time 1600
Accepted By JH Company ARCADIS Date 9/14/15 Time 0730

SURFACE SEDIMENT COLLECTION FORM

Project Name: N-B-S-A SQT / Porewater Project no.: _____
 Date: 9-13-15 Weather: OVERCAST, 70°
 Sampling Method: PONAR Crew: PJO, AMB, JEM

GRAB DATA		Location ID: <u>164-2</u>		Vessel Position Number: <u>2</u>	
Latitude/Northing (Y): <u>6810380.8</u>		Longitude/Easting (X): <u>600338.6</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
<u>1</u>	<u>1035</u>	<u>5.8</u>	<u>6"</u>	<u>Y</u>	<u>5g bucket</u>
<u>2</u>	<u>1037</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
<u>3</u>	<u>1039</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
<u>4</u>	<u>1041</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>
<u>5</u>	<u>1043</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>	<u>↓</u>

SAMPLE DATA		Sample ID: _____	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other: _____			
Sediment type	Sediment color	Sediment odor	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	none H ₂ S	
gravel	drab olive	slight petroleum	
sand (F M C)	brown	moderate other:	
silt	gray	strong	
clay	black		

Relinquished By: PJO Company: ARCADIS Date: 9/13 Time: 1600
 Accepted By: JH Company: ARCADIS Date: 9/14/15 Time: 0730

Relinquished By PJO Company ARCADIS Date 9/13 Time 1600
Accepted By JH Company ARCADIS Date 9/14/13 Time 0730

Relinquished By PJD Company ARCADIS Date 9/13 Time 1600
Accepted By JH Company ARCADIS Date 9/14/13 Time 0730

Relinquished By PJO Company ARCAMS Date 9/13 Time 1600

Accepted By JH Company ARCAMS Date 7/14/05 Time 1500

Relinquished By [Signature] Company 9/13 Date 1600

Accepted By JH Company ARCADIS Date 9/14/15 Time 0730

Relinquished By PJD Company ARCADIS Date 9/13 Time 1600
Accepted By JH Company ARCADIS Date 9/14/15 Time 0730

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONAR Crew: PSI, AMB, JEM

slit clay	black	
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Accepted By JH Company ARCADIS Date 7/14/15 Time 0730

SURFACE SEDIMENT COLLECTION FORM

Project Name: NBSA SQT/Porewater Project no.: _____
 Date: 9-13-15 Weather: overcast 70°
 Sampling Method: PANAR Crew: PJD, JEM, AMB

GRAB DATA		Location ID: 105-3		Vessel Position Number: 3	
Latitude/Northing (Y): 683466.6			Longitude/Easting (X): 600939.8		
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	1312	4.4	6"	Y	5g buckets
2	1314	↓	↓	↓	↓
3	1316	↓	↓	↓	↓
4	1318	↓	↓	↓	↓
5	1320	↓	↓	↓	↓

SAMPLE DATA		Sample ID: _____			
Analyses needed before homogenization (circle):		VOC	TEPH-Purgeables	AVS/SEM	Other: _____
Sediment type cobble gravel sand (F M C) silt clay	Sediment color brown surface drab olive brown gray black	Sediment odor none slight moderate strong	 H ₂ S petroleum other: _____	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)	

Relinquished By: PJD Company: ARCADIS Date: 9/13 Time: 1600
 Accepted By: JH Company: ARCADIS Date: 9/14/15 Time: 0730

SURFACE SEDIMENT COLLECTION FORM

Project Name: NBSA SGT-PORTAL Project no.: _____

Date: 9-15-15 Weather: OVERCAST 70

Sampling Method: PON RYC Crew: PJD, RMB, JEM

[illegible]

Relinquished By PJO Company ARCADIS Date 9/3 Time 1600

Accepted By JH Company ARCADIS Date 9/14/15 Time 0730

Relinquished By PJO Company ARCADIS Date 9/13 Time 1600
Accepted By JH Company ARCADIS Date 9/14/13 Time 0730

SURFACE SEDIMENT COLLECTION FORM

Project Name: NBSIA SQT/POREWATER Project no.: _____
Date: 9-13-15 Weather: Overcast 70°
Sampling Method: PW/AR Crew: PSD, AMB, JEM

[illegible]

Relinquished By PHD Company ARCADIS Date 9/13 Time 1600
Accepted By JH Company ARCADIS Date 9/14/15 Time 0730

Title: SQT and Porewater Sampling and Analysis
Quality Assurance Project Plan
Revision Number: 2
Revision Date: August 2015

Project Name: NB.SA Project no.: _____
Date: 9-14-15 Weather: 20 - CLEAR
Sampling Method: PONAR Crew: DSO, AMB, JEM

Relinquished By PJN Company ARCADIS Date 9/14 Time 1600 1500

Accepted By JH Company ARCADIS Date 9/14/15 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONATL Crew: PJD, AMB, JEM

clay	black		
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Accepted By JH Company ARCADIS Date 1/19/15 Time 1300

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: POMR Crew: PO, JEM, KMG

Clay			
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Accepted By [Signature] Company ARLADIS Date 11/7/15 Time 1500

[illegible]

Sample ID: NB03SED-CHM1169, NB03SED DUP-01, MS, MSD

Analyses needed before homogenization (circle): VOC ~~TEPH-Purgeables~~ AVS/SEM Other:

Sediment type	Sediment color	Sediment odor	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	none	H ₂ S
gravel	drab olive	slight	petroleum
sand (F M C)	brown	moderate	other:
silt	gray	strong	
clay	black		

Relinquished By BD Company ARCADIS Date 9/15/15 Time 1500
Accepted By JH Company ARCADIS Date 9/15/15 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A Project no.: B0009989.0044
 Date: 9-15-15 Weather: SUNNY
 Sampling Method: PONAR Crew: PJO, AMB, JEM

GRAB DATA		Location ID: <u>168-2</u>		Vessel Position Number: <u>2</u>	
Latitude/Northing (Y): <u>677907.1</u>		Longitude/Easting (X): <u>599921.0</u>			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	1104	7.5	6"	Y	5g bucket
2	1106	↓	↓	↓	
3	1108	↓	↓	↓	
4	1110	↓	↓	↓	
<u>5</u>	<u>1112</u>	↓	↓	↓	<u>DNV</u>

SAMPLE DATA		Sample ID: <u>NA</u>	
Analyses needed before homogenization (circle): VOC TEPH-Purgeables AVS/SEM Other:			
Sediment type cobble gravel <u>sand (F M C)</u> silt clay	Sediment color brown surface drab olive <u>brown</u> gray black	Sediment odor <u>none</u> H ₂ S slight petroleum moderate other: strong	Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)

Relinquished By: PP Company: ARCADIS Date: 9/15/15 Time: 1600 1500
 Accepted By: JH Company: ARCADIS Date: 9/15/15 Time: 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONAR Crew: PSD, AMB, JGM

	AND	A V.	active cells
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Accepted By JH Company NKE ADI Date 11/3/15 Time 1:00

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: POMAL Crew: POM, AMB, SEM

[illegible]Accepted By JR Company NRAD Date 7/13/13 Time 1300

SURFACE SEDIMENT COLLECTION FORM

Project Name: N-5-017 Project no.: 5079989.0549

Date: 9-15-15 Weather: SUNNY (JMS)

Sampling Method: PON AIR Crew: AD/KMS, JEM

[illegible]

Relinquished By PSD Company 1st CADIS Date 9/15/15 Time 1600 500

Accepted By JR Company ARADIS Date 9/19/13 Time 1:30

Relinquished By PJD Company Arcadis Date 9/15/15 Time 1600 500
Accepted By JH Company ARCADIS Date 9/15/15 Time 1500

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONAR Crew: PJO, AMB, JGM

clay	black		
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Relinquished By _____ Company Veradis Date 7/16/15 Time 1600

Accepted By JH Company AKLADIS Date 1/16/15 Time 1600

SURFACE SEDIMENT COLLECTION FORM

Sampling Method: PONTAR Crew: P70, Amb, Jean

Sediment type	Sediment color	Sediment odor		Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)
cobble	brown surface	none	H ₂ S	
gravel	drab olive	slight	petroleum	
sand (F M C)	brown	moderate	other:	
silt	gray	strong		
clay	black			

Accepted By JH Company ARCADIS Date 9/17/15 Time 1400

*MOVED TO SED.

Title: SQT and Porewater Sampling and Analysis

Quality Assurance Project Plan

Revision Number: 2

Revision Date: August 2015

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater

Project no.: B0009989.0044

Date:

9/23/15

Weather:

SW

Sampling Method: Ponar

Crew: PJD, AMB, JEM

GRAB DATA		Location ID: 173-1		Vessel Position Number: 1	
Latitude/Northing (Y): 662611.9		Longitude/Easting (X): 591195.7			
Grab Sample Number	Grab Sample Time	Bottom depth	Penetration Depth (cm)	Acceptable grab (Y/N)	Comments:
1	1320	8.0	6"	Y	Chem- Sg bucket
2	1322	↓	↓	↓	↓
3	1324	↓	↓	↓	↓
4	1326	↓	↓	↓	↓
5	1328	↓	↓	↓	↓
173-2 N) 662629.9 E) 591213.1					
1	1330	8.0	Y	Y	Sg bucket
2	1332	↓	↓	↓	↓
3	1334	↓	↓	↓	↓
4	1336	↓	↓	↓	↓
5	1338	↓	↓	↓	↓
173-3 N) 662641.5 E) 591232.0					
1	1340	8.0	6"	Y	Sg bucket
2	1342	↓	↓	↓	↓
SAMPLE DATA					
Sample ID: N803-SED Chem 173					
Analyses needed before homogenization (circle): VOC <input checked="" type="checkbox"/> TEPH-Purgeables <input checked="" type="checkbox"/> AVS/SEM <input checked="" type="checkbox"/> Other:					
Sediment type	Sediment color	Sediment odor		Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)	
cobble	brown surface	none		H ₂ S	
gravel	drab olive	slight		petroleum	
sand (F M C)	brown	moderate		other:	
silt	gray	strong			
clay	black				

Relinquished By PJD

Company Arcadis

Date 9/23/15

Time 1400 F30

Accepted By JA

Company ARCADIS

Date 9/23/15

Time 1530

[illegible]

Sample ID: N/A

Other:

Comments: (i.e. redox potential discontinuity, organic matter, wood debris, shell fragments, sheen, fauna, field duplicate, etc.)

