



No. DACW33-03-D-0004	Contract
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June 2008	

Final 2007 Environmental Monitoring, Sampling, and Analysis Reports



- I. Sediment Monitoring Summary Report
- II. Water Quality Monitoring Summary Report
- III. North of Wood Street Monitoring Summary Report
- IV. Sawyer Street Semi-annual Groundwater Monitoring Technical Memorandum



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FINAL Sediment Monitoring Summary Report 2007 Remedial Dredging





Environmental Monitoring, Sampling, and Analysis

New Bedford Harbor Superfund Site New Bedford Harbor, MA

FINAL REPORT

Sediment Monitoring Summary Report 2007 Remedial Dredging

Environmental Monitoring, Sampling, and Analysis New Bedford Harbor Superfund Site New Bedford Harbor, MA

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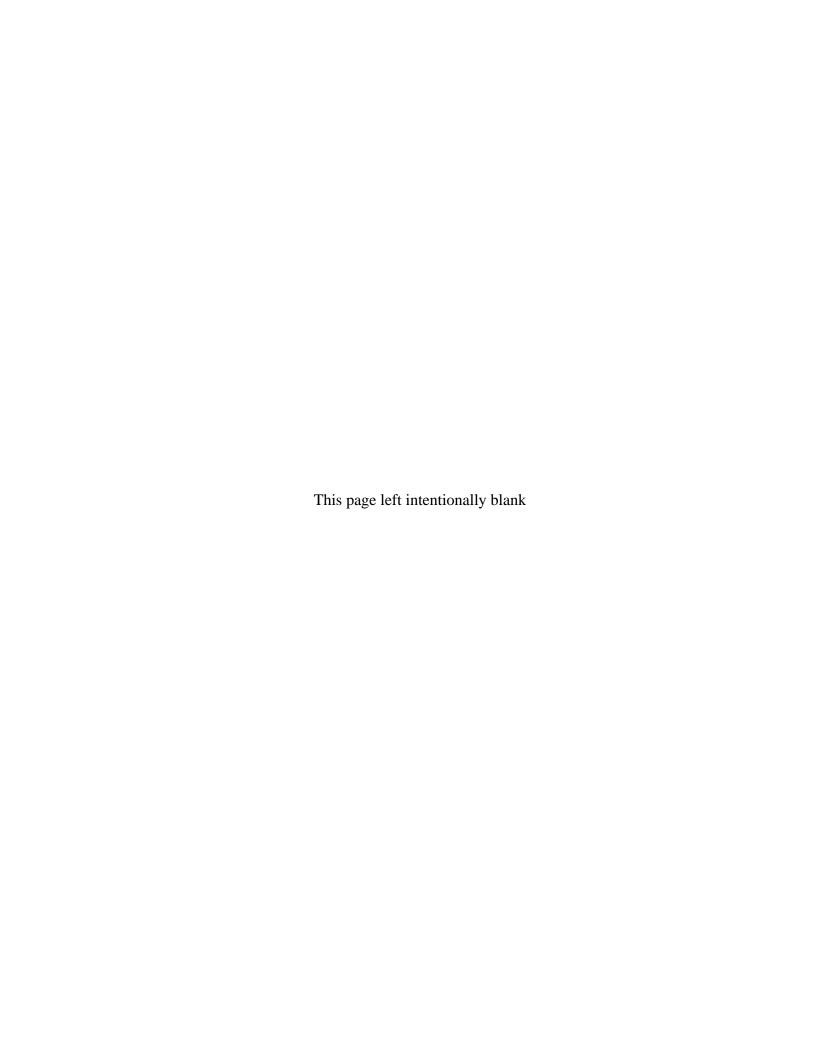






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EXECUTIVE SUMMARY

Sediment sampling was performed at New Bedford Harbor from June to November 2007 in support of remedial dredging activities. In 2007, dredge activities occurred primarily in two areas, including 'Area G' which encompasses southern sections of DMU-1 and DMU-102 and 'Area H' which encompasses sections of DMU-9 and DMU-10, and DMU-11. Dredging activities targeted removal of sediments to the approximate depth of the target dredge elevation (where polychlorinated biphenyl (PCB) concentrations are predicted, based on modeling, to be less than the 10 mg/kg remediation criteria). Sediment cores were collected before, during, and after dredging to evaluate the target dredge elevation estimates through visual characterization and observation of the elevation of sediment-type transitions. Sediment monitoring was also performed in 2007 at the OU3 Pilot Cap and proposed Boat House areas to characterize PCBs in sediment.

Site-wide geostatistical modeling based on historical PCB data has been used to develop an estimation of the vertical elevation of PCB contamination in the sediments (target dredge elevation). The dredge plan for each year is based on the target dredge elevations and contours within the planned footprint of dredging. However, changes in sediment condition over time or uncertainties in the model can result in a discrepancy between the target dredge elevation estimates and the existing features at the site. Elevation data based on the visual characterization of cores collected prior to dredging at Areas G and H in June 2007 were used to refine the dredge plan in terms of target dredge depths and sediment thickness. As a result target dredge depths were reduced, thereby reducing dredging and disposal efforts.

The collection of post-dredge cores revealed that the depth of the sediment surface and the overall thickness of OL (organic silt, organic clay according to the Unified Soil Classification System) layers were reduced across all dredged areas. However, the post-dredge cores collected within the same dredge areas (but generally at different locations) generally had less distinct visual transitions compared to the pre-dredge cores. The transitions generally occurred over a relatively broad band (>0.5-ft) of mixed sediment and in many cases, the elevation of the post-dredge visual transition also occurred at a deeper elevation than observed during the pre-dredge coring investigation.

Total PCB concentrations in post-dredge surface sediment sampled at Area G ranged from 74 mg/kg to 660 mg/kg, with no clear distribution trend except that total PCB concentrations appeared to be lower in surface sediment sampled along the eastern boundary of the dredge area. Post-dredge total PCB concentrations ranged from 5.4 mg/kg to 1,400 mg/kg at Area H. The highest PCB concentrations were measured in the fined-grained, organic-rich sediments sampled along the western boundary. Lower PCB concentrations were measured in sandy, low TOC sediments sampled near the eastern boundary.

There were no substantive changes in total PCB concentrations since 2005 in surficial sediments sampled at the OU3 Pilot Cap site, suggesting that the cap placement is still effective in this area.

Total PCB concentrations in sediment sampled at the proposed Boat House area were highest at the surface and generally decreased with depth. Most of the sediments sampled 2-ft below the surface had total PCB concentrations well below 1 mg/kg.





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1.0 INTRODUCTION

1.1 Site Description

The New Bedford Harbor Superfund Site (Site), located in Bristol County, Massachusetts (MA), extends from the shallow northern reaches of the Acushnet River estuary south through the

commercial harbor of New Bedford and into 17,000 adjacent acres of Buzzards Bay (Figure 1). Industrial and urban development surrounding the harbor has resulted in sediments becoming contaminated with high concentrations of many pollutants, notably polychlorinated biphenyls (PCBs) and heavy metals. Two manufacturers in the area used PCBs while producing electronic devices from the 1940s to the late 1970s, when the use of PCBs was banned by the U.S. Environmental Protection Agency (USEPA). Based on human health concerns and ecological risk assessments, USEPA added New Bedford Harbor to the National Priorities List in 1983 as a designated Superfund Site. Through an Interagency Agreement between the USEPA and the U.S. Army Corps of Engineers, New England District (USACE NAE), the USACE is responsible for carrying out the design and implementation of the remedial measures at the Site. The Site has been divided into three areas - the upper, lower and outer harbors - consistent with geographical features of the area and gradients of contamination (Figure 2).

Aerovox Inc. located in New Bedford, MA used PCBs in the manufacture of electrical capacitors from approximately 1940 to 1977. This facility is located in the upper harbor and is considered one of the major sources of historic PCB contamination to New Bedford Harbor. The highest concentrations of PCBs were found in sediments in a 5-acre area in the northern portion of the Acushnet River Estuary adjacent to the Aerovox facility. These 'hot spot' sediments, which contained PCBs upwards of 100,000 milligrams per kilogram (mg/kg), were removed between 1994 and 1995 as part of USEPA's 1990 "Hot Spot" Record of Decision (ROD). Full scale remediation dredging per the 1998 Upper and Lower Harbor ROD was initiated in 2004 and continued in 2005, 2006, and 2007. Another known source of PCB contamination in New Bedford Harbor is related to activities at the Cornell-Dubilier mill on the western shore of the outer harbor. In 2005, a 15 acre underwater cap pilot project was implemented near Cornell-Dubilier to cap PCBcontaminated sediments (Figure 2).



Figure 1. Location of the Site in Southeastern, MA.



Figure 2. Location of the 2007 Dredge Activity Area within New Bedford Harbor





The Site is divided into a series of Dredge Management Units (DMU) based on contamination levels, contamination sources, topography, and other factors. In 2007, dredge activities were conducted at two areas: 'Area G' encompassing sections of DMU-1 and DMU-102 and 'Area H' encompassing sections of DMU-9 and DMU-10, and DMU-11 (Figure 3).

The remediation of the Site involves the excavation and dredging of approximately 880,000 cubic yards of PCB contaminated sediment. The majority of contaminated material is being removed utilizing a hydraulic dredge that pumps dredge slurry to the project's Sawyer Street facility where it is mechanically processed to remove all sand, gravel, and debris material. The silt and clay size materials are then pumped to the Area D Dewatering Facility located on Herman Melville Boulevard where it is mechanically dewatered and transported off-site for disposal.

1.2 Project Objectives

The primary objectives of the 2007 sediment monitoring program were to 1) conduct pre-dredge coring to



Figure 3. 2007 Dredge Areas.

determine the elevation of the visual transition and sediment thickness of the OL layer ('OL' in the Unified Soil Classification System (USCS), defined as organic silt or organic clay) to assist dredge planning, 2) conduct progress-dredge coring to provide field reconnaissance information during the dredge season to maximize overall dredging productivity, and 3) conduct post-dredge coring to assess the overall performance of the dredging operation and support future needs. Additional objectives included conduct of harbor-wide monitoring at locations determined by the USEPA and USACE NAE. This included sediment monitoring at the OU3 Pilot Cap site near the Cornell-Dubilier Mill and the proposed Boat House area.

1.2.1 Pre-dredge Sediment Sampling

The entire upper harbor, including the planned 2007 dredge areas depicted in Figure 3, have been parceled into discrete 25-foot by 25-foot 'z-blocks'. During remedial design, a geostatistical model was used to predict a target elevation for dredging each z-block. This target dredge elevation, as shown in Figures 4 (Area G) and 5 (Area H), represents the elevation where PCB concentrations are predicted to be less than the 10 mg/kg remediation criteria. Using target dredge elevations in combination with bathymetric data, a preliminary dredge plan was developed which estimated the required depth of dredging and the thickness of the overlying sediment to be removed. The predredge sediment sampling plan was designed to confirm these estimates or adjust elevations as needed. Coring locations were placed onto the z-block map to achieve sufficient spatial coverage for making an evaluation of the target dredge elevations. In areas where the target dredge elevations changed substantially within adjacent z-blocks the concentration of sampling locations was increased. Visual characterization data from the pre-dredge cores was used by NAE and Jacobs Engineering Group (Jacobs) to prepare the final 2007 dredge plan.







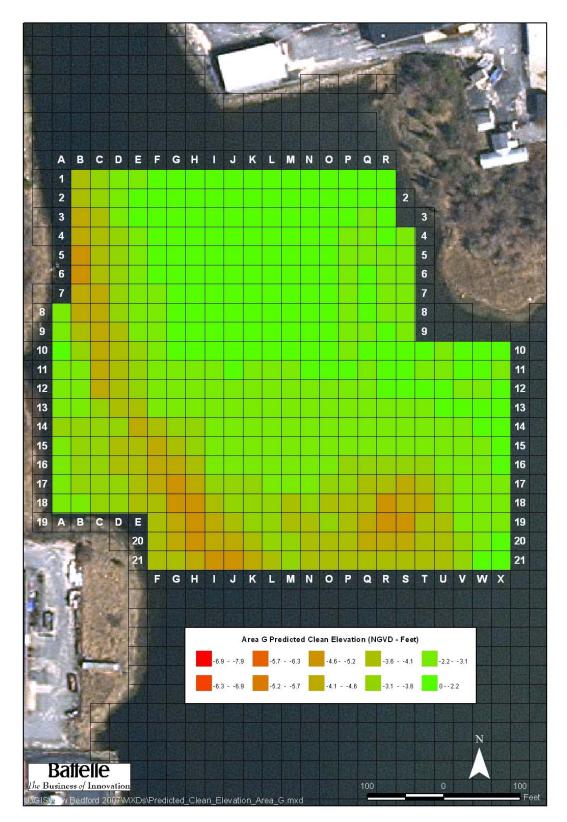


Figure 4. 2007 Planned Dredge Area G with Z-blocks and Target Dredge Elevations.







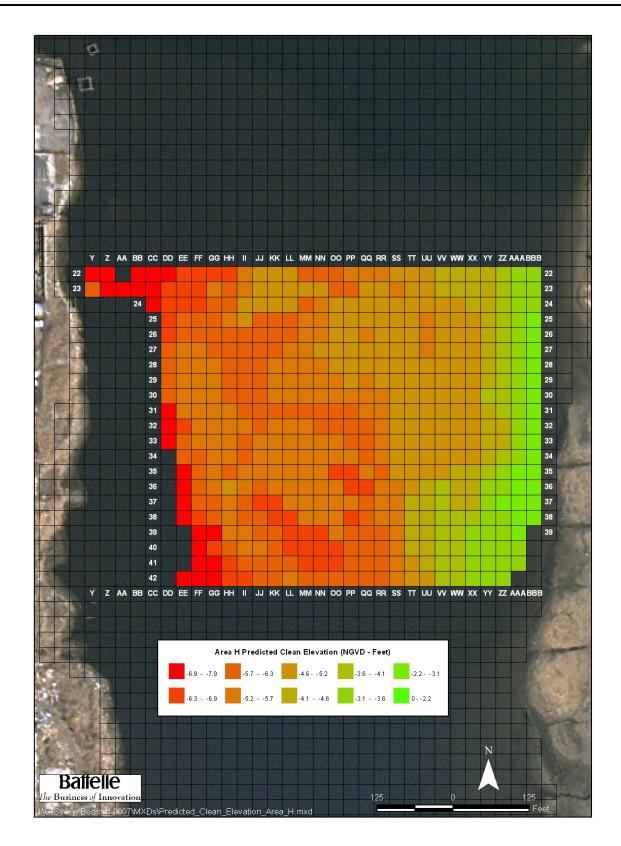


Figure 5. 2007 Planned Dredge Area H with Z-blocks and Target Dredge Elevations.





1.2.2 Progress-dredge Sediment Sampling

Push cores were collected during dredge activities to evaluate the progress of dredging operations and dredge effectiveness. Dredging operations were conducted based on opportunity (tides, weather, equipment, etc) and sample locations were determined through weekly discussions between NAE, Battelle, and Jacobs, based on the dredge operations. Samples collected during this activity received visual characterization only (Section 2.2).

1.2.3 Post-dredge Sediment Sampling

Post-dredge sediment sampling was conducted to assess the sediment condition relative to the target dredge elevation for the entire 2007 dredging event and to assist with future site needs. Visual characterization of these samples was used to determine the elevation and thickness of overlying material remaining after the completion of dredging. Chemical analysis was also performed to assess PCB concentrations remaining in the sediments in these areas. Supplemental analyses, including grain size composition, total organic carbon (TOC), and volatile organic compound (VOC), were performed on selected samples at the direction of USACE NAE.

1.2.4 Harbor-wide Sampling

Additional harbor-wide monitoring was conducted at the direction of USEPA and USACE NAE. In 2007, sediment monitoring was performed to characterize PCBs in sediments at the OU3 Pilot Cap and the proposed Boat House areas.

The OU3 Pilot Cap site is a localized area of elevated PCB concentrations located outside the hurricane barrier in New Bedford, MA (Figure 2). In 2005 the OU3 Pilot Cap site was capped with parent material dredged during the construction of a navigational dredged material Confined Aquatic Disposal (CAD) cell in New Bedford Harbor. Annual monitoring has been conducted since 2005 to assess temporal trends in PCBs in surficial sediments and the effectiveness of the cap.

Sampling was conducted in the area of the proposed Boat House location, located in the upper Harbor, and was completed during post-dredge activities. Sediment cores were collected at 10 locations to characterize PCBs in sediment at three depth intervals: 0-1 ft, 1-2 ft, and 2-3 ft.

1.3 Report Organization

This report describes the activities conducted in 2007 during sampling in New Bedford Harbor in support of dredging operations as part of the remediation of the Site. A description of the Site and project objectives is presented in Section 1. A description of the 2007 sampling and analysis methods is provided in Section 2. Results of the 2007 sediment monitoring, including sediment characteristics and chemistry, are provided in Section 3.0. A discussion of the sediment results is provided in Section 4.0. References are provided in Section 5.0.





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2.0 METHODS

Environmental sampling and analysis methods utilized for the 2007 sediment monitoring program are summarized below and described in detail in the project work plans (Battelle, 2006a, b; Battelle, 2007).

2.1 Sediment Collections

2.1.1 Pre-, Progress-, and Post-dredging Sampling

Pre-, progress-, and post-dredge core samples were collected in 2007 at Areas G (Figure 6) and H (Figure 7). Sampling of sediments was conducted with a push-core sampling device utilizing 3-inch diameter LexanTM core barrels. The sampling device was designed to securely hold one end of a pre-cut length of core barrel. Core lengths were targeted so that penetration exceeded the expected depth of the target dredge elevation by at least one foot. A piston assembly inside the core barrel was used to create suction during retrieval of the sample to prevent sediment loss from the bottom of the barrel.

Once the individual components of the push core sampler were assembled, sample collection was achieved as follows. The core assembly was measured from the bottom of the core to the top of the assembly. The piston assembly was positioned just inside the leading end of the core liner and the piston line was held loosely on deck. The device was lowered into the water until the leading end of the core bore barrel contacted the sediment surface. The piston attachment line was then tied off securely on the deck of the survey vessel, thus fixing the elevation of piston assembly. In driving the push-core into the sediment, the piston created a syringe effect as the core liner was driven past the fixed elevation of the piston. The core liner was then driven to the maximum depth of either refusal or the limiting depth allowed by the length of the piston attachment line. When retrieving the core assembly (with sample) tension was held on the piston line so that the piston and sample were not pulled back down the core liner by suction from the sediments. The sampler was recovered onto the deck of the survey vessel. The bottom end of the core barrel was fitted with a plastic cap, after which the sediment on the external body of the sampler was rinsed off. After thoroughly cleaning the sampling device the core liner was removed from the socket assembly, the piston assembly was then removed, and the top of the core liner was fitted with a plastic end cap.

Upon recovery, the core was examined for acceptability. The goal of the dredge area sampling was to identify visual transitions. If it did not appear that a clear transition layer was captured, the field team used professional judgment to determine the cause. Possible causes included; 1) the core was not long/deep enough to capture transition layers, 2) smearing of overlying sediments obscured the transition, and 3) the entire core was composed of the characteristic native material. In the first two cases the collection of a second core (longer for case 1) at the same location was conducted. In the third case the field team repositioned slightly and collected a second core. Other factors which were considered in determining acceptability included: 1) too much water at the top of the core, 2) signs of significant compaction at the top of the core, and 3) signs of loss of sediment from the bottom of the core. Because of the wide range of possible scenarios, overall core acceptability was based on the experience and judgment of the Chief Scientist and the field team. All decision making was documented on the Sediment Sampling Log sheets (Appendix A).







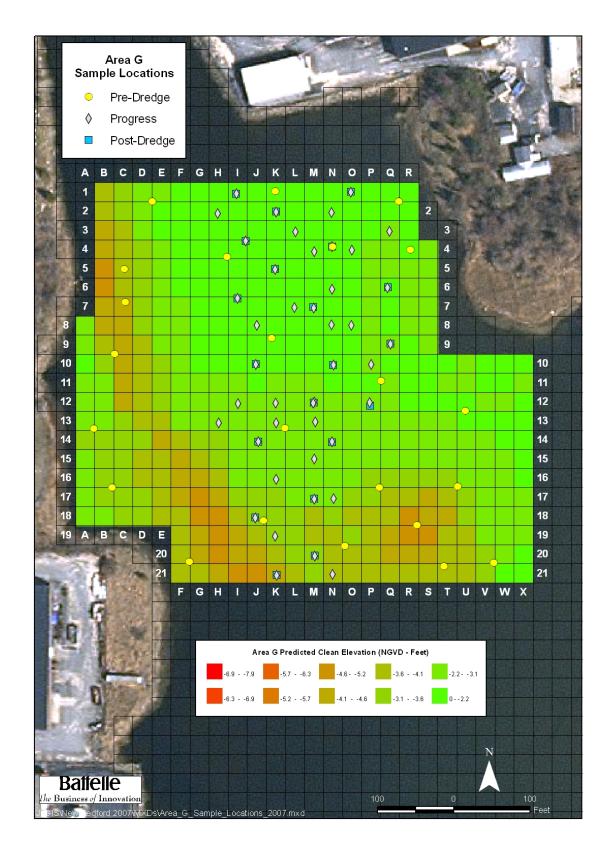


Figure 6. Pre-, Progress-, and Post-dredge Sample Locations at Area G.







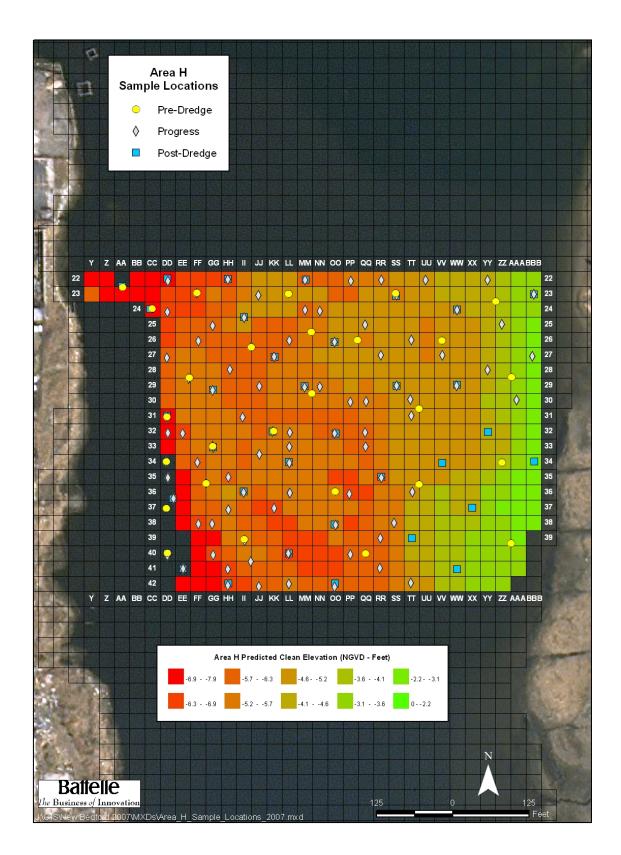


Figure 7. Pre-, Progress-, and Post-dredge Sample Locations at Area H.





Determination of the accurate vertical elevation of the samples was critical in achieving the objectives of the project. Elevation of the water levels, sediment-water interface, apparent target dredge elevation, and other sediment transition zones were all critical measurements for this project (see Section 3 and Appendix A). The project elevation datum is MLW NGVD-29. A series of measurements were conducted for each sample to correct elevations for tidal fluctuations. All measurements were recorded as ± 0.1 feet. The required measurements and techniques are listed below. See Figure 8 for graphical depiction of the measurements.

- A =Water depth. The water depth was recorded using either a lead line or a measuring pole.
- B = **Length of push core assembly**. Prior to deployment, the full length of the push core assembly from the top of the handle to the bottom edge of the core liner was recorded.
- C = Water surface to top of core assembly handle. Once the core assembly was fully inserted (refusal or full core penetration), the length of the assembly remaining above the water surface was recorded.
- D =Core Length. The core length, from bottom to top, was measured and recorded.
- E = **Surveyed elevation**. Prior to operations the dredge contractor installed a fixed sheet pile with markings indicating a survey elevation (NGVD 29). This elevation was recorded and served as the reference point for all elevation calculations.
- F = Water surface from surveyed elevation. After sample collection, the survey vessel navigated to the fixed sheet pile with surveyed elevations (position to be determined) and the distance from the water surface to the surveyed elevation was recorded.

From theses measurements a number of calculations were made to determine true elevations:

- E F = Elevation of water surface (G).
- G (B C) = Elevation of bottom of core (H).

The *H* elevation (bottom of core) was used to determine the elevation of all visual transitions, including apparent target dredge elevation. i.e.:

H + (distance to visual transition) = Elevation of visual transition (target dredge elevation)

H + D = Elevation of sediment water interface (I).

The elevation of the sediment water interface was also calculated from:

G - A = Elevation of sediment water interface (I_2) .

I and I_2 were compared at each station. In soft sediments the sediment water interface may have been difficult to discern from soundings (i.e. it is difficult to feel). Additionally, the sediment water interface within a core was subject to compaction during collection, settling after recovery, and other factors which may have impacted the accuracy of elevation measurements. If I and I_2 varied by more than 1.0 foot, the core was discarded and a new sample collected.

Once the core was deemed acceptable, a Sediment Sampling Log sheet was completed. Sample collection data, including collection date and time, station coordinates, and sample ID, were documented on Sediment Sampling Log forms. The field measurements required for determining vertical elevation of the sediment-water interface and each transitional layer was also included on the Sediment Sampling Log sheet. The core barrel was labeled with a sample ID, date, and the orientation for the top of the core. Chain of Custody for each core section was initiated in the field.







Core samples were capped tightly, stored on ice in the field, and transferred to the Sawyer Street facility for processing (Section 2.2).

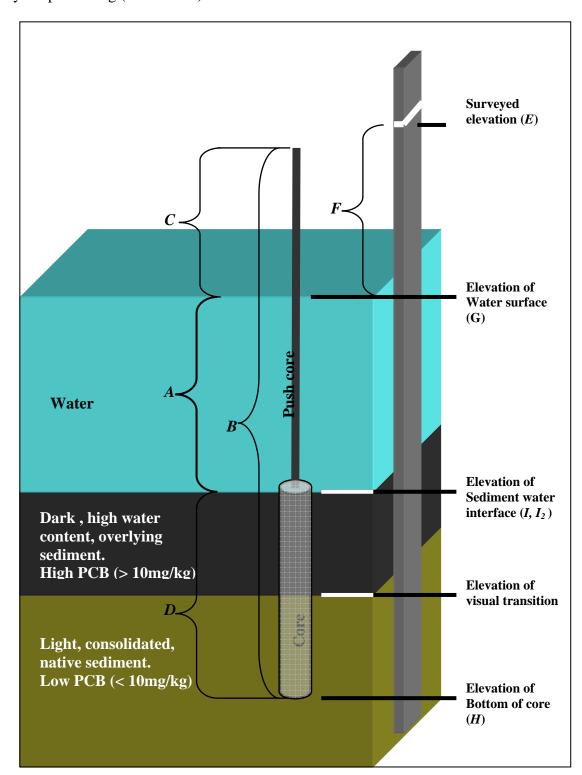


Figure 8. Graphical Depiction of Sediment Core Measurements.





2.1.2 Harbor-wide Sampling

At the direction of USEPA and USACE, sediment sampling was performed at the OU3 Pilot Cap site and the proposed Boat House area.

OU3 Pilot Cap — Grab sampling was conducted at 17 sample locations at the OU3 Pilot Cap site (Figure 2) to collect surficial sediments for PCB analysis. A 0.04m² modified Van Veen grab was used to collect sediment samples. Sample locations were based on stations previously visited by ENSR/AECom on August 25, 2005, shortly after the completion of capping activities (ENSR, 2006). Bathymetric data collected just after the capping event revealed a series of ridges and valleys formed by placement of cap materials along an east-west axis. At the time of the 2005 bathymetry and sampling as much as a 4-foot difference in elevation existed amongst the topography at this site. The 2005 sediment sampling locations were positioned to achieve good spatial coverage over the site and to obtain data representative of the high and low spots existing in the sediment cap at that time.

The 2007 sampling coordinates were based on the 2005 sampling event; however, it was expected that local currents and wave action may have resulted in a general smoothing of the topography over time. To achieve representative collections of ridge and valley locations, the vessel transited towards a target station on a heading that was perpendicular to the orientation of the ridges. As the target coordinates were approached the ridges and valleys were clearly discernable on the fathometer of the vessel. Depending on the station, either a valley or a ridge was targeted. As the appropriate feature emerged on the fathometer, a 10-lb lead weight attached to a line and surface float was thrown overboard to mark the feature. The vessel then transited back towards the location to confirm that the marker did, in fact, accurately mark the feature. If it did not, the method was repeated until successful (usually this was unnecessary). Once the feature was accurately marked, the surface grab sample was collected from that location and the actual sample coordinates were recorded. The surface 0.3 ft from each sample was homogenized and subsampled. One field replicate sample was also collected.

Boat House — Sediment cores were collected from 10 locations at the proposed Boat House area. Sediment cores were collected and processed as described in Sections 2.1.1 and 2.2, respectively. Sediment cores from multiple depth intervals were subsampled for PCB analysis. One sediment core was collected for replicate analysis.

2.2 Sample Processing

Sediment samples were kept on ice and transferred to the Sawyer Street trailer for processing, except for the progress-dredge cores which were processed on board the survey vessel and then discarded. Sediment samples were photo-documented, visually characterized, and subsampled for chemical and physical testing as described below. A summary of the samples collected is provided in Table 1.





Table 1. Sediment Samples Collected During the 2007 Sediment Monitoring Program. (a)

	Number of Samples (Number of Samples Sub-sampled for Chemical and Physical Testing					
a	Sediment	Sediment	PCB	PCB	Grain			
Sample Type	Cores	Grabs	Congener	Homologues	Size	TOC	VOC	
Pre-Dredge	50	0	0	0	0	0	0	
Progress Dredge	135	0	0	0	0	0	0	
Post-Dredge	55	0	38	4	38	38	2	
OU3	0	17	18	2	0	0	0	
Boat House	11	0	33	3	0	0	0	

⁽a) Includes field replicates.

2.2.1 Photodocumentation

In general, previous investigations have shown that dark, high water content, organic silts in the surface sediment are associated with elevated PCBs (FWENC, 2001 and 2002; ENSR, 2004 and 2005). These sediments fall under the "OL" description in the USCS (organic silt, organic clay). At the Site these contaminated OL sediments generally overlie lighter colored, more consolidated native clays which have lower PCBs concentrations. The use of this visual transition as a general indicator of the vertical location of contamination provides a rapid and inexpensive method to assess dredge targets and performance.

To document this visual transition, all sediment cores were documented with digital photographs. Digital photographs of the cores were uploaded to the New Bedford Harbor project database. These photographs are linked in the database to the location information and to the analytical results and can be viewed individually. Each photograph contained the following elements in the frame:

- The sediment core. Photographing was done through the clear liner. Alternatively, for cores that were examined on deck with no collection of analytical subsamples, the cores were extruded from the core liner on deck for photographing. Also, for cores that did receive additional subsample processing, the core liners were cut open longitudinally to expose the sediment for sampling and photographing.
- *Measurement reference*. A tape measure (or equivalent) marked in decimal feet ran parallel to length of the core.
- *Sample identifier*. A card, paper, whiteboard, or equivalent was placed next to the core with the following written information:
 - Sample ID an alpha numeric code that identifies sample matrix, sampling year, station location, and depth interval sampled
 - o Sample Collection Date

2.2.2 Visual Characterization and Subsampling for Chemical and Physical Testing

Following photodocumentation, all sediment samples (cores, grabs) were visually characterized and subsampled for chemical and physical testing as described below. A summary of the samples collected for chemical and physical testing is provided in Table 1.

Each sediment core was visually characterized and physical characteristics, including material type, color, consistency, particle size, and odor, was documented on the Sediment Sampling Log forms. For sediment grabs, the material type was documented on the Sediment Sampling Log forms.





Pre-dredge Cores. The pre-dredge sampling plan included a subset of cores to be selected for PCB analysis. However, based on determinations by the project team (USACE NAE, Jacobs and Battelle) no samples were selected for analysis. Instead, each of the cores was archived frozen at the Site for possible analysis at a later date.

Progress-dredge Cores. Samples for chemical or physical testing were not required.

Post-dredge Cores. Sediment cores were subsampled for PCB congener, sediment grain size, and total organic carbon (TOC) analysis. Based on the visual characterization, a segment from top of the core to the visual interface was collected for analysis. A 6-inch segment below the visual interface was also sampled and archived frozen at the site for potential future analysis. The sediment was removed from the core using a disposable plastic spoon and homogenized in a disposable aluminum bowl. Dedicated processing equipment was used for each sample to minimize the potential for cross-contamination and reduce the use of solvents. Samples were collected into the appropriate containers and transferred on ice to Battelle. Samples for grain size and TOC analysis were shipped by overnight carrier to Applied Marine Sciences, of League, Texas. Samples for PCB analysis were transferred to the Battelle Laboratory Custodian. Copies of the sample field logs and custody records are maintained with the project files at Battelle.

A subset of the samples was also selected for PCB homologue analysis. The field team assigned samples for homologue analysis based on horizontal location within the sampling site to achieve a representative distribution of samples across the area.

Two sediment cores (one sample plus one replicate core) were also collected at station AA22, located within Area H but outside the area dredged, for volatile organic compounds (VOC) analysis (Table 1). The cores were cut open at the target sampling depth interval (0.2-0.3 ft from top of the core), and a 5-ml syringe was used to extract the sample for VOC analysis. For each sample, a series of subsamples were collected into pre-preserved vials prepared by the analytical laboratory (Alpha Woods Hole Group Laboratories). One vial contained methanol preservative, two of the vials contained deionized water preservative, and one vial contained no preservative. These replicate vials allowed the laboratory to select the appropriate sample based on interferences seen during the analysis.

OU3 Pilot Cap Sediment Grabs. The surface 0.3 ft from each sample was homogenized and subsampled for PCB congener analysis. A subset of the samples was also selected for PCB homologue analysis. Samples for PCB analysis were transferred to the Battelle Laboratory Custodian. Copies of the sample field logs and custody records are maintained with the project files at Battelle.

Boat House Cores. Each core was subsampled for PCB analysis. A total of three depth intervals were sampled, including 0-1 foot, 1-2 feet, and 2-3 feet. A subset of the samples was also selected for PCB homologue analysis. Samples for PCB analysis were transferred to the Battelle Laboratory Custodian. Copies of the sample field logs and custody records are maintained with the project files at Battelle.





2.3 Chemical and Physical Testing

Sediment samples (Table 1) were analyzed for PCB congeners and homologues, VOCs, grain size composition and TOC content as described below.

2.3.1 Polychlorinated Biphenyls

PCB analyses of post-dredge, OU3, and Boat House sediment samples were performed by Battelle, located in Duxbury, MA. Samples were air-dried overnight to ensure percent solids in the samples were >50%. Approximately 5 g of the air-dried sample was spiked with surrogates and extracted using Accelerated Solvent Extraction (ASE) following modified EPA Method 3545. The extracts were processed through activated copper for sulfur removal and then received disposable Florisil column clean-up. The post-Florisil extract was concentrated, fortified with internal standards (IS), and submitted for analysis.

All sample extracts were analyzed for the 18 NOAA PCB congeners using gas chromatography/ electron capture detection (GC/ECD) using dual column confirmation, following modified EPA Method 8082. Sample data were quantified by the method of internal standards, using the IS compounds. Positive congener results were confirmed by a secondary column confirmation analysis with the higher of the two results reported, unless analyst discretion required otherwise (e.g. the result without an interference signal was reported).

A sub-set of the samples were also analyzed for PCB homologues using gas chromatography/mass spectrometry (GC/MS), following modified EPA Method 8270C. Sample data were quantified by the method of internal standards, using the IS compounds.

PCB congener and homologue results are reported in mg/kg dry weight and to two significant figures in this report. Concentrations of total PCB were calculated using the congener and homologue results. First, total PCB was calculated as the sum of the 18 NOAA congeners multiplied by the project-specific factor of 2.6. Next, total PCB was calculated as the sum of the homologues. A value of zero (0) was used in the summation for non-detects.

A routine set of quality control (QC) samples were prepared with each batch of 20 or fewer project samples to monitor data quality in terms of accuracy and precision. Each batch of project samples included one method blank, one laboratory control sample (LCS), and one matrix spike and matrix spike duplicate (MS/MSD).

2.3.2 Volatile Organic Compounds

VOC analyses of the post-dredge sediment core (collected at station AA22, an area of the harbor that was not dredged) were performed by Alpha Woods Hole Labs in Mansfield, MA. Samples were extracted following EPA Method 5035 and analyzed by GC/MS following EPA Method 8260B. Results are reported in mg/kg dry weight.

One trip blank was also submitted along with the field samples. Laboratory-based QC samples included analysis of one method blank, one LCS and LCS duplicate, and one MS/MSD.





2.3.3 Grain Size and Total Organic Carbon

Grain size and TOC analyses of the post-dredge sediment cores were performed by Applied Marine Sciences, Inc. of League, TX. Grain size analyses were performed according to ASTM Method D422 and reported as percent gravel, sand, silt and clay. Quality control for grain size analyses included analysis of an analytical duplicate. Total Organic Carbon (TOC) was analyzed by EPA Method 9060 and reported as percent dry weight. Quality control for TOC included analysis of an analytical duplicate.





3.0 RESULTS

3.1 Field Activities

Results from the field activities conducted during the 2007 remedial dredge season are described below. Complete field data are documented on the Sediment Sampling Log forms provided in Appendix A. Digital photographs of the cores were uploaded to the New Bedford Harbor project database. These photographs are linked in the database to the location information and to the analytical results and can be viewed individually. Further details about dredging activities are provided in Jacobs (2008).

3.1.1 Dredging and Field Monitoring Summary

Dredging was conducted from August to October 2007. Dredging was performed at Area H, which encompasses sections of DMU-9 and DMU-10, and DMU-11 and Area G, which encompasses sections of DMU-1 and DMU-102. The eastern portion of Area G (in DMU-102) is intertidal. As a result, dredging could not always be conducted during lower tides. To maintain efficiency a second dredge was set up. When low water prevented dredging in Area G, dredge crews moved over to the second dredge. This approach meant that the dredging location was variable from day to day and even within days. Weekly bathymetric data and sediment core samples were collected to provide feedback to the dredge operators in areas where dredging had been conducted to determine the need for clean up passes. Based on these data, dredgers did not return to previously dredged areas to perform clean up passes. Dredging in Areas G and H was conducted in a North-South orientation during most of the dredging season. During the last two weeks of dredging at Area H, dredging was conducted East-West in the eastern portion of the dredge area only.

Dredging was performed using a Mud CatTM hydraulic dredge equipped with a horizontal auger (Figure 9). The dredge was propelled by winching itself along a traverse cable which spans the

dredge area to opposite sides of the perimeter cable. As a pass was completed, support crews relocated the cable to position for the next pass. The auger on the dredge is eight-ft wide. Six foot wide dredge passes were conducted. This provided two feet of overlap into the previous pass to capture any residual

sediment which may have sloughed into the new cut. Dredge material was pumped



Figure 9. Mud CatTM Hydraulic Dredge.

through a pipeline to a booster pump, then to the desanding facility at Sawyer Street. Following desanding, the remaining fine material was pumped via a separate pipeline to the dewatering, treatment, and handling facility in the Lower Harbor. In total, the 2007 dredging removed over 23,300 cubic yards of material (Jacobs, 2008).

The hydraulic dredge can not handle large debris which is common in this portion of the harbor. Debris removal was accomplished by 'raking' the bottom with a barge-mounted excavator





(Figure 10). Barges secured to the side of the debris removal platform stored the debris and were moved offsite as needed. Support boats were used throughout the operation to transport crews, maintain dredges, handle the pipeline, and move barges.

Dredging related sediment sampling included collection of sediment cores prior to, during and upon completion of dredging activities. In addition to these dredge related sampling events, sediment grab samples were collected at the OU3 Pilot Cap site outside the New Bedford hurricane barrier and sediment core samples were collected at the proposed Boat House location. Results from all of these sampling activities are provided below.



Figure 10. Debris Removal Excavator.

3.1.2 Pre-dredge Core Sampling

A total of 50 pre-dredge cores were collected at Area G (Figure 6) and Area H (Figure 7) in June and July, 2007. Core locations spanned the horizontal extent of the planned dredge areas. Results from the pre-dredge sampling effort consisted of vertical elevation data based on physical measurements and visual characterization of the sediment cores. Table 2 lists the relevant elevation data from the pre-dredge sampling event, including elevation of the visual transition and thickness of the OL layer. Figures 11 and 12 show the thickness of the OL layer overlayed on the target dredge elevations.

The physical characteristics of the pre-dredge cores were typical of sediments previously described at the site. The cores were generally comprised of two distinct layers. The surface layer is comprised of very fine-grained loose black organic silt with very high moisture content ('OL' in the USCS). This surface layer ranged from about 0.2 to 5.1-ft of OL (Table 2), with the thickest sediments found along the western shoreline of Area H (Figure 12). Below this OL layer the sediment type was generally moderately stiff olive-gray clay ('OH' in the USCS, defined as organic clay, organic silt). At Area G (upriver of Aerovox facility) the upper sediment layer was fairly uniform in thickness (Figure 11). At Area H (downriver of Aerovox facility) an increased sediment thickness was observed, which generally related to deeper target dredge elevation depths with thicker OL layers on the western side of the river (Figure 12). Elevation and sediment thickness data from the pre-dredge sampling was provided to NAE and Jacobs. These data were used to modify target dredge elevations for the final 2007 dredge plan (Jacobs, 2008).





Table 2. Elevation Data From the Pre-dredge Sampling Event.

				Elevation of visual transition	Thickness of
Dredge		Northing	Easting	(native to OL)	Remaining Sediment
Area	Station	NAD 83 MA, ft	NAD 83 MA, ft	(NVGD, ft)	(ft)
	A14	2707464.30	815561.50	-2.40	0.90
	C16	2707387.11	815585.30	-2.40	1.30
	C5	2707673.60	815601.40	-3.40	0.60
	C9	2707562.30	815588.80	-4.30	1.00
	E1	2707762.50	815638.30	-1.80	0.20
	G20	2707289.56	815686.83	-4.40	1.90
	I4	2707689.90	815736.10	-1.90	1.10
	K1	2707776.10	815799.75	-1.90	1.30
	K18	2707343.84	815784.60	-3.40	1.50
	K9	2707582.87	815795.10	-2.10	1.10
	L13	2707465.40	815812.60	-2.90	1.40
Area G	N4	2707703.10	815874.90	-2.20	1.40
	019	2707310.65	815891.12	-2.90	0.60
	Q11	2707527.20	815938.30	-2.40	1.30
	Q16	2707327.20	815936.40	-2.90	1.30
	R1	2707762.50	815961.50	-1.80	1.20
	R19	2707337.70	815985.90	-2.60	0.80
	R4	2707698.80	815976.90	-2.10	1.40
	T20	2707283.63	816020.72	-3.20	1.00
	U12	2707487.50	816049.10	-2.20	0.90
	U16	2707388.20	816038.80	-2.30	0.90
	W20	2707288.30	816086.07	-3.40	1.10
	AA22	2704885.60	815001.70	-7.90	4.90
	AAA28	2704737.92	815639.02	-3.70	0.90
	AAA39	2704465.60	815638.40	-2.70	0.80
	CC24	2704851.10	815050.10	-5.90	1.90
	DD31	2704673.70	815074.10	-7.20	2.60
	DD34	2704599.90	815073.40	-7.60	2.50
	DD37	2704523.50	815073.10	-7.90	2.70
	DD40	2704450.10	815074.80	-9.50	5.10
	FF23	2704876.90	815123.30	-5.50	0.90
	FF28	2704737.10	815111.20	-5.30	1.30
	GG33	2704624.80	815149.50	-5.30	1.00
	GG35	2704563.90	815138.40	-5.40	0.90
	II39	2704472.10	815200.90	-5.60	0.90
	JJ26	2704787.20	815212.70	-4.90	1.00
Area H	KK32	2704649.80	815248.80	-5.30	1.00
	LL23	2704874.80	815273.60	-4.80	0.70
	MM25	2704812.10	815311.20	-5.00	1.00
	NN29	2704711.60	815311.90	-5.20	1.00
	NWC	2707630.40	815603.10	-3.90	0.50
	0036	2704550.90	815350.30	-5.60	1.10
	QQ26	2704799.10	815386.90	-5.60	1.50
	QQ40	2704449.20	815399.60	-5.40	1.20
	SS23	2704875.90	815448.90	-4.60	0.70
	UU30	2704686.40	815487.30	-5.10	1.20
	UU35	2704562.90	815487.50	-4.90	1.00
	VV26	2704798.70	815524.80	-4.70	1.00
	ZZ23	2704862.20	815613.40	-4.00	0.70
	ZZ34	2704598.25	815623.50	-3.60	0.80







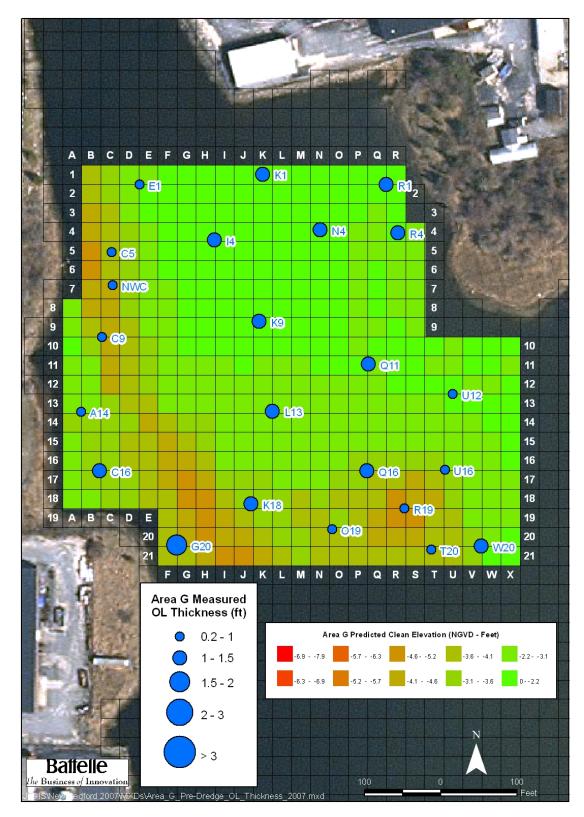


Figure 11. Pre-dredge Thickness of OL Layer at Area G.







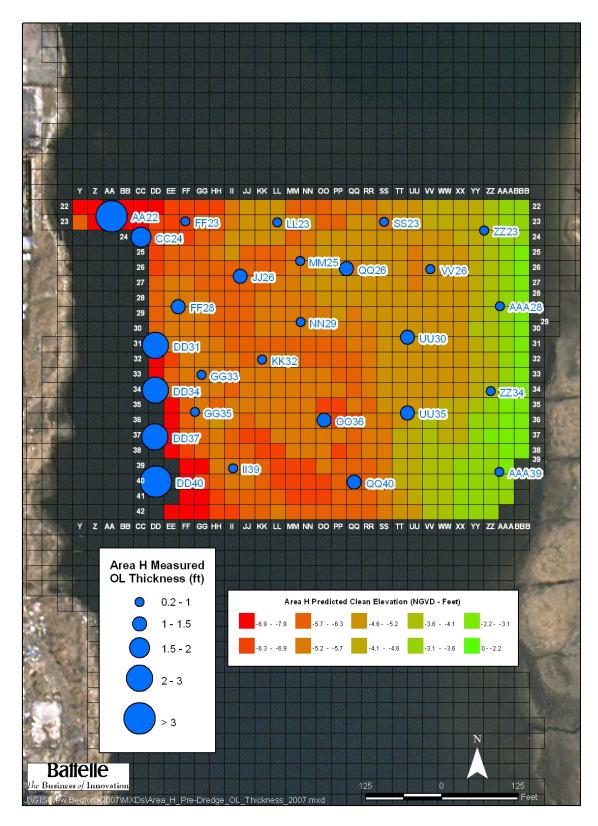


Figure 12. Pre-dredge Thickness of OL Layer at Area H.





3.1.3 Progress-dredge Sediment Sampling

Progress dredge samples were collected at Area G (Figure 6) and Area H (Figure 7) as needed during the 2007 dredge season to provide feedback regarding dredge progress and success. In general, progress-dredge sampling was conducted during each week of the dredge season, although during the early stages or when progress was slow, this sampling was not required. Progress-dredge core samples were processed (photodocumented and visually characterized) directly aboard the sampling barge for and then discarded.

Characterization and elevation measurements were targeted at identifying the elevation of the sediment-water interface and the visual transition from OL to OH. Elevation data for the progress-dredge cores are summarized in Table 3, and includes a comparison the actual vs. predicted transition elevation. This information was used by the dredge operators to confirm the amount and depth of remaining contaminated sediment. These elevation measurements were also useful in determining if areas were overdredged. Based on progress-dredge core results and the weekly bathymetric survey, dredge operators would have returned to areas to remove any remaining material, if needed. However, no additional passes were conducted during the 2007 dredge season.

Table 3. Elevation Data From the Progress-dredge Sampling Events.

		Elevation Measurements (NGVD ft)						
Dredge Area	Station (Z Block)		Measured Elevation of Visual Transition (Native to OL)	Measured Elevation of Sediment Surface	Measured Sediment Thickness Remaining (ft)	Actual vs. Predicted Transition Elevation (ft)		
	H13	-2.8	-3.3	-1.9	1.4	-0.5		
	H2	-1.6	-2	-1.9	0.1	-0.4		
	I1	-1.6	-2.7	-2.3	0.4	-1.1		
	I12	-2.7	-2.9	-2.4	0.5	-1.0		
	I 4	-1.6	-2.6	-2.3	0.3	-1.0		
	I7	-1.9	-2.3	-2.1	0.2	-0.4		
	J10	-2	-2.6	-1.9	0.7	-0.6		
	J14	-2.7	-3.4	-2.9	0.5	-0.7		
	J18	-3.3	-3.6	-3.1	0.5	-0.3		
	J8	-2.1	-2.3	-2.1	0.2	-0.2		
	K12	-2.6	-3.9	-2.6	1.3	-1.3		
	K13	-2.7	-2.5	-1.8	0.7	0.2		
Area G	K16	-3	-3.5	-2.9	0.6	-0.5		
	K19	-3.4	-3.9	-3.3	0.6	-0.5		
	K2	-1.7	-3.1	-2	1.1	-1.4		
	K21	-4.4	-5.3	-3.8	1.5	-0.9		
	K5	-1.5	-3.3	-2.4	0.9	-1.8		
	L3	-1.7	-2.9	-2.8	0.1	-1.2		
	L7	-1.9	-3.1	-2.4	0.7	-1.2		
	M12	-2.6	-3.8	-3.5	0.3	-1.2		
	M12	-2.6	-4.2	-3.9	0.3	-1.6		
	M13	-2.6	-2.9	-2.6	0.3	-0.3		
	M15	-2.9	-3.9	-3.4	0.5	-1		
	M17	-2.9	-4.4	-3.2	1.2	-1.5		
	M20	-3.3	-4.5	-3.4	1.1	-1.2		





Table 3. (cont)

	Elevation Measurements (NGVD ft)					
Dredge	Station		Measured Elevation of Visual Transition	Measured Elevation of Sediment	Measured Sediment Thickness	Actual vs. Predicted Transition
Area	(Z Block)	Elevation	(Native to OL)	Surface	Remaining (ft)	Elevation (ft)
	M4	-1.7	-2	-2	0	-0.3
	M7	-1.9	-2.3	-1.7	0.6	-0.4
	N10	-2	-3.7	-3.2	0.5	-1.7
	N14	-2.8	-4.4	-3.9	0.5	-1.6
	N17	-2.9	-4.1	-3.8	0.3	-1.2
	N2	-1.5	-3.5	-3.3	0.2	-2
	N21	-3.8	-4.2	-3.7	0.5	-0.4
	N4	-1.7	-3.9	-3.1	0.8	-2.2
Area G	N6	-1.8	-3.3	-3.2	0.1	-1.5
Area G	N8	-2	-3.3	-3.1	0.2	-1.3
	O1	-1.4	-3.3	-2.8	0.5	-1.9
	O4	-1.8	-2.75	-2.7	0.05	-0.95
	O8	-1.9	-3.1	-2.8	0.3	-1.2
	P10	-2.5	-3.3	-2.9	0.4	-0.8
	P12	-2.2	-2.6	-2.4	0.2	-0.4
	Q3	-2.2	-3.6	-2.7	0.9	-1.4
	Q6	-2	-3.3	-3	0.3	-1.3
	Q9	-2.5	-3	-2.9	0.1	-0.5
	AAA30	-3.3	-4	-3.3	0.7	-0.7
	BBB23	-3.1	-3.1	-2.4	0.7	0
	BBB27	-2.8	-3	-2.5	0.5	-0.2
	DD22	-7.2	-8	-6.6	1.4	-0.8
	DD24	-5.8	-7.3	-6.3	1	-1.5
	DD27	-5.8	-6.9	-6.1	0.8	-1.1
	DD31	-7.2	-8.1	-6.5	1.6	-0.9
	DD31	-7.2	-7.6	-5.6	2	-0.4
	DD32	-7.5	-10.4	-9.7	0.7	-2.9
	DD34	-8	-8.3	-7.4	0.9	-0.3
	DD35	-8.2	-10	-9.3	0.7	-1.8
Area H	DD36	-8.5	-9.3	-8.3	1	-0.8
	DD40	-9.5	-10.6	-9.4	1.2	-1.1
	EE32	-6.6	-7.4	-6.1	1.3	-0.8
	EE41	-8.4	-9.4	-7.3	2.1	-1
	FF23	-6.3	-5.4	-4.9	0.5	0.9
	FF26	-5.9	-6.4	-5.8	0.6	-0.5
	FF28	-5.4	-5.3	-4.9	0.4	0.1
	FF34	-5.7	-7	-6.4	0.6	-1.3
	FF38	-6.3	-6.8	-6.2	0.6	-0.5
	GG25	-5.8	-5.8	-5.5	0.3	0
	GG29	-5.4	-5.5	-4.9	0.6	-0.1
	GG33	-5.5	-6.5	-5.4	1.1	-1
	GG33	-5.5	-6.3	-5.8	0.5	-0.8





Table 3. (cont)

		Elevation Measurements (NGVD ft)		[
Dredge	Station	Target Dredge	Measured Elevation of Visual Transition	Measured Elevation of Sediment	Measured Sediment Thickness	Actual vs. Predicted Transition
Area	(Z Block)	Elevation	(Native to OL)	Surface	Remaining (ft)	Elevation (ft)
	GG35	-5.6	-6.8	-6.1	0.7	-1.2
	GG38	-5.8	-6.9	-6.6	0.3	-1.1
	GG40	-6.4	-7	-6.1	0.9	-0.6
	HH22	-6.7	-6.7	-5.9	0.8	0
	HH28	-5.9	-6.4	-5.6	0.8	-0.5
	HH35	-6.1	-6.9	-6.4	0.5	-0.8
	HH37	-5.2	-6.4	-6.3	0.1	-1.2
	HH41	-6.4	-6.6	-6.2	0.4	-0.2
	HH42	-6.5	-7.3	-6.7	0.6	-0.8
	II25	-5.1	-6.6	-6	0.6	-1.5
	II31	-6	-6.4	-5.4	1	-0.4
	II35	-5.4	-6.7	-5.6	1.1	-1.3
	II39	-5.3	-6.9	-6.1	0.8	-1.6
	II41	-5.9	-6.7	-6	0.7	-0.8
	JJ23	-5 7.0	-6.6	-5.9	0.7	-1.6
	JJ26	-5.8	-6.3	-5.7	0.6	-0.5
	JJ29	-5.9	-7	-5.9	1.1	-1.1
	JJ33	-5.3	-7.2	-6.5	0.7	-1.9
	JJ42	-6.1	-7	-6.6	0.4	-0.9
	KK27	-5.9	-7	-5.8	1.2	-1.1
Area H	KK32	-5.3	-7.7	-6.8	0.9	-2.4
	KK37	-6.3	-6.7	-6.4	0.3	-0.4
	LL26	-5.8	-6.2	-6	0.2	-0.4
	LL32	-5.3	-6.4	-5.7	0.7	-1.1
	LL33	-5.4	-6.6	-6.1	0.5	-1.2
	LL34	-5.5	-5.5	-5.2	0.3	0
	LL36	-5.5	-5.6	-5	0.6	-0.1
	LL36	-5.5	-6.8	-6.2	0.6	-1.3
	LL40	-6.3	-4.8	-4.6	0.2	1.5
	LL40	-6.3	-7.3	-6.3	1	-1
	LL42	-5.5	-4.2	-4.1	0.1	1.3
	MM22	-5.8	-7	-5.9	1.1	-1.2
	MM24	-5.7	-7.3	-6.2	1.1	-1.6
	MM29	-5.3	-6.5	-6.1	0.4	-1.2
	NN24	-5.6	-5.6	-5.1	0.5	0
	NN29	-5.3	-5.7	-4.8	0.9	-0.4
	OO26	-4.7	-6	-5.6	0.4	-1.3
	OO32	-5.9	-6.3	-5.1	1.2	-0.4
	OO38	-5.6	-7	-6.4	0.6	-1.4
	OO42	-6.2	-7.1	-6.2	0.9	-0.9
	PP22	-5.6	-5.9	-5.7	0.2	-0.3
	PP30	-5.3	-6.1	-5.4	0.7	-0.8





Table 3. (cont)

	T		T .			
		Elevati	on Measurements (N	-	<u>-</u>	
Dredge Area	Station (Z Block)		Measured Elevation of Visual Transition (Native to OL)	Measured Elevation of Sediment Surface	Measured Sediment Thickness Remaining (ft)	Actual vs. Predicted Transition Elevation (ft)
	PP36	-6.4	-6.5	-6.4	0.1	-0.1
	PP40	-6.2	-6.6	-6.4	0.2	-0.4
	QQ25	-4.6	-5.3	-4.8	0.5	-0.7
	QQ30	-5.2	-6	-5.4	0.6	-0.8
	QQ32	-5.7	-6	-5.6	0.4	-0.3
	QQ33	-5.7	-6.8	-6.6	0.2	-1.1
	RR22	-5.5	-5.4	-4.9	0.5	0.1
	RR27	-4.6	-5.2	-5	0.2	-0.6
	RR35	-5.8	-5.3	-5.1	0.2	0.5
	RR39	-5.8	-5.5	-5.1	0.4	0.3
	RR41	-5.9	-6.1	-5.6	0.5	-0.2
	SS23	-5.5	-6.1	-5.6	0.5	-0.6
Area H	SS29	-5	-6.2	-5.4	0.8	-1.2
Агеа п	SS38	-5.2	-5.6	-5.2	0.4	-0.4
	TT26	-5	-5.6	-5	0.6	-0.6
	TT30	-4.9	-5.6	-5	0.6	-0.7
	TT31	-5	-5.8	-5.2	0.6	-0.8
	TT36	-5	-5.3	-4.7	0.6	-0.3
	TT42	-5	-5.5	-4.8	0.7	-0.5
	UU22	-4.8	-5.4	-5.2	0.2	-0.6
	VV27	-4.6	-5.4	-5.1	0.3	-0.8
	WW24	-4.7	-5.4	-4.6	0.8	-0.7
	WW29	-4.7	-4.7	-4.7	0	0
	YY22	-4.1	-4.4	-4.3	0.1	-0.3
	YY28	-4.1	-4.9	-4.4	0.5	-0.8
	ZZ25	-3.7	-4.3	-4	0.3	-0.6

3.1.4 Post-Dredge Sediment Sampling

The post-dredge sampling event was conducted in November and December 2007 following the completion of dredge activities. This effort was conducted to verify the final sediment condition at the end of the 2007 dredge season. A total of 58 cores were collected during the post-dredge event at Area G (Figure 6) and Area H (Figure 7). Only six of the post dredge samples represented a revisit of pre-dredge locations for direct comparison of dredging performance. Table 4 lists the elevation data collected for the post-dredge core samples. Note that station AA22 was located just outside of the dredge area for 2007. Excluding station AA22, the average thickness of remaining contaminated sediment based on visual characterization of the post-dredge cores was 0.68-ft, with a range of 0.1 to 1.6-ft (Table 4).

The physical characteristics of the post-dredge cores had the same general characteristics as observed in the pre-dredge events. There were typically two distinct layers (OL overlying OH). However, as expected there were noticeable differences between the two events. As indicated by the





elevation results discussed above, the overall thickness of the OL was clearly decreased following completion of dredge activities. The visual transition zone in many of the post-dredge cores was also noticeably different from the pre-dredge cores. There were fewer cores with sharp demarcations between the OL and OH layers, and these blurred transitions tended to be thicker (>0.5-ft) than observed in pre-dredge cores.

Table 4. Elevation Data From the Post-dredge Sampling Event.

		Elevation	n Measurements (N	Measured	Actual vs.	
		210 (4020	Measured	Measured	Sediment	Predicted
		Target	Elevation of	Elevation of	Thickness	Transition
	Station	Dredge	Visual Transition	Sediment	Remaining	Elevation
Dredge Area	(Z Block)	Elevation	(Native to OL)	Surface	(ft)	(ft)
	<u>I1</u>	-1.60	-2.3	-1.80	0.50	-0.70
	I4	-1.60	-2.3	-1.60	0.70	-0.70
	I7	-1.90	-1.9	-1.80	0.10	0.00
	J10	-2.00	-2.9	-2.20	0.70	-0.90
	J10-DUP	-2.00	-2.8	-2.10	0.70	-0.80
	J14	-2.70	-3.5	-2.90	0.60	-0.80
	J18	-3.30	-3.1	-2.80	0.30	0.20
	K2	-1.70	-2.6	-1.80	0.80	-0.90
	K21	-4.40	-5.5	-4.30	1.20	-1.10
	K5	-1.50	-2.8	-2.20	0.60	-1.30
Area G	M12	-2.60	-3.5	-3.10	0.40	-0.90
	M17	-2.90	-3.9	-3.30	0.60	-1.00
	M20	-3.30	-3.2	-2.90	0.30	0.10
	M7	-1.90	-2.2	-1.80	0.40	-0.30
	N10	-2.00	-2.9	-2.50	0.40	-0.90
	N14	-2.80	-4.3	-3.80	0.50	-1.50
	N4	-1.70	-3.6	-3.00	0.60	-1.90
	O1	-1.40	-3	-2.40	0.60	-1.60
	P12	-2.20	-2.5	-2.20	0.30	-0.30
	Q6	-2.00	-2.7	-2.50	0.20	-0.70
	Q9	-2.50	-3.1	-2.60	0.50	-0.60
Area H	AA22	-8.00	-7.3	-3.60	3.70	0.70
	AA22 DUP	-8.00	-7.4	-3.50	3.90	0.60
	BBB23	-3.10	-3.3	-2.40	0.90	-0.20
	BBB34	-2.90	-3.4	-2.30	1.10	-0.50
	DD22	-7.20	-7	-5.90	1.10	0.20
	DD24	-5.80	-6.9	-5.70	1.20	-1.10
	DD31	-7.20	-7.5	-6.50	1.00	-0.30
	DD36	-8.50	-9.1	-7.90	1.20	-0.60
	DD36 DUP	-8.50	-9	-7.70	1.30	-0.50
	DD40	-9.50	-10.5	-8.90	1.60	-1.00
	EE41	-8.40	-8.8	-7.40	1.40	-0.40
	GG29	-5.40	-5	-4.40	0.60	0.40
	GG33	-5.50	-6.3	-5.70	0.60	-0.80
	HH22	-6.70	-7.1	-6.10	1.00	-0.40
	HH42	-6.50	-6.9	-6.10	0.80	-0.40





Table 4. (cont)

		Elevation	n Measurements (N	NGVD ft)	Measured	Actual vs.
			Measured	Measured	Sediment	Predicted
	Station	Target	Elevation of	Elevation of	Thickness	Transition
Dredge Area	(Z Block)	Dredge Elevation	Visual Transition (Native to OL)	Sediment Surface	Remaining (ft)	Elevation (ft)
	II25	-5.10	-6.2	-5.80	0.40	-1.10
	II36	-5.60	-6.5	-5.90	0.60	-0.90
	KK27	-5.90	-6.5	-5.60	0.90	-0.60
	KK32	-5.30	-6.9	-6.00	0.90	-1.60
	LL34	-5.50	-6.5	-6.40	0.10	-1.00
	LL40	-6.30	-6.7	-6.30	0.40	-0.40
	MM22	-5.80	-6.4	-5.90	0.50	-0.60
	MM29	-5.30	-7.8	-6.90	0.90	-2.50
	OO26	-4.70	-6	-5.30	0.70	-1.30
	OO32	-5.90	-6.1	-5.30	0.80	-0.20
Area H	OO38	-5.60	-7	-6.50	0.50	-1.40
Alea II	OO42	-6.20	-6.6	-5.80	0.80	-0.40
	RR35	-5.80	-5.5	-5.20	0.30	0.30
	SS23	-5.50	-5.9	-5.60	0.30	-0.40
	SS29	-5.00	-6.1	-5.40	0.70	-1.10
	TT39	-4.50	-5.7	-5.40	0.30	-1.20
	VV34	-4.60	-5.2	-4.20	1.00	-0.60
	WW24	-4.70	-5.8	-5.00	0.80	-1.10
	WW29	-4.70	-4.8	-4.40	0.40	-0.10
	WW41	-3.70	-4.4	-3.80	0.60	-0.70
	XX37	-4.10	-5.1	-4.10	1.00	-1.00
	YY32	-4.50	-5	-4.80	0.20	-0.50

3.1.5 Harbor-wide Sampling

Sediment sampling was conducted at the OU3 Pilot Cap and proposed Boat House areas of the Harbor as described below.

OU3 Pilot Cap — Grab samples were collected at the OU3 Pilot Cap site in November 2007 from either ridge or valley locations as described in Section 2.2. Detailed bathymetry was conducted in 2005 and 2007 by Apex Engineering. It appears that there have been no substantive changes of the locations of these ridges and valleys since 2005. The physical characteristics of sediments from all locations sampled were generally similar. All of the samples had a thin (<1cm) light brown surface coating representative of an active algal layer. All samples were mostly fine sand. Based on the visual characterizations, the valley locations tended to have somewhat higher silt content than the ridge locations although this was not universally true.

Boat House — Sediment cores were collected in November 2007 at 10 locations offshore of the proposed Boat House location. Each sediment core was subsampled for PCB analysis at three depth intervals: 0-1 foot, 1-2 feet, and 2-3 feet, for a total of three samples per core. Most samples were comprised of black silt overlain by grey clay or sand ('OL' over 'OH' layer).





3.2 Chemical and Physical Testing

Results from the chemical and physical testing of sediment samples (Table 1) collected in support of the 2007 remedial dredge season are presented below. Complete test results are provided as appendices to this report. PCB results are provided in Appendix B, VOC results are provided in Appendix C, and sediment grain size and TOC results are provided in Appendix D.

3.2.1 Polychlorinated Biphenyls – Congeners

3.2.1.1 Post-dredge Sediments

Total PCB concentrations measured in post-dredge surface sediment samples collected at Areas G and H are summarized in Table 5. At Area G, total PCB concentrations ranged from 74 mg/kg to 660 mg/kg, with no clear distribution trend except that concentrations appeared to be lower in sediment sampled along the eastern boundary of the dredge area (Figure 13). At Area H, total PCB concentrations ranged from 5.4 mg/kg to 1,400 mg/kg, with the highest concentrations measured in fine-grained, organic-rich sediment sampled near the western boundary of the dredge area (Figure 14). Lower total PCB concentrations were measured in the sandy, low-TOC samples sampled near the eastern boundary at Area H (Figure 14).

Table 5. Total PCB in Post-dredge Sediment Samples, November and December 2007.

	Area G			Area H	
	Sample Depth	Total PCB a		Sample Depth	Total PCB a
Station ID	Interval (ft)	(mg/kg dry)	Station ID	Interval (ft)	(mg/kg dry)
N14-F07	0.0-0.5	74	WW24	0.0-0.8	240
I1	0.0-0.5	180	WW41	0.0-0.6	80
I4-F07	0.0-0.7	150	YY32	0.0-0.2	23
K2	0.0-0.8	100	BBB23	0.0-0.9	5.4
N4-F07	0.0-0.6	75	OO26	0.0-0.7	310
01	0.0-0.6	660	OO32	0.0-0.8	280
Q9	0.0-0.5	100	OO38	0.0-0.5	160
J14	0.0-0.6	470	SS29	0.0-0.7	330
K5	0.0-0.6	250	VV34	0.0-1.0	370
J10	0.0-0.7	160	DD22 ^b	0.0-1.1	540
J10 (dup)	0.0-0.7	160	GG29 ^b	0.0-0.6	1400
K21	0.0-1.2	310	GG33-F07	0.0-0.6	300
M17	0.0-0.6	300	HH22	0.0-1.0	470
ab Sum of 18 congeners	v 2 6		1125	0.0-0.4	250

Sum of 18 congeners x 2.6

^b Target Dredge Elevation was not reached at this location

^c Sediment was not dredged at this location







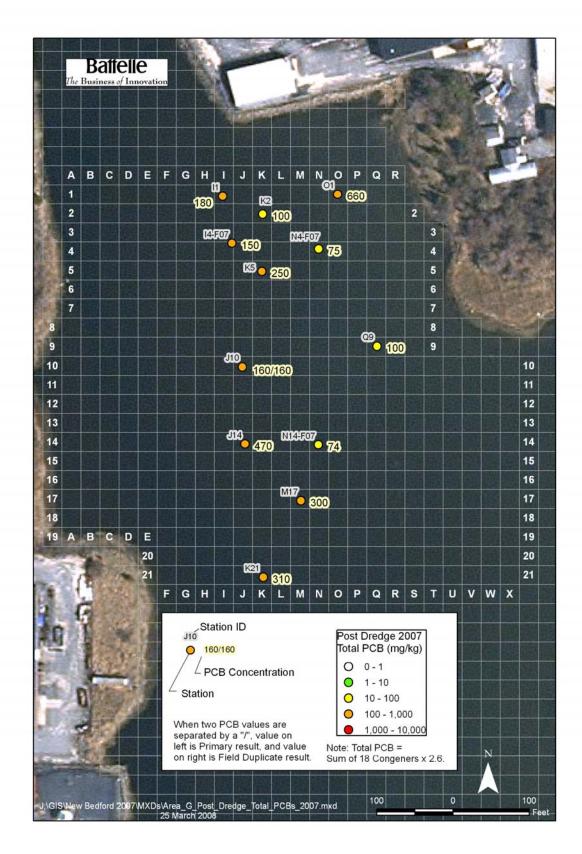


Figure 13. Total PCB in Post-dredge Sediment Samples at Area G, November and December 2007.







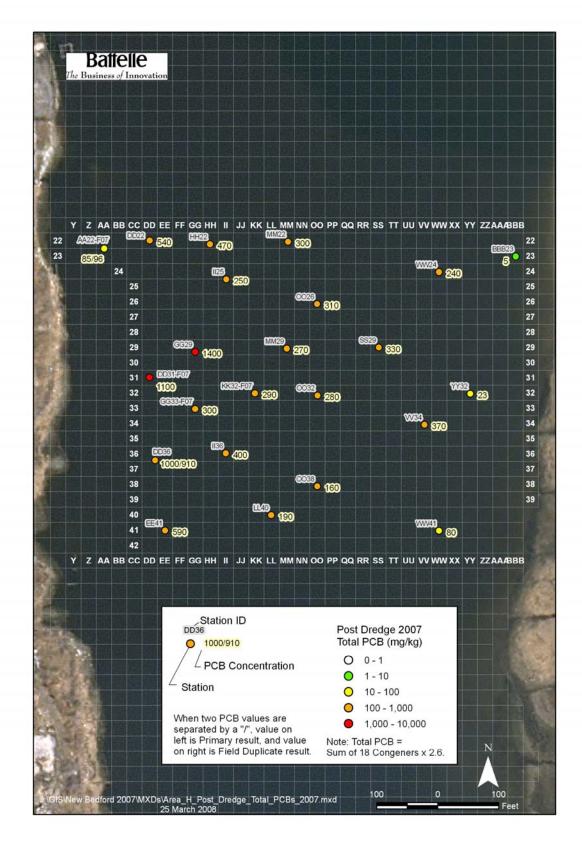


Figure 14. Total PCB in Post-dredge Sediment Samples at Area H, November and December 2007.





3.2.1.2 Harbor-wide Sediments

Total PCB concentrations measured in sediments at the OU3 Pilot Cap site and the proposed Boat House area of the Harbor in November 2007 are summarized in Table 6 and shown in Figure 15 (OU3 Pilot Cap) and Figure 16 (Boat House). Total PCB concentrations measured in surficial sediment (0-0.3 ft) samples at the OU3 Pilot Cap were fairly uniform across the spatial extent of the cap area, ranging from 0.24 mg/kg to 4.0 mg/kg (Table 6). Total PCB concentrations in surface (0-1 ft) sediments collected offshore from the proposed Boat House area ranged from 1.5 mg/kg to 250 mg/kg, and generally decreased with depth (Table 6, Figure 16). All but two of the deeper (>2-ft below surface) Boat House sediments had total PCB concentrations well below 1 mg/kg.

Table 6. Total PCB in OU3 Pilot Cap and Boat House Sediments, November and December 2007.

	OU3 Pilot Cap			Boat House	
	Depth Interval	Total PCB a		Depth	Total PCB a
Station ID	(ft)	(mg/kg dry)	Station ID	Interval (ft)	(mg/kg dry)
OU1	0.0-0.3	0.4		0.0-1.0	21
OU2	0.0-0.3	0.68	BH1	1.0-2.0	7.8
OU3	0.0-0.3	0.56		2.0-2.5	0.016
OU4	0.0-0.3	2.2		0.0-1.0	100
OU5	0.0-0.3	0.77	BH2	1.0-2.0	220
OU6	0.0-0.3	1.3		2.0-3.0	16
OU7	0.0-0.3	1.7		0.0-1.0	25
OU8	0.0-0.3	1.1	ВН3	1.0-2.0	0.058
OU9	0.0-0.3	1.8		2.0-3.0	0.021
OU10	0.0-0.3	3.1		0.0-1.0-REP	38
OU11	0.0-0.3	0.31	BH3 (dup)	1.0-2.0-REP	0.2
OU12	0.0-0.3	2.8		2.0-3.0-REP	0.018
OU13	0.0-0.3	2.3		0.0-1.0	32
OU13 (dup)	0.0-0.3	1.3	BH4	1.0-2.0	6.4
OU14	0.0-0.3	1.8		2.0-3.0	4.2
OU15	0.0-0.3	3.1		0.0-1.0	29
OU16	0.0-0.3	4.0	BH5	1.0-2.0	0.38
OU17	0.0-0.3	0.24		2.0-3.0	0.04
^a Sum of 18 congene	ers x 2.6			0.0-1.0	250





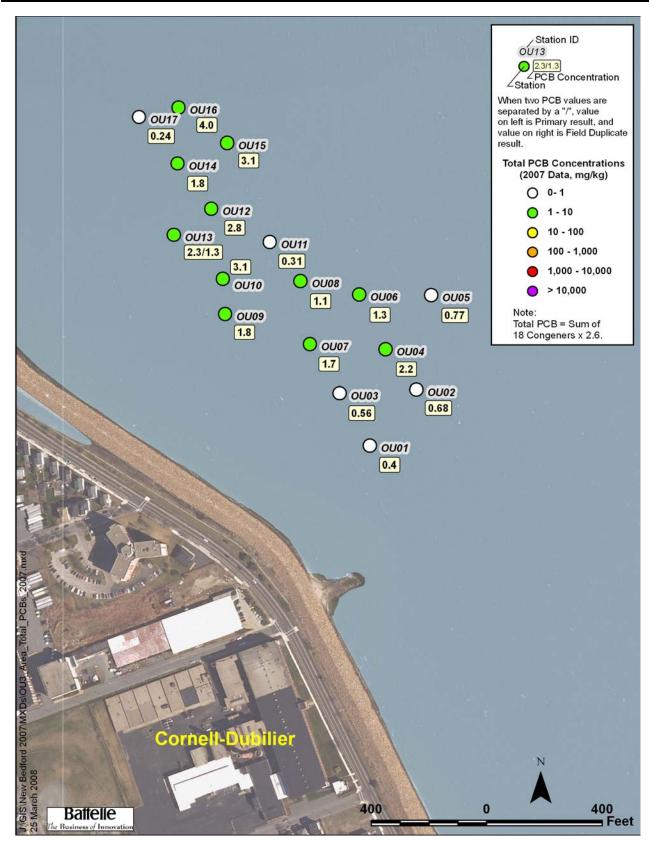


Figure 15. Total PCB in Surface Sediment at the OU3 Pilot Cap Site, November and December 2007.







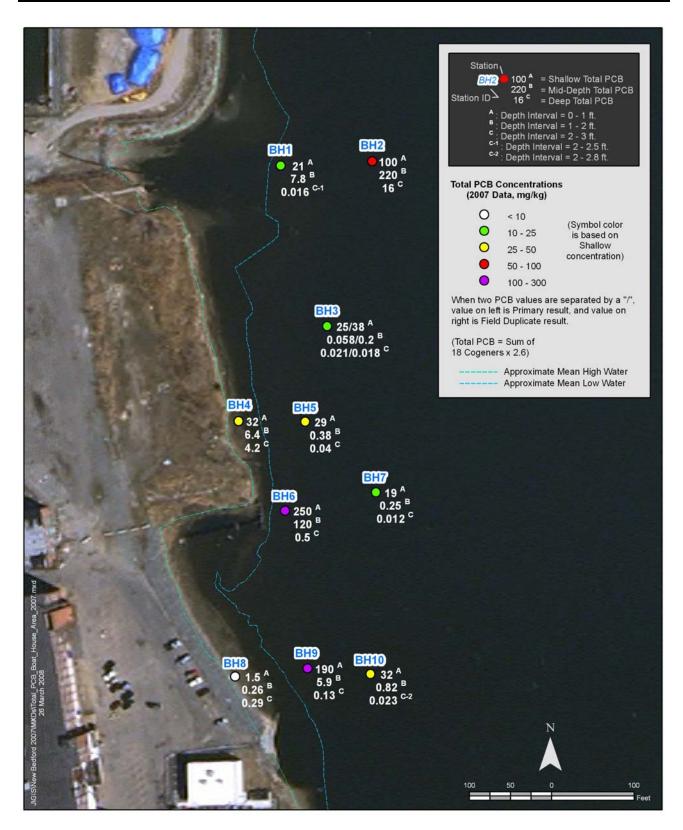


Figure 16. Total PCB in Sediment at the Boat House, November and December 2007.





3.2.1.3 Quality Control Results

Results from the field- and laboratory-based QC samples, described below, indicate that data quality is acceptable and the sample data are useable.

Field-based QC — Results from the field replicates for the post-dredge core, OU3 grab, and Boat House core samples were comparable. The relative percent differences (RPDs) between total PCB concentrations ranged from 0% to 12% for the post-dredge field replicates (Table 7), indicating representative samples were collected from a given location.

Total PCB concentrations between the field replicates collected at the OU3 Pilot Cap area were more variable (Table 7), which is probably associated with the overall lower concentration levels (<3 mg/kg).

Results from the replicate core sample collected at Boat House station BH3 were generally comparable. The RPDs between total PCB concentrations for the original and field replicate samples was 41% for the surface 0-1 ft sample, 110% for the 1-2 ft sample, and 15% for the bottom 2-3 ft sample (Table 7). The higher variability between total PCB concentrations for the 1-2 ft sample could be attributed to localized heterogeneity of the sediment material.

Total PCB a (mg/kg dry) Sample Type and Sample Depth Field **Station ID** Interval (ft) **RPD** Area **Original Duplicate** Post-dredge, Area G 0.0 - 0.7J10 160 160 0.0% 910 Post-dredge, Area H 0.0 - 1.0DD36 1000 9.4% 1.0-2.0 96 AA22-F07 85 12% OU3 Pilot Cap OU13 0.0 - 0.32.3 1.3 56% **Boat House** 0.0 - 1.025 38 41% BH3 1.0-2.0 0.058 0.2 110% 2.0-3.0 0.021 0.018 15%

Table 7. Field Replicate PCB Results.

Laboratory-based QC — Results from the routine QC samples analyzed with each batch of project samples indicated that the laboratory methods were in control. The procedural blanks were free of contamination. PCB congeners were recovered within the control limits (40% to 120%) in the LCS samples. While some of the target PCB congeners were not recovered well in the MS/MSD samples, the recovery data met the contingency criteria. That is, PCB congener concentrations in the MS/MSD were less than five times background due to the naturally elevated PCB levels in the native samples, and, as a result, the QC recovery criteria was not applicable. Surrogate compounds were generally recovered within the control limits (40% to 120%), although for some samples the surrogates were slightly over-recovered probably due to interference from the highly-contaminated native samples. In general, the impact of these minor QC exceedences on the overall data quality is minimal.

^a Sum of 18 congeners x 2.6







3.2.2 Polychlorinated Biphenyls – Homologues

Approximately 10% of the sediment samples analyzed for PCB congeners were also analyzed for PCB homologues. A comparison of the total PCB concentrations, calculated using both the congener and homologue data, is summarized in Table 8. PCB results for the North of Wood Street samples, which are evaluated in Battelle (2008), are also reported in Table 8. In general, total PCB concentrations calculated by the two methods are comparable. Samples with low concentrations of total PCB showed greater variability between the two measurements, whereas samples with higher concentrations (>5 mg/kg) agreed well. Neither the congener or homologue method consistently resulted in higher total PCB values, although the homologue method did frequently result in higher PCB concentrations for the more contaminated samples (>100 mg/kg) (Table 8).

Table 8. Total PCB Concentrations Calculated by Congener and Homologue Methods.

		Total PCB (1	mg/kg dry)	
Sampling Area	Depth Interval (ft)	Sum 18 Congeners ^a	Sum Homologue ^b	RPD
	0.0-1.0	1.5	2.2	38%
Boat House	1.0-2.0	0.26	0.28	7.4%
	2.0-3.0	0.29	0.071	121%
Post Dredging	0.0-0.5	100	110	9.5%
(Area G)	0.0-0.6	300	320	6.5%
Post Dredging	0.0-0.9	270	290	7.1%
(Area H)	0.0-1.4	590	620	5.0%
OU3	0.0-0.3	1.8	1.1	48%
003	0.0-0.3	4	2.6	42%
North of Wood	0.0-0.5	7.4	6.9	7.0%
North of Wood Street	0.0-0.5	29	30	3.4%
Succi	0.0-0.5	270	160	51%

^a Sum of 18 congeners x 2.6, non-detect = 0 mg/kg.

3.2.3 Volatile Organic Compounds

Complete test results for the single post-dredge core sample and field duplicate collected at station AA22 (Area H) are provided in Appendix C. Target VOCs were undetected in the post-dredge core sample, except for carbon disulfide and 2-butanone which were detected at low concentrations (<0.1 mg/kg dry).

Results from the field- and laboratory-based QC samples indicate that the sample data may be biased low.

Field-based QC — The precision between detected concentrations of VOCs in the field replicates was variable (40% and 55% RPD, see Appendix C). However, VOC concentrations were low in the field replicates which can contribute to the higher variability. Two common laboratory contaminants, acetone and methylene chloride, were detected in the trip blank. This resulted in positively-detected acetone results being "U" (non-detect) qualified in the two field samples. Methylene chloride was not detected in either sample.

^b Sum of 10 homologue groups, non-detect = 0 mg/kg





Laboratory-based QC — Sample data may be biased low for some compounds and high for others based on the surrogate, LCS/LCSD, or MS/MSD results, as summarized below (see Appendix C for complete details). Sample data that are biased low or high are qualified ("J' or "R") on the final data reports. Among the main contaminants of concern (i.e., trichloroethene, cis-1,2-dichloroethene, and vinyl chloride) there were no QC exceedances for cis-1,2-dichloroethene or vinyl chloride, whereas trichloroethene was under-recovered (53% and 58%) in the MS/MSD.

- Sample data for many of the target VOC compounds may be biased low because the compounds were under-recovered (<70%) in the MS/MSD samples. VOCs were generally recovered well in the LCS/LCSD, suggesting that the lower recoveries in the MS/MSD could be matrix related or associated with the low solids content (38.2%) of the native sample. While VOCs are not typically detected in marine sediment, the low bias evident by the MS/MSD results may have contributed to a higher frequency of non-detects in the two project samples.
 - o For VOCs recovered between 10% and 70% in the MS or MSD sample, results in the native sample were qualified with a "J", indicating results were estimated.
 - o For VOCs recovered below 10% (cis-1, 3-dichloropropene, hexachlorobutadiene, trans-1, 3-dichloropropene, vinyl acetate, and 1, 2, 3-trichlorobenznee), results in the native sample were rejected (qualified with an "R").
- Sample data for 1, 2-dichloroethane may be biased high based the elevated recovery of the surrogate compound 1, 2-dichloroethane-d4 (136% vs. upper QC limit of the 130%) in one sample. The impact to data quality, however, is minimal because this compound was undetected in the project samples.
- Sample data for 1,1-dichloroethene may be biased high because it was over-recovered (137%) in the LCSD. The impact to data quality, however, is minimal because this compound was undetected in the project samples. Moreover, this compound was recovered within the acceptance limits in the MS/MSD samples.
- Sample data for 2-butanone may be biased high because this compound was over-recovered (131%) in the LCSD sample. The impact to data quality, however, appears to be minimal because this compound was recovered within the acceptance limits in the MS/MSD samples.

3.2.4 Grain Size and Total Organic Carbon

Grain size and TOC results for the post-dredge sediment samples collected at Areas G and H are summarized in Table 9.

3.2.4.1 Sediment Grain Size

Grain size results were consistent with the sediment type observed during field collections, in that most surface samples were comprised of silty sediments (the majority of the samples had >80% fines). Silt was the predominant grain size fraction in all but four of the post-dredge sediment samples (sand was the predominant grain size fraction at stations K2, BBB23, WW41, and YY32; see Table 9). Grain size composition in surface sediments at Area G was dominated by silt, followed by roughly similar percentages of clay and sand for most samples. Grain size composition in surface sediments at Area H was dominated by silt, followed by clay and sand. All surface sediments had very low percentages of gravel (<7%).





3.2.4.2 Total Organic Carbon

TOC values ranged from 0.57% at station BBB23 to 14.89% at station AA22 (Table 9), and were frequently above 6% in most surface sediments.

Table 9. Post-dredge Sediment Grain Size and TOC Results, November and December 2007.

Dredge		Depth	Sedi	ment Gra	in Size Fra	action (% d	ry)	TOC
Area	Station ID	Interval (ft)	Gravel	Sand	Clay	Silt	Fines ^a	(% dry)
	I1	0.0-0.5	0.00	12.23	29.35	58.42	87.77	9.49
	I4	0.0-0.7	0.00	21.12	30.66	48.22	78.88	7.55
	J10	0.0-0.7	0.00	22.56	22.31	55.13	77.44	8.65
	J10 (dup)	0.0-0.7-REP	1.66	11.16	26.04	61.14	87.18	11.02
	J14	0.0-0.6	0.00	12.95	24.94	62.11	87.05	7.99
	K2	0.0-0.8	0.00	42.39	21.75	35.86	57.61	5.20
Area G	K5	0.0-0.6	0.63	27.51	23.93	47.93	71.86	8.21
	K21	0.0-1.2	0.00	26.65	25.82	47.53	73.35	3.90
	M17	0.0-0.6	0.00	16.1	26.28	57.62	83.9	7.74
	N4	0.0-0.6	0.00	20.98	20.63	58.39	79.02	6.71
	N14	0.0-0.5	0.00	21.88	24.29	53.83	78.12	8.28
	O1	0.0-0.6	0.00	33.25	26.51	40.24	66.75	10.02
	Q 9	0.0-0.5	0.00	12.43	30.05	57.52	87.57	7.61
	BBB23	0.0-0.9	6.87	86.07	2.89	4.17	7.06	0.57
	DD22	0.0-1.1	0.00	7.87	32.77	59.36	92.13	8.70
	DD31	0.0-1.0	2.35	4.95	35.86	56.84	92.7	11.36
	DD36	0.0-1.0	0.00	4.82	36.04	59.14	95.18	12.50
	DD36 (dup)	0.0-1.1-REP	0.63	3.65	34.05	61.67	95.72	11.60
	EE41	0.0-1.4	0.00	5.53	40.24	54.23	94.47	11.47
	GG29	0.0-0.6	0.00	16.93	34.42	48.65	83.07	10.64
	GG33	0.0-0.6	0.21	13.04	37.29	49.46	86.75	5.45
	HH22	0.0-1.0	0.09	3.66	36.64	59.61	96.25	6.81
	II25	0.0-0.4	2.78	14.16	35.84	47.22	83.06	5.44
	II36	0.0-0.6	0.00	7.01	34.73	58.26	92.99	6.95
	KK32	0.0-0.9	0.00	4.96	36.32	58.72	95.04	6.07
Area H	LL40	0.0-0.3	1.45	15.07	27.07	56.41	83.48	4.53
	MM22	0.0-0.5	0.00	3.75	37.00	59.25	96.25	6.19
	MM29	0.0-0.9	1.23	7.88	35.46	55.43	90.89	6.08
	OO26	0.0-0.7	2.20	15.59	35.79	46.42	82.21	6.04
	OO32	0.0-0.8	5.13	11.56	31.58	51.73	83.31	5.47
	OO38	0.0-0.5	0.00	12.84	39.52	47.64	87.16	4.50
	SS29	0.0-0.7	1.37	18.46	33.42	46.75	80.17	5.40
	VV34	0.0-1.0	0.00	16.95	37.06	45.99	83.05	6.38
	WW24	0.0-0.8	0.10	30.2	31.25	38.45	69.7	4.97
	WW41	0.0-0.6	3.37	63.14	12.82	20.67	33.49	2.64
	YY32	0.0-0.2	2.74	66.82	14.46	15.98	30.44	1.56
	AA22	1.0-2.0	0.00	13.16	26.77	60.07	86.84	14.89
	AA22 (dup)	1.0-2.0-REP	0.00	14.2	25.40	60.40	85.8	14.64

^a Fines = sum of silt and clay fractions.





3.2.4.3 Quality Control Results

Results from the field- and laboratory-based QC samples, described below, indicate that data quality is acceptable and the sample data are useable. Sediment grain size and TOC analyses were not planned for the 2007 dredge season, and, as a result, acceptance criteria for field- and laboratorybased QC samples are not defined in the project QAPP (Battelle, 2006a). Acceptance criteria of #50% RPD and #25% RPD were used to evaluate field- and laboratory-replicate QC results, respectively. The field-replicate precision criterion (#50% RPD) is based on criteria defined in the OAPP Addendum (Battelle, 2008) for other parameters (e.g., PCBs, TSS). The laboratory-replicate precision criterion (#25% RPD) is based on criteria defined by the laboratory.

Field-based QC —Results from the field replicate samples collected at stations J10, DD36, and AA22 were generally comparable. For sediment grain size, field replicate measurements agreed well for clay and silt fractions (RPDs < 15%) and were more variable for sand (RPDs ranged from 8% to 68%) and gravel (RPDs>200%) fractions (Table 10). The poor precision between replicate gravel measurements is attributed to the very low percentages measured in the sediment samples. For TOC, field duplicates agreed well with RPDs ranging from 2% to 24% (Table 10). Overall, the field replicate results suggested that representative samples were collected from a given location.