Shells

petroleum

other:

strong

black

Accepted By J. J. Company ARCADIS Date 9/21/15 Time 1530

* MOVING AREA AS PER *Single Comb*

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
Date: 9/23/15 Weather: SUN
Sampling Method: Ponar Crew: PJD, AMB, JEM

Relinquished By PJD Company Arcadis Date 9/23/15 Time 1700 1530

Accepted By JH Company ARCADIS Date 9/23/15 Time 1530

SURFACE SEDIMENT COLLECTION FORM

Project Name: N.B.S.A SQT/Porewater Project no.: B0009989.0044
Date: 7/29/15 Weather: SUN
Sampling Method: Ponar Crew: PJD, AMB, JEM

[illegible]

Relinquished By PJD Company Arcadis Date 9/29/15 Time 1700
Accepted By JH Company ARCADIS Date 9/29/15 Time 1515

Appendix D

Location ID: 136
Date Collected: 9/14/15
Date Processed: 9/15/15

Benthic Invertebrate Sample
NB03SED-COM136A



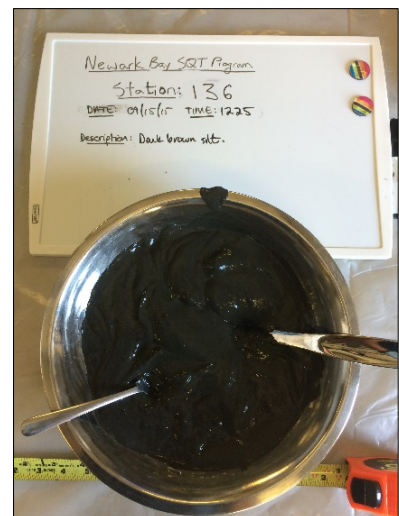
Benthic Invertebrate Sample
NB03SED-COM136B



Benthic Invertebrate Sample
NB03SED-COM136C



Post-Mixing Sediment Sample

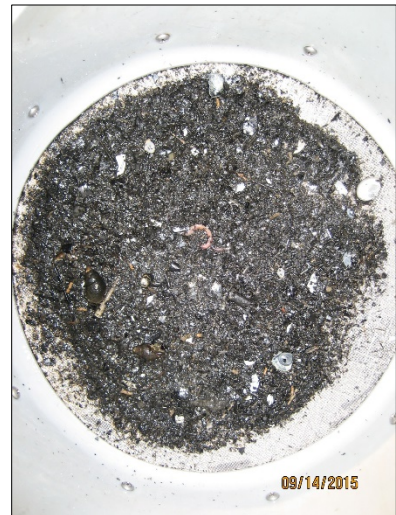


Location ID: 137
Date Collected: 9/14/15
Date Processed: 9/15/15

Benthic Invertebrate Sample
NB03SED-COM137A



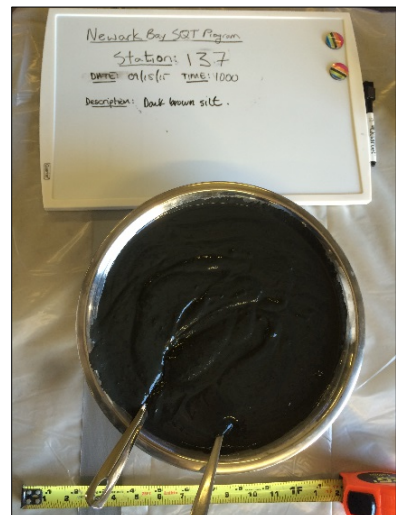
Benthic Invertebrate Sample
NB03SED-COM137B



Benthic Invertebrate Sample
NB03SED-COM137C



Post-Mixing Sediment Sample



Location ID: 138
Date Collected: 9/14/15
Date Processed: 9/15/15

Benthic Invertebrate Sample
NB03SED-COM138A



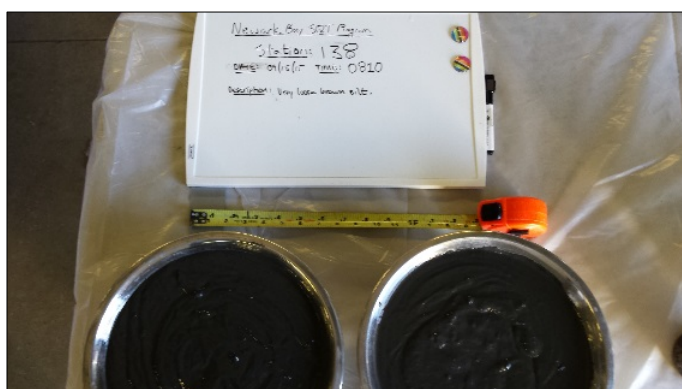
Benthic Invertebrate Sample
NB03SED-COM138B



Benthic Invertebrate Sample
NB03SED-COM138C



Post-Mixing Sediment Sample



Location ID: 139
Date Collected: 9/15/15
Date Processed: 9/16/15

Benthic Invertebrate Sample
NB03SED-COM139A



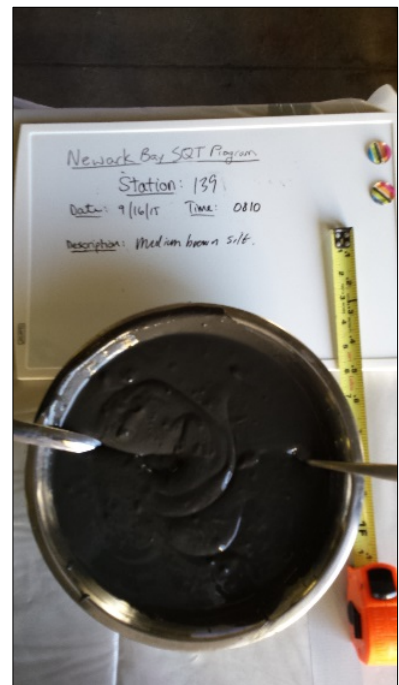
Benthic Invertebrate Sample
NB03SED-COM139B



Benthic Invertebrate Sample
NB03SED-COM139C



Post-Mixing Sediment Sample



Location ID: 140
Date Collected: 9/29/15
Date Processed: 9/30/15

Benthic Invertebrate Sample
NB03SED-COM140A



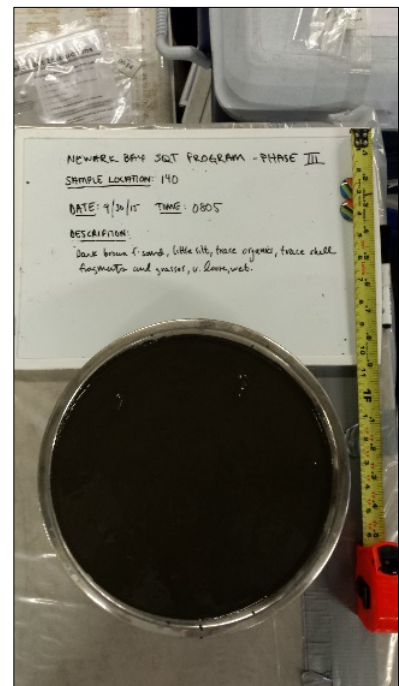
Benthic Invertebrate Sample
NB03SED-COM140B



Benthic Invertebrate Sample
NB03SED-COM140C



Post-Mixing Sediment Sample

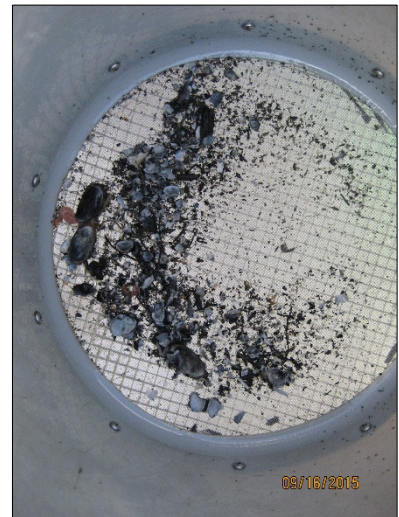


Location ID: 141
Date Collected: 9/16/15
Date Processed: 9/17/15

Benthic Invertebrate Sample
NB03SED-COM141A



Benthic Invertebrate Sample
NB03SED-COM141B



Benthic Invertebrate Sample
NB03SED-COM141C



Post-Mixing Sediment Sample



Location ID: 142
Date Collected: 9/28/15
Date Processed: 9/29/15

Benthic Invertebrate Sample
NB03SED-COM142A



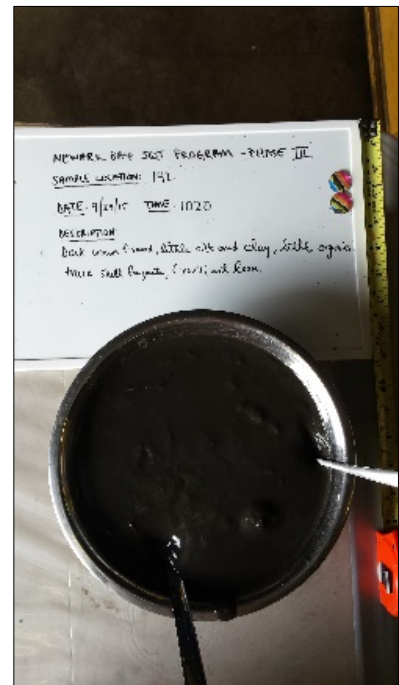
Benthic Invertebrate Sample
NB03SED-COM142B



Benthic Invertebrate Sample
NB03SED-COM142C



Post-Mixing Sediment Sample



Location ID: 143
Date Collected: 9/29/15
Date Processed: 9/30/15

Benthic Invertebrate Sample
NB03SED-COM143A



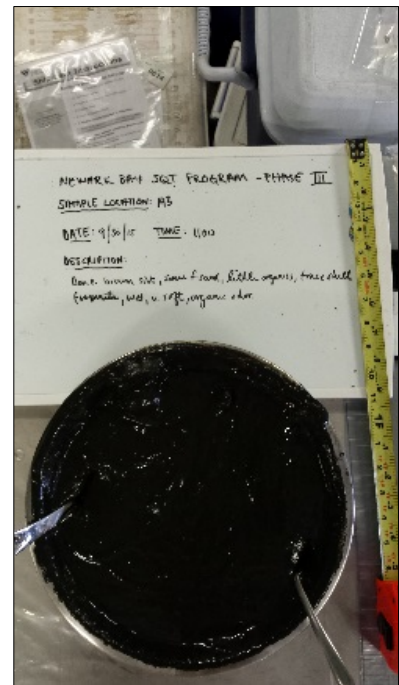
Benthic Invertebrate Sample
NB03SED-COM143B



Benthic Invertebrate Sample
NB03SED-COM143C



Post-Mixing Sediment Sample



Location ID: 144
Date Collected: 9/17/15
Date Processed: 9/18/15

Benthic Invertebrate Sample
NB03SED-COM144A



Benthic Invertebrate Sample
NB03SED-COM144B



Benthic Invertebrate Sample
NB03SED-COM144C



Post-Mixing Sediment Sample



Location ID: 145
Date Collected: 9/29/15
Date Processed: 9/30/15

Benthic Invertebrate Sample
NB03SED-COM145A



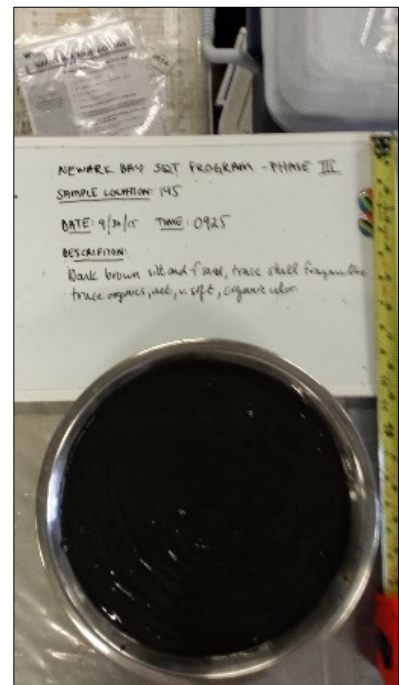
Benthic Invertebrate Sample
NB03SED-COM145B



Benthic Invertebrate Sample
NB03SED-COM145C



Post-Mixing Sediment Sample



Location ID: 146
Date Collected: 9/21/15
Date Processed: 9/22/15

Benthic Invertebrate Sample
NB03SED-COM146A



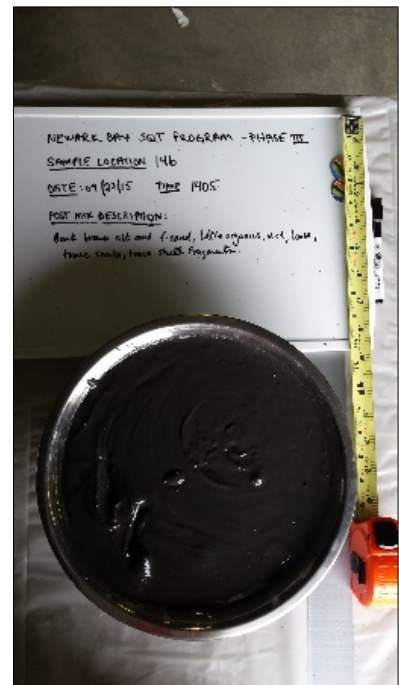
Benthic Invertebrate Sample
NB03SED-COM146B



Benthic Invertebrate Sample
NB03SED-COM146C



Post-Mixing Sediment Sample



Location ID: 147

Date Collected: 9/21/15

Date Processed: 9/22/15

Benthic Invertebrate Sample
NB03SED-COM147A



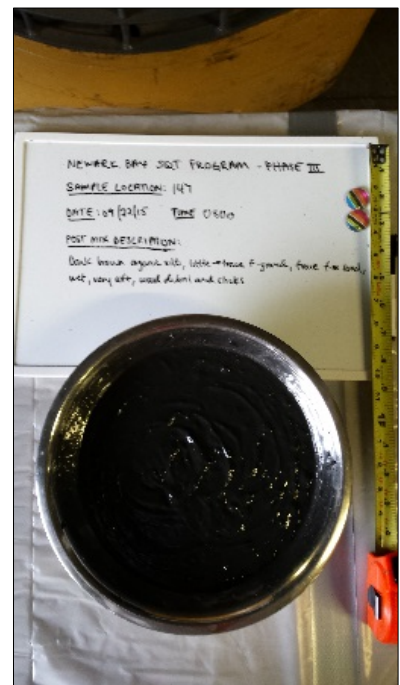
Benthic Invertebrate Sample
NB03SED-COM147B



Benthic Invertebrate Sample
NB03SED-COM147C



Post-Mixing Sediment Sample



Location ID: 148
Date Collected: 9/21/15
Date Processed: 9/22/15

Benthic Invertebrate Sample
NB03SED-COM148A



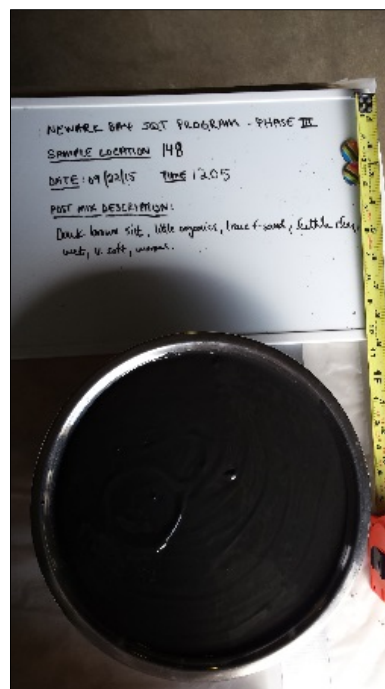
Benthic Invertebrate Sample
NB03SED-COM148B



Benthic Invertebrate Sample #3
NB03SED-COM148C



Post-Mixing Sediment Sample



Location ID: 149
Date Collected: 9/22/15
Date Processed: 9/23/15

Benthic Invertebrate Sample
NB03SED-COM149A



Benthic Invertebrate Sample
NB03SED-COM149B

No photo available for
sample NB03SED-
COM149B, photo was
accidentally not taken

Benthic Invertebrate Sample
NB03SED-COM149C



Post-Mixing Sediment Sample



Location ID: 150
Date Collected: 9/22/15
Date Processed: 9/23/15

Benthic Invertebrate Sample
NB03SED-COM150A



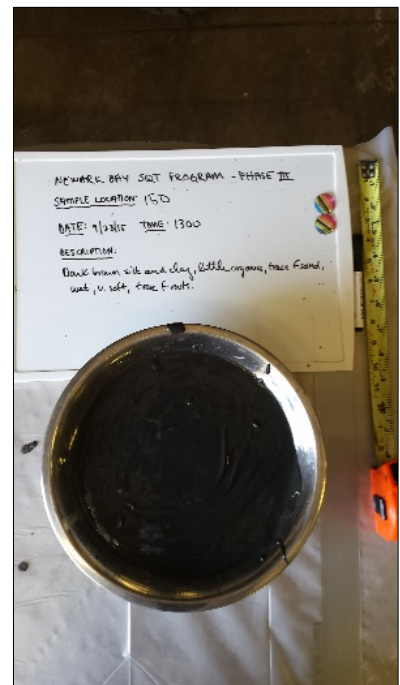
Benthic Invertebrate Sample
NB03SED-COM150B



Benthic Invertebrate Sample
NB03SED-COM150C



Post-Mixing Sediment Sample



Location ID: 151
Date Collected: 9/20/15
Date Processed: 9/21/15

Benthic Invertebrate Sample
NB03SED-COM151A



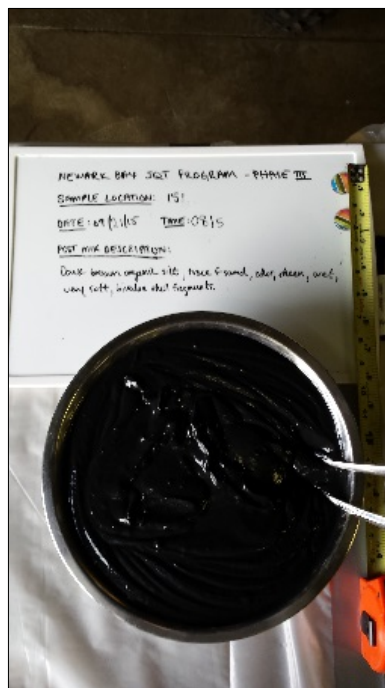
Benthic Invertebrate Sample
NB03SED-COM151B



Benthic Invertebrate Sample
NB03SED-COM151C



Post-Mixing Sediment Sample



Location ID: 152

Date Collected: 9/29/15

Date Processed: 9/30/15

Benthic Invertebrate Sample
NB03SED-COM152A



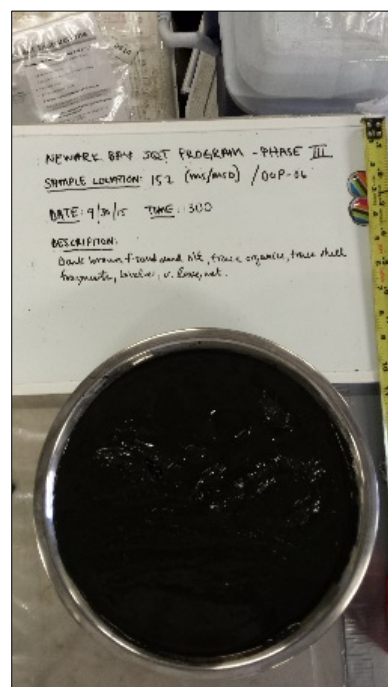
Benthic Invertebrate Sample
NB03SED-COM152B



Benthic Invertebrate Sample
NB03SED-COM152C



Post-Mixing Sediment Sample



Location ID: 153
Date Collected: 9/23/15
Date Processed: 9/24/15

Benthic Invertebrate Sample
NB03SED-COM153A



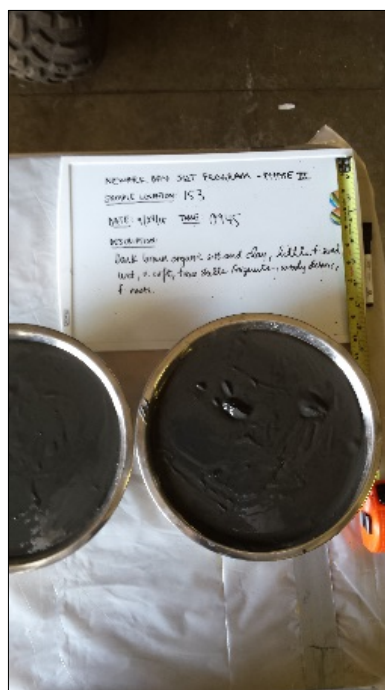
Benthic Invertebrate Sample
NB03SED-COM153B



Benthic Invertebrate Sample
NB03SED-COM153C



Post-Mixing Sediment Sample



Location ID: 154
Date Collected: 9/20/15
Date Processed: 9/21/15

Benthic Invertebrate Sample
NB03SED-COM154A



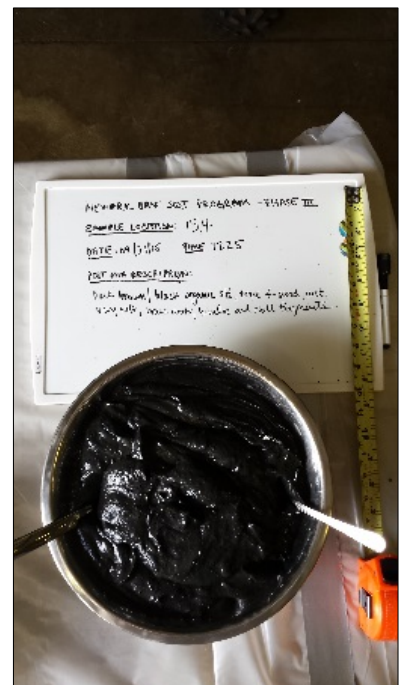
Benthic Invertebrate Sample
NB03SED-COM154B



Benthic Invertebrate Sample
NB03SED-COM154C



Post-Mixing Sediment Sample



Location ID: 155
Date Collected: 9/20/15
Date Processed: 9/21/15

Benthic Invertebrate Sample
NB03SED-COM155A



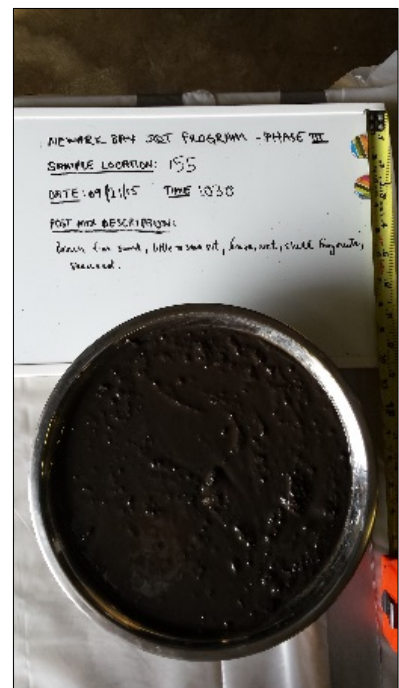
Benthic Invertebrate Sample
NB03SED-COM155B



Benthic Invertebrate Sample
NB03SED-COM155C



Post-Mixing Sediment Sample



Location ID: 156
Date Collected: 9/17/15
Date Processed: 9/18/15

Benthic Invertebrate Sample
NB03SED-COM156A



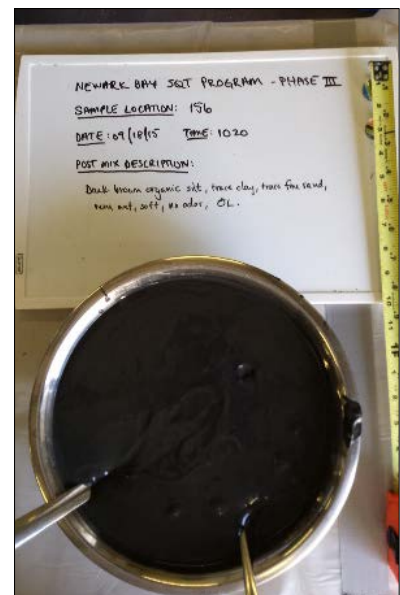
Benthic Invertebrate Sample
NB03SED-COM156B



Benthic Invertebrate Sample
NB03SED-COM156C



Post-Mixing Sediment Sample



Location ID: 157
Date Collected: 9/16/15
Date Processed: 9/17/15

Benthic Invertebrate Sample
NB03SED-COM157A



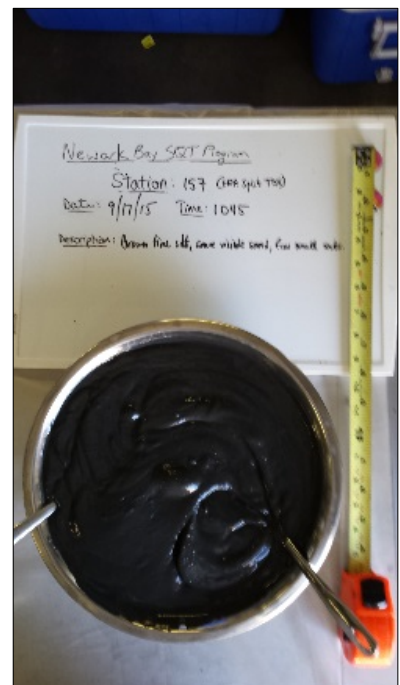
Benthic Invertebrate Sample
NB03SED-COM157B