Value (% dry) Sample Type and Sample Depth Field **Station ID** Interval (ft) **Parameter RPD** Area **Original Duplicate** Gravel 0.00 1.66 200% Sand 22.56 11.16 68% Post-dredge, Area G J10 0.0 - 0.7Clay 22.31 26.04 15% Silt 61.14 55.13 10% TOC 11.02 8.65 24% Gravel 0.00 0.63 200% 4.82 3.65 Sand 28% 36.04 34.05 DD36 0.0 - 1.0Clay 5.7% Silt 59.14 61.67 4.2% TOC 12.50 11.60 7.5% Post-dredge, Area H Gravel 0.00 0.00 N/A Sand 13.16 14.2 7.6% Clay AA22 1.0 - 2.026.77 25.40 5.3% Silt 60.07 60.40 0.5% 14.64 14.89

Table 10. Field Replicate Grain Size and TOC Results.

Laboratory-based QC — Three laboratory duplicates were analyzed as laboratory QC samples. RPDs between the parent and laboratory duplicate samples were all less than 10% for the grain size and TOC analyses, indicating the precision of the analyses was in control.

TOC

1.7%





4.0 DISCUSSION

4.1 Vertical Elevation Results Related to Dredging

The collection of pre-dredge core samples for visual characterization provided information necessary for effective dredge planning. Site-wide geostatistical modeling based on historical PCB data has been used to develop an estimation of the vertical elevation of PCB contamination in the sediments (target dredge elevation). The dredge plan for each year is based on the target dredge elevations and contours within the planned footprint of dredging. Changes in sediment condition over time or uncertainties in the model can result in a discrepancy between the target dredge elevation estimates and the existing features at the site. Elevation data based on visual characterization of cores collected in June 2007 were used to refine the dredge plan in terms of target dredge depths and thickness of the OL layer. These data were used to refine the dredge plan and as a result target dredge depths were reduced, thereby reducing dredging and disposal efforts. However, these adjustments were strictly based on the visual characterization of sediments and the transition from black silt (OL layer) to native clays (OH layer). As the remediation project continues, the relationship of this visual characterization to actual PCB concentrations will need to be continually reevaluated. At this point in the program, this method appears to be a relatively inexpensive and simple means to determine dredge depths thus maximizing funding towards remedial efforts.

During the course of dredging operators use benchmarked dGPS information for horizontal and vertical control. This allowed for accurate dredging operations and minimized both ineffective under-dredging and expensive over-dredging. However, variables such as wind and debris can result in incomplete dredging along dredge lines. The use of weekly bathymetric surveys and sediment core collections served as good checks for dredge performance and provided feedback to operators regarding areas that may require an additional dredge pass.

The collection of post-dredge cores provided a characterization of the post-dredge sediment condition relative to the pre-dredge condition as well as setting a baseline for recently dredged areas. This baseline informs the planning process for subsequent years and provides feedback regarding redeposition of sediments as a result of dredging or natural processes. Comparison of the visual characterization of the pre and post-dredge cores revealed that the depth of the sediment surface and the overall thickness of OL layers were reduced across all dredged regions. These were clear and expected results of the dredging. Other post-dredge observations related to the visual transition between sediment types were also apparent. For example, in many cases the post-dredge cores had less distinct visual transitions. In these cases the transitions occurred over a relatively broad band (>0.5-ft) of mixed sediment. In most of these cases it appeared that the visual transition zone may have been disturbed during dredge related activities. In most cases (50 out of 56), the elevation of the post-dredge visual transition also occurred at a deeper elevation than predicted. Overall it appears that dredging activity resulted in an increase in the target dredge elevation (mean = -0.73-ft, median = -0.70-ft).

For the 2007 program very few of the pre-dredge sampling stations were visited for post–dredge confirmation. Instead, post-dredge sampling locations were chosen based on areas of specific concern to determine final dredge performance. As a result the pre-post comparison made in previous seasons is inappropriate for these data. Nor can a pre-post comparison of PCB data be performed because the pre-dredge cores from 2007 were not analyzed for PCBs.





4.2 Relationship Between Sediment Properties and Total PCB in Post-Dredge Samples

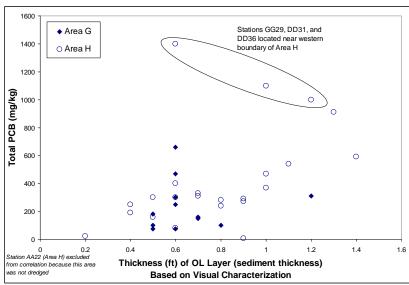


Figure 17. Correlation between Sediment Thickness and Total PCB in Post-dredge Surface Sediments, November 2007.

dredge surface sediments did not correlate with the thickness of the OL layer (amount of contaminated sediment remaining above the visual transition layer), especially at Area G (Figure 17). At Area H, the correlation is significant $(p < 0.001, r^2 = 0.5)$ only if the highly-contaminated (total PCB >1000 mg/kg) samples near the western boundary of the dredge area are excluded from the correlation. The thickness of the remaining OL layer at these western boundary locations was variable (Figure 17). Small amounts of dredge residuals and/or small-scale heterogeneity may have contributed to the elevated PCB signal at these locations.

Total PCB concentrations in post-

Generally, increasing levels of organic carbon in marine sediments correlate with increasing amounts of fine-grained sediment fractions (i.e., silt and clay). Percent fines and TOC, however, were not strongly correlated in post-dredge surface sediments sampled at Area G (Figure 18). The poor correlation may be attributed to potential sediment mixing during dredging or an artifact of the narrow range in sediment types sampled (see Table 9, percent fines ranged from 58% to 88%). At Area H, where there was a wider range of sediment types (sandy to silty sediments with wide range of TOC values), the correlation between percent fines and TOC was significant $(p = 0.001, r^2 = 0.38; Figure 18),$ albeit the r² value was not particularly strong.

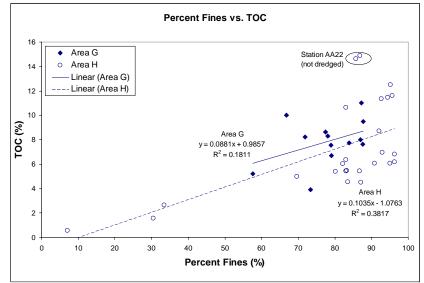


Figure 18. Correlation between Percent Fines and TOC in Postdredge Surface Sediments, November 2007.





Total PCB concentrations did not correlate well with percent fines or TOC in post-dredge surface sediments sampled at Area G (Figure 19). The poor correlation may be associated with sediment condition (e.g., mixed, disturbed sediments) and/or the narrow range of sediment types sampled. Dredging and debris removal activities could potentially cause localized resuspension and redeposition of heterogeneous sediments with varying contamination history, resulting in sediment mixing in both horizontal and vertical directions. For instance, the fine-grained, less contaminated, deep sediments could have become resuspended to varying degrees, mixing with the more contaminated surface sediments with higher TOC.

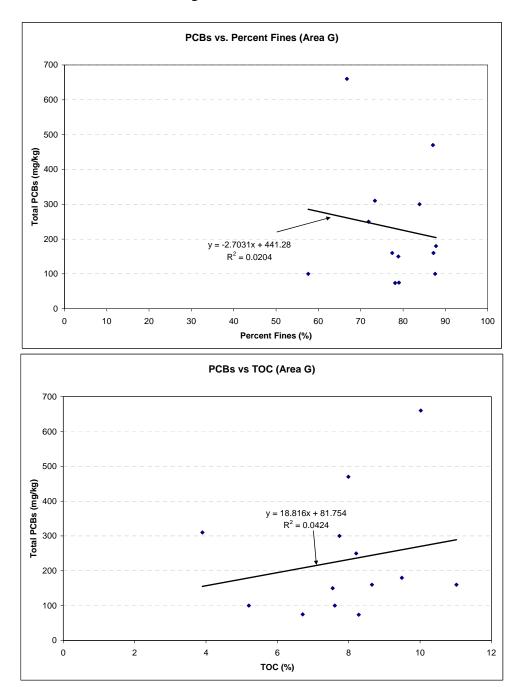


Figure 19. Correlation between Percent Fines and Total PCB (top) and TOC and Total PCB (bottom) in Post-dredge Surface Sediments at Area G, November and December 2007.





As was observed at Area G, total PCB concentrations in post-dredge surface sediments sampled at Area H did not correlate well with percent fines (Figure 20). The correlation against TOC, however, was significant (p = 0.006, $r^2 = 0.8$; Figure 20) which is not surprising because it is the organic content of the sediments that often influences chemical concentrations in the sediments (Hunt, 1979, Dayal et al., 1981; 1983, Krom et al., 1985, USACE, 1996). These results suggest that the surface sediments at Area H may be more homogenous compared to Area G, and that the contamination is influenced by the organic carbon content rather than sediment grain size.

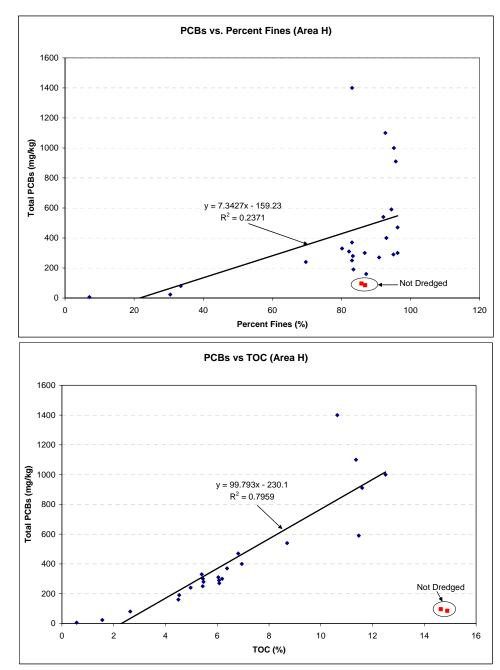


Figure 20. Correlation between Percent Fines and Total PCB (top) and TOC and Total PCB (bottom) in Post-dredge Surface Sediments at Area H, November and December 2007. (Sediments sampled at Station AA22, which was not dredged, were excluded from the correlation)





4.3 Temporal Trends in Total PCB at the OU3 Pilot Cap Site

The OU3 Pilot Cap site is a localized area of elevated PCB concentrations located outside the hurricane barrier in New Bedford, MA (Figure 2). In 2005 this area was capped with parent material dredged during the construction of a CAD cell in New Bedford Harbor. Annual monitoring has been performed since 2005 (shortly after completion of the capping activity) to determine the effectiveness of cap placement in lowering surficial sediment PCB concentrations, as well as the extent of change in PCB concentrations over time.

Temporal trends in total PCB concentrations in surficial sediments from 2005 to 2007 are shown in Figure 21. In general, total PCB concentrations are higher in surface sediments sampled at the valley locations compared to ridge locations (Figure 21). This is consistent with the visual characterization data, which indicated that the valley locations tended to have somewhat higher silt content than the ridge locations (Section 3.1.5). Total PCB concentrations in surface sediments sampled at ridge locations in 2007 are among the lowest measured since 2005 (Figure 21). Total PCB concentrations in surface sediments sampled at valley locations are frequently lower in 2006 and 2007 compared to 2005 (Figure 21). Overall, there have been no substantive changes in annual total PCB concentrations in surface sediment at the OU3 Pilot Cap site since 2005, although concentrations appear to increase over time at ridge station OU4 and decrease over time at valley stations OU7, OU12, OU13, and OU14 (Figure 21). The range of total PCB concentrations has narrowed in 2007 compared to 2005-2006 (0.36 mg/kg to 9.7 mg/kg in 2005; 0.41 mg/kg to 17 mg/kg in 2006; and 0.24 mg/kg to 4 mg/kg in 2007), which may suggest a possible "smoothing out" as a result of horizontal and vertical mixing of sediment material by local current and wave action. Overall, the OU3 PCB data suggest that the cap placement is still effective in this area.

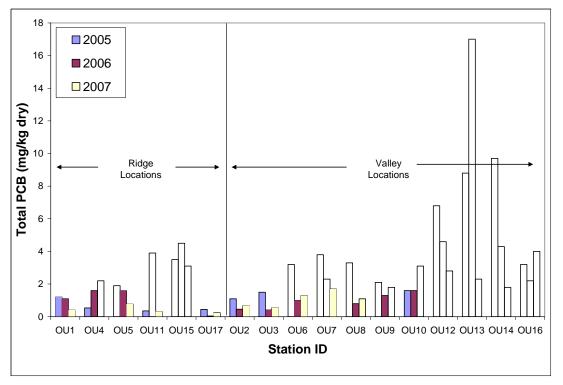


Figure 21. Total PCB in Surface Sediments Sampled at the OU3 Pilot Cap, 2005–2007.





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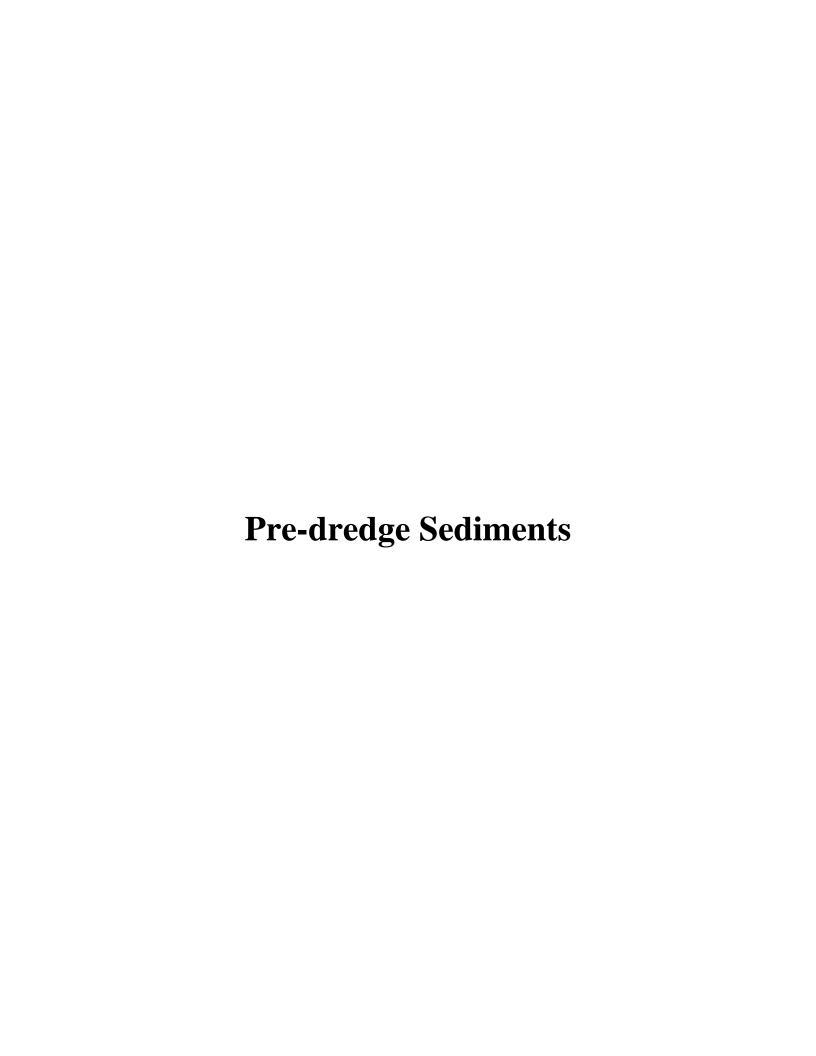




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Appendix A Field Sampling Logs







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Battelle	Project Name: Location: Client:	New E	ford Harbor Bedford, MA USACE NAE		ental Monito		Project #: Vessel: ef Scientist:		1/1/1/
tation ID:	620		Time On St	ation:	1508		All measure	ments are ±0.1 feet	Ţ,
ore Sample ID:	-167A-0620	-08-39	 Northing (N	AD 83):	24072	14.SV	_Water Depth	(A):	300
ogged by:	AWNW	***************************************	Easting (NA	AD 83):	81561	34.83	Length of pu	sh core assembly (B):	208
ollection Mechanism:	Push-Core		GPS Accura	acy:	3.41	5	_Water surfac	e to top of handle (C):	M 2
ate:	616/07		Predicted T	ide (ft):	Coule -	A Charles	Length of co	re (from bottom) (D):	3,2,
			Time of Col	lection:	151	1529	Surveyed ele	vation (NVGD 29) (E):	+
			Time Depar	t Station:	<u> 15.51</u>		Water surfac	e from surveyed elevation (F)	: <u>*</u>
O)	O (NIVOD)		Calculation	s for Deter	rmination o	f Z* Elevati	ion 🕜	400	
G) Elevation of Wate								<u> </u>	
H) Elevation of the b	ottom of the core (NVGD): 0	G - (B - C)					- /	
z*) Elevation of visua	I transition (NVGE)): H + (dis	tance to visua	al transition)		<u> </u>	<u> </u>	
 Elevation of the s 	ediment-water inte	rface as m	neasured from	n bottom of	core (NVG)): H + D		5	
I_2) Elevation of the s	ediment-water inte	rface as m	neasured from	n water dep	oth (NVGD):	G - A	2.		
(Note if I ≠ I ₂ within	± 1.0 feet, discard	l and resar	mple)						
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Composite	
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	Battelle	Location: Client:		Bedford, MA JSACE NAE			Chi	Vesset: ef Scientist:		
Stati	on ID:	Cle		Time On St		1/05	<i></i>	All measurer	ments are ±0.1 feet	
Core	Sample ID:	5-07A-	OC16-1	Northing (N	AD 83):	27073	87.11	Water Depth	(A):	02.12
Logg	ed by:	TH 150	LE	_ Easting (NA	AD 83):	8/558	5.3 C	Length of pus	h core assembly (B):	071
Colle	ction Mechanism:	Push-Core		GPS Accur	асу:	4.06	<u> </u>	_Water surface	e to top of handle (C):	04-75
Date	:	4/3/07		_ Predicted T	de (ft).	9 + 64		Length of core	e (from bottom) (D):	2
				Time of Col	lection:	OUI	11:40	_Surveyed elev	vation (NVGD 29) (E):	
				Time Depar	rt Station:		1133	_Water surface	e from surveyed elevation	n (F):
				Calculation	s for Deter	rmination of	Z* Elevat	ion		
(G)	Elevation of Wa	ter Surface (NVGD)): <i>E-F</i>					1.4		
(H)	Elevation of the	bottom of the core	(NVGD): G	a - (B - C)				-3,5		
(z*)	Elevation of visu	ual transition (NVGE	D): H + (dist	tance to visu	al transition)		-2.4		
(I)	Elevation of the	sediment-water inte	erface as m	easured from	n bottom of	core (NVGD)): H + D	-1.1		
(12)	Elevation of the	sediment-water inte	erface as m	easured fron	n water dep	oth (NVGD):	G - A	- 0.7	5	
	(Note if I ≠ i₂ withi	in ± 1.0 feet, discard	d and resan	nple)				and the same of th	yo.	
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Battelle The Business of Inne		oject Name Location: Client:	New E	iora Harbor Bedford, MA JSACE NAE		entai Monito	_	Project #: Vessel: ef Scientist:	G000422	
Station ID:		LI3		Time On St	ation:	11:4	5		ments are ±0.1 feet	
Core Sample ID:	9 4	Z7A - ØI	13-60	– #Northing (N		2707	465.4	Water Depth		2.8
Logged by:	- Im	F /TH		Easting (NA		31581	2.6	-	sh core assembly (B):	7
Collection Mechan	sm:	Push-Core		GPS Accura	acy:	2.8	la		e to top of handle (C):	2
Date:		6-7-6	7	 Predicted T		4		-	e (from bottom) (D):	<i>A</i> .
	***************************************	7		Time of Col	lection:	Fire 4445	1148	-	vation (NVGD 29) (E):	· profession
				Time Depa:	t Station:		1150	Water surfac	e from surveyed elevation (F)	9
				Caiculation	s for Dete	rmination o	[†] Z* Elevati	on # 0		
		face (NVGD)						7/	} /	
(H) Elevation of	f the bottom	of the core (NVGD): G	i - (B · C)				- 3/8	<u> </u>	
(z*) Elevation of	f visual tran	sition (NVGD): H + (dist	ance to visua	ai transition	1)		2,9		
(I) Elevation of	f the sedime	ent-water inte	rface as m	easured fron	r bottom of	core (NVGE): H + D	- 1.5		
(I ₂) Elevation of	f the sedime	ent-water inte	rface as m	easured fron	n water dep	oth (NVGD).	G - A	-019	, /	
(Note if I ≠ I _s	within ± 1.0	feet, discard	and resam	nple)					er e	
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Elevation (NVGD)		Lithology - Include USCS code				particle				
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Station ID:			Time On Sta	ation:	1210)	All measurem	ents are ±0.1 feet	
Core Sample ID:	S-07A-000	9-00-21	- Northing (N	AD 83):	27075	12.3	Water Depth (A):	5.3
Logged by:	JE MUD		Easting (NA	.D 83):	81558	9.8	Length of push	core assembly (B):	1/
Collection Mechanism:	Push-Core	······································	GPS Accura		2.2	7		to top of handle (C):	3.3
Date:	10/7/07	<u> </u>	Predicted Ti	-	2,4		****	(from bottom) (D):	2.1
			Time of Coll	, ,	1214	·	_	ation (NVGD 29) (E):	- Andrewson and
			Time Depar		12			from surveyed elevation (FI. 23
					rmination of	£		TOTAL SCIEVE CIEVARION (1- <u></u>
G) Elevation of W	arer Surface (NVGD)		Carcuration	3 ici Detei	mmation of	L Lievat	2,3		***************************************
(H) Elevation of the	e bottom of the core (NVGD): G	- (B - C)				-5.4		
z*) Elevation of vis	ual transition (NVGD)): H + (dista	ance to visua	ai transition)		-4.3		
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	sediment-water inte				`	•	0.3		
(I_2) Elevation of the	e sedimenţ-water inte	mace as me	easured from	ı water dep	ım (NVGD):	G - A	- 3.0		
(Note if I ≠ I ₂ with	nin ± 1.0 feet, discard	l and resam	ple)						
Elevation (NVGD)	Lithology - Include USCS code			ancy	Maximum particle size		SQI	A A A STATE OF THE	
Elevatíc (i.e. Bot	Litholog USCS c	Туре	Color	Consistency	Maximu síze	Odor	Sample IDs	Commen	ts
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Batte The Business of		Locat		edford Harbor v Bedford, MA USACE NAE	ŀ	ntal Monito	Ū	Project #: Vessel: ief Scientist:	G006422	
Station ID:		V q		Time On S		17.24	011		nents are ±0.1 feet	
Core Sample I	ıD.	Carron -	ØK 109 - 100			2707	8 82.8	Water Depth		2-
Logged by:	J.	200 F 10		Easting (N		81579	<u> </u>		n core assembly (B):	1 / ^
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Date.				Time of Co		12:3	5	-	vation (NVGD 29) (E):	— <u>—</u> ~~
				Time Depa			<u>ン</u> ろネ	_	e from surveyed elevation (F):) <
									s from surveyed elevation (7.).	× · · ·
(G) Flouation	on of Wo	ter Surface (NV	** CD\\	Calculation	ns for Deter	mination of	Z* Elevat	ion 2.5		
								1.9	. 4. 4. 3	
(H) Elevation	on of the	bottom of the co	ore (NVGD):	G - (B - C)						
(z*) Elevation	on of visu	al transition (N	VGD): H + (d	listance to visu	al transition))		<u> </u>	***************************************	
(I) Elevation	on of the	sediment-water	interface as	measured from	n bottom of	core (NVGD): H + D	-1.0		
(12) Elevation	on of the	sediment-water	interface as	measured from	m water dep	th (NVGD): (G - A	-0.		
(Note if I	≠ l₂ with	in ± 1 0 feet, dis	card and res	ample)				and the same of th		
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tion (Bottom	· ygy			stenc	un:		e D		
Elevation (NVGD)	(l.e. B	Lithology - Include USCS code	Type	Coior	Consistency	Maximum particle size	Odor	Sample IDs	Comments	
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Battelle Business of Innovation	Project Name: Location: Client:	New B	ord Harbor ledford, MA ISACE NAE		ental Monito		Project #: G66 Vessel: ief Scientist:	06422		
ation ID:	7234		Time On St		11:2		All measuremen	ts are +0.1 feet		
ore Sample ID:	07A-2234-00	1-1-16	Northing (N		27040			A	3, 4	
gged by:	74	140 71	7		8 (56 23 . 5 Length of push core assembly (B):					
ollection Mechanism:	Push-Core	17	GPS Accura	,	2.47			top of handle (C):	1.7	
ate:	6-8-07		Predicted T				Length of core (fro	-	1-6 5	
			Time of Col		11:38	3		on (NVGD 29) (<i>E</i>):	of second second second	
			Time Depar		11:4:		-	m surveyed elevation (F):	0,8	
			Calculation	ns for Dete	rmination of	' Z* Elevat	ion			
Elevation of War	ter Surface (NVGD):	E-F					<u>0.8</u>			
) Elevation of the	bottom of the core (I	NVGD): G	- (B - C)				-4.5			
*) Elevation of visu	al transition (NVGD)): <i>H</i> + (dista	ance to visu	al transition)		- 3,6			
Elevation of the	sediment-water inter	rface as me	easured fron	n bottom of	core (NVGD): H + D	-2.8			
	sediment-water inter						-2,6			
,	n ± 1.0 feet, discard			•	. ,					
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Elevation (NVGD)	Lithology - Include USCS code			>	Maximum particle size					
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Battelle The Business of Innovation	Project Name: A Location: Client:	lew Bedford Harbor New Bedford, MA USACE NAE		ental Monito	_	Project #: Vessel ef Scientist	
Station ID:	AAA 37	Time On St	ation:	12:0	Z	All measure	ements are ±0.1 feet
Core Sample ID: 5	-67A-AAA391		AD 83):	3964	Hampapara	Water Deptl	h (A): 3. 0
Logged by:	TH	Easting (NA	AD 83): TA	81564	orto	- _Length of pu	ush core assembly (B): $\overline{+}$
Collection Mechanism:	Push-Core	GPS Accur	acy:	2,2	9	_ Water surfa	ce to top of handle (C):
Date:	6/8/07	Predicted T	ide (ft):	**************************************		_ _Length of co	ore (from bottom) (D):
	***************************************	Time of Col	lection [.]	12:	<u> </u>	_Surveyed el	evation (NVGD 29) (E):
		Time Depar	rt Station:	12:	1.5	_Water surfa	ce from surveyed elevation (F):
		Calculation	s for Dete	rmination of	Z* Elevati	on }	1
(G) Elevation of Wat	er Surface (NVGD):	E - F					7
(H) Elevation of the I	bottom of the core (N	VGD): G - (B - C)					£
(z*) Elevation of visu	al transition (NVGD):	H + (distance to visu	al transition)		-2.1	<i>f</i>
(I) Elevation of the	sediment-water interfa	ace as measured fror	n bottom of	core (NVGD): H + D	-1,9	
		ace as measured fror				-1.7	
(Note if I ≠ I _n within	n ± 1.0 feet, discard a	and resample)					
(1000)							
(GD)	Inde			iole			
Elevation (NVGD)	Lithology - Include USCS code		ncy	Maximum particle Size		So	
/ation (N	slogy S co		Consistency	l m	_	Sample IDs	
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Battelle The Business of Innovation	Project Name: / Location: Client:	New Be	rd Harbor edford, MA SACE NAE	Environme	ental Monitor		Project #: Vessel: ef Scientist:	G606422
Station ID:	AAA18		Time On St	ation:	1220		All measure	ments are ±0.1 feet
	STA-AMAGNED-	13	Northing (Na	AD 83):	27047	37.92	Water Depth	(A):
Logged by:	MW/TH		Easting (NA		815639	1.62	Length of pus	sh core assembly (B):
Collection Mechanism:	Push-Core		GPS Accura		2.2		- Water surfac	e to top of handle (C):
Date:	6/8/2007		Predicted T		- Andrews		- Length of co	re (from bottom) (D):
			Time of Col	lection:	1225		Surveyed ele	vation (NVGD 29) (E):
			Time Depar		1227		_ _Water surfac	e from surveyed elevation (F):
			Calculation	s for Deter	rmination of	Z* Elevatio	on	
(G) Elevation of W	ater Surface (NVGD):	E-F						
(H) Elevation of the	e bottom of the core (N	IVGD): G	(B - C)				****	
(z*) Elevation of vis	sual transition (NVGD)	nce to visua	al transition)		Sany	3.7	
(I) Elevation of the	e sediment-water inter	face as me	asured from	n hottom of	core (NVGD	Y: H + D	~~	2.8
	e sediment-water inter						·**-	1.6
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(Note if I ≠ I ₂ with	hin ± 1.0 feet, discard	and resam	oie)					
(GD)	lude				ticle			
Elevation (NVGD)	Lithology - Include USCS code			ncy	Maximum particle size		SQ	
vation (N	S co		<u>_</u>	Consistency	mumi	_	Sample IDs	
<u> </u>	Litho	Туре	Color	Con	Maxi	Odor	Sam	Comments
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Battelle Project Name: New Location: The Business of Innovation Client:		New Bo	ord Harbor E edford, MA SACE NAE	v.ii Oillille	, ital MOIIIIOI		Project #: G606422 Vessel: ilef Scientist:				
	Gilent:		Time On Sta	tion:	1244	JK		ements are ±0.1 feet			
ation ID: ore Sample ID: S - Ø	1A-BULLE -	08-14	. Northing (NA			88,2	Water Depth (A):				
	7H		Easting (NAI		81603	8.8	Length of push core assembly (B):				
gged by: ollection Mechanism:	Push-Core		GPS Accura		2.95		- Water surfac	20 116			
ate:	61812007		Predicted Tic	· ·	- Andrews		- Length of co	re (from bottom) (D):	LY		
_	<u> </u>		Time of Colle		1250	300	Surveyed ele	evation (NVGD 29) (E):	- Market Control of the Control of t		
			Time Depart		1304		_ Water surfac	ce from surveyed elevation (F): <u>232.4</u>		
			Calculation	s for Dete	mination of	Z* Elevatio	on				
G) Elevation of Wate	er Surface (NVGD)	: <i>E-F</i>					2				
H) Elevation of the b	ottom of the core ((NVGD): G	- (B - C)				3	, 0	,		
:*) Elevation of visua	al transition (NVGD	0): H + (dista	ance to visua	al transition)		-2	.3			
	ediment-water inte): H + D		- Salaharan			
	ediment-water inte						b	<i>}</i> -			
				•	, ,						
(Note if I ≠ I₂ within	ı± 1.0 ieet, discard	and resam	ipie)								
(a)	eg e			-	e C						
Elevation (NVGD)	Lithology - Include USCS code			5	Maximum particle size		s				
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Battelle			ntal Monitor		Project #: G606422 Vessel: ef Scientist:				
Station ID:	ia ia		Time On Sta	ition:	1308		All measure	ments are ±0.1 feet	
Core Sample ID:	5-07A- VUIZ	-66-10	 Northing (NA		2707487.5 816044.1		Water Depth	(A):	3.6
logged by:	INW		Easting (NA				Length of push core assembly (B): 75		
Collection Mechanism:	Push-Core		-	GPS Accuracy: 3.09			 Water surface	e to top of handle (C):	2.7
Date:	618 2007		 Predicted Ti	de (ft):			_Length of cor	e (from bottom) (D):	1:0
			Time of Coll	ection:	1313		_Surveyed ele	vation (NVGD 29) (E):	
			Time Depart Station:			1515		e from surveyed elevation	(F): 2.5
			Calculation	s for Deter	rmination of	Z* Elevati	ion		
(G) Elevation of Wa	ater Surface (NVGD)): <i>E-F</i>						5	
(H) Elevation of the	bottom of the core	(NVGD): G	i - (B - C)				-2	<u>.3</u>	
(z*) Elevation of vis	ual transition (NVGI	D): H + (disi	tance to visua	al transition)			1,2	
	sediment-water into): H + D	1974-	.3	
	sediment-water into								
	nin ± 1.0 feet, discar			,				and the second s	
(Note ii i + i ₂ witi	iii ± 1.0 leet, discan	a and resur	npic)						
(GD)	apr				cle				
NV()	- Inch			<u>5</u>	parti		Sc		
tion	- vga			isten	mum		Sample IDs		
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sam	Comme	ents
1.0'		OF	Black	Loose	fins				
0.11		Silt				and the same of th	area upp h day	Asset*	
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Battelle Business of Innovati	Project Name: Location: Client:	New Be	ra Harbor E edford, MA SACE NAE	environme	ntal Monitor		Project #: G Vessel: f Scientist:	000422	
ation ID:	R 1		Time On Sta	tion:	13:25			nts are ±0.1 feet	
ore Sample ID:	-67A-0R01	-90 - 29	Northing (NA		7-7-7	-	Water Depth (A		3.0
gged by:	TH	25	Easting (NA		8/590		-	core assembly (B):	Tag-
ollection Mechanism	: Push-Core	H	GPS Accura		3.04			o top of handle (C):	
ate:	1,181200	7	Predicted Ti	•	, married and		•	from bottom) (D):	212
			Time of Coll		1335	Z	Surveyed eleva	tion (NVGD 29) (E):	and the same of th
			Time Depart	Station:	(33)	>	Water surface f	rom surveyed elevation (F):	2.8
		(Calculation	s for Deter	mination of	Z* Elevatio	on olû.		
G) Elevation of V	Vater Surface (NVGD): <i>E-F</i>					4.0		
d) Elevation of the	ne bottom of the core	(NVGD): G	· (B - C)						
*) Elevation of v	isual transition (NVGI	D): H + (dista	nce to visua	al transition,)		-1.8		
Elevation of the	ne sediment-water inte	erface as me	asured from	bottom of	core (NVGD): H + D	-0.6		
	ne sediment-water inte						-0,2		
- /	ithin ± 1.0 feet, discar								
(14016 11 1 7 12 14	Min. 2. 1.0 1001, 3.3041	d dild roodin	p10)						
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GD)	inde				licle				
N) =	- Incl			lCy.	pau		S		
Elevation (NVGD)	L'thology - Include		.	Consistency	Maximum particle size	_	Sample IDs		
Elev (I.e. I	Litho	Туре	Color	Cons	Maxi	Odor	Sam	Comments	
2.5		04	. 1	1604	fine				
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1.3' -	Signer with the significant.	16.15	olive.		FINA				
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Battelle	Project Name: / Location: Client:	New E	iora Harbor Bedford, MA USACE NAE		ental WONIC	•	Project #: Vessel: ief Scientist:	G000422		
Station ID:	R4		Time On St	***	13:41			ments are ±0.1 feet		\dashv
	1A-4R64-0	10-74			27076	Para e			3.3	1
,	7 M - 4 K 204 - 0	74 B.3	Northing (N		81597		Water Depth			\dashv
gged by:	11		Easting (NA		01071	<u>(G.71</u> *	· 	h core assembly (B):	0.9'	\dashv
ollection Mechanism:	Push-Core		GPS Accur	-	<u> </u>			e to top of handle (C):	0.41	٦,
ate:	48 CT		Predicted T	, ,	171	***		e (from bottom) (D):		_
			Time of Col		134		Surveyed ele	vation (NVGD 29) (E):	(F): 2.9	-
	•		Time Depai	rt Station:	13:5		Water surface	e from surveyed elevation	(F): <u> </u>	1
			Calculatio	s for Dete	ermination of	Z* Elevat	ion	0 a '		
,	r Surface (NVGD): ottom of the core (N		e /B (C)					<u> </u>		1
,		·						2.7	*	1
*) Elevation of visua	I transition (NVGD)): H + (dist	tance to visu	ai transitioi	n)			<u>d''</u> 6 7		
Elevation of the se	ediment-water inter	face as m	easured fror	n botiom o	f core (NVGE)): H + D	A-1	6,7		4
2) Elevation of the se	ediment-water inter	face as m	easured from	water de	pth (NVGD):	G - A	stretum, E	<u> </u>		_
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resar	nple)				-	No. of Contract of		
					*					
Qg (F	ge	7		6	<u>e</u>					
Elevation (NVGD)	Lithology - Include USCS code			ج ا	Maximum particle		w l			1
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e. B.	tholo	Туре	Color	Consistency	laxim	Odor	Sample IDs	0.000		
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Battelle The Business of Innocation	Project Name: Location: Client:	New B	ord Harbor edford, MA ISACE NAE		ntal Monito		Project #: G6 Vessei: ief Scientist:	06422	
	N4		Time On Sta		1254	0	All measuremer	ate are «Ω 1 feet	
Station ID: Core Sample ID: \$ - \(\tilde{\Pi} \)	10-0004-B	Wz 18	Northing (N		2707	703.1	Water Depth (A)		38 33
-	NW /TH	- FV	Easting (NA		4158	34. °		ore assembly (B):	71
Collection Mechanism:	Push-Core		GPS Accura		3.06	/ 1° 1		top of handle (C):	1.5
	61612007		Predicted Ti	-		*		rom bottom) (D):	14 = 1
Date.	<u> </u>		Time of Coll		12871	400		on (NVGD 29) (E):	or the second second second second second second second second second second second second second second second
			Time Depar		1403		-	om surveyed elevation (F): 29
			Timo Dopai	· Olanorii				· · · · · · · · · · · · · · · · · · ·	· /·
			Calculation	s for Deter	mination o	f Z* Elevat	ion		
(G) Elevation of Wate	r Surface (NVGD):	E-F					2	.1	
(H) Elevation of the be	ottom of the core (f	NVGD). G	- (B - C)				-2	.6	
				ai transitioni	· · · · · · · · · · · · · · · · · · ·		- 2	,7	
	I transition (NVGD)), B	
	ediment-water inter							······································	
(I_2) Elevation of the se	ediment-water inter	face as me	easured fron	n water depi	th (NVGD):	G - A		مار و	
(Note if I ≠ I₂ within	± 1.0 feet, discard	and resam	ipie)				<i></i>		,
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Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size				
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vation (h	ology SS o	Φ	5	Consistency	ximu	5	Sample IDs		
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c Business of I		1/1	Client	:	USACE NAE	***************************************	18.20	Chi	ef Scientist		
ation ID:	SUAT	<u>K.l.</u> A-a	K61-0	(a ad	Time On St		1408	77 i		ements are ±0.1 feet	1.6
ore Sample II):~ ~ ~ ~ ~ .	in y	<u> </u>	0 60 ± 7 = 7 = 7 = 7 = 7 = 7 = 7 = 7 = 7 = 7	Northing (N	•	7/1/30	1761 a 25	_Water Dept		<u> 2:2 </u>
gged by:		MW /	- T M		Easting (NA		8137	1, 1)		ush core assembly (B):	1 2/
ollection Mecl	nanism:		Push-Core		GPS Accur		111	v		ce to top of handle (C):	7-8-5-0
ate:		6/8	1207		Predicted T		1411		_	ore (from bottom) (D):	
					Time of Col		1417		-	evation (NVGD 29) (E):	F): 3 Å
					Time Depar	rt Station:		,	_ water suna	ce from surveyed elevation (F): <u> </u>
····		*****			Calculation	s for Deter	mination o	f Z* Elevati	ion	72	
3) Elevatio	n of Wat	er Surfa	ace (NVGE)): <i>E-F</i>							
f) Elevatio	n of the l	ottom (of the core	(NVGD): (G - (B - C)					7/2	
*) Elevatio	n of visu	al transi	ition (NVG	D): H + (dis	tance to visu	a! transition)			Comments of the Comments of th	
Elevatio	n of the s	sedimer	nt-water int	erface as m	neasured from	n bottom of	core (NVGE)): H + D		-0.6	
e) Elevatio	n of the s	edimer	nt-water int	erface as n	neasured from	n water dep	th (NVGD):	G - A		-0.4	
	≠ l₂ withir	1 ± 1.0 f	eet, discar	d and resar	mple)					- contraction and the cont	
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ttion	otto		- ygy cod			stenc	l mn		_ _ _ _		
Elevation (NVGD)	(Fe. H		Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Commen	ts
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Battelle	Project Name: Location: Client:	New Be	ord Harbor I edford, MA SACE NAE	Environme	ntal Monitoi		Project #: Vessel: of Scientist:	
tation ID:	EI		Time On Sta	ation:	1423		All measure	ments are ±0.1 feet
ore Sample ID	- OE61 - 00-	- 16	· Northing (N		2707	762,5	Water Depth	(A): <u>4.7</u>
ogged by:	NV MH		Easting (NA		81563	8.3		sh core assembly (B):
ollection Mechanism:	Push-Core	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	GPS Accura		1,9		- Water surfac	ce to top of handle (C):
ate:	6/8/2007		Predicted Ti		parameter .		Length of co	re (from bottom) (D):
			Time of Coll	ection:	1425		~ _Surveyed ele	evation (NVGD 29) (E):
			Time Depar	t Station:	1427		Water surfac	be from surveyed elevation (F): 3.2
			Calculation	s for Deter	mination of	Z* Elevation	on	7 7
G) Elevation of Wate	er Surface (NVGD):	E-F						5,4
H) Elevation of the b	ottom of the core (f	NVGD): G	- (B - C)					- d 10
z*) Elevation of visua	al transition (NVGD)	: H + (dista	ance to visua	al transition)	•			-1.3
Elevation of the s	ediment-water inter	face as me	asured fron	n bottom of	core (NVGD): <i>H</i> + <i>D</i>	.no.	1.6
•	ediment-water inter						nam.	1,5
	± 1.0 feet, discard							
<u> </u>	<u>a</u>				Φ			
Elevation (NVGD)	Lithology - Include USCS code			<u>~</u>	Maximum particle size		s	
vation (N	- ode			Consistency	un _E		Sample IDs	
Eleva (I.e. B	ithok	Туре	Color	onsi	//axin ize	Odor	Samp	Comments
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Battelle Business of Innovation	Project Name: Location: Client:	New Be	ord Harbor E edford, MA SACE NAE	nvironmer	ntal Monitor		Project #: Vessel: ef Scientist:	G606422
tation ID:	14		Time On Sta	ition:	14:	55		ments are ±0.1 feet
ore Sample ID: S-Ø1	- 6TO4-00	-15	Northing (NA		44076	84.9	Water Depth	7 0
	MW/TH	17	Easting (NA		81573	6.1		sh core assembly (B):
			GPS Accura		2.10	<u> </u>		e to top of handle (C):
ollection Mechanism:	Push-Core (1812007	/	Predicted Ti					re (from bottom) (D):
ate:	VIBLEOV:		Time of Coll		1439			evation (NVGD 29) (E):
			Time Depart		1442		-	ce from surveyed elevation (F):
			Calculation		nination of	7⁺ Flevati	ion	
G) Elevation of Wate	r Surface (NVGD).		Calculation	s for Deter	ininacion oi	Z Lievati		3.1
			- (B - C)				· · · · · · · · · · · · · · · · · · ·	2,3
,				- (4 :4/)				1/9
z*) Elevation of visua							- A	<u>. </u>
() Elevation of the se							<u> </u>	. 8
I_2) Elevation of the se	ediment-water inter	rface as me	easured fron	water dept	th (NVGD): (G - A	- 0	. 8
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resam	nple)					
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VVGD (H = H)	ucluc			>	artic		,	
vation (h	3y - In			tenco	_ G E		e Ds	
Elevation (NVGD)	Lithology - Include USCS code	Type	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
	<u> </u>	<u> </u>	1			0	_ v	Comments
1.5	199	Silt	Blak	loege	Sine			
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Battelle	Project Name: Location: Client:	New B	ord Harbor Bedford, MA ISACE NAE		ntal Monito	-	Project #: Vessel: ef Scientist:		
tation ID:	74 A	1 ()	Time On Sta		1447			ements are ±0.1 feet	
	6911-00-	7.1	Northing (N		2707		Water Depth		4.1
	MW	~ i	-		8159	38.3	-	ish core assembly (B):	7
ogged by:			Easting (NA		1.49	<u> </u>			1
ollection Mechanism:	Push-Core	3	_ GPS Accura	-	16 1 1			ce to top of handle (C):	7 20
ate:	6/8/2003	ř	_ Predicted Ti	ide (ft):				re (from bottom) (D):	2-0 S
			Time of Col	lection:	1449		-	evation (NVGD 29) (E):	
			Time Depar	t Station:	1454		Water surfac	ce from surveyed elevation (F): <u>3-0</u>
			Calculation	s for Deter	mination of	Z* Elevati	on	· · · · · · · · · · · · · · · · · · ·	- 4 -
G) Elevation of Wate	r Surface (NVGD)): <i>E-F</i>						<u> </u>	
H) Elevation of the b	ottom of the core	(NVGD): G	- (B - C)					<u>-3,2</u>	
z*) Elevation of visua	I transition (NVGD	D): H + (dist	ance to visua	a! transition.)		sader	2.4	Å.
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) Elevation of the se								V. O	
(2) Elevation of the se	euiment-water inte	enace as m	easured fron	water dep	iii (IAAGD):	G-A		11V	
(Note if I ≠ I ₂ within	± 1.0 feet, discard	d and resam	nple)				A	Salah Maria Maria Maria Maria Maria Maria Maria Maria Maria Maria Maria Maria Maria Maria Maria Maria Maria Ma	
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Elevation (NVGD)	Lithology - Include USCS code			<u>ن</u>	Maximum particle size		S ₂		
vation (N	- Ago			Consistency	unu unu		Sample IDs		
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Station ID: Q C Time On Station: 1459 All measurements are ±0.1 feet Core Sample ID: 5-07A-0010-00-17 Northing (NAD 83): 270-7387.3 Water Depth (A): 4.9 Logged by: MW/TH Easting (NAD 83): 815-736.4 Length of push core assembly (B): 9	Battelle The Business of Innovation	Project Name: / Location: Client:	New Bedford Harbor New Bedford, MA USACE NAL	4	ntai Monito		Project #: Vessel: ef Scientist:	G000422	
Northing (INAD 83): Appendix Marker Depth (A): Apple by MAN TH Stating (INAD 83): Apple by MAN TH Stating (INAD 83): Apple by MAN TH Stating (INAD 83): Apple by MAN TH Stating (INAD 83): Apple by MAN TH Stating (INAD 83): Apple by Marker stating of care of seasonably (8): Apple by Marker stating of care of seasonably (8): Apple by Marker stating of care of from tottom) (ID): Apple by Marker stating of care (INAD): Blevation of the sediment-water interface as measured from water depth (INVGD): By Sevation of the sediment-water interface as measured from water depth (INVGD): Apple by Marker stating of the sediment water interface as measured from water depth (INVGD): Apple by Marker stating of the sediment water interface as measured from water depth (INVGD): By Sevation of the sediment-water interface as measured from water depth (INVGD): Apple by Marker stating of the sediment water interface as measured from water depth (INVGD): Apple by Marker stating of the sediment water interface as measured from water depth (INVGD): Apple by Marker stating of the sediment water interface as measured from water depth (INVGD): Apple by Marker stating of the sediment water interface as measured from water depth (INVGD): Apple by Marker stating of the sediment water interface as measured from water depth (INVGD): Apple by Marker stating of the sediment water interface as measured from water depth (INVGD): Apple by Marker stating of the sediment water interface as measured from water depth (INVGD): Apple by Marker stating of the sediment water interface as measured from water depth (INVGD): Apple by Marker stating of the sediment of the sediment water interface as measured from water depth (INVGD): Apple by Marker stating of the sediment of the sediment water interface as measured from water depth (INVGD): Apple by Marker stating of the sediment of the sediment of the sediment of	Station ID	QVG			1459		All measure		
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Time of Collection: Time Depart Station Time Depar						,		1 6-1	>
Time Depart Station: Seculations for Determination of 2* Elevation Seculation of 1	Jaile.	<u> </u>			1501		Surveyed ele	evation (NVGD 29) (E):	
GO Elevation of Water Surface (NVGD): F - F H) Elevation of the bottom of the core (NVGD): G - (B - C) 27) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D I_z) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) Comments 1.7 Comments Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) Comments Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) Comments Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) Comments Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample)					1505	o ² 5	 _Water surfac	e from surveyed elevation (F):	
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Elevation of visual transition (NVGD): H+ (distance to visual transition) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H+D Elevation of the sediment-water interface as measured from water depth (NVGD): G-A (Note if I ≠ I₂ within ± 1.0 feet, discard and resample) Comments Co	G) Elevation of Wat	er Surface (NVGD):	E-F				war	4.1	
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Elevation of the sediment-water interface as measured from bottom of core (NVGD): H+D Iz Elevation of the sediment-water interface as measured from water depth (NVGD): G-A (Note if I ≠ Iz within ± 1.0 feet, discard and resample) I	z*) Elevation of visu	al transition (NVGD)): H + (distance to vis	ual transition)			<u>29</u>	
Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I₂ within ± 1.0 feet, discard and resample) (Note if I ≠ I₂ within ± 1.0 feet, discard and resample) (OD (I))): H + D	ventur	isologia reconstruction	
(Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Interpretation of the second of the sec	. —						\	.5	\Box
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1.7 Octo Octo Clay olive from fine From O.4 th O.10!	(NVG)	Inclu		₹ 5	parti		sc		
1.7 Octo Octo Clay olive from fine From O.4 th O.10!	ottor	- Ago		sten	unu.		le IC		
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Battelle Business of Innovation	Project Name: // Location: Client:	New B	ord Harbor I edford, MA SACE NAE	Environme	ntal Monitor		Project #: Vessel of Scientist	:	
ation ID:	0.5		Time On Sta	ation:	1513		All measure	ements are ±0.1 feet	
re Sample ID: S-47	4-0005-60	7-13	- Northing (N		27076	73.6	Water Dept	h (A):	5,8
gged by:	MW /T		Easting (NA		81560	(.4	Length of pu	ush core assembly (B):	9'
ellection Mechanism:	Push-Core		GPS Accura		2.48		- Water surfa	ce to top of handle (C):	2.0
ite:	6/8/07		- Predicted Ti	-	ARTHORNIA.		- _Length of co	ore (from bottom) (D):	445 SU
			Time of Coll		1514		- _Surveyed el	evation (NVGD 29) (E):	
			Time Depar	t Station:	1516		_Water surfa	ce from surveyed elevation (F): <u>1.9</u>
			Calculation	s for Deter	mination of	Z* Elevatio	on		₹ .
Elevation of Wate	r Surface (NVGD):	E - F					1	//	1
() Elevation of the bo	ottom of the core (N	NVGD): G	- (B - C)					r [
*) Elevation of visua	transition (NVGD)	: H + (dista	ance to visua	al transition)				0 1	
Elevation of the se	ediment-water inter	face as me	easured fron	n bottom of	core (NVGD)): H + D	-2	2 2	
Elevation of the se							-2	,9	
(Note if I ≠ I ₂ within				·				· · · · · · · · · · · · · · · · · · ·	
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Elevation (NVGD)	clude				Maximum particle size				
vation (NV	gy - Ir			stency	id wn		le IDs		
Elevat	Lithology - Include USCS code	Туре	Color	Consistency	Maxim size	Odor	Sample IDs	Comme	nts
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Battelle The Business of Innovation	Project Name Location Client	: New E	ford Harbor Bedford, MA JSACE NAE	ı	ental Monito	_	Project #: Vessel ief Scientist		
Station ID:	2223		_ Time On S	tation:	1534		All measur	ements are ±0.1 feet]
Core Sample ID: 5-0	A-2223-	Ø/-12	— _ Northing (ስ	NAD 83):	2704	862,2	Water Dept	h (A): 5.8	
Logged by:	MW/JH		Easting (N		81561	3.4		ush core assembly (B):	7
Collection Mechanism:	Push-Core		GPS Accui	•	3.38	>		ice to top of handle (C):	
Date:	6/8/200	7	 Predicted 1	•	Aliana de la constante de la c			ore (from bottom) (D):	b 1.
-		***************************************	 Time of Co		1534		-	levation (NVGD 29) (E):] 77
			Time Depa		1539		-	ice from surveyed elevation (F): 2,5	1
(G) Elevation of Water	er Surface (NVGD))· F - F	Calculation	ns for Dete	rmination o	ī Z' Elevati	ion	25	
	ottom of the core		i - (B - C)					-4,5	1
	al transition (NVGI			ıal transition	,)			-4,6	1
	ediment-water into					n. H + D		- 3,3	1
, ,	ediment-water inte				,	′		- 3.3	1
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(Note if I ≠ I ₂ withir	± 1.0 feet, discar	d and resan	nple)					· ·	-
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Elevation (NVGD)	Lithology - Include USCS code				Ticle				
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vation (N	ology S cc		5	Consistency	ji ji	_	Sample IDs		
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Battelle Business of Innovation	Project Name: Location: Client:	New E	ord Harbor Bedford, MA JSACE NAE	l	ental Monito	_	Project #: Vessel: ef Scientist:		
tation ID:	6635		Time On St		1022			ements are ±0.1 feet	
ore Sample ID:	A-64635	60-17	 Northing (N		2704	563.9	Water Depth		3433
ogged by:	MW HH	•	Easting (NA	•	81512	38.4	•	sh core assembly (B):	3.0 7.0
ollection Mechanism:	Push-Core		GPS Accur		2.01			ce to top of handle (C):	V 1.7
ate:	6/11/2007		Predicted T	•	Extended			re (from bottom) (D):	1.7
			Time of Co		1122/-	034		evation (NVGD 29) (E):	
			Time Depa			36	-	ce from surveyed elevation (F):
					rmination of			on the control of the	.,
 Elevation of Wate 	r Surface (NVGD)	: <i>E-F</i>	Calculation	is for Dete	inniacion oi	Z Elevali		-0,9	
H) Elevation of the be	ottom of the core (NVGD): G	: - (B - C)					-6.2	
	·	•	. ,	al transition	•1		790	-5,4	
	·				•			. U =	
Elevation of the se					,	•		7/5	
2) Elevation of the se	ediment-water inte	rface as m	easured fror	n water dep	oth (NVGD):	G - A		7.4	
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resam	nple)					, secondarily	
3D) (1)	de				<u> </u>				
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tion	- ygy			steno	un d		e D		
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Commer	nte.
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Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor ledford, MA ISACE NAE	l	ental Monito	_	Project #: Vessel lef Scientist		
Station ID:	6633		_ Time On S	tation:	1037		All measur	ements are ±0.1 feet	
Core Sample ID: 🖫 🚧 🗟	A-6633-0	y-72	_ Northing (N	IAD 83):	27046	74.8	_Water Dept	h (A):	3-2
Logged by:	WW		_ Easting (N	AD 83):	8(516	9.5	_Length of p	ush core assembly (B):	<u> </u>
Collection Mechanism:	Push-Core		GPS Accur	acy:	7.5	8	_Water surfa	ce to top of handle (C):	217.7
Date:	6/n/2007		Predicted T	ide (ft):	. pp. company	******	_Length of co	ore (from bottom) (D):	2++ s/b.
			Time of Co	llection:	7645	1052	_Surveyed el	evation (NVGD 29) (E):	_{SERV} ORANCE.
			Time Depa	rt Station:	[056		Water surfa	ce from surveyed elevation (F):
			Calculation	ns for Dete	rmination o	f Z* Elevati		A C	
(G) Elevation of Wat	, ,							- 0, 8 /	
(H) Elevation of the	bottom of the core (NVGD): G	- (B - C)					- 6, 7	
(z*) Elevation of visu	al transition (NVGD): H + (dista	ance to visu	al transition)		***	<u> </u>	
(I) Elevation of the	sediment-water inte	rface as me	easured fror	n bottom of	core (NVGE	D): H + D		- 4,3	
(I ₂) Elevation of the	sediment-water inte	rface as me	easured fror	m water dep	oth (NVGD):	G - A		-4,0	
(Note if I ≠ I ₂ withi	n ± 1.0 feet, discard	and resam	ple)					: negration	
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Elevation (NVGD)	Lithology - Include USCS code				ticle				
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vation (N	ology SS cc	o)	<u> </u>	Consistency	lim min		Sample IDs		
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Battelle be Business of Innovation	Project Name: Location: Client:	New E	ford Harbor Bedford, MA JSACE NAE		ental Monito		Project #: Vessel ef Scientist		
tation ID:	FF28		Time On St	tation:	1101		Ali measure	ements are ±0.1 feet	
ore Sample IDS-07A		21	Northing (N		7704	7.37.1	Water Depti		3.4
ogged by:	иV		Easting (NA		£15111	: 7		ish core assembly (B):	70
ollection Mechanism:	Push-Core		GPS Accur		7.43			ce to top of handle (C):	1.0
ate:	6/11/2007		Predicted T	-	, acceptance			re (from bottom) (D):	J-4's/k
			Time of Col		1105		-	evation (NVGD 29) (E):	A Samuel Samuel
			Time Depai		1108			ce from surveyed elevation (F)
					rmination o	f 7* Flevati		,	
G) Elevation of Wate	r Surface (NVGD)	: <i>E-F</i>					_	- 0,7	
d) Elevation of the be	ottom of the core (NVGD): G	i - (B - C)					o, [
z*) Elevation of visua	I transition (NVGD): H + (dist	ance to visu	al transition)			5.3	
Elevation of the se						W- H (D		4.0	***************************************
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(Note if I ≠ I₂ within	± 1.0 feet, discard	and resan	nple)					· controlled	
Elevation (NVGD)	lude	·			ticle				
levation (NVGE	Lithology - Include USCS code			ncy	Maximum particle size		<u> </u> න		
Vatio	S S S	ø.	,	Consistency	ii.	_	Sample IDs		
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The I	Battelle Business of Inno		Proj	ect Name: Location: Client:	New B	ord Harbor edford, MA SACE NAE		ental Monito	-	Project #: Vessel: ef Scientist:	G606422	
Stat	ion ID:		FF	23		Time On St	ation:	1117		All measure	ments are ±0.1 feet	
Core	e Sample ID:	5-057			Y-13	- Northing (N	AD 83):	27048	76.9	Water Depth	(A):	38
1	ged by:		MY) /TH		Easting (NA	ND 83):	81518	3,3	- Length of pu	sh core assembly (B):	7.0
	ection Mechai	nism:	F	Push-Core		GPS Accur	acy:	7.67		_ _Water surfac	e to top of handle (C):	1, 8
Date			6/1	12007	,	- Predicted T	ide (ft):	- acceptance of the contract o		 Length of co	re (from bottom) (D):	1.3
						Time of Col	lection:	IIIS		_ _Surveyed ele	vation (NVGD 29) (E):	A CONTRACTOR OF THE PARTY OF TH
						Time Depar	t Station:	1130		_Water surfac	e from surveyed elevation (F):	
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(G)	Elevation	of Wat	ter Surfa	ce (NVGD)	: <i>E-F</i>					***************************************		
(H)	Elevation	of the	bottom c	of the core (NVGD): G	- (B - C)					<u>-5 :4</u>	
(z*)	Elevation	of visu	al transi	tion (NVGE): H + (dista	ance to visu	al transition)			-5.5	
(1)	Elevation	of the	sedimen	t-water inte	rface as me	easured fron	n bottom of	core (NVGD): H + D		-4,6	
(12)								th (NVGD):			-4.5	
(27	(Note if I ≠ I	withi	n + 1 () fo	eet discar	l and resam	nle)						
	(Note ii i + i	2 *************************************	II ± 1.0 II	eet, discard	and resam	ibie)						
	IVGD)	È		clude				rticle				
	vation (N			y - In ode			ency	m pa		S		
	Elevation (NVGD)	5		Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments	
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	0.4				5.14	plock	Wose	7,00		and the second s	manufaci	
	0.0	and the second second	age parameter and a second and a second	CONSTRUCTION OF THE PROPERTY O	mining graphy of the company of the	11,12	^	·				
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File ID	l of digital ph	otogra	ph(s):			L		<u></u>				
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Baffelle	Project Name: Location: Client:	New Bedf		Environme	ntal Monito		Project #: Vessel: ef Scientist:	G606422	1
Station ID:	MAZZ	Ti	me On Sta	ation:	1126		All measuren	nents are ±0.1 feet	
Core Sample ID:		N	orthing (N	AD 83):	2704	8677	Water Depth ((A):	251
ogged by:	MW		asting (NA	.D 83):	81500	0.4	Length of pus	h core assembly (B):	SAF 81
Collection Mechanism:	Push-Core	G	PS Accura	acy:	2.68		 Water surface	to top of handle (C):	202.
Date:	6/11/2007	Pı	redicted Ti	ide (ft):	grand and a	,	 Length of core	e (from bottøm) (D):	
		 Ti	me of Col	lection:	تشخيل		 Surveyed elev	ration (NVGD 29) (E):	
		Ti	me Depar	t Station:			Water surface	from surveyed elevation (F)	= 200
			lculation	s for Deter	mination of	Z* Elevati	ion		
G) Elevation of Wa	ter Surface (NVGD):	E-F							
H) Elevation of the	bottom of the core (I	NVGD): <i>G - (E</i>	3 - C)				/		
z*) Elevation of visu	ual transition (NVGD)	: H + (distanc	e to visua	al transition))	,	/		
(I) Elevation of the	sediment-water inte	face as meas	ured fron	n bottom of	core (NVGD): H + D			
	sediment-water inte					/			
	in ± 1.0 feet, discard								
(140te ii i 7 i2 With	iii ± 1.0 leet, discard	and resample	')		/	/	*		
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(GD)	Inde				licie.				
Elevation (NVGD)	Lithology - Include USCS code			ζ	Maximum particle size		Sal		
ation	logy S co		_	Sonsistency	unu u		Sample IDs		
Elev (i.e. l	Litho	Type	Color	ü	Maxi	Odor	Sam	Comments	
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Battelle The Business of Innovation	Project Name: Location: Client:	New Be	rd Harbor dford, MA SACE NAE		ntal Monito		Project #: Vessel: of Scientist:	
Station ID:	QII		Time On St				All measure	ments are ±0.1 feet
-	S-OFA-BQII-	Ø6v	Northing (N				Water Depth	(A): 1
Logged by:	Jhr		Easting (NA	AD 83):			Length of pu	sh core assembly (B):
Collection Mechanism:	Push-Core		GPS Accura					e to top of handle (C):
Date:	6/1/07		Predicted T		***************************************		Length of cor	re (from bottom) (D):
_		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Time of Col					vation (NVGD 29) (E):
			Time Depar					e from surveyed elevation (F):
			,					/
(C) Floretien of Mete	r Surface (NVGD):		Calculation	s for Deteri	mination of	Z* Elevatio	on / /	
(H) Elevation of the b	ottom of the core (f	NVGD): G -	(B - C)				$-\!$	
(z*) Elevation of visua	I transition (NVGD)	: H + (dista	nce to visua	al transition)		_//		
(I) Elevation of the se	ediment-water inter	face as me	asured fron	n bottom of o	core (NVGD);/H + D/		
	ediment-water inter					/ /		
(Note if I ≠ I ₂ within	+ 1 0 feet discard	and resamo	ıle)					
(Note if I + I ₂ within	± 1.0 leet, discard	anu resam	ne)					
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Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Sansistency	Maximum particke size	Odor	Sample IDs	Comments
File ID of digital photograp					Contraction of the second			
Comments:								

Battelle The Business of Innovation	Location:	New Bed	d Harbor Enviro dford, MA ACE NAE	nmental Monit	•	Project #: Vessel ief Scientist		/	
Station ID:	DD40	-	Time On Station:	093	1	All measure	ements are ±0.1 feet		1
Core Sample ID:			Northing (NAD 83);	2704	451,9	Water Deptl	n (<i>A</i>):	BH 34 3	3.4
Logged by:	MW		Easting (NAD 83):	\$1503	35.9	 Length of pu	ush core assembly (B):	184900	10
Collection Mechanism:	Push-Core	(GPS Accuracy:	2.40	")	Water surfa	ce to top of handle (C):	18 KH	.8
Date:	6/11/2007		Predicted Tide (ft):	- Colores	-	Length of co	re (from bottom) (D):	3.8'	
		٦	Γίme of Collection:	0443,0	1010	Surveyed ek	evation (NVGD 29) (E):	- Andrewson Co.	
		٦	Time Depart Station	: <u>[015</u>		Water surfac	ce from surveyed elevation (F):	
		Ca	alculations for E	etermination o	of Z* Elevat	ion	/		
(G) Elevation of War	ter Surface (NVGD):	E-F		`					
(H) Elevation of the	bottom of the core (I	NVGD): G - (B - C)						
(z*) Elevation of visu	al transition (NVGD)): H + (distan	ce to visual trans	ition)		1			
(I) Elevation of the	sediment-water inter	rface as meas	sured from bottor	n of core (NVGI	D): H + D	7			
	sediment-water inter					7			
	n ± 1.0 feet, discard			, , ,		1			
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Elevation (NVGD)	logy .		sten	mg/		ē D			
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Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor edford, MA ISACE NAE		ental Monitor	-	Project #: Vessel: ef Scientist:		
Station ID:	LL 73		Time On St	ation:	1145		All measure	ements are ±0.1 feet	
Core Sample ID:	5-07A-LL	23-106		AD 83):	2704	87418	Water Depth	ı (A):	3.3
Logged by:	MW MH		Easting (NA		81527	3.6		sh core assembly (B):	405
Collection Mechanism:	Push-Core	······································	GPS Accur	,	3.31 Water surface to top of handle (C): 30				
Date:	6/11/Z00	t .	Predicted T	-			Length of core (from bottom) (D):		
Date.			Time of Col		1150		_	evation (NVGD 29) (E):	
			Time Depar					ce from surveyed elevation (F)	
			•		4/51			ce from surveyed elevation (r)	
(G) Elevation of Wat	ter Surface (NVGD)	F-F	Calculation	s for Detei	rmination of	Z* Elevat	ion (^)	6	
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Elevation (NVGD)	Lithology - Include USCS code			20	Maximum particle size		sc		
ation	ogy .			isten	l mnu		Je II		
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Battelle he Business of Innovation	Project Name: Location: Client:	New Be	rd Harbor dford, MA SACE NAE	Environme	ntal Monitoi		Project #: Vessel: ef Scientist:	
station ID:	IT 39		Time On Sta	ation:	0854		All measure	ments are ±0.1 feet
Core Sample ID: 5 4			Northing (N			72.1	Water Depth	. U Ø
	NW AT		Easting (NA		815 200	1.27.1	-	sh core assembly (B):
ogged by:					4.1			8 8 2
Collection Mechanism:	Push-Core		GPS Accura		181		-	
oate:	011-1-007		Predicted Ti		900		_	
			Time of Coll			······································	-	evation (NVGD 29) (E):
			Time Depar	t Station:	0902		_Water surfac	e from surveyed elevation (F):
0) =	0 ((0)(0))		Calculation	s for Deter	mination of	Z* Elevati	on A /	
G) Elevation of WateH) Elevation of the bo			(B - C)				<u> </u>))
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z*) Elevation of visual	transition (NVGD)): H + (distai	nce to visua	al transition)				·
 Elevation of the se 	diment-water inter	face as mea	asured fron	n bottom of	core (NVGD): H + D	-4,4	y
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Battelle The Business of Innovation	Project Name: Location: Client:	New Be	ord Harbor edford, MA SACE NAE		ntal Monito		Project #: Gt Vessel: ef Scientist:	506422		
Station ID:	KK 32		Time On St	ation:	0908		All measuremen	nts are ±0.1 feet		
	7A-KK32 -	00/14	Northing (N		27046	49.8	Water Depth (A)):		
Logged by:	WWM	<u> </u>	Easting (NA		81524	18.8	- ' '	core assembly (B):	7.0	
Collection Mechanism:	Push-Core		GPS Accura		3.35	<u> </u>	_	o top of handle (C):	1.3	
_	6/12/1/11/		Predicted T		- Salar Carrier		-	from bottom) (D):	135 5 N) i.
Date:	VIVILUET		•				-	ion (NVGD 29) (<i>E</i>):		
			Time of Col		0917		- -		(F) AA	
			Time Depar	t Station:	<u> </u>		_water surface if	om surveyed elevation ((F). <u>V*W</u>	
		(Calculation	s for Deter	mination of	Z* Elevati	on			
(G) Elevation of Water	er Surface (NVGD):	: <i>E-F</i>					0.0			
(H) Elevation of the b	ottom of the core (NVGD): G	- (B - C)							
(z*) Elevation of visua	al transition (NVGD): H + (dista	ance to visua	ai transition)		53			
	ediment-water inte)): H + D	-4.3			
	ediment-water inte						-4.1			
(Note if I ≠ I ₂ within								, and the same of		
(140te 11 7 12 William	12. 1.0 1001, 4100414	and roodin	p.07							
Elevation (NVGD) (i.e. Bottom = H)	Lithology - Include USCS code			Consistency	Maximum particle size		Sample IDs			
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Segritor ID. September 1997 (A) 1997 (A) 1998 (A) 1999 (A	Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor edford, MA ISACE NAE		ental Monito	_	Project #: Vessel: ef Scientist:	G606422	
Logard by: Path-Care Path	Station ID:	uu35		_ Time On Sta	ation:	0922	/	All measurer	ments are ±0.1 feet	
Logard by: Path-Care Path	Core Sample ID: 5-0	7A-4435-6	10-16	_ Northing (N.	AD 83):	2704	567.9	_Water Depth	(A): <u>3.5</u>	
Date: Predicted Tick (ft) Time of Collection: Time of Collect	Logged by:	MW/TH		_ Easting (NA	AD 83):	81548	<u> </u>	_Length of pus	th core assembly (B):	
Time of Colection: Time Depart Station: Of 30 Water surface from surveyed elevation (F): Calculations for Determination of 2* Elevation Calculations for Determination of 2* Elevation (C) Elevation of the bottom of the core (NVGD): G - (B - C) (C) Elevation of the bottom of the core (NVGD): G - (B - C) (C) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if ≠ ₀ within = 1.0 feet, discard and resample) Or (C) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if ≠ ₀ within = 1.0 feet, discard and resample) Or (C) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if ≠ ₀ within = 1.0 feet, discard and resample) Or (C) (I) Elevation of the sediment-water interface as measured from surface	Collection Mechanism:	Push-Core		GPS Accura	асу:	2.23)	_Water surface	e to top of handle (C):	
Time Depart Station: 0 Water Surface (NVGD): E-F (A) Elevation of Water Surface (NVGD): E-F (B) Elevation of the bottom of the core (NVGD): E-F (B) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H - D (Note if I + I ₂ within ± 1.0 feet, discard and resample) (C) Surface (NVGD): B - B (Note if I + I ₂ within ± 1.0 feet, discard and resample) (C) Surface (NVGD): B - B (C) Surface (NVGD): B - B (C) Surface (NVGD): B - C (C) Surface	Date:	6/12/208	<u> </u>	Predicted T	ide (ft):	-		Length of core (from bottom) (D):		
Calculations for Determination of 2" Elevation (G) Elevation of Water Surface (NVGD): E - F (H) Elevation of the bottom of the core (NVGD): A - (B - C) (2") Elevation of visual transition (NVGD): A + (distance to visual transition) (I) Elevation of the sediment-water interface as measured from bottom of core (NVGD): A + D (Rote if I + I ₂ within ± 1.0 feet, discard and resample) (I) Surface (NVGD): A - NOGO (NVGD): A - N				Time of Col	lection:	0915		_Surveyed elev	vation (NVGD 29) (E):	
(G) Elevation of the bottom of the core (NVGD): <i>B - F</i> (H) Elevation of the bottom of the core (NVGD): <i>A - (B - C)</i> (Z) Elevation of the sediment-water interface as measured from bottom of core (NVGD): <i>B + D</i> (R) Elevation of the sediment-water interface as measured from water depth (NVGD): <i>G - A</i> (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (G) (G) (E) (E) (E) (E) (E) (E) (E) (E) (E) (E				Time Depar	t Station:	09.50		_Water surface	e from surveyed elevation (F):3	
(#) Elevation of the bottom of the core (NVGD): # + (distance to visual transition) (#) Elevation of the sediment-water interface as measured from bottom of core (NVGD): # + D (#) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I), within ± 1.0 feet, discard and resample) (#) Part Part				Calculation	s for Dete	rmination of	Z* Elevati	on		
Elevation of visual transition (NVGD): H + (distance to visual transition)	(G) Elevation of Wa	ter Surface (NVGD)	: <i>E-F</i>					<u>-0,3</u>	>	
Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D (Note if I ≠ I₂ within ± 1.0 feet, discard and resample) Comments Port digital photograph(s): Port digital photograph(s)	(H) Elevation of the	bottom of the core	NVGD): G	- (B - C)					2	
(Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) Comments Comm	(z*) Elevation of visu	ual transition (NVGE)): H + (dist	ance to visua	al transitior)		-4.9		
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((Note if ≠ , within ± 1.0 feet, discard and resample) ((G) (H)								- 2, %	/	
(Comments) Comments	_,					, <u></u> ,.	-	<i>J, D</i>	I Commentation	
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Battelle	Project Name: Location: Client:	New E	ord Harbor Bedford, MA ISACE NAE		entai Monito		Project #: Vessel ef Scientist		
tation ID:	u k 30		Time On St	ation:	0938		All measure	ements are ±0.1 feet	
ore Sample ID: $\S - \mathscr{L}$	70 Jul 30	10-23	– _ Northing (N	AD 83):	27041	86.4	_Water Depti	h (A):	363 3 2
ogged by:	MW/TH		Easting (NA		8154	87.3	Length of pu	ush core assembly (B):	217.0
Collection Mechanism:	Push-Core		GPS Accura		2.05		 Water surfa	ce to top of handle (C):	JA# 1,3
Date:	6/12/200)	 Predicted T	•	Special and		 Length of co	ore (from bottom) (D):	2.3
			Time of Col	lection	C440 00	146	– Surveyed el	evation (NVGD 29) (E):	and the first of the second second
			Time Depar	t Station:	0450		Water surfa	ce from surveyed elevation	(F):
			Calculation	s for Dete	rmination o	f Z* Elevati	ion		
,	ter Surface (NVGD)						-0	<u> </u>	
H) Elevation of the	bottom of the core	(NVGD): G	- (B - C)					. Jan.	
z*) Elevation of visu	ual transition (NVGE)): H + (dist	ance to visua	al transition	1)		- 5	<u> </u>	
() Elevation of the	sediment-water inte	erface as m	easured from	n bottom of	core (NVGE)): H + D	<u> </u>	7	
(2) Elevation of the	sediment-water inte	erface as m	easured fron	n water der	oth (NVGD):	G - A	3.	7	
(Note if I ≠ I₂ with	in ± 1.0 feet, discard	d and resan	nple)					and the second s	
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	Station ID:	55 7.3		Time On St		1004			ments are ±0.1 feet
	Core Sample ID: 5		00-168	Northing (N		22148	20.9	Water Depth	12 12
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1		6/12/200	1	-	-		<u></u>		e to top of handle (C):
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Business of Innovation	Location: Client:	New B	ledford, MA ISACE NAE		ental Monito		Project #: Vessel: ef Scientist:	G000422	
ution ID:	QQ 26		Time On St	ation:	1014		All measurer	ments are ±0.1 feet	
re Sample ID: 5-97	A-Q026	00-24	~ Northing (N	AD 83):	2704	749.1	Water Depth	(A):	24 24
gged by:	MWITH		Easting (NA	·	6157	86.9	•••	h core assembly (B):	6.9
llection Mechanism:	Push-Core		GPS Accur	acy:	2.03	, <u>, , , , , , , , , , , , , , , , , , </u>	- Water surface	e to top of handle (C):	J4 1.4
te:	6/12/200	7	 Predicted T 	-	and the same of th		-	e (from bottom) (D):	2524
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Elevation of the be	ottom of the core	(NVGD): G	- (B - C)				-6.	5	
) Elevation of visua	transition (NVGE	D): H + (dista	ance to visu	al transitio	1)		- 5.	6	
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Battelle Business of Innovation	Project Name: A Location: Client:	New Be	rd Harbor E edford, MA SACE NAE	=:IVIFONMEI	nai Wonitor		Project #: (Vessel: f Scientist:	MD0D422	
tation ID:	QQ 40		Time On Sta	ıtion:	1035		All measuren	nents are ±0.1 feet	
ore Sample ID: 5	A-Q940-00	-25	Northing (NA	AD 83):	27046		Water Depth ((A): <u>3</u>	2
ogged by:	MWHH		Easting (NA	D 83):	11539	19.6	Length of push	n core assembly (B):	.1
ollection Mechanism:	Push-Core		GPS Accura	ісу:	1.96		Water surface	to top of handle (C): $\frac{2}{\sqrt{2}}$.4
ate:	6/12/2007		Predicted Ti	de (ft):			Length of core	e (from bottom) (D):	35b
			Time of Coll	ection:	1037		Surveyed elev	ration (NVGD 29) (E):	4 50
			Time Depart	t Station:	10:39		Water surface	from surveyed elevation (F):	1,0
		(Calculation	s for Deter	mination of	Z* Elevatio			
	r Surface (NVGD):						-/.		
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z*) Elevation of visua	I transition (NVGD)	: H + (dista	nce to visua	al transition))			4	
Elevation of the s	ediment-water inter	face as me	asured from	bottom of	core (NVGD)): H + D	-4.0	2	
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Core Sample ID: 5-4	1A- 90 36-60	-4	_ _ Northing (N	IAD 83):	2704	550.9	Water Depth	n (A):	SH 3.0
ogged by:	MWMH	25-14	_ Easting (NA	AD 83):	8153	50.3	Length of pu	sh core assembly (B):	7.7
Collection Mechanism:	Push-Core		GPS Accur	acy:	3.91		Water surfac	ce to top of handle (C):	2+2
Date:	6/12/2007		Predicted T	ide (ft):	granism	P10444	 Length of co	re (from bottom) (D):	2.5
			Time of Co	llection:	מנאיימנ	FC NOI	Surveyed ele	evation (NVGD 29) (E):	And when the same
			Time Depa	rt Station:	1105		Water surfac	ce from surveyed elevation (F):
			Calculation	ns for Dete	rmination o	of Z* Elevati	ion	₹°	
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H) Elevation of the	bottom of the core (I	NVGD): G	- (B - C)				- 7	Ô	
z*) Elevation of visu	ual transition (NVGD)	: H + (dist	ance to visu	al transition	1)			6	
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Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor edford, MA SACE NAE		ntal Monito	_	Project #: Vessel: ef Scientist:		
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Battelle ha Business of Innovation	Project Name: Location: Client:	New E	rora Harbor Bedford, MA JSACE NAE	ı	ental Monito	_	Project #: Go Vessel: ief Scientist:	000422	
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ogged by. collection Mechanism:	Push-Core		_ Easting (NA		2.68			core assembly (B):	24 20
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G) Elevation of Water	Surface (NVGD)	: <i>E-F</i>	Calculation	is for Detei	rmination o	t Z° Elevati	-/.3		
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	MW		Easting (NAI		8153	12.4	•	core assembly (B):
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Time of Collection: Time Depart Station: T	Collection Med	chanism: _	Push-Core)	_ GPS Accui	racy:	1.0	6	Water surta	ace to top of handle (C):	1010	4
Time Depart Station: 1335 Weste surface from surveyed elevation (F) = 55	Date:	_	6 12 200	7	Predicted	Γide (ft):	· · ·		Length of co	ore (from bottom) (D):	2515	5.
Calcutations for Determination of 2° Elevation Elevation of Water Surface (NVGD): E - F Elevation of the bottom of the core (NVGD): H - (Elevation of the sediment-water interface as measured from bottom of core (NVGD): H - D Elevation of the sediment-water interface as measured from water depth (NVGD): G - A Choice if I = I, within = 1.0 feet, discard and resample) OD					Time of Co	llection:	1270	1237 124	Surveyed e	levation (NVGD 29) (E):	Apple and the second	
Elevation of Water Surface (NVGD): E-F Elevation of the bottom of the core (NVGD): G-(B-C) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H+D Elevation of the sediment-water interface as measured from water depth (NVGD): G-A Note if I ≠ I ₀ within ± 1.0 feet, discard and resumple) Construction of the sediment-water interface as measured from water depth (NVGD): G-A Note if I ≠ I ₀ within ± 1.0 feet, discard and resumple) Construction of the sediment-water interface as measured from water depth (NVGD): G-A Note if I ≠ I ₀ within ± 1.0 feet, discard and resumple) Construction of the sediment-water interface as measured from water depth (NVGD): G-A Note if I ≠ I ₀ within ± 1.0 feet, discard and resumple) Construction of the sediment-water interface as measured from water depth (NVGD): G-A Note if I ≠ I ₀ within ± 1.0 feet, discard and resumple) Construction of the sediment-water interface as measured from water depth (NVGD): G-A Note if I ≠ I ₀ within ± 1.0 feet, discard and resumple) Construction of the sediment-water interface as measured from water depth (NVGD): G-A Note if I ≠ I ₀ within ± 1.0 feet, discard and resumple) Construction of the sediment-water interface as measured from water depth (NVGD): G-A Note if I ≠ I ₀ within ± 1.0 feet, discard and resumple) Construction of the sediment-water interface as measured from water depth (NVGD): G-A Note if I ≠ I ₀ within ± 1.0 feet, discard and resumple) Construction of the sediment-water interface as measured from vater depth (NVGD): G-A Note if I ≠ I ₀ within ± 1.0 feet, discard and resumple) Construction of the sediment-water interface as measured from vater depth (NVGD): G-A Note if I ≠ I ₀ within ± 1.0 feet, discard and resumple) Construction of the sediment-water interface as measured from vater depth (NVGD): G-A Note if I ≠ I ₀ within ± I ₀ within ± I ₀ within ± I ₀ within ± I ₀ within ± I ₀ within ± I ₀ within ± I ₀ within ± I ₀ within ± I					Time Depa	rt Station:	1335		Water surfa	ace from surveyed elevation	(F):	
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Attempt used core Tube with plunger and pushed by hand (NG)	HH-EUM	- <i>IV</i> . U				é	1 1 2					
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Sweral attempts made with insufficient recovery

Battelle Business of Innovation	Project Name: <i>I</i> Location: Client:	New B	ord Harbor I edford, MA SACE NAE	Environme	ntal Monitoi		Project #: Vessel: ef Scientist:	G606422	
tation ID:	ชง 40		Time On Sta	ation:	1344		All measure	ments are ±0.1 feet	
ore Sample ID: \$ -\$ -\$	1A-0040-06	- 55	- Northing (N	AD 83):	27044	50.1	Water Depth	(A):	4.0
ogged by:	mW		Easting (NA		8150	74.8	– Length of pu	sh core assembly (B):	10.0
ollection Mechanism:	Push-Core		GPS Accura		2.17	-	Water surfac	e to top of handle (C):	, 4
ate:	6/12/2015	7	 Predicted Ti 	-	·		- Length of cor	re (from bottom) (D):	-87 Sl
_			 Time of Coll 		iHob		-	vation (NVGD 29) (E):	particular
			Time Depar		1407		-	e from surveyed elevation (F): <u>* </u>
			Calculation	s for Deter	mination of	Z* Elevati	on		
G) Elevation of Wate	r Surface (NVGD):	E-F						<u> </u>	
H) Elevation of the b	ottom of the core (N	IVGD): G	- (B - C)				- 9	: 4	
z*) Elevation of visua	I transition (NVGD)	: H + (dista	ance to visua	al transition)		-9	5	
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Battelle Business of Innovation	Project Name: Location:	New B	edford, MA	⊒IIVII OΠIΠ€	ritai WOIIIOI			R/V Gale Force Theresa Himmer/Alex Mansfield
	Client:		Time On St	tion:	A 12	S		
tation ID:	74-0619-	00-16	Time On Sta Northing (NA		2417	4377	Water Depth	ments are ±0.1 feet (A):
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ogged by: ollection Mechanism:	Push-Core		GPS Accura		41,89	✓ ' E		e to top of handle (C):
ollection Mechanism;	7/31/07		Predicted Ti	-		encommittee	-	e (from bottom) (D):
aic.	71 01 1 0 1		Time of Coll		0840		_	vation (NVGD 29) (<i>E</i>):
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						7+ Fl		
G) Elevation of Wat	er Surface (NVGD)	: F-F	Calculation	s for Detei	rmination of	Z" Elevati	on	2.7
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(Note if I ≠ I ₂ withi	n ± 1.0 feet, discard	and resan	nple)					
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evatic	o SO	90	Jō.	Consistency	ıximu	ō	Sample IDs	
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Battelle	Project Name: Location: Client:	New B	ord Harbor ledford, MA ISACE NAE		ntal Monito	_	Vessel	G606422 : R/V Gale Force : Theresa Himmer/Alex Mansfield
Station ID:	C/ 24		Time On St		093	×		ements are ±0.1 feet
Core Sample ID:	7A-1124-00.	- 35	Northing (N		27048	51.1	Water Depti	
_ogged by:	M-V/MSh		Easting (NA		81503	10.1	_	ush core assembly (B):
Collection Mechanism:	Push-Core		GPS Accura		3.04	1		ce to top of handle (C):
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			Time Depar		-12-to	948	-	ce from surveyed elevation (F) : 3.0
G) Elevation of Wate	r Surface (NVGD)	: <i>E-F</i>	Calculation	is for Deter	mination o	Z Elevati	on	30
(H) Elevation of the bo	ottom of the core ((NVGD): G	- (B - C)					-7.5
z*) Elevation of visua	I transition (NVGD)): H + (dist	ance to visua	al transition)			-5.9
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ite:	7/31/67	,	Predicted T	-		manufatro esta	_	te to top of handle (C) : The equation of t
_	113:191		Time of Co	, ,	1015		-	evation (NVGD 29) (E):
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						***************************************	_	
) Elevation of Wate	er Surface (NVGD).		Calculation	s for Deter	rmination o	f Z* Elevati	on	2.8
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Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor ledford, MA ISACE NAE		ntal Monito	_		G606422 R/V Gale Force Theresa Himmer/Alex I	Mansfield
Station ID: Core Sample ID:	DD34 274-0034-	00 - 4	Time On St		1050 2704	<u> </u>	Water Depth		6.6
Logged by:	n walsu		Easting (NA		8150	79.4	- '	sh core assembly (B):	12.0 45-0.7 m
Collection Mechanism: Date:	Push-Core 7 / 3 / 1 / 0 7	~	_ GPS Accura Predicted T	-	7.0			re (from bottom) (D):	4.1
		······································	Time of Col		1101		-	evation (NVGD 29) (E):	A SECTION AND ADDRESS OF THE PARTY OF THE PA
			Time Depar	rt Station:	1109		Water surfac	ce from surveyed elevation	(F): 2.1
			Calculation	s for Deter	mination of	Z* Elevati	ion		
(G) Elevation of Wate	r Surface (NVGD): <i>E-F</i>						7.1	
(H) Elevation of the b	ottom of the core	(NVGD): G	- (B - C)					-92	
(z*) Elevation of visua	I transition (NVGI	D): H + (dista	ance to visu	al transition)			-7.4	
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(1 ₂) Elevation of the so				n water dep	th (NVGD): (G - A		-4.5	
(Note if I ≠ I ₂ within	± 1.0 feet, discar	and resam	ipie)						
Elevation (NVGD)	Lithology - Include USCS code			lency	um particle		IDs		
Elevati I.e. Bo	Litholog JSCS (Туре	Color	Consistency	Maximum p size	Odor	Sample IDs	Comme	nts
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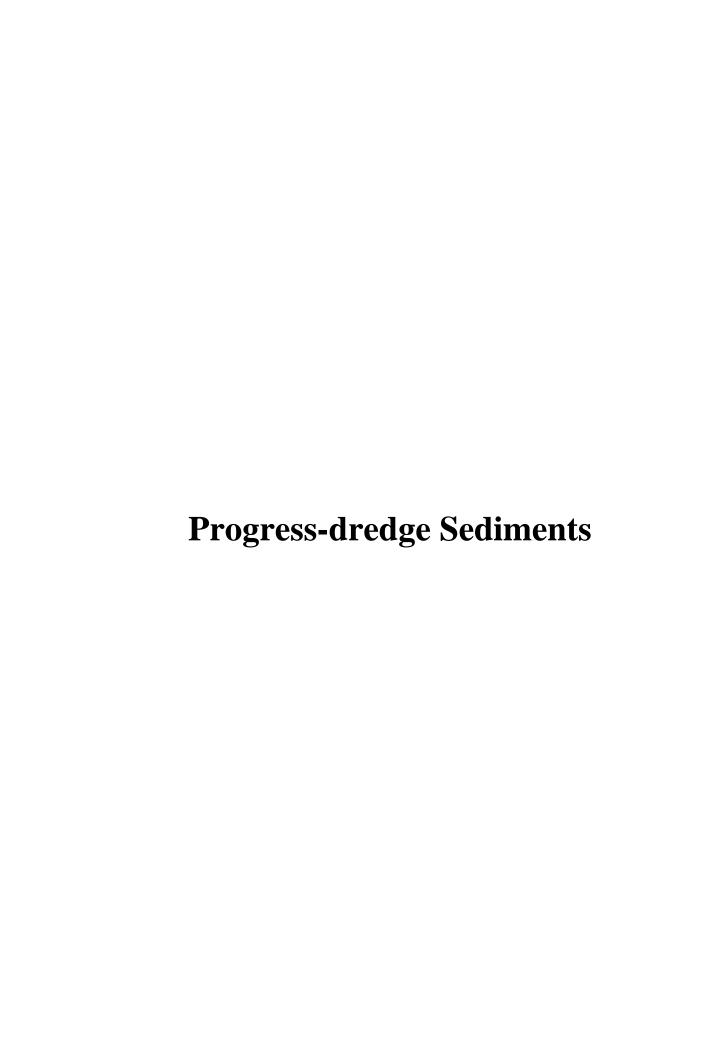
Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor i edford, MA SACE NAE	Environme	ntal Monito	_		G606422 R/V Gale Force Theresa Himmer/Alex Mansfield
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	14 74-6414- MJ Push-Core 7/31/07	00-19	Time On Sta Northing (NA Easting (NA GPS Accura Predicted Ti Time of Coll Time Depar	AD 83): D 83): acy: ide (ft): lection:	1125 24071 81556 2.6 1129 1133	164.3	Water Depth Length of put Water surface Length of cor Surveyed ele	ments are ± 0.1 feet (A): 3.0 sh core assembly (B): 5.5 re (from bottom) (D): 1.9 evation (NVGD 29) (E): 1.9 re from surveyed elevation (F): 1.7
(H) Elevation of the b(z*) Elevation of visua(I) Elevation of the se	or Surface (NVGD) ottom of the core (I transition (NVGD) ediment-water inte ediment-water inte	E - F NVGD): G): H + (distance as mentage as mentage)	- (B - C) nce to visua asured from asured from	al transition)	core (NVGD	i): H + D	on	1.7 -3.4 -2.4 -1.5 -1.3
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
0.0 =		Sit	Black olive gray	STAP	Sine fine			
ile ID of digital photograp comments: UA Gam Muto FD 101		u les	f Jun	265				

Battelle The Business of Innovation	Project Name: Location: Client:	New E	ford Harbor Bedford, MA JSACE NAE		ental Monito	_	Vessel	G606422 : R/V Gale Force : Theresa Himmer/Alex Mansfield		
Station ID:	WW C LY	0	Time On St	***************************************	1141	4		ements are ±0.1 feet		
Core Sample ID:	74-NWC-11) - 10	- Northing (N		230	11.30		425		
Logged by:	W-WAISH	<u>' </u>	Easting (NA	•	合してん	-7	Water Depth (A):			
Collection Mechanism:	Push-Core	-	_		7 1	A = 1	Length of push core assembly (B):			
-	7/31/0	7	GPS Accur		<u> </u>			ce to top of handle (C):		
Date:	7 1 71 10	<u>/</u>	Predicted T		11110		-	ore (from bottom) (D):		
			Time of Col		1140			evation (NVGD 29) (E):		
			Time Depai	t Station:	1130	3	Water surfa	ce from surveyed elevation (F):		
			Calculation	s for Dete	rmination o	f Z* Elevat	ion			
(G) Elevation of Wate	er Surface (NVGD):	F-F						and the same of th		
	,		· (D. O)				••••	_ = 7		
	ottom of the core (N		, ,					- 3.6		
(z*) Elevation of visua	I transition (NVGD)	: H + (dist	ance to visu	al transition)			-3.9		
(I) Elevation of the s	ediment-water inter	face as m	easured fron	n bottom of	core (NVGE	D): H + D		-3.4		
(I2) Elevation of the s	(I ₂) Elevation of the sediment-water interface as measured from water depth (NVGD							-3.3		
(Note if I ≠ I₂ within	± 1.0 feet, discard									
										
/GD)	Lithology - Include USCS code				icle					
Elevation (NVGD)	- Inc			γοί	Maximum particle size] s			
Elevation (I	S co			ister	l mu		l elc			
(l.e.	Litho	Туре	Color	Consistency	Maxi	Odor	Sample IDs	Comments		
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Battelle The Business of Innovation	Project Name: Location: Client:	New E	ford Harbor Bedford, MA JSACE NAE		ntal Monito	•		G606422 R/V Gale Force heresa Himmer/Alex Mansfield	
Station ID:	DD 44		Time On St		17.11	0.11		ents are ±0.1 feet	/
Core Sample ID:	-07A-70037-	00-37	Northing (N		X704	5205	Water Depth (7
Logged by:	M-Walsh		Easting (NA	•	8150	73.1		core assembly (B):	1
Collection Mechanism:	Push-Core	<u> </u>	GPS Accura	•	3.0	4	-	to top of handle (C) :	
Date:	7/31/	17	Predicted T	•				(from bottom) (D):	7_
Date.			Time of Col		122	0	_	ation (NVGD 29) (E):	and the sales of
			Time Depai		122	3	-	from surveyed elevation (F):	?
			Calculation		mination	f 7* Elovati	_		
(G) Elevation of Wat	er Surface (NVGD)	: E-F	Calculation	is for Deter	mmanon o	i Z Elevali	<i></i>	0.8	
(H) Elevation of the	bottom of the core (NVGD): G	i - (B - C)					-8.9	
. ,	al transition (NVGD			al transition)			-79	
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	sediment-water inte				•	•	1		
	sediment-water inte			n water dep	iii (NVGD):	G ~ A		-4.5	
(Note if I ≠ I ₂ within	n ± 1.0 feet, discard	and resam	nple)						
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Elevation (NVGD)	Lithology - Include USCS code			ζ	Maximum particle size		8		
ation	logy S cor	_		Consistency	En E		Sample IDs		
Elev (I.e.	Litho	Туре	Color	Cons	Maxi	Ogo	Samı	Comments	
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e Business of Innovation	Location Client		Bedford, MA JSACE NAE			_		R/V Gale Force Theresa Himmer/Alex Mansfield			
tation ID:	0032		Time On S	tation:	0855	998		ments are ±0.1 feet			
ore Sample ID:	5-075-00	a2-00-	 	IAD 83):	27048	97.04	Water Depth	21	1		
ogged by:	M. Walsh	***************************************	Easting (NA		8150	75,54			1		
ollection Mechanism:	Push-Core		GPS Accur	•	2.16	2 Congar of paori core assertibly (b).					
ate:	\$123/07		Predicted T		Address of the			A 13	-		
-	3, 1 3, 4 1	······································			0901		-	(non-socioni) (b).	\dashv		
			Time of Co					evation (NVGD 29) (E):	-		
			Time Depa	rt Station:	0905		Water surfac	e from surveyed elevation (F):	1		
G) Elevation of Water	er Surface (NVGD)· F-F	Calculation	ns for Deter	mination o	Z* Elevati	ion	-0.3			
	·	•	(F. C)					99-900	1		
	ottom of the core	,	` ′					70.1	-		
*) Elevation of visua	al transition (NVGI	D): H + (dist	ance to visu	al transition,)				_		
Elevation of the s	ediment-water into	erface as m	easured fror	n bottom of	core (NVGE): H + D	-		6.6		
2) Elevation of the s	ediment-water inte	erface as m	easured fror	n water dep	th (NVGD):	G - A		-1.2	T		
(Note if I ≠ I ₂ within	± 1.0 feet, discar	d and resan	nple)								
T	I	T	T		T				4		
Elevation (NVGD)	Lithology - Include USCS code				ticle						
(N) =	de - Inc			l cy	part		s				
atior	ogy coc			sten	unu Unu		е П		ı		
Elevation (I	orti-	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments			
2.4					20	<u> </u>	0	Comments	1		
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Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor edford, MA SACE NAE		ntal Monito			G606422 R/V Gale Force Theresa Himmer/Alex Mansfield		
Station ID:	PH33		Time On St		0910			ments are ±0.1 feet		
Core Sample ID:	5-07B-HH2	7-40-2	Northing (N			899.0	Water Depth	** 1		
· · · · · · · · · · · · · · · · · · ·	M.Walsh	K VO A			01C13	4.38	•	sh core assembly (B):		
Logged by:		***************************************	Easting (NA		1.98	3 - 70		and the same of th		
Collection Mechanism:	Push-Core	1	GPS Accura	-	1.10		-	e to top of handle (C):		
Date:	812310	<u> </u>	Predicted T		0913		-	re (from bottom) (D):		
			Time of Col				•	vation (NVGD 29) (E):		
			Time Depar	t Station:	0918		Water surfac	e from surveyed elevation (F):		
			Calculation	e for Deter	mination of	7* Elovatio	20			
			Calculation	3 IOI Deter	iiiiiiatioii oi	Z Lievain	<i>311</i>	- O.6		
(G) Elevation of Wat	er Surface (NVGD)	: <i>E-F</i>						0.0		
(H) Elevation of the t	bottom of the core (NVGD): G	- (B - C)					- 8.4		
(z*) Elevation of visu	(z*) Elevation of visual transition (NVGD): H + (distance to visual transition)									
59										
 (I) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D (I₂) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A 										
(2 /				т магет церг	in (NVGD):	u-A		-5.7		
(Note if I ≠ I₂ within	n ± 1.0 feet, discard	and resam	ple)							
	o o				_					
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size					
N) u	de -			ncy	n pa		മ			
Elevation (N	S cc			Consistency	un m		Sample IDs			
Elev (1.e.	Liffe	₹ype	Color	Con	Max size	Odor	Sam	Comments		
2.5		silt	Black	10058	FILL					
1.7	Maryellar Carriera, Aggree.					······································	arban			
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A 1/2										
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Comments:										

The Business of Innovation	Project Name Location Client	: New I	tora Harbor Bedford, MA USACE NAE	1	antai Monit	_	Vessel	G606422 : R/V Gale Force	
station ID:	FF 23	•	Time On S		0921	On:		: Theresa Himmer/Alex Mansfield	
Fore Sample ID: 5	-078-FFX	3-00-2				376.25	Water Depti	ements are ±0.1 feet	
ogged by:	M. Walsh	<u>, 179 ac</u>	Easting (N		81613	$\frac{1}{2}$		7.0 *	
ollection Mechanism:	Push-Core		GPS Accur	,	3.0	3	Length of push core assembly (B): 11. 0 Water surface to top of handle (C): 4.5		
rate:	512310		Predicted 1	-				are (from bottom) (D):	
		ž	Time of Co		092	3		evation (NVGD 29) (E):	
			Time Depa		097	8	-	ce from surveyed elevation (F):	
			Calculation	se for Doto	rmination a	4 7* Flaveti			
G) Elevation of Wate	r Surface (NVGD): <i>E-F</i>	Carculation	is for Deter	mmation o	n Z Elevali	OII	-0.7	
H) Elevation of the bo	ottom of the core	(NVGD): G	G - (B - C)					- 2	
*) Elevation of visua				al transition	1		******		
								7.7	
 Elevation of the set Elevation of the set 								4/	
I_2) Elevation of the sediment-water interface as measured from water depth (NVGD): $G - A$ (Note if $I \neq I_2$ within \pm 1.0 feet, discard and resample)								-1.0	
(Note if 1 # 12 Within	± 1.∪ ieet, discari	u and resan	nple)				-		
30)	apr				읒				
Elevation (NVGD)	Lithology - Include USCS code) ò	Maximum particle size		s		
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Elev.	Lifthol	Туре	Color	Consistency	Maxir	Odor	Sample IDs	Comments	
1.5		Silt	Black	1001	File		0)	Comments	
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Battelle The Business of Innovation	Project Name: Location: Client:	New Be	rd Harbor edford, MA SACE NAE		ntal Monito			G606422 R/V Gale Force Theresa Himmer/Alex Mansfield
Station ID:	0034		Time On St		1000	>	All measure	ments are ±0.1 feet
Core Sample ID:	5-0713-0024 -	00 785	Northing (N		27048	145,7	Water Depth	
ogged by:	M. Walsh		Easting (NA		81507	4.8	•	sh core assembly (B):
Collection Mechanism:	Push-Core		GPS Accura		2.57	}	•	e to top of handle (C):
ate:	8/23/n7		Predicted T	•	Canadanananananananananan	woods.	- _Length of cor	e (from bottom) (D):
			Time of Col	lection:	1002		_ Surveyed ele	vation (NVGD 29) (E):
			Time Depar	t Station:	1009		Water surfac	e from surveyed elevation (F):
(H) Elevation of the	ter Surface (NVGD)	: <i>E - F</i> NVGD): <i>G</i> -	· (B - C)		mination of	Z* Elevatio	on	-0.4 -8.8
(z*) Elevation of visu	al transition (NVGD): H + (dista	nce to visu	al transition))		***************************************	<u> </u>
′	n of the sediment-water interface as measured from bottom of core (NVGD): $H + D$							-43
I_2) Elevation of the	sediment-water inte	rface as me	asured fror	n water dep	th (NVGD):	G - A		-5.9
(Note if I ≠ I₂ withi	$n \pm 1.0$ feet, discard	and resamp	ole)					
				T	T	1	1	
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
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Baffelle	Project Name: Location: Client:	New B	ord Harbor edford, MA ISACE NAE		ental Monito	_		G606422 R/V Gale Force Theresa Himmer/Alex Mansfield				
Station ID:	FFAG		Time On St	ation:	0934		All measure	ments are ±0.1 feet				
Core Sample ID:	-078-FF26-0	10 - 17	- Northing (N		27047	98.26	Water Depth	A- A				
Logged by:	M. Uzlah		Easting (NA		61512	5.86	· · · · · · · · · · · · · · · · · · ·					
Collection Mechanism:	Push-Core		GPS Accur		2.0	3	Water surface to top of handle (C):					
Date:	8/23/07		Predicted T	•				re (from bottom) (D):				
Jate.	<u> </u>		-		09 37		-					
			Time of Col		0941		_	evation (NVGD 29) (E):				
			Time Depai					e from surveyed elevation (F):				
(G) Elevation of Wate	er Surface (N V GD):		Calculation	s for Dete	rmination of	Z* Elevati	ion	-0.6				
			/B (C)					. 75				
(H) Elevation of the b	ottom of the core (N	NVGD): G	- (B - C)		***							
(z*) Elevation of visua	ation of visual transition (NVGD): H + (distance to visual transition)											
(I) Elevation of the se	ediment-water inter	face as me	easured fron	n bottom of	core (NVGD): <i>H + D</i>	H+D					
(I ₂) Elevation of the se	ediment-water inter	face as me	easured fron	n water der	oth (NVGD): (G - A		-5.6				
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resam	ple)			*						
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size							
N) L	ge -			Jon John John John John John John John J	n par		SO					
/atio	s cc		_	Consistency	E E	_	Sample IDs					
Elevation (N	Litho USC	Туре	Color	Con	Maxi	Odor	Sam	Comments				
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Battelle The Business of Innovation	Project Name: Location: Client:	New Bed	d Harbor E Iford, MA ACE NAE	nvironmen	tal Monitori	•		G 606422 R/V Gale Force Theresa Himmer/Alex Mansfield
Station ID:	G6 75	-	Time On Sta	tion:	0944		All measuren	nents are ±0.1 feet
Core Sample ID:	-0713-662	5-00-181	Northing (NA	ND 83):	27048	373-70	Water Depth (A):
Logged by:	M. Walsh		Easting (NAI		61514	A. 13 A		n core assembly (B):
Collection Mechanism:	Push-Core	(GPS Accura	cy:	2-66	>	Water surface	to top of handle (C):
Date:	8123107		Predicted Tid	-	Ownerson	and the same of th	Length of core	e (from bottom) (D):
			Time of Colle	-	0947	Surveyed elev	ration (NVGD 29) (E):	
			Time Depart	_	0951		Water surface	from surveyed elevation (F):
				_				
		С	alculation	s for Detern	nination of I	Z* Elevatio	on	\$
(G) Elevation of Water	er Surface (NVGD)	: E-F						-0.4
(H) Elevation of the b	ottom of the core (NVGD): G-	(B - C)					-7.3
(z*) Elevation of visua	al transition (NVGD): H + (distan	nce to visua	l transition)				-5.8
-5.5								
	ediment-water inte ediment-water inte							-5.4
(2)				i water depti	r (ITT GD). C	, ,,		<u> </u>
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resamp	le)					
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NVG #	noln			>	artic		, n	
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Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	0
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Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor i edford, MA SACE NAE	Environme	ental Monitor			G606422 R/V Gale Force Theresa Himmer/Alex Mansfield		
Station ID:	0027		Time On Sta	ation:	1015		All measure	ments are ±0.1 feet		
Core Sample ID:	5-076-000	7-102-22	_Northing (N/		27047	70.7	Water Depth	(A): 56		
Logged by:	M. WAISh	<u> </u>	Easting (NA	•	815074-58			sh core assembly (B):		
Collection Mechanism:	Push-Core		GPS Accura		3.52	IV	-	e to top of handle (C): $\frac{243.0}{}$		
	8123107		Predicted Ti	•		uprorf.	_	2722		
Date:	<u> </u>		Time of Coll	` '	102/ 107	14	Length of core (from bottom) (D): Surveyed elevation (NVGD 29) (E):			
						<u> </u>	-	- N - 2		
			Time Depar	t Station,	19/7		_ water surfac	e nom surveyed elevation (*).		
 (H) Elevation of the (z*) Elevation of vis (I) Elevation of the (I₂) Elevation of the 	ater Surface (NVGD) e bottom of the core (sual transition (NVGD) e sediment-water inte e sediment-water inte hin ± 1.0 feet, discard	: E - F NVGD): G): H + (distanta as mentace as menta	- (B - C) ance to visual easured from easured from	s for Dete	core (NVGD)): H + D		e from surveyed elevation (F): A 5.3 -0.3 -1.9 -1.1 -5.9 Comments		
File ID of digital photog	graph(s):	L]	L		<u> </u>		1		
Comments: 15 Afternat A										

Battelle Business of Innovation	Project Name: Location: Client:	New Be	rd Harbor E dford, MA SACE NAE	invironmei	ntal Monitori			6606422 R/V <i>Gale Force</i> heresa Himmer/Alex Ma	ınsfield			
	DV31		Time On Sta	tion:	10Y2		All measurem	ents are ±0.1 feet				
tation ID:	5-073-0031	- AA- 2U			220u6	74.9	Water Depth (A		5.6			
ore Sample ID:		OD WI	Northing (NA		61CV3	4.9	-	core assembly (B):	11.0			
ogged by:	Melaun		Easting (NAI		7.9	71.7	-		2.4			
ollection Mechanism:	Push-Core		GPS Accura	-	4.7		-	to top of handle (C):	2H			
ate:	8123107		Predicted Tic	de (ft):				(from bottom) (D):	<u> </u>			
			Time of Colle	ection:	1044		_ ′	ation (NVGD 29) (E):	- 29			
			Time Depart	Station:	1050		_Water surface	from surveyed elevation (F): <u> </u>			
			Calculations	s for Deter	mination of	Z* Elevati	on	-0.3	. 1997 - 1201 - 1			
	ater Surface (NVGD):							6 9	* p. '			
H) Elevation of the	bottom of the core (NVGD): G -	(B - C)					- 0, 1				
z*) Elevation of vis	ual transition (NVGD): H + (dista	nce to visua	l transition,)	-8.1						
) Elevation of the	sediment-water inte	rface as me	asured from	bottom of	core (NVGD)	: H + D		-6.5				
	e sediment-water inte						****	-5.9				
	nin ± 1.0 feet, discard				,			3/ 2 3				
<u> </u>												
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size							
/ation (NVGE Bottom = H)	de no			ncy	n pa		Ds					
atior 30ttc	logy S co		<u></u>	Consistency	un u	<u>.</u>	Sample IDs					
Elev (I.e. I	Litho	Туре	Color	Con	Max sìze	Odor	Sam	Commen	s			
2-4		514	Black	10056	CW							
		~ `	ν.	4	7/1/							
0.8-		Clay	nii.d	7-14		The Madaman	Anagamental .	Andrewson Newsonian State of Security S				
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Battelle The Business of Innovation	Project Name Location Client	: New E	ford Harbor Bedford, MA JSACE NAE	1	ental Monit		Vessel	G606422 I: R/V Gale Force I: Theresa Himmer/Alex Mansfield		
Station ID:	FFRR		Time On S		1057			ements are ±0.1 feet		
Core Sample ID: 5	-07B-FF28	'-10 - 1º	Northing (N			736.7	Water Dept	3. /2/		
Logged by:	M. Walsh	2	Easting (N		F 2 - C	0.2		ush core assembly (B): 11-0		
Collection Mechanism:	Push-Core		_ GPS Accur		2-10	3		ice to top of handle (C): 4.7		
Date:	8/23/0	2	Predicted 1			*		ore (from bottom) (D):		
		<i></i>	Time of Co		1057	ļ	_	evation (NVGD 29) (E):		
			Time Depa		1100		-	ce from surveyed elevation (F):		
			тино Вора	otation.	_11.72		water suria	ce nom surveyed elevation (F).		
			Calculation	ns for Dete	rmination o	f Z* Elevat	ion			
(G) Elevation of Water Surface (NVGD): E - F										
(H) Elevation of the bottom of the core (NVGD): G - (B - C)										
- 2										
(I) Elevation of the sediment-water interface as measured from bottom of core (NVGD): $H + D$ (I ₂) Elevation of the sediment-water interface as measured from water depth (NVGD): $G - A$								-4.9		
(I ₂) Elevation of the se	diment-water inte	erface as mo	easured fror	n water dep	th (NVGD):	G - A		4.9		
(Note if I ≠ I₂ within :	± 1.0 feet, discard	d and resam	ple)							

6	o)									
Elevation (NVGD)	Lithology - Include USCS code				ticle					
N) E	F eg			ncy	n par		Sa			
vation (N) S S	m		Consistency	l mnu		Sample IDs			
	Lithe	Туре	Color	Con	Maximum particle size	Odor	Sam	Comments		
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omments;										

Station ID. Core Sample ID:	The	Battelle Business of Innovation	Project Name Location Client	: New E	ord Harbor Bedford, MA JSACE NAE		ental Monito		Vessel	G606422 I: R/V Gale Force I: Theresa Himmer/Alex Mansfield
Core Sample 10: 5-078-FE32-60-3 Northing (NAD 8): 270 4 GU C Legged by P. WALS C PubCore GR Accuracy Public PubCore GR Accuracy Predicted Tian (IV): 1-0 Time of Collection Time Dupur Station: 1-0 Time of Collection Time Dupur Station: 1-0 Time Dupur Station:	Stat	tion ID:					1109	0111		
Logged by: Collection Mechanism: PALMA SA Easting NAD 68)	l			2-00-2			20 m A .	641. G		
Calculation Mechanism: Public Core	l			<u> </u>	-	,	F-285 4 2	2 112 - 7		3.4
Date: S		• ′					1.47	3	-	
Time of Collection: Time Depart Station Time Depart Station Calculations for Determination of Z* Elevation Calculations for Determination of Z* Elevation Calculations for Determination of Z* Elevation (G) Elevation of Water Surface (NVGD): 6 - (B - C) (Z) Elevation of the bottom of the core (NVGD): 7 - 3 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 -	l	•								
Calculations for Determination of 2" Elevation	"	-	0127107		•••		1112	~~	_	
Calculations for Determination of 2° Elevation (G) Elevation of Water Surface (NVGD): E-F (H) Elevation of the bottom of the core (NVGD): G - (B - C) (Z°) Elevation of visual transition (NVGD): H + (distance to visual transition) (B) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D (C) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I # Iz within = 1.0 feet, discard and resample) (C) Fig. 1							100			
(G) Elevation of the bottom of the core (NVGD); E - F (H) Elevation of the bottom of the core (NVGD); H + (distance to visual transition) (I) Elevation of the sediment-water interface as measured from bottom of core (NVGD); H + D (I ₂) Elevation of the sediment-water interface as measured from water depth (NVGD); G - A (Note if I ≠ I ₂ within ± 10 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD); G - A (Note if I ≠ I ₂ within ± 10 feet, discard and resample) (I ₃) Elevation of the sediment-water interface as measured from water depth (NVGD); G - A (Note if I ≠ I ₂ within ± 10 feet, discard and resample) (I ₄) Elevation of the sediment-water interface as measured from water depth (NVGD); G - A (Note if I ≠ I ₂ within ± 10 feet, discard and resample) (I ₄) Elevation of the sediment-water interface as measured from water depth (NVGD); G - A (Note if I ≠ I ₂ within ± 10 feet, discard and resample) (I ₅) Elevation of the sediment-water interface as measured from bottom of core (NVGD); H + D (I ₅) Elevation of the sediment-water interface as measured from bottom of core (NVGD); H + D (I ₅) Elevation of the sediment-water interface as measured from bottom of core (NVGD); H + D (I ₅) Elevation of the sediment-water interface as measured from bottom of core (NVGD); H + D (I ₅) Elevation of the sediment-water interface as measured from bottom of core (NVGD); H + D (I ₅) Elevation of the sediment-water interface as measured from bottom of core (NVGD); H + D (I ₅) Elevation of the sediment-water interface as measured from bottom of core (NVGD); H + D (I ₅) Elevation of the sediment-water interface as measured from bottom of core (NVGD); H + D (I ₅) Elevation of the sediment-water interface as measured from water interface as measured from water interface as measured from water interface as measured from water interface as measured from water interface as measured from water interface as measured from water interface as measu					i ime Depai	nt Station:			_Water surfa	ce from surveyed elevation (F):
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(27) Elevation of visual transition (NVGD): H + (distance to visual transition) (8) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D (8) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (9) Fig. 10 Fig. 1	l ` ´		·	,						S - 2
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(Note if I × I ₂ within ± 1.0 feet, discard and resample) (Note if I × I ₂ within ± 1.0 feet, discard and resample) (Note if I × I ₂ within ± 1.0 feet, discard and resample) (Note if I × I ₂ within ± 1.0 feet, discard and resample) (Note if I × I ₂ within ± 1.0 feet, discard and resample) (Note if I × I ₂ within ± 1.0 feet, discard and resample) (Note if I × I ₂ within ± 1.0 feet, discard and resample) (Note if I × I ₂ within ± 1.0 feet, discard and resample) (Note if I × I ₂ within ± 1.0 feet, discard and resample) (Note if I × I ₂ within ± 1.0 feet, discard and resample) (Note if I × I ₂ within ± 1.0 feet, discard and resample) (Note if I × I ₂ within ± 1.0 feet, discard and resample)	(z*)	Elevation of visua	al transition (NVGI	D): H + (dist	ance to visu	al transition,)			7.4
(Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample)	(1)	Elevation of the s	sediment-water inte	erface as m	D): H + D		-6.1			
Tity of digital photograph(s). Comments Condition photograph(s).	(12)	Elevation of the s	sediment-water into	erface as m	G - A		- 5 9			
Tity of digital photograph(s). Comments Condition photograph(s).							<u> </u>			
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Page ____ of _

Battelle	Project Name: Location:		ord Harbor Bedford, MA		ental Monito		Vessel	G606422 : R/V Gale Force
The Business of Innovation	Client:	U	ISACE NAE			Chi	ef Scientist	: Theresa Himmer/Alex Mansfield
Station ID:	8633	7 11: 5	_ Time On St		1120	2 8 53 42 5		ements are ±0.1 feet
Core Sample ID:	5-07B-663	9-00-3		,	X+0°		Water Depth	å
Logged by:	M-walsh		_ Easting (NA	AD 83):		49.B	_Length of pu	ush core assembly (B):
Collection Mechanism: _	Push-Core	7	_ GPS Accur	acy:	1.0	<i>)</i> <u>d</u>	_Water surfa	ce to top of handle (C):
Date:	8/23/0	<u>† </u>	Predicted T	ide (ft):		would be a second of the secon	_Length of co	ore (from bottom) (D):
			Time of Col	llection:	1123		_Surveyed ele	evation (NVGD 29) (E):
			Time Depar	rt Station:	1126	,	_Water surfac	ce from surveyed elevation (F):
			Calculation	s for Deter	mination o	f 7* Flevati	On.	
(G) Elevation of Wate	r Surface (NVGD)				,,,,,,,,,,,,,,,,,,		<i>-</i>	-0.2
	, ,			~ ~ ~				
(H) Elevation of the b	ottom of the core (
(z*) Elevation of visua	l transition (NVGD		-6.5					
(I) Elevation of the se	ediment-water inte		-4# s165.4 TH					
(I_2) Elevation of the s	ediment-water inte		~5.2					
(Note if I ≠ I₂ within	± 1.0 feet, discard		· · · · · · · · · · · · · · · · · · ·					
					T	1		
Elevation (NVGD)	Slude				ticle			
vation (NVGE	de -) 20) par		SO	* .
vatio	S co	a	L.	Consistency	Maximum particle size		Sample IDs	
	Lithology - Include USCS code	Туре	Color	Con	Max size	Odor	Sam	Comments
2.1		-14	Black	10056	F.W			
		silt	Ow	10000	7,04			
1.0	and the second s		Name Person				#200 manus Suspens	
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		C 15/	907	SHA	10.00			
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ile ID of digital photograpi	n(s):	1						A-1-1
Comments:	i(o).				***************************************			

Battelle	Project Name: New Bed Location: New I	ford Harbor Environme Bedford, MA	ental Monitoring	Project #: G606422 Vessel: R/V Gale Force	
The Business of Innovation		USACE NAE	Ch	ief Scientist: Theresa Himmer	/Alex Mansfield
Station ID:	6629	Time On Station:	1130	All measurements are ±0.1 fee	
Core Sample ID:		Northing (NAD 83):	3704717.3	Water Depth (A):	4.3
Logged by:	M-Walsh	Easting (NAD 83):	<u> 815 149 4 </u>	Length of push core assembly (E	
Collection Mechanism: _	Push-Core	GPS Accuracy:	1:64	Water surface to top of handle (C	p): 4.1
Date:	8173107	Predicted Tide (ft):		Length of core (from bottom) (D)	: <u>2.7</u>
		Time of Collection:	<u> 1132 </u>	Surveyed elevation (NVGD 29) (A	E):
		Time Depart Station:	_11.38	Water surface from surveyed ele	vation (<i>F</i>):
		Calculations for Deter	raination of 7* Flores		
		Calculations for Deter	mination of Z" Elevat	2	
(G) Elevation of Wate	r Surface (NVGD): E - F			-0.3	2
(H) Elevation of the bo	ottom of the core (NVGD): (G - (B - C)		* * 1	
(z*) Elevation of visua	I transition (NVGD): H + (dis	tance to visual transition)	-5.5	
(I) Elevation of the se	ediment-water interface as m	easured from bottom of	core (NVGD): H + D	-4.9	*
i .	ediment-water interface as m			-4.5	
(Note if I ≠ I₂ within	± 1.0 feet, discard and resar	nple)			
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aVGD)	lude		cle		
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vation (N	y coc s	sten	E I		
Elevation (NVGD) (i.e. Bottom = H)	Lithology - Include USCS code	Color	Maximum particle size Odor	Sample IDs	omments
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Battelle The Business of Innovation	Project Name Location Client	New E	ord Harbor ledford, MA ISACE NAE		ntal Monito			G606422 R/V Gale Force Theresa Himmer/Alex	Mansfield
Station ID:	KK 32		Time On St		1150			ments are ±0.1 feet	
Core Sample ID:	5-07B-KK	Q-00H)				649.8	Water Depth		6.5
Logged by:	M-Wassh		∉ Easting (NA		8152	47.3		` '	11.0
Collection Mechanism:	Push-Core		GPS Accur	•	1,4	4			
Date:	812310	7	- Predicted T	•			Water surface to top of handle (C):		
_			Time of Col		1153		- -	vation (NVGD 29) (E):	4
			Time Depai		1154		_	e from surveyed elevation	(F): "A.)
					mination of	7* Floveti			
(G) Elevation of Wate	r Surface (NVGD		Curculation	is for Belef	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	L Lievain		-O.)	
(H) Elevation of the bo	ottom of the core	(NVGD): G	- (B - C)					- 9.2	
(z*) Elevation of visua				al transition	١		V-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1		
	•			,				1 (2)	
(I) Elevation of the se							***************************************	<u> </u>	
(I ₂) Elevation of the se	eaiment-water inte	ertace as me	easured fron	n water dep	th (NVGD):	Gi - A		-6.6	
(Note if I ≠ I₂ within	± 1.0 feet, discard	d and resam	iple)						
Elevation (NVGD)	Lithology - Include USCS code	90	ior	Consistency	Maximum particle size	or	Sample IDs		
	三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三三	Туре	Color	<u> </u>	Ma	Odor	Sai	Comme	nts
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omments:									***************************************

Battelle	Project Name: New Bed Location: New E	ord Harbor Environm Bedford, MA	ental Monitoring	Project #: G606422	WE W. S. A. M. J
The Business of Innovation		ISACE NAE	Ch	Vessel: R/V Gale Force ief Scientist: Theresa Himmer/	Alex Mansfield
Station ID:	1573	Time On Station:	1703	All measurements are ±0.1 feet	
	09B-JJ23-00-6	Northing (NAD 83):	2704873.5	Water Depth (A):	5-25.4
Logged by:	· WAISh	_ Easting (NAD 83):	615 RA4.3	Length of push core assembly (B)	
Collection Mechanism:	Push-Core	_ GPS Accuracy:		Water surface to top of handle (C): 3229
Date:	5123107	Predicted Tide (ft):	***************************************	Length of core (from bottom) (D):	<u> </u>
		Time of Collection:	1365 1310	Surveyed elevation (NVGD 29) (E):
		Time Depart Station:	1318	Water surface from surveyed elev	ration (F):
		Calculations for Dete	rmination of Z* Elevat	ion	
(G) Elevation of Water S	urface (NVGD): E - F			-0.1	
1	, ,	(56)		-8.2	
	om of the core (NVGD): G				· · · · · · · · · · · · · · · · · · ·
(z*) Elevation of visual tra	ansition (NVGD): H + (dist	ance to visual transitior	1)	-6.6	
i	ment-water interface as m			-5.9	
(I ₂) Elevation of the sedir	nent-water interface as m	easured from water dep	oth (NVGD): G - A	-5.5	
(Note if I ≠ I ₂ within ± 1	.0 feet, discard and resan	nple)			
- Co	og l		0		
vation (NVGE	l ogno		artick		
ion (f	gy - II	lency	ă E	Ds	
Elevation (NVGD)	Lithology - Include USCS code	Color	Maximum particle size Size Odor	Sample IDs	
2.3	158 E		Siz Siz	See Co	omments
		gray loose	Trim 1		vancation
1.6-1			Section 1 Section 2		1.6 to 2.3
		olivi firm	Girl		1-6 70
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0.0					
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I File ID of digital photograph(s):		<u> </u>	<u> </u>	
Comments: 15t Affangt N/G					
1. 44.4. 10/0					
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Battelle The Business of Innovation	Project Name: Location: Client:	New Be	rd Harbor I edford, MA SACE NAE	Environme	ntal Monito			G606422 R/V Gale Force Theresa Himmer/Alex Mansfield		
	V V 27		Time On Sta		1226	Offic	All measurements are ±0.1 feet			
Station ID:	-07B-KK2	1-11-21	Northing (NA			942.1	Water Depth	# 11		
Core Sample ID:	M. Walsh	1 VV A	Easting (NA			20. I	•	sh core assembly (B):		
Logged by:			GPS Accura		C/ 142 9000 0	25		e to top of handle (C):		
Collection Mechanism:	Push-Core			-	4947		•	7 12		
Date:	<u> </u>		Predicted Ti		1229		•	re (from bottom) (D):		
			Time of Coll		1233	2	•	vation (NVGD 29) (E): e from surveyed elevation (F):		
			Time Depar	t Station:	177	<u> </u>	water surfac	e from surveyed elevation (F).		
			Calculation	s for Deter	mination of	Z* Elevation	on			
(G) Elevation of Wate	er Surface (NVGD):	F.F						0		
			(D. 0)					82 SIB - 8.2 TH		
	ottom of the core (
(z*) Elevation of visua	al transition (NVGD): H + (dista	nc e to visua	al transition)	ı			-1.0		
(I) Elevation of the s	ediment-water inte	rface as me	asured from	bottom of	core (NVGD): H + D		-5.8		
(I ₂) Elevation of the s	ediment-water inte	rface as me	asured from	n water dept	th (NVGD):	G - A		-5.4		
(Note if I ≠ I₂ within	± 1.0 feet, discard			44						
_								<u></u>		
uvGD)	apn				icle e					
N) = =	ele de			JCy	parl		SC			
vation (N	logy S coc			ister	E E		Ji elc			
Elevation (NVGD)	Lithology - Include USCS code	Type	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments		
7.4		31TF	Black		~ 0			Oommone		
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Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor I edford, MA SACE NAE	Environmei	ntal Monito			G606422 R/V Gale Force Theresa Himmer/Alex Mansfield
Station ID:	7179		Time On Sta	ation:	1749			ments are ±0.1 feet
Core Sample ID:	5-6713-306	19-00-2	Northing (NA		2704	724.3	Water Depth	pr 19
Logged by:	M-walsh	~	Easting (NA		8152	26.1	•	sh core assembly (B):
Collection Mechanism:	Push-Core		GPS Accura		2.	14	•	te to top of handle (C):
Date:	812310	7	Predicted Ti	-			•	re (from bottom) (D):
Date.	212110		Time of Coll	• •	1201	1256	•	evation (NVGD 29) (E):
			Time Depart		12.54	1,, 20	•	se from surveyed elevation (F):
			rime Depar	olulion.	1021		- *************************************	o non-out-of-condition (1)
			Calculation	s for Deter	mination of	Z* Elevation	on	
(G) Elevation of Water	er Surface (NVGD)	: E-F						0.2
(H) Elevation of the t	oottom of the core (NVGD): G	- (B - C)					-8.4
				nt tunnnitinn)				-7.6
	al transition (NVGD							3.5
· ' '	sediment-water inte				•	•		
(I ₂) Elevation of the s	sediment-water inte	rface as me	easured from	n water dept	th (NVGD):	G - A		-5.4
(Note if I ≠ I₂ within	n ± 1.0 feet, discard	l and resam	ple)					
Elevation (NVGD)	Lithology - Include USCS code			ency	Maximum particle size		IDs	
vatic	ologi SS o	o o	'n	Consistency	xim u	, io	Sample IDs	
	in Sign	Туре	Color	Ö	Ma	Odor	Sar	Comments
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Battelle The Business of Innovation	Project Name: Location: Client:	New Bedi		Environmer	ntal Monitor			G606422 R/V Gale Force Theresa Himmer/Alex Mansfield
Station ID:	1576	Т	ime On Sta	ition:	1300		All measurer	nents are ±0.1 feet
Core Sample ID:	-0715-JJ 26-1	10-22 N	orthing (NA	AD 83):	2704	789.2	Water Depth	(A): 5.6
Logged by:	Mulsh		asting (NAI		815 7	12.6	Length of pus	h core assembly (B):
Collection Mechanism:	Push-Core		PS Accura		2.08	3	Water surface	e to top of handle (C):
Date:	8/23/07	 Р	redicted Tid	de (ft):			Length of core	e (from bottom) (D):
-		т.	ime of Colle	ection:	1306 13	311	Surveyed ele	vation (NVGD 29) (E):
		Т	ime Depart	Station:	1315		Water surface	e from surveyed elevation (F): 103
			lculation:	s for Deteri	mination of	Z* Elevatio	on	x 0.3
(G) Elevation of Water	er Surface (NVGD):	E-F						7.0
(H) Elevation of the b	oottom of the core (f	NVGD): G - (I	B - C)					77
(z*) Elevation of visua	al transition (NVGD)	: H + (distanc	e to visua	ıl transition)				<u> </u>
(I) Elevation of the s	sediment-water inter	face as meas	ured from	bottom of	core (NVGD)): H + D		5.7
(I2) Elevation of the s	sediment-water inter	face as meas	ured from	water dept	h (NVGD): 0	3 - A		-5.3
(Note if I ≠ I ₂ within	n ± 1.0 feet, discard	and resample	;)					
Q (9 D				कं			
Elevation (NVGD)	Lithology - Include USCS code			<i>≳</i>	Maximum particle size		y	
tion (- vgg			Consistency	un.		Sample IDs	
leva e. B	scs	Type	Color	onsi	laxim	Odor	amp	Comments
7.2			o OncK		6.5	0	S I	Comments
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1.6	to appropriate appropriate.			gardinatures (anti-circle)	page-1900as, material	Person poppipanganan-	and the same of th	And a conditionary
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	Batte			oject Name: Location:		ord Harbor i edford, MA	Environme	ntal Monito	ring	Project #: Vessel:	G606422 R/V Gale Force	
The I	Business of I	nnov	ation	Client:	υ	SACE NAE			Chie	f Scientist:	Theresa Himmer/Alex Mansfield	
Stat	ion ID:		بلار	4 88	64 21	Time On Sta	ation:	1427	600 per 3 1 p	All measure	ments are ±0.1 feet	
Core	e Sample I	D:	·	B-HH28	-00 = 16	Northing (N	AD 83):	2704	1914 2914	Water Depth		
Logg	ged by:		M.1	walsh		Easting (NA	D 83):	8151	14.2	Length of pu	sh core assembly (B):	
Colle	ection Mec	hani		Push-Core		GPS Accura	icy:	3.1	<u> </u>	Water surface to top of handle (C):		
Date	e:		8	23/67	<u></u>	Predicted Ti	ide (ft):	**************************************		Length of cor	re (from bottom) (D):	
						Time of Coll	ection:	1479		Surveyed elevation (NVGD 29) (E):		
]						Time Depar	t Station:	1434		Water surfac	e from surveyed elevation (F) ⁻	
						6	<i></i>		7÷ F1			
]						Calculation	s for Deter	mination of	Z Elevatio	on	+0.9	
(G)	Elevation	n of	Water Sur	face (NVGD)): <i>E-F</i>						20	
(H)	Elevation	n of	the bottom	of the core	(NVGD): G	- (B - C)					<u>- t. J.</u>	
(z*)	Elevation	n of	visual tran	sition (NVGD			-6.4					
(I)	Elevatio	n of	the sedime	ent-water inte); H + D		-510					
(12)				ent-water inte			- 5.5					
) feet, discard								
	(Note ii i	+ 1 ₂	WIGHT ± 1,C	rieet, discart			· · · · · · · · · · · · · · · · · · ·					
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	ĝ	5		ge				<u> </u>				
	N)	n = H)		luck e			>>	partic		v		
	tion	Bottom		- year			stenc	L L		<u>⊕</u>		
	Elevation (NVGD)	(I.e. B		Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Ogor	Sample IDs	6	
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	P 163				-	3"	1					
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Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor i edford, MA SACE NAE	Environmei	ntal Monito	-		606422 /V Gale Force neresa Himmer/Alex M	ansfield
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	1125 5-078-112 M-Walsh Push-Core 8/23/0	5-60-m	Time On Sta Morthing (N/ Easting (NA GPS Accura Predicted Ti Time of Coll Time Depar	AD 83): D 83): acy: de (ft): ection:	2704 8152	\$36,9 00.9	Water Depth (A Length of push o Water surface to Length of core (Surveyed elevat	nts are ±0.1 feet): core assembly (B): to top of handle (C): from bottom) (D): tion (NVGD 29) (E): rom surveyed elevation (F	6.3 10.0 1.8 1.6
 (H) Elevation of the I (z*) Elevation of visu (I) Elevation of the S (I₂) Elevation of the S 	er Surface (NVGD) pottom of the core (al transition (NVGD) sediment-water inte sediment-water inte	: E-F NVGD): G): H + (distantantantantantantantantantantantantant	ance to visua easured from easured from	al transition)	core (NVGD): H + D	on	+ 0.6 - 7.6 - 6.6 - 6.0 - 5.7	
Elevation (NVGD)	Lithology - Include USCS code	Type	Color	Han Consistency	Maximum particle size	Odor	Sample IDs	Commen	ts
0.0		Chy	gray	from	5m				
le ID of digital photogra omments:	ph(s):								

Battelle The Business of Innova		oject Name: Location: Client:	New B	ord Harbor edford, MA SACE NAE		ntal Monito		Vessel	G606422 : R/V Gale Force : Theresa Himmer/Alex Mansfield
Station ID:	录	KR7:	IT31	Time On St	ation:	1355	5		ements are ±0.1 feet
Core Sample ID:	5-076	3-1131-	00-24	Northing (N		22041	230	Water Depth	p=- 0
Logged by:	M	. Walst		Easting (NA	•	KI5)	98.6	-	ish core assembly (B):
Collection Mechanis	m:	Push-Core	\	GPS Accura		7	. 40		ce to top of handle (C) :
Date:	8	23/16	1	Predicted T	•	10,000		-	re (from bottom) (D):
Date.		7 7 1 0 1		Time of Col		1359		_	
						140	2	•	evation (NVGD 29) (E):
				Time Depar	t Station:	170	3		ce from surveyed elevation (F):
				Calculation	s for Deter	mination of	f Z* Elevati	on .	
(G) Elevation of	Water Surf	ace (NIVGD)	· E - E						+6.7
		, ,							~ V
(H) Elevation of	the bottom	of the core ((NVGD): G	- (B - C)					
(z*) Elevation of	visual trans	sition (NVGD)): H + (dista	ince to visua	al transition))		·	~ 6.4
(I) Elevation of	the sedime	nt-water inte	erface as me	asured fron	n bottom of	core (NVGD	0): H + D		-5.4
(I ₂) Elevation of				- 5.1					
(Note if I≠I₂ w	vithin ± 1 ∩	feet, discarr		** * *********************************					
(.13.6, 12.4	, 2 ,,0	Jioodic		W. W. W. W. W. W. W. W. W. W. W. W. W. W					
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vation (N		gy - code			tenc	E .		Ds	
Elevation (NVGD)		Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	<u>5</u>	Sample IDs	
(a) (a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c		<u> </u>			<u> </u>	Siz	Odor	Sa	Comments
~~)			511	Dark	10058	Fine			
			Clay	gray	10.	1.100			
1,4	parent appropria	9001000 pathti	- Annual		and parameters.	**************************************			
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Station of the sediment-water interface as measured from water depth (NYGD): G - A (Note if if if ig within ± 1.0 feet, discard and resample) Time Or Station. Time On Station. Noming NAD 83: 770 774 71 11 Wasin Depth (A): 5.9 Water surface to kept of handle (C): 3.5 Water surface to kept of handle (C): 3.5 Water surface to kept of handle (C): 3.5 Water surface to kept of handle (C): 3.5 Water surface to kept of handle (C): 3.5 Water surface to kept of handle (C): 3.5 Water surface to kept of handle (C): 3.5 Water surface from surveyed elevation (F): 3.5 Water surface from surveye	Battelle The Business of Innovation	Project Name: Location: Client:	New E	ord Harbor Bedford, MA ISACE NAE		ental Monito	Ŧ	Vesse	: <i>G606422</i> I: <i>R/V Gale Force</i> t: Theresa Himmer		
Core Sample ID. 5 140.2 - 10.0 - 11 Northing (NAD 83) 27.7 + 17.1 Water Depth (A): 5.1 10.0	Station ID:	Hλ		•	· · · · · · · · · · · · · · · · · · ·	0915					1
Collection Mechanism: Path-Core Collection Path-Core Collection Path-Core Collection Path-Core Collection Path-Core Collection Path-Core Collection Path-Core	, D	10-0402-	00-11	_		2707	747.4			5,4	1
Collection Mechanism: Paur Core S 30 07 Predicted Trie (II): The Collection: The Collection: The Collection: The Collection: The Collection: The Collection: The Collection: The Collection: The Depart Station: Calculations for Determination of 2" Elevation (G) Elevation of Water Surface (NVGD): 6 - 6 - 6) Calculations for Determination of 2" Elevation (G) Elevation of the Sodiment-water inferface as measured from water depth (NVGD): 6 - A (Note if if # within = 1.0 feet, discard and resample) (D) United the Sodiment-water inferface as measured from water depth (NVGD): 6 - A (Note if if # within = 1.0 feet, discard and resample) (D) Of digital photograph(s):	Logged by:		*···	'	·	8157	438	-		10.0	1
Date: State Predicted Tale (It): Time of Coclection: DGI Surveyed elevation (NYGD 29) (E): NA Time Depart Station: Water surface from surveyed elevation (F): 3,5		Push-Core		-		7.6	9		, , ,	3,5	1
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Calculations for Determination of 2' Elevation Calculations for Determination of 2' Elevation Calculations for Determination of 2' Elevation (G) Elevation of Water Surface (NVGD): E - F (H) Elevation of the bottom of the core (NVGD): H - C (2') Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I _V within ± 1.0 feet, discard and resample) CONTINUE OF STATES STATE						***************************************		-		NA.	•
Calculations for Determination of Z' Elevation (G) Elevation of Water Surface (NVGD): E - F (H) Elevation of the bottom of the core (NVGD): G - (B - C) (Z') Elevation of visual transition (NVGD): H - Idiatance to visual transition) (E) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H - D (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (O) E						0921				-	T
(G) Elevation of Water Surface (NVGD): E - F (H) Elevation of the bottom of the core (NVGD): G - (B - C) (Z) Elevation of visual transition (NVGD): H + (distance to visual transition) (B) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D (R) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if A within ± 1.0 feet, discard and resample) (Company) (C						VIAI			ace from surveyed elevation (F): <u>3, 3</u>	
(#) Elevation of the bottom of the core (NVGD): G - (8 - C) (27) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if 1 ≠ 1, within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if 1 ≠ 1, within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if 1 ≠ 1, within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if 1 ≠ 1, within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if 1 ≠ 1, within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if 1 ≠ 1, within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if 1 ≠ 1, within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if 1 ≠ 1, within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if 1 ≠ 1, within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if 1 ≠ 1, within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if 1 ≠ 1, within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if 1 ≠ 1, within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): H - D (I) Elevation of the sedi	(G) Elevation of Water	Surface (NIVOD)		Calculation	s for Detei	rmination o	f Z* Elevati	ion	25		
Elevation of visual transition (NVGD): H + (distance to visual transition)				- (B - C)				***************************************	- 3.J		
Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D			•		al transition)			-2.0		
(Rote if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Rote if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Rote if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Rote if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Rote if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Rote if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Rote if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Rote if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Rote if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Rote if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Rote if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Rote if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Rote if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Rote if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Rote if I ≠ I ₂ within ± 1.0 feet, discard and resample))); H + D		-1.9		
(Note if I # I, within ± 1.0 feet, discard and resample) (Note if I # I, within ± 1.0 feet, discard and resample) (Note if I # I, within ± 1.0 feet, discard and resample) (Note if I # I, within ± 1.0 feet, discard and resample) (Note if I # I, within ± 1.0 feet, discard and resample) (Note if I # I, within ± 1.0 feet, discard and resample) (Note if I # I, within ± 1.0 feet, discard and resample) (Note if I # I, within ± 1.0 feet, discard and resample) (Note if I # I, within ± 1.0 feet, discard and resample) (Note if I # I, within ± 1.0 feet, discard and resample)									-19		
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Clay gray firm find			674	Black	1.6		0	, o	Commer	nts	
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	le ID of digital photographi	(s):				<u> </u>	***************************************	L	<u> </u>		
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Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor i edford, MA SACE NAE	∟nvironme.	ntai Monitoi	-		R/V Gale Force Theresa Himmer			
Ctation ID:	T i		Time On Sta	ntion:	097	0		ments are ±0.1 feet			
Station ID:	07B-0IOI-	000	•		22/122	12-44	0		5.8		
,	16 0201-	00- 14	Easting (NA		61C 31	18.9%	Water Depth (A): 2.6				
Logged by:					013/	37	Length of push core assembly (B): 10.0 Water surface to top of handle (C): 24 2				
Collection Mechanism:	Push-Core 8/30/07	· · · · · · · · · · · · · · · · · · ·	GPS Accura	***************************************	32	<u>J 1</u>	•		1/		
Date:	6 70 107		Predicted Ti		NA O450 C	1935	Length of core (from bottom) (D): Surveyed elevation (NVGD 29) (E): NA				
			Time of Coll		7140			ce from surveyed elevation (NA NA		
			Time Depar	1		773.44		e nom surveyed elevation (r). <u>-2 s g</u>		
			Calculation		mination of						
(G) Elevation of Wat	er Surface (NVGD)	: <i>E-F</i>						3.1			
(H) Elevation of the	oottom of the core (NVGD): G	- (B - C)				**************************************	-3.9			
(z*) Elevation of visu	al transition (NVGD): H + (dista	ance to visua	al transition))			-2.7			
	sediment-water inte): H + D		-2.3	-		
• •	sediment-water inte				,			-2.1			
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	0										
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size						
levation (NVGI	ly - Ir			Consistency	E S		Ds				
evatii	olog CS o	90	<u>5</u>	nsist	e	ō	Sample IDs				
	Li# US	Туре	Color		Ma	Odor	Sa	Commer	nts		
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		5/VXF	· ·	FIRM	MA						
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mments:	10/0-										

Battelle The Business of Innovation	Project Name: Location: Client:	New Be	rd Harbor dford, MA SACE NAE		ntal Monito			G606422 R/V Gale Force Theresa Himmer			
Station ID:	TH		Time On St	···	0944		All measure	ments are ±0.1 feet			
Core Sample ID: 5	5715-0504	-00-16			2708	710.8	Water Depth	AT' A			
Logged by:	N. Valsk		Easting (NA		81576	1.20	Length of push core assembly (B):				
Collection Mechanism:	Push-Core	<u> </u>	GPS Accura		1.1	15	•	te to top of handle (C):			
-	8 30 107			•	NA	1/-2	•	re (from bottom) (D):			
Date:	0110107		Predicted T		MA			, (-)			
			Time of Col		0953		•	evation (NVGD 29) (E): NA			
			Time Depar	t Station:	<u> </u>		water sunac	e from surveyed elevation (F):			
			Calculation	s for Deter	mination of	Z* Elevation	on				
(G) Flourtian of Water	ur Surface (NIVGD)	. = =						2.7			
(G) Elevation of Wate								- 2 9			
(H) Elevation of the b	ottom of the core (NVGD): G -	(B - C)								
(z*) Elevation of visua	I transition (NVGD): H + (distar	nce to visua	al transition,)			-2.6			
(I) Elevation of the s	ediment-water inte	rface as mea	asured fron	n bottom of	core (NVGD): H + D		-2.3			
(I ₂) Elevation of the s								-2.1			
1 27											
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resamp	ne)								
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vation (NVGf	ncin				artic						
on (f	ly - li			ency	Ē		SQ				
Elevation (NVGD)	Lithology - Include USCS code	e l	ō	Consistency	Maximum particle size	ъ	Sample IDs				
	<u> </u>	Type	Color		Max	Odor	Sa	Comments			
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Battelle The Business of Innovation	Project Name: Location: Client:	New Bed			ental Monito	•		G606422 R/V Gale Force Theresa Himmer	
Station ID:	J.4	Т	ime On St	tation:	095	8	All measure	ements are ±0.1 feet	
Core Sample ID: 5	-078-0I07-	20.70 1.3	lorthing (N		2700	76.36.	Water Depth		5.4
Logged by:	M-Walsh	E	asting (NA	AD 83):	8157			sh core assembly (B):	10()
Collection Mechanism:	Push-Core		iPS Accura		3.3	Ч		ce to top of handle (C):	3.1
Date:	8/30/67	P	redicted T	ide (ft):	NA		- Length of co	re (from bottom) (D):	1.1
		Т	ime of Col	llection:	1000		-	evation (NVGD 29) (E):	NA
		Т	ime Depar	rt Station:	1004		- Water surfac	ce from surveyed elevation ((F): +3,7
				62	70763	6.0			-
		Ca	Iculation	ns for Deter	rmination of	Z* Elevati	on		
G) Elevation of Wa	ter Surface (NVGD):	E-F						3.7	
H) Elevation of the	bottom of the core (N	IVGD): <i>G - (l</i>	B - C)					-3.2	
z*) Elevation of visu	ual transition (NVGD)	: H + (distand	e to visua	al transition)			-2.3	
	sediment-water inter))· H → D	***************************************	- 7.1	
	sediment-water inter				•	•	···········	-19	
				. Haior dop	(117 GB).	. ,,		- and d	
(Note if i ≠ i ₂ withi	in ± 1.0 feet, discard	and resample	·)						
Elevation (NVGD)	Lithology - Include USCS code				ticle				
(N) = wo	/ · Inc			ncy	Maximum particle size		Ds		
vation (h	SS CC		<u> </u>	Consistency	iii m		Sample IDs		
(l.e.		Type	Color		Max	Odor	Sarr	Commer	nts
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Battelle The Business of Innovation	Project Name: // Location: Client:	New B	ord Harbor edford, MA SACE NAE	1	ental Monito		Vesse	: G606422 I: R/V Gale Force t: Theresa Himmer
Station ID:	JK		Time On S		かつな			rements are ±0.1 feet
Core Sample ID: 5-67	B-0508-00	-12	Northing (N		14/1	LLAN.U	Water Dept	
ogged by:	M-Walsh.		Easting (N.		&IC3	26 76	-	
collection Mechanism:	Push-Core		GPS Accur		2.0			29 °9
Pate:	8 30 107		Predicted 1	-			-	ace to top of handle (C):
	9 100 10 1		•		1032		-	ore (from bottom) (D):
			Time of Co		10.34		-	levation (NVGD 29) (E): NA
			Time Depa					ace from surveyed elevation (F): 3,5
G) Elevation of Wate	r Surface (NVGD):		Calculatio	ns for Dete	rmination o	f Z* Elevation	on	3.5
	ottom of the core (N		(R - C)					2 %
	·		, ,					
z*) Elevation of visual	I transition (NVGD):	H + (dista	ince to visu	al transition)			<u>-2.5</u>
 Elevation of the se 	ediment-water interfa	ace as me	asured from	n bottom of	core (NVGE)): H + D		-2.1
2) Elevation of the se	diment-water interf	ace as me	asured from	n water dep	oth (NVGD):	G - A		answer of the state of the stat
(Note if I ≠ I ₂ within	± 1.0 feet, discard a	ınd resamı	ole)					
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Elevation (NVGD)	Lithology - Include USCS code			Consistency	Maximum particle Size		Sample IDs	,
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The Business of Innovation	Client:	υ	SACE NAE		38 . *			Theresa Himmer	
Station ID:	<u> </u>	4 25 11	_ Time On St		7/05	<u> </u>		ments are ±0.1 feet	- h
		00-16	_		d #1/90	<u> </u>	_Water Depth	311 (
Logged by:	M-Walsh		_ Easting (NA	•	012 0	74.7		sh core assembly (B): 4.0	13
Collection Mechanism:	Push-Core	07	_ GPS Accur			>		te to top of handle (C):	<u> </u>
Date:	0/30/	<u>u r</u>	Predicted T		NA 1120		_	re (from bottom) (D):	, 4
			Time of Co		11.33	2	-	evation (NVGD 29) (E): NA se from surveyed elevation (F):	10
			Time Depa	n Station.		3	_ water surfac	e nom surveyed elevation (F).	- ~
			Calculation	ns for Deter	mination of	Z* Elevati	on		
(G) Elevation of Water	er Surface (NVGD)	E-F						2.6	
(H) Elevation of the b	oottom of the core (NVGD): G	- (B - C)					-6.8	
(z*) Elevation of visua	al transition (NVGD): H + (dista	ance to visu	al transition))				
(I) Elevation of the s	sediment-water inte	rface as me	easured from	n bottom of	core (NVGD): H + D		-5.2	·····
(12) Elevation of the s	ediment-water inte	rface as me	easured fror	n water dept	th (NVGD): (G - A		-4.7	
(Note if $1 \neq 1_2$ within	± 1.0 feet, discard	and resam	nple)						
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avgD)	Inde				icle				
Elevation (NVGD)	Lithology - Include USCS code			δ	Maximum particle size		 ရ		
vation (N	logy S co	•	_	Consistency	L Linguista		Sample IDs		
(I.e. Elev	USO	Туре	Color	Coo	Max size	Odor	Sam	Comments	****
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Battelle The Business of Innovation	Location: I Client:	New Bedford, M/ USACE NAI	4		<i>ring</i> Chi		R/V Gale Force Theresa Himmer	
Station ID;	LL36	Time On S	Station:	1144		All measure	ments are ±0.1 feet	
Core Sample ID: 5	178-43-00-	ス入 Northing (/	NAD 83):	2704.	548.8	Water Depth	(A):	7.6
Logged by:	MW/JP	Easting (N	AD 83):	815 2	75.2	Length of pu	sh core assembly (B):	15
Collection Mechanism:	Push-Core	GPS Accu	racy:	2.7	13		e to top of handle (C):	<u> </u>
Date:	8/30/07	Predicted '	Tide (ft):	NA 🏅	7-6 m,	_ _Length of co	re (from bottom) (D):	_2
		Time of Co	ollection:		:49	_Surveyed ele	evation (NVGD 29) (E):	NA
		Time Depa	art Station:		55	Water surfac	e from surveyed elevation (F):
			ns for Dete	rmination of	Z* Elevati	ion		
	Surface (NVGD): E -						26	
(H) Elevation of the bo	ttom of the core (NVG	D): <i>G - (B - C)</i>					- 1,2	
(z*) Elevation of visual	transition (NVGD): H	+ (distance to visu	ual transition	1)			-5.6	
(I) Elevation of the se	diment-water interface	as measured fro	m bottom of	core (NVGD): H + D		=5.0	
(I_2) Elevation of the se	diment-water interface	as measured fro	m water dep	oth (NVGD):	G - A	***************************************	<i>-</i> 5.0	
(Note if I ≠ I ₂ within :	± 1.0 feet, discard and	resample)				***************************************		
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Elevation (NVGD)	Lithology - Include USCS code		5	Maximum particle size		y s		
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Elev?	Jecs	Color	Consistency	Maxin	Odor	Sample IDs	Comments	
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	The 1	Batte Business of			ject Name Location Client		ord Harbor Bedford, MA ISACE NAE		ental Monito	- ,	Vessel	G606422 : R/V Gale Force : Theresa Himmer	
	Stat	ion ID:			140	·	Time On St		1154			ements are ±0.1 feet	
		e Sample I	D:			40-00				449.1	Water Dept		6.5
)	1	ged by:			7	14)	_ Easting (NA		8157	74.a	-	ish core assembly (B):	15
	Colle	ection Med	hanism:		Push-Core		GPS Accura		2.7	5	- '	ce to top of handle (C):	6.6
	Date	e:		4 0 3 0	10/07		Predicted T		NA		-	ore (from bottom) (D):	1.75
							Time of Col	lection:	1204	1	Surveyed el	evation (NVGD 29) (E):	NA
							Time Depar	t Station:	1207	<i>ک</i>	_ Water surfa	ce from surveyed elevation (F): <u>FZ</u>
							Calculation	s for Deter	rmination o	f Z* Elevation	on		
	(G)	Elevation	on of Wa	ater Surfa	ace (NVGD): <i>E-F</i>					,	2.0	
	(H)	Elevation	on of the	bottom	of the core	(NVGD): G	- (B - C)					-6.4	
	(z*)	Elevation	n of vis	ual trans	ition (NVGI	D): H + (dista	ance to visua	al transition,)			-4.8	
	(1)	Elevation	n of the	sedimer	nt-water int	erface as me	easured fron	n bottom of	core (NVGE	D): H + D		-4.6	
	(12)	Elevation	n of the	sedimer	nt-water int	erface as me	easured fron	n water dep	th (NVGD):	G - A		-4.5	
		(Note if I	≠ l ₂ with	in ± 1.0 f	feet, discar	d and resam	ple)						
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		Elevation (NVGD)	Ξ̂	1	Lithology - Include USCS code				Maximum particle size				
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Battelle The Business of Inno	•	ect Name: / Location: Client:	New Be	dford, MA	:nvironmen	tai Monitori	J		R/V Gale Force	
Station ID:	1.	L42			tion:	1216	<u>}</u>	All measurer	nents are ±0.1 feet	
	8-03	7B-LL4	2 m X		•			Water Depth	(A):	6.0
	***************************************				•	81527	-4.5	Length of pus	h core assembly (B):	15.
						2-18	3	Water surface	to top of handle (C):	6.5
	81		1		•	NA		Length of core	e (from bottom) (D):	2.5
						121	3	Surveyed elev	ration (NVGD 29) (E):	NA
				Time Depart	Station:	121	φ	Water surface	e from surveyed elevation	(F): + =
				Calculations	s for Detern	nination of	Z* Elevatio	n	Λ	
(G) Elevation of	f Water Surfac	ce (NVGD):	E-F						1.1	
(H) Elevation of	f the bottom of	f the core (N	NVGD): G-	(B - C)					76.6	
(z*) Elevation of	f visual transit	ion (NVGD)	: H + (dista	nce to visua	ıl transition)				-4.2	
(I) Elevation (f the sediment	t-water inter	face as me	asured from	bottom of a	ore (NVGD)): H + D		-4.1	
									-4.1	
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	Station ID: Core Sample ID: Logged by: Collection Mechani Date: (G) Elevation o (H) Elevation o (I) Elevation o (Note if I ≠ I₂ (QDNN) (QBNN	Station ID: Core Sample ID: Logged by: Collection Mechanism: Date: (G) Elevation of Water Surfact (H) Elevation of the bottom of (z*) Elevation of the sediment (I) Elevation of the sediment (Note if I ≠ I₂ within ± 1.0 fe	Station ID: Core Sample ID: Logged by: Collection Mechanism: Date: (G) Elevation of Water Surface (NVGD): (H) Elevation of the bottom of the core (N(z*) Elevation of the sediment-water inter (Note if I ≠ I₂ within ± 1.0 feet, discard (GDDNN) unitary and in the sediment-water inter (Note if I ≠ I₂ within ± 1.0 feet) (GDDNN) unitary and in the sediment-water inter (Note if I ≠ I₂ within ± 1.0 feet) (DDNN) unitary and in the sediment-water inter (Note if I ≠ I₂ within ± 1.0 feet) (DDNN) unitary and in the sediment-water inter (Note if I ≠ I₂ within ± 1.0 feet) (DDNN) unitary and in the sediment-water inter (Note if I ≠ I₂ within ± 1.0 feet) (DDNN) unitary and in the sediment-water inter (Note if I ≠ I₂ within ± 1.0 feet) (DDNN) unitary and in the sediment-water inter (Note if I ≠ I₂ within ± 1.0 feet) (DDNN) unitary and in the sediment-water inter (Note if I ≠ I₂ within ± 1.0 feet) (DDNN) unitary and in the sediment-water inter (Note if I ≠ I₂ within ± 1.0 feet) (DDNN) unitary and in the sediment-water inter (Note if I ≠ I₂ within ± 1.0 feet) (DDNN) unitary and in the sediment-water inter (Note if I ≠ I₂ within ± 1.0 feet) (DDNN) unitary and in the sediment-water inter (Note if I ≠ I₂ within ± 1.0 feet) (DDNN) unitary and in the sediment-water inter (Note if I ≠ I₂ within ± 1.0 feet)	Station ID: Core Sample ID: Logged by: Collection Mechanism: Date: (G) Elevation of Water Surface (NVGD): E-F (H) Elevation of the bottom of the core (NVGD): G- (z*) Elevation of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ within ± 1.0 feet, discard and resample of the sediment-water interface as me (Note if I ≠ I₂ wi	Station ID: Core Sample ID: Logged by: Collection Mechanism: Date: Calculation Collection Mechanism: Push-Core GPS Accura Predicted Time of Collection Mechanism: Push-Core Calculations Push-Core Calculations Push-Core Calculations Push-Core Calculations Push-Core Calculations Push-Core Calculations Push-Core Calculations Push-Core Calculations Push-Core Calculations Push-Core Calculations Push-Core Predicted Time of Collection of Water Surface (NVGD): E-F Predicted Time Depart Push-Core Predicted Time Of Collection Push-Core Predicted Time Of Collection Push-Core Predicted Time Of Collection Predicted Ti	Station ID: Core Sample ID: Logged by: Collection Mechanism: Push-Core Date: Clevation of Water Surface (NVGD): E - F (G) Elevation of the bottom of the core (NVGD): G - (B - C) (2*) Elevation of the sediment-water interface as measured from water depth (Note if I ≠ I₂ within ± 1.0 feet, discard and resample)	Station ID: Core Sample ID: Logged by: Collection Mechanism: Push-Core Predicted Tide (ft): Time of Collection: Time of Collection: Time of Collection: Time of Collection: Time of Collection: Time of Collection: Time Depart Station: Calculations for Determination of (G) Elevation of the bottom of the core (NVGD): E - F (H) Elevation of the sediment-water interface as measured from bottom of core (NVGD): (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample)	Station ID: Core Sample ID: L 4 7	Client: USACE NAE Chief Scientist: Station ID:	Station ID

Battelle The Business of Innovation	Location:	lew Bedford Hari New Bedford, USACE N	MA	ental Monito		Vesse	: G606422 II: R/V Gale Force t: Theresa Himmer	
Station ID:	<u></u>	Time O	n Station:	122	2	All measu	rements are ±0.1 feet	
Core Sample ID:	<u>5-078-6633</u>	-00 -18 Northin	g (NAD 83):	27040	025-6	<u></u> Water Dep	th (A):	7.2
Logged by:	MW JMY	Easting	(NAD 83):	8151	49.0		ush core assembly (B):	15,0
Collection Mechanism:	Push-Core	GPS Ac	ccuracy:	2:1	3	Water surfa	ace to top of handle (C):	5.0
Date:	5/30/07	Predicte	ed Tide (ft):	NA		Length of c	ore (from bottom) (D):	1.8
		Time of	Collection:	122	5	Surveyed e	elevation (NVGD 29) (E):	NA
		Time D	epart Station:	12:	30	Water surfa	ace from surveyed elevation (F): <u>+ 1.</u> S
		Calcula	tions for Dete	ermination of	Z* Elevat	ion		*
(G) Elevation of Wa	ter Surface (NVGD):	E-F				***************************************	1.5	
(H) Elevation of the	bottom of the core (N	VGD): <i>G - (B - C)</i>					-7.6	
(z*) Elevation of visu	ual transition (NVGD):	H + (distance to v	isual transitior	1)			-6.3	
	sediment-water interfa). H + D		-5.8	
	sediment-water interfa						712	
	n ± 1.0 feet, discard a		rom water dep	our (IVV GD).	u · A			
	T T			T		T		
Elevation (NVGD)	Lithology - Include USCS code		lcy	Maximum particle size		Sc		
/atior/	S cor		Consistency	Enu		Sample IDs		
(F. e.	Litho	Type	Cons	Maxii	Odor	Samp	Comment	۹.
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	Baffelle the Business of Innovation station ID: tore Sample ID:			oject Name: Location: Client:	New B	ord Harbor edford, MA ISACE NAE		ental Monito	_		G606422 R/V Gale Force Theresa Himmer	
Statio	on ID:		(2635		Time On St	ation:	1736	7	All measure	ements are ±0.1 feet	
Core	Sample	ID:	5-0	78-6635	5-00-18	Northing (N	AD 83):	2704	564.9	_Water Depth	n (A):	42
Logg	ed by:			MF MU	_	_ Easting (NA	AD 83):	8151	38.67	_ Length of pu	sh core assembly (B):	15.0
Colle	ction Med	chanism	:	Push-Core		GPS Accura	acy:	<u>3.C</u>	2	_Water surface	ce to top of handle (C):	6.0
Date				130107	<u> </u>	_ Predicted T	ide (ft):	NA		_Length of co	re (from bottom) (D):	1.8
						Time of Col	lection:	125	<u>ij</u>	_Surveyed ele	evation (NVGD 29) (E):	NA
						Time Depar	t Station:	124	¥	_Water surfac	ce from surveyed elevation (F): <u>+ ~ </u>
·						Calculation	s for Deter	mination of	Z* Elevation	on		
(G)	Elevation	on of W	ater Sur	face (NVGD							Medical State of Stat	
(H)	Elevation	on of th	e bottom	of the core	(NVGD): G	- (B - C)					-19	
(z*)	Elevation	on of vi	sual tran	sition (NVG	D): H + (dista	ance to visua	al transition)			-6.8	
<i>(1)</i>	Elevation	on of th	e sedime	ent-water inte	erface as me	easured fron	n bottom of	core (NVGD): H + D		-6.1	
(12)	Elevation	on of th	e sedime	ent-water inte	erface as me	easured fron	n water dep	th (NVGD):	G - A		-6.1	
	(Note if I	≠ I ₂ wit	hin ± 1.0	feet, discar	d and resam	ple)						
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ĺ	Elevation (NVGD)	Bottom = H)		Lithology - Include USCS code			ζ	Maximum particle size		s		
	ation	Botto		S coc			Consistency	En E		Sample IDs		
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			Battelle Business of Inno		oject Name: Location: Client:	New B	ord Harbor edford, MA SACE NAE		ntal Monito	. •	Vessel	G606422 : R/V Gale Force : Theresa Himmer	
		Stati	on ID:		3G38		Time On St	ation:	12	55	All measure	ements are ±0.1 feet	
		Core	Sample ID:	5-0	78-663	8-00-16	Northing (N.	AD 83):	27044	98.33	_Water Deptl	h (A):	7.1
		Logg	jed by:		ME		Easting (NA	ND 83):	81514	18.20	_Length of pu	ush core assembly (B):	15.0
		Colle	ction Mechani	ism:	Push-Core		GPS Accura	acy:	2.64		Water surfa	ce to top of handle (C):	6,2
		Date	:	***************************************	8/30/0	77	Predicted T	ide (ft):	NA		_Length of co	ore (from bottom) (D):	1.6
							Time of Col	lection:			_Surveyed el	evation (NVGD 29) (E): N	4 2
							Time Depar	t Station:		03	_Water surfa	ce from surveyed elevation (F):	1,6
		(G) (H) (z*) (l) (l ₂)	Elevation o	f the botton f visual tran f the sedim	face (NVGD) of the core sition (NVGE ent-water inte): <i>E - F</i> (NVGD): <i>G -</i> 0): <i>H + (dista</i> erface as me	- (B - C) ince to visua asured fron	al transition; n bottom of	core (NVGD	i): H + D	on	0.6 -8.2 -6.9 -6.6 -6.5	
		, , ,) feet, discard			·	, ,			<u> </u>	
			Elevation (NVGD) (I.e. Bottom = H)		Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs		
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Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor E edford, MA SACE NAE	nvironme	ntal Mönitor			G606422 R/V Gale Force Theresa Himmer	
Station ID:	6640	i.	Time On Sta	tion:	1300	1	All measure	ments are ±0.1 feet	
Core Sample ID:	9-07R-6640	-00-27	Northing (NA		2704	447.1	Water Depth		6.3
Logged by:	MWISMF		Easting (NAI		81515	70,4	Length of pus	sh core assembly (B):	15.0
Collection Mechanism:	Push-Core		GPS Accura		1.85	ζ	_ _Water surfac	e to top of handle (C):	6.5
Date:	\$ 13010	7	- Predicted Tid	de (ft):	NA		 Length of cor	re (from bottom) (D):	2.2
			Time of Colle	ection:	1311	9	Surveyed ele	vation (NVGD 29) (E):	NA
			Time Depart	Station:	131	8	_Water surfac	e from surveyed elevation (F): <u>+0:2</u>
					, -				
			Calculations	s for Deter	mination of	Z* Elevati	ion		
(G) Elevation of Wat	ter Surface (NVGD)	E-F						<u> </u>	
(H) Elevation of the	bottom of the core (NVGD): G	- (B - C)					-8.5	
(z*) Elevation of visu	ıal transition (NVGD): H + (dista	ance to visua	I transition,)			<u> </u>	
(I) Elevation of the	sediment-water inte	rface as me	easured from	bottom of	core (NVGD)	: H + D		-61	
(12) Elevation of the								-6.1	
	n ± 1.0 feet, discard								
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4VGD)	Lithology - Include USCS code				ticle				
Elevation (NVGD)	de - Inc			гc	Maximum particle size		SO		
Elevation (f	ology SS co	on.	5	Consistency	imum	-	Sample IDs		
Ele	C Life	Туре	Color	Cod	May	Odor	San	Comments	3
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The Business o	elle Innovation	Location	: New E	ledford, MA ISACE NAE	١	ental Monito	-		R/V Gale Force Theresa Himmer	
Station ID:		HHHA		Time On S		132			ements are ±0.1 feet	
Core Sample	יחוי.		<i>₩₩</i> 2-∞ -			230U 2	7 197:1	Water Depth		63
•	ID.		na ac ∞ (a)	Easting (N		8/C1:	279.60		sh core assembly (B):	45.6
Logged by:			W/	<u> </u>		7.7	9 11			2.7
Collection Me	ecnanism:	Push-Core	3-	_ GPS Accur	100	<u>}`</u>	1_11	****	ce to top of handle (C):	
Date:		<u>813010</u>	7	Predicted T		NA		_	re (from bottom) (D):	1.8
				Time of Co	llection:	152	<u> </u>	Surveyed ele	evation (NVGD 29) (E):	NA
				Time Depa	rt Station:	_133	<u>. 3</u>	Water surfac	e from surveyed elevation ((F): <u>* dv</u>
				Calculation	ns for Dete	rmination o	Z* Elevat	ion		
(G) Elevat	ion of Wa	ter Surface (NVGD	D): E-F						<u> </u>	
(H) Elevat	ion of the	bottom of the core	(NVGD): G	- (B - C)		,		(g)	-8.5	
		ual transition (NVG			ıal tranciti∩n)			7.2	
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		sediment-water in				•	•		<u> </u>	
(I ₂) Elevat	ion of the	sediment-water in	terface as m	easured fror	n water dep	ith (NVGD):	$G \cdot A$		-6.5	
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Elevation (NVGD)	H E	Lithology - Include USCS code				Maximum particle size				
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vatio	Bottom	(golog)	0	ä	Consistency	imur	_	Sample IDs		
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ľ	Stati	on ID:		ゴゴ	42		Time On Sta	ation:	1337	_	All measurer	ments are ±0.1 feet	
		Sample II	D:	5-078-33		00-14	Northing (N	AD 83):	2704	396.2	Water Depth	(A):	60
ı		ged by:		37NE	K		Easting (NA		8152	94.7	- Length of pus	h core assembly (B):	11.8
١		ection Mec	hanisr		ore		GPS Accura		2.5		- Water surface	e to top of handle (C):	3.3
١	Date		i ida ii oi	8/3	1		Predicted Ti		NA			e (from bottom) (D):	1.4
١	Date				<u> </u>	4	Time of Coll		134	41	-	vation (NVGD 29) (E):	NA
١							Time Depar		134		_	e from surveyed elevation	
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	(H)			he bottom of the								-7 ^	
	(Z*)			visual transition (N								<u> </u>	
	(1)			he sediment-wate								-6.6	
	(12)	Elevation	on of t	he sediment-wate	r inter	face as me	asured fron	n water dep	th (NVGD): (G - A		-6.3	
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		tion ID:			4491	- 7	_ Time On St		135	122 /		ements are ±0.1 feet	1 2
		e Sample	ID:	5.0	16-II41		_ Northing (N		\$109	7-27-U	Water Depti		<u> </u>
		ged by: ection Me	obanin		Push-Core	<u>w</u>	Easting (NA		2.1	<u> </u>	•	ush core assembly (B):	2 X
	Date		CHAIRS		K 3015	ν	GPS Accur	-	NA.	-3		ce to top of handle (C):	2.5
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Ī							Calculation	s for Dete	rmination o	f Z* Elevati	on		
	(G)	Elevat	ion of	Water Sur	face (NVGD): <i>E-F</i>						-0.5	
I	(H)	Elevat	ion of	the bottom	of the core	(NVGD): G	- (B - C)					-8.5	
l	(z*)	Elevat	ion of	visual tran	sition (NVGI	D): H + (dist	ance to visua	al transition)			-6:7	,
	(1)				ent-water inte					0). H + D		-600	
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1		Elevation (NVGD)	m = H)		Lithology - Include USCS code			Š	Maximum particle Size		S		
1		ation	Bottom		logy S co			ister	E DE] ec		
2.5		Elev	.e	*	Litho	Type	Color	Consistency	Maxi	Ogor	Sample IDs	Comments	
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		Batte			ject Name: Location: Client:	New Be	ord Harbor I edford, MA SACE NAE		ntal Monitor			G606422 R/V Gale Force Theresa Himmer	
	Statio	on ID:			工39		Time On Sta	ation:	1400	ζ	All measurer	ments are ±0.1 feet	
`\		Sample I	D: _<	5-048	·II29	-00 -22	Northing (N <i>i</i>	AD 83):	27041	PATH	Water Depth	(A):	53
)		ed by:	- Proces	mr.		ć	Easting (NA	D 83):	81520	19	_ Length of pus	sh core assembly (B):	11.0
-		ction Med	hanism:		Push-Core		GPS Accura	асу:	2.40	*	_ Water surface	e to top of handle (C):	3.2
	Date:				8 20	07	· Predicted Ti	ide (ft):	NA		_ Length of cor	e (from bottom) (D):	Q, Q
							Time of Coll	lection:	1405		Surveyed ele	vation (NVGD 29) (E):	NA
							Time Depar	t Station:	1409		_ Water surface	e from surveyed elevation	(F): <u>= 0.5</u>
						(Calculation	s for Deter	mination of	Z* Elevatio	on		
	(G)	Elevation	on of W	ater Surfa	ace (NVGD)	: E-F						-0.5	
	(H)	Flevation	on of the	e bottom	of the core	(NVGD): G	- (B - C)					-8,3	
								al transition	1			-6.9	
	(z*)				•)): H + (dista				=		-/- 1	• • • • • • • • • • • • • • • • • • • •
	(1)								core (NVGD)			- 0:1	
	(12)	Elevation	on of the	e sedime	nt-water inte	erface as me	easured from	n water dep	th (NVGD): (э - A		-5.8	
	((Note if I	≠ l ₂ witl	hin ± 1.0	feet, discard	d and resam	ple)						
		Elevation (NVGD)	Bottom = H)		Lithology - include USCS code			Consistency	Maximum particle size		Sample IDs		
		Eleva	(I.e. B		ithok	Туре	Color	Consi	/axin iize	Odor	Samp	Comme	nts
2.2						Craf	DK Geri	10058	Sine				
1.4		ng at a graph graph of the last	-	yes	4 00nase ************************************		application of the state of the	and the second projection of a	_{per} onance,		(a)	garagement and any array of the second secon	
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	7/	Batte Business of	lle		oject Name: Location:	New E	Bedford, MA	١	ental Monito	-	Vessei	G606422 : R/V Gale Force	•
	-		mova	uon .	Client:	een.	ISACE NAE			Chi		: Theresa Himmer	
		ation ID:	10		<u> 구구 99</u>		Time On St		33/14	p-1-10 -	72%	ements are ±0.1 feet	
	1	re Sample : gged by:	ID;	2-0		ИГР) <u>2-00-5</u> 7	Northing (N		EIC K	<u>3300</u> 1976	Water Deptl		5.0
	1	llection Med	hanier		Push-Core	<u> ~((()</u>	Easting (NA GPS Accur		3.1	<u> </u>		ush core assembly (B):	201
	Da		JIIGIIIJI		8/201	Δī	Predicted T		NA NA			ce to top of handle (C): ore (from bottom) (D):	2 7
	"				- W	<u> </u>	Time of Col		741(_	evation (NVGD 29) (E):	NA
							Time Depar		142	?\	-	ce from surveyed elevatio	AND 2
							2 3 4 4				_ *************************************	oc nom ourcyed elevatio	
							Calculation	ns for Deter	mination o	f Z* Elevati	on		7-
	(G) Elevation	on of \	Nater Sur	face (NVGD)): <i>E-F</i>						-0,6	
	(H)	Elevation	on of t	he bottom	of the core	(NVGD): G	- (B - C)					-7.9	% • > ;
	(z*,) Elevation	on of v	/isual tran	sition (NVGE	D): H + (dist	ance to visu	al transition)			-6.7	T March
	(1)				ent-water inte))· H + D	***************************************	-5.6	
	(12				ent-water inte						***************************************		***************************************
	` -				feet, discard				, , , , , , , , , , , , , , , , , , , ,		***************************************		
		(Note ii i	7 12 W	mini ± 1.0	ricet, discart	anu resam	ipie)				***************************************		
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		(GB	£		nde				- Ge			3	
		Elevation (NVGD)	H = H)		P P			\ \fo	parti		<u>s</u>		
		ation	Воттош		Scoc			isten	unu.	3			
7		Elev	l.e.		Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comm	rents
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The Business of Innovation	Location: Client:	New B	ord Harbor I edford, MA SACE NAE	Environmei	ntal Monitoi			R/V Gale Force Theresa Himmer	
tation ID:	46634	- 2033	·	ition:	1424		All measurem	ents are ±0.1 feet	
Core Sample ID:	- 1- 1- 1- 1- 1- 1- 1- 1- 1- 1- 1- 1- 1-	F-06	Northing (NA		77046	12.8	Water Depth (/	4):	5.3
_ogged by:	THE /MU		Easting (NA	D 83):	81570	5.5	- _Length of push	core assembly (B):	11.0
Collection Mechanism:	Push-Core		GPS Accura		0.5		Water surface	to top of handle (C):	3.1
Date:	8/30/05	<u> </u>	- Predicted Ti	de (ft):	NA		Length of core	(from bottom) (D):	2.2
·			Time of Coll		1426		- _Surveyed eleva	ation (NVGD 29) (E):	NA
			Time Depart	Station:	143		- Water surface	from surveyed elevation (F)	<u> ~ 0.8</u>
			Calculation	s for Deter	mination of	Z* Elevation	on		
(G) Elevation of Wat	er Surface (NVGD)	: <i>E-F</i>						-0.8	
(H) Elevation of the I	oottom of the core (NVGD): G	- (B - C)				***************************************	-8.7	
(z*) Elevation of visu	al transition (NVGD): H + (dista	ance to visua	al transition)	ı			-7.2	
	sediment-water inte): H + D		-6,5	
	sediment-water inte sediment-water inte							-1-2	
	n ± 1.0 feet, discard			dop	(• •		VI	
					· ·	· · · · · · · · · · · · · · · · · · ·	I T	4	
Elevation (NVGD)	Lithology - Include USCS code	:		_	Maximum particle size		_		
vation (N Bottom :	3y - l			tenci	G E] o		
evatì	holog SCS o	Туре	Color	Consistency	axim.	Odor	Sample IDs		
Elev (1.e.	US Lit	CUM'S	ο¥		Siz	ŏ) ÿ	Comments	6
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		Batte			oject Name Location: Client:	New B	ord Harbor edford, MA SACE NAE		ntal Monito			G606422 : R/V Gale Force : Theresa Himmer	
	Stati	ion ID:		H	H37		Time On St	ation:	9 14	38	All measure	ements are ±0.1 feet	
	Core	Sample I	ID: S)FO= (<u> </u>	-00-16	Northing (N	AD 83):		251.41	_Water Depth	n (A):	49
	Logg	ged by:			mf		_ Easting (NA	D 83):	8151	74.6	_Length of pu	ush core assembly (B):	11.0
	1	ection Med	chanism:		Push-Core		GPS Accura		2.5	·	-	ce to top of handle (C):	4.7
	Date	r:			813010	<u> </u>	Predicted T		NA A A A A			ore (from bottom) (D):	1.6
							Time of Col		1440	1	-	evation (NVGD 29) (E):	NA
							Time Depar	t Station:		7	_Water surfac	ce from surveyed elevation	(F):
	(G) (H) (z*) (l)	Elevation	on of the	e bottom	sition (NVGI): <i>E - F</i> (NVGD): <i>G</i> D): <i>H + (dista</i>	- (B - C) ance to visua	al transition,	mination of		on	-1.1 -7.9 -6.4 -6.3	
						erface as me		n water dep	th (NVGD): (G - A		-6:0	
Common Co		Elevation (NVGD)	(I.e. Bottom = H)		Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comme	ents
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00			THE REAL PROPERTY.	×		aggregate - Collection of the proposed purples of the Proposed Parts of the Proposed Par							
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		of digital	photogr	aph(s):							L	L	
	Comme	ents:											

$7h_0$	Battelle Business of Innoval	Project Name Location Clien	n: New	Bedford, MA USACE NAI	4	entai Monit			: R/V Gale Force : Theresa Himmer	
Sta	ation ID:	KK3°	Ì	Time On S		146			ements are ±0.1 feet	
Co	re Sample ID:	5-09B-KK3	7-00-				524.1	Water Depth	3 :	\$ 5
Log	gged by:	3m F		Easting (N		-	19.7		sh core assembly (B):	11.0
Co	flection Mechanism	1: Push-Core		GPS Accu	-	A 2	66	-	be to top of handle (C): 44	2 0
Da	te:	8/30/0	57	— Predicted	-	NA	<u> </u>		re (from bottom) (D):	4
				 Time of Co		145	G	_	evation (NVGD 29) (E): NA	
				Time Depa		145			ce from surveyed elevation (F):	<u>*</u>
				Calculation	ns for Dete	rmination o				
(G) Elevation of V	Vater Surface (NVGE)): <i>E-F</i>						-1,2	
(H,) Elevation of the	ne bottom of the core	(NVGD): C	G - (B - C)					-7.8	
(z*		isual transition (NVG			al transition	1)			1.17	
									_/ ()	
(1)		ne sediment-water int								
(12		ne sediment-water int			n water dep	oth (NVGD):	G - A	***	-6.2	
	(Note if I ≠ I ₂ wi	thin ± 1.0 feet, discar	d and resar	nple)						
	(1)	nde				<u>ė</u>				
	Elevation (NVGD)	Lithology - Include USCS code			>	Maximum particle size		6	*:	
	ation	- ygy			stend	l E		e Ö		
	Elevation (N	ithok	a 51	Color	Consistency	axim	Odor	Sample IDs	_	
	- E	6-33	AT TU	BEN	10054			, iii	Comments	
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Battelle	Project Name: A Location: Client:	ew Bedford Harbor New Bedford, MA USACE NAE		ntai Wonitorin		Project #: G Vessel: R lef Scientist: Th	V Gale Force	
tation ID:	4441	Time On St		0903			nts are ±0.1 feet	
ore Sample ID:	075-HH41-	<u> </u>	AD 83):	270442	14.11	_Water Depth (A):	<u>>/4</u>
ogged by:	M-VM5W	Easting (N/	AD 83):	815171	<u> 1. 44</u>	_Length of push	core assembly (B):	11.0
ollection Mechanism:	Push-Core	GPS Accur	асу:	2-61		_Water surface t	o top of handle (C):	2/18
ate:	9/6/07	Predicted T	ide (ft):	NA		Length of core	from bottom) (D):	
		Time of Co	llection:		915	Surveyed eleva	tion (NVGD 29) (E):	NA
		Time Depa	rt Station:	0920		_Water surface f	rom surveyed elevation ((F): <u>**0, 7</u>
			ns for Dete	rmination of 2	Z* Elevati	on	- 0 7	
	r Surface (NVGD):						- 0.	
H) Elevation of the b	ottom of the core (N	/GD): <i>G - (B - C)</i>						
z*) Elevation of visua	I transition (NVGD):	H + (distance to visua	l transition)				-6.4	
) Elevation of the s	ediment-water interfa	ice as measured from	bottom of c	ore (NVGD): F	1 + D		-6.2	
		ce as measured from					-6.0	
	± 1.0 feet, discard a							
Elevation (NVGD)	Lithology - Include USCS code		<u>.</u>	Maximum particle size		ø		
vation (N	- vgy		Consistency	l m		Sample IDs		
Eleval	tholo	Type	onsi	Maxim	Odor	Samp	Comme	nts
1.3		mital gold.	FOUR	Civa		0)	Odinine	TIG
0.7	-	MYCH STAK	1000	First	and the second second		Janes Comments	
* 1 g		olive						
		919	Stiff	fine				
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ID of digital photogra	ph(s):							
mments:	t N/v							
In Vilent	/10							

Battelle	Project Name: Location: Client:	New E	ord Harbor Bedford, MA JSACE NAE		ntal Monitor	_		R/V Gale Force Theresa Himmer	
	Client:				000	2			
Station ID:	<u> </u>	e and	_ Time On St		22000	<u> </u>	-9	ments are ±0.1 feet	i com
Core Sample ID:	1-018-11119	5-00-16	Northing (N	AD 83):	X 7093	> 7 St 16	Water Depth		2.4
_ogged by:	WA IZEL		_ Easting (NA	AD 83):	81517	4.85	_Length of pu	sh core assembly (B):	11.0
Collection Mechanism: _	Push-Core		GPS Accur	acy:	3.10	5	_Water surfac	e to top of handle (C):	100
Date:	916107		_ Predicted T	ide (ft):	NA		_Length of co	re (from bottom) (D):	1.6
			Time of Co	llection:	0436	0940	_Surveyed ele	vation (NVGD 29) (E):	NA
			Time Depa	rt Station:	094	7	_Water surfac	e from surveyed elevation (F): -0-6
									5/6-
			Calculation	ns for Dete	rmination of	Z* Elevation	on	4000	
G) Elevation of Water	Surface (NVGD):	E-F						-0.1	
H) Elevation of the bo	ottom of the core (N	IVGD): G -	(B - C)				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	-8.0	
z*) Elevation of visual	transition (NVGD)	: H + (dista	nc e to vi suai	transition)				-6.9	
Elevation of the se	dîment-water inter	face as me	acured from	hottom of c	ore (NIVGD):	H+D		-1.4	_
Elevation of the set (I_2)					, ,			-/. I	
*/					<i>abj. a</i>			Ψ(l	
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resam	oie)						
- H)	lude				icle				
Elevation (NVGD)	- Inc			lo,	pan		SC		
wation (N	logy S co			ister	l unu		ole II		
Elev (I.e. E	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle	Odor	Sample IDs	Comments	6
1.6		elay	black						
		STP)	a cay	loose	Sire				
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ID of digital photograph iments: irrst attemp	+ N/G								

Battelle The Business of Innovation	Project Name: <i>N</i> Location: Client:	New Bedford Harbo New Bedford, N USACE NA	1A .	ntal Monitori			G606422 : R/V Gale Force : Theresa Himmer	
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	FF38 S-078-FF39 JH Push-Core 9/6/07	Easting (GPS Acc Predicted Time of 0	(NAD 83): NAD 83):	0953 2704+ 81512 2.7 NA 0956 1004	198.24 5.62 1	Water Depth Length of pu Water surface Length of co Surveyed ele Water surface	ements are ±0.1 feet In (A): Ish core assembly (B): Ice to top of handle (C): Iore (from bottom) (D): Iore evation (NVGD 29) (E): Ice from surveyed elevation (5.3 11.0 4.0 1.5 NA =0.7
 (H) Elevation of the b (z*) Elevation of visua (I) Elevation of the s (I₂) Elevation of the s 	er Surface (NVGD): nottom of the core (NVGD): all transition (NVGD): sediment-water interfacediment-water interfaced in ± 1.0 feet, discard a	VGD): G - (B - C) H + (distance to visuace as measured fro	m bottom of co				-0.7 -7.7 -6.8 -6.2 -6.0	
Elevation (NVGD)	Lithology - Include USCS code	clay gray	Consistency	Maximum particle size	Odor	Sample IDs	well mixed	nts
omments:								

Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	Location: Client: FR3 78 FF3 JH Push-Core 9/6/0	E FF3F	Time On St Northing (NA Easting (NA GPS Accur	ation: IAD 83): IAD 83):	815124 815124	08 1599.6 1.57	ef Scientist: All measure Water Depth	R/V Gale Force Theresa Himmer ments are ±0.1 feet 1 (A): 5 4 11 (C):	
Core Sample ID: S~(Logged by: Collection Mechanism:	717	1 FF3* 1-00-2	Northing (N	AD 83):	815124	1.57	Water Depth	(A): <u>5.4</u>	
Logged by: Collection Mechanism:	717	1-00-2	Easting (NA	AD 83):	VI 4	1.57			
Collection Mechanism:		7	-		VI 4		_Length of pu	sh core assembly (B):	
	Push-Core	7	GPS Accur	acv:	1 2.4				
	9/6/0	7			167	<u> </u>	Water surfac	be to top of handle (C): 3.2	
		<i></i>	Predicted T	ide (ft):	NA		Length of co	re (from bottom) (D): 2,2	
			Time of Col	llection:	101	1	_Surveyed ele	evation (NVGD 29) (E): NA	
			Time Depai	rt Station:	1018	\$	_Water surfac	be from surveyed elevation (F): $\frac{-c}{2}$	
			Calculation	ns for Deter	mination of	Z* Elevation	on .		
G) Elevation of Water Si	urface (NVGD):	E-F						-0.8	
H) Elevation of the botto	m of the core (N	NVGD): <i>G</i> -	(B - C)					-8.6	
z*) Elevation of visual tra	nsition (NVGD)	: H + (distar	nce to visual	transition)				-7.0	
(I) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D									
(12) Elevation of the sedin							,	-6.1	
(Note if I ≠ I₂ within ± 1								<u> </u>	
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(0)	e p				<u>a</u>				
Elevation (NVGD)	Lithology - Include USCS code			<u></u>	Maximum particle size				
tion	- yboo			steno	E E		e De		
i.e. B	ithok	Туре	Color	Consistency	laxin ize	Odor	Sample IDs	Comments	
2,2		ÓW	Nark	0		0	0)	Comments	
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Battelle	Location:	Bedford Harbor Environm New Bedford, MA	cinal monitoring	Project #: G60 Vessel: R/V	Gale Force	
he Business of Innovation	Client:	USACE NAE	\$ 1 c #	Chief Scientist: The		
Station ID:	<u> </u>	Time On Station:	100	All measurement	s are ±0.1 feet	1.5
Core Sample ID: S	-07B-EE41-00-	Northing (NAD 83):	2704424			12.0
ogged by:	MW/JH	Easting (NAD 83):	815101.01	Length of push co		10.0
Collection Mechanism:	Push-Core	GPS Accuracy:	2.13	Water surface to t	,	3+
Date:	4/6/01	Predicted Tide (ft):	NA 140 ()	Length of core (fro		2
		Time of Collection:	1102	Surveyed elevatio		NA (F): =0.5
		Time Depart Station:		Water surface from	n surveyed elevation ((F): <u> </u>
		Calculations for Det	ermination of Z* Ele	vation		
G) Elevation of Wate	r Surface (NVGD): E - I	=			70.5	
H) Elevation of the b	ottom of the core (NVGE	0): G - (B - C)			<u> </u>	
z*) Elevation of visua	I transition (NVGD): H+	(distance to visual transition)			
Elevation of the s	ediment-water interface	as measured from bottom of	core (NVGD): H + D		- 7,3	
		as measured from water dep			- 7.0	
	± 1.0 feet, discard and i	esample)		***************************************		
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(0)	lqe		96			
Elevation (NVGD)	Lithology - Include USCS code	As a	Maximum particle	s _s		
vation (N	- Ago	Color	En l	Sample IDs		
Eleva (i.e. B	ithol	Color	Maxir	Samp	Comme	nts
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1.0-1	470	at the Exw	fine		~ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	M.a.
0.0-		3(2)	71,00		[
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ID of digital photogra	oh(s):				-	
mments:	-A					
heavy shee	ř.					