Benthic Invertebrate Sample
NB03SED-COM157C



Post-Mixing Sediment Sample



Location ID: 158
Date Collected: 9/24/15
Date Processed: 9/25/15

Benthic Invertebrate Sample
NB03SED-COM158A



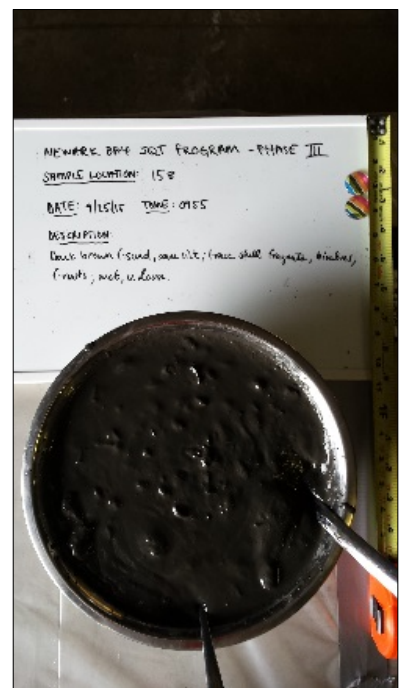
Benthic Invertebrate Sample
NB03SED-COM158B



Benthic Invertebrate Sample
NB03SED-COM158C



Post-Mixing Sediment Sample



Location ID: 159
Date Collected: 9/24/15
Date Processed: 9/25/15

Benthic Invertebrate Sample
NB03SED-COM159A



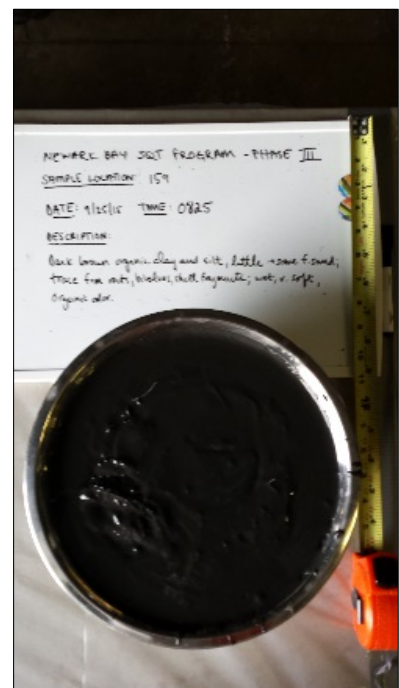
Benthic Invertebrate Sample
NB03SED-COM159B



Benthic Invertebrate Sample
NB03SED-COM159C



Post-Mixing Sediment Sample



Location ID: 160
Date Collected: 9/28/15
Date Processed: 9/29/15

Benthic Invertebrate Sample
NB03SED-COM160A



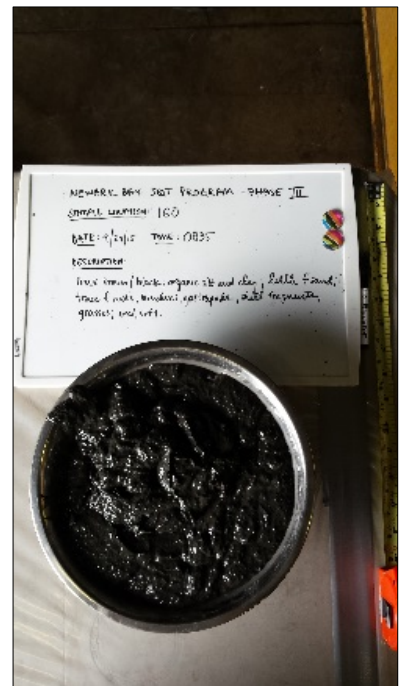
Benthic Invertebrate Sample
NB03SED-COM160B



Benthic Invertebrate Sample
NB03SED-COM160C



Post-Mixing Sediment Sample



Location ID: 161
Date Collected: 9/15/15
Date Processed: 9/16/15

Benthic Invertebrate Sample
NB03SED-COM161A



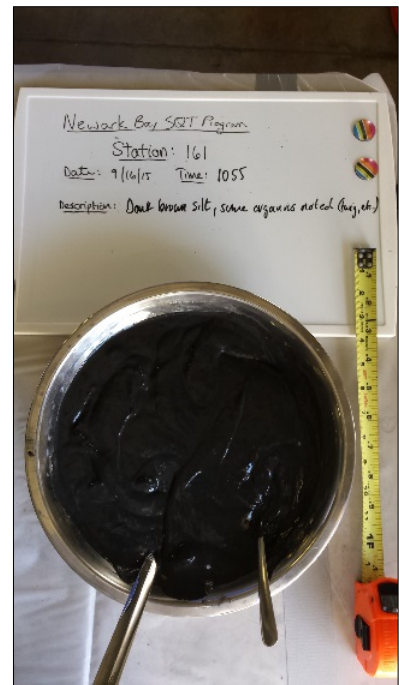
Benthic Invertebrate Sample
NB03SED-COM161B



Benthic Invertebrate Sample
NB03SED-COM161C



Post-Mixing Sediment Sample



Location ID: 162
Date Collected: 9/21/15
Date Processed: 9/22/15

Benthic Invertebrate Sample
NB03SED-COM162A



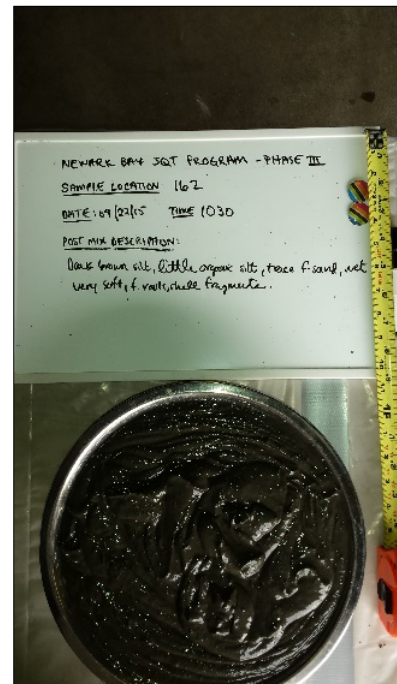
Benthic Invertebrate Sample
NB03SED-COM162B



Benthic Invertebrate Sample
NB03SED-COM162C



Post-Mixing Sediment Sample



Location ID: 163
Date Collected: 9/22/15
Date Processed: 9/23/15

Benthic Invertebrate Sample
NB03SED-COM163A



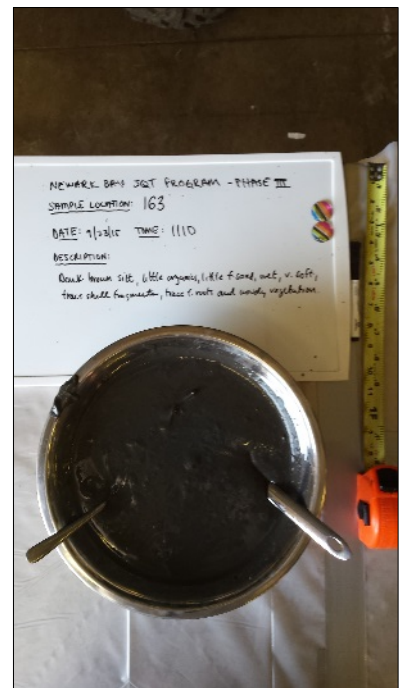
Benthic Invertebrate Sample
NB03SED-COM163B



Benthic Invertebrate Sample
NB03SED-COM163C



Post-Mixing Sediment Sample



Location ID: 164
Date Collected: 9/13/15
Date Processed: 9/14/15

Benthic Invertebrate Sample
NB03SED-COM164A



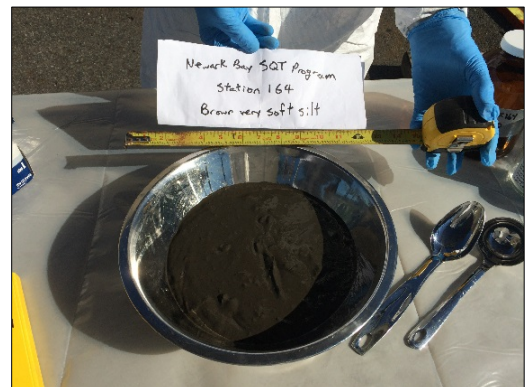
Benthic Invertebrate Sample
NB03SED-COM164B



Benthic Invertebrate Sample
NB03SED-COM164C



Post-Mixing Sediment Sample



Location ID: 165
Date Collected: 9/13/15
Date Processed: 9/14/15

Benthic Invertebrate Sample
NB03SED-COM165A



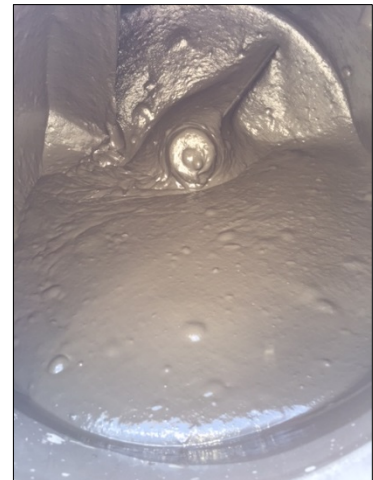
Benthic Invertebrate Sample
NB03SED-COM165B



Benthic Invertebrate Sample
NB03SED-COM165C



Post-Mixing Sediment Sample



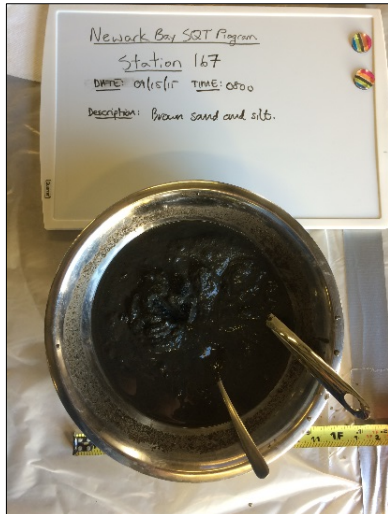
Location ID: 166
Date Collected: 9/13/15
Date Processed: 9/14/15

Post-Mixing Sediment Sample



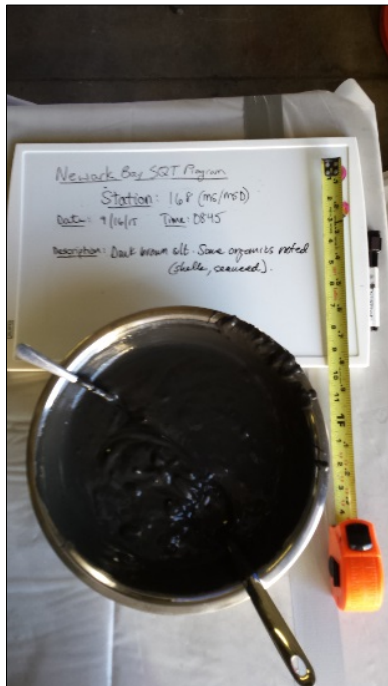
Location ID: 167
Date Collected: 9/14/15
Date Processed: 9/15/15

Post-Mixing Sediment Sample



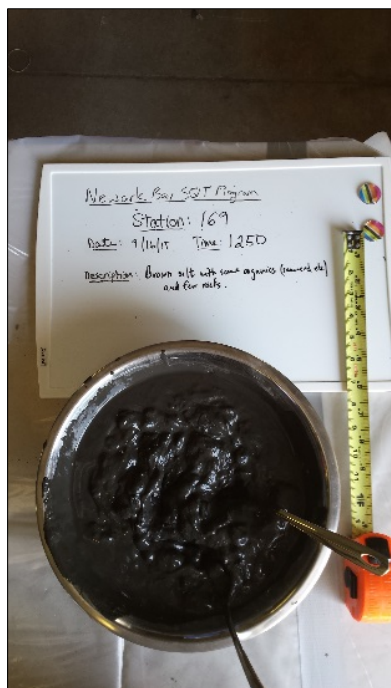
Location ID: 168
Date Collected: 9/15/15
Date Processed: 9/16/15