Battelle The Business of Innovation	Project Name Location Client	New E	ord Harbor Bedford, MA ISACE NAE	4	ental Monitor		Vessel	G606422 : R/V Gale Force : Theresa Himmer	
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	H13 -07B-0HB MW/JH Push-Core 9/6/0	3-00-20	Easting (Na GPS Accur Predicted 1 Time of Co	NAD 83): AD 83): racy: Tide (ft): ollection: \{23} art Station:	12/2 2707 8157 3.0 NA 30 12/8 123:		Water Depti Length of pu Water surfa Length of co Surveyed el Water surfa	ements are ±0.1 feet In (A): ush core assembly (B): ce to top of handle (C): ore (from bottom) (D): evation (NVGD 29) (E): ce from surveyed elevation (A)	2.0 NA
 (G) Elevation of Wate (H) Elevation of the body (z*) Elevation of visua (I) Elevation of the set (I₂) Elevation of the set (Note if I ≠ I₂ within 	ottom of the core (I transition (NVGD ediment-water inte	NVGD): G -): H + (distar rface as mea rface as mea	(B - C) nce to visual asured from asured from	l transition) bottom of c	ore (NVGD):	H + D		0.0 -3.9 -3.3 -1.9 -1.1	
Bevation (NVGD)	Lithology - Include USCS code	sant Sant	JORD CARRY TO THE	Consistency	Maximum particle size	Odor	Sample IDs	HEAVY SHEE WHEN CO	N/
File ID of digital photograph Comments:	n(s):								

Battelle The Business of Innovation	Project Name: N Location: Client:	ew Beatora Harl New Bedford, USACE I	MA	ental Monito		Vessel	G606422 I: R/V Gale Force I: Theresa Himmer		
Station ID:	T 12		On Station:	123	39	****	ements are ±0.1 feet		
Core Sample ID:	-078-0I12-	A .	ng (NAD 83):		97.61	Water Dept	0.0		
_ogged by:	7H		(NAD 83):	-	0.63		ush core assembly (B):		
Collection Mechanism:	Push-Core	GPS A	ccuracy:	2.0	8	Water surface to top of handle (C):			
Date:	9/6/07	Predict	ed Tide (ft):	NA		Length of core (from bottom) (D): Surveyed elevation (NVGD 29) (E): NA			
		Time o	f Collection:	124	9				
		Time D	epart Station:	124	9	Water surfa	ce from surveyed elevation (F):		
(O) =1			ations for Dete	ermination o	Z* Elevation	on			
	Surface (NVGD): E					***************************************	0.0		
H) Elevation of the bo	ottom of the core (NV	GD): <i>G - (B - C)</i>							
z*) Elevation of visual	transition (NVGD): F.	l + (distance to vi	su a l transition)				-74-290		
	diment-water interfac						-2.4		
) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A							-2.2		
(Note if I ≠ I ₂ within	± 1.0 feet, discard and	d resample)							
uVGD)	Jude			ticle					
Elevation (NVGD)	Lithology - Include USCS code		ncy	Maximum particle Size		So			
evation (N	olog)	9 J	Consistency	kim un	-	Sample IDs			
Ele.	NSO	Type	/	Max	Odor	Sarr	Comments		
118	*	Chely Cara	E CUM	Qine			sheen when core		
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	C	Ship gro	2 Kim	STILL					
	<i>\$</i> 3.6	OF CONTRACT							
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D of digital photograph	(s):	1		·					
ments: ① AE	m \$3/12/0	18 - erro	r in co	alcal	nortz				
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Baffelle The Business of Innovation	Project Name: / Location: Client:	New Bedford Harbo New Bedford, M USACE NA	IA	ental Monitol	_		G606422 R/V Gale Force Theresa Himmer	
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	310 -07B-0310-00 3 H Push-Core 9/6/07	Northing Easting (I GPS Acc Predicted Time of C	Time On Station: Northing (NAD 83): Easting (NAD 83): GPS Accuracy: Predicted Tide (ft): Time of Collection: Time Depart Station: Calculations for Deteriors		14.44 3 13 12° 28	All measurements are ±0.1 feet Comparison of push core assembly (B): Water surface to top of handle (C): Length of core (from bottom) (D): Solveyed elevation (NVGD 29) (E): Water surface from surveyed elevation (F):		75 2.4
 (H) Elevation of the bold (z*) Elevation of visual (I) Elevation of the second (I₂) Elevation of the second (Note if I ≠ I₂ within second (I₂) 	ediment-water interfa ediment-water interfa ± 1.0 feet, discard a	E - F VGD): G - (B - C) H + (distance to visuace as measured from	al transition) n bottom of c	core (NVGD):	H + D	on	0.0 -4.3 -2.6 -1.9 -1.5	
Elevation (NVGD)	Lithology - Include USCS code	Type	Consistency	Maximum particle size	Odor	Sample IDs	Comments	
24 1.7-18 -		classed grays	secon server, second	Sint - Sint				
File ID of digital photograph Comments: \S+ A++e+++6								

Battelle The Business of Innovation	Project Name: Location: Client:	New Bed	d Harbor E dford, MA ACE NAE	nvironmer	ntal Monitori			G606422 R/V Gale Force Theresa Himmer	
Station ID:	K13		Time On Sta	ation:	130	-		ements are ±0.1 feet	
Core Sample ID:	-07B-0K1	3 4 6	Northing (N		1.52	72.51	Water Depth		1.7
Logged by:	70 01/16		Easting (NA	,	815800.			sh core assembly (B):	110
	Org				2 64	31	_		47
Collection Mechanism:	Push-Core		GPS Accura	-		<i></i>	-	ce to top of handle (C):	16
Date:	9/6/07		Predicted Ti		131	1	-	re (from bottom) (D):	117
			Time of Coll			<u> </u>	-	evation (NVGD 29) (E):	NA 🔿
			Time Depar	t Station:	13 2		_Water surfac	ce from surveyed elevation (F):	0,2
(G) Elevation of Water	r Surface (NVGD):	_	Calculation	s for Deter	mination of	Z* Elevation	on	0.2	
			n 0)					-27	
(H) Elevation of the bo	ottom of the core (r	NVGD): G - (E	B - C)						
(z*) Elevation of visual	transition (NVGD)	: H + (distanc	e to visual	transition)				-2.5	
(I) Elevation of the se	ediment-water inter	face as meas	ured from I	bottom of co	ore (NVGD):	H + D		-1.8	
(I_2) Elevation of the se	ediment-water inter	face as meas	ured from	water depth	(NVGD): G -	- A		-1.5	
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resample	;)						
	e				Ф				
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size				
vation (N	yy - II			Consistency	Ę		Sample IDs		
Bol	nolog CS c	e l	or	nsist	e xim	ŏ	l du		
	n S	Type	Color	క	Ma	Ogo	Sa	Comments	
19		Dayit	90-107 10-106	ON IK	0.0			slight sheen v	when
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ID of digital photograp	h(s):			L	I	L	L		
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Battelle The Business of Innovation	Project Name: Location: Client:	New Bedford Har New Bedford USACE	, MA	ntal Monitorii			G606422 R/V Gale Force Theresa Hirnmer	
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	M12 -078-0M13 SH Push-Core 9/6/07	-Ob >) M Northi Eastin GPS A Predic	On Station: ng (NAD 83): g (NAD 83): Accuracy: eted Tide (ft): of Collection: Depart Station:	133 27074 815860 2 NA 133	3 199,61 2,69 38 5	Water Depth Length of pus Water surface Length of core Surveyed elev	ments are ±0.1 feet (A): th core assembly (B): e to top of handle (C): e (from bottom) (D): vation (NVGD 29) (E): e from surveyed elevation	4.0 11.0 5.5 1.4435 NA N(F): 0.6
 (H) Elevation of the bolic (z*) Elevation of visua (I) Elevation of the set 	r Surface (NVGD): ottom of the core (N I transition (NVGD) ediment-water inter ediment-water inter ± 1.0 feet, discard	E - F IVGD): G - (B - C) H + (distance to volace as measured face as measured	visual transition) from bottom of c	ore (NVGD): /	H + D	on	0.6 -4.9 -3.8 -3.5 -3.4	
Elevation (NVGD)	Lithology - Include USCS code	Clay Go	Consistency	Maximum particle size	Odor	Sample IDs	Сотп	nents
0,0		day of shells	and lower	of the			large she ils	
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Battelle The Business of Innovation	Project Name: A Location: Client:	New Be	rd Harbor E edford, MA SACE NAE	nvironmen	tai Monitorin			R/V Gale Force Theresa Himmer			
Station ID:	7 19		Time On Sta	ation:	1347	7	All measurer	ments are ±0.1 feet			
Core Sample ID:	-078-0LC7-	-00-15	Northing (NA		27076	24,00	Water Depth		3,0		
-	2 H		Easting (NAI		815824.79		-	th core assembly (B):	11.0		
logged by: Collection Mechanism:		Push-Core GPS Accuracy: 2,10					Water surface to top of handle (C):				
Dollection Mechanism:	9/6/07		Predicted Tic	•	.NA		-	e (from bottom) (D):	1,5		
Jale.			Time of Colle			R	Surveyed elevation (NVGD 29) (E): NA				
			Time Depart			4		e from surveyed elevation (F):	0.7		
					mination of 2	Z* Elevatic	- on				
(G) Elevation of Water	er Surface (NVGD):		Ou.ou.	J		- :		6.7			
(H) Elevation of the b	oottom of the core (N	.VGD): <i>G</i> -	(B - C)					- 3,9			
	al transition (NVGD):			transition)				-3,1			
	sediment-water interfa				ore (NVGD): /	H + D		-2.4			
	sediment-water interfa							-3.3			
	n ± 1.0 feet, discard a										
(HOIG II 1 7 12 MICH	1± 1.0 1661, dioda.4 2		———								
GD)	lude				icle						
Elevation (NVGD)	Lithology - Include USCS code	!		ýοι	Maximum particle size		SO				
ation	logy S cor	1		Consistency	l mum	_	Sample IDs				
Eleva (I.e. E	Liffho	Туре	Color	Cons	Maxi size	Odor	Sam	Comments			
1.5		day	hort	10050				sheen when			
		sing	Twin		826			core empti	LC'		
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Station ID:	" Client	: New I	ford Harbor i Bedford, MA USACE NAE	•	ntal Monitori		Vessel	G606422 : R/V Gale Force : Theresa Himmer	
ation ID: Sore Sample ID: Sogged by: Dilection Mechanism: Push-Core 9/6/07			Easting (NA GPS Accur Predicted T Time of Co	Morthing (NAD 83): Easting (NAD 83): GPS Accuracy: Predicted Tide (ft): Time of Collection: Time Depart Station:		6.23 1	All measurements are ±0.1 feet Water Depth (A): Length of push core assembly (B): Water surface to top of handle (C): Length of core (from bottom) (D): Surveyed elevation (NVGD 29) (E): Water surface from surveyed elevation		3.2 [1.0 5.1].S NA F): 0.9
Elevation of the z*) Elevation of the El	ater Surface (NVGD) be bottom of the core	NVGD): G): H + (distantantantantantantantantantantantantant	- (B - C) ance to visual easured from	<i>I transition)</i> bottom of c		H + D	on	0.9 -4.3 -2.9 -2.8 -2.4	
Elevation (NVGD)	Lithology - Include USCS code	Stract Stract	2000 King to the	Consistency	Maximum particle size	Odor	Sample IDs	Commer Very thin	nts

Battelle The Business of Innovation	Project Name: Location: Client:	New Be	d Harbor i dford, MA ACE NAE		ntal Monitori		Vessel	G606422 : R/V Gale Force : Theresa Himmer	
Station ID:	KS		Time On St		1421			ements are ±0.1 feet	
	-07B-CK05	n0 00	Northing (N		2707	1. 73.86	Water Depti		3-23;
Logged by:	HZ.Vur		Easting (NA	*	81579	9.87	_	ush core assembly (B):	11.0
Collection Mechanism:	Push-Core		GPS Accur	•	3.5	\		ce to top of handle (C):	5856
-	9/6/07			•	NIA.	<u> </u>	•	ore (from bottom) (D):	10
Date:			Predicted T		NA NA	5 1426	•		NA.
			Time of Col		1/1/2/	u	-	evation (NVGD 29) (E):	NA 1.2
	<u> </u>		Time Depai			7: []		ce from surveyed elevation (F)	
(G) Elevation of Wate	r Surface (NVGD):		aicuiatioi	is for Deter	mination of	z" Elevatic		12	
(H) Elevation of the bo	ottom of the core (N	IVGD): G - (B - C)					-4.4	
				l transition)				-3.3	
, ,	I transition (NVGD)							-21	
.,	ediment-water inter				• •				
(I2) Elevation of the se	ediment-water inter	face as meas	ured from	water depth	(NVGD): G -	· A		-2.1	
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resample))				******		
	<u>o</u>								
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size				
vation (N	y - Ir			Consistency	E E		Os		
vatic	olog SS c	Φ	ĕ	Isist	ximu.	'n	Sample IDs	1	
	Lith USC	Type	Color			Odor	Sar	Sheen when cores	emotice
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comments:	N/6								
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77.	Battelle Business of Innovation	Project Name: Location: Client:	New L	ford Harboi Bedford, MA JSACE NAL	4	ental Monite	_	Vessel	: G606422 I: R/V Gale Force I: Theresa Himmer	
Sta	ation ID:	K2		Time On S		144	3		ements are ±0.1 feet	
Co	ore Sample ID:	S-07B-0KO	2-00-	24 orthing (1		27077	49,01			3.5
- 1	gged by:	-)H		Easting (N		81580	1.13		ush core assembly (B):	110
- 1	ollection Mechanism:	Push-Core		GPS Accu		2 (23		ice to top of handle (C):	
Da	-	9/6/17	7	Predicted		NA NA		_	ore (from bottom) (D):	20
	-			Time of Co		144	Ц		levation (NVGD 29) (E):	NA NA
				Time Depa					ce from surveyed elevation (F)	1.6
				= 565				_ ** ater saria	ice from surveyed elevation (F)	
(G	Elevation of Water	er Surface (NVGD):	E - F	Calculation	ns for Dete	rmination o	f Z* Elevat	ion	1.6	
(H) Elevation of the b	oottom of the core (I	NVGD): G	- (B - C)					-4,4	
(Z*) Elevation of visua	al transition (NVGD)): H + (dist	ance to visu	al transition	1)			-3.1	
(1)		ediment-water inter)). H + U		-2.0	
(12		ediment-water inter							-19	
1,5					aici uel	(ITVGD).	J /	·	1.7	
	(Note if i ≠ i ₂ within	± 1.0 feet, discard	and resan	nple)						
<u> </u>	l l			T	T		,	T		·
	(GE (F	Lithology - Include USCS code				e e				
	Elevation (NVGD)	e Inclu			>	Maximum particle		"		
	vation (h	- vgc			stend	l is		ğ		
	Eleva (I.e. B	ithok	Type	Color	Consistency	axim	Odor	Sample IDs	_	
	2.4		3andy	dark.	1		<u> </u>) iii	Comments	
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Comm	ems:									

Battelle Business of Innovation	Project Name: Location: Client:	New Be	rd Harbor I edford, MA SACE NAE	Environme	ntal Monitor	-		G606422 R/V Gale Force Theresa Himmer	
tation ID:	DD34		Time On Sta	ition:	15/3			ements are ±0.1 feet	
re Sample ID:	3-078-DD	34-00-2	Northing (N	AD 83):	27046	00,81	Water Depth	ı (A):	10,0
gged by:)H		Easting (NA		815073	53	- _Length of pu	sh core assembly (B):	15,3
ollection Mechanism:	Push-Core		GPS Accura	ıcy:	2,6	1	_ _Water surfac	ce to top of handle (C):	233,0
te:	9/6/07	,	Predicted Ti	de (ft):	NA		_Length of co	re (from bottom) (D):	2.6
			Time of Coll	ection: 155	4516	1526	Surveyed ele	evation (NVGD 29) (E):	NA
			Time Depart	Station:	<u>1535</u>		_Water surfac	ce from surveyed elevation (F): <u>2.0-2.3</u>
		(Calculation	s for Deter	mination of	Z* Elevati	on		
	r Surface (NVGD)							2.3	
) Elevation of the b	ottom of the core (NVGD): G	· (B - C)					<u>-10.0</u>	
) Elevation of visua	l transition (NVGD): H + (dista	nce to visua	al transition,)			-8.5	
Elevation of the s	ediment-water inte	rface as me	asured from	bottom of	core (NVGD): H + D			
) Elevation of the se	ediment-water inte	rface as me	asured from	water dep	th (NVGD): (3 - A		-7.1	
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resam	ole)						
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size				
N) uc	y - In			ency	m pa		SQ		
evation (h	nolog CS o	e l	lor	Consistency	in wix	ō	Sample IDs		
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Battelle The Business of Innovation	Project Name: Location: Client:	New I	ord Harbor Bedford, MA USACE NAE	١	ntal Monitori		Vessel	G606422 I: R/V Gale Forcé t: Theresa Himmer
	N2				0805	6		ements are ±0.1 feet
Station ID:	<u> </u>	2.00.1	Time On S		22023)	/	
	MW /1 H	1	Northing (N		CITY	72 92	Water Dept	. 1
ogged by:			Easting (N.		3128	<u>/ 3+ </u>		ush core assembly (B):
ollection Mechanism:	Push-Core 9/13/0	7	GPS Accui		<u>^`</u>		_	ice to top of handle (C):
Date:	4/13/0		Predicted 7	. ,	NA OC 11		-	ore (from bottom) (D):
			Time of Co		2011	```	~	levation (NVGD 29) (E): NA
			Time Depa	rt Station:	0820	<i>*</i>	_Water surfa	ice from surveyed elevation (F): *** 🕻 💰
			Calculatio	ns for Dete	rmination of	Z* Elevati	on	9
G) Elevation of Water	er Surface (NVGD):	E - F						
H) Elevation of the b	ottom of the core (N	IVGD): G	- (B - C)					-5.0
z*) Elevation of visua	al transition (NVGD)	: H + (dista	in ce to visua	l transiti o n)				<u>-3:5</u>
Elevation of the s	ediment-water inter	face as me	asured from	bottom of co	ore (NVGD):	H + D		-3.3
	ediment-water inter							- 3.0
	± 1.0 feet, discard				, , , , ,			<u> </u>
T _			T	T				T
avgD	clude				rticle			
N) 11	de Jū			ncy	n pai		Ds	
Elevation (NVGD)	Lithology - Include USCS code	m)	=	Consistency	Maximum particle size	_	Sample IDs	
(f. e.	Lith	Туре	Color	Con	Max size	Odor	Sam	Comments
1.00		Clay	gray	quely				slight sheen wher
		Silt	15.	1 40 3	eire			core emptied
1.5-		separate	I suit		Magazin Siri	9000	50 miles	Management Supplement
		clay	disk	54W	E. W.C			
		~	3					
0.0-								
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i i								
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ID of digital photograph	ph(s):							
ID of digital photographments:								
nments:						***************************************		

Sinton ID From Sample ID Fro	Battelle The Business of Innovation	Project Name: Location: Client:	New Bedford Harb New Bedford, I USACE N	MA	ental Monitol	_		G606422 R/V Gale Force Theresa Himmer	
Elevation of the bottom of the core (NVGD): E - F	Station ID: Core Sample ID: 5-0 Logged by: Collection Mechanism: Date:	MW/JH Push-Core	Northing Easting GPS Ac Predicte Time of	(NAD 83): (NAD 83): curacy: d Tide (ft): Collection:	082	3	Water Depth (Length of push Water surface Length of core Surveyed elev	A): n core assembly (B): to top of handle (C): t(from bottom) (D): ation (NVGD 29) (E):	H-8 1.2 NA
Doldigital photograph(s):	 (H) Elevation of the bole (z*) Elevation of visual (I) Elevation of the sel	ttom of the core (N transition (NVGD) diment-water inter	E - F IVGD): G - (B - C) : H + (distance to v.) face as measured face as measured f	<i>isual transitior</i> rom bottom of	ı) core (NVGD)): H + D	on	+1.9 -5.0-4 -3.9 -3.1 -3.2	.30
ments: Wafu analy hading Taken	e ID of digital photograph	(s):	clay gray	Soft Soft	Ykihe eine	JOPO	Sample IDs	Comments	3

Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor edford, MA SACE NAE	ı	ental Monito			G606422 R/V Gale Force Theresa Himmer	
Station ID:	N6		Time On S		0841			ements are ±0.1 feet	
Core Sample ID:	-07.8-0NC6-	20-06	Northing (N			47.57	Water Depth		5,0
Logged by:	MW/JH		Easting (N			4,36	•	ish core assembly (B):	11.0
Collection Mechanism:	Push-Core		_		2.5	<u> </u>	-		4,80
-	9/13/0 7	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	GPS Accur			>	-	ce to top of handle (C):	26
Date:			Predicted 1		NA Out-	E Abul	-	re (from bottom) (D):	<u> </u>
			Time of Co		_4377		•	evation (NVGD 29) (E):	NA +2.0
			Time Depa		085		_	ce from surveyed elevation (F): = 2,0
(G) Elevation of Water	er Surface (NVGD):		Calculatio	ns for Detei	rmination of	Z* Elevation	on	۵.0	
	ottom of the core (I		- (B - C)					-28	
	·							7 2	
(z*) Elevation of visua	al transition (NVGD)	: H + (dista	ance to visu	al transition)			<u></u>	
(I) Elevation of the s	ediment-water inter	face as me	easured from	m bottom of	core (NVGD): H + D		<u>-3,2</u>	
(I_2) Elevation of the s	ediment-water inter	face as me	easured from	m water dep	oth (NVGD): (G - A		~ 2.0	
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resam	ple)						
l a	9				o o				
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size				
vation (N	ly - Ir			Consistency	E D		S		
Bot	lolog CS c	Ф	l ö	siste	ximu	'n	Sample IDs		
	<u> </u>	Туре	Color	Š	Ma. size	Odor	Sar	Comment	S
0.6		57/4	3104	query	eme				
0.5-	comment of the commen	gazon, spin,		American description of	Notes - sumborner		Mileson,	manages and a second	
		steed	olive	firm	fine				
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	1								
ID of digital photograp	ph(s):			<u> </u>	L1				
nments: L st attempt						<u></u>			
r MEMBI	g - g -								

Battelle	Project Name Location Client	. New B	ord Harbor edford, MA SACE NAE		ntal Monitor			G606422 R/V Gale Force Theresa Himmer	
Station ID: Core Sample ID: Sugged by: Collection Mechanism: Date:	MW/シト Push-Core	7	Time On St Northing (N Easting (NA GPS Accura Predicted T Time of Col	AD 83): AD 83): acy: ide (ft): lection: 090	0855 27070 815 87 3.5 NA 090	3.3 5 5.0859	Water Depth Length of pue Water surfac Length of cor Surveyed ele	sh core assembly (B):	10.0 10.0 3.7 4.23 0.9 NA (F): 2.73
(G) Elevation of Wate (H) Elevation of the b (z*) Elevation of visua (I) Elevation of the s (I_2) Elevation of the s (Note if $I \neq I_2$ within	oottom of the core al transition (NVG ediment-water intended	i): E-F (NVGD): G D): H+(dista erface as ma erface as ma	- (B - C) ance to visu easured fror easured fror	al transition, n bottom of	core (NVGD): H + D	on	2.3 -4.0 -3.3 -3.1 -2.6	
Elevation (NVGD)	Lithology - Include USCS code	Type	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comme	ents
0.7		Sandy clay shell hash	gray gray	1003l	fine				
e ID of digital photogramments: 1 st attem 2 nd atten									

Battelle The Business of Innovation	Project Name: Location: Client:	New E	ord Harbor Bedford, MA ISACE NAE	1	ental Monito	_		G606422 R/V Gale Force Theresa Himmer
Station ID: Core Sample ID:	N10 -078-0416 JH	2-00-12	Time On S Northing (N Easting (N	NAD 83):	81587	18.65 6.43	Water Depth	(A): 5:6 th core assembly (B): 10:4
Collection Mechanism: _ Date: _	Push-Core 9/13/0	7	GPS Accur	Tide (ft): ollection:	NA 0917	75	Length of cor _Surveyed ele	e (from bottom) (D): e (from bottom) (D): vation (NVGD 29) (E): NA e from surveyed elevation (E):
 (H) Elevation of the b (z*) Elevation of visual (I) Elevation of the s 	er Surface (NVGD) ottom of the core (al transition (NVGD ediment-water inte	(NVGD): G 0): H + (dist	- (B - C) ance to visu easured fro	ns for Deter ual transition m bottom of	rmination of	[†] Z* Elevati o): H + D	_	2.5 -4.4 -3.1
Elevation (NVGD) (I.e. Bottom = H) N ≥ N	± 1.0 feet, discard	Jand resam	nple)	Consistency	Maximum particle size	Odor	Sample IDs	Comments
0.7=-		silt clay mix sandy clay	grad olaver	ticm film	Fine	- Salamana Maja-aran	galanteen	promoting.
e ID of digital photograp mments:	h(s):							

Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor I edford, MA SACE NAE	Environme	ntal Monitor			G606422 R/V Gale Force Theresa Himmer	
	114		Time On Sta	rtion:	101	7		ments are ±0.1 feet	
Station ID:	<u>N </u>	1	-		2707/		Water Depth		6.3
Core Sample ID:	J O AD ON IS	12	Northing (N		81587	4.39		sh core assembly (B):	10.0
Logged by:	<u> </u>		Easting (NA		2.6				2.4
Collection Mechanism:	Push-Core 9 / 13 / C	1-7	GPS Accura	-		<u> </u>	-	ce to top of handle (C):	231.
Date:	1/12/6	<u> </u>	_ Predicted Ti		NA ()926	2	-	re (from bottom) (D):	
			Time of Coll			1 93 6	- 1	evation (NVGD 29) (E):	NA F): ⁴ 2.5
			Time Depar	t Station:	<u> 200</u> 0	100	_Water surfac	e from surveyed elevation (F): ' - 2 : 3
			Calculation	s for Dete	rmination of	Z* Elevati	оп		
(G) Elevation of Wate	er Surface (NVGD):	F.F						2.5	
, .			(D. 0)					-61	
(H) Elevation of the t	oottom of the core (NVGD): G	- (B - C)				***************************************		
(z*) Elevation of visua	al transition (NVGD): H + (dista	ance to visua	al transition)				
(I) Elevation of the s	sediment-water inte	rface as me	easured fron	n bottom of	core (NVGD)): H + D	<u></u>		···
(12) Elevation of the s	sediment-water inte	rface as me	easured fron	n water dep	oth (NVGD): (G - A		- 3.8	
(Note if I ≠ I₂ within	n ± 1.0 feet, discard	and resam	nple)						
<u> </u>									
99	apr				90				
(NVGE)	e Inclr			5	parti		S		
vation (N	- ygy			stenc	mne		<u>e</u> □		
انه ف	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comme	nte
12=	<u> </u>		100ct	S/nge		0	· · · ·	Comme	no
		5714	acay	XW	Rine				
1,0		-	<u>V</u>	**************************************		and the same of th	- Lagranian Lagr	gallaterronian iggalaterialistika	
"		Class K	1804	304	Live				
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		clay	a cay	52 cm	Sino		1		
0.0		- 1	0						
						,			
				· Andreas					
o ID of digital photogra	nph(e):		<u> </u>	L		<u> </u>	<u> </u>		
e ID of digital photogra imments:	ι λ ι ((ο):								

Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor edford, MA SACE NAE		ental Monito			G606422 R/V Gale Force Theresa Himmer	
Station ID:	NIT		Time On St	ation:	094	0	All measure	ements are ±0.1 feet	
Core Sample ID:	5-076-0NV	7-10-11	; ≫Northing (N	AD 83):	27078	73,11	Water Depth	ı (A):	6.0
Logged by:	. JH		Easting (NA	,	81587	6.25	-	sh core assembly (B):	10,0
Collection Mechanism:	Push-Core		GPS Accur		1.7		•	ce to top of handle (C):	2.1
Date:	9/13/0	7	 Predicted T 		NA		~	re (from bottom) (D):	1.6
			Time of Col		094	12	-	evation (NVGD 29) (E):	NA
			Time Depai			8	-	ce from surveyed elevation (
					rmination of	7* Elevati			
(G) Elevation of Water	r Surface (NVGD):		Calculation	is for Deter	ininacion or	Z Ljevati	on ·	2.5	
(H) Elevation of the bo			- (B - C)					- 9 4	
	,	•		_1, 10-			***************************************	-111	
(z*) Elevation of visual	•						***************************************		
(1) Elevation of the se						-			
(I ₂) Elevation of the se	ediment-water inte	rface as me	asured fror	n water dep	th (NVGD):	G - A		3.5	
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resam	ple)					· · · · · · · · · · · · · · · · · · ·	
Tall	0								
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size				
N	ge -			ncy	n pa		Ds		
Elevation (f	S CC	ø.	ž	Consistency	imur	<u>.</u>	Sample IDs		
⊕ ⊕ ⊕ ⊕	Lift USC Lift	Туре	Color	So	May	Odor	San	Comme	nts
1.6		dox	dork	very wise	gine				
		2 Miles	gray		watering.	pulpipupunani, ,	Orași de Caracian (Caracian Caracian Caracian Caracian Caracian Caracian Caracian Caracian Caracian Caracian C		
1.3	eleting and an eletinostation and an electric state of the electri	Ca. Asi	olive	Gram	Sine			And the state of t	
		Clay	gray	-418 a.					
		Shells							
0.0									
ID of digital photograp	h(s):				<u> </u>		<u> </u>		
e ID of digital photograpi imments:	II(5).								

Battelle The Business of Innovation	Project Name Location	: New E	Bedford, MA	,	ental Monito	•	Project #: G606422 Vessel: R/V Gale Force Chief Scientist: Theresa Himmer			
	Client	: (JSACE NAE		nac	Chi	· · · · · · · · · · · · · · · · · · ·			
Station ID: Core Sample ID:	S-078-0N	21-00-12	Time On Si Northing (N		2707	274.12		ements are ±0.1 feet	10	
Logged by:	NH.		Easting (N	·	***	5.03	_ Water Dept	n (A): ush core assembly (B):	10.0	
Collection Mechanism:	Push-Core	· · · · · · · · · · · · · · · · · · ·	GPS Accur	•	1.	75		ce to top of handle (C) :	70.5	
Date:	9/13/0	77	Predicted T		NA NA	<i></i>		ore (from bottom) (D):	1.2	
- 4.07			Time of Co			52		evation (NVGD 29) (<i>E</i>):	_ E & -	
			Time Depa			8		ce from surveyed elevation	NA (F): 12 - 6	
							_ *************************************	de nom surveyed elevation	(/). <u></u>	
			Calculation	ns for Deter	rmination o	f Z* Elevati	on			
(G) Elevation of Water	er Surface (NVGD): E-F					*******	2.6		
(H) Elevation of the b	ottom of the core	(NVGD): G	- (B - C)					-4.9		
(z*) Elevation of visua	al transition (NVGI	D): <i>H + (dist</i>	ance to visu	al transition	}			-4.2		
(/) Elevation of the s							***************************************	~ 2 ~ 1		
(l_2) Elevation of the s										
1				water dop	in (III GB).	G 71		2.7		
(Note if I ≠ I₂ within	± 1.∪ ieet, discar	u and resam	ihie)							
 			T	I	T	T	T	T		
(G)	apn				98					
vation (NVGI	- Incl			6	partir		s			
ation	- Ago			stenc	mnt		<u>a</u>			
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Commer	ate	
1/2-		37(+	duck,	10050			0	1	ns .	
		Clay	gray	10	Sinc			very well wixed		
0.7-	. etiletare _{aprili} ina (1000).	EAIL	15.1	er annean,	patient services.	ADMITTAL		WIX		
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O. Ozen								,		
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File ID of digital photograp	h(s):		<u> </u>							
Comments:										
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Battelle	Project Name: Location: Client:	New E	ord Harbor ledford, MA ISACE NAE		ental Monito	· 7	Vessel	G606422 : R/V Gale Force : Theresa Himmer	
itation ID:	M4		Time On S	tation:	100	9	All measure	ements are ±0.1 feet	
	5-07B-0M0	4-00-09	_		27076	97.11	Water Depth		4.7
ogged by:	ИČ		Easting (N/		81585			ish core assembly (B):	10.0
Collection Mechanism:	Push-Core		GPS Accur		1.7		-	ce to top of handle (C):	0054
- Pate:	9/13/0	7	~ Predicted T	•	NA		-	re (from bottom) (D):	0.8
			 Time of Co		101	Õ		evation (NVGD 29) (E):	NA
			Time Depa		101		-	ce from surveyed elevation (F	437
								,	,
G) Elevation of Wate	r Surface (NVGD)): <i>E-F</i>	Calculation	is for Dete	rmination o	r Z* Elevati	оп	2.7	
•			(B, C)				***************************************	-3 8	
								0.0	
z*) Elevation of visua	I transition (NVGE	0): H + (dist	ance to visu	al transition))			<u>~~</u>	
 Elevation of the se 	ediment-water inte	erface as m	easured fror	n bottom of	core (NVGD)): H + D		<u>-2.0</u>	
(t_2) Elevation of the se	ediment-water inte	erface as m	easured fror	n water dep	oth (NVGD):	G - A		- 2 - 0	
(Note if I ≠ I ₂ within	± 1.0 feet, discard	d and resam	nple)						
Q (ep Op				Φ.				
Elevation (NVGD)	Lithology - Include USCS code			<u> </u>	Maximum particle size				
vation (N	- dg			tenc	u u		Ω̈́		
Eleva:	SCS	Туре	Color	Consistency	axim	Odor	Sample IDs		
0.8	<u></u>		T		T	Ō	j ö	Comments	<u> </u>
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		candy	OUVE	Sacra	coasse				
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ID of digital photograp	n(s):								
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Baffelle The Business of Innovation	Project Name Location Clien	n: New I	ford Harbo Bedford, M. USACE NA	4	ental Monite	_	Vesse	: G606422 I: R/V Gale Force t: Theresa Himmer
Station ID:	M7		Time On S		102		****	
Core Sample ID:	S-078-0MC	77-170-1	Northing (I		1707	623.39		rements are ±0.1 feet th (A):
Logged by:	714	rov y		•	81584		Water Dept	` '
Collection Mechanism:	Dt. C	***************************************	Easting (N					
Date:	Push-Core 9/13/0		_ GPS Accu	-		83		ace to top of handle (C):
Date:	1/13/0		_ Predicted		NA	7	_ Length of c	ore (from bottom) (D):
			Time of Co		102		-	levation (NVGD 29) (E): NA
			Time Depa	art Station:	<u>102</u>	1	Water surfa	ace from surveyed elevation $(F)^{\frac{1}{2}} \frac{2 \cdot 7}{2 \cdot 7}$
(G) Elevation of Wa	ater Surface (NVGI		Calculatio	ns for Dete	rmination o	f Z* Elevat	ion	4
	·	•						<u>dil</u>
	bottom of the core							_3.0
z*) Elevation of vis	ual transition (NVG	D): H + (dist	ance to visu	ıal transitior	1)		***	-2.3
(I) Elevation of the	sediment-water in	terface as m	easured fro	m bottom of	core (NVGE	D): H + D		
	sediment-water int						***************************************	
	in ± 1.0 feet, discar				, /-			113
		I	T	T	T	1		T
Elevation (NVGD)	Lithology - Include USCS code			İ	ticle			
vation (NVGI	de - n			Joy) par		s	
/atio	s co			ister	L L		Ji ejc	
	Cutho	Туре	Color	Consistency	Maximum particle size	l ogo	Sample IDs	Comments
1,3		in J	Jork	Linker	fine			
		SUCEY	9104	3011	4111			
A 7-	The second second second	~		agilalakain. Vangagayyan	Chipping completely.	control of the second		-agginterior
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		day	gray		1			
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D of digital photogra	ph(s):				1			
ments:							******	

Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor edford, MA SACE NAE	· .	ental Monito			G606422 R/V Gale Force Theresa Himmer	
Station ID:	MIZ		Time On S	tation:	103	5	All measure	ments are ±0.1 feet	
Core Sample ID:	9-07B-0142	00-15	Northing (N		2707	2 72	Water Depth		6.1
Logged by:	HC	k	Easting (N	,	81584			sh core assembly (B):	10.0
Collection Mechanism:	Push-Core		GPS Accur		2.1	16		ce to top of handle (C):	2.1
Date:	V13/07	,	Predicted 1		NA		····	re (from bottom) (D):	1.5
	7.847	·····	Time of Co		103	7	_	evation (NVGD 29) (E):	NA NA
			Time Depa		1 10046	<u>-</u>	_	ce from surveyed elevation (F)	4-1 G
					-, -, -		_	3.1011 02170 001 0101 0101 (1)	
(G) Elevation of Wat	er Surface (NVGD):		Calculatio	ns for Dete	rmination of	t Z* Elevati	on	0 <	
•	,		(D. O)					_	
	oottom of the core (-// ^	
(z*) Elevation of visua	al transition (NVGD): H + (dista	ince to visu	ıal transition))			714	
(I) Elevation of the s	sediment-water inte	rface as me	asured from	m bottom of	core (NVGD)): H + D		<u></u>	
(I ₂) Elevation of the s	sediment-water inte	rface as me	asured from	m water dep	oth (NVGD):	G - A		~ 3.6	
(Note if I ≠ I ₂ within	n ± 1.0 feet, discard	and resam	ple)						
l î	Φ.				Ф				
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size				
vation (N	Jy - Ii			ency	E E		Ds		
evati	holog SCS c	e G	Color	Consistency	e e	<u></u>	Sample IDs		
iei ei ei ei ei ei ei ei ei ei ei ei ei		Type	8			Odor	Sa	Comments	
1,3		Stilt	gark	Wise	fine				
1,2-		_wix	5-1						
1117		(Olive		0 0	- A	particulary programme		
		sandy:	gray	Firm	fine]			
		Clay	0 /						
0,0									
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ID of digital photograp	oh(s):			I					
mments:									

Battelle	<u>}</u>	oject Name: Location: Client:	New B	ord Harbor edford, MA ISACE NAE		ental Monito	-	Vessel	G606422 : R/V Gale Force : Theresa Himmer	
Station ID:		LL37		Time On St		110	8		ements are ±0.1 feet	
Core Sample ID:	<u> </u>	7B-LL3	2122-	-		27046		Water Depth		7.4
Logged by:	4	114		Easting (N		RIS 27	5.65	-	ush core assembly (B):	10.0
Collection Mechani		Push-Core		GPS Accur		<u> </u>	20		ce to top of handle (C):	13./
Date:	SIII	9/13/0	3 -7	-	•	NA NA	<u> </u>	_		7.2
Date.	***************************************	4,070	<i>8</i>	_ Predicted T	e de la companya de l	NA	79	-	ore (from bottom) (D):	110
				Time of Col	6.4	LOT	a	-	evation (NVGD 29) (<i>E</i>): ce from surveyed elevation (<i>F</i>)	NA
				Time Depai	rt Station.	11:19	Tu	water sunar	ce from surveyed elevation (F)	
				Calculation	ns for Deter	mination o		on		
(G) Elevation of	f Water Sur	face (NVGD	\· F-F						2.1	
				(B, C)						
l		of the core								
(z*) Elevation of visual transition (NVGD): H + (distance to visual transition)										
(I) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D										
(I ₂) Elevation of	f the sedim	ent-water inte	erface as me	easured fror	n water dep	th (NVGD):	G - A		-5.3	
(Note if I ≠ I₂ within ± 1.0 feet, discard and resample)										
(D)		ide				e				
(NVG[l lick			>-	partic		(0		
vation (N		- x60			stenc	E E		e D		
Elevation (NVGD)		Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs		
1,6		33	35 14	light	Aldrews.	Fine		l Ø	Comments	
	Augustinos.	and the second	21.77	,25	fluster -	4-110				
12-			dake	1000	Soft	Edn of				
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			day	groy	from	Fire	ļ			
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File ID of digital phot	tograph(s):				L	L	<u> </u>	<u> </u>		
Comments:	<u> </u>									
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Battelle The Business of Innovation	Project Name: Location: Client:	New E	ford Harbor Bedford, MA JSACE NAE	l	ental Monito			G606422 R/V Gale Force Theresa Himmer	· · ·
Station ID:	M AAC	101			112				
Station ID:	278-144	<u>C1</u> 30-20-2	_ Time On S		7704			ments are ±0.1 feet	0 (^
_	5-078-MM	Les V Char Z			\$1520		Water Depth		<u>8.0</u> 71.0
Logged by:	<u> </u>		_ Easting (N	•		0.10		sh core assembly (B):	
Collection Mechanism:	Push-Core		GPS Accur	acy:	<u> </u>	14	_Water surfac	e to top of handle (C):	0.9
Date:	9/13/0		_ Predicted 1	Tide (ft):	NA	er a	_Length of cor	re (from bottom) (D):	<u> 2.0</u>
			Time of Co	llection:			_Surveyed ele	vation (NVGD 29) (E):	NA
			Tìme Depa	rt Station:	113	3	_Water surfac	e from surveyed elevation ((F): <u>†2 , D</u>
			Calculation	ns for Detei	rmination o	Z* Elevati	on	~	
(G) Elevation of Wate	er Surface (NVGD)): E -F						<u> </u>	
(H) Elevation of the b	ottom of the core	(NVGD): G	i - (B - C)					<u>-8,1</u>	
(z*) Elevation of visua	al transition (NVGI)): H + (dist	ance to visu	al transition)			-6.5	
	,			,	•	W. 11 . D			
	ediment-water inte				•	•		<u></u>	
(12) Elevation of the s				ıı water dep	uii (NVGD):	G - A		<u>-6.0</u>	
(Note if I ≠ I₂ within	± 1.0 feet, discard	d and resan	nple)						
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Elevation (NVGD)	Lithology - Include USCS code				Ticle				
N) u	ge -			ρ	n pai		Sa		
vation (N	S co			Consistency	l i		Sample IDs		
(F.e.	Liffic	Туре	Color	Con	Maximum particle size	Ogo	Sam	Commer	nts
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File ID of digital photograp Comments:	лη(δ).								

Battelle The Business of Innovation	Project Name: Location:	New B	edford, MA	l	ental Monito	_	Vessel	G606422 : R/V Gale Force		
	Client:		Time On St		113	7200		: Theresa Himmer		
Station ID: Core Sample ID:		5-00-14	Time On St Northing (N			99,36	Water Depti	ements are ±0.1 feet		
Logged by:	·U	200/1	Easting (NA	•	91507	15,24		ush core assembly (B):		
Collection Mechanism:	Push-Core		GPS Accur		11/2/	05	-	ce to top of handle (C) :		
Date:	9/13/0	7	Predicted T		NA NA	<u> ~ 6 /</u>	-	ore (from bottom) (D):		
Duic.			Time of Co		112	8 1145	-	evation (NVGD 29) (E): NA		
			Time Depa		1148		-	ce from surveyed elevation (F):		
			Calculation	ns for Deter	rmination o	f Z* Elevati	on			
(G) Elevation of Wate	er Surface (NVGD)							1.8		
(H) Elevation of the b	ottom of the core ((NVGD): G	- (B - C)					~7.4		
(z*) Elevation of visua	al transition (NVGD)): H + (dista	ance to visu	al transition)			-6.2		
(I) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D										
(I_2) Elevation of the sediment-water interface as measured from water depth (NVGD): $G - A$										
(Note if I ≠ I ₂ within ± 1.0 feet, discard and resample)										
(Note if I # I ₂ within	i ± 1.0 feet, discard	and resam	ipie)							
3D)	nde.				æ					
Elevation (NVGD)	Lithology - Include USCS code			6	Maximum particle size		စ္ခ			
vation (N	- Afa			sten	L mar		<u>□</u>			
Eleva (I.e. B	ithok	Туре	Color	Consistency	/axinize	Odor	Sample IDs	Comments		
1.4		MOY	in : X-	Valle C		1	"	Comments		
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		day	Den	1 ×2000	KUL					
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O. T										
ID of digital photograp	oh(s):									
nments:										
		4.								

Battelle	Project Name: Location: Client:	New B	ord Harbor edford, MA SACE NAE		ntal Monito		Vessel	G606422 : R/V Gale Force : Theresa Himmer				
Station ID:	MM25	/	Time On St		11.55			ements are ±0.1 feet				
Core Sample ID:	-07B-MM2	4-00-21	Northing (N		27048	48.85	Water Depth		7.4			
Logged by:	NC.		Easting (NA		81530		-	ish core assembly (B):	7/.0			
Collection Mechanism:	Push-Core		GPS Accur		2,1	57	-	ce to top of handle (C):	1.3			
Date:	9/13/0	7	Predicted T	-	NA			ore (from bottom) (D):	7.1			
- Date.	- 1, 3, 3, 1	<u> </u>	Time of Col		115	6		evation (NVGD 29) (E):	NA			
					120		-		NA .			
			Time Depar	t Station.	- Labor		_ water surial	ce from surveyed elevation (F)			
			Calculation	s for Deter	mination of	f Z* Elevati	on					
(G) Elevation of Wate	(G) Elevation of Water Surface (NVGD): E - F											
			(5.0)					_ 0 2				
(H) Elevation of the bottom of the core (NVGD): G - (B - C)												
(z*) Elevation of visual transition (NVGD): H + (distance to visual transition)												
(I) Elevation of the se	ediment-water inte	rface as me	asured from	n bottom of	core (NVGD)): H + D		-6.7				
(I2) Elevation of the se	ediment-water inte	erface as me	asured fron	n water dep	th (NVGD):	G - A		-6.0				
(Note if I ≠ I₂ within	± 1.0 feet, discard	and resam	ole)									
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/GD)	Lithology - Include USCS code				ticle							
Elevation (NVGD)	de -			ncy	Maximum particle size		SQ	,				
/ation	S co	0	<u>_</u>	Consistency	l mei	_	Sample IDs					
	Lith	Туре	Color	Con	Max	Odor	Sam	Comments				
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Comments.												
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Battelle	Project Name: Location:		ord Harbor ledford, MA		ntal Monito	oring	•	G606422 : R/V Gale Force		
The Business of Innovation	Client:		SACE NAE			Chi		: Theresa Himmer/Alex Mansfield		
Station ID:	<u>MM27</u>		Time On St		174	06	J-16	ements are ±0.1 feet		
Core Sample ID: 5	07B-MM21	1 23	Northing (N		2104	A 1 2 2	∫Water Deptl	1 1 1		
Logged by:	MW/J	<u>H ~~</u>	- Easting (NA			01. LL		ush core assembly (B):		
Collection Mechanism:	Push-Core	~ 7	_ GPS Accur		V/V	44	_	ce to top of handle (C):		
Date:	1/ 13/2		Predicted T		/\/\	ART	-	ore (from bottom) (D):		
			Time of Co		121	4	-	evation (NVGD 29) (E): ce from surveyed elevation (E):		
			Time Depa	nt Station:			_water surfa	ce from surveyed elevation (F):		
			Calculation	s for Deter	mination of	f Z* Elevati	on			
(G) Elevation of Wate	r Surface (NVGD)): <i>E-F</i>						***************************************		
(H) Elevation of the be	ottom of the core ((NVGD): G	- (B - C)					-8.2		
(z*) Elevation of visua	I transition (NVGE)): H + (dista	ance to visu	al transition,)			-7.0		
(I) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D										
1,3					,	•		-1.0		
(I ₂) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample)										
(11010 11 7 12 1111 1111	1.0 100t, a 100are	a dila recan	,				***************************************			
	, o			I	I		T			
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size					
on (N	ly - Ir			ency	ed u		Ds			
Elevation (P. C.e. Bottom	holog	Туре	Color	Consistency	aximu e	Odor	Sample IDs			
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e ID of digital photograp omments:	11(5).									

Battelle	Project Name: Location:	New E	ledford, MA		ntal Monito			: R/V Gale Force
The Business of Innovation	Client	L	ISACE NAE		,	- 4		: Theresa Himmer/Alex Mansfield
Station ID:	<u></u>	3 10 1 1	_ Time On St		0701	- <u>9</u>	73	ements are ±0.1 feet
Core Sample ID:	-078-DD31-0	<u> </u>	_ Northing (N		2/07	<u>673.5</u>	Water Depth	
Logged by:	<i>..</i>		_ Easting (NA		81001	7.67	-	ish core assembly (B):
Collection Mechanism: _	Push-Core	<u> </u>	_ GPS Accura	-		<u> </u>		ce to top of handle (C):
Date:	9/13/07	<i>-</i>	_ Predicted T	ide (ft):	N/1	ි	_Length of co	ore (from bottom) (D):
			Time of Col	lection:	122		-	evation (NVGD 29) (E):
			Time Depar	t Station:	123	1	_Water surfac	ce from surveyed elevation (F):
			Calculation	s for Deter	mination of	f Z* Elevati	on	
(G) Elevation of Water	er Surface (NVGD): <i>E - F</i>						0.7
(H) Elevation of the b	ottom of the core	(NVGD): G	- (B - C)					- 52
(z*) Elevation of visua	I transition (NVGI	D): H + (dist	ance to visua	al transition)	,			-7.6
(I) Elevation of the s	ediment-water inte	erface as m	easured fron	n bottom of	core (NVGD)): <i>H + D</i>		-5.6
(I ₂) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A								
(Note if I ≠ I₂ within ± 1.0 feet, discard and resample)								
(**************************************			,,					
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Elevation (NVGD)	Lifhology - Include USCS code				Maximum particle size			
ion (gy - F			tency	e E		Ds	
levation (h	holo	Туре	Color	Consistency	axim Se	Odor	Sample IDs	
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omments:	(5).							

	Battelle Business of Inn		Locat	me: <i>New Bed</i> ion: <i>New</i> ent:	dford Harbor Bedford, MA USACE NAE	ı	ental Monito	-	Vessel	G606422 :: R/V Gale Force :: Theresa Himmer/Alex Mansfie	ıld		
Stati	ion ID:		D033	7	Time On S		124	5		ements are ±0.1 feet			
1	e Sample ID:	5	-07K-ND	32-00-2			2704	5 8 1 8 mm 1 1 1	Water Dept		9,5		
1	ged by:	****	ŽĮ.		Easting (N/	•	81507	15.81	_	ush core assembly (B): 150	Leo		
1	ection Mechai	nism [.]	Push-Co	re	GPS Accur		1,1	12	_	ice to top of handle (C) :	9		
Date			9/13	. I seems	Predicted 1	-	- G	100		ore (from bottom) (D):), ₂		
Date	z.		- 1/1/	<u> </u>	Time of Co		120	54	-		· · · &		
							100	8	_	levation (NVGD 29) (E):	0,2		
					Time Depa	rt Station:	1 600 2)	<u> </u>	_ water suma	ce from surveyed elevation (F):	<u> </u>		
-					Calculation	ns for Dete	rmination o	f Z* Elevati	ion				
(G)	Elevation	of Mate	r Surface (NIV	GDV: E.E						0.0			
	1.0												
(H)	(H) Elevation of the bottom of the core (NVGD): G - (B - C)												
(z*) Elevation of visual transition (NVGD): H + (distance to visual transition)													
(I) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D													
(12)	Elevation	of the se	ediment-water	interface as r	measured from	oth (NVGD):	G - A		-9.3				
		l _a within	± 1.0 feet, dis	card and resa	ımple)								
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	Elevation (NVGD)		Lithology - Include USCS code			>	Maximum particle size						
	vation (P		- dg			tenc	E E		l so				
	evat	3	holog	Type	Color	Consistency	axim.	Odor	Sample IDs				
	2.2				8		Max	<u> </u>	S S	Comments			
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Comme	ents:												

Battelle	Project Name: Location:		ord Harbor edford, MA		ental Monito	ring	Project #: Vessel	G606422 : R/V Gale Force	
The Business of Innovation	Chent.	U	SACE NAE	•	1 mg gr	N. compositio	ef Scientist	: Theresa Himmer/Alex Mansfield	
Station ID:	<u>DD35</u>	7.5	Time On St		130	<u> </u>		ements are ±0.1 feet	
Core Sample ID:	5-078-DD35-	00-2-			3/04S	574.00		9 100 100	
Logged by:			Easting (NA		XIDU I	<u>15,48 </u>	-	7 2	
Collection Mechanism:	Push-Core 9/12/0	erry	GPS Accur			<u> </u>	Water surface to top of handle (C): 3,9 Length of core (from bottom) (D): 2,3		
Date:	- 1/13/0	*	Predicted T		<u>NA</u>	ı Ø	-	evation (NVGD 29) (E):	
			Time of Col		131	2		ce from surveyed elevation (F):	
			rime Depai	it Station.			_ water surial	te nom surveyed elevation (F).	
			Calculation	s for Deter	rmination of	f Z* Elevati	on		
(G) Elevation of W	ater Surface (NVGD)	: <i>E-F</i>						-0.1	
(H) Elevation of the	e bottom of the core (NVGD): G	- (B - C)					and the second s	
1	sual transition (NVGE			al transition	}			-in.0	
(I) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D									
1	e sediment-water inte				·			- 9 1	
		- /,		£ 8 - E					
(Note if 1 ≠ 1 ₂ with	hin ± 1.0 feet, discard	and resam	ipie)				<u> </u>		
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Elevation (NVGD)	ncl			5	parti		S		
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Elevi	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments	
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Comments:	.~p.,\\0/.								

Battelle The Business of Innovation	Project Name: Location: Client:	New Bed	Harbor E Hord, MA ACE NAE	Environmer	ntal Monitor			G606422 R/V Gale Force Theresa Himmer	
Station ID:	0040	-	Time On Sta	ation:	132	28		ments are ±0.1 feet	
-	-07B-DD90		Northing (N		77041	4470	Water Depth		0.7
Logged by:	MW/J+	â.	Easting (NA		61503	u. 78		sh core assembly (B):	15.0
Collection Mechanism:				•	3 1	<u> </u>		, , ,	-17:
1	Push-Core 9/13/	do. westy	GPS Accura		A . 1.	2	-	te to top of handle (C):	9.0
Date:	1/19/		Predicted Ti		NA 1331)	-	re (from bottom) (D):	414
			Time of Coll		133	<u>(</u>		evation (NVGD 29) (E):	NA (
		-	Time Depar	t Station:	100		_Water surfac	e from surveyed elevation	(F): 0 · 6
			alculation	s for Deter	mination of	7* Flovatio	\n		
			aiculation	is for Deter	iliniation of	Z Lievatio	л	- I	
(G) Elevation of Wate	er Surface (NVGD):	E-F					-	<u> </u>	
(H) Elevation of the b	ottom of the core (N	IVGD): <i>G - (E</i>	3 - C)				***************************************	-11/6	
(z*) Elevation of visua	l transition (NVGD)	: H + (distanc	e to visual	transition)				-10.6	
(1) Elevation of the se	ediment-water inter	fano as moasi	ired from I	nottom of co	ore (NIVGD):	нтп		-9 U	
(I_2) Elevation of the se	_ () 2	***************************************							
, -,				rater depth	(144 GD). G	/7		<u> </u>	
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resample)						
6	œ.								
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size				
Z : E 0	- John Jahr	İ		ncy	n pa		SO		
Elevation (N	S S S	0	<u>.</u>	Consistency	un uu		Sample IDs		
	nso nso	Type	Color	Con	Max size	Odor	Sam	Comme	ents
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File ID of digital photograp	h(s):								
Comments:									

Battelle	Project Name: <i>New Bed</i> Location: <i>New</i>	fford Harbor Environme Bedford, MA	ental Monitoring	Project #: G606422 Vessel: R/V Gale Force	
The Business of Innovation	Client:	USACE NAE	· · · · · · · · · · · · · · · · · · ·	hief Scientist: Theresa Himmer	
Station ID:	0026-0076-00-	Time On Station:	0834	All measurements are ±0.1 feet	
Core Sample ID:	MW	Northing (NAD 83): Easting (NAD 83):	27097168	Water Depth (A):	2014 - 12 - 12 - 12 - 12 - 12 - 12 - 12 -
Collection Mechanism:	Push-Core	GPS Accuracy:	3.4	Length of push core assembly (B): Water surface to top of handle (C):	400 1110 VI VI VI
Date:	9/20/07	Predicted Tide (ft):	NA 💜	Length of core (from bottom) (D):	2.3
		Time of Collection:	0342 1084643	Surveyed elevation (NVGD 29) (E):	NA 32
		Time Depart Station:	0916	Water surface from surveyed elevati	
		Calculations for Dete	rmination of Z* Elevat		
(G) Elevation of Water	Surface (NVGD): E-F		, made of E	-0.4	
	ttom of the core (NVGD): G	i - (B - C)		-7.9	
	transition (NVGD): H + (dist			-6:0	***************************************
	diment-water interface as m		ore (NVGD): H + D	-5.6	
1	diment-water interface as m			-5.3	
	± 1.0 feet, discard and resan				
,		·F·-/			
6 -	o				
Elevation (NVGD)	Lithology - Include USCS code		Maximum particle size		
vation (N	gy - L	tency	ă H	l Ds	
Eleva(Litholo USCS Type	Color	Maximi size Odor	Sample Ds	
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Baffelle The Business of Innovation	Project Name Location	: New E	Bedford, MA	l	ental Monito	_	Vesse	G606422 I: R/V Gale Force	
Station ID:	Client	i; <u>(</u>	JSACE NAE		A02	Ch 3		t: Theresa Himmer	
Core Sample ID:	-MAR-000	2-188-16	Time On S Northing (N		2374	296.80		ements are ±0.1 feet	
Logged by:	Mu)	<u> </u>	Easting (N		8153	75.85		•	<u>5.7</u>
Collection Mechanism:	Push-Core		GPS Accur		1.7	· (*		ush core assembly (B): uce to top of handle (C):	11.0 3.9
Date:	9/20/07		Predicted 7		NA		_	ore (from bottom) (D):	1.6
-		***************************************	Time of Co		0927		Surveyed elevation (NVGD 29) (E): NA		
			Time Depa		0933		_	ce from surveyed elevation	
								•	
			Calculation	ns for Dete	rmination o	f Z* Elevati	on		
(G) Elevation of Wate	r Surface (NVGD)	: <i>E-F</i>						<u>-0.1</u>	
(H) Elevation of the bo	ottom of the core (NVGD): G-	(B - C)					- 4.3	
(z*) Elevation of visual transition (NVGD): H + (distance to visual transition)									
(I) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H+D -5, 7									
(12) Elevation of the se	ediment-water inte	rface as mea	asured from	water depth	(NVGD): G	- A		-5.4	
(Note if I ≠ I₂ within ± 1.0 feet, discard and resample)									
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Elevation (NVGD)	Lithology - Include USCS code				ticle				
(N) E	de Fig			Joch	parl r		SO		
vation (N	ology SS cc		5	Consistency	Maximum particle size	_	Sample IDs		
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ID of digital photographe	(s):								
mments:									

Station ID PF 30 Time On Station: OPH Water surface to top of handle (C): Peach Core GP Accuracy Predictor ID Predictor I	Battelle	Location:	New Bedford Harb New Bedford, USACE N	MA	ental Monito	_		R/V Gale Force	
Core Sample ID: 5-75-W30-M-36 Northing (NAD 83): 3704-48-01 Water Depth (A): 50-0000 Northing (NAD 83): 815-374, 74 Leagh of push core assembly (8): 10.0000 GP SAccuracy Water surface to tep of handle (C): 3.7 Northing (NAD 83): 15-9 Water surface to tep of handle (C): 3.7 Northing (NAD 83): 15-9 Water surface to tep of handle (C): 3.7 Northing (NAD 83): 15-9 Water surface from bottom (IV): 2.6 No. 2745 Surveyed elevation (NVCD 29) (E): NA Water surface from surveyed elevation (NVCD 29) (E): NA Water surface from surveyed elevation (NVCD 29) (E): NA Water surface from surveyed elevation (NVCD 29) (E): 7.2 No. 2 Northing (NVCD): 8-6 No. 2 Northing (NVCD): 8-6 No. 2	Station ID:				0941	- OII			
Collection of the sediment-water interface as measured from bottom of core (NVGD): H + D + D + D + D + D + D + D + D + D +		A	. / 21		2704	698.N			CA
Public Core Pale: Public Core Place: Place Core Place: Place Core Place: Place Core Place: Place Core Place: Place Core Place: Place: P	-	<u> </u>		- '	*****				
Predicted Tole (ft): Time of Collection: Time of									
Time of Collection: Time Depart Station: O 9 45 Surveyed elevation (NVGD 29) (E): NA Water surface from surveyed elevation (F):	Date:	- 1001					-		3/
Time Depart Station: Calculations for Determination of Z' Elevation G) Elevation of Water Surface (NVGD): E · F H) Elevation of the bottom of the core (NVGD): G · (B · C) Delevation of visual transition (NVGD): H · (distance to visual transition) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H · D (Note if I · F b within = 1.0 feet, discard and resample) Or (Note if I · F b within = 1.0 feet, discard and resample) Or (NVGD): H · D Or (NVGD): H · D Or (NVGD): H · D Or (NVGD): H · D Or (NVGD): H · D Or (NVGD): H · D Or (NVGD): G · A (Note if I · F b within = 1.0 feet, discard and resample) Or (NVGD): G · A Or (NVGD): G						·····	_		N: O
Calculations for Determination of 2" Elevation Gillevation of Water Surface (NVGD): E - F H) Elevation of the bottom of the core (NVGD): G - (B - C) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I₂ within ± 1.0 feet, discard and resample) Or of digital photographics Or of digital photographics:									
Elevation of Water Surface (NVGD): E - F -0.2							_	e from surveyed elevation (P): <u>U) & </u>
Elevation of the bottom of the core (NVGD): G - (B - C) 2) Elevation of visual transition (NVGD): H + (distance to visual transition) (b) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D (c) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I # Is within ± 1.0 feet, discard and resample) (c) ON Use of the sediment water interface as measured from water depth (NVGD): G - A (c) ON Use of the sediment water interface as measured from water depth (NVGD): G - A (c) ON Use of the sediment-water interface as measured from water depth (NVGD): G - A (c) ON Use of the sediment-water interface as measured from water depth (NVGD): G - A (c) ON Use of the sediment-water interface as measured from water depth (NVGD): G - A (c) ON Use of the sediment-water interface as measured from water depth (NVGD): G - A (c) ON Use of the sediment-water interface as measured from water depth (NVGD): G - A (c) ON Use of the sediment-water interface as measured from water depth (NVGD): G - A (c) ON Use of the sediment-water interface as measured from water depth (NVGD): G - A (c) ON Use of the sediment-water interface as measured from water depth (NVGD): G - A (c) ON Use of the sediment-water interface as measured from water depth (NVGD): H + D (c) ON Use of the sediment-water interface as measured from water depth (NVGD): H + D (c) ON Use of the sediment-water interface as measured from water depth (NVGD): H + D (c) ON Use of the sediment-water interface as measured from water depth (NVGD): H + D (c) ON Use of the sediment-water interface as measured from water depth (NVGD): H + D (c) ON Use of the sediment-water interface as measured from water depth (NVGD): H + D (c) ON Use of the sediment-water interface as measured from water depth (NVGD): H + D (c) ON Use of the sediment-water interface as measured from water depth (NVGD): H + D (c) ON Use of the sediment-water interface as measured from water depth (NVGD): H + D (c) ON Use of th	(G) Elevation of	Water Surface (NVGD):		tions for Dete	rmination o	f Z* Elevatio	on	-0.0	
Elevation of visual transition (NVGD): H + (distance to visual transition) Description of the sediment-water interface as measured from bottom of core (NVGD): H + D Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) ODD of digital photograph(s): Description of the sediment-water interface as measured from water depth (NVGD): G - A Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) ODD of digital photograph(s):		•						\$ 0	
Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D -5 . 4								-6.1	
(Note if I ≠ I₂ within = 1.0 feet, discard and resample) Comments City C								<u> </u>	
(Note if I # I ₂ within ± 1.0 feet, discard and resample) Comments Comm							*****	-5.1	
Clay gray firm for a digital photograph(s):	(1 ₂) Elevation of	the sediment-water interf	ace as measured fro	om water depth	n (NVGD): <i>G</i>	- A		-5,2	
26 1.9 Clay gray firm fine O O O O O O O O O O O O O O O O O O O	(Note if I ≠ I ₂ v	vithin ± 1.0 feet, discard a	nd resample)						
26 1.9 Clay gray firm fine O O O O O O O O O O O O O O O O O O O	(DS)	epi			<u>a</u>				
26 1.9 Clay gray firm fine O O O O O O O O O O O O O O O O O O O	(NVC	lucin			partic				
26 1.9 Clay gray firm fine O O O O O O O O O O O O O O O O O O O	tion	gy -		tenc	E		S C		
26 1.9 Clay gray firm fine O O O O O O O O O O O O O O O O O O O	ie. B	tholo	Je Jpe	onsis	axim	Ę	l agu		
Clay gray firm fine O O T O of digital photograph(s):			100		∑ is	ŏ	SS	Comments	i
Clay gray firm fine Clay gray firm fine D of digital photograph(s):			5.1+ D'	K 1003K	fred				
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Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor I edford, MA SACE NAE		ntal Monitor	_	Vessel	G606422 : R/V Gale Force : Theresa Himmer	
Station ID:	P836	1619 - 27	Time On St		0955	TVZ 1		ements are ±0.1 feet	£ & / \
Core Sample ID:	7D-1136	~ (0×0 ~ 0\~	Northing (N	•	270 9	3 181A	_ Water Depti	• ,	6061
-	MU		Easting (NA		81537	<u> 75・み</u>		ush core assembly (B):	11.0
Collection Mechanism:	Push-Core		GPS Accura	acy:	1.8		_ Water surfa	ce to top of handle (C):	230
Date:	9120107		Predicted T	ide (ft):	NA		Length of co	ore (from bottom) (D):	30 61
			Time of Col	lection:		013	Surveyed el	evation (NVGD 29) (E):	NA
			Time Depar	t Station:	1018		Water surfa	ce from surveyed elevation	(F): <u>O · l</u>
(G) Elevation of Water	Surface (NIVGD):		Calculation	s for Deter	rmination of	Z* Elevati	on	~0.1	
			(D. C)					-	
(H) Elevation of the bo	attorn of the core (N	IVGD): G-	(B - C)					<u> </u>	
(z*) Elevation of visual	transition (NVGD):	H + (distar	ce to visual	transition)			***************************************	-0.2	
(I) Elevation of the se-	diment-water inter	ace as mea	sured from	bottom of co	ore (NVGD):	H + D	***************************************	-6,4	
(12) Elevation of the se	diment-water inter	ace as mea	sured from	water depth	(NVGD): <i>G</i>	- A		-6,2	
(Note if I ≠ I₂ within ±	± 1.0 feet, discard	and resamp	le)						
(GD)	ge				<u>a</u>				
1 ≥ #1	Lithology - Include USCS code			े	Maximum particle size		ω ₀		
vation (N	- ygo			Consistency	I I I I I I I I I I		Sample IDs		
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Battelle	Project Name: , Location: Client:	New Be	rd Harbor E edford, MA SACE NAE	Environme	ntal Monitor	_		G606422 R/V Gale Force Theresa Himmer	
station ID:	PP40		Time On Sta	ation:	1021		All measure	ments are ±0.1 feet	
ore Sample ID: 5	0713-PP410-	00-16	Northing (N	AD 83):	27044	148.03	Water Depth	ı (A):	606.1
ogged by:	MW		Easting (NA	D 83):	81537	74.75	Length of pu	sh core assembly (B):	11.0
collection Mechanism:	Push-Core		GPS Accura	acy:	2.7	^О тансиция	_ _Water surfac	ce to top of handle (C):	303
ate:	9120107		Predicted Ti	ide (ft):	NA		_ _Length of co	re (from bottom) (D):	1.6
			Time of Coll	ection:	102511	231	_ _Surveyed ele	evation (NVGD 29) (E):	NA
			Time Depar	t Station:	1038		_Water surfac	ce from surveyed elevation (F):	0.0
G) Elevation of Water	Surface (NVGD):		Calculation	s for Dete	rmination of	Z* Elevation	on	0.0	
•	, ,		(D. C)				***************************************	-4.0	***************************************
H) Elevation of the bo									
z*) Elevation of visual	transition (NVGD):	H + (distan	ce to visual	transition)				-0.0	
) Elevation of the se	diment-water interfa	ace as meas	sured from b	oottom of c	ore (NVGD):	H + D		<u> </u>	
(2) Elevation of the se	diment-water interfa	ace as mea	sured from v	water depth	(NVGD): <i>G</i>	- A			
(Note if I ≠ I ₂ within ±	= 1.0 feet, discard a	nd resampl	e)						
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs		
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ments:	16								
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Battelle	Project Name: // Location: Client:	New Be	d Harbor E dford, MA ACE NAE	nvironmei	ntal Monitori	_		G606422 R/V Gale Force Theresa Himmer	
Station ID:	0047		Time On Sta	tion:	1042		All measure	ments are ±0.1 feet	
***	67B-0042-1		Northing (NA		270439	5.27	Water Depth		6.1
_ogged by:	NW		Easting (NAI		815349	1,40	•	sh core assembly (B):	11.0
Collection Mechanism:	Push-Core		GPS Accura		2.15	-	- Water surfac	e to top of handle (C):	2.8
Date:	9/20/03	3	Predicted Tid	-	NA		•	re (from bottom) (D):	2.0
-			Time of Colle		1046		Surveyed ele	vation (NVGD 29) (E):	NA
			Time Depart	Station:	10.54		- Water surfac	e from surveyed elevation	(F): <u>0 · 0</u>
	<u></u>		Calculations	s for Deter	mination of	Z* Elevatio	าก	~~.	
(G) Elevation of Wate	r Surface (NVGD):	E - F						0.0	· · · · · · · · · · · · · · · · · · ·
(H) Elevation of the bo	ottom of the core (N	VGD): <i>G - (</i>	B - C)					-8.1	
(z*) Elevation of visua	I transition (NVGD):	H + (distand	ce to visual i	transition)				<u>-7. [</u>	
(I) Elevation of the se	ediment-water interfa	ace as meas	sured from b	ottom of co	ore (NVGD):	H + D		-6.2	
	ediment-water interfa							-6.1	
	± 1.0 feet, discard a								
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Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size				
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evatir Bot	nolog CS c	g	lo	Consistency	ixim.	lor	Sample IDs		
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Battelle The Business of Innovation	Project Name: <i>Ne</i> Location: Client:	ew Bedford Harbor New Bedford, MA USACE NAE	ı	ntal Monito	_		G606422 R/V Gale Force Theresa Himmer					
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	0038 1713-0038-60 MW) Push-Core 9 120 167	Time On St Northing (N Easting (NA GPS Accur. Predicted T Time of Col Time Depar	AD 83): AD 83): acy: ide (ft):	81533 Z.1 NA	496.7 50.50	Water Depth Length of pus Water surfac Length of cor Surveyed ele	sh core assembly (B): e to top of handle (C): e (from bottom) (D): vation (NVGD 29) (E):	11.0 2020 24 NA (F):†0.2				
Time Depart Station:												
Elevation (I.e. Bottom		Silt Black On gray	The Consistency	F. F. Maximum particle	Jopo	Sample IDs	Commer	nts				
File ID of digital photograph(Comments:	16											

Battelle The Business of Innovation	Project Name Location	: New	Bedford, MA	4	ental Monito	oring	-	: G606422 II: R/V Gale Force
	Client 0032	:	USACE NAE		11 7 1			t: Theresa Himmer
Station ID:	273-0032-	K0~2	Time On S		21/2			rements are ±0.1 feet
· 	<u> </u>	-00 - A	6 Northing (N		0150	164616	Water Dep	
Logged by: Collection Mechanism:			Easting (N.		7:09 2.	77.4		ush core assembly (B):
Date:	Push-Core 9/20/07	-	GPS Accur			74		ace to top of handle (C): $\frac{29}{2}$
Date.	TIP TO T		Predicted 1		NA /130			ore (from bottom) (D):
			Time of Co		-			levation (NVGD 29) (E): NA
			Time Depa	rt Station:	1134		Water surfa	ace from surveyed elevation (F):
			Calculation	ns for Dete	rmination o	f Z* Elevati	on	. 4.
(G) Elevation of Water							-	***************************************
(H) Elevation of the bo	ttom of the core (I	NVGD): G	- (B - C)					- m f f
(z*) Elevation of visual	transition (NVGD)): H + (dista	nce to visua	l transition)				6,3
(I) Elevation of the sec	diment-water inter	rface as me	asured from	bottom of c	ore (NVGD)	: H + D		-5.
(I2) Elevation of the sec							****	-4.8
(Note if I ≠ I₂ within ±								g
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vation (N	ogy -			stenc	un un		D _s	
<u>e</u> e	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle	Odor	Sample IDs	5
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mments:								

Battelle The Business of Innovation	Project Name: Location: Client:	New Be	d Harbor i dford, MA ACE NAE		ntal Monitor	_	Vessel	G606422 I: R/V Gale Force I: Theresa Himmer
Station ID:	MIS		Time On St	ation:	1153	·····		ements are ±0.1 feet
ore Sample ID: 5	098-8M13-		Northing (N		1707	473.51		A 01
ogged by:	AAW/		Easting (NA	,	8158	52-00	- '	ush core assembly (B):
ollection Mechanism:	Push-Core		GPS Accura		1.7	***************************************		ce to top of handle (C):
ate:	9/20/07		Predicted T	-	NA			ore (from bottom) (D):
			Time of Col		1158		-	evation (NVGD 29) (E): NA
			Time Depar		12.05		-	ce from surveyed elevation (F): $\frac{1}{60.5}$
					rmination of	7* Eleveti		
G) Elevation of Wat	er Surface (NVGD):		aiculatioi	is for beter	mmadon of	Z Lievau	<i>3</i> (1	+0.5
H) Elevation of the b	pottom of the core (N	VGD): <i>G - (1</i>	B - C)					-3.9
				(transition)			***************************************	- 2.9
,	al transition (NVGD):	·		ŕ				-7.6
•	sediment-water interf							
(2) Elevation of the s	sediment-water interf	ace as meas	ured from	water depth	(NVGD): <i>G</i>	- A		-2.4
(Note if I ≠ I ₂ within	n ± 1.0 feet, discard a	and resample))					
G a	_ υ						T	
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size			
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E E	ns E	Type	Color			Odor	Sal	Comments
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Battelle The Business of Innovation	Project Name: New I Location: A Client:	Bedford Harbor lew Bedford, MA USACE NAE	4	ental Monito	_		G606422 : R/V Gale Force : Theresa Himmer	
Station ID:	MIS	Time On S		120				
\	978-8N15-10	Northing (N		2307	424.9	7	ements are ±0.1 feet	3-63.8
	Mu)	Easting (N		81555			sh core assembly (B):	11.0
Collection Mechanism:	Push-Core	GPS Accur		1.8			ce to top of handle (C):	6.76.0
Date:	1/20/07	Predicted 7		NA			re (from bottom) (D):	1.1
		Time of Co		56	218		evation (NVGD 29) (<i>E</i>):	
		Time Depa		1225	010		ce from surveyed elevation (NA 1015
							o nom surveyed elevation ():
(G) Elevation of Water 9	Surface (NVGD): E-F	Calculation	ns for Dete	ermination o	t Z^ Elevati	on	+0.5	
	tom of the core (NVGD):	G - (B - C)					-4.5	
							7 9	
	ransition (NVGD): H + (d		-				-3/1	
	iment-water interface as						-3,4	
(I ₂) Elevation of the sed	iment-water interface as	measured from	water depth	n (NVGD): G	- A		3.3	
(Note if I ≠ I ₂ within ±	1.0 feet, discard and res	sample)						
			I	T	1			
Elevation (NVGD)	Lithology - Include USCS code			ficle				
vation (NVGE)	nde de		کو	Maximum particle		sc		
Vatio	shogy SS co		Consistency	mnw.		Sample IDs		
	Litho	Color	Con	Maxi	Odor	Sam	Comment	s
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ID of digital photograph(s)	<u>, </u>						***************************************	
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Battelle The Business of Innovation	Project Name: / Location: Client:	New B	ord Harbor E edford, MA SACE NAE	nvironme	ntal Monitori	_		G606422 R/V Gale Force Theresa Himmer	
Station ID:	M17		Time On Sta	ation:	1228	***************************************	All measure	ments are ±0.1 feet	
Core Sample ID:	5-076-6N MLF Push-Core	117-6p	Northing (NA Easting (NA GPS Accura	D 83):	27073 815832	72.46		sh core assembly (B): te to top of handle (C):	373
Date:	9/20/07	7	Predicted Ti	ide (ft):	NA 174	—	 Length of co _Surveyed ele	re (from bottom) (<i>D</i>): evation (NVGD 29) (<i>E</i>):	2.4 NA
			Time Depar	t Station:	125	/	_Water surfac	e from surveyed elevation (F): -8 -8
			Calculation	s for Deter	rmination of	Z* Elevatio	on	40 R	
•	er Surface (NVGD): ottom of the core (N'		(B - C)					-5.6	
	I transition (NVGD):			transition)				-4.4	
(I) Elevation of the se	ediment-water interfa	ace as mea	asured from I	oottom of c	ore (NVGD):	H + D		-3,2	
(I_2) Elevation of the s	ediment-water interfa	ace as mea	sured from	water depth	i (NVGD): G	- A		-3.0	
(Note if I ≠ I ₂ within	± 1.0 feet, discard a	ınd resamp	ile)						
Elevation (NVGD)	Lifnology - Include USCS cade		:	лсу	Maximum particle size		SO	-	
levation (N	thology SCS co	Туре	Color	Consistency	aximun ze	Odor	Sample IDs		
<u>ш</u> =		SIFT	7 4 81 62.	1005 €		ŏ	SS	Comment	S
1.9	m ann s	send yorgu	pierr		fine	sispector		Clark	*
_		silt	black	loose	fine			slight	
1/2 -	ACTION NAME OF THE PARTY OF THE	~p *	W. W	Firm			~ ~	Suzen	
		Clay	olive grey	N. Carr	tine				
0,0		shelk)			Andrew Control of the			water	
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ist	2 a	Hem	rks	N	G				

Battelle The Business of Innovation	Project Name: Location: Client:	New Bedi		nvironmer	ntal Monitor	_		G606422 R/V Gale Force Theresa Himmer	
Station ID: Core Sample ID: Logged by: Collection Mechanism:	Push-Core	250 - 500 - 750 Ea	me On Sta orthing (NA asting (NAE PS Accurac	D 83): D 83):	1300 270729 815851 2.15	7,53	Water Depth	ments are ± 0.1 feet (A): Sh core assembly (B): te to top of handle (C):	[] [] []
Date:	9/20/0	Til	edicted Tid	ection: Station:	1305 1315		_Surveyed ele _Water surfac	re (from bottom) (D): evation (NVGD 29) (E): NA er from surveyed elevation (F):	.0
(H) Elevation of the (z*) Elevation of visu (I) Elevation of the s (I ₂) Elevation of the s	er Surface (NVGD): bottom of the core (N al transition (NVGD): sediment-water interfacediment-water interfaced in ± 1.0 feet, discard in	E - F IVGD): G - (B H + (distance) ace as measur ace as measur	- C) to visual t ed from b	ransition) ottom of co	, ,	H + D		+1.0 -5.8 -4.5 -3.4	
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments	
7.3		well mixed silt-clu some sum	black	loose				some shelk	
0.0		clay of	Jet 1	stiff	five				
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	í								

Battelle	Project Name: Location: Client:	New B	ord Harbor E edford, MA SACE NAE		ital Monitori	_		G606422 R/V Gale Force Theresa Himmer
Station ID:	K21		Time On St	ation:	1317		All measure	ements are ±0.1 feet
Core Sample ID:	5-07B-0821	-00-25	Northing (N		270727	7.18	Water Depth	.1 /
ogged by:	MRF	- J. Land	Easting (NA		815801.		,	sh core assembly (B):
Collection Mechanism:	Push-Core		GPS Accura		2.29	<u> </u>	′	be to top of handle (C) :
Date:	9/20/0	7	Predicted T		NA			re (from bottom) (D):
	4040		Time of Col		737	1	_	
					122	0	_	evation (NVGD 29) (E): NA
			Time Depar					ce from surveyed elevation (F):
G) Elevation of Water	Surface (NVGD):	F-F	Calculation	ns for Deter	mination of	Z* Elevatio	on	and the second
•	, ,		/D (0)					-63
(H) Elevation of the bo	attom of the core (i	₩GD): G ~	(B - C)					
z*) Elevation of visual	transition (NVGD)	: H + (distar	nce to visual	transition)				<u>-5.3</u>
 Elevation of the se 	diment-water inter	face as mea	sured from	bottom of co	re (NVGD):	H + D		-3.8
$I_2)$ Elevation of the se	diment-water inter	face as mea	sured from	water depth	(NVGD): G	- A		-3.5
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resamp	le)					
	υ				o.			
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size			
N) no	y - Ir	ı		ency	e E		SQ.	
vatic	olog SS o	O)	5	Consistency	i din di	5	Sample IDs	
E E	LE F	Туре	Color	Ö	Ma; síze	Odor	Sar	Comments
2.5		Mixel	MoHed	loose	C 3			
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1.0		4 50 ME 5410	Buse	,				
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Battelle	Project Name: <i>I</i> Location: Client:	New Be	rd Harbor E edford, MA SACE NAE		ntal Monitori	_		G606422 R/V Gale Force Theresa Himmer	
tation ID:	K19		Time On Sta	ation:	133		All measure	ments are ±0.1 feet	
ore Sample (D:	5-07B-0K19x	00-24	Northing (N		270732	178	Water Depth		454,
ogged by:	MRF		Easting (NA	AD 83):	815799,	59	Length of pus	sh core assembly (B):	7/
ollection Mechanism:	Push-Core		GPS Accura	acy:	3.08		 _Water surfac	e to top of handle (C):	4-33
ate: +	9/20/0"	7	Predicted Ti	ide (ft):	NA		Length of cor	e (from bottom) (D):	2.4
-			Time of Coll	lection:	134	0	Surveyed ele	vation (NVGD 29) (E):	NA
			Time Depar	t Station:	134	4	Water surfac	e from surveyed elevation (F):
			Calculation	ns for Deter	mination of	Z* Elevati	on	· .	
G) Elevation of Wate	er Surface (NVGD):	E-F						<u> </u>	
d) Elevation of the b	ottom of the core (N	VGD): <i>G - (</i>	(B - C)				****		
*) Elevation of visua	I transition (NVGD):	H + (distan	ce to visual	transition)				-3.9	
) Elevation of the se	ediment-water interfa	ace as meas	sured from	bottom of co	ore (NVGD):	H + D		-3,3	
	ediment-water interfa							-3.1	
	± 1.0 feet, discard a			,				V 2 \$	
1	- 1 - 1			I	T				. , , , , , , , , , , , , , , , , , , ,
Elevation (NVGD)	Lithology - Include USCS code		<u> </u>		Maximum particle size			* .	
N) u	. hi			ncy	n par		SΩ		
devation (NVGE	ology SS cc		. 5	Consistency	l m	_	Sample IDs		
Ele.	USC	Туре	Color	ပ်	Max size	Odor	San	Commen	nts
2.5		GIT SUN	Black	10058	five med				
1.8		leat	gentation of the second				- Kressenson		
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To The second se	atlempt	<u> </u>							

Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	518 -978-0518	xx. 26	Time On St		140	A CONTRACTOR OF THE CONTRACTOR	All measure	ements are ±0.1 feet	
Core Sample ID: \$\frac{5}{2}\$ Logged by: Collection Mechanism:	-97B-0518.	xx. 26				7			
Logged by: Collection Mechanism:	34 11 12		≥Northina (N.	VD 83/-	270734	7 4	Water Depth		44
Collection Mechanism:	WIK Y	Postpol	Easting (NA		815773	97		ish core assembly (B):	-///
	Push-Core		GPS Accura		3 1)	111			37
	al- lon		•	•	<u> </u>			ce to top of handle (C):	7/
Date.	420101	***************************************	Predicted T		NA IUA7			re (from bottom) (D):	- C - C
			Time of Col		1701		_	evation (NVGD 29) (E):	NA
			Time Depar	t Station:	1402	·	_Water surfac	ce from surveyed elevation (F): 1+6
(C) Flouring of Mato	r Curtage (ADVOD)		Calculation	ns for Deter	rmination of	Z* Elevation	on	+1	,
	r Surface (NVGD): 1							110	
(H) Elevation of the bo	ottom of the core (NV	/GD): <i>G</i> - i	(B - C)					<u> </u>	
(z*) Elevation of visual	transition (NVGD):	H + (distan	nce to visual	transition)					
(I) Elevation of the se	ediment-water interfa	ice as mea	sured from	bottom of co	ore (NVGD):	H+D		-3.1	
• •	ediment-water interfa				, ,		***************************************	- 1 G	
				Transf Gopan	· (==). =			<u> </u>	
(Note if I ≠ I ₂ within	± 1.0 feet, discard a	nd resampi	le)						
G C	e g				e				
Elevation (NVGD)	Lithology - Include USCS code				particle				
vation (N	yy - 1			ency	Ē		۵		
evati Bo	nolog CS c	e l	or	Consistency	Maximum size	5	Sample IDs		
	<u></u>	Type	Color	Ö	Ma	Odor	Sar	Commer	nts
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The	Battel Business of In		Loca	ame: <i>Ne</i> ition: lient:	New B	rd Harbor E edford, MA SACE NAE		ntal Monitori			G606422 R/V Gale Force Theresa Himmer	
Star	tion ID:		KIG	1		Time On St		1506			ments are ±0.1 feet	
1	e Sample ID): 5	-07B-0	K16-00	w-25	gent.		27073	6.18	Water Depth		4.64.7
1	ged by:	1,4	MRF	, , , , , , , , , , , , , , , , , , , ,		Easting (NA		81580	્. 3શ		sh core assembly (B):	77
1	lection Mech	anism:	Push-C	Core		GPS Accura		2.2			te to top of handle (C):	4-03-
Dat		- Laring III.	9/20/	777		Predicted Ti		NA		-	re (from bottom) (D):	- k of Com-
) Date	c.	-	+=+	- / -		Time of Col		150		-		NIA
								1638		-	evation (NVGD 29) (E):	NA 1 S
						Time Depar	t Station.	1000		_vvater surrac	e from surveyed elevation (F)	:
-					······································	Calculation	s for Deter	mination of	Z* Elevation	on		
(G)	Elevation	n of Wate	r Surface (N\	ICD): E	E						+19	
			•	•							- C U	
(H)	Elevation	of the b	ottom of the o	ore (NV	GD): <i>G</i> -	(B - C)						
(z*)	Elevation	of visua	l transition (N	VGD): H	+ (distar	nce to visual	transition)				-5.0	
(1)	Elevation	of the se	ediment-wate	r interfac	e as mea	sured from I	bottom of co	ore (NVGD):	H + D		-2.9	
(12)) Elevation	of the se	ediment-wate	r interfac	e as mea	sured from	water depth	(NVGD): G	- A		-2.8	
		la within	± 1.0 feet, dis	scard and	d resamo	le)						
	614010 IFT	15 4AHTIILI	z i.u icet, un	oouru ark	a resamp	,						
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	N N	(H = H	Inclu				>	artic				
) uoi	Bottom	\ \frac{1}{2}	gode			tenci	E E		Ds		
	Elevation (NVGD)	B B	Lithology - Include	2	Туре	lor	Consistency	Maximum particle size	ъ	Sample IDs		
<u> </u>		(L.e.			1 12	Color	<u>8</u>	Ma	ogo	Sa	Comments	
	2.5			5	1/1	1.10	1000	Di.				
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Battelle	Project Name: Location: "Client:	New I	ord Harbor Bedford, MA USACE NAE	ı	ental Monito	_	Vesse	G606422 : R/V Gale Force :: Theresa Himmer	
tation ID:	KIZ		_ Time On Si	tation:	142	0	All measur	ements are ±0.1 feet	
ore Sample ID:	5-07B-0K12	-po-18	 Northing (N	IAD 83):	2707	198,16	Water Dept	h (<i>A</i>):	4774
ogged by:	MRF		_ Easting (N/	AD 83):	8158	00.07	Length of p	ush core assembly (B):	·
Collection Mechanism:	Push-Core		_ GPS Accur	асу:	2.5		Water surfa	ce to top of handle (C):	3-4-3
rate:	9/20/07	7	Predicted T	ide (ft):	NA		Length of co	ore (from bottom) (D):	1.8
	, (Time of Co	llection:	1435	5	Surveyed e	evation (NVGD 29) (E):	NA
			Time Depa	rt Station:	1441	2	Water surfa	ce from surveyed elevation (F):
			Calculation	ns for Dete	ermination o	f Z* Elevati	on	.10	
G) Elevation of Wa	ater Surface (NVGD):	E-F						<u> </u>	
H) Elevation of the	bottom of the core (i	NVGD): G	- (B - C)					-14	
z*) Elevation of vis	ual transition (NVGD): H + (dista	nce to visua	l transition)				-5:4	
) Elevation of the	e sediment-water inte	face as me	asured from	bottom of	core (NVGD):	H + D		-2,6	
I_2) Elevation of the	e sediment-water inte	face as me	asured from	water dept	h (NVGD): <i>G</i>	- A		-2.5	
(Note if I ≠ I₂ with	nin ± 1.0 feet, discard	and resam	ple)				***************************************		
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4VGD)	Inde				icle				
	- Incl			20	part		Sc		
ation	logy S coc			isten	E no		e i		1
Elevation (I.e. Bottom	Lithology - Indude USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Commer	its
1.8		silt	Black	loose					
1.3		nonemental conference of the second		10000	tine				
		Silt	Dark	Rrm	C	-		D - ACCAN	transition
0.5		Clay	1504	plase	tine			123,000	1 11 (KS) 7
0.0		Clay	20.00A	Arm	fine			· · · · · · · · · · · · · · · · · · ·	
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The I	Batte Business of			oject Name: Location: Client:	New B	ord Harbor E edford, MA SACE NAE		ntal Monitor			G606422 : R/V Gale Force : Theresa Himmer	
Stat	ion ID:		- 5	PL		Time On St	ation:	144-)	All measure	ements are ±0.1 feet	
l	e Sample I	D:	5-00	7B-0714	-05-20	-/		27074	48.03	Water Depth		4,4
1	ged by:		//	nof		Easting (NA	·		7.89	-	ish core assembly (B):	11
١	ection Med	chani	sm:	Push-Core	***************************************	GPS Accura		1,7	2_	-	ce to top of handle (C):	44
Date			9	12010	> 7	Predicted T		NA		-	ere (from bottom) (D):	7.7
	•			t = t		Time of Col		145	j	_	evation (NVGD 29) (E):	NA
						Time Depar		145	 &	-	ce from surveyed elevation	£ 5.
									73	-	, , , , , , , , , , , , , , , , , , , ,	
				***************************************		Calculation	s for Deter	mination of	Z* Elevation	on		
(G)	Elevation	on of	Water Surf	ace (NVGD):	E-F						+1.7	
(H)	Elevation	nn ∩f	the hottom	of the core (I	NVGD): G-	(B - C)					-4.9	
				·	,	. ,	tuanaitian)				-24	
(z*)			Agenty-re-ry,	sition (NVGD			ŕ				- 3 .4	
(1)				nt-water inte							100	
(I ₂)	Elevation	on of	the sedime	ent-water inte	rtace as mea	sured from	water depth	(NVGD): G	- A		727	
	(Note if I	≠ l ₂	within ± 1.0	feet, discard	and resamp	le)						
	(GD)	= H)		Lithology - Include USCS code				icle				
	Elevation (NVGD)	± LL		de - Inc			JC,	par		ျ		
	atior	Bottom		S co			ister	E E		Sample IDs		
	Ele	(J.e.		USC	Type	Color	Consistency	Maximum particle size	Odor	Sam	Comme	ents
	2. (.)	0			silt	Black	10050	Rue				
	8				A A CONTRACTOR AND A CO	1015 (A	^					
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Battelle The Business of Innovation	Project Name: <i>I</i> Location: Client:	New Bedford Harbor I New Bedford, MA USACE NAE		ental Monitor			G606422 R/V Gale Force Theresa Himmer	
Station ID: Core Sample ID: Logged by:	MRF	Time On St	AD 83): AD 83);	1550 2704° 81532°	847.5	Water Depth Length of pu	sh core assembly (B):	6.5
Collection Mechanism: _ Date: _	9/20/07	GPS Accurate Predicted To Time of Col	ide (ft): lection:	NA 155	6	Length of co Surveyed ele	the to top of handle (C): The (from bottom) (D): Evation (NVGD 29) (E): The from surveyed elevation (F)	1,8 2,5 NA
 (H) Elevation of the bit (z*) Elevation of visua (I) Elevation of the set (I₂) Elevation of the set 	ediment-water interfa	E - F /GD): G - (B - C) H + (distance to visual ace as measured from ace as measured from	transition)	core (NVGD):	H + D	on	+1.6 -7.6 -5.6 -5.1 -4.9	
といいGD) ででいい(I.e. Bottom = H)	Lithology - Include USCS code	Aype Black	Consistency	Maximum particle size	0000	Sample IDs	Comments	
0.0		Clay olive grey	firm	fine				
				To dige				
le ID of digital photograp omments:	л(ə).							

Battelle	Project Name: Location: Client:	New B	ord Harbor I edford, MA SACE NAE		ntal Monitor	•		G606422 : R/V Gale Force : Theresa Himmer	
Station ID:	11129		Time On St		1607			ements are ±0.1 feet	
Core Sample ID:	5-07B-NN	29-60-2	Northing (N		27047	23.15	Water Depti		toit a.
Logged by:	MRF		Easting (NA		815325	5.28	-	ish core assembly (B):	The same
Collection Mechanism:	Push-Core		GPS Accura		2.44	5		ce to top of handle (C):	221 2
Date:	9/20/07		Predicted T		NA		-	re (from bottom) (D):	2.4
•	11-1-1		 Time of Col 		1623		-	evation (NVGD 29) (E):	NA
			Time Depar	t Station:	1627		-	ce from surveyed elevation (F)	1 /1
			Calculation	s for Dete	rmination of	Z* Elevatio	on	1	
G) Elevation of Wate	er Surface (NVGD):	E-F					•	+1,4	
H) Elevation of the b	oottom of the core (N	IVGD): G-	(B - C)				*	<u>-7.2</u>	
z*) Elevation of visua	al transition (NVGD)	: H + (distar	nce to visual	transition)				-5.7	
Elevation of the s	ediment-water inter	ace as mes	scured from	hottom of c	ore (NVGD):	н т Р		-4.8	
	ediment-water inten				, ,			-11 R	
					. (1.1.40). 4	. •		. 1 4 7	
(Note If I ≠ I ₂ withir	a ± 1.0 feet, discard a	and resamp	ie)				***************************************	***************************************	
= H)	Jude				ticle				
N) L	, Inc			δ	par		SO		
Elevation (NVGD)	Lithology - Include USCS code	•	ly.	Consistency	Maximum particle size		Sample IDs	-	Į.
	Lithc	Туре	Color	Con	Max	Odor	Sam	Comments	
2.4		silt	Black	loose					
1.5		2111	0	(00)	the				
113_		·						de acception de Africa de La Acceptance de participa de la Companya del Companya de la Companya de la Companya del Companya de la Companya de	
		clay	olive	子子	time				
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ID of digital photograp	oh(s):				<u> </u>		<u></u>		
	a Hempts	, N	06				<u></u>		
, «	- 1								

Battelle The Business of Innovation	Project Name: Location: Client:	New E	ord Harbor Bedford, MA ISACE NAE	Į.	ntal Monito	-	Vessel	G606422 : R/V Gale Force : Theresa Himmer
Station ID:	Q 3		Time On St		0849			ements are ±0.1 feet
Core Sample ID:	5-075-06	23-29-1	7 Northing (N		27077	-24.08	Water Dept	/ / /
Logged by:	MW/SH		Easting (N	AD 83):	81594	9.43	 Length of pu	ush core assembly (B):
Collection Mechanism:	Push-Core		_ _ GPS Accur	acy:	5.25	7	_ _Water surfa	ce to top of handle (C): 3, 0 3,334
Date:	9/27/0	7	Predicted T	ide (ft):	NA		_ _Length of co	ore (from bottom) (D):
			Time of Co	llection: 094	10,0858	K0857	_Surveyed el	evation (NVGD 29) (E): NA
			Time Depa	rt Station:	091	2	_Water surfa	ce from surveyed elevation (F): 3,6
• •	er Surface (NVGD):			ns for Dete	rmination o	f Z* Elevatio	on	+3,6
, ,	oottom of the core (•						-3 4
(z*) Elevation of visua	al transition (NVGD): H + (dista	nce to visua	l transition)				
(I) Elevation of the s	ediment-water inter	face as me	asured from	bottom of co	ore (NVGD):	H + D		
(I2) Elevation of the s	ediment-water inter	rface as me	asured from	water depth	(NVGD): <i>G</i>	- A		-2.5
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resamp	ole)					
Elevation (NVGD)	Lithology - Include USCS code			Consistency	Maximum particle size		Sample IDs	
Eleva (I.e. B	ifhold	Туре	Color	onsik	faxim	Odor	ampl	Commonto
		silty		200	≥ 8	0	<u> </u>	Some Sneen when
		20ganic	black	wose	Sine			core emptied
		motter		and the second	Augustines against	Total State of State	And Marketines	agast miles spillplattere, propriet persons, spillplatterers
0.8			dive	Eum	SINE			T.
		clay	Aroy	1 * '	1			
0.0-		Shells						
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ID of digital photograp					L	L	L	
mments:								**************************************
1st Attemp and Attemp	+ 11/6							
sheen whe	n more nul	led op						
DIMAI MI	N. C. C. C. C. C. C. C. C. C. C. C. C. C.	F						

Battelle The Business of Innovation	Project Name: Location: Client:	New Bea		nvironmer	ntal Monitor	_		G606422 R/V Gale Force Theresa Himmer
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	01 078-0001 MW 1 TH Push-Core 9 12 7 10 3	- 20-18 N E G 2- F	ime On Sta Iorthing (NA asting (NAI APS Accurated Iredicted Tic ime of Colle ime Depart	AD 83): D 83): cy: de (ft): ection:	0910 2707 51569 1.71 NA 0949 0	774.17 8.20 92508	Water Depth Length of pus Water surface Length of core Surveyed elev	the core assembly (B): the totop of handle (C): the (from bottom) (D): vation (NVGD 29) (E): the from surveyed elevation (F):
 (G) Elevation of Water (H) Elevation of the bo (z*) Elevation of visual (I) Elevation of the sec (I₂) Elevation of the sec (Note if I ≠ I₂ within ± 	ttom of the core (N transition (NVGD): diment-water interfi diment-water interf	E - F VGD): G - (B H + (distance) ace as measu ace as measu	- C) red from b red from w	transition) ottom of co	ore (NVGD):		n	+3,6 -4,6 -3,3 -2.8 -2.5
Elevation (NVGD) (i.e. Bottom = H)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
File ID of digital photograph(Comments:		clay	olive gray	form form	sine sine	Julium.		gazzinen.
Comments: 1° Attempt	+ N/G . N/G	sheen i	a specie			r		

Battelle The Business of Innovation	Project Name Location Client:	: New E	ord Harbor Bedford, MA JSACE NAE	4	ntal Monito		Vesse	G606422 I: R/V Gale Force t: Theresa Himmer
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	Q6 678-6006- MW 31- Push-Core, 9127 0	<u>00-09</u> f	Time On S Northing (N Easting (N) GPS Accur Predicted 1 Time of Co	NAD 83): AD 83): racy: Fide (ft):		2 6 43.50 46.94 2	Water Dept Length of p Water surfa Length of co Surveyed e	th (A): ush core assembly (B): use to top of handle (C): ore (from bottom) (D): levation (NVGD 29) (E): NA use from surveyed elevation (F):
 (G) Elevation of Water (H) Elevation of the bo (z*) Elevation of visual (I) Elevation of the se (I₂) Elevation of the se (Note if I ≠ I₂ within ± 	ttom of the core (I transition (NVGD) diment-water inter diment-water inter	NVGD): <i>G -</i>): <i>H + (distal</i> rface as mea	(B - C) nce to visual asured from asured from	<i>I transition)</i> bottom of co		H+D	on	+3.6 -3.9 -3.3 -3.0 -2.7
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
0.6 0.0 File ID of digital photograph(**************************************	sitt // organize matter Clay Shells	black	100se		underdan. und		sheen when core emptied
Comments: 5 heen when	core ta	ken						

Battelle The Business of Innovation	Project Name: Location: Client:	New Bedford Ha New Bedford USACE	i, MA	ntal Monitor	•	Vessel	G606422 I: R/V Gale Force I: Theresa Himmer
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	Q9 5-078-00Q9- MW_5F1 Push-Core 9127-0	North Eastir GPS Predic	On Station: ing (NAD 83): ing (NAD 83): Accuracy: cted Tide (ft): of Collection: Depart Station:	095 2707 8595 2.2 NA 100	3	Water Dept Length of pr Water surfa Length of co Surveyed el Water surfa	ements are ±0.1 feet In (A): Ush core assembly (B): Use to top of handle (C): Use (from bottom) (D): It is the property of the property o
 (H) Elevation of the b (z*) Elevation of visua (I) Elevation of the set (I₂) Elevation of the set 	or Surface (NVGD): ottom of the core (N I transition (NVGD): ediment-water interfacediment-water interfaced in the core of the	VGD): G - (B - C) H + (distance to vace as measured ace as measured	visual transition) from bottom of c	` '			+5.6 -4.3 -3.0 -2.9 -2.8
Elevation (NVGD)	Liftnology - Include USCS code	Type	Consistency	Maximum particle size	Odor	Sample IDs	Comments
File ID of digital photograph Comments:		silt ble	wy loose	Fine			Sheen when core emptied

Battelle	Project Name: Location:		ord Harbor Bedford, MA		ntal Monitor	ring	-	G606422 I: R/V Gale Force	
The Business of Innovation	Client:		ISACE NAE			Ch		t: Theresa Himmer	
Station ID:	04		_ Time On St		100	1	All measur	ements are ±0.1 feet	
Core Sample ID: 57	07B-MO°	<u>1-00-15</u>	Northing (N	AD 83):	2707	<u> 599.39</u>	Water Dept	h (A):	<u> 5.7</u>
Logged by:	NW/J	<u> </u>	_ Easting (NA	AD 83):	81596	2011	_Length of p	ush core assembly (B):	41.0
Collection Mechanism:	Push-Core	f an en	_ GPS Accur	acy:	<u> </u>	9	_Water surfa	ice to top of handle (C):	3:8
Date:	9/27/	07	_ Predicted T	ide (ft):	NA	**	_Length of co	ore (from bottom) (D):	12
			Time of Col		7010	<u>) </u>	-	levation (NVGD 29) (E):	NA S
			Time Depai	rt Station:	102	<u> </u>	Water surfa	ce from surveyed elevation (F): <u>13,3</u>
		i i	Calculation	ns for Deter	rmination of	Z* Elevati	on		
(G) Elevation of Water	Surface (NVGD):	,						+3,3	
			(D. O)					79	
(H) Elevation of the bo								- 	
(z*) Elevation of visual	transition (NVGD)	: H + (distai	nce to visuai	transition)				- 3 T	
(I) Elevation of the se								- 2, 1	
(l ₂) Elevation of the se	diment-water inter	face as mea	asured from	water depth	(NVGD): G	- A		- 2:4	
(Note if I ≠ I ₂ within :	± 1.0 feet, discard	and resamp	ole)						
<u> </u>	9	-			ao				
vation (NVGE	ncluc		ļ		artíci				
ion (l	gy - I			tency	E E		I Ds		
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs		
12		<u> </u>	black	10056	€is €in€		J W	Commen	
1,15	Asignature waterwater weeks	ton pagestories .	Spiritine	Manne Malinere	parameter parameter	- contravione.	agement	Sheen when	vnot ed
		clay	alive	Com	Sine				
1 1		,	green						
0.0									
			r· .						
	-								
							L		
File ID of digital photograph Comments:	(S):								

	Project Name: Location: Client:	New E	ord Harbor Bedford, MA ISACE NAE	l	ntal Monitoi	-	Vesse	G606422 I: R/V Gale Force t: Theresa Himmer
Station ID:	0Q		Time On St		1020			rements are ±0.1 feet
	-078-WO8	10-17	.		2207	600.21		mat Al
Core Sample ID: 5	1016 acco	1 () () () () () () () () () (Northing (N		8158	99 22	<u> </u>	- 1
Logged by:	79/0/31	f	Easting (NA		7.16	<u> </u>	-	ush core assembly (B):
Collection Mechanism:	Push-Core 4 1721A	7	GPS Accur				_	ace to top of handle (C):
Date:	716710	1	Predicted T		NA		-	ore (from bottom) (D):
			Time of Co		1023	<u> </u>	-	elevation (NVGD 29) (E): NA
			Time Depa	rt Station:	102		_Water surfa	ace from surveyed elevation (F): +3 + C
(G) Elevation of Water	r Surface (NVGD):	F F	Calculation	ns for Deter	mination of	f Z* Elevatio	on	+3.0
	ottom of the core (N		(B - C)					-4.0
	transition (NVGD):			(transition)				-3.1
		·		-				-2.8
	diment-water interf						*	
(1 ₂) Elevation of the se	aiment-water interf	race as mea	asured from	water depth	(NVGD): G	- A		-2.8
(Note if I ≠ I ₂ within	± 1.0 feet, discard a	and resamp	le)				***************************************	
/GD) H)	epr				<u>e</u>			
5 "	Lithology - Indude USCS code			>>	Maximum particle size		s	
levation (I	- Affic			stenc	E E		e D	
e. B	SCS	Type	Color	Consistency	laxim	Odor	Sample IDs	0
					≥ 'ऊ	9	<u> </u>	San & Sheen when
		8714	PLOCK	1005l	cone	ļ		some sheen when
0.9		partition. Care		**************************************	/ 11	manana, gyaddanana		the state of the s
		May	olive	Licon	fine			
		rhells	gray	-4 /4 143				İ
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		\$4.8C3 ti						
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		I						
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		1		Ì	Ì	l		
ID of digital photograph	(s):							

Battelle The Business of Innovation	Project Name: Location: Client:	New E	ord Harbor Bedford, MA JSACE NAE	l	ntal Monito	_	Project #: G606422 Vessel: R/V Gale Force Chief Scientist: Theresa Himmer			
Station ID:	Pio	<i></i>	Time On S	tation:	1031		All measur	ements are ±0.1 feet		
Core Sample ID:	-076-071	<u> </u>	_ Northing (N		41500	548.96	_Water Dept			
Logged by:	WA VILL		_ Easting (N		8074	<u> 3.63</u> 10		ush core assembly (B):		
Collection Mechanism:	Push-Core		_ GPS Accui	-		10	_	ice to top of handle (C):		
Date:	716705		_ Predicted 1		NA .	271	_	ore (from bottom) (D):		
			Time of Co		10.	<u>) </u>		levation (NVGD 29) (E): NA		
			Time Depa	rt Station:	108	0	_Water surfa	ce from surveyed elevation (F):		
			Calculation	ns for Dete	rmination o	f Z* Elevation	on	er.		
(G) Elevation of Water	Surface (NVGD):	E-F						*2.8		
(H) Elevation of the bo	ttom of the core (I	NVGD): G -	(B - C)					-41		
(z*) Elevation of visual	transition (NVGD)): H + (dista	nce to visua	l transition)				~), <u>)</u>		
(I) Elevation of the sec										
(I2) Elevation of the sec	diment-water inter	face as mea	asured from	water depth	(NVGD): <i>G</i>	- A		-2.7		
(Note if I ≠ I₂ within ±	: 1.0 feet, discard	and resamp	ole)							
				Ţ	·			,		
GD)	nde				eg eg					
Elevation (NVGD)	Lithology - Include USCS code			cy .	Maximum particle size		S			
ation	logy S co	_	_	Consistency	E E		Sample IDs			
	Litho	Туре	Color	Cons	Maxí size	Ogor	Sam	Comments		
1 Lamestania		5114	whot	1005C	CAC			some sheen when		
0.8-	internation of the second	Marine Marine	V	T	8:46	application approximate	entres.	COLS CARALLER		
		nlay	olive alay	Sim	RINC					
		Shells	860-A							
0.0=										
							i			
File ID of digital photograph(Comments:	s):									
2 · · · · · · · · · · · · · · · · · · ·										

Page ____ of ____

Battelle The Business of Innovation	Project Name: Location: Client:	New E	ord Harbor Bedford, MA ISACE NAE	l	ental Monito	_	Vesse	G606422 I: R/V Gale Force	
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	P12 8-87B-8P1 MW/JV Push-Gore 912707	2-09-1	Time On S Northing (N Easting (N GPS Accur Predicted T Time of Co	IAD 83): AD 83): racy: Fide (ft): illection:		199,0° 23.78 29	Water Dept Length of p Water surfa Length of co Surveyed e	ements are ±0.1 feet h (A): ush core assembly (B): ice to top of handle (C): ore (from bottom) (D): levation (NVGD 29) (E): ice from surveyed elevation	5.0 5.0 111 NA (F):+2.5
 (H) Elevation of the b (z*) Elevation of visua (I) Elevation of the service 	er Surface (NVGD): ottom of the core (I il transition (NVGD) ediment-water inter ediment-water inter ± 1.0 feet, discard	NVGD): G -): H + (distail rface as mea	(B - C) nce to visual asured from asured from	<i>l transition)</i> bottom of c	, ,	H+D	ion	+2.5 -3.5 -2.6 -2.4 -2.4	
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comme	nts
0.0		silt	black	firm	fine Fine			some sheen	when mp fied
e ID of digital photograpi mments:	n(s):								

Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor edford, MA SACE NAE	1	ental Monito		Vessel	G606422 : R/V Gale Force : Theresa Himmer	
Station ID:	DD36		Time On S		1546	sij		ements are ±0.1 feet	
Core Sample ID:	-078-DD30	20-25	Northing (N			39,69	Water Dept		
Logged by:	<i>3</i> ₭		Easting (N	•	815 08	4.71	_	ush core assembly (B): 15.3	
Collection Mechanism:	Push-Core		GPS Accur	acy:	1.	71	-	ce to top of handle (C) : 2.1	
Date:	9/6/07	P	Predicted T	îde (ft):	NA		Length of core (from bottom) (D):		
			Time of Co	llection:	154	7	_ _Surveyed el	evation (NVGD 29) (E): NA	
			Time Depa	rt Station:	155	5	Water surfa	ce from surveyed elevation (F): 2,4	
			Calculation	e for Doto	rmination of	f 7* Elovati	on.		
G) Elevation of Water	er Surface (NVGD):		ouicuiutioi	is for beter	inination of	Z Lievan	On .	2.4	
	oottom of the core (N		- (B - C)					-In.8	
	·		. ,	al transition	١		*******	9.2	
	al transition (NVGD)			· ·			***************************************	- 70	
	sediment-water inter				`	,			
(1 ₂) Elevation of the s				n water dep	th (NVGD):	G - A			
(Note if I ≠ I ₂ within	t ± 1.0 feet, discard	and resam	ole)						
1 6	Φ								
√VG[nclud				rticle				
vation (N	ly - Ir			ency	m pa		Ds		
Elevation (NVGD)	Lithology - Include USCS code	e g	or	Consistency	Maximum particle size	, b	Sample IDs		
9 e: 2,5		Type	Color	ပိ	Ma	Odor	Sar	Comments	
210		silt clay	dork	- SE					
		cree y	plack	1000	HIM				
			P. cont. be						
1,5	Appear shipports		olive	Δ	t		gra- yum	1000 miles and 1 a	
		day	olive	from	fine				
0.0									
		į					:		
		ľ							
ID of digital photograp	ph(s):				<u> </u>		L		
nments:									

Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor Redford, MA ISACE NAE	i	ntal Monitor	•	Vessel	G606422 : R/V Gale Force : Theresa Himmer	
Station ID:	QM25		Time On St	tation:	1113		***************************************	ements are ±0.1 feet	
Core Sample ID:	-07B-QQ25-	00-18	Northing (N		7704	K 7 S. 23			LA 6.5
	MW/TH	<u>wy iv</u>	-	•	8152	99.51	_ ••uici bepi	ush core assembly (B):	15.0
Logged by:	141		Easting (NA		1.91	74.3	- - ·	• • • • • • • • • • • • • • • • • • • •	4310
Collection Mechanism:	Push-Core 9/27-103-		_ GPS Accur				~	ce to top of handle (C):	0 (1 Q
Date: _	11-10/		_ Predicted T		NA	patroi	-	ore (from bottom) (D):	1:0
			Time of Co			?	-		NA
			Time Depa	rt Station:	112	<u> </u>	_Water surfa	ce from surveyed elevation (F):	1 , 7
 (H) Elevation of the be (z*) Elevation of visua (I) Elevation of the se 	r Surface (NVGD): ottom of the core (N I transition (NVGD) ediment-water intended iment-water intended iment-water intended iment-water intended iment-water intended iment-water intended iment-water intended iment-water intended iment-water intended iment-water intended iment-water intended impossible impos	IVGD): G - : H + (distar face as mea face as mea	(B - C) nce to visual asured from asured from	ns for Deter I transition) bottom of co	Maximum particle BD: CD: CD: CD: CD: CD: CD: CD: CD: CD: C	Z* Elevatio H + D	-	ce from surveyed elevation (F): +1, 7 -6.6 -5.3 -4.8 -4.7 Comments Some Sycery Core empth	in it
	-								
e ID of digital photograph	n(s):								
mments:									

Battelle	Project Name: Location: Client:	New E	ord Harbor Bedford, MA JSACE NAL	4	ental Monito		Vesse	G606422 I: R/V Gale Force I: Theresa Himmer	
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	QQ32 Ø7B-QQ3 MW/SI Push-Core 9/27/0	2-44-25	Time On S Northing (N Easting (N GPS Accu Predicted Time of Co	NAD 83): AD 83): racy: Tide (ft): bllection:	1129 27641 81539 117 NA 1205	648.75 78,77 70	Water Depring Length of p Water surface Length of common Surveyed e	ements are ±0.1 feet th (A): ush core assembly (B): use to top of handle (C): ore (from bottom) (D): levation (NVGD 29) (E): use from surveyed elevation	5.8 1110 2,4 2.5 NA (F): ±0,5
 (G) Elevation of Water (H) Elevation of the bolic (z*) Elevation of visual (I) Elevation of the second (I₂) Elevation of the second (Note if I ≠ I₂ within second (I₂) 	ottom of the core (I transition (NVGD diment-water inter	NVGD): G -): H + (distal rface as mea	· (B - C) nce to visua asured from asured from	ol transition)	ore (NVGD):	: H + D	on	+0.5 -8.1 -6.0 -5.6 -5.3	
Elevation (NVGD) (i.e. Bottom = H)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle Size	Odor	Sample IDs	Comme	nts
2.1	(s):	sand Sand Clay	of any	1003R	Gre Gre			some she	in when imptied
Comments: 15+Attemp 2nd Attemp 3rd Attemp 4th Attemp									

Battelle The Business of Innovation	Project Name: / Location: Client:	New Bed	i Harbor I iford, MA ACE NAE		tal Monitori	_	Vessel	G606422 : R/V Gale Force : Theresa Himmer	
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	QQ 30 -678-QQ30-6 Mw JJH Push-Core 912710	9-22 r	Firme On St Northing (NA Easting (NA GPS Accura Predicted T Firme of Col Firme Depar	AD 83): AD 83): acy: ide (ft): lection:	1220 2704 8154 2 NA 1221 123	699.31 006.55 45	Water Depth Length of pu Water surface Length of co	ements are ±0.1 feet In (A): ush core assembly (B): ce to top of handle (C): ore (from bottom) (D): evation (NVGD 29) (E): ce from surveyed elevation	5154 110 2113 213 NA NA (F): 0.0
 (H) Elevation of the l (z*) Elevation of visu (I) Elevation of the s (I₂) Elevation of the s 	ter Surface (NVGD): bottom of the core (N al transition (NVGD): sediment-water interfa sediment-water interfa n ± 1.0 feet, discard a	E - F VGD): G - (E H + (distance ace as measi ace as measi	3 - C) e to visual ured from ured from	transition)		H + D	on	0.0 -7.6 -6.0 -5.4 -5.1	
C Elevation (NVGD)	Lithology - Include USCS code	elay o	olive gray	A. A. Consistency	Maximum particle size	Jopo	Sample IDs	Slight sheer Core ex	ients When nptied
e ID of digital photogramments:	iph(s):	ō.							

Battelle The Business of Innovation	Project Name: Location: Client:	New Bedfo		ental Monitori			G606422 R/V Gale Force Theresa Himmer	
01.25 - 10.	0077			12.39			ments are ±0.1 feet	
Station ID:	NN4N	and the second	e On Station:			Water Depth		4.3
Core Sample ID:	7070° 15 1540	- 200 (0.0)	thing (NAD 83):	***************************************	5,84	-		7.3
Logged by:	MW /JH		sting (NAD 83):				sh core assembly (B):	4.0
Collection Mechanism: _	Push-Core	e	S Accuracy:	2.20	<i></i>	-	ce to top of handle (C):	7 6
Date: _	712710		dicted Tide (ft):	NA		-	re (from bottom) (D):	4:0
		Tim	e of Collection:	1241		- '	evation (NVGD 29) (E):	NA
		Tim	e Depart Station:	1245		_Water surface	ce from surveyed elevation	(F):
		0-1	culations for De	tarmination of	7t Elevetic			-,
		Can	cuiations for De	termination of	Z Elevatio	н	- 1	
(G) Elevation of Wate	r Surface (NVGD):	E-F					<u>-0,4</u>	
(H) Elevation of the be	ottom of the core (N	VGD): <i>G - (B -</i>	C)				-7.4	
(z*) Elevation of visua	i transition (NVGD):	H + (distance t	o visual transitior	1)			-5,4	
• /	, ,	•			ц. П		-4.9	
	ediment-water interf						. / /	
(I ₂) Elevation of the se	ediment-water interf	ace as measure	ed from water dep	olii (NVGD). G	·A		<u> </u>	
(Note if I ≠ I ₂ within	± 1.0 feet, discard a	and resample)						
Elevation (NVGD)	Lithology - Include USCS code			Maximum particle size				
N =	- e		λο	par		s		
Elevation (N	ogy S		Color	unu l		Sample IDs		
Elevi	lithol JSC	Туре	Color	Maxi	Odor	Sami	Comme	ents
2.5			ray lossé				some sheen i	
20	toggen specialist page of	31/5 g			manan jijaanna	, marketine.	Corce	myriea
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ile ID of digital photograp	ph(s):					I	1	
Comments:								

Battelle The Business of Innovation	Project Name: / Location: Client:	New Bedford Harbo New Bedford, N USACE NA	1A	ntal Monitori			G606422 R/V Gale Force Theresa Himmer	
Station ID:	RPAI	Time On		125	λ	All measure	ements are ±0.1 feet	
7	-07B-RR2	3 400 05	(NAD 83):	46		Water Depth		4.2
Core Sample ID: 5	NISTITH		(NAD 83). NAD 83):	Dr. b. van. 5 K. offe	25.13		sh core assembly (B):	11.70
Logged by:	744 5/011		•	7.3	and the state of t			21
Collection Mechanism: _	Push-Core	GPS Acc				-	ce to top of handle (C):	7,5
Date: _	1121101		Tide (ft):	NA 1253	r	-	re (from bottom) (D):	
			Collection:			_	evation (NVGD 29) (E):	NA
		Time Dep	oart Station:	1258)	_Water surfac	ce from surveyed elevation	(F): <u>~0 16</u>
		Calculat	ions for Dete	rmination of	Z* Elevation	on .		
(G) Elevation of Wate	r Surface (NVGD):	E-F					<u> </u>	
(H) Elevation of the bo	ottom of the core (N	VGD): G - (B - C)					The half	
(z*) Elevation of visua	I transition (NVGD):	H + (distance to visi	ual transition)				-5,2	
,				(NI) (CD):	и. Б		- 5,0	
	ediment-water interfa						-11 0	
, -,	ediment-water interfa		m water deptr	1 (NVGD). G	· A		7 7 6	
(Note if I ≠ I ₂ within	± 1.0 feet, discard a	nd resample)						<u></u>
				T				·
Elevation (NVGD)	nde			ticle				
N) #	e Pe		Į ģ	par		l s		
vation (N	ygo ogy		isten	wnu		l el		
Elev:	Lithology - Include USCS code	Type	Consistency	Maximum particle size	Odor	Sample IDs	Comme	nts
2,5		Sandy Oback		CK 15		J. J.		
2.3	CON STATE OF THE PROPERTY OF THE PARTY OF TH	Silt Black	Martin Albertan are	- J.WS	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
		plat gray		SIN			- parties - part	
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	P S S S S S S S S S S S S S S S S S S S	***************************************						
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ID of digital photograp	h(s):							
mments:								

Battelle The Business of Innovation	Project Name: Location: Client:	New Be	ord Harbor E edford, MA SACE NAE	nvironmen	tai Monitorir	•		G606422 R/V Gale Force Theresa Himmer
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	078-7726- MW SH Push-Core 9 27 0	\$ 100-200 1	Time On Sta Northing (NA Easting (NAI GPS Accura Predicted Ti Time of Colle Time Depart	AD 83): D 83): acy: ide (ft):	1307 2704 81547 3.0 NA 1309 1319	3	Water Depth Length of pus Water surfac Length of cor Surveyed ele	ments are ±0.1 feet (A): Sh core assembly (B): e to top of handle (C): re (from bottom) (D): vation (NVGD 29) (E): NA e from surveyed elevation (F):
 (H) Elevation of the bold (z*) Elevation of visual (I) Elevation of the set 	er Surface (NVGD): ottom of the core (N al transition (NVGD) ediment-water inter ediment-water inter a ± 1.0 feet, discard	E - F IVGD): G - : H + (distar) face as mea	(B - C) nce to visual asured from to	<i>transition)</i> bottom of co		H + D	n	-1.0 -7.0 -5.6 -5.0 -4.8
	garine	silt day	back dive gray	Consistency	Maximum particle	Odor	Sample IDs	Comments

Battelle The Business of Innovation	Project Name: Location: Client:	New Bedford Harbor E New Bedford, MA USACE NAE		ntal Monitori			G606422 R/V Gale Force Theresa Himmer	
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	LL40 -07B-4L4p-, MW/5H Push-Core 9/27/0	Time On St. Northing (N. Easting (NA GPS Accura Predicted T Time of Col Time Depar	AD 83): AD 83): acy: ide (ft): lection:	1347 2704 81527 2.81 NA 1400	1947.66 3.56 1 1351	Water Depth Length of pus Water surfac Length of cor Surveyed ele	ments are ±0.1 feet (A): sh core assembly (B): the to top of handle (C): the (from bottom) (D): the vation (NVGD 29) (E): the from surveyed elevation (F	5-84.9 11.0 3+13.6 2.5 NA
 (H) Elevation of the b (z*) Elevation of visua (I) Elevation of the s (I₂) Elevation of the s 	sediment-water inter	E - F IVGD): G - (B - C) H + (distance to visual face as measured from face as measured from	<i>transition)</i> bottom of co		H + D		-1.4 -8.8 -6.7 - 7.3 -6.3	
(i.e. Bottom = H)	Lithology - Include USCS code	sait black stay dive gray	Consistency	S S Size	Odor	Sample IDs	Comments	
File ID of digital photogra Comments:	iph(s): *Atternp	7 N/G						

Battelle The Business of Innovation	Project Name: Location: Client:	New B	rd Harbor E edford, MA SACE NAE	Environmen	tal Monitorii			G606422 R/V Gale Force Theresa Himmer	
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	LL36 -07B-LL36 mw /5t- Push-Core 9/2710		Northing (N. Easting (NA GPS Accura Predicted T Time of Col	AD 83): D 83): acy: ide (ft):	***************************************	48.95 5.46	Water Depth Length of pu Water surface Length of co Surveyed ele	ements are ±0.1 feet I (A): sh core assembly (B): the to top of handle (C): re (from bottom) (D): evation (NVGD 29) (E): the from surveyed elevation	4.6 11.0 4.0 2.2 NA
(z*) Elevation of visual(l) Elevation of the se	ottom of the core (N transition (NVGD) ediment-water inter	NVGD): G - : H + (distar face as mea face as mea	(B - C) nce to visual asured from asured from	transition) bottom of co		H + D	on	-1.4 -8.4 -6.8 -6.2 -6.0	
Elevation (NVGD)	Lithology - Include USCS code	adk_t t	black office gray	Consistency	Maximum particle size	Odor	Sample IDs	Some Sheer Core em	
	ph(s):								

Battelle The Business of Innovation	Project Name: Location:	New E	Bedford, MA	ŀ	ntal Monitor		Vesse	: G606422 If: R/V Gale Force
Station ID:	Client:		Time On St			Chi		t: Theresa Himmer
Core Sample ID:	078-852	3-00-1	Northing (N		2204/	173.92	Water Dep	rements are ±0.1 feet th (A):
Logged by:	MW/5H	- / / . .	_ Easting (NA					oush core assembly (B):
Collection Mechanism:	Push-Core	***************************************	GPS Accur		1. 7			ace to top of handle (C) :
Date:	9/27/0	7	 Predicted T		NA			core (from bottom) (D):
			Time of Col	llection:	148	18	Surveyed elevation (NVGD 29) (E): N	
			Time Depar	rt Station:	143	5		ace from surveyed elevation (F) :
***************************************	······································		Calculation	ns for Deter	rmination of	'Z* Elevatio	on	
(G) Elevation of Water	Surface (NVGD):	E-F						-1.3
(H) Elevation of the bo	ttom of the core (i	NVGD): G-	- (B - C)					-7.4
(z*) Elevation of visual	transition (NVGD): H + (dista	nce to visual	transition)				
(I) Elevation of the se	diment-water inte	rface as mea	asured from	bottom of co	ore (NVGD):	H + D		-5.6
q_2) Elevation of the se	diment-water inte	rface as mea	asured from	water depth	(NVGD): G	- A		-5.3
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resamp	ole)				-	
			:			Į		
Elevation (NVGD)	Lithology - Include USC,S code				Maximum particle size			
ion (l	ay - I			ency	ed w		οŪ	
Bevati	holog SCS o	Type	Color	Consistency	aximu	lor	Sample IDs	
1.8	<u> </u>					Odor	Sa	Comments
850		STIT	black	1005E	fine			
13 +	galaction	and the same of th	_{pE} y CONTRACTOR IN CONTRACTO	appletion	man, mane			attions. _{Sill} ations and a property of the sillation of
		3 - 3/	olive	Salm	Sine			
		clay	gray	4 5 4	7441			
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ID of digital photograph ments:	(S):							

Battelle The Business of Innovation	Project Name: Location: Client:	New B	rd Harbor E edford, MA SACE NAE	nvironmen	ntal Monitori			G606422 R/V Gale Force Theresa Himmer	
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	55 29 078-5529 MW JH Push-Core 9 127 0°	100-23 }	Northing (NA Easting (NA GPS Accura Predicted Ti Time of Coll	AD 83): D 83): acy: de (ft): ection:	143 2704 81545 3 NA 1441 144	0.67	Water Depth Length of pus Water surface Length of cos Surveyed ele	ments are ±0.1 feet (A): sh core assembly (B): se to top of handle (C): re (from bottom) (D): evation (NVGD 29) (E): se from surveyed elevation	4.6 2.3 NA (F): -1.3
 (G) Elevation of Water (H) Elevation of the bo (z*) Elevation of visual (I) Elevation of the se (I₂) Elevation of the se (Note if I ≠ I₂ within : 	ttom of the core (N transition (NVGD) diment-water inter diment-water inter	E - F IVGD): G - : H + (distar face as mea	(B - C) nce to visual sured from to	transition)		H + D		-1.3 -7.7 -6.2 -5.4 -5.3	
Elevation (NVGD) (i.e. Bottom = H)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comm	
1.5	anne garan. A	silt clay	olive gray	Loose	fine	aren _{Land} arian	- mpgagagadah	some sheen core en	when, nptied
0.0									
_			:						
_		÷.							
le ID of digital photograph	n(s):	¥ :	×, .				4. A. A. A. A. A. A. A. A. A. A. A. A. A.		
omments:									/"

	Project Name:	New Bedf	ord Harbor	Environme	ntal Monito	rina	Project #:	G606422	
Battelle	Location:	New I	Bedford, MA			3		l: R/V Gale Force	
The Business of Innovation	Client:	(USACE NAE			Ch	ief Scientist	: Theresa Himmer	
Station ID:	TT3		Time On S	tation:	14.	50	All measur	ements are ±0.1 feet	
Core Sample ID: 5	778-TT3	-00-	— Northing (N	IAD 83)·	2204	676.15	Water Dept		3.5
Logged by:	WWI/TU				eicu	74.84			710
		3	_ Easting (N		913 1	<u> </u>		ush core assembly (B):	11/0
Collection Mechanism:	Push-Core	~	GPS Accur	acy:		3.7	_Water surfa	ice to top of handle (C):	H. S
Date:	9/27/0	7	Predicted T	ide (ft):	NA	ate 1	Length of co	ore (from bottom) (D):	2.4
			Time of Co	llection:	14	5 <u>/</u>	Surveyed el	levation (NVGD 29) (E):	NA
			Time Depa	rt Station:	148	56	Water surfa	ce from surveyed elevation	n(F): - 44
			Calculation	ns for Dete	rmination o	f Z* Elevati	on		·······
(G) Elevation of Water 5	Surface (NVGD):	E-F						-1.4	
								-3/	
(H) Elevation of the bott	om of the core (r	NVGD): G	- (B - C)					7.0	
(z*) Elevation of visual transition (NVGD): H + (distance to visual transition)									
(I) Elevation of the sed	iment-water inter	face as me	asured from	bottom of a	ore (NVGD)	H + D		-5.0	
(I ₂) Elevation of the sed								_ 4 a	
				ator dopts	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	А			
(Note if $I \neq I_2$ within \pm	1.0 feet, discard	and resamp	ole)						
<u> </u>	æ								
NVGD = H)	Inde				ticle ticle				
Z =	e e			<u>5</u>	parl		Se		
vation (N) 00 c			sten	m _p		e E		
<u>a</u> a	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs		
2.4		<u> </u>	0	<u> </u>	_ ≥ .22	 ° -	, vi	Sone Shen	ents
A* 1		Silt	black	loaic	801			Solve Sine	
10	and the same of th		gaerrae ag	1000	fine				
18=		alasi	dave		fine	observe uppositions.	etalerentationes	garden	****
		clay	4 02 M	Firm	tine				
			9,21						
0.0									
					l				
MARINA									
								The state of the s	
ile ID of digital photograph(s	·):								
Comments:									
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Battelle The Business of Innovation	Project Name: Location: Client:			G606422 : R/V Gale Force : Theresa Himmer				
	Push-Core 9 27 07	3-111-17 N		AD 83): D 83): acy: ide (ft): lection: t Station:	1505 27046 61527 2.3 NA 1506 \S11		Water Depth Length of pu Water surface Length of co Surveyed ele Water surface	ements are ±0.1 feet In (A): Usin core assembly (B): Use to top of handle (C): Use (from bottom) (D): Evation (NVGD 29) (E): NA Deform surveyed elevation (F): 1.5
(I) Elevation of the se	I transition (NVGD) ediment-water inter ediment-water inter ± 1.0 feet, discard	face as measi face as measi	ured from I	bottom of co	, ,			-6.6 -6.1 -6.0
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
File ID of digital photograpi		stit clay shells	black olive gray	loose firm	fine			
Comments.								

Battelle The Business of Immovation	Project Name Location Client	New E	ord Harbor Bedford, MA JSACE NAE	1	ntal Monito	•		G606422 R/V Gale Force Theresa Himmer	
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	7747 978-7742 902/5H Push-Core 10/4/07	-90-26	Time On S Northing (N Easting (N GPS Accur Predicted T Time of Co	NAD 83): AD 83): racy: Fide (ft): illection:	061.5 27044 81.5 47 2.5 3 NA 0830	101.26 P4.32 20822	Water Depth Length of pu Water surface Length of co Surveyed ele	sh core assembly (B): the to top of handle (C): the (from bottom) (D): evation (NVGD 29) (E): NA	83.5 1.0 6
 (G) Elevation of Water (H) Elevation of the bolic (z*) Elevation of visual (I) Elevation of the se (I₂) Elevation of the se (Note if I ≠ I₂ within : 	ottom of the core (transition (NVGD diment-water inte	NVGD): G -): H + (dista rface as mea rface as mea	· (B - C) nce to visua asured from asured from	<i>l transition)</i> bottom of c	, ,	H+D	on .	-1.0 -7.4 -5.5 -4.8 -4.5	
Elevation (NVGD) (i.e. Bottom = H)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments	
1,9	(s):	skit sand clay shells	gray black plive gray	loose	fine fine			Sheen when core emptical	
omments:	+ N/G				-				

Battelle The Business of Innovation	Project Name: A Location: Client:	New Be	rd Harbor I edford, MA SACE NAE		ntal Monitoi	•	Vessel	G606422 I: R/V Gale Force I: Theresa Himmer			
Station ID:	RRAI		Time On St	******	083			ements are ±0.1 feet			
Core Sample ID:	0715-RR41-0	0-26	Northing (N		22041		Water Dept				
Logged by:	MIJ/TH	95.0			CICU	72.40	vvaler bept	ush core assembly (B):			
_	Dish Coo			Easting (NAD 83): \$1.5 4.45.90 GPS Accuracy: 1.66				° alls plan			
Collection Mechanism:	Push-Core	····						•			
Date:	10/7/0/			e of Collection:			_	ore (from bottom) (D):			
			Time of Col								
			Time Depar	rt Station:	2071	<u> </u>	_Water surfa	ce from surveyed elevation (F):			
			Calculation	ns for Deter	mination of	7* Flevatio					
(0) Flooring (0)	0 ((1)(00)		Carcaration	is for better	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Z Lievan	,,,				
(G) Elevation of Water	Surface (NVGD): E	= - F					***************************************	<u>-0, r</u>			
(H) Elevation of the bo	ttom of the core (NV	/GD): <i>G</i> - ((B - C)					<u>-8.2</u>			
(z*) Elevation of visual	transition (NVGD):	H + (distand	ce to visual	transition)				· · · · · · · · · · · · · · · · · · ·			
(I) Elevation of the se	diment-water interfa	ce as meas	sured from	bottom of co	ore (NVGD):	H + D		-5.6			
	diment-water interfa							-5.3			
1				Pr 11 1	jr 		***************************************	: J 2 M			
(Note if I ≠ I ₂ within :	± 1.0 teet, discard ar	ia resampli	e)								
,											
	au										
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size						
N) no	- Ju			ncy	n pa		o _s				
Elevation (h	gology SS oc	a)	>	Consistency	in in	_	Sample IDs				
<u> </u>	USC	Type	Color	Ö	Max size	Odor	Sam	Comments			
2.6		3714	black	locuse.	Eine			slight sheen when core emptied			
			gray	10				tore emptied			
2.1			olive		0	- and parent and a second and a	as. g yddifeddyn ffa	Charge Control (Charge Control			
		elay	gray	firm	Ane						
1		ioné shells	0. /								
0,0		74500									
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File ID of digital photograph	(s):										
Comments:											

Battelle The Business of Innovation	Project Name: / Location: Client:	New Bedfo	larbor Environme rd, MA E NAE	ental Monitoi			G606422 R/V Gale Force Theresa Himmer
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	RR39 -07B-RR39-/ MW/JH Push-Core 10/4/07	V-22 Nort Eas GPS Prec	e On Station: thing (NAD 83): ting (NAD 83): S Accuracy: dicted Tide (ft): e of Collection: e Depart Station:	NA	52 474.80 24.07 4 33	Water Depth Length of pus Water surface Length of cor Surveyed elev	the transfer of the transfer o
(H) Elevation of the book(z*) Elevation of visual(I) Elevation of the se	r Surface (NVGD): A ottom of the core (NV transition (NVGD): ediment-water interfal ediment-water interfal ± 1.0 feet, discard an	E - F /GD): G - (B - (H + (distance to ce as measured ce as measured	visual transition)	ore (NVGD):	H + D	on	-0.7 -7.3 -5.5 -5.1 -4.9
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Maximum particle size	Odor	Sample IDs	Comments
0.0	, same and the same	011	ack loose rue from	fine	manus, substitutibilities		gamme _{contemporaries}
D of digital photograph(ments: S +cong +	(s): 128 oder				',		

The	Battelle Business of Innovation	Project Name Location Client	New E	ord Harbor Bedford, MA JSACE NAL	4	ental Monito	_	Vesse	: G606422 It: R/V Gale Force tt: Theresa Himmer		
Str	ation ID:	SS38		Time On S		090		****	rements are ±0.1 feet		
	-	-07:13-5838	-117-18	Northing (I		-0.09	500.01			4,4	
1	gged by:	141.1 / 14	NY 10	Easting (N		215 446 44		Water Depth (A): Length of push core assembly (B):		-7/1	
1	ollection Mechanism:	Push Core			•	2.04				<u> </u>	
	-	Push-Core 10 4 6 7		_ GPS Accu	•		<u> </u>		ace to top of handle (C):	770	
Da	ite:	10/7/107	****	_ Predicted ⁻	2000		_	ore (from bottom) (D):	1 6 8		
				Time of Co		2/1	Surveyed elevation (NVGD 29) (E): NA				
				Time Depa	rt Station:	091	<u> </u>	_Water surfa	ace from surveyed elevation (F): <u>~0,6</u>	
(G) (H) (Z* (I) (I ₂	Elevation of the bo Elevation of visual Elevation of the se	ottom of the core (I transition (NVGD diment-water inte diment-water inte ± 1.0 feet, discard POSCS Code appropriate (S):	NVGD): G. i: H + (distarface as meaniface as meaniface as meaniface as meaniface as meaniface) and resample clay Clay	Calculation (B - C) nce to visual asured from	ns for Dete	ore (NVGD):		-	Commen very stight suhen core	ıts	
	Strong	Mas od									

Battelle The Business of Innovation	Project Name: Nev Location: Client:	v Bedford Harbor New Bedford, MA USACE NAE	1	ental Monito		Vessel	G606422 : R/V Gale Force : Theresa Himmer		
Station ID:	71.36	Time On S		092	2,		ements are ±0.1 feet		
Core Sample ID:	87B-71-36-60			2704	(550.4	∑Water Dept		4.7	
Logged by:	nw /TH	Easting (N	•	8154	76-31		ush core assembly (B):	11.0	
Collection Mechanism:	Push-Core	GPS Accur					ce to top of handle (C):	H 3	
Date:	10/4/02	Predicted 1		NA			ore (from bottom) (D):	9.1	
_		Time of Co		0923			evation (NVGD 29) (<i>E</i>):	NA	
		Time Depa		0932)	-	ce from surveyed elevation (F	ath agent	
							, (,	
		Calculation	ns for Dete	rmination o	f Z* Elevati	on	- tuni		
(G) Elevation of Water	Surface (NVGD): E-	F					-0,5		
(H) Elevation of the bo	ttom of the core (NVGI	D): G - (B - C)					-6.8		
(z*) Elevation of visual	transition (NVGD): H+	- (distance to visua	l transition)				-5.3		
(I) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D									
l .	diment-water interface						4 6	····	
			dopti	. ₍ , , , , , , , , , , , , , , , , , , ,	, ·		- 110		
(INOTE IT I ≠ I ₂ Within ±	t 1.0 feet, discard and i	resample)				***************************************			
	T T		Т	T	T	1	T		
G (+	l de			9.					
(NVGE (NVGE	lucit.			partic					
otton	- ogo		stenc	l m		e D			
Elevation (NVGD)	Lithology - Include USCS code	Type	Consistency	Maximum particle size	Odor	Sample IDs			
2.1		F 0	0	∑ .22	 	, vi	Comments	<u> </u>	
	Si	It black	bose	fine.					
16-	production consistency	_ gray	bose	Bast C.			A SAME TO A SAME		
1.5	cla	dive	from	fine	Section Confirms		,,		
	(00)	y gray							
0.0-									
File ID of digital photograph(s).								
Comments:									

Battelle The Business of Innovation	Project Name: <i>N</i> Location: Client:	ew Bedford Harbor New Bedford, MA USACE NAE	i	ntal Monitor	_		G606422 R/V Gale Force Theresa Himmer
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	RR35 MW/JH Push-Core	Northing (N Easting (N) GPS Accur Predicted T Time of Co	Time On Station: Northing (NAD 83): Easting (NAD 83): GPS Accuracy: Predicted Tide (ft): Time of Collection: Time Depart Station: 73.5 815.425.44 NA 103.6 093.6 094.0 Calculations for Determination of Z* Elevation				nents are ±0.1 feet (A): In core assembly (B): It to top of handle (C): It (from bottom) (D): In ation (NVGD 29) (E): If (From surveyed elevation (F):
 (H) Elevation of the b (z*) Elevation of visua (I) Elevation of the si (I₂) Elevation of the si 	er Surface (NVGD): E ottom of the core (NV I transition (NVGD): F ediment-water interface ediment-water interface ± 1.0 feet, discard an	GD): G - (B - C) H + (distance to visual ce as measured from the ce as measure	I transition) bottom of co	ore (NVGD):	H + D		-0.4 -6.8 -5.3 -5.1 -4.8
	n yeardenstan appointmen	ear jogo it black jaysand gray dive gray	Consistency	Maximum particle size	Odor	Sample IDs	Comments
File ID of digital photograpi Comments:	n(s):						

Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	QQ33 -078-QQ33 MV JH Push-Core	-60-1k	_ Time On S Northing (I		<u>6940</u>		All measur	t: Theresa Himmer rements are ±0.1 feet
Core Sample ID: 5	## ## ## ## ## ## ## ## ## ## ## ## ##	-60-K	Northing (I					2 .
ogged by: Collection Mechanism:	Mw /TH Push-Core	KUKU KE		NAD 83):	18 48 5 5 48			
Collection Mechanism:	/						_Water Dept	th (A):
	/		_ Easting (N	AD 83):		00.08	_Length of p	ush core assembly (B):
	\$ # \$ E E B X " F		_ GPS Accu	racy:	2.	8	_Water surfa	ice to top of handle (C): 3.1
	10/4/07	***************************************	_ Predicted	Tide (ft):	NA		_Length of co	ore (from bottom) (D):
	*		Time of Co	ollection:	0947		Surveyed el	levation (NVGD 29) (E): NA
			Time Depa	art Station:	095	3		ce from surveyed elevation (F):
			Calculation	una for Data	rmination	f Z* Elevatio		7)
G) Elevation of Water	Surface (NVGD): I	E - F	Calculatio	ns for Dete	rmmauon c	ı Z" Elevatio	on	-03
	, ,							<u> </u>
H) Elevation of the bot	tom of the core (NV	/GD): G -	(B - C)					<u> </u>
z*) Elevation of visual t	ransition (NVGD):	H + (dista	nce to visua	l transition)				
) Elevation of the sec	liment-water interfa	ice as mea	asured from	bottom of c	ore (NVGD)	· H + D		-6.6
(2) Elevation of the sec								7 7
				Marci nehtt	1 (144 GD). G	- 7		-613
(Note if I ≠ I₂ within ±	1.0 feet, discard ar	nd resamp	ele)				***************************************	
G (9							
Elevation (NVGD)	Joloc				į			
vation (N	ode			ucy	n pa		SO	
Vatic	olog)	4 0	-	siste	l E		ple I	
(l.e.	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
1.6		silt	grey	1005C	fine			Comments
1.45	Special population .		Plack	P	- Landerstein James	and the second	Sepportunismo	gartinologica quantitation de la constitución de la
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Battelle The Business of Innovation	Project Name: A Location: Client:	New B	ord Harbor ledford, MA ISACE NAI	4	ntal Monito			G606422 : R/V Gale Force : Theresa Himmer	
Station ID:	uuaz	,	Time On S	station:	1009			ements are ±0.1 feet	
Core Sample ID:	078-W22-	00-18	Northing (N		27041		Water Depth		484,7
Logged by:	MW/JH	**./E	Easting (N			18.34	-	sh core assembly (B):	110
Collection Mechanism:	Push-Core		GPS Accu	,	7.0	49		the to top of handle (C) :	444 4
Date:	10/4/07	-	Predicted	-	NA			re (from bottom) (D):	1.0
_			•	lection: 10		Z IMM		evation (NVGD 29) (E):	NA NA
			Time Depa		loa	8	•	ce from surveyed elevation (F	60. e ⁻² 3
·						f Z* Elevatio		o nom surveyed elevation ()
(G) Elevation of Water	Surface (NVGD): E		Cuicalatio	no for beter	mination b	iz Lievatic		-0.2	
(H) Elevation of the bo	ttom of the core (NV	'GD): <i>G</i> -	(B - C)					-7.0	
(z*) Elevation of visual	transition (NVGD): F	H + (distan	ce to visua	l transition)				_ G 4	
					(1) (0.5)			-5.2	
	diment-water interfac								
	diment-water interfac			water depth	(NVGD): G	- A		-4.9	
(Note if I ≠ I₂ within :	± 1.0 feet, discard ar	nd resampi	le)						
GD) H)	ge Ge				<u>u</u>				
>	Lithology - Include USCS code				Maximum particle size				
vation (h	gy -			Consistency	E		Sample IDs		
e. B	tholc	Туре	Color	onsis	a xim	Odor	ample		
18 =			black		Si.⊠	Ŏ	Š	Comments Sizet Sheen u	
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Battelle The Business of Innovation	Project Name: Location: Client:	New Bedford Harb New Bedford, USACE N	MA	ental Monito	_	Vessel	G606422 I: R/V Gale Force I: Theresa Himmer			
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	M W / J H Easting (NAD 83): 815600 - 16 hanism: Push-Core GPS Accuracy: 2 - 44 10 / 4 / 6 7 Predicted Tide (ft): NA Time of Collection: 1 / 2 / 3 / 5					Water Depth (A): Length of push core assembly (B): Water surface to top of handle (C): Length of core (from bottom) (D): Surveyed elevation (NVGD 29) (E): Water surface from surveyed elevation (F):				
(H) Elevation of the book(z*) Elevation of visual(I) Elevation of the set	ediment-water interfa	E - F VGD): G - (B - C) H + (distance to visace as measured from the content of	<i>ual transition)</i> om bottom of c	core (NVGD):	H+D		-0:2 -6:1 -4:4 -4:3 -4:0			
Elevation (NVGD)	Lithology - Include USCS code	Type	Consistency	Maximum particle size	Odor	Sample IDs	Comments			
1.3		olay oliv	y 1005e	Ane The		32	Communic			
0.0										
						* y.				
File ID of digital photograph Comments:	(s):				-					

Battelle The Business of Innovation	Project Name: Location: Client:	New	ford Harbor Bedford, M. USACE NA	4	ental Monito	•	Vesse	I: R/V Gale Force t: Theresa Himmer	
Station ID:	000012				lin's	U			
	<u> </u>	3 m n	Time On S		1102	62h 0	9	rements are ±0.1 feet	9 3
Core Sample ID: 5		5-00-0	√ Northing (I	NAD 83):		874.97	Water Dep	th (A):	<u> </u>
ogged by:	MW/3H		Easting (N	AD 83):	87.56	75.58	Length of p	ush core assembly (B):	100
Collection Mechanism:	Push-Core		GPS Accu	racy:	100	69	Water surfa	ace to top of handle (C) :	6.5
Date:	10/4/07		Predicted	Tide (ft):	NA		Length of c	ore (from bottom) (D):	0.0
			Time of Co	ollection:	110	3	Surveyed e	levation (NVGD 29) (E):	NA
			Time Depa	art Station:	1//	'.P	Water surfa	ace from surveyed elevation	(F): +0 i
			Calculatio	ns for Dete	rmination o	of 7* Flevati	ion	-	. ,
(G) Elevation of Wate	er Surface (NVGD):	E-F						+0.2	
(H) Elevation of the b	oottom of the core (I	ANGD). G	- (B - C)					-33	
	·		,					- 2 · V	
z*) Elevation of visua	al transition (NVGD)): H + (dista	ince to visua	l transition)			***************************************	2.1	
 Elevation of the s 	ediment-water inter	face as me	asured from	bottom of c	ore (NVGD):	: H + D		- d. 7	
(12) Elevation of the s	ediment-water inter	face as me	asured from	water depth	ı (NVGD): G	: - A		-0.1	***************************************
	± 1.0 feet, discard			•	,			G	
_			·		7			+	
Elevation (NVGD)	Lithology - Include USCS code				icle				
\(\int\) = \(\begin{array}{c} \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- Inc			رخ	parl		S		
ation	ogy.			sten	E a		_ = □		
Elevation (NVGE (I.e. Bottom = H)	SCS	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs		
0.9		£	gray		∑ 8	 	, ÿ	Commer	nts
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ıments:	11(3).								******
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Battelle The Business of Innovation	Project Name Location	n: New	Bedford, M.	A	ental Monito		Vess	#: G606422 el: R/V Gale Force
Station ID:	Clien マスンミ	en/	Time On S		1 :	CI		st: Theresa Himmer
Core Sample ID: S	-07B-ZZ2	5-110-11	Northing (33041	825.88	7	pth (A):
Logged by:	MW/SH	<u> </u>	Easting (N	·	5156	22.97		push core assembly (B):
Collection Mechanism:	Push-Core	* * * * * * * * * * * * * * * * * * * *	GPS Accu		7100	76		face to top of handle (C) :
Date:	10/4/	07	Predicted	•	NA			core (from bottom) (D):
			Time of Co	ollection:	- cathoda	18		elevation (NVGD 29) (E): NA
			Time Depa	art Station:	112	5		face from surveyed elevation (F):
			Calculation	ons for Dete	ermination o	of Z* Elevat	ion	10.
G) Elevation of Wate	r Surface (NVGD)): <i>E-F</i>						0.0
(H) Elevation of the b	ottom of the core	(NVGD): G	- (B - C)					-5.6
z*) Elevation of visua	I transition (NVGE	D): H + (dista	ance to visua	al transition)			<u></u>	<u>"4,3</u>
(I) Elevation of the s	ediment-water inte	erface as me	asured from	bottom of c	ore (NVGD)	: H + D		-4.0
(I_2) Elevation of the sediment-water interface as measured from water depth (NVGI								-4,0
(Note if I ≠ I₂ within	± 1.0 feet, discard	d and resam	ple)					
			1					T
Elevation (NVGD)	Lithology - Include USCS code				ticle			
N) not	y - 'n			incy	n par		S	
Elevation (P. Bottom	Polog CS c	g	jo	Consistency	Maximum particle size	5	Sample IDs	
 	<u> </u>	Type	Color	Š		Odor	San	Comments
1.6		Sand	Prick	bose	Prine-			
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Battelle The Business of Innovation	Project Name: Location: Client:	New E	ord Harbor Bedford, MA JSACE NAE	l	ntal Monitor	_		G606422 R/V Gale Force Theresa Himmer
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	WW. 178-WW24 MW /5H Push-Core 10 / 4 /	24 -08-21 87	Time On S Northing (N Easting (N) GPS Accur Predicted 1 Time of Co	IAD 83): AD 83): acy: fide (ft): Illection:	91550 2.3	0 849.27 49.65 53	Water Depth Length of pu Water surfac Length of col Surveyed ele	ements are ±0.1 feet If (A): Sh core assembly (B): She to top of handle (C): Free (from bottom) (D): Evation (NVGD 29) (E): She from surveyed elevation (F):
 (H) Elevation of the b (z*) Elevation of visua (I) Elevation of the sometime (I₂) Elevation of the sometime (Note if I ≠ I₂ within 	er Surface (NVGD): ottom of the core (in transition (NVGD) ediment-water interediment-wat	NVGD): G -): H + (distai rface as mea rface as mea	(B - C) nce to visua asured from asured from	<i>transition)</i> bottom of co	. ,	H + D		0,0 -6,7 -5,4 -4,6 -4,4
Elevation (NVGD) (I.e. Bottom = H)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
File ID of digital photograph	n(s):	Silt Clay shells	otive gray	firm	ane ane			

Battelle The Business of Innovation	Project Name: Location: Client:	New E	ord Harbor Bedford, MA ISACE NAE	l	ntal Monito	_	Vessel	G606422 : R/V Gale Force : Theresa Himmer	
Station ID:	BERG 7		Time On S		1146			ements are ±0.1 feet	
Core Sample ID:	Ø75-B8627	-007- 15	_ Northing (N		77/1	1773.	3 Water Depti		7.8
Logged by:	MIN/TH	-Z	Easting (N		4156'	73.32		ush core assembly (B):	10.0
Collection Mechanism:	Push-Core		GPS Accur			04		ce to top of handle (C) :	5,6
Date:	10/4/07		Predicted 1		NA			ore (from bottom) (D):	1.5
	79111		Time of Co		1/4	/1		evation (NVGD 29) (E):	NA NA
			Time Depa			55	_	ce from surveyed elevation (
			типе Бера	it Station.			_ Water Surfa	ce from surveyed elevation (r). <u>* O* /</u>
(0) =	0.1.000		Calculation	ns for Dete	rmination o	f Z* Elevati	on	i # 1	
(G) Elevation of Water								<u>+0,1</u>	
H) Elevation of the bo	ttom of the core (I	NVGD): <i>G</i> -	(B - C)					<u> </u>	
(z*) Elevation of visual	transition (NVGD)	: H + (distar	nce to visua	l transition)				-3,0	
(I) Elevation of the se	e sediment-water interface as measured from bottorn of core (NVGD): H + D								
(12) Elevation of the se	diment-water inter	face as mea	asured from	water depth	n (NVGD): <i>G</i>	- A		-2.4	
(Note if I ≠ I ₂ within ±	± 1.0 feet, discard	and resamp	ile)						
	T .				T	T	T	I	
Elevation (NVGD)	Lithology - Include USCS code				ticle				
NN) u	- Inc			ncy	Maximum particle size				
vation (N	ology SS co	a)	<u>_</u>	Consistency	Linu.		Sample IDs		
	Lith	Туре	Color	Con	Max size	Odor	Sam	Commer	ıts
1,5		sand	gray		Ane-				
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1.0-		Philipping.	Aggetien seise en en		partition of the land	granien.		ANAMAGARAN PAR	
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0,0		organic matter			WCD.				
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Battelle The Business of Innovation	Project Name Location Client	New	Bedford, M. USACE NA	A		_	Vesse	G606422 I: R/V Gale Force I: Theresa Himmer	
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	A A A 3 07B-AA A3 nw /J1-1 Push-Core 10/4/0	0 0-69-1	Time On S Northing (Easting (N GPS Accu	Station: NAD 83): IAD 83): iracy:	130 8700 8156 23	94 1701,7	All measur Water Dept Length of po Water surfa Length of co	ements are ±0.1 feet h (A): ush core assembly (B): ce to top of handle (C): ore (from bottom) (D):	10.0 4.85, 1.
			Time Depa	2 -	1215	5		evation (NVGD 29) (E): ce from surveyed elevation (F)	NA): <u>†0 , 5</u>
			Calculation	ns for Dete	ermination o	of Z* Elevai	ion		
(G) Elevation of Water	Surface (NVGD):	E-F						+0.5	******
(H) Elevation of the bo	ttom of the core (I	NVGD): G	- (B - C)				***************************************	-4,4	
(z*) Elevation of visual								-4,0	********
(I) Elevation of the se									
(I_2) Elevation of the se (Note if $I \neq I_2$ within =				water depth	1 (NVGD): G	i - A		- 5, [
(Note in 1 7-12 within 1	e 1.0 leet, discard	anu resam	pie)						
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments	*
		sand	tan	1 === 500	fine -		1 0	Comments	
		51th mix	gray	1000	med				
0.4	, , , , , , , , , , , , , , , , , , ,	10.	olive	12.10	fire-	and the second		ggggaaner, generaliseliseliseliseliseliseliseliseliselise	
		gio-y gravel	Swy	Grm	Course				
0.0).							
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ments: 1st Atten	npt N/c	5							

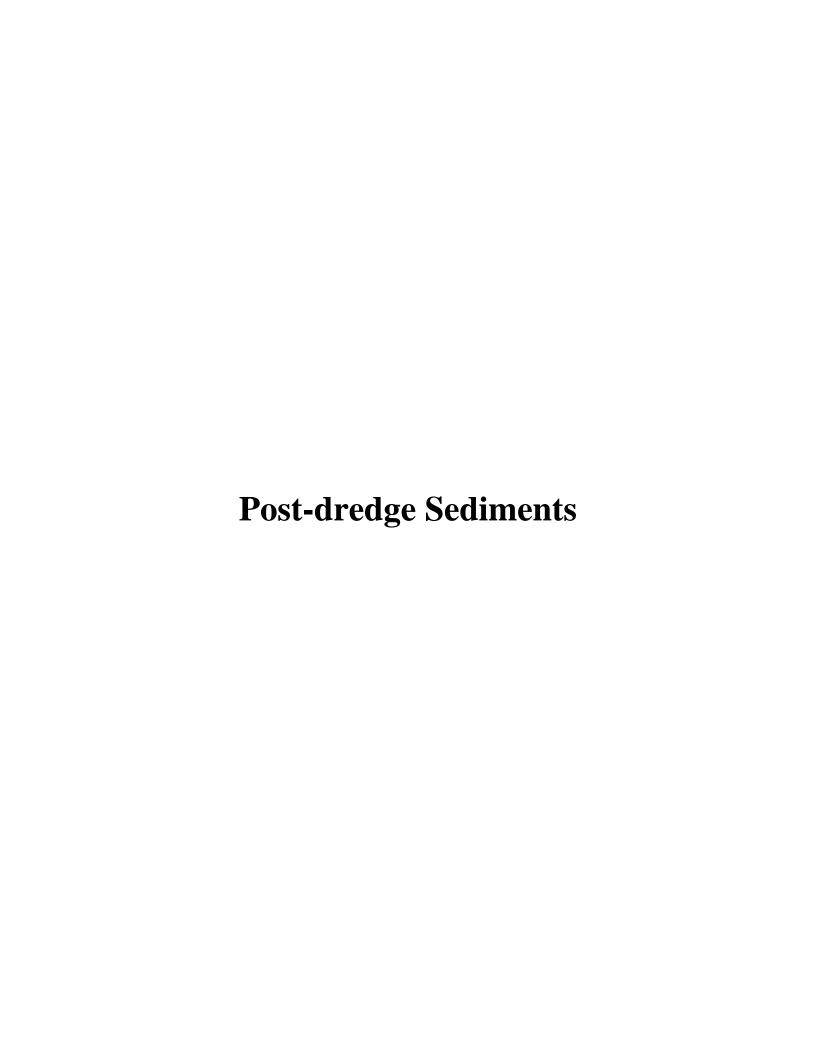
Battelle The Business of Innovation	Project Name: Location: Client:	New E	ord Harbor Redford, MA ISACE NAE	l	ntal Monito		Vessel	G606422 : R/V Gale Force : Theresa Himmer	
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	ore Sample ID: 5 0B - 17.30 - 00 - 23 orged by: Vision Mechanism: Push-Core		Time On Station: Northing (NAD 83): Easting (NAD 83): GPS Accuracy: Predicted Tide (ft): Time of Collection: Time Depart Station:		7704 707.15 815 473.45 2-25 NA 12 19 1223		Length of push core assembly (B): Water surface to top of handle (C): Length of core (from bottom) (D): Surveyed elevation (NVGD 29) (E): NA		#
 (H) Elevation of the b (z*) Elevation of visua (I) Elevation of the se 	r Surface (NVGD): ottom of the core (N I transition (NVGD): ediment-water interfi	VGD): <i>G -</i> <i>H + (distar</i> ace as mea	Calculation (B - C) nce to visual	ns for Dete I transition) bottom of c	` ,	H + D		+0.5 -7.3 -5.6 -5.0	
Elevation (NVGD) (I.e. Bottom = H) Solution Solut	± 1.0 feet, discard a	and resamp	Color	Consistency	Maximum particle size	Odor	Sample IDs	Commer	nts
0.0	and project and the second second second second second second second second second second second second second		gray black dive gray	loose firm	fine	entition in the second			
le ID of digital photographormments:	n(s):								

Battelle	Project Name: Location: Client:	New Bedf		Environmer	ntal Monitor			G606422 : R/V Gale Force : Theresa Himmer	
Station ID:	ww 29	Tir	ne On Sta	ation:	127	32		ements are ±0.1 feet	
Core Sample ID: 5	-07R-UW29	May 8 pm	orthing (NA		2704	725.12	Water Depti		4.8
Logged by:	AW JH		sting (NA		8755	49.50		ish core assembly (B):	10.0
Collection Mechanism:	Push-Core		PS Accura		7.2	43		ce to top of handle (C):	3.4
Date:	10/4/0	2	edicted Ti	•	NA			ore (from bottom) (D):	1.5
_		Tir	ne of Colle	ection:	123	3	-	evation (NVGD 29) (E):	NA
		Tir	ne Depart	: Station:	174	2	-	ce from surveyed elevation (F	+0.4
Elevation of the boundary) Elevation of visual Elevation of the set (I_2) Elevation of the set (I_2) Elevation of the set	r Surface (NVGD): ottom of the core (NI I transition (NVGD): ediment-water interfacediment-water interfaced	E - F /GD): G - (B - H + (distance ce as measur ce as measur	· <i>C)</i> to visual i	<i>transition)</i> pottom of co	, ,	H + D		+0,4 -6,2 -4,7 -4,7	
Elevation (NVGD) (I.e. Bottom = H)	± 1.0 feet, discard a	ed/y	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments	
1.5	against experience and		Managaran address.	, s s		print, Minimum printerprint, and the printerprints	and the same of		
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Battelle The Business of Innovation	Project Name: Location: Client:	New	ford Harbor Bedford, MA USACE NAE	ı	ntal Monito	•	Vessel	G606422 : R/V Gale Force : Theresa Himmer	
Station ID:	74493		Time On S		12	45		ements are ±0.1 feet	
Core Sample ID: $\mathcal{C} \leftarrow \mathcal{D}_{\mathcal{T}}$	78-VV)7-	P(2-17	Northing (N		7.7047	74.77	Water Dept		5.5
Logged by:	MW ITH	<u> </u>	Easting (N		815.52	5.90		ush core assembly (B):	10,0
Collection Mechanism:	Push-Core		GPS Accur		3.07			ce to top of handle (C) :	2.6
Date:	10/4/07	-	Predicted T	-	NA	V GP			1.7
	, , , , , , ,		Time of Co		174	7	_	ore (from bottom) (D):	NA
			Time Depa		128	9	-	evation (NVGD 29) (E):	NA F): +0.6
			типе Бера	n Station.			_ water suna	ce from surveyed elevation (i	-): <u> • </u>
(G) Elevation of Water	Surface (NIVGD):	<i></i>	Calculation	ns for Dete	rmination o	f Z* Elevati	on	÷0 6	
(H) Elevation of the bo			- (B - C)					-6.8	
z*) Elevation of visual				l transition)			***************************************	-5,4	
Elevation of the sec	, , ,	•		,	ore (NVGD):	H + D		- <	***************************************
(2) Elevation of the sec								_ 4 0	
(Note if I ≠ I₂ within ±				•	, ,			4490	····
1					T		T		
Elevation (NVGD)	Lithology - Include USCS code				licle				
N) (NV = WC	- Ind			yor	Maximum particle size		Sc		
vation (N	logy S co			Consistency	mnw.		Sample IDs		
 	Liff	Туре	Color	Con	Maxi	Odor	Sam	Comment	ls
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nments:	<i>3j.</i>								
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Battelle The Business of Innovation	Project Name: Location: Client:	New Bedfo		nvironmei	ntal Monitoi		Vessel	G606422 : R/V Gale Force :: Theresa Himmer	
Station ID:	YYIR	Tin	ne On Stat	ion:	1255	•		ements are ±0.1 feet	
Core Sample ID: 3	-d72-4728	the of	rthing (NAI			751,08	Water Dept		50
Logged by:	MW/514		sting (NAD	•		79,99	•	ush core assembly (B):	10.0
·	Bush Com					6	•	· , ,	7000
Collection Mechanism:	Push-Core 10/4/07		S Accurac	-		<u> </u>	-	ce to top of handle (C):	1.6
Date:	10/9/07		edicted Tide		NA	. /	-	ore (from bottom) (D):	1.0
			ne of Colle			<u>6</u>	-	evation (NVGD 29) (E):	NA O
		Tim	ne Depart (Station:	130	<u> </u>	_Water surfa	ce from surveyed elevation (F): <u>+0,8</u>
			culations	for Deter	mination of	Z* Elevation	on	-08	
(G) Elevation of Water			-					-/ A	
(H) Elevation of the bo	ottom of the core (N	VGD): G - (B -	<i>C</i>)					010	
(z*) Elevation of visual	transition (NVGD):	H + (distance t	o visual tr	ransition)				-44	
(I) Elevation of the se	diment-water inter	ace as measure	ed from bo	ottom of co	ore (NVGD):	H + D		-4.4	
(l_2) Elevation of the se	diment-water inter	ace as measure	ed from wa	ater depth	(NVGD): G	- A		-4,2	
(Note if I ≠ I₂ within :	± 1.0 feet, discard :	and resample)							
(Note ii 1 7 i ₂ within 1	r 1.0 leet, discard	and resample)							• • • • • • • • • • • • • • • • • • • •
a (98				Φ				
Elevation (NVGD)	Lithology - Include USCS code			_	Maximum particle size				
vation (NV	3y - I		l	ency	<u> </u>		Ds		
evati	lolog CS (e e	<u>io</u>	Consistency	w Xiii	5	Sample IDs		
1 7	<u> </u>	Туре	Color	ပိ	Max size	Ogo	Sal	Comments	
1.6		Sand do	44	Loose	0.1.]			
	Market State Control of the Control	Clay mix 91	7	1000	mild	(Application (Application))			
		, 0	(ive	Com	Give		,	property	
		cry g	my !	1 1					
0.0									
		-							
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ile ID of digital photograph omments:	(0).								
como.									