Post-Mixing Sediment Sample



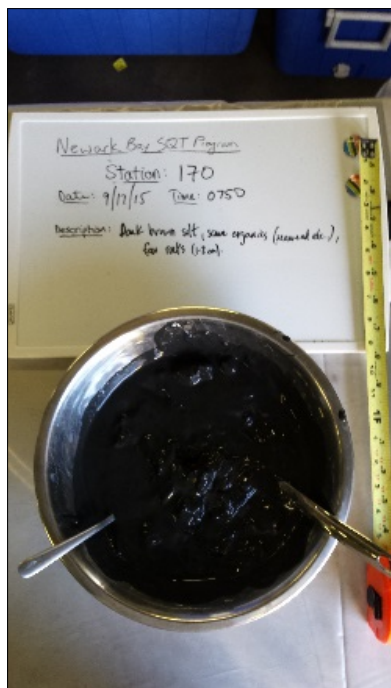
Location ID: 169
Date Collected: 9/15/15
Date Processed: 9/16/15

Post-Mixing Sediment Sample



Location ID: 170
Date Collected: 9/16/15
Date Processed: 9/17/15

Post-Mixing Sediment Sample



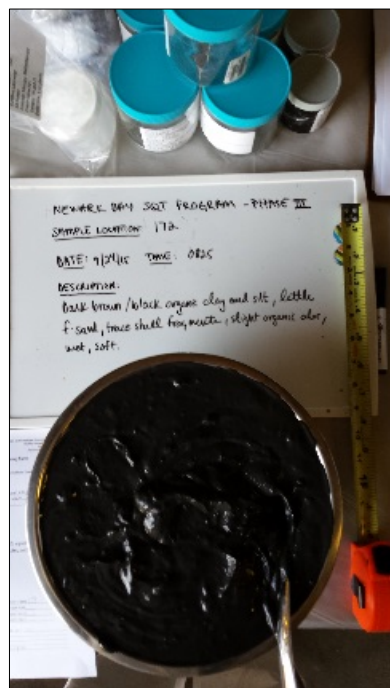
Location ID: 171
Date Collected: 9/17/15
Date Processed: 9/18/15

Post-Mixing Sediment Sample



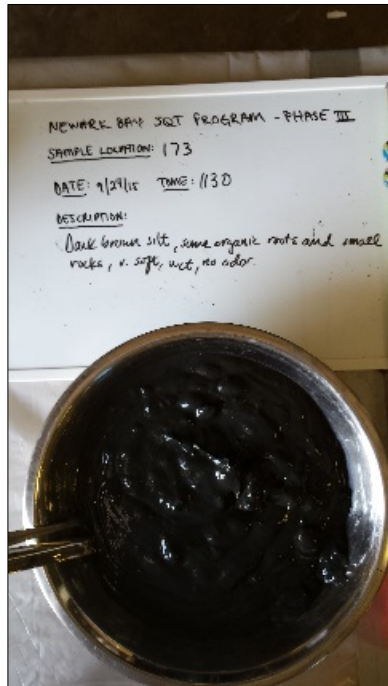
Location ID: 172
Date Collected: 9/23/15
Date Processed: 9/24/15

Post-Mixing Sediment Sample



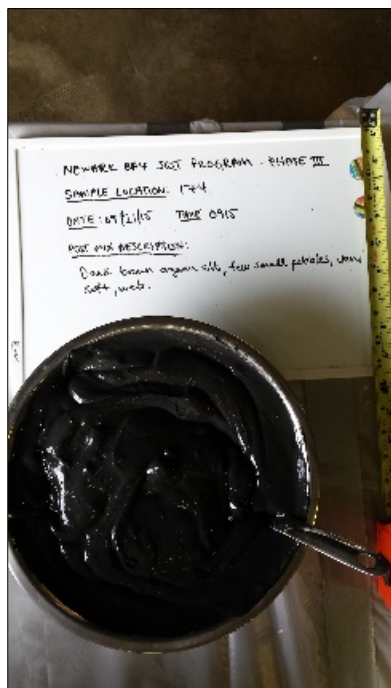
Location ID: 173
Date Collected: 9/23/15
Date Processed: 9/24/15

Post-Mixing Sediment Sample



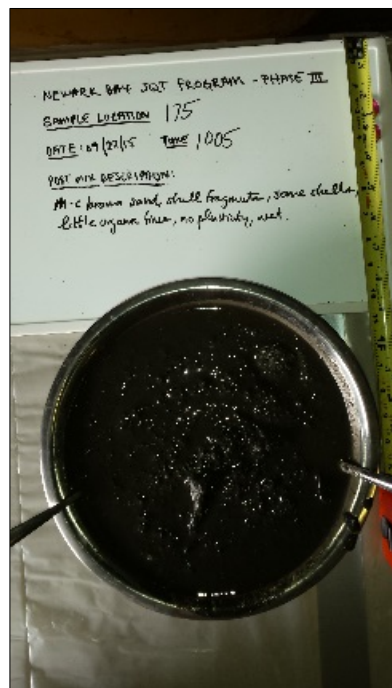
Location ID: 174
Date Collected: 9/20/15
Date Processed: 9/21/15

Post-Mixing Sediment Sample



Location ID: 175
Date Collected: 9/21/15
Date Processed: 9/22/15

Post-Mixing Sediment Sample



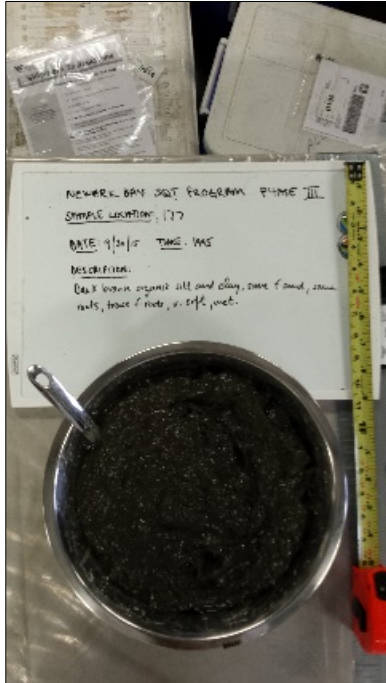
Location ID: 176
Date Collected: 9/23/15
Date Processed: 9/24/15

Post-Mixing Sediment Sample



Location ID: 177
Date Collected: 9/29/15
Date Processed: 9/30/15

Post-Mixing Sediment Sample



Location ID: 178
Date Collected: 9/23/15
Date Processed: 9/24/15

Post-Mixing Sediment Sample



Appendix E

Surface Sediment Sample Processing Form

Date: 09/15/2015 Time Sample Buckets Removed from Cooler: 1200
Location ID: 136
Number of Buckets to Homogenize: 4
Pre-Mixing Description of Sediment: Dark brown silt

Mixer:

Mixer Used? ☒ Y / N

Time on: 1215

Time off: 1220

Homogeneity Achieved? ☒ Y / N

Post-Mixing Description of Sediment: Dark brown silt

Photograph (after mixing):

Number: 3 : IMG_7231, 7232, 7233

Date: 9/15/15

Time: 1225

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM 136

☒ Toxicity

Sample ID: NB03SED-POR 136

☒ Porewater

Sample ID: NB03SED-TOX 136

☒ Bioaccumulation

Sample ID: NB03SED-BIO 136

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): EPA split for
chemistry: NB03SED-CHM136-LB
PE samples associated with this location. See field book.

Person Responsible for Completing Form: Julianne Hagarty

Surface Sediment Sample Processing Form

Date: 09/15/2015 Time Sample Buckets Removed from Cooler: 0945

Location ID: 137

Number of Buckets to Homogenize: 3

Pre-Mixing Description of Sediment: Dark brown silt

Mixer:

Mixer Used? ☒ Y / N

Time on: 0955

Time off: 1000

Homogeneity Achieved? ☒ Y / N

Post-Mixing Description of Sediment: Dark brown silt

Photograph (after mixing):

Number: 3 : IMG_7229, 7228, 7230

Date: 9/15/15

Time: 1000

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM 137

☒ Toxicity

Sample ID: NB03SED-POR 137

☒ Porewater

Sample ID: NB03SED-TOX 137

☐ Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): —

Person Responsible for Completing Form: Julianne Hagarthy

Surface Sediment Sample Processing Form

Date: 09/15/2015 Time Sample Buckets Removed from Cooler: 0750

Location ID: 138

Number of Buckets to Homogenize: 4

Pre-Mixing Description of Sediment: very soft brown silt

Mixer:

Mixer Used? ☒ Y / N

Time on: 0800

Time off: 0805

Homogeneity Achieved? ☒ Y / N

Post-Mixing Description of Sediment: very loose brown silt

Photograph (after mixing):

Number: 20150915-083319, -083325, -083330, -083334, -083336

Date: 9/15/15

Time: 0833

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM 138

☒ Toxicity

Sample ID: NB03SED-POR 138

☒ Porewater

Sample ID: NB03SED-TOX 138

☒ Bioaccumulation

Sample ID: NB03SED-BIO 138

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): —

Person Responsible for Completing Form: Julianne Hagarty

Surface Sediment Sample Processing Form

Date: 09/18/2015

Time Sample Buckets Removed from Cooler: 0745

Location ID: 139

Number of Buckets to Homogenize: 3

Pre-Mixing Description of Sediment: dark brown/black organic silt, t. roots,
wet, v. soft.

Mixer:

Mixer Used? ☒ Y / N

Time on: 0755

Time off: 0800

Homogeneity Achieved? ☒ Y / N

Post-Mixing Description of Sediment: medium brown silt

Photograph (after mixing):

Number: 20150916-081340, -081348, -081353

Date: 9/16/15

Time: 0813

Analyses (check analyses to be conducted):

 Sediment Chemistry

Sample ID: NB03SED-CHM 139

X Toxicity

Sample ID: NB03SED-POR 139

~~✓~~ Porewater

Sample ID: NB03SED-TOX 139

Bioaccumulation

Sample ID: NB03SED-BIO_____

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): _____

Person Responsible for Completing Form: Julianne Hagarty

Person Responsible for Completing Form:

Surface Sediment Sample Processing Form

Date: 09/17/2015 Time Sample Buckets Removed from Cooler: 0755

Location ID: ~~144~~ J# 9/17/15 141

Number of Buckets to Homogenize: 6 (3+3 in 2 batches)

Pre-Mixing Description of Sediment: dark brown organicsilt, trace f. sand,
organic odor, wet, v. soft OL

Mixer:

Mixer Used? (Y) N

Time on: 0806; 0835

Time off: 0811; 0840

Homogeneity Achieved? (Y) / N

Post-Mixing Description of Sediment: dark brown, organic silt, trace f. sand,
organic odor, wet, v. soft, OL

Photograph (after mixing):

Number: 20150917-084508, -084515, -084521, -084530, -090047, -090059, -090059, -090104

Date: 9/17/15

Time: 20th 0900

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM 141

☒ Toxicity

Sample ID: NB03SED-POR 141

☒ Porewater

Sample ID: NB03SED-TOX 141

☒ Bioaccumulation

Sample ID: NB03SED-BIO 141

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): EPA split for
Bioaccumulation: NB03SED-BIO141-LB.

Person Responsible for Completing Form: Julianne Hagarty.