Battelle The Business of Innovation	Project Name: Location: Client:	New E	ord Harbor I Bedford, MA ISACE NAE		nta! Monito	-	Vessel	G606422 : R/V Gale Force : Theresa Himmer	
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	M 12 5-070-0MR- MW / MM Push-Core 11 5 0 7	10-14	Time On Standard (N. Landard (AD 83): aD 83): acy: ide (ft):	81583	50.433 51	Water Deptl Length of pu Water surfa Length of co	ements are ±0.1 feet (A): ush core assembly (B): ce to top of handle (C): ore (from bottom) (D): evation (NVGD 29) (E):	3.2 9.0 4.3 1.4
			Time Depar		125			ce from surveyed elevation	(F): 10.2
 (H) Elevation of the S (z*) Elevation of visu (I) Elevation of the S (I₂) Elevation of the S 	er Sunace (NVGD): pottom of the core (I al transition (NVGD sediment-water inter sediment-water inter n ± 1.0 feet, discard	NVGD): G -): H + (distar face as mea face as mea	(B - C) nce to visual asured from the	<i>transition)</i> bottom of co		H + D	+ C - 4, - 3, - 3, - 3, - 3, - 3, - 3, - 3,	5 .5 1	
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Commer	nts
1.0		Sitt Chyllith Clay	Black Sylving Oliving	tim	fine fine med				
-			(shelle)						
_									
le ID of digital photograpomments:	ph(s):								

Baffelle he Business of Innovation	Project Name Location Client	i: New I	Bedford, MA USACE NAL	1	mar mormo	_		: R/V Gale Force : Theresa Himmer	
tation ID:	NIY		Time On S	tation:	125			ements are ±0.1 feet	
ore Sample ID:	- 1070 - ON 14 -	-00-16	 Northing (N	NAD 83):	72707	44635	6 Water Dept		3.9
ogged by:	MW/MW		Easting (N.	AD 83):	81587	13.95V		ush core assembly (B):	9-0
ollection Mechanism:	Push-Core		GPS Accui	acy:	24	4		ce to top of handle (C) :	37
ate:	11/5/67		 Predicted 1	-	NA			ore (from bottom) (D):	1.6
-			Time of Co		1300	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		evation (NVGD 29) (E):	NA
			Time Depa		1212			ce from surveyed elevation (
								oe nom salveyed elevation (). <u> </u>
G) Elevation of Water	Surface (NVGD)	: <i>E-F</i>	Carculatio	ns for Dete	rmination o	T Z- Elevati	ion +	0.4	
f) Elevation of the bo	ttom of the core ((NVGD): G	- (B - C)				- 2	= 4/	
	·	,	` ′				1000	2/1	
,							*	7.5	
Elevation of the se							~ <	8 8	
2) Elevation of the se				water depth	(NVGD): G	- A	3	.5	
(Note if I ≠ I ₂ within =	± 1.0 feet, discard	and resamp	ole)						
<u> </u>			1	T	1	T			
Elevation (NVGD)	Lithology - Include USCS code			lency	Maximum particle size		IDs		
Eleva:	Litholo	Type	Color	Consistency	Maximu size	Odor	Sample IDs	Commen	s
1,6		silt	Black	wosk	Line				
	geometric and the second	against .		glassia, and	Name of the	Annual Ann	an water on	S-07D-01	// - 90-ps
		Circle	70/iv	tian	fint			TOP 05"	4.746
		(GM/16)) '		T Anna Anna				
0.0								Sampre 13	V TEBTIC
_								TOP 0.5' Sampled for 12/11/07	JMF/WW
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of digital photograph(s):								
nents:									

Battelle The Business of Innovation	Project Name: Location: Client:	New E	ord Harbor i Bedford, MA JSACE NAE		ntal Monito			G606422 R/V Gale Force Theresa Himmer	
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	N 10 -07D -0 N/6 - MW Push-Core 11/5/07	06-12	Time On St Northing (N Easting (NA GPS Accur: Predicted T Time of Col	IAD 83): AD 83): acy: Tide (ft):	85 87 2.2	547.948 15-614 332	Water Depth Length of pu Water surfac Length of cor Surveyed ele	ments are ±0.1 feet (A): sh core assembly (B): te to top of handle (C): tre (from bottom) (D): evation (NVGD 29) (E): te from surveyed elevation (A)	3/52.9 8.0 3/53.7 1/2 NA +0.6
 (G) Elevation of Water (H) Elevation of the bologic (z*) Elevation of visual (I) Elevation of the se (I₂) Elevation of the se (Note if I ≠ I₂ within seed 	ttom of the core (NVGD) transition (NVGD) diment-water inter	NVGD): G - : H + (distal face as mea	(B - C) nce to visual asured from asured from	transition)		H+D	> 3x	† 0, 6 3.7 2.9 2.5 -2.3	
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Commen	19
File ID of digital photograph	(5):	Silt	Black	firm	fine				
Comments: 13t Allurgh	N/6								

Battelle The Business of Innovatio		ect Name: Location: Client:	New B	ord Harbor I ledford, MA ISACE NAE		ntal Monitor	-		G606422 R/V Gale Force Theresa Himmer	
Station ID:	TI			Time On St	ation:	0906		All measure	ements are ±0.1 feet	
Core Sample ID:	\$070 ·	-10/CI-0	01-10	- Northing (N	AD 83):	2707	77211	Water Depth	n (A):	2.7
ogged by:	MW			Easting (NA	AD 83):	81574	18.28		sh core assembly (B):	8.0
Collection Mechanism:	Pı	ush-Core		GPS Accura		3.3	6		ce to top of handle (C):	4.2
Date:	11/14	107		- Predicted T	-	NA		 Length of co	re (from bottom) (D):	10
		*		- Time of Col		0910		 Surveyed ele	evation (NVGD 29) (E):	NA
				Time Depar	t Station:	0914		Water surface	ce from surveyed elevation (F): <u> </u>
				Calculation	ns for Deter	mination of	Z* Elevation	on		
G) Elevation of Wa	ater Surface	e (NVGD):	E-F					+	<i>l</i> . O	
H) Elevation of the	e bottom of	the core (N	VGD): <i>G</i> -	(B - C)				1	2.8	
·			·		transition)			* '	7 1	
						(N) (O.5)		:	<u>(a . </u>	
(I) Elevation of the									. 3	
(12) Elevation of the	e seaiment-	water interf	ace as mea	asurea from	water depth	(NVGD): G	- A		<u>. '}-</u>	
(Note if I ≠ I ₂ with	hin ± 1.0 fee	et, discard	and resamp	ole)					······································	
		Т		<u> </u>	1	T	T	T	I	
GD)		nqe				ge				
)/N)		Incl			5	parti		2		
ttion		- Ago			sten	En c		e D		
Elevation (NVGD)		Lithology - Include USCS code	Type	Color	Consistency	Maximum particle Size	Odor	Sample IDs	Comments	
1.00			- -		Tous 4	20		()	Minney 12	11
			7/43	Black	1 /-	Fine			mixed in sil	Flavera
pre pro-			CWY		4im				14-1/1-0/1	1177
0.5	,	~	- F	20.5 3 4	eren's species	2411	gar eer	employment.	SATOLOGE	-08- 8
			Clay	Mind		five			3-010	3-3- 14
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		GS/TOX	5pli	ts tak	er 21ulæ					

Battelle	Project Name: Location: Client:	New B	ord Harbor I Bedford, MA JSACE NAE		ntai Monitori		Project #: G606422 Vessel: R/V Gale Force nief Scientist: Theresa Himmer			
Station ID:	O I		Time On St		OGIK	<u> </u>		ements are ±0.1 feet		
Station ID: Core Sample ID: 5		14-15	- Northing (N		27077	75.17	Water Depth		3.0	
Logged by:	M.W	242 3	Easting (NA	•	815899	1-20	-	sh core assembly (B):	8.0	
Collection Mechanism:	Push-Core		GPS Accura		2.90			be to top of handle (C):	3.3	
Date:	11 /6 10 7		Predicted T	-	NA			re (from bottom) (D):	1.5	
suic.	7 2 2 - 2	 	Time of Col		0921	,	-	evation (NVGD 29) (E):	NA	
			Time Depar	t Station:	0926		-	ce from surveyed elevation	(F): *O+8	
			Calculation	ns for Deter	rmination of	Z* Elevati	on			
•	er Surface (NVGD):						*	<u>), 8</u>		
(H) Elevation of the b	ottom of the core (N	VGD): G -	- (B - C)					9 . 4		
z*) Elevation of visua	al transition (NVGD):	H + (dista	nce to visual	transition)				<i>5.0</i>		
(I) Elevation of the s	ediment-water interf	ace as mea	asured from	bottom of co	ore (NVGD):	H + D		2,4		
(I_2) Elevation of the s	ediment-water interf	ace as mea	asured from	water depth	(NVGD): G	- A		2 / 2		
(Note if I ≠ I ₂ within	± 1.0 feet, discard a	and resamp	ole)							
(a (Φ 70				<u>a</u>					
NVG[ncluc				articl					
vation (N	gy - I			tenc	E E		e D			
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle Size	Odor	Sample IDs	Comme	nts	
1.5		Silt	Black	10058	Fine			5-030-00	01-00-06	
0.9 + 0		war garen	agenture .	,	and an appropriate	garen a		and the second	- 5 /	
		Clay	Olive gray	tim	fw			PCB+TO	ic/65 sm	
0.0								taken fee	70°0.6	
									JY JY	
								12/11/07 Jr	MELMIN	
									1100	
				•				Chemical	Odor	
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								Transcensor.		
ID of digital photograp	ph(e):	·	<u> </u>	<u> </u>	<u> </u>		1			
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the state of	show on t	up of	LONE							
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Battelle Business of Innovation	Project Name: Location: Client:	New E	ord Harbor Bedford, MA ISACE NAE		ntai Mönitoi	•		G606422 R/V Gale Force Theresa Himmer	
ation ID:	кa		Time On St		011×	7		ements are ±0.1 feet	
ore Sample ID: 5~	x20-881/2-	NN_14	Northing (N		27/17	49. 12			2.3
igged by:	MW	<u> </u>	Easting (NA	,	81280	0. 88	Water Depth	•	*****
ollection Mechanism:	Bugh Care		- '	•	<u> </u>			sh core assembly (B):	<u>8.0</u> 4.1
ate:	Push-Core		GPS Accur		***************************************			ce to top of handle (C):	- Company
ne.	1179107		 Predicted T Time of Col 		NA 09 30			re (from bottom) (D):	
					0936		-	evation (NVGD 29) (E):	<u>NA</u> (F): [†] 0-7
			Time Depa	t Station:	<u> </u>		_ water sunac	e from surveyed elevation	(F): <u>V* F</u>
N Florestine - (14/-1	0 - ((1)) (0.0)		Calculation	ns for Detei	rmination of	Z* Elevation	on ~*	A 7	
Elevation of WaterElevation of the both	. ,		(B, C)				4700	<u>V. f</u>	
	•	•	,					<u>to, ku</u>	
*) Elevation of visual	transition (NVGD)	: H + (distai	nce to visuai	transition)				2.6	
Elevation of the sec					, ,		abn.	1.8	
) Elevation of the sec	diment-water inter	face as mea	asured from	water depth	(NVGD): G	- A	- 1	.6	
(Note if I ≠ I ₂ within ±	= 1.0 feet, discard	and resamp	ole)				ATTICLE OF THE PARTY OF THE PAR		
()	ep O				<u> </u>				
ration (NVGE Bottom = H)	e Inclu			ج ا	partic	Ī	ω l		
tion	- vgi			steno	m m		e D		
Ele,	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Commer	nts
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		5:11	Black	COSE	five			5-020-000	
0.6	Mahan : Mahan Milandarin .	Agency water	physics of physics	Appen 4		gant photo-	paterior	- contact-size:	
_		Clay	Aud	6				TOPO	
		(skills)	gray	film	fine			FCB+ 65 taken 12/	tremples
		(Species)	7 /						, 20.1F = 3
0.0								taken 12/	11/07 JMF
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nents:									
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Battelle	Project Name: Location: Client:	New E	ord Harbor I ledford, MA ISACE NAE		ntal Monitor	•	Vesse	I: R/V Gale Force t: Theresa Himmer		
Station ID:	TH		Time On St	ation:	0940)	All measur	rements are ±0.1 feet		
Core Sample ID: 5	\$70-60I4-	86-14	- Northing (N			10.66	Water Dept	all a		
ogged by:	WU	,	Easting (NA	(D 83):	81576	0.75	-	ush core assembly (B):		
Collection Mechanism:	Push-Core		GPS Accur	acy:	3-47		-	ace to top of handle (C):		
Date:	11/6/67		 Predicted T 	-	NA	-	Length of core (from bottom) (D):			
•			Time of Col	lection:	0146		Surveyed e	levation (NVGD 29) (E): NA		
			Time Depar	t Station:	0950		_ Water surfa	ace from surveyed elevation (F):		
G) Elevation of Water	Surface (NVGD):	E-F	Calculation	ns for Dete	rmination of	Z* Elevatio		0.6		
H) Elevation of the bo	ttom of the core (N	1VGD): G -	(B - C)				Name .	3 0		
·	·	•		trancition)			-	> 2		
•						=		<u>6213</u>		
Elevation of the se								1,6		
(I ₂) Elevation of the se				water depth	i (NVGD): G	- A		1, 4		
(Note if I ≠ I ₂ within:		and resamp	le)		T			T		
Elevation (NVGD)	Lithology - Include USCS code	Φ	'n	Consistency	Maximum particle Size	01	Sample IDs			
	Litt	Туре	Color	<u>5</u>	May	ogo	San	Comments		
100		Silt	Black	lase	Fine			S-010-0014-00		
n 12 ⁴ 7		O		1000						
6.7_	1 1 mm	Popular . Yes	garen Senter .	Chicago			programme	TC8+ 63/10C		
		Clay	0/14	EMM	fine			PCB+65/70c Sompleo taken 12/1		
		(skdG)	5004							
0.0										
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c Business of Innovation	Client:		USACE NAE			Ch		I: R/V Gale Force t: Theresa Himmer	
tation ID:	<u> </u>	- / /	Time On S	tation:	095	3		ements are ±0.1 feet	
ore Sample ID: 5_	<u> 070-00N4-</u>	<u> 99-12</u>	Northing (N	IAD 83):	<u> 2707</u>	703.45	Water Dept	h (A):	<u>3.9</u>
gged by:	MW		Easting (N	AD 83):	81567		Length of p	ush core assembly (B):	8-0
ellection Mechanism:	Push-Core		_ GPS Accur	acy:	3.0) b	_ Water surfa	ice to top of handle (C) :	<u>3.2</u>
te:	11.16/67		Predicted 1	ide (ft):	NA	***************************************	Length of co	ore (from bottom) (D):	1.7
			Time of Co	llection:	0956)	-	levation (NVGD 29) (E):	NA .
			Time Depa	rt Station:	1000	***************************************	Water surfa	ce from surveyed elevation (F): <u>TO-(o</u>
			Calculation	ns for Deter	rmination of	Z* Elevati	on		
) Elevation of Water	Surface (NVGD):	E-F						0,6	
) Elevation of the bo	ttom of the core (N	IVGD): G	- (B - C)				a. la	12	
) Elevation of visual	transition (NVGD)	: H + (dista	nce to visua	transition)			64a, N	3.6	
Elevation of the se	diment-water inter	face as me	asured from	bottom of co	ore (NVGD):	H + D	* 2	0	
,) Elevation of the se								· q	
(Note if I ≠ I₂ within :	± 1.0 feet, discard	and resami	ple)					· , e · §	***************************************
		·	,						
(a)	e				0				
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size				
vation (N	gy - I			tency	d win		S I Ds		
Elevat	scs	Туре	Color	Consistency	aximı	Odor	Sample IDs		
ш <u>=</u>					Siż	ŏ	S.	Commen	ts
		Silt	Black	10056	Cive			S-07D-001	14-00-06
0.6-	ANTE CONTRACTOR CONTRACTOR	and a	- m		ļ				
		Clay	9/24	firm	1 C.W			PCB + TOO taken on	:/63 sm
		ŧ	3001	* * * * * * * * * * * * * * * * * * * *	114-7				
0.0								TAKON M	1211110+
								TOP 0.6	, 1
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Battelle The Business of Innovation	Project Name: / Location: Client:	New Bedf		nvironmer	ntal Monito	_		G606422 : R/V Gale Force : Theresa Himmer	
Station ID: Core Sample ID: 5- Logged by: Collection Mechanism: _ Date:	M7 1970-80117-10 MW Push-Core 11/6/07	No. 14 No. Ea GF	me On State orthing (NA String (NAE PS Accuracy edicted Tiden of Colle one Depart	D 83): D 83): cy: de (ft): ection:	1002 27676 8(584 2.7 NA 1005 K	73.88 9.85 L	Water Depti Length of pu Water surfa Length of co	ements are ±0.1 feet In (A): Ush core assembly (B): Ice to top of handle (C): Ice (from bottom) (D): Ice evation (NVGD 29) (E): Ice from surveyed elevation (F	2.1 23 8.0 404.9 1.4 NA
(H) Elevation of the book (2*) Elevation of visual	r Surface (NVGD): Interpretation of the core (NV transition (NVGD): Interpretation (NVGD):	E - F /GD): G - (B - H + (distance in ce as measure ce as measure	C) to visual to	<i>ransition)</i> ottom of co	ore (NVGD):		7 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -	0,4 5.2 2.2 .8	
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comment	
File ID of digital photograph		811+ B1 B	ack stay	loope	find find	C seeds		Comments.	
File ID of digital photograph Comments: 15t Atharch Sheen m	N/G Surface of	f Cre	And the second			***************************************			

Battelle The Business of Innovation	Project Name Location Client	: New E	ord Harbor Bedford, MA USACE NAE	1	ntal Monitol	•	Vesse	: G606422 el: R/V Gale Force et: Theresa Himmer
Station ID:	IN		Time On S		1024			rements are ±0.1 feet
Core Sample ID: 💲	-070-0314	<u>-140-15</u>	Northing (N	IAD 83):		47.32	_Water Dep	
Logged by:	MW	····	_ Easting (N/		8157.7	<u>† - 65 </u>		bush core assembly (B):
Collection Mechanism:	Push-Core		_ GPS Accur		2.23			ace to top of handle (C): sore (from bottom) (D):
Date:	11/8/6/		Predicted T Time of Co		NA 1078		-	, , , , , , , , , , , , , , , , , , ,
			Time of Co		1033			elevation (NVGD 29) (F): Ace from surveyed elevation (F):
			`		rmination of	7* Flevatio		
(G) Elevation of Wate	er Surface (NVGD)	: <i>E-F</i>		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			C	0.0
(H) Elevation of the b	ottom of the core (NVGD): G-	(B - C)				** 4	4. 4
	I transition (NVGD			l transition)				25
•	ediment-water inte			ŕ	oro (NIVGD):	н. Б		a Ca
	ediment-water inte							
(Note if I ≠ I₂ within				water depti	, (III GB). G			
		1	Г	ī	1	ı		-
NVGD)	nclude				article			
Elevation (NVGD)	Lithology - Include USCS code		_	Consistency	Maximum particle size	,	Sample IDs	
Elev (i.e.	Litho	Type	Color		Maxi	Odor	Sam	Comments
6.9 -	and an and	silt	Black	loox	Fire			S-070-0374-00-56
			- \$1.0 mag			Market .		
		Clay (shells)	9104	Firm	Fire			@ TOP O.6'
0.0		(shells)	J /					
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ile ID of digital photograph	n(s):							
Comments: Slight S1	un a	sur For	2 1	Cre	0	PCB	+ 70 5	165 sample token 12/11/57 SMF/MW
								12/11/94 JMF/44

Battelle The Business of Innovation	Project Name: Location: Client:	New E	ord Harbor I Bedford, MA ISACE NAE		ntal Monito	. •		G606422 : R/V Gale Force : Theresa Himmer		
Station ID:	6.9		Time On St		1040			ements are ±0.1 feet		
Core Sample ID:	5- Ø7D- ØØ <i>D</i> 9-	180-12	Northing (N		27075	75.88	Water Depth		2.5	
ogged by:	MW	77 111	Easting (NA	•	81594	0 80	-	ish core assembly (B):	X.O	
ollection Mechanism:	Push-Core		GPS Accura		1.2		_	ce to top of handle (C) :	4,2	
ate:	11/1/107		Predicted T	-	NA			re (from bottom) (D):	1.2	
, ato.			Time of Col		1042		_	evation (NVGD 29) (E):	NA	
			Time Depar		1046			ce from surveyed elevation		
					rmination of	***************************************		Le Horri Surveyed elevation	(F)	
G) Elevation of Wai	ter Surface (NVGD):	E-F	Calculation	is for Deter	rmination of	Z" Elevau	On	.0		
H) Elevation of the	bottom of the core (N	IVGD): G -	(B - C)				- 2	Ŷ		
	,	,	, ,	(dua maidia m)			~ 2	/		
z*) Elevation of visu	al transition (NVGD)	: H + (distai	ice to visuai	transition)				<i>.</i>		
•	sediment-water inter				, ,			.6		
(2) Elevation of the	sediment-water inter	face as mea	asured from	water depth	(NVGD): G	- A		5		
(Note if I ≠ I ₂ withi	n ± 1.0 feet, discard	and resamp	ole)				Martin			
Elevation (NVGD)	ithology - Include JSCS code	0	1	Consistency	Maximum particle size		Sample IDs			
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1.7		Silt	Black	Toole	Fine			C	***	
0.7-	Market Ambries	Name of the second	·		James Lance		October Obsession	2 -0 +0-	0009-001	55
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		Clay	Olive grad	tion	time			S-\$70- Samples to for PIB (Ken Alem	4
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inents.										
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Battelle The Business of Innovation	Project Name: Location: Client:	,	W.A	ental Monito			G606422 : R/V Gale Force : Theresa Himmer	
Station ID:	17		Station:	A 341		<u> </u>	ements are ±0.1 feet	
Core Sample ID:	-620-0657	11 119	(NAD 83):	1303/	35.439	Water Depth		Hel
				CO 15 3				<u>-∵*</u>
Logged by:	11/ W		(NAD 83):	3131	<u> </u>		sh core assembly (B):	
Collection Mechanism:	Push-Core	GPS Ac		1.0	- Paul	Water surfac	ce to top of handle (C):	<u> </u>
Date:	1/18/04	Predicte	d Tide (ft):	NA		Length of co	re (from bottom) (D):	<u>IA</u>
		Time of	Collection:	<u>0749</u>		_Surveyed ele	evation (NVGD 29) (E):	NA
		Time De	part Station:	0751		Water surfac	ce from surveyed elevation (F):
(C) Flouration of Make	C		tions for Dete	ermination o	f Z* Elevat	ion †	- > 4/	
	er Surface (NVGD):						box , and	
H) Elevation of the b	ottom of the core (N	NVGD): <i>G - (B - C)</i>				-	<u>3.0</u>	
z*) Elevation of visua	d transition (NVGD)	: H + (distance to vis	ual transition)			latine .	1.9	
(I) Elevation of the s	ediment-water inter	face as measured fro	m bottom of c	ore (NVGD):	H + D	*the	X.	
		face as measured fro		, ,			7	
27			water gepti	. (110 GD). G				
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resample)						
Elevation (NVGD)	Lithology - Include USCS code			Maximum particle size				
N) u	n - In		ncy	n pa		Ds		
vation (N	S cc		Consistency	l iii		Sample IDs		
	Lith	Type		Max	Odor	Sam	Commen	ts
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nments:	ι(<i>υ)</i> -							***************************************

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Core Sample ID Core	Station ID:	4			0753	, OII				
Collection Mechanism		F 1			17676	73.94			41	
Collection Mechanism Plath Core 1 S C Predicted Trie (t) NA Lamphor tool (tool bottom) (D) Lambor tool (tool bottom) (D) Lambor tool (tool bottom) (D) Lambor tool (tool bottom) (D) Lambor tool (tool bottom) (D) Lambor tool (tool bottom) (D) Lambor tool (tool bottom) (D) Lambor tool (tool bottom) (D) Lambor tool (Lambor tool (Lambor) (D) Lambor tool (Lambor) (Lambor) (D) Lambor tool (Lambor) (Lambor) (D) Lambor tool (Lambor)					81579	4.88	· ·	, ,		
Date: Predicted Tide (It): Time of Collection Time Depart Station O S C Surveyee deviation (NVDD 29) (E): NA	-				3.7	<u>. v u </u>		, , ,	7.1	
Time of Colection: Time Depart Station: Time Depart Station: Calculations for Determination of Z* Elevation Calculations for Determination of Z* Elevation (G) Elevation of the bottom of the core (NVGD): E - F (H) Elevation of the bottom of the core (NVGD): G - (G - C) (Z*) Elevation of the sediment-water interface as measured from bottom of core (NVGD): G - A (Note if I + I _Z within ± 1.0 feet, discard and resample) (A) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I + I _Z within ± 1.0 feet, discard and resample) (B) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I + I _Z within ± 1.0 feet, discard and resample) (B) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I + I _Z within ± 1.0 feet, discard and resample) (B) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I + I _Z within ± 1.0 feet, discard and resample) (B) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I + I _Z within ± 1.0 feet, discard and resample) (Comments to the sediment-water interface as measured from water depth (NVGD): G - A (Note if I + I _Z within ± 1.0 feet, discard and resample) (Comments to the sediment-water interface as measured from water depth (NVGD): G - A (Note if I + I _Z within ± 1.0 feet, discard and resample) (Note if I + I _Z within ± 1.0 feet to the sediment-water interface as measured from water depth (NVGD): G - A (Note if I + I _Z within ± 1.0 feet to the sediment-water interface as measured from water depth (NVGD): G - A (Note if I + I _Z within ± 1.0 feet to the sediment-water interface as measured from water depth (NVGD): G - A (Note if I + I _Z within ± 1.0 feet to the sediment-water interface as measured from water depth (NVGD): G - A (Note if I + I _Z within ± 1.0 feet to the sediment-water interface as measured from water depth (NVGD): G - A (Note if I + I	Date:	11/8/67		•	NA	///	_		1.5	
Calculations for Determination of 2" Elevation (3) Elevation of Water Surface (NVGD): E - F (4) Elevation of the source of (NVGD): G - (8 - C) (7) Elevation of the seatment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I, within ± 1.0 feet, discard and resample) (6) Elevation of the seatment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I, within ± 1.0 feet, discard and resample) (7) Elevation of the seatment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I, within ± 1.0 feet, discard and resample) (8) Elevation of the seatment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I, within ± 1.0 feet, discard and resample) (9) Elevation of the seatment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I, within ± 1.0 feet, discard and resample) (1.3) Elevation of the seatment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I, within ± 1.0 feet, discard and resample) (1.3) Elevation of the seatment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I, within ± 1.0 feet, discard and resample) (2.7) Elevation of the seatment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I, within ± 1.0 feet, discard and resample) (2.7) Elevation of the seatment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I, within ± 1.0 feet, discard and resample) (2.7) Elevation of the seatment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I, within ± 1.0 feet, discard and resample) (2.7) Elevation of the seatment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I, within ± 1.0 feet, discard and resample) (3.7) Elevation of the seatment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I, within ± 1.0 feet, discard and resample) (3.7) Elevation of the seatment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I, wi	-									
Calculations for Determination of 2" Elevation (G) Elevation of Water Surface (NVGD): E - F (H) Elevation of the bottom of the core (NVGD): B - (B - C) (E) Elevation of visual transition (NVGD): H + (distance to visual transition) (E) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D (R) Elevation of the sediment-water interface as measured from water depth (NVGD): H + D (Note if I + L, within x 1.0 feet, discard and resample)									1	
Bevation of Water Surface (NVGD): E - F 72.7			Calcul	ations for Dete				•		
Elevation of visual transition (NVGD): H + (distance to visual transition) - 2 X	(G) Elevation of Water	Surface (NVGD):						2.2		
Elevation of the sediment-water interface as measured from bottom of core (NVQD): G - A P - Q	(H) Elevation of the bo	ttom of the core (N	/GD): <i>G - (B - C)</i>				- A	<u> </u>		
(i) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H+D -2.2 -1.9 (Note if I = 1/2 within = 1.0 feet, discard and resample) (i) I = unique = 1.0 feet, discard and resample) (ii) I = unique = 1.0 feet, discard and resample) (iii) I = unique = 1.0 feet, discard and resample) (iv) I = unique = 1.0 feet, discard and resample = 1.0 feet, discard and resample = 1.0 feet, discard and resample = 1.0 feet, discard and resample = 1.0 feet, discard and resample = 1.0 feet, discard and resample = 1.0 feet, discard and resample = 1.0 feet, discard and resample = 1.0 feet, discard and resample = 1.0 feet, discard and resample = 1.0 feet, discard and resample = 1.0 feet, discard and resample = 1.0 feet, discard and resample = 1.0 feet, discard and resample = 1.0 feet, discard and resam	(z*) Elevation of visual	transition (NVGD):	H + (distance to vi	sual transition)			· Land	2 . X		
(Note if I ≠ I _E within ± 1.0 feet, discard and resample) (Note if I ≠ I _E within ± 1.0 feet, discard and resample) (Note if I ≠ I _E within ± 1.0 feet, discard and resample) (GD) Note in I ≠ I _E within ± 1.0 feet, discard and resample) (GD) Note	(I) Elevation of the se	diment-water interfa	ce as measured f	om hottom of c	ore (NVGD):	H±D	- I	7 7		
(Note if I * I ; within = 1.0 feet, discard and resample) (Note if I * I ; within = 1.0 feet, discard and resample) (One if I * I								· 6		
analysis on 12/11/07 maps				om nator dopa	r (itt ab). a	71				
S-Q7D-pocks to so of TOP 0.6' taken for FLB r Tock analysis on 12111 on The one 12/11/07 mp.	(Note ii i 7 i ₂ within s	E 1.0 feet, discard a	nd resample)					***************************************		
S-Q7D-pocks to so of TOP 0.6' taken for FLB r Tock analysis on 12111 on The one 12/11/07 mp.	VGD)	clude			ticle					
S-Q7D-pocks to so of TOP 0.6' taken for FLB r Tock analysis on 12111 on The one 12/11/07 mp.	on (N	y - In		ancy	m par		©			
S-Q7D-pocks to so of TOP 0.6' taken for FLB r Tock analysis on 12111 on The one 12/11/07 mp.	evatic	olog CS c	or se	ısiste	ximur	, in	nple			
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	mments:	<u>.</u>								

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Collection Mechanism: Date: (G) Elevation of Water Surfa (H) Elevation of the bottom of (z*) Elevation of the sedimen (I) Elevation of the sedimen (Note if I ≠ I₂ within ± 1.0 for (QD) (H = worthood of the sedimen (Note if I ≠ I₂ within ± 1.0 for (Note if I ≠ I₂ within ± I + I₂ within ± I + I₂ within ± I + I + I + I + I + I + I + I + I	of the core (NV tion (NVGD): t-water interfa t-water interfa	E - F /GD): G - H + (distan ice as mea: ice as mea:	(B - C) ce to visual sured from to	AD 83): D 83): acy: ide (ft): lection: t Station: transition) pottom of co	NA 6 8 13 0 8 14 mination of	7. 60 7. 40 1 Z* Elevation	Water Surveyed ele Water surface Length of coo Surveyed ele Water surface	sh core assembly (B): the to top of handle (C): the (from bottom) (D): the varion (NVGD 29) (E): the from surveyed elevation (4.4 8.0 2.5 0.9 NA F): †3.1
(H) Elevation of the bottom of (z*) Elevation of visual transit (I) Elevation of the sediment (I ₂) Elevation of the sediment (Note if $I \neq I_2$ within \pm 1.0 for (QD) $I = I_2$ within $I = I_3$ within $I = I_4$ within $I = $	of the core (NVGD): t-water interfatet-water interfateet, discard a	E - F /GD): G - _I H + (distan ce as meas	(B - C) ce to visual sured from to	transition)	re (NVGD):	H + D		4	
	- Include de								
	ithology ISCS cox	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Common	***
e ID of digital photograph(s):	1	ciay ciay	Dark gray	firm	time fred			Commer	

Battelle	Project Name: <i>I</i> Location: Client:	New Be	rd Harbor I edford, MA SACE NAE		ntal Monitor		Vessel	G606422 : R/V Gale Force : Theresa Himmer	
station ID:	J10 2	r d	Time On St	ation:	0822			ements are ±0.1 feet	*****
ore Sample ID:	570-ØTIØ-00)-13	Northing (N	AD 83):	17075	48.85	Water Depti	ı (<i>A</i>):	3.8
ogged by:	MW	*	Easting (NA	AD 83):	81577	4.26		sh core assembly (B):	3.3
collection Mechanism:	Push-Core		GPS Accura	асу:	2.3	1	_Water surfa	ce to top of handle (C):	3,6
ate:	11/8/07		Predicted T	ide (ft):	NA		Length of co	re (from bottom) (D):	1, 3
			Time of Col	lection:	<u> </u>	}	_Surveyed el	evation (NVGD 29) (E):	NA
			Time Depar	t Station:	085		_Water surfa	ce from surveyed elevation (i	F):
O. E			Calculation	s for Deter	rmination of	Z* Elevati	on	4. 1 309	
	Surface (NVGD): E						<u></u>	· · · · · · · · · · · · · · · · · · ·	
H) Elevation of the bo	ttom of the core (NV	/GD): <i>G - (</i>	(B - C)					3.5	
z*) Elevation of visual	transition (NVGD):	H + (distand	ce to visual	transition)				2.9	
) Elevation of the se	diment-water interfa	ce as meas	sured from I	oottom of co	ore (NVGD):	H + D	h ₂ 8	<u> </u>	
2) Elevation of the se	diment-water interfa	ce as meas	sured from	water depth	(NVGD): <i>G</i>	- A		2	
(Note if I ≠ I ₂ within :	± 1.0 feet, discard ar	nd resample	e)						
Elevation (NVGD) (i.e. Bottom = H)	Lithology - Include USCS code	90	Or.	Consistency	Maximum particle size	or	Sample IDs		
	US	Type	Color	Š	Max	Odor	San	Comment	s
	5000000 S	silt	Black	10054	Ever			5-010-051	0-00-0
		5.17	Dark.	T. Carrie		a^		S-010-051 Blurrul thro (Hub transition	vala widd
		clay	307	44 400	Fr 1 Brown			(HWO transition	X2
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	Howd +		W. C.		<i>I</i>				

-yd s	Battetle	Project Name: Location:	New B	edford, MA		ntal Monitor	_	Vesse	G606422 I: R/V Gale Force
ihe l	Business of Innovation	Client	<u> </u>	SACE NAE		200		ief Scientis	t: Theresa Himmer
Stat	ion ID:	<u> </u>	DAL.	Time On St	ation:	0837			rements are ±0.1 feet
Core	s Sample ID: 5 💯	7) /(10-/c-	13 - KEY	_ Northing (N.	AD 83):	110 13	<u>48.85</u>	_Water Dept	
Log	ged by:	MW_		Easting (NA	AD 83):	815 tt	<u>4. 46</u>	_ Length of p	oush core assembly (B):
Colle	ection Mechanism: _	Push-Core		GPS Accura	acy:	2.31	<u> </u>	_Water surfa	ace to top of handle (C): 2.8
Date	:	11/8/07		Predicted T	ide (ft):	NA		_Length of c	ore (from bottom) (D):
				Time of Col	lection:	0343		_Surveyed e	elevation (NVGD 29) (E):
				Time Depar	t Station:	085	Ť.	_Water surfa	ace from surveyed elevation (F):
(G) (H)	Elevation of Water				s for Deter	mination of	Z* Elevatio	on of	-1.6 3.3
(z*)	Elevation of visual	transition (NVGD): H + (distar	nce to visual	transition)			No.	z, 8
	Elevation of the se	diment-water inte	rface as me:	asured from	hottom of cr	ore (NVGD):	H + D	***	> 1
(I)									
(12)	(Note if I ≠ I₂ within				г	(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
	Elevation (NVGD) (I.e. Bottom = H)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
	14 3.		Silt	Black	10058	fine			S-070-0518-00-07-RU
		İ							7 7 7 - 7
ļ	0,5	perform destroyee day	J			No.	man and an analysis of the same and the same		O - TOP 0.7'
			Clay	01.01 GAY	film	121			
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	of digital photograpi	0(s)							

Battelle	Project Name: Location: Client:	New E	ord Harbor I ledford, MA ISACE NAE		ntal Monitor	_		G606422 R/V Gale Force Theresa Himmer	
Station ID:	PIZ	· 40	_ Time On St		23030	4 (47) 3(4)		ments are ±0.1 feet	2.0
Core Sample ID: 5	<u>070-0712-00</u>	1-01	Northing (N.	·	<u> </u>		_Water Depth		
Logged by:	MW		- Easting (NA	D 83):	51574	<u>M. ID.†</u> 2:2	_Length of pu	sh core assembly (B):	8:0
Collection Mechanism:	Push-Core	·····	_ GPS Accura	acy:	3.	2.5	-	e to top of handle (C):	<u>3.5</u>
Date:	115/07		_ Predicted T	ide (ft):	NA	a. 1	_Length of co	re (from bottom) (D):	0.9
			Time of Col	lection:		<u> </u>	_Surveyed ele	evation (NVGD 29) (E):	NA
			Time Depar	t Station:	070	<u> </u>	_Water surfac	e from surveyed elevation	n (F):
	0.6.401000		Calculation	s for Deter	mination of	Z* Elevation		. 4	
	ter Surface (NVGD): bottom of the core (N		(B. C)					·	
								<u> </u>	
(z*) Elevation of visu	al transition (NVGD)	: H + (distai	nce to visual	transition)				·	
**	sediment-water inter							<u> </u>	
(I_2) Elevation of the	sediment-water inter	face as mea	asured from	water depth	(NVGD): G	- A	- 2	.0	
(Note if I ≠ I ₂ withi	n ± 1.0 feet, discard	and resamp	ole)						
(1)	de				9				
Elevation (NVGD)	Lithology - Include USCS code			>	Maximum particle Size		s s		
vation (N	- ygy			Consistency	un _L		Sample IDs		
Eleva	tholc	Type	Color	onsi	Maxim	Odor	amp	0	
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			2.0						
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	<u> </u>								
ile ID of digital photogra	ph(s):								
Comments:									

he Business of Innovation	Location: Client:		Bedford, MA ISACE NAE			Chi		R/V Gale Force Theresa Himmer	
Station ID:	MIT	,	Time On St	ation:	0908	?	All measure	ments are ±0.1 feet	
	70-0M17-0	1d-15	Northing (N		27072	72.71	Water Depth	*	4.3
ogged by:	Mω	<u> </u>	Easting (NA	•	8158	51.07	_	sh core assembly (B):	8.0
Collection Mechanism:	Push-Core		GPS Accur		7.5		_ ,	e to top of handle (C):	2. 0
Date:	11/8/07		Predicted T	-	NA NA			re (from bottom) (D):	1.5
	<u> </u>		Time of Co		0113		-	evation (NVGD 29) (E):	NA
			Time Depar		0915	en en en en en en en en en en en en en e	-	e from surveyed elevation	do a
			типе Бера	it Station.	2 8 ~	-		e nom surveyed elevation	(1).
			Calculation	ns for Detei	rmination of	Z* Elevation	on		
G) Elevation of Water	Surface (NVGD):	E-F						<u> </u>	
H) Elevation of the bo	ttom of the core (N	NVGD): G-	(B - C)				- 41	8	
z*) Elevation of visual	transition (NVGD)	: H + (distai	nce to visuai	transition)			. 3.	q	
(I) Elevation of the se	diment-water inter	face as me	asured from	bottom of c	ore (NVGD):	H + D	- 1	*	
Elevation of the section (I_2)					, ,			$\overline{\wedge}$	
2,					,	•		<u> </u>	
(Note if I ≠ I ₂ within a	e 1.0 leet, discard	and resamp	ne)						
<u> </u>				1	T				
/GD)	Lithology - Include USCS code				ticle				
N) =	- lnc			lo,	parl		sc		
Elevation (NVGD)	logy S cor	_		ister	E E		Sample IDs		
Elev (I.e.	Litho	Туре	Color	Consistency	Maximum particle size	Odor	Sam	Comme	ents
7.5		57,440	N. Kgre	1000	Fine	- -		S-070-01	
1.3	and the same of th	3 11				em e			, , , , , , , , , , , , , , , , , , , ,
		5. IT	Block	100%	File				
69-					- Agrania	garante approximation	energy gar	normal grammatic transport	
		Clay	ONV	40M	Fire			70P0.6	Occasion of a st
100-		š	3.7	. ```				4	2011/02/01
1000								on 12/11/0	7 1 7 7
									ampled to to took
_]							PCB+HO	mo laos
								Manual Const	Marine Control of the
								JMP	· /mw
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								all just s	Numm
								arufal	2 12/1/102
								Commence	-/mw sheemon = 12/11/07 3
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ID of digital photograph nments:	(s):								
anento.									

Battelle The Business of Innovation	Project Name: A Location: Client:	lew Bedford Harbor New Bedford, MA USACE NAE	ı	ntal Monitor	-	Vessel	G606422 I: R/V Gale Force I: Theresa Himmer
Station ID: Core Sample ID: 5 - (J18 270-0518-00 MW	Time On S Northing (N Easting (N)	AD 83):	0920 2707 8057		_Water Dept	tements are ±0.1 feet th (A): 3.4 ush core assembly (B): 5.0
Collection Mechanism: Date:	Push-Core	GPS Accur Predicted Time of Co Time Depa	ide (ft): llection:	NA 0 9 1	23 24	Length of co _Surveyed el	coe to top of handle (C): Dre (from bottom) (D): Evaluation (NVGD 29) (E): NA Ideo from surveyed elevation (F):
	nouet - t	Calculatio	ns for Dete	rmination of	Z* Elevation	on	
 (H) Elevation of the b (z*) Elevation of visua (I) Elevation of the s (I₂) Elevation of the s 	er Surface (NVGD): Evottom of the core (NVGD): It transition (NVGD): It ediment-water interfacediment-water interfaced in ± 1.0 feet, discard ar	GD): G - (B - C) H + (distance to visual ce as measured from ce as measured from	bottom of c	, .		- 3	0.9
Elevation (NVGD)	Lithology - Include USCS code	Type	Consistency	Maximum particle size	Odor	Sample IDs	Comments
0.0		SITES SAIK	frm.	fine			very mottled suttleby mix
_							
_							
1 1							

Battelle Business of Innovation	Project Name: A	New Be	d Harbor E dford, MA SACE NAE	vii Oillilei	mai monnorn			R/V Gale Force Theresa Himmer	
	Client:			tion:	0931	Cili		ments are ±0.1 feet	
tation ID: ore Sample ID:	/20-0K2\-0		Time On Sta Northing (NA		730 72	72.16	Water Depth	7 04	
ore Sample ID:	Mil	<u> </u>	Easting (NAI	*		. 50		sh core assembly (B):	
ollection Mechanism:	Push-Core		GPS Accura		7.8			te to top of handle (C):	
ate:	11/9/07	······································	Predicted Tid	-	NA		- Length of co	re (from bottom) (D):	
			Time of Colle		1014		- _Surveyed ele	evation (NVGD 29) (E): NA	
			Time Depart	Station:	1015		_ _Water surfac	ce from surveyed elevation (F):	
		(Calculation	s for Deter	rmination of	Z* Elevatio	on		
G) Elevation of Water	Surface (NVGD): I	E -F						2.1	
H) Elevation of the bo	ttom of the core (N	/GD): <i>G</i> - ((B - C)					3. /	
z*) Elevation of visual	transition (NVGD):	H + (distan	ce to visual	transition)			-5	. 5	
) Elevation of the se	diment-water interfa	ice as mea:	sured from t	oottom of c	ore (NVGD):	H + D	- 41	.3	
	diment-water interfa						-4	. 0	
(Note if I ≠ I ₂ within									
(11010 11 17 12 11 11 11	_ ,,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	·	,				***************************************		
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/ation (N	yy - Ir			tency	l E		e IDs		l
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments	
34 · 8		Thur.	BWK 9024	loost	Civi			S-070-0K21-0	9-1 Z
2.1	Annual Milangari or No.		- V /	politikara		46.17	gart Staden	S-010-0K21-0 Mottled mix of	
		5.15	Block	land				Mottled Mix 9	set-
		CWY	3 104	FIN	Enry			Silt and Clay	
1.6	and and age	-		3		Aut*			
		11/11/1	01.00	GMM	2-1-2			attil t	
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								TOP 1.2' ta	
0.0							İ	on 12/11/07 for	PUB
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								+ QA Sphits	
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								ans is shown	mita
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	86								1

Battelle The Business of Innovation	Project Name: Location: Client:	New B	rd Harbor E edford, MA SACE NAE		ntal Monitori			G606422 R/V Gale Force Theresa Himmer
Station ID:	M 20		Time On Sta	ation:	10 Z S		All measure	ments are ±0.1 feet
•	670-11M211-	0K - 15	Northing (N		27072	97:70	Water Depth	200
Logged by:	MW.	<u> </u>	Easting (NA		81585	1.82	•	sh core assembly (B): 8.0
Collection Mechanism:	Push-Core		GPS Accura		1.7	5	Water surfac	ce to top of handle (C):
Date:	11/8/07		Predicted T		NA		-	re (from bottom) (D):
<u>-</u>			Time of Col			035	-	evation (NVGD 29) (E): NA
			Time Depar		103		•	ce from surveyed elevation (F):
					rmination of	7* Flevatio	- -	
(G) Elevation of Water	er Surface (NVGD):	E-F	Calculation	is for Deter	i iiiiiiaaa oo oo	2 Lievanie). 4
,	oottom of the core (N		(B - C)				m lo	1. 41
				transition)			~ 3	***
,	al transition (NVGD)							0
	ediment-water inter							. 7
(I2) Elevation of the s	ediment-water inter	ace as mea	sured from	water depth	1 (NVGD): <i>G</i>	- A		7
(Note if I ≠ I ₂ within	1 ± 1.0 feet, discard	and resamp	le)					The state of the s
Elevation (NVGD)	Lithology - Include USCS code			Consistency	Maximum particle size		Sample IDs	
Eleva (I.e. B	ithole	Type	Color	Consi	//axin size	Odor	Samp	Comments
7,5		511+	Black			<u> </u>	0,	Straks down
		. 1 2	Director.	10001	1-1-1			
1 62 + -	gar i Alexandria - Marajar i jaran i j	- **** *** **	Median 1	gar. See 11	MARKAN , N	Por	Aprendicts of	an a tradiment to the second
		.516	Olive	Lim.	fore		744 840 840 840 840 840 840 840 840 840 8	
		Clay	304	South & Buch				
0.0								
100								
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nments:								
1st Atempt A	1/6							
8	# ·							

Station ID: Time On Station: 10.5 All measurements are ±0.1 feet Core Sample ID: 5 10.5 Northing (NAD 83): 2.70 44.73.7 Water Depth (A): 6.0 Logged by: Easting (NAD 83): 15 54.7 Length of push core assembly (B): 1.0 Collection Mechanism: Push-Core GPS Accuracy: 3.34 Water surface to top of handle (C): 1.4 Date: 11/14/67 Predicted Tide (ft): NA Length of core (from bottom) (D): 6.3 Time of Collection: 10.5 Surveyed elevation (NYGD 29) (E): NA Time Depart Station: 11.6 Water surface (NYGD): E-F (H) Elevation of Water Surface (NYGD): E-F (H) Elevation of the bottom of the core (NYGD): G-(B-C) (I) Elevation of the sediment-water interface as measured from bottom of core (NYGD): H+D (I) Elevation of the sediment-water interface as measured from water depth (NYGD): G-A (Note if I ≠ I₂ within ± 1.0 feet, discard and resample)	Battelle The Business of Innovation	Project Name: Location: Client:	New Be	ord Harbor edford, MA SACE NAE		ntal Monito	-	Vessel	G606422 : R/V Gale Force : M. WALDLA
(G) Elevation of Water Surface (NVGD): E - F (H) Elevation of the bottom of the core (NVGD): G - (B - C) (Z') Elevation of visual transition (NVGD): H + (distance to visual transition) (I) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I₂ within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I₂ within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I₂ within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I₂ within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I₂ within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I₂ within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I₂ within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I₂ within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I₂ within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I₂ within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I₂ within ± 1.0 feet, discard and resample) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I₂ within ± 1.0 feet, discard and	Station ID:	MWY Push-Core	7	Northing (NA Easting (NA GPS Accura Predicted Ti Time of Coll Time Depar	AD 83): D 83): acy: ide (ft): lection: t Station:	27041 8155 2.3 NA 1054 1160	<u> </u>	Water Depth Length of pu Water surface Length of co Surveyed ele Water surface	h (A): Sush core assembly (B): Sush core to top of handle (C): Sush core (from bottom) (D): Sush core (from bottom) (D): Sush core (from bottom) (E): Sush core (From bottom) (B): Sush core (From bottom) (B):
5:14 Shark loosy from from S-07D-WW41-00-06 Clay gray from from TOP 0.6' sampled f TCB + Toc/GS on	 (H) Elevation of the bold (z*) Elevation of visual (I) Elevation of the second (I₂) Elevation of the second 	ottom of the core (I transition (NVGD) diment-water inter	NVGD): G- : H + (dista face as me face as me	nce to visua asured from asured from	n bottom of	core (NVGD	•		2.5 -5.1 -4.4 -3.8 -3.5
	0.7	Lithology - Include USCS code	Slag	Bank	100st	Five	Odor	Sample IDs	Mixlayus of STOP 0.6' Sompled for TOP 0.6' Sompled for TOP 0.6' Sompled for TOB + TOC/GS on

Battelle The Business of Innovation	Project Name: Location: Client:	New E	ord Harbor ledford, MA ISACE NAE		ental Monito	_	Vessel	G606422 : R/V Gale Force : M. Voliny	
Station ID:	XX 37		Time On St		1108	<u> </u>		ements are ±0.1 feet	
Core Sample ID: 5-2	70-XX37-100	~ (L)	_ Northing (N	AD 83):	27045	74,4	Water Dept	ר (<i>A</i>):	6,4
Logged by:	MW		_ Easting (NA	AD 83):	81557	15.2	 Length of pu	ush core assembly (B):	9.0
Collection Mechanism:	Push-Core		GPS Accura	acy:	1.14		 Water surfa	ce to top of handle (C):	<u></u>
Date:	11/14/07		- Predicted T	ide (ft):	N.A			re (from bottom) (D):	i.H
			 Time of Col 		1111			evation (NVGD 29) (E):	ALA.
			Time Depar		1112			ce from surveyed elevation	(F): 7.4
					rmination of	: 7* Elevet		oo nom surveyed elevation	(/).
(G) Elevation of Wate	r Surface (NVGD):		Calculation	is for Deter	inination of	Z Eleval		linelj	
(H) Elevation of the b	ottom of the core (N	IVGD): G	- (B - C)				our long	47	
	I transition (NVGD)	,						+ /	
	ediment-water inter						- 4		
(I ₂) Elevation of the se	ediment-water inter	face as me	easured fron	n water dep	th (NVGD):	G - A	- 4	0	
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resarr	ple)					entropy (Carlotte Carlotte Carlotte Carlotte Carlotte Carlotte Carlotte Carlotte Carlotte Carlotte Carlotte Car	
Elevation (NVGD)	Lithology - Include USCS code			ency	Maximum particle size		IDs		
levati	rolog CS c	æ	ŏ	Consistency	ximu é	JC	Sample IDs		
	# S	Туре	Color	Ö	May	Odor	San	Commer	nts
		Silt	Black	FOUSE	fin				
1.0						gradule or a con-		ages and properties and the second	ye Godadddian
		Silt	1127	<u>بر بر بر ب</u>	(°)			of Siltan	& layor
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mments:	1/1	1.44							
12-4-74-14	16-4/11/14	N.							

Battelle The Business of Innovation	Project Name: Location: Client:	New Be	rd Harbor dford, MA SACE NAE		ental Monito	-	Vessel	G606422 : R/V Gale Force : M	
Station ID:	VV 31		Time On St	ation:	1137			ements are ±0.1 feet	
Core Sample ID: 5	570-YY 3Q-60	~ 13	Northing (N.	AD 83):	2704	64X.6	Water Dept	h (A):	6.7
Logged by:	MW		Easting (NA	D 83):		0 · 9		ush core assembly (B):	9.0
Collection Mechanism:	Push-Core		GPS Accura	асу:	2.5	ÿ	_ _Water surfa	ce to top of handle (C):	G8
Date:	11/11/02		Predicted T	ide (ft):	NA		_ Length of co	ore (from bottom) (D):	1.3
			Time of Col	lection:	1140		Surveyed el	evation (NVGD 29) (E):	NA
			Time Depar	t Station:	1143		Water surfa	ce from surveyed elevation	(F):
		C	Calculation	s for Deter	rmination of	f Z* Elevati	ion		
(G) Elevation of Water	er Surface (NVGD):	E-F							······································
(H) Elevation of the t	oottom of the core (N	IVGD): <i>G</i> -	(B - C)				-6		
z*) Elevation of visua	al transition (NVGD)	: H + (distar	nce to visua	al transition,)		- 500 1000	5. Ö	
Elevation of the s	sediment-water inter	face as mea	asured from	n bottom of	core (NVGD	n. H + D	- 4	8	
	sediment-water inten				•	-	~ 13		***************************************
				4P	(is the	
(Note if I ≠ I ₂ within	n ± 1.0 feet, discard a	and resamp	ile)				- Salaharan - Sala		MA 200 1000 2000 2000 2000 2000 2000 2000
Elevation (NVGD)	Lithology - Include USCS code		<u>.</u>	Consistency	Maximum particle size		Sample IDs		
(F.e.	Litho	Type	Color	Cons	Maxi	Odor	Sam	Comme	nts
1.3		Silt	Bluch	1008	File	7			
	magnetic for the second of the second of	w/plantery				Authorities against	-water and	S-070-yy	32-00-0
		- 1	01.04	0					- Com 4
		Clay	604	LAW	Five			TAP 0 2	
								S-07D-yy; TOP 0.2' for 7CB+	Sampa
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Battelle	Project Name: Location: "Client:	New B	ord Harbor ledford, MA ISACE NAE		ntal Monito	-	Vessel	G606422 : RN Gale Force : ペーレン(らん
Station ID:	WW 34		Time On St	ation:	1123		All measure	ements are ±0.1 feet
Core Sample ID:	5-870-229-	ØØ - 14	- Northing (N		2204	775,5	_Water Deptl	
ogged by:	NW		Easting (NA		8155	50.3		ush core assembly (B):
Collection Mechanism:	Push-Core		GPS Accura		3.06	2		ce to top of handle (C):
Date:	11/14/67		Predicted T	•	NA		-	pre (from bottom) (D):
			Time of Col		1156		-	evation (NVGD 29) (E):
			Time Depar		1158		-	ce from surveyed elevation (F):
			Calculation			7* Elovati		oo nom our op ou or a nor (t).
G) Elevation of W	ater Surface (NVGD)	: <i>E-F</i>	Calculation	3 TOT DETET	initation of	Z Lievan		1,9
(H) Elevation of the	e bottom of the core ((NVGD): G	- (B - C)				ASS.	-5.8
	sual transition (NVGE			al transition)			*	- W S
•	•			·				
	e sediment-water inte				,			4.4
I_2) Elevation of the	e sediment-water inte	erface as me	easured fron	n water dept	n (NVGD): (<i>i - A</i>	4	-4.3
(Note if I ≠ I ₂ with	nin ± 1.0 feet, discard	and resam	ple)				~	
	0							
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size			
N) nd	y - In			ency	m pa		SQ	
evatic	iolog CS o	e	, b	Consistency	simu e	, b	Sample IDs	
	· · · · · · · · · · · · · · · · · · ·	Туре	Color	Ŝ	Ma Sizi	Odor	Sar	Comments
# iii		1/10	Black	LUBBL	Fire			
1.0	. was was passage.	and the same of	on paperson.	Salari Salari Marketini	game	Magazin Magazin	White again, againm	- Same Staking
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Battelle	Project Name: Location: Client:	New E	ord Harbor Bedford, MA ISACE NAE		ental Monito	-	Vesse	: G606422 I: <i>R/V Gale Force</i> t: M. Volls M	
Station ID:	WW 24		Time On St		120			rements are ±0.1 feet	
	5-07-0-VW24	-80 - 15	Northing (N		27048				6.4
Core Sample ID:		72-13	- •	,			_Water Dep	• •	9.0
ogged by:	<u></u>		_ Easting (NA			49.6	_	ush core assembly (B):	0. 9
Collection Mechanism:	Push-Core		_ GPS Accur	-	<u> </u>	<u> </u>	_	ace to top of handle (C):	
ate:	1114167		_ Predicted T	ide (ft):	NA	A	_Length of c	ore (from bottom) (D):	1.5
			Time of Col	llection:	-/	<u> </u>	_Surveyed e	levation (NVGD 29) (E):	<u> </u>
			Time Depai	rt Station:	1234		Water surfa	ace from surveyed elevation	(F):
			Calculation	s for Deter	rmination o	f Z* Elevati	ion	<i>A</i>	
G) Elevation of Wat	er Surface (NVGD)	: E-F						1.6	
H) Elevation of the	bottom of the core	(NVGD): G	- (B - C)					<u>-6.5</u>	·
z*) Elevation of visu	al transition (NVGE)): H + (dist	ance to visu	al transition)			<u>. 5. 8</u>	
() Elevation of the	sediment-water inte	rface as m	easured fron	n bottom of	core (NVGD)): H + D		<u>-5.0 </u>	
(2) Elevation of the	sediment-water inte	rface as m	easured fron	n water dep	th (NVGD):	G - A		-4_X	
(Note if I ≠ I₂ withi	n ± 1.0 feet, discard	and resam	nple)						
	υ								
Elevation (NVGD)	Lithology - Include USCS code				particle				
on (k	ly - Ir			ency	l ä		Ds		
Elevation (h	holog	Туре	Cotor	Consistency	Maximum size	Odor	Sample IDs		
1.5	C C		ပိ	ပိ	Ma	8_	Sa	Commer	nts
		5:15	Black	KOOK	Cv			S-07D-ww	24-00-05
1077	·	addition to the same	aver a despectable	ordenday Quantum	April Aggreempton		gazzani.	rappers aprecia - an	
		Clay	201.10	EIM	Çws			Some S!	veaking.
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Battelle	Project Name: Location: Client:	New B	ord Harbor edford, MA SACE NAE		ental Monito	•	Vessel	G606422 : RN Gale Force : M. Wals M.
Station ID:	BBK 34	<u>_</u>	Time On St		J X	50		ements are ±0.1 feet
	+0-8BB34	- MM - 11	_ Northing (N		27041	000 is	Water Depth	
ogged by:	MW	<i>LP</i> 14	Easting (NA		K1567	6.62		ush core assembly (B):
Collection Mechanism:	Push-Core		GPS Accur	•	7.4	····	-	ce to top of handle (C) :
Date:		2	Predicted T	•	6/4	*		ore (from bottom) (D):
			Time of Col		C 8 5			evation (NVGD 29) (E):
			Time Depar		610		-	ce from surveyed elevation (F):
								ce irom surveyed elevation (F).
G) Elevation of Wate	r Surface (NVGD)		Caiculation	is for Dete	rmination of	r∠" Elevati	on	0.4
(H) Elevation of the bo	ottom of the core	(NVGD): G	- (B - C)					- 4, 4
			,	al tuamaitian	,			- 2 U
z*) Elevation of visua								
(I) Elevation of the se					,	•		- L. D
(I ₂) Elevation of the se	eaiment-water inte	erface as me	easured fron	n water dep	th (NVGD):	G - A		
(Note if I ≠ I ₂ within	± 1.0 feet, discard	d and resam	ple)					janifer.
Elevation (NVGD)	Lithology - Include USCS code]	ticle			
VN) n	- Inc			ncy	n par		Ds	
levation (I	ology SS cc	ø,	-	Consistency	Maximum particle size		Sample IDs	
Ele (I.e.	Lith	Туре	Color	S	Max	Odor	Sam	Comments
The state of the s		Savul	9:04	, at the	five to med			no noticelle Transition
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ments:		4.	110904	J Seav	J Fall	(140)		6-25=
ments:	Inst on	120 110 W	- 1 (0 × 0	20-0-	m 6 2 0 25	V W .		No.
ments:			6000	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		· • · /		
* Approx of	lost on 1		Cross	20 - 4 · 1		· • ;		-1

Battelle he Business of Innovation	Project Name: Location: Client:	New E	ford Harbor Bedford, MA JSACE NAE		ental Monito	-	Vessel	G606422 : R/V Gale Force : M- V/4{5 h
tation ID:	881973		Time On S		0908			ements are ±0.1 feet
ore Sample ID: S-01	10-38633-	00-13	 Northing (N		2704	R74.17	Water Depth	
ogged by:	MV/JF		Easting (N		X156	75.45		ish core assembly (B):
ollection Mechanism:	Push-Core		GPS Accur	,	3.2	7		ce to top of handle (C): 1. 7
ate:	11/16/69	L.	Predicted 1	•	0549	M /_		
			Time of Co		OUZ NO	1773	-	re (from bottom) (D):
			Time Depa		100	2.1		evation (NVGD 29) (E):
						JU		ce from surveyed elevation (F): + Alb
G) Elevation of Water	r Surface (NVGD)	: <i>E-F</i>	Calculation	is for Detei	rmination o	f Z* Elevati	on	06
d) Elevation of the bo	ottom of the core	NVGD): G	- (B - C)					-2 7
*) Elevation of visual		,	, ,	al 4iti			***************************************	any >
Elevation of the se								25-2,4
2) Elevation of the se	diment-water inte	rface as me	easured fron	n water dep	th (NVGD):	G - A		2.2
(Note if I ≠ I ₂ within :	± 1.0 feet, discard	and resam	ple)					
Elevation (NVGD)	Lithology - Include USCS code			Consistency	Maximum particle size		Sample IDs	
Eleva I.e. B	itholc	Туре	Color	onsis	laxim	Odor	ample	_
1.3		<u> </u>	i o	0	je-,		, vi	Comments
		Savel	Lown		tivu			S-07D-BBB23-00-
		fort 10	Mak	IDAL	to			
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0.4 +		C		1.410		* ****************	. obligación o la la la la la la la la la la la la la	All the state of t
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Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor edford, MA ISACE NAE		ntal Monito	•	Vessel	G606422 : R/V Gale Force : M VM3/M
Station ID:	5523		Time On St	ation:	0941			ements are ±0.1 feet
Core Sample ID: 5	D-5523-10	Y- 1.4	Northing (N		27048	71.7	Water Dept	1.5
Logged by:	MW		Easting (NA		81545		_	ush core assembly (B): q_{i}
Collection Mechanism:	Push-Core		GPS Accura		4	Q	-	ce to top of handle (C):
Date:	11/16/07		Predicted T	-	N 4			de to top of rialidic (e).
Date.	1.1.9/		-		<u> </u>			ore (from bottom) (D): evation (NVGD 29) (E):
			Time of Col		0153		_	evation (NVGD 29) (E): $\frac{\sqrt{A}}{\sqrt{A}}$ ce from surveyed elevation (F):
			Time Depar					ce from surveyed elevation (F):
(G) Elevation of Water	· Surface (NVGD)		Calculation	s for Deter	mination o	t Z* Elevati	on	06
(H) Elevation of the bo			(P. C)					`
								- 7 4J
(z*) Elevation of visual	transition (NVGD): H + (dista	ance to visua	al transition,)			
(I) Elevation of the se	diment-water inte	rface as me	easured fron	n bottom of	core (NVGD); H + D		5.6
(I ₂) Elevation of the se	diment-water inte	rface as me	easured fron	n water dep	th (NVGD):	G - A		5.4
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resam	ple)					- Andrews
_			· · · · · · · · · · · · · · · · · · ·	 	,			
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size			
vation (NV	n h			ncy	n pa		SQ	
vatio	olog)	Φ	5	Consistency	in diameter		Sample IDs	
Eley Eley	Li l	Туре	Color		May size	Odor	San	Comments
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Battelle Business of Innovation	Location: Client:	New B	edford, MA SACE NAE	Environm	ental Monitor		Vessel:	G606422 R/V Gale Force M-Walsh	
tation ID:	5529		Time On Sta	ation:	0959		All measure	ments are ±0.1 feet	
ore Sample ID: 5-07	0-5529-00	-15	Northing (N.		19047	24.5	Water Depth	(A):	5.8
ogged by:	MY		Easting (NA		81545	0-8	Length of pus	sh core assembly (B):	4.0
ollection Mechanism:	Push-Core		GPS Accura		1.77		- Water surfac	e to top of handle (C):	1.5
ate:	11/16/07		Predicted Ti	ide (ft):	A/A		Length of cor	re (from bottom) (D):	1.5
-			Time of Coll	lection:	1003		- _Surveyed ele	vation (NVGD 29) (E):	NA
			Time Depar	t Station:	1009		_Water surfac	e from surveyed elevation	(F): 10 · 6
			Calculation	s for Dete	ermination of	Z* Elevati	on		····
G) Elevation of Wate	er Surface (NVGD):	E-F						0.6	
H) Elevation of the b	ottom of the core (N	IVGD): G	- (B - C)					-6,4	
z*) Elevation of visua	al transition (NVGD):	: H + (dista	ance to visua	al transition	7)		****	-6.1	
) Elevation of the s	ediment-water inter	iace as me	easured fron	n bottom o	f core (NVGD): H + D		75,4	
•	ediment-water inter							· 5 7	
								and the second	
(Note if 1 + 12 within	ı ± 1.0 feet, discard a	and lesan	pie)						
Elevation (NVGD)	Lithology - Include USCS code	ω	or	Consistency	Maximum particle size	or	Sample IDs		
Eley (i.e.	Lith	Туре	Color	Ö	80 -	Odor	Sar	Comme	nts
	uniform and an analysis of the second	Silv	Black	Inche	FINE	e. gare a	www	and the second	1 1
		38/24	9787LK	form	Fru			mixed sill	L Cley jays
5.8	4	man, pages			-07800			3-07 D-SS	29-00-07
		Clay	0110	FXW	fine			5-07 D-55	
0.6		Carl	7,00					Sompled 7 FLB+ TOC/ on 12/12	
0.0								and the same of th	•
								TCB+ TOC/	63 and
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ID of digital photogra	ph(s):								
nments:									

Battelle	Project Name: Location: Client:	New E	ord Harbor Bedford, MA ISACE NAE	l	ental Monito	_	Vessel	G606422 : RN Gale Force : M-W≈\\$\1	
itation ID:	VV34		Time On S		1016			ements are ±0.1 feet	
ore Sample ID: 5-69		-24	Northing (N		27043	597.63	Water Depth		5.0
ogged by:	My		Easting (NA		81557	5.64		ush core assembly (B):	7.0
Collection Mechanism:	Push-Core		GPS Accur	acy:	2.26	}	Water surfa	ce to top of handle (C):	1 1
ate:	11/16/07		- _ Predicted T	ide (ft):	N/A		 Length of co	ore (from bottom) (D):	2.4
			Time of Co	llection:	w ii		Surveyed el	evation (NVGD 29) (E):	NA
			Time Depa	rt Station:	1026		Water surfac	ce from surveyed elevation	(F): 1/2
			Calculation	ns for Dete	rmination o	f Z* Elevat	ion		
G) Elevation of Wat	er Surface (NVGD):	E-F							
H) Elevation of the I	oottom of the core (N	NVGD): G	- (B - C)					<u> </u>	············
z*) Elevation of visu	al transition (NVGD)	: H + (dist	ance to visu	al transition	n)			<u> 5,2</u>	
() Elevation of the s	sediment-water inter	face as me	easured fror	n bottom of	core (NVGE)): H + D		-4.2	
I ₂) Elevation of the s	sediment-water inter	face as m	easured fror	n wate r dep	oth (NVGD):	G - A		-3.8	
	n ± 1.0 feet, discard	and resam	nple)				***************************************		
	,		,	·					
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size				
vation (N	ly - In			ency	l m		Ds		
levati	holog	Туре	Color	Consistency	e e	Odor	Sample IDs		
				1	, and 1	8_	- Sa	Commer	nts
		51lt	Black	10050	first				***** *** · · · · · · · · · · · · · · ·
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Baffelle Business of Innovation	Location: Client:		edford, MA SACE NAE			Chi		R/V Gale Force M - Vかけん
ation ID:	TT39		Time On Sta	ation:	1034		All measure	ements are ±0.1 feet
ore Sample ID: 5-1/2_	70-1139-1	20-14	Northing (N	AD 83):	2704	474.4	Water Depth	n (A):
ogged by:	MW		Easting (NA	AD 83):	81547	6-50		sh core assembly (B):
ollection Mechanism:	Push-Core	·····	GPS Accura	асу:	2.30	&	_Water surfac	be to top of handle (C): O
ate:	11/16/67		Predicted Ti	ide (ft):	NA.		_Length of co	re (from bottom) (D):
			Time of Col	lection:	1038		_Surveyed ele	evation (NVGD 29) (E):
			Time Depar	t Station:	1041		_Water surfac	ce from surveyed elevation (F): $\frac{1}{\sqrt{1 - s^2}}$
			Calculation	s for Deter	mination of	Z* Elevati	on	
G) Elevation of Water	er Surface (NVGD):	E-F						1.5
d) Elevation of the b	ottom of the core (I	NVGD): G	- (B - C)					-6.8
*) Elevation of visua	I transition (NVGD)	· H + (dista	nce to visua	al transition)			5.7
,), U , D		- Et del
	ediment-water inter							
	ediment-water inter			ıı water dep	ur (14 4GD): (J - M		<u> </u>
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resam	ple)					and the second s
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size			
(X) = E	de - inc			ncy	n par		So	
/ation (f	ology S co	d)	<u>_</u>	Consistency	iii m	_	Sample IDs	
(l.e.	Lithe	Туре	Color	Co	Max size	Odor	Sarr	Comments
1.4		Silt	Black	10086	Line			
(i) (ii) (ii) (ii) (iii)		The second second				aggetinos.	American American	- Same Strallen
			-11.4					of Silt layer
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Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor ledford, MA ISACE NAE		ental Monito	_	Vessel	G606422 : RV Gale Force : M. Valsu
Station ID:	KR 35		Time On St	· · · · · · · · · · · · · · · · · · ·	10 48			ements are ±0.1 feet
Core Sample ID: 5-4	0710-RR35-	90-10	Northing (N	AD 83):	27645	74.77		
Logged by:	NW	<i></i>	_ Easting (NA		81547	15.95	-	ush core assembly (B):
Collection Mechanism:	Push-Core		GPS Accura		1.96	- Aller		ce to top of handle (C):
Date:	11/16/67		 Predicted T 		N/A-		•••	ore (from bottom) (D):
_			Time of Col	, ,	1052		_	evation (NVGD 29) (E):
			Time Depar		1057	v		ce from surveyed elevation (F):
					mination o	f Z* Elevati		
(G) Elevation of Wate	er Surface (NVGD)							1.6
(H) Elevation of the b	ottom of the core	(NVGD): G	- (B - C)				-00.	6 had
(z*) Elevation of visua	al transition (NVGE)): H + (dista	ance to visua	al transition)		~	5.5
, ,	ediment-water inte	,		ĺ		W- LI - D		
	ediment-water inte				,	•	- 1	1 G
(2)				Hatel dep	ar (itvab).	□ /1		L. C. C. C. C. C. C. C. C. C. C. C. C. C.
(Note if I ≠ I ₂ within	ı ± 1.0 teet, discard	and resam	ipie)					
Tal								T
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size			
N) u	n - h			aucy	π pa		Ds	
vation (N	olog)	a)	5	Consistency	in cin		Sample IDs	
E E E	n Cit	Type	logo O Professional Professiona Professional Professiona Professiona Professiona Professiona Pro	5 \005L	P 1	Odor	Sar	Comments
0.9		Silt	Bluck	100%	+1124	nghesari (ndh)		
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Battelle	Project Name: / Location: Client:	New E	ford Harbor Bedford, MA JSACE NAE		ental Monito	-	Project #: Vessel: ef Scientist:	G606422 RV Gale Force M-Walsh	
tation ID:	0626		_ Time On St	ation:	1100	Ü	All measure	ements are ±0.1 feet	
ore Sample ID: 5	670-0026-00	-14	Northing (N	AD 83):	27047	15.93	Water Depth	n(A): <u>G-S</u>	
ogged by:	MW		Easting (NA	AD 83):	61534	4.49	_Length of pu	sh core assembly (B):	
ollection Mechanism:	Push-Core		GPS Accur	acy:	2.	27	_Water surfac	ce to top of handle (C):	
ate:	11/16/07		_ Predicted T	ide (ft):	NA		_Length of co	re (from bottom) (D):	
			Time of Col	lection:	Manage of Parage (Commercy production		Surveyed ele	evation (NVGD 29) (E):	
			Time Depai	t Station:	1112	····	_Water surfac	ce from surveyed elevation (F):	
			Calculation	s for Dete	rmination of	Z* Elevatio	on		
G) Elevation of Wa	ter Surface (NVGD):	E-F						1.6	
H) Elevation of the	bottom of the core (N	IVGD): G	i - (B - C)					6. +	
z*) Elevation of visu	ual transition (NVGD)	: H + (dist	ance to visu	al transition)			-6,0	
() Elevation of the	sediment-water inter	face as m	easured from	n bottom of	core (NVGD): H + D		553	
	sediment-water inter						-	- 5 7	
	in \pm 1.0 feet, discard a			·	•			intelled in the second	
(Note ii 1 7 12 Will)	in I (.o ieet, discard t	and resum	прісу						
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs		
<u> </u>			Vac.			Ŏ) vi	Comments	
*		Silt	BISNEY	1008	five		ĺ		
1.0		Silt	Black	mcd.	Con	September September	Planters part phone,	3 may be sit	
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6.7	dered (America)	Clay	0100	frm	fine			"	
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ments:									

Battelle Business of Innovation	Project Name: I Location: Client:	New B	ord Harbor edford, MA SACE NAE		ental Monito	J		: RN Gale Force : M-Va\S\	
ation ID:	6033	.ن	Time On St		1129	Cili			
ore Sample ID: 5 6		7-14	Northing (N			45.64	Water Deptl	ements are ±0.1 feet	7. 入
gged by:	MW	<i>y</i> 17	Easting (NA	·	K152	50.44	····	n (A): ush core assembly (B):	10.0
 bllection Mechanism:	Push-Core		GPS Accura	ŕ	3.5	7		ce to top of handle (C):	1.3
ate:	11/14/07		Predicted T	-	N/A		_	ore (from bottom) (D):	i.u
_			Time of Col		11 32		-	evation (NVGD 29) (<i>E</i>):	114
			Time Depar		11 24		···	ce from surveyed elevation	(F) PS.O
								oe nom surveyed elevation	(1).
i) Elevation of Wate	r Surface (NVGD):		Calculation	is for Detei	rmination o	f Z* Elevati	on	76	
	ottom of the core (N		(B (C)						*****
	·	·							
*) Elevation of visua	I transition (NVGD)	: H + (dista	ince to visua	al transition)			<u>-6, l</u>	
Elevation of the se	ediment-water inter	face as me	asured fron	n bottom of	core (NVGE)): H + D	***************************************	^ <i>5,</i> }	
,) Elevation of the se	ediment-water inter	face as me	asured fron	n water dep	th (NVGD):	G - A		5.2	
(Note if I ≠ I₂ within	± 1.0 feet, discard	and resam	ple)					NEW PROPERTY.	
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vation (N	- ygy -			stenc	mnı		le D		
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum p size	Odor	Sample IDs	Commo	140
1.4		SILL	Brown	10054	I Foru	0	8	Commer	
		silt	Black	1000	1 71000			Appears S	one Mix
		Cind	0.0					- of 100156	tue to
6.6	open wellow with	ni	.1.4					Appears S - of layers of Durdye or	0.1.21 0.
		Clay	Olive Harp	Firm	five			Voldye or	Across Kr
0-0		SOME	BULL	604]				
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Battelle The Business of Innovation	Project Name: Location: Client:	New E	ord Harbor Bedford, MA ISACE NAE	Environme	ntal Monito	-	Vesse	: G606422 I: R/V Gale Force t: M-Valju
Station ID:	0038		Time On Str	ation:	# 48			rements are ±0.1 feet
Core Sample ID: 5-07		/- i.2	Northing (N		2704	198.3	Water Dep	4 1
	MW				8153	49.9		1
Logged by:			_ Easting (NA	•	4.65			
Collection Mechanism:	Push-Core		GPS Accura		1:03		_	4
Date:	11/14/07		_ Predicted Ti		-NA			
			Time of Col		1123		-	elevation (NVGD 29) (E):
			Time Depar	t Station:	1157		_Water surfa	ace from surveyed elevation (F):
(C) Flourism of Mater	Curtoss (NIVCD):		Calculation	s for Deter	mination of	Z* Elevati	on	1 0
(G) Elevation of Water								
(H) Elevation of the bo	ttom of the core (N	NVGD): G	- (B - C)					<u> </u>
z*) Elevation of visual	transition (NVGD)	: H + (dist	ance to visua	al transition,)			<u> </u>
(I) Elevation of the se	diment-water inter	face as m	easured from	bottom of	core (NVGD): H + D		6.5
(I_2) Elevation of the se	diment-water inter	face as m	easured from	water dep	th (NVGD): (G - A		~ 6. 3
L,				•	, ,			
(Note if I ≠ I₂ within :	1.0 feet, discard	ano resam	іріе)					
Elevation (NVGD)	Lithology - Include USCS code			ncy	n particle		lDs	
Elevation (P	ithology JSCS cc	Туре	Color	Consistency	Maximum size	Odor	Sample IDs	Comments
1.7		Silt	Brown	(wst	4m		"	
1.2	n was allow gardens.	-		option with	years ages :	galan garan	rife i i i i i i i i i i i i	S-07D-0038-00-05
		Clay	gray	FILM	five			709 05 1 1 1 1
0.0								70P 0.5' sompled for FCB + 70C/65 onal on 12/12/07
								7 CB + 100/65 onal
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: ID of digital photograph	(0):							

Station ID: Core Sample ID: Spt Logged by: Collection Mechanism: Date:	LL34 D-LL34- IN W Push-Core IN/20/c	<i>100-1</i> 4	SACE NAE Time On Sta Northing (NA Easting (NA	ation: AD 83):	2853 24045	<u>5</u>		ments are ±0.1 feet (A):	5.1
Core Sample ID: Sp7 Logged by: Collection Mechanism:		:	Northing (N	AD 83):	37045	598.8			5.1
Logged by: Collection Mechanism:					81-3	~ 68		6.7	23.0
Collection Mechanism:		:	. Lasting (IVA	VD 001.		74. YQ	Length of nus	sh core assembly (B):	8.2
			GPS Accura	•	7.3	4	-	e to top of handle (C):	1. 4
Date:	11/2010	2	•		1.7				
		of g	Predicted Ti		0901		-	re (from bottom) (D):	
			Time of Coll			,	•	vation (NVGD 29) (E):	
			Time Depar	t Station:	0907		. Water surface	e from surveyed elevation	(F):
			Calculation	s for Deteri	mination of	Z* Elevatio	on		
(G) Elevation of Water								1.0	
(H) Elevation of the bo		-						4.5	
(z*) Elevation of visual								-62	
(I) Elevation of the se								-6,4	
(I_2) Elevation of the se	diment-water inte	rface as me	asured from	n water dept	.h (NVGD): C	à - A		-6.1	
(Note if I ≠ I ₂ within :	± 1.0 feet, discard	and resam	ple)					. All the second	
- C C	<u>ā</u>				w				
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size				
vation (N	l - yt			tency	d ur		IDs		
levati	holog SCS (a l	<u>o</u>	Consistency	e axim	Jo.	Sample IDs		
	<u> </u>	Туре	Color		6	Odor	Sa	Comme	nts
1.47	and the same again	5: It	Black	10096	- Fred	399977		Marine State Control of Control o	
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tation ID: ore Sample	0642 PD-0042- MW Push-Core	7	Time On Si Northing (N Easting (NA GPS Accur	IAD 83):	0009 2704 9 9			ements are ±0.1 feet	tok de a Alba
ogged by: ollection Mechanism: ate: G) Elevation of Water H) Elevation of the bot t*) Elevation of the sec	NW) Push-Core	7	Easting (N/		270499	9.8			tik der state
ate: 3) Elevation of Water H) Elevation of the bot t') Elevation of the sec	Push-Core		GPS Accur	AD 83):	profession and service		water Depti	1 (A):	Y8 49
ate: 3) Elevation of Water H) Elevation of the bot t*) Elevation of the sec	£	Ť	-		315336	1. 2	Length of pu	sh core assembly (B):	7.9
3) Elevation of Water H) Elevation of the bot t*) Elevation of visual the second of the second in	11/20/6	7		acy:	7.5	Ž	 _Water surfac	ce to top of handle (C):	1.0
Elevation of the bot Elevation of visual to Elevation of the sec			Predicted T	ide (ft):	NA		_ _Length of co	re (from bottom) (D):	1.5
Elevation of the bot Elevation of visual to Elevation of the sec			Time of Co	llection:	0720		Surveyed ele	evation (NVGD 29) (E):	MA
Elevation of the bot Elevation of visual to Elevation of the sec			Time Depa	rt Station:	0974	······································	Water surfac	ce from surveyed elevation (F)	er
Elevation of the bot Elevation of visual to Elevation of the sec	Surface (NVGD):		Calculation	ns for Deter	rmination of	Z* Elevat	ion	-/O. 8	
**) Elevation of visual t			- (B - C)					-1/-	
) Elevation of the sec	·		,	-14				~ / C	
		•		· ·			******		
₂) Elevation of the sec					•	•		<u> </u>	
	ıment-water inte	nace as me	easured fror	n water dep	th (NVGD): ('i - A		7.4	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
(Note if I ≠ I ₂ within ±	1.0 feet, discard	and resam	ple)					Accompliance accounts.	
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs		
	- 53 	à 4	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	VW4	Siz	8	Na Sa	Comments	
		Silt	Mark	10036	five			age DAWY.	
1.5	gare and the second of the second of	5114	bluck	10034	ſ.,		1 / ***	mixed Clay	Silt
		Clay	Direct	1003~	MW			MXXX Clay	N.
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Client: M M 19 7D - MM29		Time On St			-111		: m-walsh	
			ation:	091	8	All meseur	ements are ±0.1 feet	
<u> </u>	-00-15	Northing (N		37047	22.99	Water Dept		
NW		-	•	2127	19.8	_		
		_ Easting (NA	,	3.65	11.0		1 22 1	
Push-Core		_ GPS Accur	•		3		t Same	- 100
W LUICI		_ Predicted T		NA		-	ore (from bottom) (D):	
						_Surveyed e	· · · · · · · · · · · · · · · · · · ·	
		Time Depai	t Station:	0436		Water surfa	ce from surveyed elevation (F):	<u> </u>
0 ((1)(00)		Calculation	s for Dete	rmination o	f Z* Elevati	on	·	
,		(B, O)					<u> </u>	
·	•						-X-4	
transition (NVGD): H + (dista	ance to visu	al transition)			- 7,8	
diment-water inte	rface as me	easured fron	n bottom of	core (NVGE)): H + D		-6.9	
diment-water inte	rface as me	easured fron	n water dep	th (NVGD):	G - A		5.4	
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Li# USC	<u></u>		Ş	May	ğ	San	Comments	
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gadoso .	pp 391-1				-	Total Consumination Consuminat	galan, y, otherwise	
	JIIT	black	10034	fire			S-007D-MM29-00	0
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	Clay	gray	F'AM	Fine			C	١.
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L.								
***	Surface (NVGD) ottom of the core (transition (NVGD) diment-water inte	Surface (NVGD): E - F ottom of the core (NVGD): G transition (NVGD): H + (distance as measured and result and	Time of Col Time Depail Calculation Surface (NVGD): E - F Intom of the core (NVGD): G - (B - C) transition (NVGD): H + (distance to visual diment-water interface as measured from diment-water interface as measured from the core (NVGD): Book of the core (NVGD): H + (distance to visual diment-water interface as measured from the core (NVGD): H + (distance to visual diment-water interface as measured from the core (NVGD): H + (distance to visual diment-water interface as measured from the core (NVGD): H + (distance to visual diment-water interface as measured from the core (NVGD): H + (distance to visual diment-water interface as measured from the core (NVGD): H + (distance to visual diment-water interface as measured from the core (NVGD): H + (distance to visual diment-water interface as measured from the core (NVGD): A transition (NVGD): H + (distance to visual diment-water interface as measured from the core (NVGD): A transition (NVGD):	Time of Collection: Time Depart Station: Calculations for Determination of the core (NVGD): G - (B - C) transition (NVGD): H + (distance to visual transition diment-water interface as measured from water depart and the core (NVGD): H + (distance to visual transition of diment-water interface as measured from water depart and the core (NVGD): H + (distance to visual transition of diment-water interface as measured from water depart and the core (NVGD): H + (distance to visual transition of diment-water interface as measured from water depart and the core (NVGD): H + (distance to visual transition of diment-water interface as measured from water depart and the core (NVGD): H + (distance to visual transition of diment-water interface as measured from water depart and the core (NVGD): H + (distance to visual transition of diment-water interface as measured from water depart and the core (NVGD): H + (distance to visual transition of diment-water interface as measured from water depart and the core (NVGD): H + (distance to visual transition of diment-water interface as measured from water depart and the core (NVGD): H + (distance to visual transition of diment-water interface as measured from water depart and the core (NVGD): H + (distance to visual transition of diment-water interface as measured from water depart and the core (NVGD): H + (distance to visual transition of diment-water interface as measured from water depart and the core (NVGD): H + (distance to visual transition of diment-water interface as measured from water depart and the core (NVGD): H + (distance to visual transition of diment-water depart and the core (NVGD): H + (distance to visual transition of diment-water depart and the core (NVGD): H + (distance to visual transition of diment-water depart and the core (NVGD): H + (distance to visual transition of diment-water depart and the core (NVGD): H + (distance to visual transition of diment-water depart and the core (NVGD): H + (distance to visual transition of diment-water depart and the core (N	Time of Collection: Time Depart Station: Calculations for Determination of Surface (NVGD): E - Foltom of the core (NVGD): G - (B - C) transition (NVGD): H + (distance to visual transition) diment-water interface as measured from bottom of core (NVGD): ± 1.0 feet, discard and resample) Time Depart Station: O150 Calculations for Determination of Surface (NVGD): ### ### ### ### ### ### ### ### ### #	Time of Collection: Time Depart Station: Calculations for Determination of Z* Elevation: Surface (NVGD): E - F oftom of the core (NVGD): G - (B - C) Itransition (NVGD): H + (distance to visual transition) diment-water interface as measured from bottom of core (NVGD): H + D diment-water interface as measured from water depth (NVGD): G - A ± 1.0 feet, discard and resample) STIF STIF STIF STIF STIF STIF STIF STIF	Time of Collection: Time Depart Station: Calculations for Determination of Z* Elevation Calculations for Determination of Z* Elevation Calculations for Determination of Z* Elevation Control of the core (NVGD): G - (B - C) Itransition (NVGD): H + (distance to visual transition) diment-water interface as measured from water depth (NVGD): G - A at 1.0 feet, discard and resample) Time Depart Station: O145 Water surface Water surface Control of the core (NVGD): H + D Distance of the co	Time of Collection: Time Depart Station: Calculations for Determination of 2* Elevation Surface (NVGD): E - F Itom of the core (NVGD): G - (B - C) transition (NVGD): H + (distance to visual transition) diment-water interface as measured from water depth (NVGD): G - A 1 to feet, discard and resample) Some of the core (NVGD): G - (B - C) Transition (NVGD): G - (B - C) Transition (NVGD): H + (Distance to visual transition) Graph of the core (NVGD): H + D Graph of the core (NVGD): H

c Business of Innovation	Location: Client:		Bedford, MA ISACE NAE			Chi		el: RN Gale Force et: MN (>h			
tation ID:	WW 33		Time On St	ation:	1000	10° 11 2	All measu	rements are ±0.1 feet			
ore Sample ID: S 🎾	4	<u>l-00-11</u>	Northing (N	AD 83):		98.1	Water Dep				
ogged by:	<u> </u>		_ Easting (NA		\$1530	1.97	Length of push core assembly (B):				
ollection Mechanism:	Push-Core		_ GPS Accur	-	2-91	Page 1	Water surface to top of handle (C):				
ate: _	11/26/67-		_ Predicted T		<u>NA</u>		-	core (from bottom) (D):			
			Time of Co		10:00		-	elevation (NVGD 29) (E): Age from surveyed elevation (E):			
			Time Depai	rt Station:	10:10		_Watersum	ace from surveyed elevation (F):			
3) Fl	(AD/OD)		Calculation	s for Dete	rmination o	Z* Elevat	ion	~ /^ I			
,	er Surface (NVGD)		(F. C)								
	ottom of the core										
*) Elevation of visua	al transition (NVGE)): H + (dist	ance to visu	al transition)			-6-7			
	ediment-water inte				•	•					
2) Elevation of the s	ediment-water inte	rface as me	easured fror	n water dep	th (NVGD):	G - A		5,6			
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resam	nple)					*Company of the Compa			
				Ī			7	T			
4VGD)	Lithology - Include USCS code				ticle						
(N) u	de - Inc			Je J	n par		Ds				
Elevation (NVGD)	ology SS cc	e)	à	Consistency	Maximum particle size		Sample IDs				
	n SC	Туре	Color	S	Max	Odor	San	Comments			
1,0		Silt	Black	10056	r			Top half appears			
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0.5-	· · · · · · · · · · · · · · · · · · ·	~		and the same of th		Paragraph.	parente .	ggggge- gggggge- gggggg gggggg			
		Clay	Olive	fin							
		C/	344	/ /sobace	time			S-070-MMZZ-00-05			
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								Sampled TOP 05/4			
								Samplea TOP 0.51/6. PCB + TOC/65 an			
								PCB + TOC/GS an			
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Battelle Business of Innovation	Project Name: Location: Client:	New B	ord Harbor ledford, MA ISACE NAE		ntal Monito	•	•	: G606422 I: R/V Gale Force t: M-Valsh	
ation ID:	HHZZ		Time On St	ation:	101	5	All measur	rements are ±0.1 feet	
ore Sample ID: $S - \overline{\emptyset}$	70-HH22	-00-1	Northing (N	AD 83):	27648	14.2	_Water Dept	th (A):	51
ogged by:	MW		Easting (NA	D 83):	81517	3,9	Length of p	ush core assembly (B):	3.0
ollection Mechanism:	Push-Core		GPS Accura	асу:	1-3	35	Water surfa	ace to top of handle (C):	1.0
ate:	11/20/0	7	- _ Predicted T	-	AIA-			ore (from bottom) (D):	1.6
			Time of Col	lection:	1020	7	Surveyed e	levation (NVGD 29) (E):	NA
			Time Depar	t Station:	023	ł .	 _Water surfa	ace from surveyed elevation (F):
			Calculation	s for Deter	mination of	Z* Elevati	on		
Elevation of Wate	Surface (NVGD)	: E-F						<u> </u>	
d) Elevation of the bo	ottom of the core (NVGD): G	- (B - C)					- J. F	
*) Elevation of visua	transition (NVGD): H + (dista	ance to visua	al transition;)			-71	
Elevation of the se	·	,		•): H + D		m. / 1	
					•	•		- & X	
-,				ator uch	((11 GD). (/1		2.9	
(Note if I ≠ I₂ within	± 1.0 feet, discard	and resam	iple)					Andrews	
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Commer	ıtc.
1.6	1 1 2		VENY	0	2 s	0	<u>σ</u>	Connine	16
		sit	Black	(WX	fu			S-87D-H4	22-60-10
0.6:	Julijan - alaktorikana vyggjjangerir -	clay	Olive	fren	Five	allian i rin i fatta an i fatta an i fatta an i fatta an i fatta an i fatta an i fatta an i fatta an i fatta a	gadan.	Samples to from TOF + TOC/6	
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Battelle Business of Innovation	Project Name: Location: Client:	New B	edford, MA		ernar wormo	_	Project #: G606422 Vessel: R/V Gale Force ief Scientist: MAGA					
		U	SACE NAE		1 . 9							
re Sample ID: \$\frac{1}{2}	IIIS		_ Time On St		27048	en . 1.2		ements are ±0.1 feet	Li Ci			
. ,	. 8	<u> </u>	Northing (N	•	<u> </u>	36. XX	_Water Depth		4.9			
gged by:	MW		_ Easting (NA		\$1520	1.0	Length of push core assembly (B):		8.0			
llection Mechanism:	Push-Core	/12	_ GPS Accura	-	1.93		Water surface to top of handle (C):					
te:		O F	Predicted T	, ,	1033	**************************************	-	re (from bottom) (D):	1. 1			
			Time of Col			· · · · · · · · · · · · · · · · · · ·	_	evation (NVGD 29) (E):	<u>-NA</u>			
			Time Depar	t Station:	1040		_Water surfac	ce from surveyed elevation	(F): <u>10.7</u>			
			Calculation	s for Dete	rmination of	Z* Elevation	on	- A				
) Elevation of Water	Surface (NVGD)): <i>E - F</i>						<u> </u>				
Elevation of the bo	ottom of the core	(NVGD): G	- (B - C)					<u>- 1.2 </u>				
) Elevation of visual	transition (NVGE	D): H + (dista	ance to visua	al transition)			<u>-6.2</u>				
Elevation of the se	diment-water inte	erface as me	easured fron	n bottom of	core (NVGD): H + D		5.8				
) Elevation of the se								- F - L				
,						- ·		<u> </u>				
(Note if I ≠ I ₂ within	± 1.0 reet, discard	a and resam	ihie)					size contraction of the contract				
Elevation (NVGD)	Lithology - Include USCS code				ticle							
N) (N) = m0	de de			ιcy	Maximum particle size		SQ					
vation (N	sogy S co		_	Consistency	mum		Sample IDs					
(Fe.	Litho	Type	Color	Con	Maxi	Odor	Sam	Comme	nts			
1.4		Silt	NWONO	10036	fi.w							
1.0+-		J. 11	black	1000	4,000	obles billions		and the same of th	again Steam garanning and			
' -	9990		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					A 3 6 1 A	. i . c C			
			Olive	6m	Gal			0.4 101.0	3 Clay			
		Clark	gray	1 8 8 - 2	1,,,,,,			layer 13 100	TURK			
0.0			7					WITH SOW	C 37 1 T			
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								Zinc.				
								9-11-10-	Annual Control			
								2 % 10 -	1-4-5 -60			
								Sand	. /			
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								S-1070-: Somples to	7775110			
								7	10-105 at			
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Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	KK 27 70-KK 27- VIW Push-Core	-80-14	Time On St Northing (N Easting (NA	AD 83):	2707	7116	All measure	ements are ±0.1 feet
	11/20/0	7	GPS Accura Predicted T Time of Col	acy: ide (ft): lection:	1160 1167	50.9 Ly	Length of pu Water surfa Length of co	ush core assembly (B): ce to top of handle (C): ore (from bottom) (D): evation (NVGD 29) (E): ce from surveyed elevation (F):
 (G) Elevation of Water (H) Elevation of the bol (z*) Elevation of visual (I) Elevation of the sec (I₂) Elevation of the sec (Note if I ≠ I₂ within ± 	ttom of the core transition (NVGE diment-water into diment-water into	n: E-F (NVGD): G (NVGD): H+(dista	- (B - C) ance to visual easured from	al transition)	core (NVGD)): H + D	on	-0.7 -4.0 -6.5 -5.6 -5.3
Elevation (NVGD)	Lithology - Include USCS code	adv. Type	black of 28	The state of the s	A A Maximum particle size	Jopo	Sample IDs	Comments Two Distrigues that upper sift layers

Battelle Business of Innovation	Project Name: Location: Client:	New B	edford, MA SACE NAE				Vessel	G606422 : S/V Gale Force : M√V√l5√	
ation ID:	6629		Time On Sta	ition:	MЗ			ements are ±0.1 feet	
ore Sample ID: 5-4		-MM-13	Northing (NA		27047	17.44	Water Depth		38
,	nw	-PY-12	Easting (NA	•		9-61	- '	ush core assembly (B):	9.0
gged by:	Push-Core		GPS Accura	•	2.77	1.0		ce to top of handle (C):	\tilde{a} . \tilde{q}
ollection Mechanism:	1120/0	2	Predicted Ti	-	NA	aminuman-2-3-1-1-	_	1.3	
ue.			Time of Coll		1118		Length of core (from bottom) (D): Surveyed elevation (NVGD 29) (E):		
			Time Depart		112		 '	ce from surveyed elevation	(F): 0 / G
			Calculation	s for Dete	rmination of	Z* Elevati	on		
6) Elevation of Wat	er Surface (NVGD)	: E-F						-0,6	
() Elevation of the b	oottom of the core (NVGD): G	- (B - C)					-5, 7	
*) Elevation of visu	al transition (NVGD): H + (dista	ance to visua	al transitior	1)			-5,0	
,	sediment-water inte					N. H. + D		- 4 4	
	sediment-water inte sediment-water inte							- Li LI	
-,				· water dep	Jan (144 GD).	- A		1.7	
(Note if I ≠ I ₂ within	n ± 1.0 feet, discard	and resam	ıple)					- And the Control of	
Q (eb eb				<u>a</u>				
Elevation (NVGD)	Lithology - Include USCS code			· 3:	Maximum particle size		<u>م</u>		
vation (N	ĝy Č code			Consistency	E E		Sample IDs		
Elevat	tholo	Туре	Color	onsik	Maxim size	Odor	ampl	0	
		164	promov	10056	<u> </u>	0	S	Comme FICA / Si	ents
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0.7	· years	- 3 · 1 r	Diaca	100 %	- Time	agazanterio garanco		the many and the m	
		Clay	01.4	fim	fine			Some Sh S-1070-6 Somplestal	uky
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Battelle Business of Innovation	Project Name: Location: Client:	New E	ford Harbor Bedford, MA JSACE NAE		ental Monito	-		G606422 : SN Gale Force : M√X(5/√	
ation ID:	iz v AA		Time On St		11.3.5			ements are ±0.1 feet	
re Sample ID: 💲 📿	3D-1/23	- 1/1/-)	Northing (N		370 H	49 1	Water Depti		5,3
	MW	DA I	Easting (NA		26.1	7.32		ush core assembly (B):	3,3
gged by:			'	•	3.0		<u> </u>	, , ,	1.5
llection Mechanism:	Push-Core	07	_ GPS Accur	-				ce to top of handle (C):	15
te:	<u> </u>	<u> </u>	Predicted T Time of Col		1/2/2			ore (from bottom) (D):	1-1
					1125	~	-	evation (NVGD 29) (E): ce from surveyed elevation	(F): ************************************
			Time Depai					ce from surveyed elevation	(r)
i) Elevation of Wate	r Surface (NVGD)	: F.F	Calculation	s for Detei	rmination of	Z* Elevati	ion	~ A 5	
,	, ,		(5.0)					- my 6m	
) Elevation of the bo	ottom of the core ((NVGD): G	- (B - C)					<u> </u>	
*) Elevation of visua	transition (NVGE)): H + (dist	ance to visu	al transition)				
Elevation of the se	diment-water inte	rface as m	easured fror	n bottom of	core (NVGD): <i>H + D</i>		76.0	
,) Elevation of the se	ediment-water inte	rface as m	easured fror	n water dep	th (NVGD):	G - A	***************************************	<u>-5,8</u>	
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resam	nple)					and the same of th	
,	,		_	,			,	4	
(GD)	Inde				licle				
3	Lithology - Include USCS code			JC,	Maximum particle size		్ట		
vation (N	logy S co			Consistency	₩nw		Sample IDs		
Elev (1.e. l	Litho	Туре	Color	Cons	Maxi size	Odor	Sam	Comme	nts
1.5		Silt	BOWN	10014	Cw			Two distin	butture
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1.0		Silt	Bluck	(voy	Fine			2 1 1 101	1
0.6	Aller Allerden Glader	Marie Marie						.philliadap.com	
		Clay	olivi	firm	fine			S-GZD-1	1000
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								S-870-4 Soraples- TOP 0.91. TOC/6	6
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of digital photograp	n(s):								
nents:									

Battelle	Project Name: Location: Client:	New E	ford Harbor Bedford, MA JSACE NAE		ental Monito		Vessel	G606422 : S/V Gale Force : M-V&V	
tation ID:	LLHO		Time On S	tation:		19		ements are ±0.1 feet	
ore Sample ID: 5	70-LL46	-d0-10	_ ∑Northing (N	IAD 83):	2704	449,3	Water Dept		59
ogged by:	MW	,	_ _ Easting (N/	AD 83):	815 a	74.3	Length of pu	ush core assembly (B):	8.0
ollection Mechanism:	Push-Core		_ GPS Accur	acy:	7,0	5	_	ce to top of handle (C):	0.9
ate:	11/26/	or	Predicted T	ide (ft):	NA		 Length of co 	ore (from bottom) (D):	l, i
			Time of Co	llection:	115	5		evation (NVGD 29) (E):	NA
			Time Depa	rt Station:	115	4	Water surfâ	ce from surveyed elevation	***************************************
G) Elevation of Water	Surface (NVGD)		Calculation	ns for Dete	rmination o	f Z* Elevati	ion	~/1 4/	
 Elevation of the both 	, ,		- (B - C)				****	and the second	
		•	. ,					<u> </u>	
**) Elevation of visual								<u>-6. t</u>	
Elevation of the se								<u>-6.5</u>	
 Elevation of the se 	diment-water inte	rface as me	easured fror	n water dep	oth (NVGD):	G - A		<u> </u>	
(Note if I ≠ I ₂ within :	⊧ 1.0 feet, discard	and resam	ple)						
Elevation (NVGD)	Lithology - Include USCS code			ency	Maximum particle size	-	IDs		
levati	holog SCS c	e B	ō	Consistency	iximu e	Jo .	Sample IDs		
97)	<u> </u>	Туре	Color		7	Odor	Sar	Commer	nts
		5. lt	Black	100%	ting.			a at the life	
6.8	سنو بيعي دهي	- Apper agent	accessor Consession		Militan. paker-			- 5144 C	my lay-e
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		(Course)	304	,	100			8	
0.0		(Skelly)	legiones anno est en en est est est en en est est en en en en en en en en en en en en en		(120)			S-07D-LLE Sampled T for FCB +	10-00-00
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of digital photograph(nents:	s):								

Battelle	Project Name: Location: Client:	New Be	ord Harbor E edford, MA SACE NAE	±nvironmei	ntal Wonitor		Project #: Vessel: of Scientist:	SN Gale Force
	Sim win Old	U	Time On Sta	ation:	140			ements are ±0.1 feet
ion ID:		-00-15	Northing (NA		270 4	550.7	Water Depth	#9-2.f
	<u> </u>	700-13	Easting (NA		KICIO	101. Q	•	ish core assembly (B):
ged by:	MW		GPS Accura		7.4	7		ce to top of handle (C):
ection Mechanism:	Push-Core	<u></u>		-		- Bu	-	ore (from bottom) (D):
e: _	-1/ N V	1	Predicted Ti		iaos		-	evation (NVGD 29) (E):
			Time of Coll		1311		-	ce from surveyed elevation (F):
			Time Depart					ce from surveyed elevation (7).
	0 ((N)/OD)		Calculation	s for Deter	mination of	Z* Elevation	on	~. O. Z.
	r Surface (NVGD) ottom of the core (- (B - C)					7.4
	I transition (NVGD			al trancition)			
						=		2 0
	ediment-water inte							
) Elevation of the s	ediment-water inte	rtace as me	easured from	n water dep	tn (NVGD): (a - A		7.6
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resam	ple)					and the second s
Elevation (NVGD)	Lithology - Include USCS code				particle			
ation (NVGE Bottom = H)	n - h			ency	E pa		2 €	
/atio	ology SS cc	ø)		Consistency	Maximum size	'n	Sample IDs	
Elev (F.e.	Lithc	Туре	Color	8	Max size	Odor	San	Comments
1,5		7. N.	Black	10056	Fine			Sight Swam on Swifter
		Silt	Digen.	10030	Libra			S-070-1136-00-6
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Battelle The Business of Innovation	Project Name Location Client	New E	ord Harbor Bedford, MA ISACE NAE		ental Monito	_	Vessel	G606422 : S/V Gale Force : M-VU(54
Station ID: Core Sample ID: \$\frac{1}{2} \frac{1}{2}	HH42 D-HH42 MW Push-Core	-49-11	Time On Si Northing (N Easting (NA GPS Accur	AD 83): AD 83): acy:	2704 81517 2,04	6 399.7 7 506 03	All measure Water Depth Length of pu Water surface	ements are ±0.1 feet
_	8		Time of Col		132	3	_ _Surveyed ele	evation (NVGD 29) (E):
 (G) Elevation of Wate (H) Elevation of the bolic (z*) Elevation of visual (I) Elevation of the second (I₂) Elevation of the second (Note if I ≠ I₂ within 	ottom of the core I transition (NVGI ediment-water inte): E-F (NVGD): G D): H+(dista	ance to visua easured fron easured fron	a <i>l transition,</i> n bottom of) core (NVGE)): <i>H + D</i>	on	-0.1 -7.7 -6.9 -6.1
Elevation (NVGD) (i.e. Bottom = H)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
File ID of digital photograph		silt silt cian	Brak Black Oliving gray	100sl 100sl	time fine	O		Flocky Brown Silt layer maked with black Silt on top layer
Comments:	(IV).							