Surface Sediment Sample Processing Form

Date: 09/29/2015 Time Sample Buckets Removed from Cooler: 1000

Location ID: 142

Number of Buckets to Homogenize: 3

Pre-Mixing Description of Sediment: dark brown, f. sand; little silt and clay; trace,
shell fragments, f. roots wet, loose

Mixer:

Mixer Used? ☒ / N

Time on: 10:09

Time off: 10:14

Homogeneity Achieved? ☒ / N

Post-Mixing Description of Sediment: dark brown; f. sand; little silt and clay,
little organics, ^{frag} shell fragments, f. roots; wet, loose

Photograph (after mixing):

Number: 3 20150929-101905; -101916; -101922

Date: 9/29/15

Time: 1019

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM 142

☒ Toxicity

Sample ID: NB03SED-~~PO~~TOX142

☒ Porewater

Sample ID: NB03SED-~~TOX~~PO142

☐ Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): _____

Person Responsible for Completing Form: Julianne Hagarty

Surface Sediment Sample Processing Form

Date: 09/18/2015 Time Sample Buckets Removed from Cooler: 0800

Location ID: 144

Number of Buckets to Homogenize: 4

Pre-Mixing Description of Sediment: brown, dark brown organic silt, little clay, trace f. sand, mild 2L odor
bivalves, snails, wet, v. soft OL

Mixer:

Mixer Used? (Y) / N

Time on: 0815

Time off: 0820

Homogeneity Achieved? (Y) / N

Post-Mixing Description of Sediment: dark brown black organic silt, little clay, moderate organic
odor bivalves, snails, wet, v. soft OL

Photograph (after mixing):

Number: 3: 20150918_082916, -082924, -082932

Date: 9/18/15

Time: 0830

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM 144

☒ Toxicity

Sample ID: NB03SED-POR 144

☒ Porewater

Sample ID: NB03SED-TOX 144

☐ Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): EPA split collected
for Toxicity: NB03SED-TOX 144-LB

Person Responsible for Completing Form: Julianne Hogarty

Surface Sediment Sample Processing Form

Date: 09/30/2015

Time Sample Buckets Removed from Cooler: 0905

Location ID: 145

Number of Buckets to Homogenize: 3

Pre-Mixing Description of Sediment: dark brown silt, some f-sand, trace shell
fragments, trace organics, wet, soft

Mixer:

Mixer Used? ☒ / N

Time on: 09:14

Time off: 09:19

Homogeneity Achieved? ☒ / N

Post-Mixing Description of Sediment: dark brown silt, ^{and} f-sand, trace shell
shell fragments, trace organics, wet, v-soft, organic odor

Photograph (after mixing):

Number: 3 : 20150930 092357, -092404, -092410

Date: 9/30/15

Time: 0924

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

☒ Toxicity

☒ Porewater

☐ Bioaccumulation

Sample ID: NB03SED-CHM 145

Sample ID: NB03SED-~~POR~~ TOX 145

Sample ID: NB03SED-~~TOX~~ POR 145

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): ✓

Person Responsible for Completing Form: Julianne Haggerty

Surface Sediment Sample Processing Form

Date: 09/22/2015

Time Sample Buckets Removed from Cooler: 1335

Location ID: 146

Number of Buckets to Homogenize: 4

Pre-Mixing Description of Sediment:

dark brown, f-m sand and silt, little organics,
wet, loose, true snails, trace shell fragments

Mixer:

Mixer Used? ☒ Y / N

Time on: 1354

Time off: 1359

Homogeneity Achieved? ☒ Y / N

Post-Mixing Description of Sediment: dark brown silt and f. sand, little organics,
wet, loose, trace snails, trace shell fragments

Photograph (after mixing):

Number: 3

20150922-140406, -140412, -140418

Date: 9/22/15

Time: 1404

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

☒ Toxicity

☒ Porewater

☒ Bioaccumulation

Sample ID: NB03SED-CHM 146

Sample ID: NB03SED-POR TOX 146

Sample ID: NB03SED-TOX POR 146

Sample ID: NB03SED-BIO 146

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): —

Person Responsible for Completing Form: Julianne Hagarty

Surface Sediment Sample Processing Form

Date: 09/22/2015

Time Sample Buckets Removed from Cooler: 0730

Location ID: 147

Number of Buckets to Homogenize: 6 (2 batches of 3 buckets)

Pre-Mixing Description of Sediment: dark brown to black silt, little organic silt, trace f-gravel,
trace f-sand, wet, v. soft

Mixer:

Mixer Used? ☒ Y / N

Time on: 7:43; 8:07

Time off: 7:48; 8:12

Homogeneity Achieved? ☒ Y / N

Post-Mixing Description of Sediment: dark brown organic silt, little → trace f-gravel,
trace f-m. sand, wet, v. soft, ^{2L 9/22/15} small wood debris and sticks

Photograph (after mixing):

Number: 4 : 26150922-680304, 080313, -680320, -080325

Date: 9/22/15

Time: 0805

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM 147

☒ Toxicity

Sample ID: NB03SED-~~POR~~TH-TOX 147

☒ Porewater

Sample ID: NB03SED-~~TOX~~TH-POR 147

☒ Bioaccumulation

Sample ID: NB03SED-BIO 147

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): Field duplicates
collected for sediment chemistry & porewater.
Both labeled as NB03SEDDUP-04.

MS/MSD collected for sediment chemistry

Person Responsible for Completing Form: Julianne Hagarty

Time Sample Buckets Removed from Cooler: 1145

148

3

Number of Buckets to Homogenize:	3
Pre-Mixing Description of Sediment:	dark brown silt, trace sand, ^{2L green} trace ^{little} clay, little organic, wet, v. soft, worms, brick fragments?

Mixer Used? Y / N

Time on: 1:56

Time off: 12:01

Homogeneity Achieved? (Y) / N

Post-Mixing Description of Sediment: dark brown silt, little organics, trace f-sand,
trace clay, wet, v. soft, worms

Number: 5: 20160922-120904, -120913, -120920, -120927, -120946

Date: 9/22/15

Time: 1210

☒ Sediment Chemistry

✓ Toxicity

✓ Porewater

Bioaccumulation

Sample ID: NB03SED-CHM 148

Sample ID: NB03SED-POR TOX148

Sample ID: NB03SED-~~TOX~~ POR 148

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): _____

Person Responsible for Completing Form: Julianne Hagarty

Surface Sediment Sample Processing Form

Date: 09/23/2015

Time Sample Buckets Removed from Cooler: 0805

Location ID: 149

Number of Buckets to Homogenize: 9 (batches: 5+4 buckets)

Pre-Mixing Description of Sediment: dark brown organic silt, trace f.sand,
wet, soft, trace f. roots, trace shell fragments

Mixer:

Mixer Used? ☒ Y / N

Time on: 0818; 0859

Time off: 0823; 0904

Homogeneity Achieved? ☒ Y / N

Post-Mixing Description of Sediment: dark brown organic silt, little → some f.sand,
wet, v soft, trace f. roots, trace shell fragments, organic odor

Photograph (after mixing):

Number: 4: 20150923-091044, -091051, -091057, -091102

Date: 9/23/15

Time: 0910

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

☒ Toxicity

☒ Porewater

☒ Bioaccumulation

Sample ID: NB03SED-CHM 149

Sample ID: NB03SED-POR TOX 149

Sample ID: NB03SED-TOX-POR 149

Sample ID: NB03SED-BIO 149

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): MS/MSD and
Field duplicate collected for Bioaccumulation:

Labeled NB03SED-BIO149MS, NB03SED-BIO149MSD,
NB03SEDDUP-05

Person Responsible for Completing Form: Julianne Haggerty

Surface Sediment Sample Processing Form

Date: 09/23/2015

Time Sample Buckets Removed from Cooler: 1245

Location ID: 150

Number of Buckets to Homogenize: 3

Pre-Mixing Description of Sediment:

dark brown silt and clay, little organics, trace f. sand
wet, v. soft, trace f. roots

Mixer:

Mixer Used? Y / N

Time on: 1250

Time off: 1255

Homogeneity Achieved? Y / N

Post-Mixing Description of Sediment:

dark brown silt and clay, little organics, trace f. sand
wet, v. soft, trace f. roots

Photograph (after mixing):

Number: 3: 20150923-125918, -125926, -125932

Date: 9/22/10

Time: 1300

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

☒ Toxicity

☒ Porewater

☐ Bioaccumulation

Sample ID: NB03SED-CHM 150

Sample ID: NB03SED-POR TOX 150

Sample ID: NB03SED-TOX POR 150

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.):

Person Responsible for Completing Form:

Julianne Hargarty

Surface Sediment Sample Processing Form

Date: 9/21/15 Time Sample Buckets Removed from Cooler: 0740

Location ID: 151

Number of Buckets to Homogenize: 4

Pre-Mixing Description of Sediment: brown to black silt, little organics, trace f-sand,
bivalve shells, odor, sheen, wet, v. soft

Mixer:

Mixer Used? (Y) / N

Time on: 8:05

Time off: 8:10

Homogeneity Achieved? (Y) / N

Post-Mixing Description of Sediment: dark brown organ. silt, trace f-sand, odor, sheen,
wet, v. soft, bivalve shell fragments

Photograph (after mixing):

Number: 3; 20150921-082121, -082129, -082140

Date: 9/21/15

Time: 08:20

Analyses (check analyses to be conducted):

X Sediment Chemistry

Sample ID: NB03SED-CHM151

X Toxicity

Sample ID: NB03SED-TOX151

X Porewater

Sample ID: NB03SED-POR151

 Bioaccumulation

Sample ID:

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): Field duplicate
collected for Toxicity: NB03SEDUP-02.

Person Responsible for Completing Form: Julianne Hagarty

Surface Sediment Sample Processing Form

Date: 09/30/2015

Time Sample Buckets Removed from Cooler: 1235; 1305

Location ID: 152

Number of Buckets to Homogenize: 7 (4+3)

Pre-Mixing Description of Sediment: dark brown f.sand and silt, trace organics,
trace shell fragments, loose, wet

Mixer:

Mixer Used? ☒ Y / N

Time on: 1245; 1311

Time off: 12:50; 1316

Homogeneity Achieved? ☒ Y / N

Post-Mixing Description of Sediment: dark brown f.sand and silt, trace organics,
trace shell fragments, bivalves, v-loose, wet

Photograph (after mixing):

Number: 7; 20150930-131746, -131827, -131834, -131840, -131846, -131855, -131859

Date: 9/30/15

Time: 1319

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM 152

☒ Toxicity

Sample ID: NB03SED-~~POR~~ TOX 152

☒ Porewater

Sample ID: NB03SED-~~TOX~~ POR 152

☐ Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): MS/MSD + Duplicate
collected for sediment chemistry and porewater
Duplicate ID: NB03SEDDUP-06

Person Responsible for Completing Form: Julianne Hagarty

Surface Sediment Sample Processing Form

Date: 09/24/2015

Time Sample Buckets Removed from Cooler: 0925; 0955

Location ID: 153

Number of Buckets to Homogenize: 7 (2 batches: 4+3)

Pre-Mixing Description of Sediment: dark brown organic silt and clay, trace f. sand,
wet, soft, trace shells fragments, ^{20% wood} woody debris, f. roots

Mixer:

Mixer Used? ☒ Y / N

Time on: 0944; 1004

Time off: 0949; 1009

Homogeneity Achieved? ☒ Y / N

Post-Mixing Description of Sediment: dark brown organic silt and clay, little f. sand,
wet, v. soft; trace shells fragments, woody debris, f. roots

Photograph (after mixing):

Number: 4: 20150924-101601, -101607, -101613, -101617

Date: 9/24/15

Time: 1617

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM153

☒ Toxicity

Sample ID: NB03SED-POR-TOX153

☒ Porewater

Sample ID: NB03SED-TOX-POR153

☐ Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): MS/MSD collected
for porewater: NB03SED-POR153MS and NB03SED-POR153MSD.
EPA split sample collected for porewater: NB03SED-POR153-LB.

Person Responsible for Completing Form: Julianne Haggarty

Surface Sediment Sample Processing Form

Date: 9/21/15 Time Sample Buckets Removed from Cooler: 1155

Location ID: 154

Number of Buckets to Homogenize: 4

Pre-Mixing Description of Sediment: black brown organic silt, trace f.sand,
wet, v. soft, f. roots, bivalve and other shell fragments

Mixer:

Mixer Used? (Y) / N

Time on: 12:13

Time off: 1218

Homogeneity Achieved? (Y) / N

Post-Mixing Description of Sediment: dark brown / black organic silt, trace f.sand,
wet, v. soft, trace f.roots, bivalve and shell fragments

Photograph (after mixing):

Number: 3: 20150921-122907, -122917, -122923

Date: 9/21/15

Time: 1230

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM154

☒ Toxicity

Sample ID: NB03SED-TOX154

☒ Porewater

Sample ID: NB03SED-POR154

☐ Bioaccumulation

Sample ID: _____

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): EPA split for chemistry:

NB03SED-CHM154-LB

Field duplicate for toxicity: NB03SEDDUP-03

Person Responsible for Completing Form: Julianne Hogarty

Surface Sediment Sample Processing Form

Date: 9/21/15 Time Sample Buckets Removed from Cooler: 1005
Location ID: 155
Number of Buckets to Homogenize: 4
Pre-Mixing Description of Sediment: medium brown f-m sand, little silt,
loose, wet, shell fragments, seaweed

Mixer:

Mixer Used? (Y) / N

Time on: 10:21

Time off: 10:26

Homogeneity Achieved? (Y) / N

Post-Mixing Description of Sediment: brown f-m sand, little to some silt, loose
wet, shell fragments, seaweed

Photograph (after mixing):

Number: 3: 26150921-103340, 103353, 103359

Date: 9/21/15

Time: 1030

Analyses (check analyses to be conducted):

X Sediment Chemistry

Sample ID: NB03SED-CHM155

X Toxicity

Sample ID: NB03SED-TOX155

X Porewater

Sample ID: NB03SED-POR155

 Bioaccumulation

Sample ID:

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): EPA split collected
for toxicity: NB03SED-TOX155-LB.