Battelle	Project Name: Location: Client:	New B	ord Harbor I edford, MA SACE NAE	znvii oniilei	inai WOIIILO		Project #: Vessel: of Scientist:	SN Gale Force	
	GC 2A		Time On Sta	ation:	(A A	9		ments are ±0.1 feet	
tation ID: ore Sample ID: 5 9 <u>7</u>		0-14	Northing (NA		2704	123.5	Water Depth		5.4
ogged by:	MW	Z	Easting (NA		81514	9.65	•	sh core assembly (B):	8.0
collection Mechanism:	Push-Core		GPS Accura	·	7,	24	Water surfac	e to top of handle (C):	1.0
eate:		17	Predicted Ti		N/		_ Length of cor	re (from bottom) (D):	1,4
			Time of Coll		13.55	L	_ _Surveyed ele	vation (NVGD 29) (E):	NA
			Time Depart	t Station:	/334	f	_Water surfac	e from surveyed elevation (F)	: <u> </u>
			Calculation	s for Deter	mination of	Z* Elevati	on		
G) Elevation of Water	Surface (NVGD):	E-F						<u> </u>	
H) Elevation of the bo	ttom of the core (I	NVGD): G	- (B - C)					4.1	
z*) Elevation of visual	transition (NVGD)): H + (dista	ance to visua	al transition,)			-6.3	
Elevation of the se	diment-water inte	rface as me	easured from	n bottom of	core (NVGD): H + D		~5 · 7	
I_2) Elevation of the se								-5,5	
.∠/ (Note if I ≠ I₂ within :								All the second s	
(11010 II 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	, 4,004,4		' '						
Elevation (NVGD)	Lithology - Include USCS code	Type	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments	
1,4					<u> 2 σ</u>	0		Odminorae	
		Silt	Black	100%	the				
								S / Land S	THA KAYA A
0.8	p. addition - inaggraph and the specific state of the specific sta		0/104		1.			5-07D- Sample	11
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e ID of digital photograp	h(s):								
□ ID of digital photograp	h(s):						(1)	idded WEY	12/18/04
	h(s):			2			0	odded WAEH	12/18/07

Battelle The Business of Innovation	Project Name: Location: Client:	New E	ford Harbor Bedford, MA JSACE NAE	4	ental Monito	-	Vesse	: G606422 I: SN Gale Force I: M-√∧\S\	
Station ID:	PAGO		Time On S	tation:	124			ements are ±0.1 feet	
ore Sample ID: 5~(770-0024°	-160 - 2:	_ 3 Northing (N	NAD 83):	2704	441.9	Water Dept		5-356
ogged by:	MW		Easting (N.	AD 83):	815047.0		Length of p	ush core assembly (B):	8-0%
ollection Mechanism:	Push-Core		GPS Accur	racy:	3.45		-	ace to top of handle (C):	A OR
ate:	11/2010	Y	Predicted 1	Tide (ft):	NA			ore (from bottom) (D):	2.3
			Time of Co	ollection:	125°	Š	 Surveyed e	levation (NVGD 29) (E):	NA-
			Time Depa	rt Station:	1303		Water surfa	ace from surveyed elevation	(F):
			Calculation	ns for Dete	ermination o	f Z* Elevat	ion	^ ^	
	er Surface (NVGD):		(2.0)					<u>0,2</u>	
,	ottom of the core (,						<u> </u>	
:*) Elevation of visua	al transition (NVGD): H + (dist	ance to visu	ıal transitioi	n)			<u> 4. I </u>	
) Elevation of the s	ediment-water inte	rface as me	easured froi	m bottom o	f core (NVGE	D): H + D		<u> </u>	
2) Elevation of the s	ediment-water inte	rface as me	easured froi	m water de	pth (NVGD):	G - A		-5.4	***************************************
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resam	nple)				***************************************	and the second s	
(GD)	nde				cle				
Elevation (NVGD)	Lithology - Include USCS code			ncy	Maximum particle size		Ds		
levatio	hology SCS or	Туре	Color	Consistency	aximur	Odor	Sample IDs		
2.5	<u> </u>	silt	Roman	0 VOV	garg.	8	- S	Comme	T %
2.1-		2011	Breck	10034	pw.	Norman		Flock / Brow	K Still 100 A
× * * <u> </u>		, and	Black	NonV	fork				
		S	Moura	KWX	tw				
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of digital photograp ments: of AttuW	1 A//.								
at 4 th	t 176								

Baffelle The Business of Innovation	Project Name: A Location: Client:	New Be	ord Harbor edford, MA SACE NAE	ŀ	ental Monitol	•	Vessel	G606422 : SN Gale Force : M-WALS M	
Station ID:	nn 33		Time On S	tation:	1309		All measure	ements are ±0.1 feet	
Core Sample ID: 5 - 07	D-0022-	001-2.0	Northing (N	IAD 83):	atous	(44, 4	Water Dept		6.1
Logged by:	N. I.I		Easting (N	•	<1507	255000		ush core assembly (B):	9.0
Collection Mechanism:	Push-Core		GPS Accur		4106			ce to top of handle (C):	0.6
Date:	, a	-	Predicted Tide (ft):		124			ore (from bottom) (D):	3.0
Date.	Time of Collection:					_			
							-	evation (NVGD 29) (E):	<u> </u>
			Time Depa		1319			ce from surveyed elevation (F): <u>~ ~ + 3</u>
(G) Elevation of Water	Purfose (NIVCD):		Calculation	ns for Dete	rmination of	Z* Elevati	ion	7a 5	
(G) Elevation of Water	•						·····		
(H) Elevation of the bot	ttom of the core (N	IVGD): G-	· (B - C)					<u> </u>	
(z*) Elevation of visual	transition (NVGD)	: H + (distai	nce to visu	al transition)			4-10	
(I) Elevation of the sec	diment-water inter	ace as mea	asured fror	n bottom of	core (NVGD)	: H + D		St. 75.9	
(I2) Elevation of the sec	diment-water inter	ace as mea	asured fror	n water dep	oth (NVGD): 0	∂ - A		-54-50	
(Note if I ≠ I₂ within ±	1 0 feet discard	and recomm	ale)						
(Note in 17 12 William 1	. 1.0 leet, discard	and resamp	ne)						
Elevation (NVGD)	Lithology - Include USCS code	SIFF SIFF Clay	Black Black	To an an an an an an an an an an an an an	A Size	JOPO The second of the second	Sample IDs	Comments - roficable - of silt - of silt - struking Thin vence silt who. S-07D-DD22 Somples for + OA splits - top 1.1' on	Hetrans. V of 2-00-11 TCB+TOX taken fie
									JMF/M
ID of digital photograph(s):								
ments: — Lite Swa		g/cun	16 OV	541	fue of	CCL	land a		
0 wods. 11/2	a 10 7								

Battelle Business of Innovation	Project Name: Location: Client:	: New B	ord Harbor Bedford, MA ISACE NAE	l	ental Monito	•	Vesse	: G606422 I: S/V Gale Force I: M-WALS V	
ation ID:	เกมนก		Time On St		099	(kg		rements are ±0.1 feet	
ore Sample ID: S={	/2D= 0040-0	w-27	Northing (N			50.15	Water Dept		we have
gged by:	·// // // //	<u> </u>	Easting (NA	,		25.4	-	ush core assembly (B):	16.0
				· ·	7.3			ace to top of handle (C):	7-0
ellection Mechanism:	Push-Core	7	GPS Accur	-		2	_		27
te:	11/21/6	7	Predicted T		<u>N/A</u> -		_	ore (from bottom) (D):	<u> </u>
			Time of Co		<u> </u>		_	levation (NVGD 29) (E):	7. U
			Time Depa	rt Station:	1022		_Water surfa	ace from surveyed elevation ((F): <u>// / / / / / / / / / / / / / / / / / </u>
			Calculation	ns for Deter	mination o	f Z* Elevati	on		
Elevation of Wate			(D, C)				****	<u> </u>	
) Elevation of the bo									
) Elevation of visua	transition (NVGE	0): H + (dista	ance to visu	al transition,)			10.2	
Elevation of the se	ediment-water inte	erface as me	easured fror	n bottom of	core (NVGD)): H + D		- 8. 4	
,) Elevation of the se	ediment-water inte	erface as me	easured fror	n water dep	th (NVGD):	G - A		8.7	
(Note if I ≠ I₂ within	± 1.0 feet, discard	d and resam	nple)					of the state of th	
			·						
(GD)	nde				cle				
 	Lithology - Include USCS code			5	Maximum particle size		s		
vation (N	. ygo			sten	unu unu	WHAT I] e		
Eleva (l.e. B	ithok	Type	Color	Consistency	faxin ize	Odor	Sample IDs	Commer	nte
717		SILT FILL	Brown	10034	(124	- º -	0)		
7.6		46.				Section 1	-	- WVa(sca)	413 B
		de la company	21.1	1008	I Co.			0.0 32000	w L
		Salt	Black	1000	11001				
	arter. approved to the contract of the contrac	er graden yan	ation appropria	****	gazanto, gazanto,	gaganian dispenses and	Magazin Magazin	Andrew State	
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Battelle The Business of Innovation	Project Name: Location: Client:	New Bedfo		=nvironme	rntai Monito	-		S/V Gale Force	
Station ID:	171736		ne On Sta	ation:	104			ements are ±0.1 feet	
Core Sample ID:	-070-0074-40	1 09 84	rthing (NA		2704		Water Depth		10:0
_ogged by:	MW		sting (NA		815084.3			sh core assembly (B):	13.3
Collection Mechanism:	Push-Core		S Accura	·		7	-	ce to top of handle (C):	1.0
Date:	11/28/07		Predicted Tide (ft):		NA	· · · · · · · · · · · · · · · · · · ·	_	re (from bottom) (D):	2.0
Ju (0.			ne of Coll		1050		_	evation (NVGD 29) (E):	NA
			ne Depart		105		_	ce from surveyed elevation	
							_	se from surveyou elevation	(/ /· <u></u>
G) Elevation of Wat	ter Surface (NVGD):		culation	s for Deter	mination of	t Z* Elevati	on	2.4	
	bottom of the core (I		- C)					- 4 4	
•	al transition (NVGD)			ıl transition))			79.1	
(I) Elevation of the	sediment-water inter	face as measu	red from	bottom of	core (NVGD)): H + D		- 7 9	
I_2) Elevation of the	sediment-water inter	face as measu	red from	water dept	th (NVGD):	G - A		- 7.6	
(Note if I ≠ I ₂ within	n ± 1.0 feet, discard	and resample)						and a second distribution of the second distribu	
(D)	e e				<u> </u>				
Elevation (NVGD)	Lithology - Include USCS code		1	юу	particle		SC		
vation (N	ology SS coc	o l	_	Consistency	Maximum size		Sample IDs		
		Type	Color	Con	Maxi size	Odor	Sam	Comme	nts
7.0		int/Flock Bro	my/sik	louse	Ary	Hilmann	p	galance .	CV.
1.6		Sit B	lack	(0022	file			S-070-E	256-86
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0.0								Somples tak TOP1.2' (+TOC/GS	on Juan
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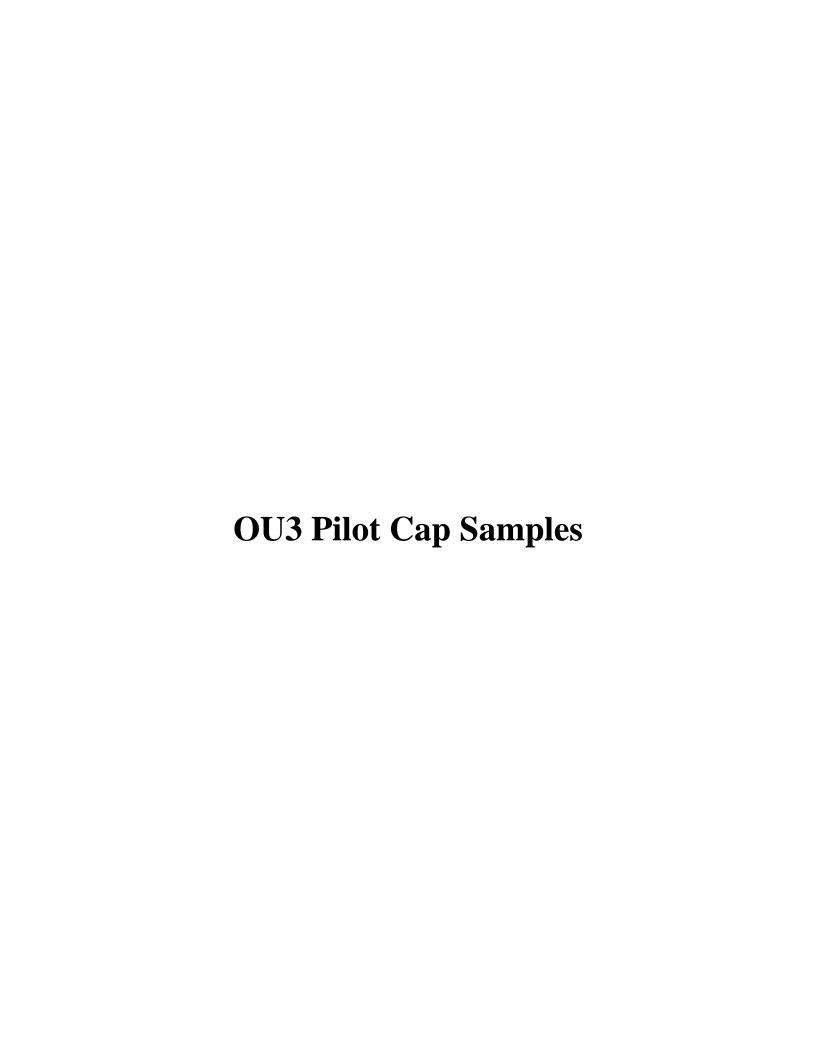
Battelle Business of Innovation	Project Name: Location: Client:	New E	ford Harbo Bedford, M. USACE NA	A	ental Monito		Vesse	: G606422 hl: S/V Gale Force t: M-V-154	
ation ID:	pp 36	DWP	Time On S	Station:	inu	3		rements are ±0.1 feet	
re Sample ID: S-Ø	70-0036-00	-21 - REI			2704	534.2	Water Dep		7.8
gged by:	MW		Easting (N	•	8150	84.5		oush core assembly (B):	17.0
llection Mechanism:	Push-Core		GPS Accu		2.63	<u> </u>		ace to top of handle (C):	1.0
te:		7	 Predicted		NA			ore (from bottom) (D):	2.1
			Time of Co	ollection:	1103		_	elevation (NVGD 29) (E):	N/L
			Time Depa	art Station:	1114			ace from surveyed elevation	
			Calculatio	ns for Dete	rmination of	Z* Elevati	on		
	r Surface (NVGD)						***************************************	2.2	·····
Elevation of the b	ottom of the core (NVGD): <i>G</i>	i - (B - C)				· u _n	<u>4.8</u>	
) Elevation of visua	l transition (NVGD): H + (dist	ance to visu	ual transitior	1)		-	9.0	
Elevation of the se	ediment-water inte	rface as me	easured fro	m bottom of	core (NVGD): H + D	~~		
) Elevation of the se	ediment-water inte	rface as me	easured fro	m water der	oth (NVGD):	G - A	~	7.6	
(Note if I ≠ I₂ within	± 1.0 feet, discard	and resam	nple)				***************************************	Salar Salar Salar Salar Salar Salar Salar Salar Salar Salar Salar Salar Salar Salar Salar Salar Salar Salar Sa	
T	· · · · · · · · · · · · · · · · · · ·		T		7			· · · · · · · · · · · · · · · · · · ·	
Elevation (NVGD)	Lithology - Include USCS code			Consistency	Maximum particle size		Sample IDs		
(l.e.	Litho	Туре	Color	Cons	Maxi	Odor	Samp	Commer	ıts
		5:11/Flack	Browkik	loose	Fine				
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_		Silt	Rack	\WXL	time			S-010-DD86	-00-13-B
0.8	(\$5000), \$5000, \$5000.	-	01110	den ganner.	g saarri' sa	er gar- sauc	Messel, gare	Mercani	
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Battelle © Business of Innovation	Location: Client:		Bedford, MA USACE NAE			Chi		l: S/V Gale Force t: M-WA\\$\	
ation ID:	<u> </u>		Time On S	tation:	113-8			rements are ±0.1 feet	
ore Sample ID: 5	-0717-EE41-0	<u>10-23</u>	_ Northing (N	IAD 83):	1704	424.7	Water Dept	th (A):	9.0
ogged by:	<u></u>		_ Easting (N	AD 83):	815100.6		_Length of p	ush core assembly (B):	13.0
ollection Mechanism:	Push-Core		GPS Accur	асу:	2.41		Water surfa	ace to top of handle (C):	1.5
ate:	11/28/0	7	_ Predicted 1	Tide (ft):	NA_	~	Length of c	ore (from bottom) (D):	7.3
			Time of Co		1135		_ ′	levation (NVGD 29) (E):	_// <u>/</u>
			Time Depa	rt Station:	11.31		_Water surfa	ace from surveyed elevation	(F): \$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
			Calculation	ns for Dete	rmination of	Z* Elevati	on		
6) Elevation of Wa	ter Surface (NVGD)): <i>E-F</i>						4.701.8	
f) Elevation of the	bottom of the core	(NVGD): G	6 - (B - C)					<u>-9.7</u>	
*) Elevation of vis	ual transition (NVGE	D): H + (dist	tance to visu	al transition)			-8.8	
Elevation of the	sediment-water inte	erface as m	easured fror	m bottom of	core (NVGD): H + D		-7,4	
) Elevation of the	sediment-water into	erface as m	easured fror	m water dep	th (NVGD):	G - A		-7.2	
(Note if I ≠ I ₂ with	in ± 1.0 feet, discard	d and resan	nple)					Compression,	
3D)	rde				l eg				
Elevation (NVGD)	Lithology - Include USCS code			Cy	Maximum particle size		s		
vation (N	logy S coc			Consistency	H H		Sample IDs		
	Litho	Туре	Color	Cons	Maxi size	Odor	Sam	Comme	nts
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		8 8	Black	Wal	fine			J-0 70-EE	41-80-14
		Silt							
6.9	an laser specific publishers fallen	age mades.	**************************************	and the second		NAMES OF THE PARTY	Angela, ye. or	prince, particular,	
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nents:	11-06-								
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0 w/ ds.	11/29/07								

Battelle Business of Innovation	Project Name: Location: Client:	New B	ord Harbor E edford, MA SACE NAE	nvironmer	ntal Monitor		Vessel	G606422 : S/V Gale Force : M-WAISH	
	nn 21		Time On Sta	tion:	1146			ements are ±0.1 feet	
tation ID: ore Sample ID: 5-¢	90-0031-0	のースト	Northing (NA		27046	75.3	Water Depth		7: 8
ogged by:	MW	<u> </u>	Easting (NAI		81 5 0	14.4	-	ush core assembly (B):	II. C
ollection Mechanism:	Push-Core		GPS Accura		7.2	7	_	ce to top of handle (C):	1.0
ate:		57	Predicted Tid		NA.			ore (from bottom) (D):	ス·0
			Time of Colle		1157		-	evation (NVGD 29) (E):	NA
	a						_	ce from surveyed elevation	(F): 15 S
			Calculations	s for Deteri	mination of	Z* Elevati	on .		
G) Elevation of Wate	r Surface (NVGD):	E-F					***************************************	1,5	
H) Elevation of the b	ottom of the core (I	NVGD): G	- (B - C)					`8.5	
z*) Elevation of visua	I transition (NVGD)): H + (dista	ance to visua	l transition)				- 7.5	
•	ediment-water inte): H + D		-6.5	
	ediment-water inte							-6.4	
				- · ·	, , ,				
(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resam	ipie)						
Elevation (NVGD) (I.e. Bottom = H)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comme	ents
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		Clay	307	HIM	11100				*
0.0								Samples	taken frem
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ID of digital photograp	oh(s):								
ID of digital photographments:	oh(s):								1
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Station ID: ### 37	Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor ledford, MA ISACE NAE		ental Monito		100000000000000000000000000000000000000	G606422 : R/V Gale Force :	
are Sample 10: State Content	tation (D:	AA 22		Time On St	ation:	13 39		All measur	ements are ±0.1 feet	
Collection Mechanism: Push-Core GPS Accusage: 2 SCO C Length of push core assembly (8): C C C C C C C C C	,	AN-CIN-S	77-00-5	-		27048	17.3	······································		1 67
Collection Mechanism Publicate Take: 1	***************************************		<u> </u>	_		615000	1.6			
Date: 17/11/07 Predicted Tide (th: 1/30 Surveyed elevation (VOC) 29) (E): Time of Coselection: 1/30 Surveyed elevation (VOC) 29) (E): Time Depart Station: 1/4/4/4 Water surface from surveyed elevation (F): 1/2 Calculations for Determination of 2° Elevation (G) Elevation of Water Surface (NVGD): E-F (F) Elevation of the bottom of the core (NVGD): G-(B-C) (G) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H+D (F) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H+D (NOTE III II) (within ± 1.0 feet, discard and resample) (G) Elevation of the sediment-water interface as measured from water depth (NVGD): G-A (NOTE III II) (within ± 1.0 feet, discard and resample) (G) Elevation of the sediment-water interface as measured from water depth (NVGD): G-A (NOTE III II) (within ± 1.0 feet, discard and resample) (G) Elevation of the sediment-water interface as measured from water depth (NVGD): G-A (NOTE III II) (within ± 1.0 feet, discard and resample) (G) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H+D (NOTE III II) (within ± 1.0 feet, discard and resample) (G) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H+D (NOTE III II) (within ± 1.0 feet, discard and resample) (G) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H+D (NOTE III II) (within ± 1.0 feet, discard and resample) (G) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H+D (NOTE III II) (within ± 1.0 feet, discard and resample) (G) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H+D (NOTE III) (within ± 1.0 feet, discard and resample) (G) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H+D (NOTE III) (within ± 1.0 feet, discard and resample) (G) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H+D (NOTE III) (within ± 1.0 feet, discard a				-	•					0.6
Time of Collection: Time Depart Station Time Depart Station Time Depart Station Time Depart Station Time Depart Station Calculations for Determination of Z* Elevation Calculations for Determination of Z* Elevation (F): 71. 2 Calculations for Determination of Z* Elevation (F): 71. 2 Calculations for Determination of Z* Elevation (F): 71. 2 Calculations for Determination of Z* Elevation (F): 71. 2 Calculations for Determination of Z* Elevation Time Depart Station of Year Station of Year (NVGD): 6 - 6 - 7 - 7 - 8 - 6 - 6 - 7 - 7 - 8 - 6 - 6 - 7 - 7 - 8 - 6 - 7 - 7 - 8 - 6 - 7 - 7 - 8 - 6 - 7 - 7 - 8 - 6 - 7 - 7 - 8 - 6 - 7 - 7 - 7 - 8 - 6 - 7 - 7 - 7 - 8 - 6 - 7 - 7 - 7 - 8 - 6 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7 - 7	1.0	1 1 -		-			7			
Calculations for Determination of 2" Elevation (G) Elevation of Water Surface (NVGD): E-F (D) Elevation of the source (NVGD): E-G (E) Elevation of the bottom of the core (NVGD): G-(B-C) (E) Elevation of the bottom of the core (NVGD): H-C (E) Elevation of the sediment-water interface as measured from water depth (NVGD): G-A (Note III # 1/2 within = 1.0 feet, discard and resample) (Note III # 1/2 within = 1.0 feet	Date.	4.1707		-		120	<u> </u>	_		-5: V
Calculations for Determination of 2° Elevation (G) Elevation of Water Surface (NVGD): E-F H) Elevation of the bottom of the core (NVGD): G-(B-C) (T) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H+D (Note if I ≠ I, within ± 1.0 feet, discard and resample) (Note if								-		51. 7
Comments Clay Cla									ce from surveyed elevation (r):
Elevation of the bottom of the core (NVGD): G - (B - C)	G) Elevation of Wat	er Surface (NVGD)		Calculation	s for Dete	ermination of	Z* Elevati	ion 	1,2 0	
Elevation of visual transition (NVQD): H+ (distance to visual transition) (i) Elevation of the sediment-water interface as measured from bottom of core (NVQD): H+D (i) Elevation of the sediment-water interface as measured from water depth (NVQD): G-A (Note if I + Is, within ± 1.0 feet, discard and resample) (i) Elevation of the sediment-water interface as measured from water depth (NVQD): G-A (Note if I + Is, within ± 1.0 feet, discard and resample) (i) Gradient of the sediment-water interface as measured from water depth (NVQD): G-A (Note if I + Is, within ± 1.0 feet, discard and resample) (ii) Gradient of the sediment-water interface as measured from water depth (NVQD): G-A (Note if I + Is, within ± 1.0 feet, discard and resample) (iii) Gradient of the sediment-water interface as measured from water depth (NVQD): G-A (Note if I + Is, within ± 1.0 feet, discard and resample) (iii) Gradient of the sediment-water interface as measured from water depth (NVQD): G-A (Note if I + Is, within ± 1.0 feet, discard and resample) (iii) Gradient of the sediment-water interface as measured from water depth (NVQD): G-A (Note if I + Is, within ± 1.0 feet, discard and resample) (iii) Gradient of the sediment-water interface as measured from water depth (NVQD): G-A (Note if I + Is, within ± 1.0 feet, discard and resample) (iii) Gradient of the sediment-water interface as measured from water depth (NVQD): G-A (Note if I + Is, within ± 1.0 feet, discard and resample) (iii) Gradient of the sediment-water interface as measured from water depth (NVQD): G-A (Note if I + Is, within ± 1.0 feet, discard and resample) (iii) Gradient of the sediment-water interface as measured from water depth (NVQD): G-A (Note if I + Is, within ± 1.0 feet, discard and resample) (iii) Gradient of the sediment-water interface as measured from water depth (NVQD): G-A (NOTE I + Is, within ± 1.0 feet, discard and resample) (iii) Gradient of the sediment-water interface as measured from water depth (NVQD): G-A (NOTE I + Is, within ±	·			- (B - C)				****	8.60	
Elevation of the sediment-water interface as measured from bottom of core (NVGD): H+D	•		,	•						
1.3 Selevation of the sediment-water interface as measured from water depth (NVGD): G-A Comments Comments Comments	z*) Elevation of visu) Elevation of visual transition (NVGD): H + (distance to visual transition)								
(Note it I + 1, within = 1.0 feet, discard and resample) Comments Comments	(I) Elevation of the s	sediment-water inte	erface as me	easured fron	n bottom of	f core (NVGD): H + D		- 3:00 -	
(Note III II within 21.0 leet, discard and resample) Order III Within 21.0 leet, discard and resample) Order III Order	(I_2) Elevation of the s	2) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A							-3 0	
Signature of the core Sompled 1-2' interest for PCB+TOC and on 12/12/07 Signature of the samples sampled 12/11/07@time of Sompl	(Note if I ≠ I₂ within	n ± 1.0 feet, discard	d and resam	nple)					/ 0	
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Sompled 1-2' interns for PCB+TOC and on 12/12/07 Sompled 1-2' interns for PCB+TOC and on 12/12/07 Sompled 1-2' interns for PCB+TOC and on 12/12/07 Sompled 1-2' interns for PCB+TOC and on 12/12/07 Sompled 1-2' interns for PCB+TOC and on 12/12/07 Sompled 1-2' interns on 12/1	IVGD)	clude				rticle				
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Sompled 1-2' interns for PCB+TOC and on 12/12/07 Sompled 1-2' interns for PCB+TOC and on 12/12/07 Sompled 1-2' interns for PCB+TOC and on 12/12/07 Sompled 1-2' interns for PCB+TOC and on 12/12/07 Sompled 1-2' interns for PCB+TOC and on 12/12/07 Sompled 1-2' interns on 12/1	Bot	olog SS c	ф	5	siste	kim s	,	ad de		
S-DID-AA22-10-2 Sompled 1-2' inter for PCB+TOC and on 12/12/04 Firm Clay Olive firm fine OOD S-DID-AA22-10-2 Sompled 1-2' inter on 12/12/04 NOA sompled sompled 12/11/04-3+time of sompled 12/11/04-3+time of sompled 12/11/04-3+time of sompled 12/11/04-3+time of sompled 12/11/04-3+time of sompled 12/11/04-3+time of sompled 12/11/04-3+time of sompled 12/11/04-3+time of sompled 12/11/04-3+time of sompled 12/11/04-3+time of sompled 12/11/04-3+time of sompled 12/11/04-3+time of sompled 12/11/04-3+time of sompled 12/11/04-3+time of sompled 12/11/04-3+time of sompled 12/11/04-3+time of sompled 12/11/04-3+time of sompled 12/11/04-3-time	(i.e.		Тур	Ö	Ç	Max	ğ	Sar	Commen	ts
Sit Black firm Clay of the Olive firm fine Clay of the Olive firm fine S-070-AA22-D2-03 Ms/MsA also collected The outside of the core	5.0								S-07D-A1	AZZ-10-20
Sit Black firm Clay of the outside of the core on 12/12/07 The samples sompled 12/11/07 time of the core on 12/12/07 The samples sompled 12/11/07 time of					loose				Sompled 1	-2' interve
Sit Black firm Clay of the Olive firm fine Clay of the Olive firm fine S-070-AA22-D2-03 Ms/MsA also collected The outside of the core					oo aaaa qoo dhaaaaaa aa qoo aa	Fine			for PCB,	TOC and
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Clay olive firm fine VOA somples sompled 12/11/07@ Hims q & S-\$10-AA22-\$2-\$23 MS/MSA also collected The of digital photograph(s): Inments: Sheen on the outside of the core					firm					JANE WA
O.O S-\$70-AA22-\$2-\$3 Ms/MsA also collected The outside of the core	1.3	Appen Appendix scares	opposite States of	ست سيد	۰ سب	*****	20081			
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Dof digital photograph(s): Then on the outside of the core			ľ	onve.	tirm	tive		1 ?	12/11/00	_ /celu
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O AEM 12/13/07			<i>i</i>							

Battelle The Business of Innovati	f Banks	ject Name: Location: Client:	New B	ord Harbor edford, MA SACE NAE		ntal Monito			G606422 I: RV Gale Force I:
Station ID:		4427	DUP	_ Time On St	ation:	133	q	All measur	rements are ±0.1 feet
Core Sample ID: ,	S-07	O-14622	-DOP-00-	- ∫¶ iorthing (N	AD 83):	2704	18873	Water Dept	9 }
Logged by:	311	<u> </u>		_ Easting (NA	ND 83):	3150	815000 Ja Length of push of		ush core assembly (B): 8 0
Collection Mechanism	1:	Push-Core		GPS Accura	асу:	2-5		_Water surfa	ace to top of handle (C):
Date:		2/11/07		Predicted T	ide (ft):	-		_Length of ca	ore (from bottom) (D):
				Time of Col	lection:		12	_Surveyed e	levation (NVGD 29) (E):
				Time Depar	t Station:	14	44	_Water surfa	ace from surveyed elevation (F):
	·		<u></u>	Calculation	s for Deter	mination of	Z* Elevati	on	
(G) Elevation of V	Vater Surf	ace (NVGD): <i>E-F</i>						-1.2 0
(H) Elevation of the	ne bottom	of the core	(NVGD): G	- (B - C)					-8.4 0
(z*) Elevation of v	isùal trans	sition (NVGI	D): H + (dista	ance to visua	al transition)	ı			-7.4 O
(I) Elevation of the	ne sedime	nt-water into	erface as me	easured from	n bottom of	core (NVGD): H + D	-	-3.5 0
(12) Elevation of the						•	•		-3.3 0
(Note if I ≠ I₂ w					,	• •			<i>y</i> 0
(14010 11 7 7 12 44	101111111111	ices, discar	and resum	ipic)					
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Elevation (NVGD)		Lithology - Include USCS code	1	1		Maximum particle size			
/ation (NVGE		y - in			ancy	m pa		. ⊴	
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) — — — — — — — — — — — — — — — — — — —		— CS (∰	Туре	Color	Š	May	og O		Comments
4.9						,			S-07D-AH22-10-20 Sampled 1-2' interest for FCB + TOC/65 are on 12/12/07 JMF/40
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				Black					on 12/12/07 Just/4
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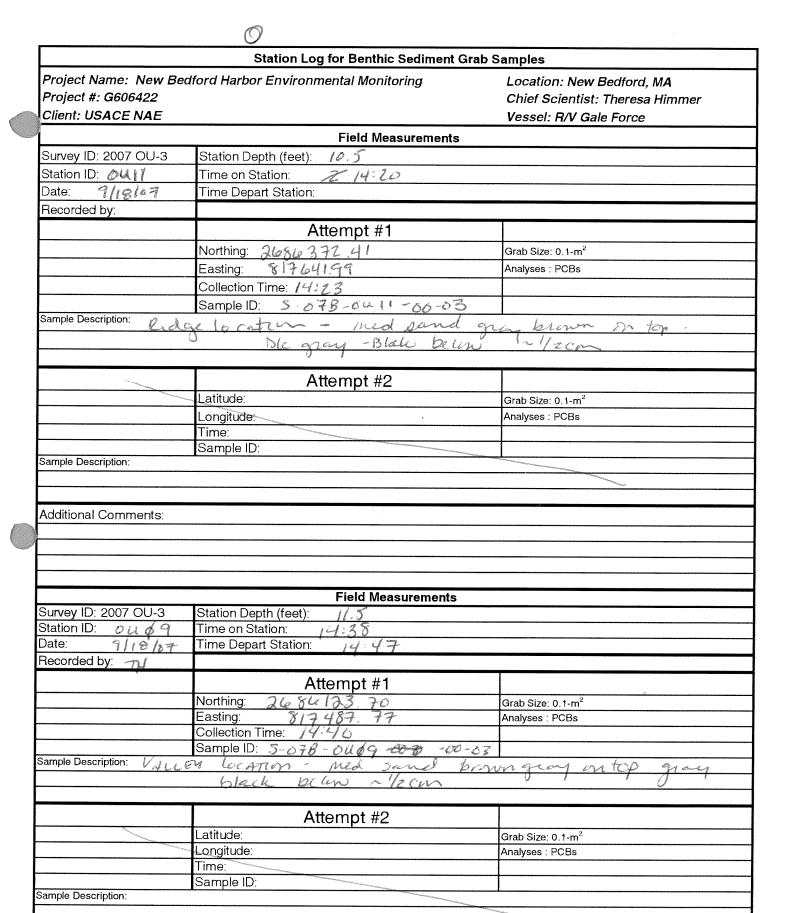
	Station Log for Benthic Sediment Grab S	amples
Project Name: New Bed	ford Harbor Environmental Monitoring	Location: New Bedford, MA
Project #: G606422	-	Chief Scientist: Theresa Himmer
Client: USACE NAE		Vessel: R/V Gale Force
	Field Measurements	
Survey ID: 2007 OU-3	Station Depth (feet): 12,9	
Station ID: 005	Time on Station: 6911	
Date: 9/15/0子	Time Depart Station: 0929	
Recorded by: //ww/		
	Attempt #1	
	Northing: 3656188: 27 3686188: 69	Grab Size: 0.1-m ²
	Easting: \$15179,444 \$18300.33	Analyses : PCBs
	Collection Time: 948 0724	
	Sample ID: 5-078-0405-00-03	
Sample Description: Fmc		& brewn sard below
	Java will wan Jill that his	y brown from pace w
	Attempt #2	l .
	Latitude:	Grab Size: 0.1-m ²
,	Longitude:	Analyses : PCBs
	Time:	;
	Sample ID:	
Sample Description:	Huyst N/6	
Additional Comments: *	· Completely Flat Bottom noted on	Echoso4ndes
<u></u>	/	
	Field Measurements	
Survey ID: 2007 OU-3	Station Depth (feet): 13-7	
Station ID: 0 WG	Time on Station: 0935	
Date: 7/18/07	Time Depart Station: 0150	
Recorded by: Mw		:
	Attempt #1	
	Northing: 2686 190. 2	Grab Size: 0.1-m ²
	Easting: 817951.0	Analyses : PCBs
	Collection Time: 0947 0945	
	Sample ID: 5-676 ~ 0 406 - 00-63	
	tempt N/G	
	and an surface with Black Filt and s	savel blew.
- Completely f	Int Bottom noted an Echosonnell	<u> </u>
	Attempt #2	
	Latitude:	Grab Size: 0.1-m ²
	Longitude:	Analyses : PCBs
	Time:	And the state of t
Sample Description:	Sample ID:	The second secon
Campie Description.		
		· · · · · · · · · · · · · · · · · · ·
Additional Comments:		
Auditional Comments,		

	Station Log for Benthic Sediment G	Grab Samples
Project Name: New Be Project #: G606422 Client: USACE NAE	edford Harbor Environmental Monitoring	Location: New Bedford, MA Chief Scientist: Theresa Himmer Vessel: R/V Gale Force
CHERT: USACE NAE		vessei: H/v Gaie Force
° 'D 2007 OH 0	Field Measurements	
Survey ID: 2007 OU-3	Station Depth (feet): 13.5	
Station ID: 04 \$2	Time on Station: 10:14	
Date: 9/18/87	Time Depart Station: 1020	
Recorded by: TH		
	Attempt #1	
	Northing: 2685862,09	Grab Size: 0.1-m ²
	Easting: 818148.65	Analyses : PCBs
	Collection Time: 10:15	
	Sample ID: 5-878-0462-80-03	
Sample Description:	ned sand gray brown on	top dk and black
	stow below of con	
	71.7	
	Attempt #2	
- Control of Control o	Latitude:	Grab Size: 0.1-m ²
	Longitude:	Analyses : PCBs
***************************************	Time:	,,
	Sample ID:	
Sample Description:		
Additional Comments:	Flat bottom ment -c	could not see any redges
	on diepth fully.	, 0
	· ·	
	Field Measurements	
Survey ID: 2007 OU-3	Station Depth (feet):	
Station ID: Ou 41	Time on Station: /3/03	
Date: 9/18/07	Time Depart Station: 13:/8	
Recorded by: Tu		
	Attempt #1	
	Attempt #1 Northing: 3/285/268 245	0.1.0
	Northing: 7685668,45 Easting: 814987,27	Grab Size: 0.1-m ² Analyses: PCBs
	Collection Time: 301 N/6 13:00	
	Sample ID: 5-078-046 -00-03	
Sample Description:		
Rida		
<u> </u>	med, well sixted si	ienell !
Filing and the state of the sta	Attempt #2	
	Latitude:	Grab Size: 0.1-m ²
	Longitude:	Analyses : PCBs
	Time:	
	Sample ID:	The second secon
Sample Description:		- Control Cont
Additional Comments:		

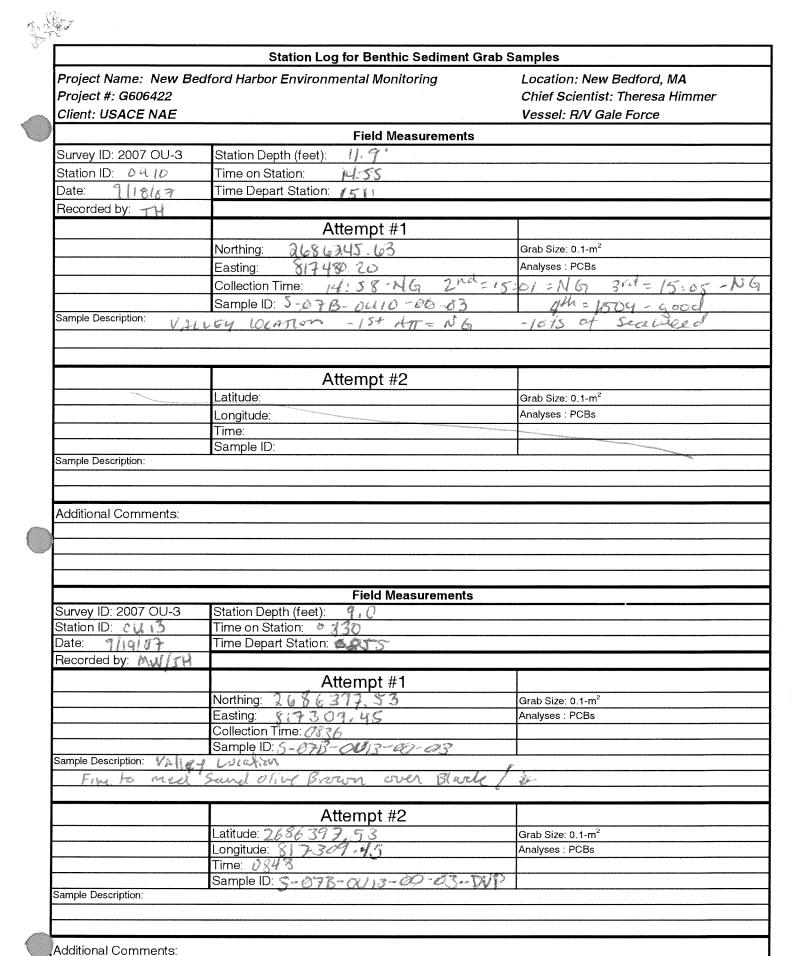
	Station Log for Benthic Sediment C		
•	dford Harbor Environmental Monitoring	Location: New Bedford, MA	
Project #: G606422		Chief Scientist: Theresa Himmer	
Client: USACE NAE		Vessel: R/V Gale Force	
	Field Measurements		
Survey ID: 2007 OU-3	Station Depth (feet): 12.6		
Station ID: じゅダチ	Time on Station: 13°34		
Date: 9/18/17	Time Depart Station: 13:40		
Recorded by: TH			
	Attempt #1		
	Northing: 2686019.63	Grab Size: 0.1-m ²	
	Easting: 817780.73	Analyses : PCBs	
	Collection Time: 13:36		
	Sample ID: 5-078-0467-00-8	3	
Sample Description: VALL	EY LOCATION - well sorted - in	ed sand - gray brown	
Ow.	top ; gray blacke below ~1/2	cm	
7			
y.	Attempt #2		
The state of the s	Latitude:	Grab Size: 0.1-m ²	
	Longitude.	Analyses : PCBs	
	Time:		
	Sample ID:	Secretaria de Constante de Cons	
Sample Description:			
	Field Measurements		
Survey ID: 2007 OU-3	Station Depth (feet): 12-11		
Station ID: 04 08 Date: 9/18/03	Time on Station: (400) Time Depart Station: 1410		
Date: 9/18/07 Recorded by: Tu	Time Depart Station. 19.70		
necorded by.	Attacent #4		
	Attempt #1	2	
	Northing: 3686237.33	Grab Size: 0.1-m ² Analyses: PCBs	
	Easting: 8(7748.3) Collection Time: 14201	Analyses , POBS	
	Sample ID: 5-076-04 \$8-00.	02	
Sample Description: ///		sorted sund gray byor	
and the second s	on top De gray - black	below yzcm	
	0		
	Attempt #2		
The state of the s	Latitude:	Grab Size: 0.1-m ²	
	Longitude:	Analyses : PCBs	
	Time:		
Sample Description:	Sample ID:		
Sample Description:			
A -L-liki			
Additional Comments:			

-

Station Log for Benthic Sediment Grab Samples				
Project Name: New Bedf	ford Harbor Environmental Monitoring	Location: New Bedford, MA		
Project #: G606422	·	Chief Scientist: Theresa Himmer		
Client: USACE NAE		Vessel: R/V Gale Force		
	Field Measurements			
Survey ID: 2007 OU-3	Station Depth (feet): 14.8			
Station ID: Ou #44	Time on Station: 4:30 11:47			
	Time Depart Station: 1(:55			
Recorded by:				
11172	Attempt #1			
	Northing: 2686006 43 2684011 73	Grab Size: 0.1-m ²		
	Easting: \$1904904 \$196431	Analyses : PCBs		
	Collection Time: 11:49 8180 42.04	P		
	Sample ID: 5-048 - 0484 - 20-03	\$		
Sample Description:	Cample 10.) 645 Cap 7 Ca 25			
	Attomat #2	<u> </u>		
Section and the section of the secti	Attempt #2	Grab Size: 0.1-m ²		
	Longitude:	Analyses : PCBs		
	Time:	Artaysos . 1 ODS		
	Sample ID:			
Sample Description:				
Additional Comments:		edges on death		
	finder.	0		
	Field Measurements			
Survey ID: 2007 OU-3	Station Depth (feet): 12:5/			
Station ID: 04 Ø3	Time on Station: 13:30			
Date: 9/19/64	Time Depart Station: 12:39			
Recorded by: TH				
	Attempt #1			
	Northing: 2655849.97	Grab Size: 0.1-m ²		
	Easting: 81-4883.42	Analyses : PCBs		
	Collection Time: / 2 - 32			
Sample Description:	Sample ID: 5-076 - 04 \$3 -00-63	L		
ouripio bookingtoni.				
	Attempt #2			
	Latitude:	Grab Size: 0.1-m²		
	Longitude:	Analyses : PCBs		
	Time:			
	Sample ID:			
Sample Description:				
Additional Comments:				



Additional Comments:

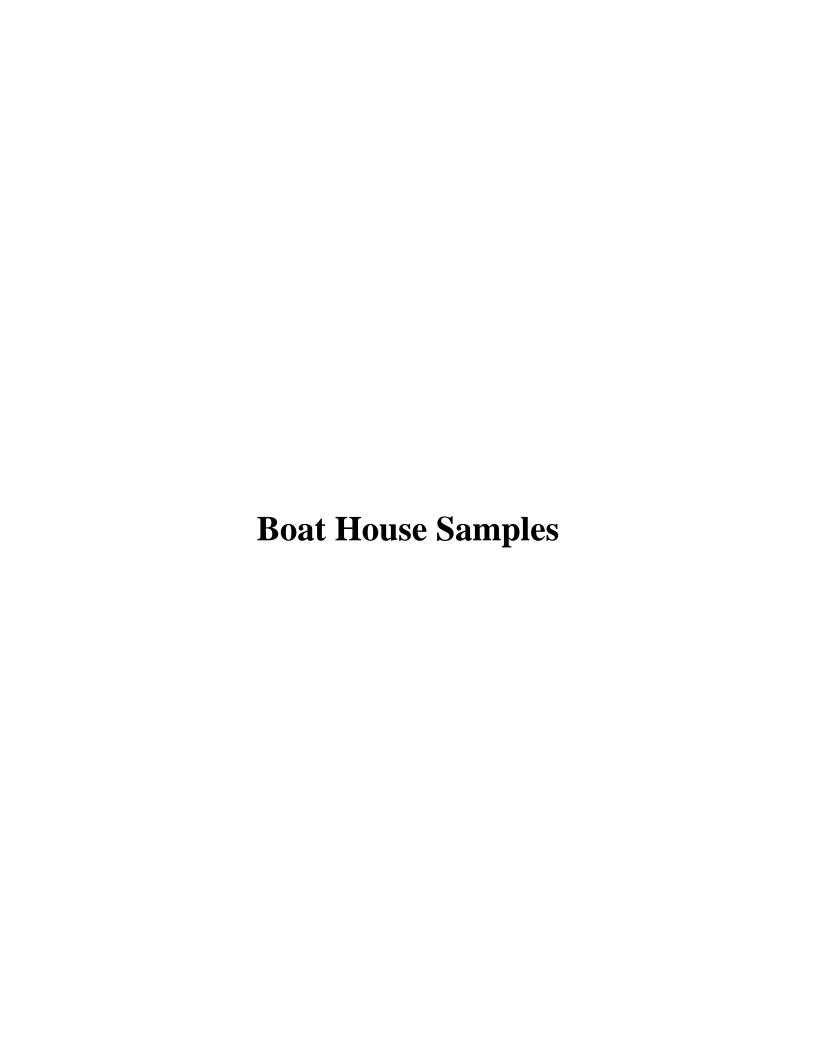


	Station Log for Benthic Sediment Grab	Samples
Project Name: New Bedford Harbor Environmental Monitoring		Location: New Bedford, MA
Project #: G606422	Ç	Chief Scientist: Theresa Himmer
Client: USACE NAE		Vessel: R/V Gale Force
	Field Measurements	
Survey ID: 2007 OU-3	Station Depth (feet): // /	
Station ID: OUIZ	Time on Station: 0900	
Date: 9/19/07	Time Depart Station: (192)	
Recorded by: 14W/5H		
	Attempt #1	
	Northing: 2686487.64	Grab Size: 0.1-m ²
	Easting: 817490.28	Analyses : PCBs
	Collection Time: 0905 6908 6914	/ individue / 1 GBS
Sample Description: \\$\frac{1}{2} \frac{1}{2}	Sample ID: \$-678-6012-60-03	
- LOUNC	mpt=NG Valley Location	
	mos > NG	1- 10 1 5+14
otive brown ev	er black w/ seaward 4 limpit shall	Is I fine sand, silt
	Attempt #2	
	Latitude:	Grab Size: 0.1-m ²
***************************************	Lengitude:	Analyses : PCBs
	Time:	
Carrolla Description:	Sample ID:	
Sample Description:		
Additional Comments:		
Additional Comments.		
	Field Measurements	
Survey ID: 2007 OU-3	Station Depth (feet): 10 0	
Station ID: ひんぱ	Time on Station: 6930	
Date: 9/19/07	Time Depart Station: 7939	
Recorded by:ベル /JH		
	Attempt #1	
	Northing: えんりんしょう. 69	Grab Size: 0.1-m ²
	Easting: 81+3人う・うタ	Analyses : PCBs
	Collection Time: 0932	
	Sample ID: S-678-0014-60-63	
Sample Description: Valley	location	
dense fine san	d clive brown over gray wisea	ini cert
4 5.	Attampt #2	
	Attempt #2	0-1-22
	Latitude:	Grab Size: 0.1-m² Analyses : PCBs
	Longitude: Time:	Arrayses : FODS
	Sample ID:	
Sample Description:		
Additional Comments:		
, taditional Committees.		

Station Log for Benthic Sediment Grab Samples				
Project Name: New Bedford Harbor Environmental Monitoring Project #: G606422 Client: USACE NAE		Location: New Bedford, MA Chief Scientist: Theresa Himmer Vessel: R/V Gale Force		
	Field Measurements			
Survey ID: 2007 OU-3	Station Depth (feet): 8 7			
Station ID: 04 15	Time on Station: 0950			
Date: 9 / 11/1/27	Time Depart Station: 1000			
Recorded by: Mw/JH	Time Depart Station. 777 DO			
recorded by. Few 73 7	Attompt #1			
	Attempt #1			
	Northing: 3686715.27	Grab Size: 0.1-m²		
	Easting: 617494.06	Analyses : PCBs		
	Collection Time: 0952			
Comple Description:	Sample ID: S-078-0015-00-03			
	location	A1 :		
olive brown or	ver durk gray / clay contant in	fine Sand		
	<i>V F</i>			
in the state of th	Attempt #2			
- White the state of the state	Latitude:	Grab Size; 0.1-m ²		
	Longitude:	Analyses : PCBs		
	Time:			
Sample Description:	Sample ID:			
Campic Description.				
Additional Comments:				
Additional Comments.				
	Field Measurements			
Survey ID: 2007 OU-3	Station Depth (feet): 10 - 8			
Station ID: OUG	Time on Station:			
Date: 9/19/07	Time Depart Station: 1019			
Recorded by: ムッ/チャ				
	Attempt #1			
	Northing: 7686837-43	Grab Size: 0.1-m ²		
	Easting: 817326.43	Analyses : PCBs		
	Collection Time: 10 1 4			
Sample Description: Valle	Sample ID: 5-07B-0016-00-03			
V MALLINE	y Location Ver black fine sand w/ silt / se	alveal		
DIVE OF ELVIN D	ver black the same with the	\$130° \-1.24		
£-	Attempt #2			
· · · · · · · · · · · · · · · · · · ·	Latitude:	Grab Size: 0.1-m ²		
	Longitude:	Analyses : PCBs		
	Time:			
	Sample ID:			
Sample Description:		And the state of t		
Additional Comments:				

	Station Log for Benthic Sediment G	Grab Samples
Project Name: New Bedford Harbor Environmental Monitoring Project #: G606422		Location: New Bedford, MA Chief Scientist: Theresa Himmer
Client: USACE NAE		Vessel: R/V Gale Force
	Field Measurements	
Survey ID: 2007 OU-3	Station Depth (feet): 7./	
Station ID: 6417	Time on Station: 1029	
Date: 9/19/07	Time Depart Station: 1045	
Recorded by: Mw /JH	Time Depart Glation.	
necolded by. Med / / /	Attomat #1	
	Attempt #1	2
	Northing: 2486804.30	Grab Size: 0.1-m ²
	Easting: 817189.50	Analyses : PCBs
	Collection Time: 1032	
	Sample ID: 3-075-0017-00-03	L. L. L. L. L. L. L. L. L. L. L. L. L. L
Sample Description: Rida	e Location	
medium sandu	otive gray some pebbles 4 shells	
	Attempt #2	
	Latitude:	Grab Size: 0.1-m ²
	Longitude:	Analyses : PCBs
	Time:	
	Sample ID:	
Sample Description:		
		38
Additional Comments:		
	\$2 T	
0 10 0007 011 0	Field Measurements	
Survey ID: 2007 OU-3	Station Depth (feet): Time on Station:	
Station ID: Date:	Time Depart Station:	
Recorded by:	Time Depart Station.	
necorded by.	A.:	
	Attempt #1	
	Northing:	Grab Size: 0.1-m²
	Easting:	Analyses : PCBs
	Collection Time: Sample ID:	
Sample Description:	Sample ID.	
oumpio Boompion.		
	Attompt #2	
	Attempt #2	Grab Size: 0.1-m ²
	Latitude: Longitude:	Analyses : PCBs
	Time:	Analyses . 1 ODS
	Sample ID:	
Sample Description:	Campio in.	
Additional Comments:		
Auditional Comments.		







Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor edford, MA SACE NAE		ental Monito	•		G606422 : S/V Gale Force	
Station ID:	MHA		Time On St	ation:		?	All measure	ements are ±0.1 feet	
Core Sample ID: 5-0	717-01BHZ-	011-34	- Northing (N		27011	72.1	A Water Depth		3 € 7.1
Logged by:	Mw)		Easting (NA	,	81509	3.66		ish core assembly (B):	12-0
Collection Mechanism:	Push-Core		GPS Accur	•	3.06	-	<u> </u>	ce to top of handle (C):	1,1
Date:	11/29/67	×	Predicted T	•				re (from bottom) (D):	3.4
-		····	Time of Col		11 24		-	evation (NVGD 29) (E):	***************************************
			Time Depar		1137			ce from surveyed elevation (F): NA
			•					, , , , , , , , , , , , , , , , , , , ,	
 (G) Elevation of Wate (H) Elevation of the body (Z*) Elevation of visual (I) Elevation of the second (I₂) Elevation of the second 	ottom of the core (I transition (NVGE	:	- (B - C) ance to visua easured fron	al transition	core (NVGD): H + D	ation		
(Note if $I \neq I_2$ within	± 1.0 feet, discard	l and resam	ple)						
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments	****
3.4					2 0		0,		
_		5	Black	Imal	fine			-S-07 D-0BH	
							10	5070-0BHZ	· /0 -20
1.0	and a second	.0000egg	pu aspilentu	year.		gerian , way	_ \ _ \ \ _ \ \	to gaster gasterinterio	
0.0		Clay	Bull	teen.	tw			S-070 - 013HZ	- 20-30
_			T CONTRACTOR AND AND AND AND AND AND AND AND AND AND						
			T Constitution of the Cons						
			12.00						
le ID of digital photograph	n(s):	I				,			
omments: Shew an	······································	d u	ne bur	rull	(1)	00	in 420,	n PCB+Archin 1 Sod interface 1 12/5/67 JMF	

BH 3 D-ØBH3-0 MW	000	Ti O- 04			011	ief Scientis	τ:	
7 .		Time On St	ation:	1154		All measu	rements are ±0.1 feet	
7 .	0-35	Northing (N	AD 83):	27009	71.5	Water Dep	th (A):	6.5
		Easting (NA	ND 83):	815038	9.1	Length of p	oush core assembly (B):	12.0
Push-Core		GPS Accura	acy:	7-73		— Water surfa	ace to top of handle (C):	2.0
11/29/0	7	Predicted T	ide (ft):				ore (from bottom) (D):	3.5
		Time of Col		1201		_	elevation (NVGD 29) (E):	
		Time Depar	t Station:	1206	1216	_	ace from surveyed elevation (F): #/4
		Calculation	s for Deter	rmination of	Z* Elevat	ion		
Surface (NVGD):	E-F							
om of the core (N	VGD): G-	(B - C)				***************************************	MANNAL	***************************************
ansition (NVGD):	H + (dista	nce to visua	al transition,)				
iment-water interf	ace as me	asured fron	n bottom of	core (NVGD): H + D			
				,	•			
				, ,		***************************************		
1.0 feet, discard a	ınd resamp	ole)						·
0								
oclude				Irticle				
y - in	I		ancy	Ed E		S□		
ologi CS c	φ.	ŏ	siste	ximu	5	nple		
			Š	Max	ğ	Sar	Commen	ts
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Service Aller Aller			Section (physical co.)		akabum - African		5-07D-08	3H3-00-1
		-: V	1002	Car			<i>'</i>	
	5:14	Bros		7,4			9 x7 = 00	112-1N-7
							J-070-08	25. 7. 130 7
alexan application and applications.		an weeken and the	National Solution (grania. Was-	(SSERENCE)	and the same of		
	. 5	Oliva	Cicia	2002			3-070-00	110000
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	ŀ	•						
2).		1				<u> </u>		
	<i>F</i>	0.0		9				
						معلم		
				w			C)	
	om of the core (N ransition (NVGD): iment-water interfiment-water interfinent-water	Surface (NVGD): E-F com of the core (NVGD): G- ransition (NVGD): H + (dista iment-water interface as me iment-water interface as me 1.0 feet, discard and resamp Silve S	Surface (NVGD): E - F com of the core (NVGD): G - (B - C) ransition (NVGD): H + (distance to visual iment-water interface as measured from 1.0 feet, discard and resample) Silver Si	Surface (NVGD): E-F com of the core (NVGD): G-(B-C) ransition (NVGD): H+ (distance to visual transition, iment-water interface as measured from bottom of iment-water interface as measured from water dep 1.0 feet, discard and resample) Policy	Surface (NVGD): E-F com of the core (NVGD): G-(B-C) ransition (NVGD): H+ (distance to visual transition) iment-water interface as measured from bottom of core (NVGD): iment-water interface as measured from water depth (NVGD): 1.0 feet, discard and resample) Distributed minute and poor sold properties of the water sediment interface as measured from water depth (NVGD): Other content of the core (NVGD): Other core (NVGD): G-(B-C) Other core	Surface (NVGD): E-F from of the core (NVGD): G-(B-C) ransition (NVGD): H+ (distance to visual transition) iment-water interface as measured from bottom of core (NVGD): H+D iment-water interface as measured from water depth (NVGD): G-A 1.0 feet, discard and resample) Silver (NVGD): H+D iment-water interface as measured from water depth (NVGD): G-A 1.0 feet, discard and resample) Silver (NVGD): H+D iment-water interface as measured from water depth (NVGD): G-A 1.0 feet, discard and resample) Silver (NVGD): H+D iment-water interface as measured from bottom of core (NVGD): H+D iment-water interface as measured from water depth (NVGD): G-A 1.0 feet, discard and resample) Silver (NVGD): H+D iment-water interface as measured from bottom of core (NVGD): H+D iment-water interface as measured from bottom of core (NVGD): H+D iment-water interface as measured from bottom of core (NVGD): H+D iment-water interface as measured from bottom of core (NVGD): H+D iment-water interface as measured from bottom of core (NVGD): H+D iment-water interface as measured from bottom of core (NVGD): H+D iment-water interface as measured from bottom of core (NVGD): H+D iment-water interface as measured from bottom of core (NVGD): H+D iment-water interface as measured from bottom of core (NVGD): H+D iment-water interface as measured from bottom of core (NVGD): H+D iment-water interface as measured from bottom of core (NVGD): H+D iment-water interface as measured from water depth (NVGD): H+D iment-water interface as measured from water depth (NVGD): H+D iment-water interface as measured from water depth (NVGD): H+D iment-water interface as measured from water depth (NVGD): H+D iment-water interface as measured from water depth (NVGD): H+D iment-water interface as measured from water depth (NVGD): H+D iment-water interface as measured from water depth (NVGD): H-D iment-water interface as measured from water depth (NVGD): H-D iment-water interface as measured from water depth (NVGD): H-D iment-water interface	ransition (NVGD): G - (B - C) ransition (NVGD): H + (distance to visual transition) iment-water interface as measured from bottom of core (NVGD): H + D iment-water interface as measured from water depth (NVGD): G - A 1.0 feet, discard and resample) Silt Blue 1002 from Rand 0002 from Rand 0002 from Rand 1002 from Rand 0002 from Rand 1002 from	Surface (NVGD): <i>E - F</i> com of the core (NVGD): <i>G - (B - C)</i> ransition (NVGD): <i>H + (distance to visual transition)</i> iment-water interface as measured from bottom of core (NVGD): <i>H + D</i> iment-water interface as measured from water depth (NVGD): <i>G - A</i> 1.0 feet, discard and resample) 30 30 30 30 30 30 30 30 30 3

The Business of Innovation	Location Client	: New E	Bedford, MA JSACE NAE	İ	ental Monito	-	:# Project Vessel ief Scientist	: S/V Gale Force	
Station ID:	BH 3	DWP	Time On S		1154			ements are ±0.1 feet	
Core Sample ID: 5-07	7D-05H3-	00-39-1	_ Northing (N		27669		Water Dept		6. <u>Z</u>
_ogged by:	NW		Easting (N		8150		-	ush core assembly (B):	12.0
Collection Mechanism:	Push-Core		GPS Accur	•	7.11			ce to top of handle (C):	1.8
Date:	11/29/	07	Predicted T	-			_	ore (from bottom) (D):	3.9
	111-11		Time of Co		1212		_		J-1
					12.16	****	_	evation (NVGD 29) (E):	- 4.74
			Time Depa					ce from surveyed elevation (F): <u>W/A</u>
G) Elevation of Water	Surface (NVGD)· F - F	Calculation	ns for Detei	rmination of	Z* Elevati	ion		
(H) Elevation of the bo	·	•	- (B - C)						
z*) Elevation of visual	transition (NVG	D): H + (dist	ance to visu	al transition)				
 Elevation of the se 	diment-water int	erface as m	easured fror	n bottom of	core (NVGD): H + D			
(1 ₂) Elevation of the se	diment-water int	erface as m	easured fror	n water dep	th (NVGD):	G - A			
(Note if I ≠ I ₂ within ±	⊦1 ∩ feet discar	d and resam	nnie)						
(140to 1117 12 Main) 2	The reet, disour	a and result	ipic)						
(Qg (+	apr				e,				
Elevation (NVGD)	Lithology - Include USCS code			6	Maximum particle size		S.		
/ation (N	ogy S			sten	unu Unu		- e □		
Elev.	lithol	Type	Color	Consistency	//axir	Odor	Sample IDs	Commen	te
3.1		51 1200	BIKBOW	100%	- Z S		0)		
3.8	Name and the second second	11200	/5.0			- Marie - Mari		S-07D-08	H3-00-10
				f f			(,	
		Silt	Black	10056	fine		\		10
							1 2 /	S-07D-08H	3-160-20
							05	00.00	- Mr
1.7		Spine Spinessing Spine	dipanah (************************************	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	dering Adaptives	سي . سير	1 -/		
			Aliot.	r	Cim			S-07D-08H	3-20-30-
		Clay	and	Firm	FVV				-
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EID = 10 CORE = 1	11-146) M <	. Dust	n + r) c				
		ni-/	Trul	レルト	/ _>				
CAPT - (01-17	U 5							I I

Somple 1 Ds to PCB+ Archice; so is the water sediment Subsompted on 12/5/07 (perviously fuzzon)

Battelle The Business of Innovation	Project Name: A Location: Client:	lew Bedford Harbo New Bedford, M USACE NA	1A	ental Monito		•	G606422 S/V Gale Force	
Station ID:	BHA	Time On		1219	- 31		ements are ±0.1 feet	
•••	077-08H7-0	$\frac{100 - 30}{100}$ Northing		21007	19.6	Water Depth		6.8
Logged by:	M W		NAD 83):	815091	2.6	_	ish core assembly (B):	(2.0
Collection Mechanism:	Push-Core	GPS Acc		2.31	<u> </u>		ce to top of handle (C):	2.0
Date:	11/29/03	3	Tide (ft):	- 20.71		_	re (from bottom) (D):	3.0
		,	Collection:	1229		-	evation (NVGD 29) (E):	<u> </u>
			part Station:	1333	1	-	ce from surveyed elevation (E) W/4
				rmination of	7* Floreti		on our our of the contract of	. 1. 2. 123
(H) Elevation of the b	r Surface (NVGD): ottom of the core (N' I transition (NVGD):	E-F VGD): G-(B-C)			L Elevau			
(I) Elevation of the set(I₂) Elevation of the set	ediment-water interfa ediment-water interfa ± 1.0 feet, discard a	ace as measured frace as measured fr	om bottom of	core (NVGD	•			
(I.e. Bottom = H)		Silt Black Silt Black Clay gray	A lase	Size Size	Oqor	Sample IDs	Commen -S-Ø7D-ØBH S-Ø7D-ØBH S-Ø7D-ØBH	47-00-10 47-10-22
ID of digital photograpi	() Somple	ados aus in Haol Sed sampled on	1 Ate	fore	chie			

Battelle Business of Innovation	Project Name: Location: Client:	New B	ord Harbor ledford, MA ISACE NAE		ental Monito	_	-	G606422 : S/V Gale Force :		
tation ID:	BH 10		Time On S	tation:	1246		All measur	ements are ±0.1 feet		1
ore Sample ID: 5ರ್	70 BBH10-	00-28	_ Northing (N	IAD 83):	2700	548-21	Water Dept	h (<i>A</i>):	436.1	1
ogged by:	MW		Easting (N	AD 83):	81500			ush core assembly (B):	10.0	1
ollection Mechanism:	Push-Core		GPS Accur		3,10		_	ce to top of handle (C):	١٠٥ اسم	1
ate:	11/29/07		- Predicted 1	ide (ft):			_	ore (from bottom) (D):	7.8	1
			Time of Co	llection:	1259		-	evation (NVGD 29) (E):		1
			Time Depa	rt Station:	1305		-	ce from surveyed elevation (F): N/L	1
G) Elevation of Water	· Surface (NVGD):		Calculation	ns for Deter	rmination of	Z* Elevati	on			
	, ,		(D, C)							l
	,	•	, ,							
z*) Elevation of visual	transition (NVGD)): H + (dista	ance to visu	al transition)					-
) Elevation of the se	diment-water inter	face as me	easured from	n bottom of	core (NVGD): <i>H</i> + <i>D</i>				
 Elevation of the se 	diment-water inter	face as me	easured fror	n water dep	th (NVGD):	3 - A				
(Note if I ≠ I ₂ within :	± 1.0 feet, discard	and resam	ple)							
Elevation (NVGD)	Lithology - Include USCS code			ıcy	Maximum particle size		SC			
vation (N	ology SS co	ω	5	Consistency	limum.	<u>.</u>	Sample IDs			ĺ
	HE DSC	Туре	Color	Co	Max	Odor	Sam	Comment	s	
2.8		Silt	Black	1002	fine			3-070	-BH10-00) -1
211				100000	1 (40,00	-Sidenani	Appendix 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	-		
_		c.H	Black	r				WELL	1	!
		201	6,04	FIRM	+144) 31/12 8	-07D-BH	10
1.0	and the second	CVay	7, 1	Man Marin	**Planta	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	_ 0.	J Clay		
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		Clay 1	0000	Mit	time		(S-IXIN D	111/4 74	~ 6
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D of digital about	(0)									
O of digital photograph ments: # ###################################		- SKIFT	e ode		O San	nplo 1	Ds A	PCB+ Archiv	e Somples	Þ
					00	is the	4-0/5	sed intuface		
								15/07 JMF		

Battelle	Project Name: Location: Client:	New E	ord Harbor Bedford, MA ISACE NAE	l	ental Monito	_	-	G606422 I: S/V Gale Force ::	
Station ID:	BHC		_ Time On St	tation:	1319		Ali measur	ements are ±0.1 feet	
Core Sample ID: 5	-070-03H6-0	00 - 3C	Northing (N	IAD 83):	2700	747.	Water Dept	h (A):	4.6
_ogged by:	MW		_ Easting (N/	AD 83):	81998	2.8	 Length of p	ush core assembly (B):	10.0
Collection Mechanism	: Push-Core		_ GPS Accur	acy:	2.98		Water surfa	ce to top of handle (C):	3.3
Date:	11/29/0	7	Predicted T	ide (ft):			Length of co	ore (from bottom) (D):	30
	•		Time of Co	llection:	1327		Surveyed el	levation (NVGD 29) (E):	
			Time Depa	rt Station:	1337	>	Water surfa	ce from surveyed elevation ((F): <u>N/L</u>
(G) Elevation of W	/ater Surface (NVGD)	: <i>E-F</i>	Calculation	ns for Dete	rmination o	[†] Z* Elevat	ion		
(H) Elevation of th	e bottom of the core (NVGD): G	- (B - C)					www.mana.com	
z*) Elevation of vi	sual transition (NVGD): H + (dist	ance to visu	al transition	1)		***********		
(I) Elevation of th	e sediment-water inte	rface as m	easured fror	n bottom of	core (NVGE): H + D			
I_2) Elevation of th	e sediment-water inte	rface as m	easured fror	n water dep	oth (NVGD):	G - A			
(Note if I ≠ I₂ wit	hin ± 1.0 feet, discard	and resam	nple)				+		
(
Elevation (NVGD)	Liftology - Include USCS code				ticle			,	
vation (NV	y - In			ancy	Maximum particle size		S _O		
vatic	ology SS o	Φ	 	Consistency	simur.	5	Sample IDs		
	# <u></u> SS	Туре	Color	Cor	Max	Odor	San	Commer	nts
3,0								S-OTD-OB	H6-00-12
•		41:5	Black	10086	five			S-07D-081	
_		7//		,	4100			17000	
	ļ							S-070-08H	16-10-20
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1.0	The second of the second secon	w	AND STREET, AND STREET,	Man.	team	,000a	+05		
		164	Black	med	five			0 - 40	11/ 30 38
		5000	gray	film	71000			S-070-08	H6-40-30
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L ID of digital photogi	raph(s):				L	***************************************			
ments: Hury She	en and cl	cunc	al od	w Wh	ule m	wing	COLL	barrel	
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	subsomple					- 7		- 1 - a/C 1/1/2	w TA CQ

Baffelle The Business of Innovation	Project Name: / Location: Client:	New Bedfo		nental Monito	•	•	G606422 : S/V Gale Force :
Station ID: Core Sample ID: \$\(\sigma_0^2 \) Logged by: Collection Mechanism: Date:	BH 1 +P-ABH 1-01 MW Push-Core 11/29/0) - 24 Nor Eas GP 7 Pre	thing (NAD 83): sting (NAD 83): sting (NAD 83): S Accuracy: dicted Tide (ft): the of Collection: the Depart Station:	1341 27611 8149 3-28	67.3 82.4 6	Water Depti Length of pu Water surface Length of co	ements are ±0.1 feet In (A): Sush core assembly (B): Core (from bottom) (D): Evation (NVGD 29) (E): Core from surveyed elevation (F):
 (H) Elevation of the bo (z*) Elevation of visual (I) Elevation of the se 	r Surface (NVGD): ottom of the core (N transition (NVGD) ediment-water interlediment-w	E - F VGD): G - (B H + (distance ace as measurace as measurace	to visual transition	<i>on)</i> of core (NVGD)): H + D	on	
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Maximum particle size	Odor	Sample IDs	Comments
1.9 -		Sand B	lack 100% ack 100% look 100%	t first			S-07D-08H1-00-10 S-07D-08H1-10-20 S-07D-08H1-20-25
File ID of digital photograph Comments: 15 Affryd 1 Silfy Sound 0	V/G -	sand.	7 104				

Page ____ of ___

O Subscripted 12/5/07 for FCB analysis+ Archivel
00 - in the water so Dimential losse in Sonal in.

@ OA Split taken here (00-10)

Battelle	Project Name: A Location: Client:	lew Bedford Harbor New Bedford, MA USACE NAB	l	ental Monito	_	Project #: Vessel: ef Scientist:	S/V Gale Force	
Station ID:	348	Time On S		0915		All measure	ements are ±0.1 feet	
Core Sample ID: 5- <u>0</u>	70-081-18-0	<u>ひっるの</u> Northing (N	IAD 83):	17005	45.18	_Water Depth	(A):	
_ogged by:	MW	Easting (N		3.492	4.12	_Length of pu	sh core assembly (B):	10/
Collection Mechanism: _	Push-Core	GPS Accui	acy:	7,3(Z	_Water surfac	ce to top of handle (C):	$-/\Delta$
Date:	11/34/07	Predicted 1	îde (ft):		· · · · · · · · · · · · · · · · · · ·	_Length of co	re (from bottom) (D):	8//7
		Time of Co	llection:	0720		_Surveyed ele	evation (NVGD 29) (E):	26 3.0
		Time Depa	rt Station:	0730		_Water surfac	ce from surveyed elevati	on (F):
		Calculation	ns for Dete	rmination of	Z* Elevation	on		
G) Elevation of Water	Surface (NVGD):	E - F						
(H) Elevation of the bo	ottom of the core (N	VGD): G - (B - C)						
,	,	H + (distance to visu	al transition	1)			***************************************	
•	, ,	,		•	5			
		ace as measured from ace as measured from		•				
			ii water det	om (144 GB). (4 - A			
(Note if I ≠ I ₂ within	± 1.0 leet, discard a	no resample)						
VGD)	Inde		•	ticle				
Elevation (NVGD)	Lithology - Include USCS code		incy	Maximum particle size		Ds		
vation (h	ology SS ac	• •	Consistency	dimuri	۲.	Sample IDs		
		Type	Co	May	Odor	San	Com	nents
28 -	3	STALL SOLIK	10036	the to			2-070-08	H8-00-10
60	Present Application of the Present o		`*************************************	1	. James T		The state of the s	
		Sand Jan	10086	tive o		\	9-22- 104	V
1.6+-	Toloni ggan, ngologya- yeres			W.	- Carrier		O_bio_bes	9-10-20
			Supplies.			0	•	The last
		May Old	FILM	tine			. 545	The
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6.0		Way		,			* P(0	L
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D of digital photograph	(0):			<u> </u>				
ID of digital photograph nments:			é				76 - 1- 17	CE PRIL
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BURGO	MUVE	int 3.5	and	East	5.8		so in the	H20/Sed inter
O TINT	5 8					anie.	subcon	ded 12/5/77
				N.	,		CONTRACTOR DE DE LA COLUMNIA	A Common 1 Ame 1 Ame 1
		7, 1418,1	419/	for s	ik /	24)		
Photo # 1		7, 1418,1	419 (for s	ak f	84)		Homo logue

Battelle The Business of Innovation	Project Name: Location: Client:	New Bedf	Harbor Environn ord, MA CE NAE	nental Monitorin	_	Project #: Vessel: of Scientist:	S/V Gale Force	
Station ID: Core Sample ID: Logged by: Collection Mechanism: Date:	BH4 -070-0BH4- MW Push-Core 11130/67	- <u>()() - 30</u> No Ea Gi	me On Station: orthing (NAD 83): asting (NAD 83): PS Accuracy: redicted Tide (ft):	0945 270633 814931 3,62	55.g 1.5	Water Depth Length of pu Water surface	ements are ±0.1 feet In (A):	N/A N/A N/A
			me of Collection: me Depart Station:	1003			evation (NVGD 29) (E): ce from surveyed elevati	on (F): N/4
		Cal	culations for Det	ermination of Z*	* Elevatio	on		
•	er Surface (NVGD): ottom of the core (N		3 - C)					
	l transition (NVGD)		,	n)				
I_2) Elevation of the s	ediment-water inter ediment-water inter ± 1.0 feet, discard	face as measu	ured from water de	, ,				
Elevation (NVGD)	Limology - Include USCS code	Туре	Color	Maximum particle size	Odor	Sample IDs	Com	monto
3.0	70	Sand B"	0 0 600/ 100%	fine to	0	<u> </u>	S-870-1	3H4 -90-10
2.6	Mayer Barrens	5.17	3 /	C. 0	gades s. sg	- (-	- 66/2	
		Sand F	200 100%	10			S-010 -06	HU-10-20
P. St. States		JWX _		Comze		0/	<i>'</i> ,	7 ₀ ,
1.0		Joy.	\.	Gree				Fly
0-0		5000	lack to	will will			S-010-08	H4-20-30
		Silt					,	
_		**************************************	ļ					
 D of digital photograp ments:	h(s):				f :			
Sample	then as	Son	Sungle	with A	tugu		- 3.0 - 2.0 - 1.0	
(1)	Sample 10'	s for Po	13 t Arch	ie; 00 x	in 14.	o/Sed	interface;	subsmoled

Battelle	Project Name: Location: Client:	New B	ora Harbor edford, MA ISACE NAE	⊑≀IVII O⊓Mei	inai WONILO		Project #: Vessel: ef Scientist:	S/V Gale Force
Station ID:	RHK		Time On Sta	ation:	1043			ments are ±0.1 feet
	070-0845-	00-29	Northing (N			155.3		7 0
ogged by:	NV		Easting (NA	,		12.6		sh core assembly (B):
Collection Mechanism:	Push-Core		GPS Accura	•	3,0	3		te to top of handle (C):
Date:	N/30/65	2	- Predicted T i	•			Length of co	re (from bottom) (D):
•			Time of Col	lection:	165	<u>ک</u>	_ _Surveyed ele	evation (NVGD 29) (<i>E</i>):
			Time Depar	t Station:	0.57	<i>š</i>	Water surfac	e from surveyed elevation (F):
			Calculation	s for Deter	mination of	Z* Elevati	ion	
G) Elevation of Wat	er Surface (NVGD)	: <i>E-F</i>					***************************************	
H) Elevation of the t	oottom of the core (NVGD): G	- (B - C)					
z*) Elevation of visu	al transition (NVGD)): H + (dista	ance to visua	al transition))			
() Elevation of the	sediment-water inte	rface as me	easured fron	n bottom of	core (NVGD): H + D		MINIMA AND AND AND AND AND AND AND AND AND AN
(2) Elevation of the	sediment-water inte	rface as me	easured fron	n water dept	th (NVGD):	G - A	· · · · · · · · · · · · · · · · · · ·	
(Note if I ≠ I₂ within	n ± 1.0 feet, discard	and resam	nple)				•	
<u> </u>			T		I		<u> </u>	
VGD)	clude]	rticle			
N) (N)	- In			ancy	m pa			
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
3.8		ANY H	Brownyblk	10056	Five			3-07D-08H5-00
35 -		1		Omen a geological a		Management and a second	. , ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	- Company
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							-	S-07-D-0BH5-18-
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THE ID								
- maga in								h depth

	elle	Project Name Location Client	New B	ord Harbor Bedford, MA JSACE NAE		ental Monito	-	•	G606422 : S/V Gale Force :	
Station ID:		BH 9		Time On St	ation:	11/15		All measure	ements are ±0.1 feet	
Core Samp	le ID: \$~0	7D-0849-00	5-33	 Northing (N	AD 83):	27609	554.8	Water Depth	ı (A):	35 4.0
Logged by:	-	MW		Easting (NA	AD 83):	91501	5.25	Length of pu	ish core assembly (B):	10.0
Collection N	lechanism:	Push-Core		GPS Accur	acy:	3.3	2	- Water surfa	ce to top of handle (C):	ス・チ
Date:		11/30/63	***************************************	 Predicted T	-			-	ore (from bottom) (D):	3.3
				Time of Col		112	X		evation (NVGD 29) (E):	
				Time Depar		113	4	-	ce from surveyed elevation (F)	NH
				•		mination of	f Z* Elevatio	-		
(H) Eleva (z*) Eleva (I) Eleva (I ₂) Eleva	ation of the ation of visuation of the ation of the	er Surface (NVGD pottom of the core al transition (NVGI sediment-water into sediment-water into n ± 1.0 feet, discare	(NVGD): G O): H + (distance as materiace as	ance to visual easured fron easured fron	n bottom of	core (NVGE				
Flavation (NVGD)		Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments	
3,	3		. 1			<i>r</i>			Sheen	9
			Silt	Back	10036	time			7 mosale	<i>A</i> .
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	1.9 + -				w.			Appears again	-, 2-00r	349-0012
1	, » «			201	C-24A				C 2-0+0-0	3/1 (00/)
			CVY	13507	1-1111	fivu			2020-0	BH9-10
								9	1) 3 -0 -0	· · ·
0	,5 + ~	, and the second	,	1		Japanier 'son :	, , , , , , , , , , , , ,	ngga garanta .	S-07D-0	BH9-20-
	.0		Clay	01/2	LIM	FINE			0-0700	Table 1
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14'8		wd 8.6								
				- 1-1					mens interface	

PCB + Archival Somples taken



Appendix B PCB Analytical Data



Station ID	N14-F07		l1			I4-F07		
Collection Date		11/5/07			11/6/07			11/6/07
Fraction	TOTAL		TOTAL			TOTAL		
QC Code	SA		SA			SA		
Samp ID	S-07D-0N14-00-05		S-07D-00	11-00-05		S-07D-00	014-00-07	
Analyte	Result Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
2,4'-Dicb (PCB 8)	1.933 MG/KG_DRYWT	D	5.18	MG/KG_DRYWT	D	3.361	MG/KG_DRYWT	D
2,2',5-Tricb (PCB 18)	4.383 MG/KG_DRYWT	D		MG/KG_DRYWT	D	7.812	MG/KG_DRYWT	D
2,4,4'-Tricb (PCB 28)	4.519 MG/KG_DRYWT	D	11.82	MG/KG_DRYWT	D	8.709	MG/KG_DRYWT	D
2,2',3,5'-Tetracb (PCB 44)	2.752 MG/KG_DRYWT	D	8.044	MG/KG_DRYWT	D	5.621	MG/KG_DRYWT	D
2,2',5,5'-Tetracb (PCB 52)	11.26 MG/KG_DRYWT	D	27.5	MG/KG_DRYWT	D	17.9	MG/KG_DRYWT	D
2,3',4,4'-Tetracb (PCB 66)	0.214 MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU
2,2',4,5,5'-Pentacb (PCB 101)	1.694 MG/KG_DRYWT	D	6.665	MG/KG_DRYWT	D	4.481	MG/KG_DRYWT	D
2,3,3',4,4'-Pentacb (PCB 105)	0.214 MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU
2,3',4,4',5-Pentacb (PCB 118)	0.216 MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	3.01	MG/KG_DRYWT	D
2,2',3,3',4,4'-Hexacb (PCB 128)	0.214 MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU
2,2',3,4,4',5'-Hexacb (PCB 138)	0.216 MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	1.863	MG/KG_DRYWT	D
2,2',4,4',5,5'-Hexacb (PCB 153)	1.852 MG/KG_DRYWT	D	0.222	MG/KG_DRYWT	DU	4.223	MG/KG_DRYWT	D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.214 MG/KG_DRYWT	DU		MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.214 MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.214 MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.214 MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.214 MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.214 MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU	0.222	MG/KG_DRYWT	DU
Total MonoCB								
Total DiCB								
Total TriCB								
Total TetraCB								
Total PentaCB								
Total HexaCB								
Total HeptaCB								
Total OctaCB								
Total NonaCB								
DecaCB								
Total PCB Congeners (sum CONG x 2.6)	74 MG/KG_DRYWT		180	MG/KG_DRYWT		150	MG/KG_DRYWT	
Total PCB Homologues (sum HOM)								

Station ID	K2			N4-F07			01			
Collection Date			11/6/07		11/6/07			7 11/		
Fraction	TOTAL			TOTAL			TOTAL			
QC Code	SA			SA			SA			
Samp ID	S-07D-00)K2-00-08		S-07D-00N4-00-06			S-07D-00	O1-00-06		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	2.008	MG/KG_DRYWT	D	1.568	MG/KG_DRYWT	D	30.56	MG/KG_DRYWT	D	
2,2',5-Tricb (PCB 18)	5.322	MG/KG_DRYWT	D	4.258	MG/KG_DRYWT	D	52.69	MG/KG_DRYWT	D	
2,4,4'-Tricb (PCB 28)	5.686	MG/KG_DRYWT	D	4.32	MG/KG_DRYWT	D	36.86	MG/KG_DRYWT	D	
2,2',3,5'-Tetracb (PCB 44)	3.716	MG/KG_DRYWT	D	2.612	MG/KG_DRYWT	D	18.68	MG/KG_DRYWT	D	
2,2',5,5'-Tetracb (PCB 52)	12.83	MG/KG_DRYWT	D	10.98	MG/KG_DRYWT	D	90.95	MG/KG_DRYWT	D	
2,3',4,4'-Tetracb (PCB 66)	0.217	MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	1.125	MG/KG_DRYWT	DU	
2,2',4,5,5'-Pentacb (PCB 101)	3.371	MG/KG_DRYWT	D	1.83	MG/KG_DRYWT	D	8.337	MG/KG_DRYWT	Dp	
2,3,3',4,4'-Pentacb (PCB 105)	0.217	MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	1.125	MG/KG_DRYWT	DU	
2,3',4,4',5-Pentacb (PCB 118)	2.425	MG/KG_DRYWT	D	1.307	MG/KG_DRYWT	D	3.169	MG/KG_DRYWT	Dp	
2,2',3,3',4,4'-Hexacb (PCB 128)	0.217	MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	1.125	MG/KG_DRYWT	DU	
2,2',3,4,4',5'-Hexacb (PCB 138)	1.581	MG/KG_DRYWT	D	0.226	MG/KG_DRYWT	DU	5.076	MG/KG_DRYWT	D	
2,2',4,4',5,5'-Hexacb (PCB 153)		MG/KG_DRYWT	D	2.043	MG/KG_DRYWT	D	8.469	MG/KG_DRYWT	D	
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.217	MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	1.125	MG/KG_DRYWT	DU	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.217	MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	1.125	MG/KG_DRYWT	DU	
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.217	MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	1.125	MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,6-Octacb (PCB 195)		MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	1.125	MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.217	MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	1.125	MG/KG_DRYWT	DU	
Decacb - Congener (PCB 209)	0.217	MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	1.125	MG/KG_DRYWT	DU	
Total MonoCB										
Total DiCB										
Total TriCB										
Total TetraCB										
Total PentaCB										
Total HexaCB										
Total HeptaCB										
Total OctaCB										
Total NonaCB										
DecaCB										
Total PCB Congeners (sum CONG x 2.6)	100	MG/KG_DRYWT		75	MG/KG_DRYWT		660	MG/KG_DRYWT		
Total PCB Homologues (sum HOM)										

Station ID	Q9			J14			K5		
Collection Date			11/6/07			11/6/07	,		11/8/07
Fraction	TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA		
Samp ID	S-07D-00	Q9-00-05		S-07D-0J14-00-06			S-07D-00K5-00-06		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
2,4'-Dicb (PCB 8)	2.055	MG/KG_DRYWT	D	22.38	MG/KG_DRYWT	D	5.151	MG/KG_DRYWT	D
2,2',5-Tricb (PCB 18)	5.291	MG/KG_DRYWT	D		MG/KG_DRYWT	D	13.38	MG/KG_DRYWT	D
2,4,4'-Tricb (PCB 28)		MG/KG_DRYWT	D	39.64	MG/KG_DRYWT	D	16.12	MG/KG_DRYWT	D
2,2',3,5'-Tetracb (PCB 44)	3.481	MG/KG_DRYWT	D	13.73	MG/KG_DRYWT	D	11.15	MG/KG_DRYWT	D
2,2',5,5'-Tetracb (PCB 52)	12.73	MG/KG_DRYWT	D	46.98	MG/KG_DRYWT	D	32.39	MG/KG_DRYWT	D
2,3',4,4'-Tetracb (PCB 66)	0.213	MG/KG_DRYWT	DU	0.238	MG/KG_DRYWT	DJ	0.423	MG/KG_DRYWT	DJ
2,2',4,5,5'-Pentacb (PCB 101)	2.701	MG/KG_DRYWT	D	4.578	MG/KG_DRYWT	D	5.993	MG/KG_DRYWT	D
2,3,3',4,4'-Pentacb (PCB 105)	0.213	MG/KG_DRYWT	DU	0.524	MG/KG_DRYWT	DU	0.518	MG/KG_DRYWT	DU
2,3',4,4',5-Pentacb (PCB 118)	1.817	MG/KG_DRYWT	D	2.778	MG/KG_DRYWT	Dp	3.974	MG/KG_DRYWT	D
2,2',3,3',4,4'-Hexacb (PCB 128)	0.213	MG/KG_DRYWT	DU	0.524	MG/KG_DRYWT	DU	0.518	MG/KG_DRYWT	DU
2,2',3,4,4',5'-Hexacb (PCB 138)	1.332	MG/KG_DRYWT	D	1.981	MG/KG_DRYWT	D	2.609	MG/KG_DRYWT	D
2,2',4,4',5,5'-Hexacb (PCB 153)	2.941	MG/KG_DRYWT	D	5.384	MG/KG_DRYWT	D	6.114	MG/KG_DRYWT	D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.213	MG/KG_DRYWT	DU	0.524	MG/KG_DRYWT	DU	0.518	MG/KG_DRYWT	DU
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.213	MG/KG_DRYWT	DU	0.524	MG/KG_DRYWT	DU	0.518	MG/KG_DRYWT	DU
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.213	MG/KG_DRYWT	DU	0.524	MG/KG_DRYWT	DU	0.518	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.213	MG/KG_DRYWT	DU	0.524	MG/KG_DRYWT	DU	0.518	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.213	MG/KG_DRYWT	DU	0.524	MG/KG_DRYWT	DU	0.518	MG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.213	MG/KG_DRYWT	DU	0.524	MG/KG_DRYWT	DU	0.518	MG/KG_DRYWT	DU
Total MonoCB		MG/KG_DRYWT							
Total DiCB	6.75	MG/KG_DRYWT							
Total TriCB	34.91	MG/KG_DRYWT							
Total TetraCB	35.63	MG/KG_DRYWT							
Total PentaCB	21.39	MG/KG_DRYWT							
Total HexaCB	9.995	MG/KG_DRYWT							
Total HeptaCB	1.739	MG/KG_DRYWT							
Total OctaCB	0.369	MG/KG_DRYWT							
Total NonaCB	0.1	MG/KG_DRYWT							
DecaCB	0.04	MG/KG_DRYWT	D						
Total PCB Congeners (sum CONG x 2.6)		MG/KG_DRYWT		470	MG/KG_DRYWT		250	MG/KG_DRYWT	
Total PCB Homologues (sum HOM)	110	MG/KG_DRYWT							