Person Responsible for Completing Form: Julianne Hagarty

Surface Sediment Sample Processing Form

Date: 09/18/2015

Time Sample Buckets Removed from Cooler: 09 1000 ^{JH 9/18/15}

Location ID: 156

Number of Buckets to Homogenize: 4

Pre-Mixing Description of Sediment: Brown to dark brown organic silt, little to some clay 2L 2/18/15
wet, v. soft no odor OL

Mixer:

Mixer Used? (Y) N

Time on: 1011

Time off: 1016

Homogeneity Achieved? (Y) / N

Post-Mixing Description of Sediment: dark brown organic silt, trace clay, trace E. sand
wet, v. soft no odor OL

Photograph (after mixing): M. Thompson

Number: 3: 20150918_102406, 102413, 102419

Date: 9/18/15

Time: 1024

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM 156

☒ Toxicity

Sample ID: NB03SED-~~POR~~-TOX 156 JH 9/18/15

☒ Porewater

Sample ID: NB03SED-~~TOX~~-~~POR~~ 156 JH 9/18/15

☐ Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): EPA split samples
collected for toxicity NB03SED-TOX156-LB.

Also collect one Teflon-lined 5-gallon bucket for porewater: 1
NB03SED-POR156-LB.

Person Responsible for Completing Form: Julianne Hargarty

Surface Sediment Sample Processing Form

Date: 9/17/15 Time Sample Buckets Removed from Cooler: 1030
Location ID: 157
Number of Buckets to Homogenize: 4
Pre-Mixing Description of Sediment: black/brown/dark brown organic silt wet, v. soft
mild organic odor

Mixer:

Mixer Used? (Y) / N

Time on: 1041

Time off: 1045

Homogeneity Achieved? (Y) / N

Post-Mixing Description of Sediment: dark brown ~~silt~~ organic silt wet, v. soft
mild organic odor

Photograph (after mixing):

Number: 3: 20150917-105330, -105338, -105346

Date: 9/17/15

Time: 1050

Analyses (check analyses to be conducted):

X Sediment Chemistry

Sample ID: NB03SED-CHM157

X Toxicity

Sample ID: NB03SED-TOX157

X Porewater

Sample ID: NB03SED-POR157

 Bioaccumulation

Sample ID:

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): EPA split for
Toxicity: NB03SED-TOX157-LB

Person Responsible for Completing Form: Julianne Harty

Surface Sediment Sample Processing Form

Date: 09/25/2015 Time Sample Buckets Removed from Cooler: 0935

Location ID: 158

Number of Buckets to Homogenize: 3

Pre-Mixing Description of Sediment: ^{dark} brn f-^{2L 9/25/15} Sand, little \rightarrow some silt; trace shell fragments, bivalves, wet, loose

Mixer:

Mixer Used? ☒ Y / N

Time on: 0943

Time off: 0948

Homogeneity Achieved? ☒ Y / N

Post-Mixing Description of Sediment: dark brown, f-sand, some silt; trace shell fragments, bivalves, f-roots; wet, v-loose

Photograph (after mixing):

Number: 4: 20150925_095310, -095317, -095320, -095327

Date: 10/25/15

Time: 0953

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

☒ Toxicity

☒ Porewater

☐ Bioaccumulation

Sample ID: NB03SED-CHM 158

Sample ID: NB03SED-~~POR~~ TOX 158

Sample ID: NB03SED-~~TOX~~ POR 158

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): _____

Person Responsible for Completing Form: Julianne Hagarty

Surface Sediment Sample Processing Form

Date: 09/25/2015 Time Sample Buckets Removed from Cooler: 0800

Location ID: 159

Number of Buckets to Homogenize: 4

Pre-Mixing Description of Sediment: dark brown organic clay and silt, little f. sand,
trace f-m. roots, bivalves, shell fragments

Mixer:

Mixer Used? (Y) / N

Time on: 0812

Time off: _____

Homogeneity Achieved? Y / N

Post-Mixing Description of Sediment: dark brown organic clay and silt, little → some
f-sand; trace f-m. roots, bivalves, shell fragments; wet, v. soft, organic odor

Photograph (after mixing):

Number: 3: 2050925-082344, -082404, -082410.

Date: 9/25/15

Time: 0825

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM159

☒ Toxicity

Sample ID: NB03SED-~~POR~~ TOX159

☒ Porewater

Sample ID: NB03SED-~~TOX~~ POR159

☐ Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): EPA split sample
collected for porewater:
NB03SED-POR159-LB

Person Responsible for Completing Form: Julianne Hagarty

Surface Sediment Sample Processing Form

Date: 09/29/2015

Time Sample Buckets Removed from Cooler: 7:45 0815

Location ID: 160

Number of Buckets to Homogenize: 4

Pre-Mixing Description of Sediment: dark brown / black organic silt, some to little f.
sand, little clay, trace f. roots, bivalves, gastropods, shell fragments, grasses
wet, soft

Mixer:

Mixer Used? ☒ Y / N

Time on: 8:26

Time off: 8:31

Homogeneity Achieved? ☒ Y / N

Post-Mixing Description of Sediment: dark brown / black, organic silt and clay,
little f. sand; trace f. roots, bivalves, gastropods, shell fragments, grasses,
wet, soft

Photograph (after mixing):

Number: 3 20150929-084303; -084311; -084319

Date: 9/29/15

Time: 0843

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM 160

☒ Toxicity

Sample ID: NB03SED-POR-TOX 160

☒ Porewater

Sample ID: NB03SED-TOX-POR 160

☒ Bioaccumulation

Sample ID: NB03SED-BIO 160

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): _____

Person Responsible for Completing Form: Julianne Hogarty

Surface Sediment Sample Processing Form

Date: 09/16/2015 Time Sample Buckets Removed from Cooler: 1030
Location ID: 161
Number of Buckets to Homogenize: 7
Pre-Mixing Description of Sediment: dark brown/black silt, trace f. sand, roots,
wet, v. soft

Mixer:

Mixer Used? ☒ Y / N
Time on: 1047; 1114
Time off: 1052; 1119
Homogeneity Achieved? ☒ Y / N
Post-Mixing Description of Sediment: dark brown/black ^{organic} silt, f. roots, wet,
v. soft

Photograph (after mixing):

Number: 2050916_110721, _110727, _110731
Date: 9/16/15
Time: 1107 (sample time listed in photo: 1055)

Analyses (check analyses to be conducted):

<input checked="" type="checkbox"/> Sediment Chemistry	Sample ID: <u>NB03SED-CHM 161</u>
<input checked="" type="checkbox"/> Toxicity	Sample ID: <u>NB03SED-POR 161</u>
<input checked="" type="checkbox"/> Porewater	Sample ID: <u>NB03SED-TOX 161</u>
<input checked="" type="checkbox"/> Bioaccumulation	Sample ID: <u>NB03SED-BIO 161</u>

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): EPA splits for:

Bioaccumulation: NB03SED-BIO161-LB (in refrigerator)
Toxicity: NB03SED-TOX161-LB (in walk-in refrigerator) 4/6/17 JEM
Chemistry: NB03SED-CHM161-LB (in freezer) Note: ARCADIS collected chemistry split
Person Responsible for Completing Form: Julianne Hagarty

Surface Sediment Sample Processing Form

Date: 09/22/2015

Time Sample Buckets Removed from Cooler: 1010

Location ID: 162

Number of Buckets to Homogenize: 3

Pre-Mixing Description of Sediment: medium brown silt, little organic silt, trace f. sandy
wet, v. soft, f. roots, shell fragments

Mixer:

Mixer Used? (Y) / N

Time on: 10:19

Time off: 10:24

Homogeneity Achieved? Y / N

Post-Mixing Description of Sediment: dark brown silt, little organic silt,
trace f. sandy, wet, v. soft, f. roots, shell fragments

Photograph (after mixing):

Number: 3: 20150922-10344, -103502, -103509

Date: 9/22/15

Time: 1035

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

☒ Toxicity

☒ Porewater

☐ Bioaccumulation

Sample ID: NB03SED-CHM 162

Sample ID: NB03SED-POR-TOX 162

Sample ID: NB03SED-TOX-POR 162

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): —

Person Responsible for Completing Form: Julianne Haggerty

Surface Sediment Sample Processing Form

Date: 09/23/2015

Time Sample Buckets Removed from Cooler: 1045

Location ID: 163

Number of Buckets to Homogenize: 5

Pre-Mixing Description of Sediment: dark brown organic silt and clay, little f. sand,
wet, soft, trace shell fragments, trace roots, woody vegetation

Mixer:

Mixer Used? ☒ Y / N

Time on: 1058

Time off: 1103

Homogeneity Achieved? ☒ Y / N

Post-Mixing Description of Sediment: dark brown silt, little organics, little f-sand,
wet, v-soft, trace shell fragments, trace f. roots and woody vegetation

Photograph (after mixing):

Number: 3: 20150923-111005, -111015, -111027

Date: 9/23/15

Time: 1110

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

☒ Toxicity

☒ Porewater

☐ Bioaccumulation

Sample ID: NB03SED-CHM163

Sample ID: NB03SED-POR-TOX163

Sample ID: NB03SED-TOX-POR163

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): EPA split samples

for sediment chemistry: NB03SED-CHM163-LB

Porewater: NB03SED-POR163-LB

Person Responsible for Completing Form: Julianne Haggerty

Surface Sediment Sample Processing Form

Date: 09/14/2015 Time Sample Buckets Removed from Cooler: 0900
Location ID: 164
Number of Buckets to Homogenize: 3
Pre-Mixing Description of Sediment: black/brown silt, very soft

Mixer:

Mixer Used? ☒ Y / N

Time on: 0915

Time off: 0920

Homogeneity Achieved? ☒ Y / N

Post-Mixing Description of Sediment: Brown silt, very soft.

Photograph (after mixing):

Number: 1377

Date: 9/14/15

Time: 0937

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM 164

☒ Toxicity

Sample ID: NB03SED-POR 164

☒ Porewater

Sample ID: NB03SED-TOX 164

☐ Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): —

Person Responsible for Completing Form: Julianne Hagarty

Surface Sediment Sample Processing Form

Date: 09/14/2015 Time Sample Buckets Removed from Cooler: 1145

Location ID: 165

Number of Buckets to Homogenize: 3

Pre-Mixing Description of Sediment: dark brown very soft silt

Mixer:

Mixer Used? ☒ Y / N

Time on: 1200

Time off: 1205

Homogeneity Achieved? ☒ Y / N

Post-Mixing Description of Sediment: dark brown very soft silt

Photograph (after mixing):

Number: 3: IMG-0783, -0784, -0785

Date: 9/14/15

Time: 1159

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM 165

☒ Toxicity

Sample ID: NB03SED-POR 165

☒ Porewater

Sample ID: NB03SED-TOX 165

☐ Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.):

Person Responsible for Completing Form: Julianne Hogarty

Surface Sediment Sample Processing Form

Date: 09/14/2015

Time Sample Buckets Removed from Cooler: 1145

Location ID: 166

Number of Buckets to Homogenize: _____

Pre-Mixing Description of Sediment: Brown very soft s. 1

Mixer:

Mixer Used? Y ☒ N ☐

Time on: 1155
Time off: 1200) reflects stirring time - stirred by hand Jth 9/16/15

Time off: 1200

Homogeneity Achieved? (Y) / N

Post-Mixing Description of Sediment: Brown very soft silt

Photograph (after mixing):

Number: 3: IMG-7219, -7220, -7221

Date: 9/14/15

Time: 1200

Analyses (check analyses to be conducted):

X Sediment Chemistry

Sample ID: NB03SED-CHM 166

_____ Toxicity

Sample ID: NB03SED-POR

_____ Porewater

Sample ID: NB03SED-TOX

_____ Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.):

Person Responsible for Completing Form: Michael Thompson

Date: 09/15/2015

Time Sample Buckets Removed from Cooler: 0750

Location ID: 167

Number of Buckets to Homogenize: 1

Pre-Mixing Description of Sediment: Brown sand + silt

Mixer Used? Y ☐ N ☒

Time on: 0755
Time off: 0800) reflects stirring time - stirred by hand JH 9/18/15

Homogeneity Achieved? (Y) / N

Post-Mixing Description of Sediment: Brown sand + silt

Number: 3: IMG-7225, -7226, -7227

Date: 9/15/15

Time: 0815 JH 9/18/15
0500

X Sediment Chemistry

Sample ID: NB03SED-CHM_167

 Toxicity

Sample ID: NB03SED-POR_

Porewater

Sample ID: NB03SED-TOX

Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.):

Person Responsible for Completing Form: Michael Thompson

Surface Sediment Sample Processing Form

Date: 09/16/2015 Time Sample Buckets Removed from Cooler: 0845

Location ID: 168

Number of Buckets to Homogenize: 1

Pre-Mixing Description of Sediment: dark brown silt

Mixer:

Mixer Used? Y ☒ N

Time on: _____

Time off: _____

Homogeneity Achieved? ☒ Y ☐ N

Post-Mixing Description of Sediment: dark brown silt, some organics (shells, seaweed)

Photograph (after mixing):

Number: 3: 20150916-090354, -090400, -090405

Date: 9/16/15

Time: 0904

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM 168

☐ Toxicity

Sample ID: NB03SED-POR

☐ Porewater

Sample ID: NB03SED-TOX

☐ Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): MS/MSD and
NB03SEDDUP 01 collected

Person Responsible for Completing Form: Michael Thompson

Surface Sediment Sample Processing FormDate: 09/16/2015Time Sample Buckets Removed from Cooler: 1245Location ID: 169Number of Buckets to Homogenize: 1Pre-Mixing Description of Sediment: Brown soft silt**Mixer:**Mixer Used? Y ☒ NTime on: 1255-1300Time off: 1301Homogeneity Achieved? ☒ Y / NPost-Mixing Description of Sediment: Brown silt, some organics (seaweed) and few roots.**Photograph (after mixing):**Number: 9/16/15 5 # 9/18/15Date: 20150916-130141, -130150, -130156Time: 1301**Analyses (check analyses to be conducted):**☒ Sediment ChemistrySample ID: NB03SED-CHM169☐ ToxicitySample ID: NB03SED-POR☐ PorewaterSample ID: NB03SED-TOX☐ BioaccumulationSample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): EPA split collected for chemistry: NB03SED-CHM169-LB. ARCADIS collected this sample (filled sample jars) at request of EPA representative onsite.

Person Responsible for Completing Form: Michael Thompson

Surface Sediment Sample Processing Form

Date: 09/17/2015 Time Sample Buckets Removed from Cooler: 0745

Location ID: 170

Number of Buckets to Homogenize: 1

Pre-Mixing Description of Sediment: Dark brown silt

Mixer:

Mixer Used? Y / (N)

Time on: 0757

Time off: 0803

Homogeneity Achieved? (Y) / N

Post-Mixing Description of Sediment: Dark brown silt, some organics (seaweed),
few roots (1-2cm)

Photograph (after mixing):

Number: 20150917-080528, -080539, -080545

Date: 9/17/15

Time: 0805

Analyses (check analyses to be conducted):

X Sediment Chemistry

Sample ID: NB03SED-CHM 170

 Toxicity

Sample ID: NB03SED-POR

 Porewater

Sample ID: NB03SED-TOX

 Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.):

Person Responsible for Completing Form: Michael Thompson

Surface Sediment Sample Processing Form

Date: 09/18/2015 Time Sample Buckets Removed from Cooler: 0900

Location ID: ~~NB03SED-CHM-171~~ 171

Number of Buckets to Homogenize: 1

Pre-Mixing Description of Sediment: Dark brown silt/clay, medium plasticity, some small rocks and shell fragments, organics noted (seaweed, etc.), roots.

Mixer:

Mixer Used? Y ☒ N ☐

Time on: 910

Time off: 920

Homogeneity Achieved? ☒ Y ☐ N

Post-Mixing Description of Sediment: Dark brown organic silt w/ some larger grain sediment, some rocks and organics.

Photograph (after mixing):

Number: 3: 20150918_092225, -092234, -092240

Date: 09/18/15

Time: 0922

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

☐ Toxicity

☐ Porewater

☐ Bioaccumulation

Sample ID: NB03SED-CHM 171

Sample ID: ~~NB03SED-POR-TOX~~

Sample ID: ~~NB03SED-TOX-POR~~

Sample ID: NB03SED-BIO

09/18/2015

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): NONE.

Person Responsible for Completing Form: M. Thompson

Surface Sediment Sample Processing Form

Date: 09/24/2015 Time Sample Buckets Removed from Cooler: 07:50

Location ID: 172

Number of Buckets to Homogenize: 1

Pre-Mixing Description of Sediment: dark brown organic clay and silt, little f-sand, wet, soft, trace shell fragments, slight organic odor

Mixer:

Mixer Used? Y / N

Time on: _____ } 0801-0810

Time off: _____

Homogeneity Achieved? (Y) / N

Post-Mixing Description of Sediment: dark brown/black organic clay and silt, little f-sand, trace shell fragments, slight organic odor, wet, soft

Photograph (after mixing):

Number: 3: 20150924-082104, -082111, -082118

Date: 9/24/15

Time: 0820

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM 172

☐ Toxicity

Sample ID: NB03SED-POR

☐ Porewater

Sample ID: NB03SED-TOX

☐ Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): ✓

Person Responsible for Completing Form: Michael Thompson

Surface Sediment Sample Processing Form

Date: 09/24/2015 Time Sample Buckets Removed from Cooler: 1100

Location ID: 173

Number of Buckets to Homogenize: 1

Pre-Mixing Description of Sediment: Dark brown to black organic silt, some organics such as roots, very soft, wet.

Mixer:

Mixer Used? Y / (N)

Time on: _____
Time off: _____ } 1111 → 1124

Homogeneity Achieved? (Y) / N

Post-Mixing Description of Sediment: Dark brown silt, some organics roots and small rocks, v. soft, wet, no odor.

Photograph (after mixing):

Number: 3: 20150924-113011, -113016, -113024

Date: 9/24/15

Time: 1125

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

☐ Toxicity

☐ Porewater

☐ Bioaccumulation

Sample ID: NB03SED-CHM 173

Sample ID: NB03SED-POR

Sample ID: NB03SED-TOX

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): EPA split CHM:
NB03SED-CHM173-LB.

Person Responsible for Completing Form: [Signature]

Surface Sediment Sample Processing Form

Date: 9/21/15 Time Sample Buckets Removed from Cooler: 0850

Location ID: 174

Number of Buckets to Homogenize: 1

Pre-Mixing Description of Sediment: Dark brown organic silt, soft w/ some cohesion,
few small rocks, very soft, wet.

Mixer:

Mixer Used? Y ☒ N

Time on: _____ } 0858-0908

Time off: _____

Homogeneity Achieved? ☒ Y N

Post-Mixing Description of Sediment: Dark brown silt (organic silt), very soft, wet.
Few small pebbles.

Photograph (after mixing):

Number: 3; 20150921-091350, -091358, -091408

Date: 9/21/15

Time: 0812 ^{9/22/15} 0912

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NA03SED-CHM174

☐ Toxicity

Sample ID: _____

☐ Porewater

Sample ID: _____

☐ Bioaccumulation

Sample ID: _____

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): _____

Person Responsible for Completing Form: Michael Thompson

Surface Sediment Sample Processing Form

Date: 09/22/2015

Time Sample Buckets Removed from Cooler: 0945

Location ID: 175

Number of Buckets to Homogenize: 1

Pre-Mixing Description of Sediment: m-c sand, shell fragments, few intact bivalve shells, no plasticity, dense, wet.

Mixer:

Mixer Used? Y ☒ N

Time on: _____
Time off: _____ } 0950 - 1005

Homogeneity Achieved? ☒ Y ☐ N

Post-Mixing Description of Sediment: m-c brown sand, shell fragments, some shells, no plasticity, little organic fines, wet.

Photograph (after mixing):

Number: 3: 20150922-095026, 20150922-100819, -100827, -100847

Date: 9/22/15

Time: 1005

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

☐ Toxicity

☐ Porewater

☐ Bioaccumulation

Sample ID: NB03SED-CHM 175

Sample ID: NB03SED-POR

Sample ID: NB03SED-TOX

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): _____

Person Responsible for Completing Form: [Signature]

Surface Sediment Sample Processing Form

Date: 09/24/2015

Time Sample Buckets Removed from Cooler: 0750

Location ID: 176

Number of Buckets to Homogenize: 1

Pre-Mixing Description of Sediment: 2L 9/24/15
dark brown and black, organic silt and clay, little some organics,
trace f. sand, wet, soft, trace f. roots, trace shell fragments

Mixer:

Mixer Used? Y / N

Time on: 08:09-08:17

Time off: 08:09-08:17

Homogeneity Achieved? Y / N

Post-Mixing Description of Sediment: dark brown and black, organic silt and clay,
trace f. sand, trace f. roots, trace shell fragments, wet, soft

Photograph (after mixing):

Number: 3 : 20150924-082648, -082701, -082707

Date: 9/24/15

Time: 0825

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM 176

☐ Toxicity

Sample ID: NB03SED-POR

☐ Porewater

Sample ID: NB03SED-TOX

☐ Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): —

Person Responsible for Completing Form: Michael Thompson

Surface Sediment Sample Processing Form

Date: 09/30/2015 Time Sample Buckets Removed from Cooler: 1425

Location ID: 177

Number of Buckets to Homogenize: 1

Pre-Mixing Description of Sediment: Dark brown organic silt and clay, trace roots, v. soft, wet.

Mixer:

Mixer Used? Y / (N)

Time on: 1435 → 1445

Time off: 1445

Homogeneity Achieved? (Y) N

Post-Mixing Description of Sediment: Dark brown organic silt and clay, some f.sand, some roots, trace f.roots, v. soft, wet.

Photograph (after mixing):

Number: cf: 20150930-143728, -144637, -144644, -144654

Date: 9/30/15

Time: 1445

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM 677

☐ Toxicity

Sample ID: NB03SED-POR

☐ Porewater

Sample ID: NB03SED-TOX

☐ Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): none

Person Responsible for Completing Form: [Signature]

Surface Sediment Sample Processing Form

Date: 09/24/2015 Time Sample Buckets Removed from Cooler: 0750

Location ID: 178

Number of Buckets to Homogenize: 1

Pre-Mixing Description of Sediment: dark brown/black silt and clay, little f. sand,
wet, soft, bivalves, trace f. roots and ^{woody} debris, ^{slight} organic odor

Mixer:

Mixer Used? Y / N

Time on: _____ } 0758 - 0804
Time off: _____

Homogeneity Achieved? Y / N

Post-Mixing Description of Sediment: dark brown/black organic silt and clay,
little f. sand, wet, soft, trace f. roots and woody debris, trace bivalves

Photograph (after mixing):

Number: 4: 20150924-081519, -081526, -081532, -081540

Date: 9/24/15

Time: 0815

Analyses (check analyses to be conducted):

☒ Sediment Chemistry

Sample ID: NB03SED-CHM178

☐ Toxicity

Sample ID: NB03SED-POR

☐ Porewater

Sample ID: NB03SED-TOX

☐ Bioaccumulation

Sample ID: NB03SED-BIO

Notes (i.e., PE samples, EPA split samples, field duplicate, MS/MSD, etc.): _____

Person Responsible for Completing Form: Michael Thompson