Station ID	J10			J10			K21			
Collection Date			11/8/07	1		11/8/07	11/8/07			
Fraction	TOTAL			TOTAL			TOTAL			
QC Code	REP			SA	SA			SA		
Samp ID	S-07D-0	J10-00-07-REP		S-07D-0J10-00-07			S-07D-0K21-00-12			
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	5.052	MG/KG_DRYWT	D	5.163	MG/KG_DRYWT	D	17.09	MG/KG_DRYWT	D	
2,2',5-Tricb (PCB 18)	11.2	MG/KG_DRYWT	D	10.91	MG/KG_DRYWT	D	25.44	MG/KG_DRYWT	D	
2,4,4'-Tricb (PCB 28)	10.21	MG/KG_DRYWT	D	10.15	MG/KG_DRYWT	D	22.07	MG/KG_DRYWT	D	
2,2',3,5'-Tetracb (PCB 44)	5.508	MG/KG_DRYWT	D	5.325	MG/KG_DRYWT	D	9.909	MG/KG_DRYWT	D	
2,2',5,5'-Tetracb (PCB 52)	20.95	MG/KG_DRYWT	D	19.84	MG/KG_DRYWT	D	26.31	MG/KG_DRYWT	D	
2,3',4,4'-Tetracb (PCB 66)	0.224	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU	2.538	MG/KG_DRYWT	D	
2,2',4,5,5'-Pentacb (PCB 101)	2.792	MG/KG_DRYWT	D	2.712	MG/KG_DRYWT	D	4.989	MG/KG_DRYWT	D	
2,3,3',4,4'-Pentacb (PCB 105)	0.224	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU	0.216	MG/KG_DRYWT	DU	
2,3',4,4',5-Pentacb (PCB 118)	1.865	MG/KG_DRYWT	D	1.722	MG/KG_DRYWT	D	2.949	MG/KG_DRYWT	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	0.224	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU	0.216	MG/KG_DRYWT	DU	
2,2',3,4,4',5'-Hexacb (PCB 138)	1.253	MG/KG_DRYWT	D	1.124	MG/KG_DRYWT	D	2.132	MG/KG_DRYWT	D	
2,2',4,4',5,5'-Hexacb (PCB 153)	3.373	MG/KG_DRYWT	D	3.16	MG/KG_DRYWT	D	4.295	MG/KG_DRYWT	D	
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.224	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU	0.216	MG/KG_DRYWT	DU	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.224	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU	0.216	MG/KG_DRYWT	DU	
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.224	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU	0.216	MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.224	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU	0.216	MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.224	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU	0.216	MG/KG_DRYWT	DU	
Decacb - Congener (PCB 209)	0.224	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU	0.216	MG/KG_DRYWT	DU	
Total MonoCB										
Total DiCB										
Total TriCB										
Total TetraCB										
Total PentaCB										
Total HexaCB										
Total HeptaCB										
Total OctaCB										
Total NonaCB										
DecaCB										
Total PCB Congeners (sum CONG x 2.6)	160	MG/KG_DRYWT		160	MG/KG_DRYWT		310	MG/KG_DRYWT		
Total PCB Homologues (sum HOM)										

Station ID	M17		WW24		WW41	WW41		
Collection Date		11/8/07		11/1	4/07		11/14/07	
Fraction	TOTAL		TOTAL		TOTAL	TOTAL		
QC Code	SA		SA		SA	SA		
Samp ID	S-07D-0M17-00-06		S-07D-WW24-00-0	8	S-07D-V	VW41-00-06		
Analyte	Result Unit	FinQ	Result	Unit Fin	Q Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	9.768 MG/KG_DRYWT	D	7.544 MG/KG_I	DRYWT D	2.32	4 MG/KG_DRYWT	D	
2,2',5-Tricb (PCB 18)	21.4 MG/KG_DRYWT	D	14.2 MG/KG_I	DRYWT D	4.90	2 MG/KG_DRYWT	D	
2,4,4'-Tricb (PCB 28)	19.61 MG/KG_DRYWT	D	16.49 MG/KG_I		6.07	3 MG/KG_DRYWT	D	
2,2',3,5'-Tetracb (PCB 44)	9.723 MG/KG_DRYWT	D	8.161 MG/KG_I	DRYWT D	2.9	5 MG/KG_DRYWT	D	
2,2',5,5'-Tetracb (PCB 52)	38.16 MG/KG_DRYWT	D	18.67 MG/KG_I	DRYWT D	8.62	3 MG/KG_DRYWT	D	
2,3',4,4'-Tetracb (PCB 66)	0.563 MG/KG_DRYWT	DU	3.528 MG/KG_I	DRYWT D	0.10	4 MG/KG_DRYWT	DU	
2,2',4,5,5'-Pentacb (PCB 101)	4.808 MG/KG_DRYWT	D	8.23 MG/KG_I	DRYWT D	2.02	8 MG/KG_DRYWT	D	
2,3,3',4,4'-Pentacb (PCB 105)	0.563 MG/KG_DRYWT	DU	0.228 MG/KG_I	DRYWT DU	0.10	4 MG/KG_DRYWT	DU	
2,3',4,4',5-Pentacb (PCB 118)	3.015 MG/KG_DRYWT	D	5.64 MG/KG_I	DRYWT D	1.56	2 MG/KG_DRYWT	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	0.563 MG/KG_DRYWT	DU	0.228 MG/KG_I	DRYWT DU	0.10	4 MG/KG_DRYWT	DU	
2,2',3,4,4',5'-Hexacb (PCB 138)	1.865 MG/KG_DRYWT	D	2.536 MG/KG_I	DRYWT D	0.10	5 MG/KG_DRYWT	DU	
2,2',4,4',5,5'-Hexacb (PCB 153)	5.719 MG/KG_DRYWT	D	6.049 MG/KG_I		2.09	9 MG/KG_DRYWT	D	
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.563 MG/KG_DRYWT	DU	0.228 MG/KG_I	DRYWT DU	0.10	4 MG/KG_DRYWT	DU	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.563 MG/KG_DRYWT	DU	0.228 MG/KG_I	DRYWT DU	0.10	4 MG/KG_DRYWT	DU	
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.563 MG/KG_DRYWT	DU	0.228 MG/KG_I	DRYWT DU	0.10	4 MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.563 MG/KG_DRYWT	DU	0.228 MG/KG_I	DRYWT DU	0.10	4 MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.563 MG/KG_DRYWT	DU	0.228 MG/KG_I	DRYWT DU	0.10	4 MG/KG_DRYWT	DU	
Decacb - Congener (PCB 209)	0.563 MG/KG_DRYWT	DU	0.228 MG/KG_I	DRYWT DU	0.10	4 MG/KG_DRYWT	DU	
Total MonoCB	0.211 MG/KG_DRYWT							
Total DiCB	33.06 MG/KG_DRYWT							
Total TriCB	115.1 MG/KG_DRYWT							
Total TetraCB	102.9 MG/KG_DRYWT							
Total PentaCB	47.42 MG/KG_DRYWT							
Total HexaCB	20.89 MG/KG_DRYWT							
Total HeptaCB	3.382 MG/KG_DRYWT							
Total OctaCB	0.647 MG/KG_DRYWT							
Total NonaCB	0.198 MG/KG_DRYWT							
DecaCB	0.048 MG/KG_DRYWT	D						
Total PCB Congeners (sum CONG x 2.6)	300 MG/KG_DRYWT		240 MG/KG_I	DRYWT	8	0 MG/KG_DRYWT		
Total PCB Homologues (sum HOM)	320 MG/KG_DRYWT						1	

Station ID	YY32			BBB23			OO26		
Collection Date			11/14/07			11/16/07	7		11/16/07
Fraction	TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA		
Samp ID	S-07D-Y	/32-00-02		S-07D-BBB23-00-09			S-07D-O		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
2,4'-Dicb (PCB 8)	0.514	MG/KG_DRYWT	D	0.09	MG/KG_DRYWT	D	9.751	MG/KG_DRYWT	D
2,2',5-Tricb (PCB 18)	1.066	MG/KG_DRYWT	D	0.27	MG/KG_DRYWT	D	17.82	MG/KG_DRYWT	D
2,4,4'-Tricb (PCB 28)	1.536	MG/KG_DRYWT	D	0.383	MG/KG_DRYWT	D	22.22	MG/KG_DRYWT	D
2,2',3,5'-Tetracb (PCB 44)	0.707	MG/KG_DRYWT	D	0.141	MG/KG_DRYWT	D	12.41	MG/KG_DRYWT	D
2,2',5,5'-Tetracb (PCB 52)	2.272	MG/KG_DRYWT	D	0.602	MG/KG_DRYWT	D	24.09	MG/KG_DRYWT	D
2,3',4,4'-Tetracb (PCB 66)	0.328	MG/KG_DRYWT	D	0.038	MG/KG_DRYWT	D	4.04	MG/KG_DRYWT	D
2,2',4,5,5'-Pentacb (PCB 101)	0.673	MG/KG_DRYWT	D	0.161	MG/KG_DRYWT	D	10.67	MG/KG_DRYWT	D
2,3,3',4,4'-Pentacb (PCB 105)	0.036	MG/KG_DRYWT	D	0.011	MG/KG_DRYWT	DU	0.226	MG/KG_DRYWT	DU
2,3',4,4',5-Pentacb (PCB 118)	0.558	MG/KG_DRYWT	D	0.128	MG/KG_DRYWT	D	6.557	MG/KG_DRYWT	D
2,2',3,3',4,4'-Hexacb (PCB 128)	0.028	MG/KG_DRYWT	D	0.011	MG/KG_DRYWT	DU	0.226	MG/KG_DRYWT	DU
2,2',3,4,4',5'-Hexacb (PCB 138)	0.34	MG/KG_DRYWT	D	0.075	MG/KG_DRYWT	D	3.488	MG/KG_DRYWT	D
2,2',4,4',5,5'-Hexacb (PCB 153)	0.659	MG/KG_DRYWT	D	0.178	MG/KG_DRYWT	D	7.978	MG/KG_DRYWT	D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.044	MG/KG_DRYWT	Dp	0.011	MG/KG_DRYWT	DU	0.226	MG/KG_DRYWT	DU
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.063	MG/KG_DRYWT	D	8.40E-04	MG/KG_DRYWT	DpJ	0.226	MG/KG_DRYWT	DU
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.067	MG/KG_DRYWT	D	0.011	MG/KG_DRYWT	DU	0.226	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.226	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.226	MG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.226	MG/KG_DRYWT	DU
Total MonoCB									
Total DiCB									
Total TriCB									
Total TetraCB									
Total PentaCB									
Total HexaCB									
Total HeptaCB									
Total OctaCB									
Total NonaCB									
DecaCB									
Total PCB Congeners (sum CONG x 2.6)	23	MG/KG_DRYWT		5.4	MG/KG_DRYWT		310	MG/KG_DRYWT	
Total PCB Homologues (sum HOM)									

Station ID	OO32			OO38			SS29		
Collection Date			11/16/07			11/16/07			11/16/07
Fraction	TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA		
Samp ID	S-07D-O	O32-00-08		S-07D-O	O38-00-05		S-07D-SS29-00-07		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
2,4'-Dicb (PCB 8)	8.637	MG/KG_DRYWT	D	4.767	MG/KG_DRYWT	D	10.36	MG/KG_DRYWT	D
2,2',5-Tricb (PCB 18)	15.75	MG/KG_DRYWT	D	9.546	MG/KG_DRYWT	D	20.05	MG/KG_DRYWT	D
2,4,4'-Tricb (PCB 28)	19.89	MG/KG_DRYWT	D	11.83	MG/KG_DRYWT	D	25.03	MG/KG_DRYWT	D
2,2',3,5'-Tetracb (PCB 44)	11.32	MG/KG_DRYWT	D	6.33	MG/KG_DRYWT	D	12.83	MG/KG_DRYWT	D
2,2',5,5'-Tetracb (PCB 52)	23.61	MG/KG_DRYWT	D	13.98	MG/KG_DRYWT	D	27.18	MG/KG_DRYWT	D
2,3',4,4'-Tetracb (PCB 66)	3.762	MG/KG_DRYWT	D	2.033	MG/KG_DRYWT	D	3.746	MG/KG_DRYWT	D
2,2',4,5,5'-Pentacb (PCB 101)	8.522	MG/KG_DRYWT	D	5.421	MG/KG_DRYWT	D	10.8	MG/KG_DRYWT	D
2,3,3',4,4'-Pentacb (PCB 105)	0.107	MG/KG_DRYWT	DU	0.22	MG/KG_DRYWT	DU	0.537	MG/KG_DRYWT	DU
2,3',4,4',5-Pentacb (PCB 118)	5.461	MG/KG_DRYWT	D	3.567	MG/KG_DRYWT	D	6.805	MG/KG_DRYWT	D
2,2',3,3',4,4'-Hexacb (PCB 128)	0.107	MG/KG_DRYWT	DU	0.22	MG/KG_DRYWT	DU	0.537	MG/KG_DRYWT	DU
2,2',3,4,4',5'-Hexacb (PCB 138)	3.212	MG/KG_DRYWT	D	1.572	MG/KG_DRYWT	D	2.698	MG/KG_DRYWT	D
2,2',4,4',5,5'-Hexacb (PCB 153)	6.768	MG/KG_DRYWT	D	4.086	MG/KG_DRYWT	D	7.51	MG/KG_DRYWT	D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.107	MG/KG_DRYWT	DU	0.22	MG/KG_DRYWT	DU	0.537	MG/KG_DRYWT	DU
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.107	MG/KG_DRYWT	DU	0.22	MG/KG_DRYWT	DU	0.537	MG/KG_DRYWT	DU
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.107	MG/KG_DRYWT	DU	0.22	MG/KG_DRYWT	DU	0.537	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.107	MG/KG_DRYWT	DU	0.22	MG/KG_DRYWT	DU	0.537	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.107	MG/KG_DRYWT	DU		MG/KG_DRYWT	DU		MG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.107	MG/KG_DRYWT	DU	0.22	MG/KG_DRYWT	DU	0.537	MG/KG_DRYWT	DU
Total MonoCB									
Total DiCB									
Total TriCB									
Total TetraCB									
Total PentaCB									
Total HexaCB									
Total HeptaCB									
Total OctaCB									
Total NonaCB									
DecaCB									
Total PCB Congeners (sum CONG x 2.6)	280	MG/KG_DRYWT		160	MG/KG_DRYWT		330	MG/KG_DRYWT	
Total PCB Homologues (sum HOM)									

Station ID	VV34			DD22			GG29		
Collection Date			11/16/07			11/20/07	7		11/20/07
Fraction	TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA		
Samp ID	S-07D-V	V34-00-10		S-07D-DD22-00-11			S-07D-GG	29-00-06	
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
2,4'-Dicb (PCB 8)	8.823	MG/KG_DRYWT	D	16.1	MG/KG_DRYWT	D	57.24 N	//////////////////////////////////////	D
2,2',5-Tricb (PCB 18)	19.2	MG/KG_DRYWT	D	28.76	MG/KG_DRYWT	D	88.21 N	//////////////////////////////////////	D
2,4,4'-Tricb (PCB 28)	27.65	MG/KG_DRYWT	D	37.96	MG/KG_DRYWT	D	111.9 N	//IG/KG_DRYWT	D
2,2',3,5'-Tetracb (PCB 44)	14.62	MG/KG_DRYWT	D	23.09	MG/KG_DRYWT	D	53.84 N	//IG/KG_DRYWT	D
2,2',5,5'-Tetracb (PCB 52)	29.4	MG/KG_DRYWT	D	35.32	MG/KG_DRYWT	D	93.05 N	//IG/KG_DRYWT	D
2,3',4,4'-Tetracb (PCB 66)	6.297	MG/KG_DRYWT	D	8.043	MG/KG_DRYWT	D	19.35 N	//IG/KG_DRYWT	D
2,2',4,5,5'-Pentacb (PCB 101)	14.05	MG/KG_DRYWT	D	24.83	MG/KG_DRYWT	D	49.14 N	//IG/KG_DRYWT	D
2,3,3',4,4'-Pentacb (PCB 105)	0.566	MG/KG_DRYWT	DU	0.558	MG/KG_DRYWT	DU	1.104 N	/IG/KG_DRYWT	DU
2,3',4,4',5-Pentacb (PCB 118)	9.455	MG/KG_DRYWT	D	13.79	MG/KG_DRYWT	D	25.53 N	/IG/KG_DRYWT	D
2,2',3,3',4,4'-Hexacb (PCB 128)	0.566	MG/KG_DRYWT	DU	0.558	MG/KG_DRYWT	DU	1.104 N	//////////////////////////////////////	DU
2,2',3,4,4',5'-Hexacb (PCB 138)	4.017	MG/KG_DRYWT	D	5.927	MG/KG_DRYWT	D	12.46 N	//IG/KG_DRYWT	D
2,2',4,4',5,5'-Hexacb (PCB 153)	9.947	MG/KG_DRYWT	D	14.72	MG/KG_DRYWT	D	30.54 N	//////////////////////////////////////	D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.566	MG/KG_DRYWT	DU	0.558	MG/KG_DRYWT	DU	0.449 N	/IG/KG_DRYWT	DpJ
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.566	MG/KG_DRYWT	DU	0.389	MG/KG_DRYWT	DpJ	1.098 N	/IG/KG_DRYWT	DpJ
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.566	MG/KG_DRYWT	DU	0.558	MG/KG_DRYWT	DU	0.99 N	/IG/KG_DRYWT	DpJ
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.566	MG/KG_DRYWT	DU	0.558	MG/KG_DRYWT	DU	1.104 N	/IG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.566	MG/KG_DRYWT	DU	0.558	MG/KG_DRYWT	DU	1.104 N	/IG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.566	MG/KG_DRYWT	DU	0.558	MG/KG_DRYWT	DU	1.104 N	/IG/KG_DRYWT	DU
Total MonoCB									
Total DiCB									
Total TriCB									
Total TetraCB									
Total PentaCB									
Total HexaCB									
Total HeptaCB									
Total OctaCB									
Total NonaCB									
DecaCB									
Total PCB Congeners (sum CONG x 2.6)	370	MG/KG_DRYWT		540	MG/KG_DRYWT		1400 N	/IG/KG_DRYWT	
Total PCB Homologues (sum HOM)							i i		

Station ID	GG33-F07	,		HH22			1125		
Collection Date			11/20/07			11/20/07	,		11/20/07
Fraction	TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA		
Samp ID	S-07D-GG	33-00-06		S-07D-H	122-00-10		S-07D-II	25-00-04	
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
2,4'-Dicb (PCB 8)	9.55 N	MG/KG_DRYWT	D	14.92	MG/KG_DRYWT	D	7.909	MG/KG_DRYWT	D
2,2',5-Tricb (PCB 18)	16.74 N	MG/KG_DRYWT	D	27.71	MG/KG_DRYWT	D	14.96	MG/KG_DRYWT	D
2,4,4'-Tricb (PCB 28)	23.39 N	MG/KG_DRYWT	D	37.08	MG/KG_DRYWT	D	18.7	MG/KG_DRYWT	D
2,2',3,5'-Tetracb (PCB 44)	13.32 N	MG/KG_DRYWT	D	18.19	MG/KG_DRYWT	D	9.321	MG/KG_DRYWT	D
2,2',5,5'-Tetracb (PCB 52)	20.71 N	MG/KG_DRYWT	D	36.33	MG/KG_DRYWT	D	20.87	MG/KG_DRYWT	D
2,3',4,4'-Tetracb (PCB 66)	3.915 N	MG/KG_DRYWT	D	4.324	MG/KG_DRYWT	Dp	2.51	MG/KG_DRYWT	Dp
2,2',4,5,5'-Pentacb (PCB 101)	10.37 N	MG/KG_DRYWT	D	17.05	MG/KG_DRYWT	D	8.324	MG/KG_DRYWT	D
2,3,3',4,4'-Pentacb (PCB 105)	0.223 N	MG/KG_DRYWT	DU	0.57	MG/KG_DRYWT	DU	0.226	MG/KG_DRYWT	DU
2,3',4,4',5-Pentacb (PCB 118)	5.675 N	MG/KG_DRYWT	D	8.667	MG/KG_DRYWT	D	5.003	MG/KG_DRYWT	D
2,2',3,3',4,4'-Hexacb (PCB 128)	0.223 N	MG/KG_DRYWT	DU	0.57	MG/KG_DRYWT	DU		MG/KG_DRYWT	DU
2,2',3,4,4',5'-Hexacb (PCB 138)	3.206 N	MG/KG_DRYWT	D	4.544	MG/KG_DRYWT	D	2.734	MG/KG_DRYWT	D
2,2',4,4',5,5'-Hexacb (PCB 153)	6.794 N	MG/KG_DRYWT	D	11.42	MG/KG_DRYWT	D	6.349	MG/KG_DRYWT	D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.223 N	MG/KG_DRYWT	DU		MG/KG_DRYWT	DU		MG/KG_DRYWT	DU
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.223 N	MG/KG_DRYWT	DU		MG/KG_DRYWT	DU	0.226	MG/KG_DRYWT	DU
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.223 N	MG/KG_DRYWT	DU	0.57	MG/KG_DRYWT	DU	0.226	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.223 N	MG/KG_DRYWT	DU		MG/KG_DRYWT	DU	0.226	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.223 N	MG/KG_DRYWT	DU	0.57	MG/KG_DRYWT	DU	0.226	MG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.223 N	MG/KG_DRYWT	DU	0.57	MG/KG_DRYWT	DU	0.226	MG/KG_DRYWT	DU
Total MonoCB									
Total DiCB									
Total TriCB									
Total TetraCB									
Total PentaCB									
Total HexaCB									
Total HeptaCB									
Total OctaCB									
Total NonaCB									
DecaCB									
Total PCB Congeners (sum CONG x 2.6)	300 N	MG/KG_DRYWT		470	MG/KG_DRYWT		250	MG/KG_DRYWT	
Total PCB Homologues (sum HOM)									

Station ID	1136			KK32-F0	7		LL40		
Collection Date			11/20/07			11/20/07			11/20/07
Fraction	TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA		
Samp ID	S-07D-II3	36-00-06		S-07D-KK32-00-09			S-07D-LL40-00-03		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
2,4'-Dicb (PCB 8)	13.08	MG/KG_DRYWT	D	9.261	MG/KG_DRYWT	D	5.436	MG/KG_DRYWT	D
2,2',5-Tricb (PCB 18)	24.72	MG/KG_DRYWT	D	18.02	MG/KG_DRYWT	D	11.05	MG/KG_DRYWT	D
2,4,4'-Tricb (PCB 28)	31.44	MG/KG_DRYWT	D	22.55	MG/KG_DRYWT	D	13.92	MG/KG_DRYWT	D
2,2',3,5'-Tetracb (PCB 44)	16.61	MG/KG_DRYWT	D	11.09	MG/KG_DRYWT	D	7.01	MG/KG_DRYWT	D
2,2',5,5'-Tetracb (PCB 52)	33.32	MG/KG_DRYWT	D	24.52	MG/KG_DRYWT	D	17.3	MG/KG_DRYWT	D
2,3',4,4'-Tetracb (PCB 66)	3.662	MG/KG_DRYWT	D	2.727	MG/KG_DRYWT	D	1.834	MG/KG_DRYWT	Dp
2,2',4,5,5'-Pentacb (PCB 101)	12.65	MG/KG_DRYWT	D	8.724	MG/KG_DRYWT	D	5.68	MG/KG_DRYWT	D
2,3,3',4,4'-Pentacb (PCB 105)	0.566	MG/KG_DRYWT	DU	0.228	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU
2,3',4,4',5-Pentacb (PCB 118)	7.044	MG/KG_DRYWT	D	5.41	MG/KG_DRYWT	D	3.595	MG/KG_DRYWT	D
2,2',3,3',4,4'-Hexacb (PCB 128)	0.566	MG/KG_DRYWT	DU	0.228	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU
2,2',3,4,4',5'-Hexacb (PCB 138)	3.566	MG/KG_DRYWT	D	3.121	MG/KG_DRYWT	D	1.922	MG/KG_DRYWT	D
2,2',4,4',5,5'-Hexacb (PCB 153)	8.579	MG/KG_DRYWT	D	6.988	MG/KG_DRYWT	D	4.659	MG/KG_DRYWT	D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.566	MG/KG_DRYWT	DU	0.228	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.566	MG/KG_DRYWT	DU	0.228	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.566	MG/KG_DRYWT	DU	0.228	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.566	MG/KG_DRYWT	DU	0.228	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.566	MG/KG_DRYWT	DU	0.228	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.566	MG/KG_DRYWT	DU	0.228	MG/KG_DRYWT	DU	0.225	MG/KG_DRYWT	DU
Total MonoCB									
Total DiCB									
Total TriCB									
Total TetraCB									
Total PentaCB									
Total HexaCB									
Total HeptaCB									
Total OctaCB									
Total NonaCB									
DecaCB									
Total PCB Congeners (sum CONG x 2.6)	400	MG/KG_DRYWT		290	MG/KG_DRYWT		190	MG/KG_DRYWT	
Total PCB Homologues (sum HOM)									

Station ID	MM22			MM29			DD31-F07		
Collection Date			11/20/07			11/20/07		11/28/07	
Fraction	TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA		
Samp ID	S-07D-MI	M22-00-05		S-07D-M	M29-00-09		S-07D-DD31-00-10		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result Unit	FinQ	
2,4'-Dicb (PCB 8)	9.033	MG/KG_DRYWT	D	8.276	MG/KG_DRYWT	D	36.09 MG/KG_DRYWT	D	
2,2',5-Tricb (PCB 18)	17.01	MG/KG_DRYWT	D	15.46	MG/KG_DRYWT	D	62.41 MG/KG_DRYWT	D	
2,4,4'-Tricb (PCB 28)	21.08	MG/KG_DRYWT	D	19.71	MG/KG_DRYWT	D	75.99 MG/KG_DRYWT	D	
2,2',3,5'-Tetracb (PCB 44)	11.32	MG/KG_DRYWT	D	10.6	MG/KG_DRYWT	D	49.01 MG/KG_DRYWT	D	
2,2',5,5'-Tetracb (PCB 52)	23.66	MG/KG_DRYWT	D	21.6	MG/KG_DRYWT	D	82.88 MG/KG_DRYWT	D	
2,3',4,4'-Tetracb (PCB 66)	3.495	MG/KG_DRYWT	D	3.212	MG/KG_DRYWT	D	12 MG/KG_DRYWT	D	
2,2',4,5,5'-Pentacb (PCB 101)	10.72	MG/KG_DRYWT	D	9.232	MG/KG_DRYWT	D	36 MG/KG_DRYWT	D	
2,3,3',4,4'-Pentacb (PCB 105)	0.224	MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	1.094 MG/KG_DRYWT	DU	
2,3',4,4',5-Pentacb (PCB 118)	6.226	MG/KG_DRYWT	D	5.649	MG/KG_DRYWT	D	18.65 MG/KG_DRYWT	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	0.224	MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	1.094 MG/KG_DRYWT	DU	
2,2',3,4,4',5'-Hexacb (PCB 138)	3.385	MG/KG_DRYWT	D	2.975	MG/KG_DRYWT	D	10.31 MG/KG_DRYWT	D	
2,2',4,4',5,5'-Hexacb (PCB 153)	7.899	MG/KG_DRYWT	D	6.929	MG/KG_DRYWT	D	23.36 MG/KG_DRYWT	D	
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.224	MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	1.094 MG/KG_DRYWT	DU	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.224	MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	0.338 MG/KG_DRYWT	DpJ	
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.224	MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	0.566 MG/KG_DRYWT	DpJ	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.224	MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	1.094 MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.224	MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	1.094 MG/KG_DRYWT	DU	
Decacb - Congener (PCB 209)	0.224	MG/KG_DRYWT	DU	0.224	MG/KG_DRYWT	DU	1.094 MG/KG_DRYWT	DU	
Total MonoCB				0.178	MG/KG_DRYWT				
Total DiCB				27.37	MG/KG_DRYWT				
Total TriCB				100.3	MG/KG_DRYWT				
Total TetraCB					MG/KG_DRYWT				
Total PentaCB				53.05	MG/KG_DRYWT				
Total HexaCB				20.79	MG/KG_DRYWT				
Total HeptaCB				3.623	MG/KG_DRYWT				
Total OctaCB				0.626	MG/KG_DRYWT				
Total NonaCB				0.165	MG/KG_DRYWT				
DecaCB					MG/KG_DRYWT	D			
Total PCB Congeners (sum CONG x 2.6)	300	MG/KG_DRYWT			MG/KG_DRYWT		1100 MG/KG_DRYWT		
Total PCB Homologues (sum HOM)				290	MG/KG_DRYWT				

Station ID	DD36			DD36			EE41			
Collection Date			11/28/07			11/28/07			11/28/07	
Fraction	TOTAL			TOTAL			TOTAL			
QC Code	SA			REP	REP			SA		
Samp ID	S-07D-DD36-0	00-10		S-07D-DI	D36-00-11-REP		S-07D-EE41-00-14			
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	36.63 MG/I	KG_DRYWT	D	32.96	MG/KG_DRYWT	D	22.38	MG/KG_DRYWT	D	
2,2',5-Tricb (PCB 18)	63.81 MG/I	KG_DRYWT	D	59.38	MG/KG_DRYWT	D	38.17	MG/KG_DRYWT	D	
2,4,4'-Tricb (PCB 28)	72.16 MG/I	KG_DRYWT	D	66.81	MG/KG_DRYWT	D	41.14	MG/KG_DRYWT	D	
2,2',3,5'-Tetracb (PCB 44)	44.59 MG/I	KG_DRYWT	D	42.34	MG/KG_DRYWT	D	25.14	MG/KG_DRYWT	D	
2,2',5,5'-Tetracb (PCB 52)	96.04 MG/I	KG_DRYWT	D	91.74	MG/KG_DRYWT	D	58.93	MG/KG_DRYWT	D	
2,3',4,4'-Tetracb (PCB 66)	28.35 MG/I	KG_DRYWT	Dp		MG/KG_DRYWT	Dp	3.531	MG/KG_DRYWT	Dp	
2,2',4,5,5'-Pentacb (PCB 101)	21.97 MG/I	KG_DRYWT	D	20.6	MG/KG_DRYWT	D	12.91	MG/KG_DRYWT	D	
2,3,3',4,4'-Pentacb (PCB 105)	1.077 MG/I	KG_DRYWT	DU	1.104	MG/KG_DRYWT	DU	0.533	MG/KG_DRYWT	DU	
2,3',4,4',5-Pentacb (PCB 118)	10.65 MG/I	KG_DRYWT	D	9.237	MG/KG_DRYWT	D	6.952	MG/KG_DRYWT	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	1.077 MG/I	KG_DRYWT	DU	1.104	MG/KG_DRYWT	DU	0.533	MG/KG_DRYWT	DU	
2,2',3,4,4',5'-Hexacb (PCB 138)	8.77 MG/I	KG_DRYWT	D	8.174	MG/KG_DRYWT	D	6.082	MG/KG_DRYWT	D	
2,2',4,4',5,5'-Hexacb (PCB 153)		KG_DRYWT	D		MG/KG_DRYWT	D		MG/KG_DRYWT	D	
2,2',3,3',4,4',5-Heptacb (PCB 170)		KG_DRYWT	DU		MG/KG_DRYWT	DU	0.533	MG/KG_DRYWT	DU	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.095 MG/I	KG_DRYWT	DpJ	1.104	MG/KG_DRYWT	UJ	0.533	MG/KG_DRYWT	DU	
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.607 MG/I	KG_DRYWT	DpJ	0.439	MG/KG_DRYWT	DpJ	0.981	MG/KG_DRYWT	D	
2,2',3,3',4,4',5,6-Octacb (PCB 195)		KG_DRYWT	DU	1.104	MG/KG_DRYWT	DU	0.533	MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	1.077 MG/I	KG_DRYWT	DU	1.104	MG/KG_DRYWT	DU	0.533	MG/KG_DRYWT	DU	
Decacb - Congener (PCB 209)	1.077 MG/I	KG_DRYWT	DU	1.104	MG/KG_DRYWT	DU	0.533	MG/KG_DRYWT	DU	
Total MonoCB							0.395	MG/KG_DRYWT		
Total DiCB							67.17	MG/KG_DRYWT		
Total TriCB							219.4	MG/KG_DRYWT		
Total TetraCB							191.3	MG/KG_DRYWT		
Total PentaCB							98.41	MG/KG_DRYWT		
Total HexaCB							39.65	MG/KG_DRYWT		
Total HeptaCB								MG/KG_DRYWT		
Total OctaCB								MG/KG_DRYWT		
Total NonaCB								MG/KG_DRYWT		
DecaCB								MG/KG_DRYWT	D	
Total PCB Congeners (sum CONG x 2.6)	1000 MG/I	KG_DRYWT		910	MG/KG_DRYWT			MG/KG_DRYWT		
Total PCB Homologues (sum HOM)							620	MG/KG_DRYWT		

Station ID	AA22			AA22-F0	7			
Collection Date			12/11/07		12/11/07			
Fraction	TOTAL			TOTAL				
QC Code	REP			SA				
Samp ID	S-07D-A	A22-10-20-REP		S-07D-A	AA22-10-20			
Analyte	Result	Unit	FinQ	Result	Unit	FinQ		
2,4'-Dicb (PCB 8)	5.628	MG/KG_DRYWT	D	5	MG/KG_DRYWT	D		
2,2',5-Tricb (PCB 18)	8.539	MG/KG_DRYWT	D	7.481	MG/KG_DRYWT	D		
2,4,4'-Tricb (PCB 28)	9.205	MG/KG_DRYWT	D	7.772	MG/KG_DRYWT	D		
2,2',3,5'-Tetracb (PCB 44)	4.152	MG/KG_DRYWT	D	3.588	MG/KG_DRYWT	D		
2,2',5,5'-Tetracb (PCB 52)	6.979	MG/KG_DRYWT	D	6.234	MG/KG_DRYWT	D		
2,3',4,4'-Tetracb (PCB 66)	0.117	MG/KG_DRYWT	UJ	0.099	MG/KG_DRYWT	DJ		
2,2',4,5,5'-Pentacb (PCB 101)	1.072	MG/KG_DRYWT	D	1.145	MG/KG_DRYWT	D		
2,3,3',4,4'-Pentacb (PCB 105)	0.117	MG/KG_DRYWT	DU	0.12	MG/KG_DRYWT	DU		
2,3',4,4',5-Pentacb (PCB 118)	0.498	MG/KG_DRYWT	Dp	0.528	MG/KG_DRYWT	Dp		
2,2',3,3',4,4'-Hexacb (PCB 128)	0.117	MG/KG_DRYWT	DU	0.12	MG/KG_DRYWT	DU		
2,2',3,4,4',5'-Hexacb (PCB 138)	0.272	MG/KG_DRYWT	D	0.26	MG/KG_DRYWT	Dp		
2,2',4,4',5,5'-Hexacb (PCB 153)	0.736	MG/KG_DRYWT	D	0.722	MG/KG_DRYWT	D		
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.117	MG/KG_DRYWT	DU	0.12	MG/KG_DRYWT	DU		
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.117	MG/KG_DRYWT	DU	0.12	MG/KG_DRYWT	DU		
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.117	MG/KG_DRYWT	DU	0.12	MG/KG_DRYWT	DU		
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.117	MG/KG_DRYWT	DU	0.12	MG/KG_DRYWT	DU		
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.117	MG/KG_DRYWT	DU	0.12	MG/KG_DRYWT	DU		
Decacb - Congener (PCB 209)	0.117	MG/KG_DRYWT	DU	0.12	MG/KG_DRYWT	DU		
Total MonoCB								
Total DiCB								
Total TriCB								
Total TetraCB								
Total PentaCB								
Total HexaCB								
Total HeptaCB								
Total OctaCB								
Total NonaCB								
DecaCB								
Total PCB Congeners (sum CONG x 2.6)	96	MG/KG_DRYWT		85	MG/KG_DRYWT			
Total PCB Homologues (sum HOM)								

Station ID	OU01			OU02			OU03			OU04		
Collection Date			9/18/07	,		9/18/07			9/18/07			9/18/07
Fraction	TOTAL			TOTAL	TOTAL					TOTAL		
QC Code	SA			SA			SA			SA		
Samp ID	S-07B-OU	01-00-03		S-07B-Ol	J02-00-03		S-07B-OU03-00-03			S-07B-OU04-00-03		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
2,4'-Dicb (PCB 8)	0.0051	MG/KG_DRYWT	D	0.017	MG/KG_DRYWT	D	0.015	MG/KG_DRYWT	D	0.075	MG/KG_DRYWT	D
2,2',5-Tricb (PCB 18)	0.0075	MG/KG_DRYWT	D	0.016	MG/KG_DRYWT	D	0.013	MG/KG_DRYWT	D	0.063	MG/KG_DRYWT	D
2,4,4'-Tricb (PCB 28)	0.021	MG/KG_DRYWT	D	0.04	MG/KG_DRYWT	D	0.032	MG/KG_DRYWT	D	0.151	MG/KG_DRYWT	D
2,2',3,5'-Tetracb (PCB 44)	0.01	MG/KG_DRYWT	D	0.015	MG/KG_DRYWT	D	0.013	MG/KG_DRYWT	D	0.036	MG/KG_DRYWT	D
2,2',5,5'-Tetracb (PCB 52)	0.02	MG/KG_DRYWT	D	0.033	MG/KG_DRYWT	D	0.027	MG/KG_DRYWT	D	0.115	MG/KG_DRYWT	D
2,3',4,4'-Tetracb (PCB 66)	0.013	MG/KG_DRYWT	D	0.021	MG/KG_DRYWT	D	0.019	MG/KG_DRYWT	D	0.073	MG/KG_DRYWT	D
2,2',4,5,5'-Pentacb (PCB 101)	0.017	MG/KG_DRYWT	D	0.028	MG/KG_DRYWT	D	0.021	MG/KG_DRYWT	D	0.083	MG/KG_DRYWT	D
2,3,3',4,4'-Pentacb (PCB 105)	0.0042	MG/KG_DRYWT	D	0.0078	MG/KG_DRYWT	D	0.0076	MG/KG_DRYWT	D	0.019	MG/KG_DRYWT	Dp
2,3',4,4',5-Pentacb (PCB 118)	0.019	MG/KG_DRYWT	D	0.032	MG/KG_DRYWT	D	0.025	MG/KG_DRYWT	D	0.111	MG/KG_DRYWT	D
2,2',3,3',4,4'-Hexacb (PCB 128)	0.0021	MG/KG_DRYWT	D	0.003	MG/KG_DRYWT	D	0.0027	MG/KG_DRYWT	D	0.0051	MG/KG_DRYWT	D
2,2',3,4,4',5'-Hexacb (PCB 138)	0.015	MG/KG_DRYWT	D	0.024	MG/KG_DRYWT	D	0.018	MG/KG_DRYWT	D	0.059	MG/KG_DRYWT	D
2,2',4,4',5,5'-Hexacb (PCB 153)	0.015	MG/KG_DRYWT	D	0.023	MG/KG_DRYWT	D	0.02	MG/KG_DRYWT	D	0.073	MG/KG_DRYWT	D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.0011	MG/KG_DRYWT	Dp	0.0013	MG/KG_DRYWT	Dp	0.0007	MG/KG_DRYWT	Dp	0.001	MG/KG_DRYWT	DU
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.0016	MG/KG_DRYWT	Dp	0.0015	MG/KG_DRYWT	Dp		MG/KG_DRYWT	Dp	0.001	MG/KG_DRYWT	DU
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.00062	MG/KG_DRYWT	Dp	0.0001	MG/KG_DRYWT	DU	0.00054	MG/KG_DRYWT	Dp	0.001	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.0005	MG/KG_DRYWT	DU	0.0001	MG/KG_DRYWT	DU	0.0001	MG/KG_DRYWT	DU	0.001	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.0005	MG/KG_DRYWT	DU	0.0001	MG/KG_DRYWT	DU	0.0001	MG/KG_DRYWT	DU	0.001	MG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.0005	MG/KG_DRYWT	DU	0.0001	MG/KG_DRYWT	DU	0.0001	MG/KG_DRYWT	DU	0.001	MG/KG_DRYWT	DU
Total MonoCB												
Total DiCB												
Total TriCB												
Total TetraCB												
Total PentaCB												
Total HexaCB												
Total HeptaCB												
Total OctaCB					_							
Total NonaCB												
DecaCB												
Total PCB Congeners (sum CONG x 2.6)	0.4	MG/KG_DRYWT		0.68	MG/KG_DRYWT		0.56	MG/KG_DRYWT		2.2	MG/KG_DRYWT	
Total PCB Homologues (sum HOM)												

Station ID	OU05			OU06			OU07			OU08			
Collection Date			9/18/07	,		9/18/07			9/18/07			9/18/07	
Fraction	TOTAL			TOTAL	OTAL TO			TOTAL			TOTAL		
QC Code	SA			SA	SA					SA			
Samp ID	S-07B-OU05-00-03			S-07B-O	S-07B-OU06-00-03			U07-00-03		S-07B-O	J08-00-03		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	0.012	MG/KG_DRYWT	D	0.036	MG/KG_DRYWT	D	0.051	MG/KG_DRYWT	D	0.035	MG/KG_DRYWT	D	
2,2',5-Tricb (PCB 18)	0.012	MG/KG_DRYWT	D	0.036	MG/KG_DRYWT	D	0.043	MG/KG_DRYWT	D	0.032	MG/KG_DRYWT	D	
2,4,4'-Tricb (PCB 28)	0.039	MG/KG_DRYWT	D	0.081	MG/KG_DRYWT	D	0.095	MG/KG_DRYWT	D	0.063	MG/KG_DRYWT	D	
2,2',3,5'-Tetracb (PCB 44)	0.015	MG/KG_DRYWT	D	0.026	MG/KG_DRYWT	D	0.036	MG/KG_DRYWT	D	0.027	MG/KG_DRYWT	D	
2,2',5,5'-Tetracb (PCB 52)	0.035	MG/KG_DRYWT	D	0.069	MG/KG_DRYWT	D	0.077	MG/KG_DRYWT	D	0.052	MG/KG_DRYWT	D	
2,3',4,4'-Tetracb (PCB 66)	0.024	MG/KG_DRYWT	D	0.044	MG/KG_DRYWT	D	0.053	MG/KG_DRYWT	D	0.033	MG/KG_DRYWT	D	
2,2',4,5,5'-Pentacb (PCB 101)	0.032	MG/KG_DRYWT	D	0.052	MG/KG_DRYWT	D	0.062	MG/KG_DRYWT	D	0.039	MG/KG_DRYWT	D	
2,3,3',4,4'-Pentacb (PCB 105)	0.012	MG/KG_DRYWT	D	0.014	MG/KG_DRYWT	D	0.024	MG/KG_DRYWT	D	0.014	MG/KG_DRYWT	D	
2,3',4,4',5-Pentacb (PCB 118)	0.041	MG/KG_DRYWT	D	0.062	MG/KG_DRYWT	D	0.073	MG/KG_DRYWT	D	0.046	MG/KG_DRYWT	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	0.0045	MG/KG_DRYWT	D	0.0005	MG/KG_DRYWT	DU	0.01	MG/KG_DRYWT	D	0.0057	MG/KG_DRYWT	D	
2,2',3,4,4',5'-Hexacb (PCB 138)	0.031	MG/KG_DRYWT	D	0.043	MG/KG_DRYWT	D	0.054	MG/KG_DRYWT	D	0.032	MG/KG_DRYWT	D	
2,2',4,4',5,5'-Hexacb (PCB 153)	0.033	MG/KG_DRYWT	D	0.049	MG/KG_DRYWT	D	0.061	MG/KG_DRYWT	D	0.034	MG/KG_DRYWT	D	
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.0024	MG/KG_DRYWT	Dp	0.0005	MG/KG_DRYWT	DU	0.0058	MG/KG_DRYWT	Dp	0.0031	MG/KG_DRYWT	D	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.0031	MG/KG_DRYWT	Dp	0.0005	MG/KG_DRYWT	DU	0.0067	MG/KG_DRYWT	D	0.0039	MG/KG_DRYWT	D	
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.001	MG/KG_DRYWT	DU	0.0005	MG/KG_DRYWT	DU	0.0042	MG/KG_DRYWT	Dp	0.0027	MG/KG_DRYWT	Dp	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.001	MG/KG_DRYWT	DU	0.0005	MG/KG_DRYWT	DU	0.001	MG/KG_DRYWT	DU	0.0005	MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.001	MG/KG_DRYWT	DU	0.0005	MG/KG_DRYWT	DU	0.001	MG/KG_DRYWT	DU	0.0005	MG/KG_DRYWT	DU	
Decacb - Congener (PCB 209)	0.001	MG/KG_DRYWT	DU	0.0005	MG/KG_DRYWT	DU	0.001	MG/KG_DRYWT	DU	0.0005	MG/KG_DRYWT	DU	
Total MonoCB													
Total DiCB													
Total TriCB													
Total TetraCB													
Total PentaCB													
Total HexaCB													
Total HeptaCB													
Total OctaCB													
Total NonaCB													
DecaCB													
Total PCB Congeners (sum CONG x 2.6)	0.77	MG/KG_DRYWT		1.3	MG/KG_DRYWT		1.7	MG/KG_DRYWT		1.1	MG/KG_DRYWT		
Total PCB Homologues (sum HOM)													

Station ID	OU09			OU10_0	7		OU11_07			OU12_07		
Collection Date		9)/18/07			9/18/07			9/18/07	•		9/19/07
Fraction	TOTAL			TOTAL		TOTAL				TOTAL		
QC Code	SA			SA		SA				SA		
Samp ID	S-07B-OU09-00-03			S-07B-OU10-00-03			S-07B-OU	11-00-03		S-07B-0	U12-00-03	
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ		Unit	FinQ
2,4'-Dicb (PCB 8)	0.075	MG/KG_DRYWT	D	0.15	MG/KG_DRYWT	D	0.0074	MG/KG_DRYWT	D	0.119	MG/KG_DRYWT	D
2,2',5-Tricb (PCB 18)	0.069 [MG/KG_DRYWT	D	0.118	MG/KG_DRYWT	D	0.0063	MG/KG_DRYWT	D	0.095	MG/KG_DRYWT	D
2,4,4'-Tricb (PCB 28)	0.124	MG/KG_DRYWT	D	0.224	MG/KG_DRYWT	D	0.019	MG/KG_DRYWT	D	0.186	MG/KG_DRYWT	D
2,2',3,5'-Tetracb (PCB 44)	0.037 [MG/KG_DRYWT	D	0.049	MG/KG_DRYWT	D	0.005	MG/KG_DRYWT	D	0.059	MG/KG_DRYWT	D
2,2',5,5'-Tetracb (PCB 52)	0.098	MG/KG_DRYWT	D	0.151	MG/KG_DRYWT	D	0.015	MG/KG_DRYWT	D	0.126	MG/KG_DRYWT	D
2,3',4,4'-Tetracb (PCB 66)	0.047 [MG/KG_DRYWT	D	0.087	MG/KG_DRYWT	D	0.0095	MG/KG_DRYWT	D	0.086	MG/KG_DRYWT	D
2,2',4,5,5'-Pentacb (PCB 101)	0.058	MG/KG_DRYWT	D	0.102	MG/KG_DRYWT	D		MG/KG_DRYWT		0.088	MG/KG_DRYWT	D
2,3,3',4,4'-Pentacb (PCB 105)	0.016	MG/KG_DRYWT	D	0.023	MG/KG_DRYWT	Dp	0.0029	MG/KG_DRYWT	Dp	0.034	MG/KG_DRYWT	D
2,3',4,4',5-Pentacb (PCB 118)	0.069 [MG/KG_DRYWT	D	0.129	MG/KG_DRYWT	D	0.017	MG/KG_DRYWT	D	0.109	MG/KG_DRYWT	D
2,2',3,3',4,4'-Hexacb (PCB 128)	0.0044	MG/KG_DRYWT	D	0.0031	MG/KG_DRYWT	D	0.00024	MG/KG_DRYWT	DJ	0.011	MG/KG_DRYWT	D
2,2',3,4,4',5'-Hexacb (PCB 138)	0.046	MG/KG_DRYWT	D	0.08	MG/KG_DRYWT	D	0.012	MG/KG_DRYWT	D	0.07	MG/KG_DRYWT	D
2,2',4,4',5,5'-Hexacb (PCB 153)	0.042	MG/KG_DRYWT	D	0.084	MG/KG_DRYWT	D	0.013	MG/KG_DRYWT	D	0.075	MG/KG_DRYWT	D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.0001	MG/KG_DRYWT	DU	0.0011	MG/KG_DRYWT	DU	0.00098	MG/KG_DRYWT	DU	0.0031	MG/KG_DRYWT	Dp
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.0001	MG/KG_DRYWT	DU	0.0011	MG/KG_DRYWT	DU	0.00098	MG/KG_DRYWT	DU	0.0058	MG/KG_DRYWT	Dp
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.0001	MG/KG_DRYWT	DU	0.0011	MG/KG_DRYWT	DU	0.00098	MG/KG_DRYWT	DU	0.0017	MG/KG_DRYWT	DpJ
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.0001	MG/KG_DRYWT	DU	0.0011	MG/KG_DRYWT	DU	0.00098	MG/KG_DRYWT	DU	0.002	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.0001	MG/KG_DRYWT	DU	0.0011	MG/KG_DRYWT	DU	0.00098	MG/KG_DRYWT	DU	0.002	MG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.0001	MG/KG_DRYWT	DU	0.0011	MG/KG_DRYWT	DU	0.00098	MG/KG_DRYWT	DU	0.002	MG/KG_DRYWT	DU
Total MonoCB	0.006	MG/KG_DRYWT										
Total DiCB	0.104	MG/KG_DRYWT										
Total TriCB	0.342	MG/KG_DRYWT										
Total TetraCB	0.278	MG/KG_DRYWT										
Total PentaCB		MG/KG_DRYWT										
Total HexaCB	0.103	MG/KG_DRYWT										
Total HeptaCB	0.028	MG/KG_DRYWT	J									
Total OctaCB	0.02	MG/KG_DRYWT	U									
Total NonaCB			U									
DecaCB	0.002	MG/KG_DRYWT	DU									
Total PCB Congeners (sum CONG x 2.6)		MG/KG_DRYWT		3.1	MG/KG_DRYWT		0.31	MG/KG_DRYWT		2.8	MG/KG_DRYWT	
Total PCB Homologues (sum HOM)	1.1	MG/KG_DRYWT										

Station ID	OU13_07			OU13_07	,		OU14_07	,		OU15_07		
Collection Date			9/19/07			9/19/07			9/19/07			9/19/07
Fraction	TOTAL			TOTAL			TOTAL		TC		TOTAL	
QC Code	REP			SA			SA			SA		
Samp ID	S-07B-OL	J13-00-03-DUP		S-07B-O	J13-00-03		S-07B-O	J14-00-03		S-07B-C)U15-00-03	
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ		Unit	FinQ
2,4'-Dicb (PCB 8)	0.099	MG/KG_DRYWT	D	0.167	MG/KG_DRYWT	D	0.086	MG/KG_DRYWT	D	0.174	MG/KG_DRYWT	D
2,2',5-Tricb (PCB 18)	0.068	MG/KG_DRYWT	D	0.129	MG/KG_DRYWT	D	0.069	MG/KG_DRYWT	D	0.141	MG/KG_DRYWT	D
2,4,4'-Tricb (PCB 28)	0.123	MG/KG_DRYWT	D	0.208	MG/KG_DRYWT	D	0.135	MG/KG_DRYWT	D	0.216	MG/KG_DRYWT	D
2,2',3,5'-Tetracb (PCB 44)	0.017	MG/KG_DRYWT	D	0.04	MG/KG_DRYWT	D	0.045	MG/KG_DRYWT	D	0.081	MG/KG_DRYWT	D
2,2',5,5'-Tetracb (PCB 52)	0.064	MG/KG_DRYWT	D	0.118	MG/KG_DRYWT	D	0.091	MG/KG_DRYWT	D	0.16	MG/KG_DRYWT	D
2,3',4,4'-Tetracb (PCB 66)	0.035	MG/KG_DRYWT	D	0.06	MG/KG_DRYWT	D	0.053	MG/KG_DRYWT	D	0.081	MG/KG_DRYWT	D
2,2',4,5,5'-Pentacb (PCB 101)	0.024	MG/KG_DRYWT	D	0.048	MG/KG_DRYWT	D	0.053	MG/KG_DRYWT	D	0.078	MG/KG_DRYWT	D
2,3,3',4,4'-Pentacb (PCB 105)	0.0042	MG/KG_DRYWT	DpJ	0.007	MG/KG_DRYWT	Dp	0.016	MG/KG_DRYWT	D	0.028	MG/KG_DRYWT	D
2,3',4,4',5-Pentacb (PCB 118)	0.037	MG/KG_DRYWT	D	0.065	MG/KG_DRYWT	D	0.061	MG/KG_DRYWT	D	0.089	MG/KG_DRYWT	D
2,2',3,3',4,4'-Hexacb (PCB 128)	0.0048	MG/KG_DRYWT	DU	0.0051	MG/KG_DRYWT	DU	0.0043	MG/KG_DRYWT	D	0.0071	MG/KG_DRYWT	D
2,2',3,4,4',5'-Hexacb (PCB 138)	0.017	MG/KG_DRYWT	Dp	0.03	MG/KG_DRYWT	D	0.041	MG/KG_DRYWT	D	0.058	MG/KG_DRYWT	D
2,2',4,4',5,5'-Hexacb (PCB 153)	0.015	MG/KG_DRYWT	Dp	0.026	MG/KG_DRYWT	Dp	0.046	MG/KG_DRYWT	D	0.066	MG/KG_DRYWT	D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.0048	MG/KG_DRYWT	DU	0.0051	MG/KG_DRYWT	DU	0.0013	MG/KG_DRYWT	DpJ	0.0033	MG/KG_DRYWT	Dp
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.0048	MG/KG_DRYWT	DU	0.0051	MG/KG_DRYWT	DU	0.0023	MG/KG_DRYWT	Dp	0.0047	MG/KG_DRYWT	Dp
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.0048	MG/KG_DRYWT	DU	0.0051	MG/KG_DRYWT	DU	0.0019	MG/KG_DRYWT	DU	0.0011	MG/KG_DRYWT	DpJ
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.0048	MG/KG_DRYWT	DU	0.0051	MG/KG_DRYWT	DU	0.0019	MG/KG_DRYWT	DU	0.002	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.0048	MG/KG_DRYWT	DU	0.0051	MG/KG_DRYWT	DU	0.0019	MG/KG_DRYWT	DU	0.002	MG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.0048	MG/KG_DRYWT	DU	0.0051	MG/KG_DRYWT	DU	0.0019	MG/KG_DRYWT	DU	0.002	MG/KG_DRYWT	DU
Total MonoCB												
Total DiCB												
Total TriCB												
Total TetraCB												
Total PentaCB												
Total HexaCB												
Total HeptaCB												
Total OctaCB												
Total NonaCB												
DecaCB												
Total PCB Congeners (sum CONG x 2.6)	1.3	MG/KG_DRYWT		2.3	MG/KG_DRYWT		1.8	MG/KG_DRYWT		3.1	MG/KG_DRYWT	
Total PCB Homologues (sum HOM)												

Station ID	OU16_07			OU17_07					
Collection Date			9/19/07	_		9/19/07			
Fraction	TOTAL			TOTAL					
QC Code	SA			SA					
Samp ID	S-07B-OU	16-00-03		S-07B-OU17-00-03					
Analyte	Result	Unit	FinQ	Result	Unit	FinQ			
2,4'-Dicb (PCB 8)	0.273	MG/KG_DRYWT	D	0.0056	MG/KG_DRYWT	D			
2,2',5-Tricb (PCB 18)	0.201	MG/KG_DRYWT	D	0.0061	MG/KG_DRYWT	D			
2,4,4'-Tricb (PCB 28)	0.349	MG/KG_DRYWT	D	0.014	MG/KG_DRYWT	D			
2,2',3,5'-Tetracb (PCB 44)	0.08	MG/KG_DRYWT	D	0.0047	MG/KG_DRYWT	D			
2,2',5,5'-Tetracb (PCB 52)	0.195	MG/KG_DRYWT	D	0.012	MG/KG_DRYWT	D			
2,3',4,4'-Tetracb (PCB 66)	0.111	MG/KG_DRYWT	D	0.0073	MG/KG_DRYWT	D			
2,2',4,5,5'-Pentacb (PCB 101)	0.092	MG/KG_DRYWT	D	0.0099	MG/KG_DRYWT	D			
2,3,3',4,4'-Pentacb (PCB 105)	0.022	MG/KG_DRYWT	D	0.0025	MG/KG_DRYWT	Dp			
2,3',4,4',5-Pentacb (PCB 118)	0.115	MG/KG_DRYWT	D	0.012	MG/KG_DRYWT	D			
2,2',3,3',4,4'-Hexacb (PCB 128)	0.001	MG/KG_DRYWT	DU	0.0001	MG/KG_DRYWT	DU			
2,2',3,4,4',5'-Hexacb (PCB 138)	0.058	MG/KG_DRYWT	D	0.0088	MG/KG_DRYWT	D			
2,2',4,4',5,5'-Hexacb (PCB 153)	0.052	MG/KG_DRYWT	D	0.0099	MG/KG_DRYWT	D			
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.001	MG/KG_DRYWT	DU	0.0001	MG/KG_DRYWT	DU			
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.001	MG/KG_DRYWT	DU	0.0001	MG/KG_DRYWT	DU			
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.001	MG/KG_DRYWT	DU	0.0001	MG/KG_DRYWT	DU			
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.001	MG/KG_DRYWT	DU	0.0001	MG/KG_DRYWT	DU			
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.001	MG/KG_DRYWT	DU	0.0001	MG/KG_DRYWT	DU			
Decacb - Congener (PCB 209)	0.001	MG/KG_DRYWT	DU	0.0001	MG/KG_DRYWT	DU			
Total MonoCB	0.027	MG/KG_DRYWT							
Total DiCB	0.368	MG/KG_DRYWT							
Total TriCB	0.976	MG/KG_DRYWT							
Total TetraCB	0.63	MG/KG_DRYWT							
Total PentaCB	0.441	MG/KG_DRYWT							
Total HexaCB	0.151	MG/KG_DRYWT							
Total HeptaCB	0.041	MG/KG_DRYWT	J						
Total OctaCB	0.05	MG/KG_DRYWT	U						
Total NonaCB	0.015	MG/KG_DRYWT	U						
DecaCB	0.005	MG/KG_DRYWT	DU						
Total PCB Congeners (sum CONG x 2.6)		MG/KG_DRYWT		0.24	MG/KG_DRYWT				
Total PCB Homologues (sum HOM)	2.6	MG/KG_DRYWT							

Station ID	BH1			BH1			BH1			BH2			
Collection Date		1	1/29/07		1	1/29/07		1	1/29/07	,	1	1/29/07	
Fraction	TOTAL			TOTAL			DTAL TOTAL				TOTAL		
QC Code	SA			SA			A SA			SA			
Samp ID	S-07D-0E	3H1-00-10		S-07D-0BH1-10-20			S-07D-0BH	11-20-25		S-07D-0BH2-00-10			
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	0.212	MG/KG_DRYWT	D	0.087	MG/KG_DRYWT	Dp	0.0002	MG/KG_DRYWT	DU	1.765	MG/KG_DRYWT	D	
2,2',5-Tricb (PCB 18)	0.535	MG/KG_DRYWT	D	0.128	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	DU	4.342	MG/KG_DRYWT	D	
2,4,4'-Tricb (PCB 28)	1.145	MG/KG_DRYWT	D	0.173	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	DU	7.668	MG/KG_DRYWT	D	
2,2',3,5'-Tetracb (PCB 44)	0.693	MG/KG_DRYWT	D	0.335	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	DU	4.505	MG/KG_DRYWT	D	
2,2',5,5'-Tetracb (PCB 52)	1.475	MG/KG_DRYWT	D	0.797	MG/KG_DRYWT	D	0.0026	MG/KG_DRYWT	Dp	5.922	MG/KG_DRYWT	D	
2,3',4,4'-Tetracb (PCB 66)	0.773	MG/KG_DRYWT	D	0.174	MG/KG_DRYWT	D	0.00087	MG/KG_DRYWT	Dp	5.199	MG/KG_DRYWT	D	
2,2',4,5,5'-Pentacb (PCB 101)	0.852	MG/KG_DRYWT	D	0.457	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	DU	3.644	MG/KG_DRYWT	D	
2,3,3',4,4'-Pentacb (PCB 105)	0.171	MG/KG_DRYWT	D	0.032	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	DU	0.114	MG/KG_DRYWT	DU	
2,3',4,4',5-Pentacb (PCB 118)	0.733	MG/KG_DRYWT	D	0.267	MG/KG_DRYWT	D	0.0025	MG/KG_DRYWT	Dp	3.153	MG/KG_DRYWT	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	0.061	MG/KG_DRYWT	D	0.0054	MG/KG_DRYWT	DpJ	0.0002	MG/KG_DRYWT	DU	0.114	MG/KG_DRYWT	DU	
2,2',3,4,4',5'-Hexacb (PCB 138)	0.432	MG/KG_DRYWT	D	0.18	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	DU	0.115	MG/KG_DRYWT	DU	
2,2',4,4',5,5'-Hexacb (PCB 153)	0.659	MG/KG_DRYWT	D	0.317	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	DU	2.232	MG/KG_DRYWT	D	
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.044	MG/KG_DRYWT	D	0.0028	MG/KG_DRYWT	DpJ	0.0002	MG/KG_DRYWT	DU	0.114	MG/KG_DRYWT	DU	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.071	MG/KG_DRYWT	D	0.01	MG/KG_DRYWT	DpJ	0.0002	MG/KG_DRYWT	DU	0.114	MG/KG_DRYWT	DU	
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.052	MG/KG_DRYWT	D	0.013	MG/KG_DRYWT	Dp	0.0002	MG/KG_DRYWT	DU	0.114	MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.01	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	0.114	MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.01	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	0.114	MG/KG_DRYWT	DU	
Decacb - Congener (PCB 209)	0.01	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	0.114	MG/KG_DRYWT	DU	
Total MonoCB													
Total DiCB													
Total TriCB													
Total TetraCB													
Total PentaCB													
Total HexaCB													
Total HeptaCB													
Total OctaCB													
Total NonaCB													
DecaCB													
Total PCB Congeners (sum CONG x 2.6)	21	MG/KG_DRYWT		7.8	MG/KG_DRYWT		0.016	MG/KG_DRYWT		100	MG/KG_DRYWT	1 1	
Total PCB Homologues (sum HOM)													

Station ID	BH2			BH2			ВН3			BH3	BH3		
Collection Date		,	1/29/07		,	11/29/07		1	1/29/07	7	1	1/29/07	
Fraction	TOTAL			TOTAL			TOTAL			TOTAL			
QC Code	SA			SA			REP			SA			
Samp ID	S-07D-0BH2-10-20 S-			S-07D-0E	3H2-20-30		S-07D-0	BH3-00-10-REP		S-07D-0E	3H3-00-10		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	2.482	MG/KG_DRYWT	D	0.011	MG/KG_DRYWT	DU	0.052	MG/KG_DRYWT	UJ	0.409	MG/KG_DRYWT	D	
2,2',5-Tricb (PCB 18)	5.41	MG/KG_DRYWT	D	0.011	MG/KG_DRYWT	DU	0.052	MG/KG_DRYWT	UJ	0.65	MG/KG_DRYWT	D	
2,4,4'-Tricb (PCB 28)	10.67	MG/KG_DRYWT	D	0.193	MG/KG_DRYWT	Dp	2.494	MG/KG_DRYWT	D	1.475	MG/KG_DRYWT	D	
2,2',3,5'-Tetracb (PCB 44)	6.622	MG/KG_DRYWT	D	0.334	MG/KG_DRYWT	D	1.676	MG/KG_DRYWT	D	0.829	MG/KG_DRYWT	D	
2,2',5,5'-Tetracb (PCB 52)	10.2	MG/KG_DRYWT	D	0.904	MG/KG_DRYWT	D	2.774	MG/KG_DRYWT	D	1.645	MG/KG_DRYWT	D	
2,3',4,4'-Tetracb (PCB 66)	9.769	MG/KG_DRYWT	D	0.258	MG/KG_DRYWT	D	1.8	MG/KG_DRYWT	D	0.727	MG/KG_DRYWT	D	
2,2',4,5,5'-Pentacb (PCB 101)	13.51	MG/KG_DRYWT	D	0.921	MG/KG_DRYWT	D	2.295	MG/KG_DRYWT	D	1.052	MG/KG_DRYWT	D	
2,3,3',4,4'-Pentacb (PCB 105)	0.226	MG/KG_DRYWT	DU	0.256	MG/KG_DRYWT	D	0.052	MG/KG_DRYWT	UJ	0.212	MG/KG_DRYWT	D	
2,3',4,4',5-Pentacb (PCB 118)	11.68	MG/KG_DRYWT	D	0.808	MG/KG_DRYWT	D	1.992	MG/KG_DRYWT	D	0.96	MG/KG_DRYWT	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	0.226	MG/KG_DRYWT	DU	0.15	MG/KG_DRYWT	D	0.052	MG/KG_DRYWT	UJ	0.104	MG/KG_DRYWT	D	
2,2',3,4,4',5'-Hexacb (PCB 138)	5.467	MG/KG_DRYWT	D	0.722	MG/KG_DRYWT	D	0.052	MG/KG_DRYWT	UJ	0.6	MG/KG_DRYWT	D	
2,2',4,4',5,5'-Hexacb (PCB 153)	8.997	MG/KG_DRYWT	D	0.859	MG/KG_DRYWT	Dp	1.571	MG/KG_DRYWT	D	0.859	MG/KG_DRYWT	D	
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.226	MG/KG_DRYWT	DU	0.084	MG/KG_DRYWT	D	0.052	MG/KG_DRYWT	UJ	0.072	MG/KG_DRYWT	D	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.226	MG/KG_DRYWT	DU	0.145	MG/KG_DRYWT	D	0.052	MG/KG_DRYWT	UJ	0.106	MG/KG_DRYWT	D	
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.226	MG/KG_DRYWT	DU	0.082	MG/KG_DRYWT	D	0.052	MG/KG_DRYWT	UJ	0.072	MG/KG_DRYWT	D	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.226	MG/KG_DRYWT	DU	0.057	MG/KG_DRYWT	Dp	0.052	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.226	MG/KG_DRYWT	DU	0.145	MG/KG_DRYWT	D	0.052	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	
Decacb - Congener (PCB 209)	0.226	MG/KG_DRYWT	DU	0.12	MG/KG_DRYWT	D	0.052	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	
Total MonoCB													
Total DiCB													
Total TriCB													
Total TetraCB													
Total PentaCB			1						1				
Total HexaCB													
Total HeptaCB													
Total OctaCB													
Total NonaCB													
DecaCB													
Total PCB Congeners (sum CONG x 2.6)	220	MG/KG_DRYWT		16	MG/KG_DRYWT		38	MG/KG_DRYWT		25	MG/KG_DRYWT		
Total PCB Homologues (sum HOM)													
						_	_			_			

Station ID	ВН3			ВН3			ВН3			ВН3			
Collection Date		1	1/29/07		,	11/29/07		1	1/29/07	7	1	1/29/07	
Fraction	TOTAL			TOTAL	TOTAL TO					TOTAL			
QC Code	REP			SA			REP			SA			
Samp ID	S-07D-0BH3-10-20-REP S-			S-07D-0	S-07D-0BH3-10-20 S-0			S-07D-0BH3-20-30-REP			S-07D-0BH3-20-30		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	0.014	MG/KG_DRYWT	Dp	0.001	MG/KG_DRYWT	D	0.00054	MG/KG_DRYWT	Dp	0.0015	MG/KG_DRYWT	Dp	
2,2',5-Tricb (PCB 18)	0.0028	MG/KG_DRYWT	D	0.0016	MG/KG_DRYWT	D	0.00037	MG/KG_DRYWT	D	0.0012	MG/KG_DRYWT	D	
2,4,4'-Tricb (PCB 28)	0.008	MG/KG_DRYWT	D	0.0026	MG/KG_DRYWT	D	0.0013	MG/KG_DRYWT	D	0.0014	MG/KG_DRYWT	D	
2,2',3,5'-Tetracb (PCB 44)	0.0066	MG/KG_DRYWT	D	0.0019	MG/KG_DRYWT	Dp	0.0002	MG/KG_DRYWT	UJ	0.0004	MG/KG_DRYWT	Dp	
2,2',5,5'-Tetracb (PCB 52)	0.0097	MG/KG_DRYWT	D	0.0043	MG/KG_DRYWT	D	0.0028	MG/KG_DRYWT	Dp	0.0028	MG/KG_DRYWT	Dp	
2,3',4,4'-Tetracb (PCB 66)	0.006	MG/KG_DRYWT	D	0.0022	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	
2,2',4,5,5'-Pentacb (PCB 101)	0.0064	MG/KG_DRYWT	D	0.0017	MG/KG_DRYWT	D	0.00021	MG/KG_DRYWT	Dp	0.0002	MG/KG_DRYWT	UJ	
2,3,3',4,4'-Pentacb (PCB 105)	0.0012	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	UJ	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	
2,3',4,4',5-Pentacb (PCB 118)	0.009	MG/KG_DRYWT	D	0.0037	MG/KG_DRYWT	D	0.00099	MG/KG_DRYWT	D	0.0007	MG/KG_DRYWT	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	0.00033	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	UJ	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	
2,2',3,4,4',5'-Hexacb (PCB 138)	0.004	MG/KG_DRYWT	D	0.0016	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	
2,2',4,4',5,5'-Hexacb (PCB 153)	0.0062	MG/KG_DRYWT	D	0.0018	MG/KG_DRYWT	D	0.00059	MG/KG_DRYWT	Dp	0.0002	MG/KG_DRYWT	UJ	
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.00033	MG/KG_DRYWT	Dp	0.0002	MG/KG_DRYWT	UJ	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.00048	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	UJ	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.00026	MG/KG_DRYWT	Dp	0.0002	MG/KG_DRYWT	UJ	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	
Decacb - Congener (PCB 209)	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	
Total MonoCB													
Total DiCB													
Total TriCB													
Total TetraCB													
Total PentaCB													
Total HexaCB													
Total HeptaCB													
Total OctaCB													
Total NonaCB													
DecaCB													
Total PCB Congeners (sum CONG x 2.6)	0.2	MG/KG_DRYWT		0.058	MG/KG_DRYWT		0.018	MG/KG_DRYWT		0.021	MG/KG_DRYWT		
Total PCB Homologues (sum HOM)													

Station ID	BH6			BH6			BH6			ВН7			
Collection Date		1	11/29/07		1	1/29/07	7	,	11/29/07	•	,	11/29/07	
Fraction	TOTAL			TOTAL			TOTAL			TOTAL			
QC Code	SA			SA			SA			SA			
Samp ID	S-07D-0	-07D-0BH6-00-10 S			BH6-10-20		S-07D-0B	H6-20-30		S-07D-0BH7-00-10			
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	5.299	MG/KG_DRYWT	D	0.221	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	0.509	MG/KG_DRYWT	Dp	
2,2',5-Tricb (PCB 18)	9.822	MG/KG_DRYWT	D	0.221	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	0.401	MG/KG_DRYWT	D	
2,4,4'-Tricb (PCB 28)	19.28	MG/KG_DRYWT	D	0.221	MG/KG_DRYWT	DU	0.0078	MG/KG_DRYWT	D	0.866	MG/KG_DRYWT	D	
2,2',3,5'-Tetracb (PCB 44)	12.31	MG/KG_DRYWT	D	4.096	MG/KG_DRYWT	D	0.012	MG/KG_DRYWT	D	0.561	MG/KG_DRYWT	D	
2,2',5,5'-Tetracb (PCB 52)	19.94	MG/KG_DRYWT	D	11.23	MG/KG_DRYWT	D	0.025	MG/KG_DRYWT	D	1.153	MG/KG_DRYWT	D	
2,3',4,4'-Tetracb (PCB 66)	7.558	MG/KG_DRYWT	D	3.254	MG/KG_DRYWT	D	0.02	MG/KG_DRYWT	Dp	0.414	MG/KG_DRYWT	D	
2,2',4,5,5'-Pentacb (PCB 101)	6.118	MG/KG_DRYWT	D	9.067	MG/KG_DRYWT	D	0.019	MG/KG_DRYWT	Dp	0.777	MG/KG_DRYWT	D	
2,3,3',4,4'-Pentacb (PCB 105)	1.35	MG/KG_DRYWT	D	0.221	MG/KG_DRYWT	DU	0.0086	MG/KG_DRYWT	D	0.19	MG/KG_DRYWT	D	
2,3',4,4',5-Pentacb (PCB 118)	5.055	MG/KG_DRYWT	D	7.461	MG/KG_DRYWT	D	0.033	MG/KG_DRYWT	D	0.701	MG/KG_DRYWT	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	0.11	MG/KG_DRYWT	DU	0.221	MG/KG_DRYWT	DU	0.0037	MG/KG_DRYWT	D	0.102	MG/KG_DRYWT	D	
2,2',3,4,4',5'-Hexacb (PCB 138)	3.079	MG/KG_DRYWT	D	3.958	MG/KG_DRYWT	D	0.016	MG/KG_DRYWT	D	0.54	MG/KG_DRYWT	D	
2,2',4,4',5,5'-Hexacb (PCB 153)	4.347	MG/KG_DRYWT	D	6.839	MG/KG_DRYWT	D	0.019	MG/KG_DRYWT	D	0.722	MG/KG_DRYWT	D	
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.11	MG/KG_DRYWT	DU	0.221	MG/KG_DRYWT	DU	0.0016	MG/KG_DRYWT	D	0.058	MG/KG_DRYWT	D	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.11	MG/KG_DRYWT	DU	0.221	MG/KG_DRYWT	DU	0.002	MG/KG_DRYWT	Dp	0.088	MG/KG_DRYWT	D	
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.11	MG/KG_DRYWT	DU	0.221	MG/KG_DRYWT	DU	0.0028	MG/KG_DRYWT	Dp	0.053	MG/KG_DRYWT	D	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.11	MG/KG_DRYWT	DU	0.221	MG/KG_DRYWT	DU	0.0038	MG/KG_DRYWT	Dp	0.011	MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.11	MG/KG_DRYWT	DU	0.221	MG/KG_DRYWT	DU	0.0091	MG/KG_DRYWT	D	0.018	MG/KG_DRYWT	D	
Decacb - Congener (PCB 209)	0.11	MG/KG_DRYWT	DU	0.221	MG/KG_DRYWT	DU	0.0095	MG/KG_DRYWT	D	0.005	MG/KG_DRYWT	DpJ	
Total MonoCB													
Total DiCB													
Total TriCB													
Total TetraCB													
Total PentaCB													
Total HexaCB													
Total HeptaCB													
Total OctaCB													
Total NonaCB													
DecaCB													
Total PCB Congeners (sum CONG x 2.6)	250	MG/KG_DRYWT		120	MG/KG_DRYWT		0.5	MG/KG_DRYWT		19	MG/KG_DRYWT		
Total PCB Homologues (sum HOM)													

APPENDIX B

2007 Boat House Sediment PCB Analytical Results

Station ID	BH7			BH7			BH10			BH10			
Collection Date		1	1/29/07		11	1/29/07		1	1/29/07		1	1/29/07	
Fraction	TOTAL			TOTAL			TOTAL			TOTAL			
QC Code	SA			SA			SA			SA			
Samp ID	S-07D-0BH	7-10-20		S-07D-0	3H7-20-30		S-07D-BI	H10-00-10		S-07D-BI	H10-10-20		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	0.002	MG/KG_DRYWT	Dp	0.00019	MG/KG_DRYWT	DU	0.419	MG/KG_DRYWT	Dp	0.011	MG/KG_DRYWT	DU	
2,2',5-Tricb (PCB 18)	0.0048	MG/KG_DRYWT	D	0.00019	MG/KG_DRYWT	DU	0.569	MG/KG_DRYWT	D	0.011	MG/KG_DRYWT	DU	
2,4,4'-Tricb (PCB 28)	0.0082	MG/KG_DRYWT	D	0.00082	MG/KG_DRYWT	Dp	1.223	MG/KG_DRYWT	D	0.035	MG/KG_DRYWT	D	
2,2',3,5'-Tetracb (PCB 44)	0.0062	MG/KG_DRYWT	D	0.00019	MG/KG_DRYWT	DU	0.847	MG/KG_DRYWT	D	0.019	MG/KG_DRYWT	D	
2,2',5,5'-Tetracb (PCB 52)	0.016	MG/KG_DRYWT	D	0.0025	MG/KG_DRYWT	D	1.91	MG/KG_DRYWT	D	0.053	MG/KG_DRYWT	D	
2,3',4,4'-Tetracb (PCB 66)	0.0054	MG/KG_DRYWT	D	0.0004	MG/KG_DRYWT	Dp	0.749	MG/KG_DRYWT	D	0.013	MG/KG_DRYWT	D	
2,2',4,5,5'-Pentacb (PCB 101)	0.011	MG/KG_DRYWT	D	0.00019	MG/KG_DRYWT	DU	1.856	MG/KG_DRYWT	D	0.061	MG/KG_DRYWT	D	
2,3,3',4,4'-Pentacb (PCB 105)	0.003	MG/KG_DRYWT	D	0.00019	MG/KG_DRYWT	DU	0.273	MG/KG_DRYWT	D	0.00088	MG/KG_DRYWT	DpJ	
2,3',4,4',5-Pentacb (PCB 118)	0.012	MG/KG_DRYWT	D	0.00084	MG/KG_DRYWT	Dp	1.67	MG/KG_DRYWT	D	0.061	MG/KG_DRYWT	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	0.0019	MG/KG_DRYWT	D	0.00019	MG/KG_DRYWT	DU	0.165	MG/KG_DRYWT	D	0.011	MG/KG_DRYWT	DU	
2,2',3,4,4',5'-Hexacb (PCB 138)	0.009	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	DU	0.842	MG/KG_DRYWT	D	0.029	MG/KG_DRYWT	D	
2,2',4,4',5,5'-Hexacb (PCB 153)	0.012	MG/KG_DRYWT	D	0.00019	MG/KG_DRYWT	DU	1.23	MG/KG_DRYWT	D	0.041	MG/KG_DRYWT	D	
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.00086	MG/KG_DRYWT	D	0.00019	MG/KG_DRYWT	DU	0.096	MG/KG_DRYWT	D	0.011	MG/KG_DRYWT	DU	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.0014	MG/KG_DRYWT	D	0.00019	MG/KG_DRYWT	DU	0.152	MG/KG_DRYWT	D	0.011	MG/KG_DRYWT	DU	
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.00071	MG/KG_DRYWT	D	0.00019	MG/KG_DRYWT	DU	0.1	MG/KG_DRYWT	D	0.011	MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.0004	MG/KG_DRYWT	Dp	0.00019	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.0009	MG/KG_DRYWT	D	0.00019	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	
Decacb - Congener (PCB 209)	0.00089	MG/KG_DRYWT	Dp	0.00019	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	
Total MonoCB													
Total DiCB													
Total TriCB													
Total TetraCB													
Total PentaCB													
Total HexaCB													
Total HeptaCB													
Total OctaCB													
Total NonaCB													
DecaCB													
Total PCB Congeners (sum CONG x 2.6)	0.25	MG/KG_DRYWT		0.012	MG/KG_DRYWT		32	MG/KG_DRYWT		0.82	MG/KG_DRYWT		
Total PCB Homologues (sum HOM)													

APPENDIX B

2007 Boat House Sediment PCB Analytical Results

Station ID	BH10			BH4			BH4			BH4			
Collection Date		1	1/29/07	•	1	1/30/07		1	1/30/07	,	1	1/30/07	
Fraction	TOTAL			TOTAL			TOTAL			TOTAL			
QC Code	SA			SA			SA			SA			
Samp ID	S-07D-BH	10-20-28		S-07D-0	BH4-00-10		S-07D-0E	S-07D-0BH4-10-20		S-07D-0B			
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
2,4'-Dicb (PCB 8)	0.002	MG/KG_DRYWT	Dp	0.214	MG/KG_DRYWT	D	0.071	MG/KG_DRYWT	D	0.031	MG/KG_DRYWT	Dp	
2,2',5-Tricb (PCB 18)	0.0014	MG/KG_DRYWT	D	0.474	MG/KG_DRYWT	D	0.196	MG/KG_DRYWT	D	0.076	MG/KG_DRYWT	D	
2,4,4'-Tricb (PCB 28)	0.0018	MG/KG_DRYWT	D	1.076	MG/KG_DRYWT	D		MG/KG_DRYWT			MG/KG_DRYWT		
2,2',3,5'-Tetracb (PCB 44)	0.00053	MG/KG_DRYWT	Dp	0.756	MG/KG_DRYWT	D	0.234	MG/KG_DRYWT	D	0.121	MG/KG_DRYWT	D	
2,2',5,5'-Tetracb (PCB 52)	0.0024	MG/KG_DRYWT	Dp	1.103	MG/KG_DRYWT	D	0.328	MG/KG_DRYWT	D	0.159	MG/KG_DRYWT	D	
2,3',4,4'-Tetracb (PCB 66)	0.00019	MG/KG_DRYWT	DU	0.927	MG/KG_DRYWT	D	0.223	MG/KG_DRYWT	D	0.171	MG/KG_DRYWT	D	
2,2',4,5,5'-Pentacb (PCB 101)	0.00019	MG/KG_DRYWT	DU	1.655	MG/KG_DRYWT	D	0.311	MG/KG_DRYWT	D	0.24	MG/KG_DRYWT	D	
2,3,3',4,4'-Pentacb (PCB 105)	0.00019	MG/KG_DRYWT	DU	0.575	MG/KG_DRYWT	D	0.078	MG/KG_DRYWT	D	0.055	MG/KG_DRYWT	D	
2,3',4,4',5-Pentacb (PCB 118)	0.0007	MG/KG_DRYWT	Dp	1.647	MG/KG_DRYWT	D	0.23	MG/KG_DRYWT	D	0.198	MG/KG_DRYWT	D	
2,2',3,3',4,4'-Hexacb (PCB 128)	0.00019	MG/KG_DRYWT	DU	0.281	MG/KG_DRYWT	D	0.023	MG/KG_DRYWT	D	0.012	MG/KG_DRYWT	D	
2,2',3,4,4',5'-Hexacb (PCB 138)	0.00019	MG/KG_DRYWT	DU	1.469	MG/KG_DRYWT	D	0.184	MG/KG_DRYWT	D	0.153	MG/KG_DRYWT	D	
2,2',4,4',5,5'-Hexacb (PCB 153)	0.00019	MG/KG_DRYWT	DU	1.657	MG/KG_DRYWT	Dp	0.212	MG/KG_DRYWT	Dp	0.19	MG/KG_DRYWT	Dp	
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.00019	MG/KG_DRYWT	DU	0.151	MG/KG_DRYWT	D	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.00019	MG/KG_DRYWT	DU	0.184	MG/KG_DRYWT	D	0.0023	MG/KG_DRYWT	DpJ	0.00053	MG/KG_DRYWT	DpJ	
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.00019	MG/KG_DRYWT	DU	0.073	MG/KG_DRYWT	D	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.00019	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.00019	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	
Decacb - Congener (PCB 209)	0.00019	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	
Total MonoCB													
Total DiCB													
Total TriCB													
Total TetraCB													
Total PentaCB													
Total HexaCB													
Total HeptaCB													
Total OctaCB													
Total NonaCB													
DecaCB													
Total PCB Congeners (sum CONG x 2.6)	0.023	MG/KG_DRYWT		32	MG/KG_DRYWT		6.4	MG/KG_DRYWT		4.2	MG/KG_DRYWT		
Total PCB Homologues (sum HOM)													

APPENDIX B

2007 Boat House Sediment PCB Analytical Results

Station ID	BH5			BH5			BH5			BH8		
Collection Date		1	1/30/07		,	11/30/07		1	1/30/07	,	1	1/30/07
Fraction	TOTAL			TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA			SA		
Samp ID	S-07D-0BI	H5-00-10		S-07D-0E	3H5-10-20		S-07D-0B	H5-20-30		S-07D-0E	3H8-00-10	
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
2,4'-Dicb (PCB 8)	0.458	MG/KG_DRYWT	D	0.0048	MG/KG_DRYWT	D	0.00076	MG/KG_DRYWT	Dp	0.01	MG/KG_DRYWT	DU
2,2',5-Tricb (PCB 18)	0.778	MG/KG_DRYWT	D	0.0098	MG/KG_DRYWT	D	0.0011	MG/KG_DRYWT	D	0.02	MG/KG_DRYWT	Dp
2,4,4'-Tricb (PCB 28)	1.248	MG/KG_DRYWT	D	0.018	MG/KG_DRYWT	D	0.0021	MG/KG_DRYWT	D	0.091	MG/KG_DRYWT	D
2,2',3,5'-Tetracb (PCB 44)	0.936	MG/KG_DRYWT	D	0.012	MG/KG_DRYWT	D	0.0011	MG/KG_DRYWT	D	0.057	MG/KG_DRYWT	Dp
2,2',5,5'-Tetracb (PCB 52)	2.041	MG/KG_DRYWT	D	0.021	MG/KG_DRYWT	D	0.0035	MG/KG_DRYWT	Dp	0.121	MG/KG_DRYWT	D
2,3',4,4'-Tetracb (PCB 66)	0.825	MG/KG_DRYWT	D	0.014	MG/KG_DRYWT	D	0.0024	MG/KG_DRYWT	Dp	0.083	MG/KG_DRYWT	D
2,2',4,5,5'-Pentacb (PCB 101)	1.59	MG/KG_DRYWT	D	0.016	MG/KG_DRYWT	D	0.00087	MG/KG_DRYWT	D	0.056	MG/KG_DRYWT	D
2,3,3',4,4'-Pentacb (PCB 105)	0.228	MG/KG_DRYWT	D	0.004	MG/KG_DRYWT	D	0.00019	MG/KG_DRYWT	DU	0.013	MG/KG_DRYWT	Dp
2,3',4,4',5-Pentacb (PCB 118)	1.091	MG/KG_DRYWT	D	0.018	MG/KG_DRYWT	D	0.0021	MG/KG_DRYWT	D	0.057	MG/KG_DRYWT	D
2,2',3,3',4,4'-Hexacb (PCB 128)	0.121	MG/KG_DRYWT	D	0.0016	MG/KG_DRYWT	D	0.00019	MG/KG_DRYWT	DU	0.01	MG/KG_DRYWT	DU
2,2',3,4,4',5'-Hexacb (PCB 138)	0.652	MG/KG_DRYWT	D	0.0099	MG/KG_DRYWT	D	0.00051	MG/KG_DRYWT	D	0.032	MG/KG_DRYWT	D
2,2',4,4',5,5'-Hexacb (PCB 153)	0.95	MG/KG_DRYWT	D	0.015	MG/KG_DRYWT	D	0.00084	MG/KG_DRYWT	D	0.035	MG/KG_DRYWT	D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.117	MG/KG_DRYWT	D	0.0011	MG/KG_DRYWT	D	0.00019	MG/KG_DRYWT	DU	0.01	MG/KG_DRYWT	DU
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.133	MG/KG_DRYWT	D	0.0016	MG/KG_DRYWT	D	0.00019	MG/KG_DRYWT	DU	0.01	MG/KG_DRYWT	DU
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.075	MG/KG_DRYWT	D	0.001	MG/KG_DRYWT	D	0.00019	MG/KG_DRYWT	DU	0.01	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.0068	MG/KG_DRYWT	DpJ	0.0002	MG/KG_DRYWT	DU	0.00019	MG/KG_DRYWT	DU	0.01	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.012	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	DU	0.00019	MG/KG_DRYWT	DU	0.01	MG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.011	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	0.00019	MG/KG_DRYWT	DU	0.01	MG/KG_DRYWT	DU
Total MonoCB										0.042	MG/KG_DRYWT	U
Total DiCB										0.038	MG/KG_DRYWT	J
Total TriCB										0.405	MG/KG_DRYWT	
Total TetraCB										0.827	MG/KG_DRYWT	
Total PentaCB										0.669	MG/KG_DRYWT	
Total HexaCB										0.222	MG/KG_DRYWT	J
Total HeptaCB										0.048	MG/KG_DRYWT	J
Total OctaCB										0.209	MG/KG_DRYWT	U
Total NonaCB										0.063	MG/KG_DRYWT	U
DecaCB										0.021	MG/KG_DRYWT	DU
Total PCB Congeners (sum CONG x 2.6)	29	MG/KG_DRYWT		0.38	MG/KG_DRYWT		0.04	MG/KG_DRYWT		1.5	MG/KG_DRYWT	
Total PCB Homologues (sum HOM)											MG/KG_DRYWT	

Qualifiers:

D Result from dilution run. Result from initial run outside linear range of instrument
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- J Result is estimated. Analyte detected below the sample specific reporting limit
- U Analyte not detected at the sample specific reporting limit
- p Relative percent difference (RPD) between values obtained from the dual columns is >40%

Appendix C VOC Analytical Data



APPENDIX C

Station ID	AA22-F07			AA22					
Collection Date			12/11/07			12/11/07			12/11/0
Fraction	TOTAL			TOTAL			TOTAL		
QC Code	SA			REP			ТВ		
Samp ID	S-07D-AA22	2-02-03		S-07D-AA22	-02-03-REP		Trip Blank		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
Acetone	0.155	MG/KG_DRYWT	UJ	0.265	MG/KG_DRYWT	U	0.028	MG/KG_DRYWT	
Benzene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Bromobenzene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Bromodichloromethane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Bromoform	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Bromomethane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Carbon Disulfide	0.014	MG/KG_DRYWT		0.021	MG/KG_DRYWT		0.002	MG/KG_DRYWT	U
Carbon Tetrachloride	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Chlorobenzene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Chloroethane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Chloroform	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Chloromethane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U		MG/KG_DRYWT	U
Cis-1,2-Dichloroethene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Cis-1,3-Dichloropropene	0.0035	MG/KG_DRYWT	R	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Dibromochloromethane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Dibromomethane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Dichlorodifluoromethane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Ethylbenzene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Hexachlorobutadiene	0.0035	MG/KG_DRYWT	R	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Isopropylbenzene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Methylene Chloride	0.0088	MG/KG_DRYWT	UJ	0.0094	MG/KG_DRYWT	U	0.0015	MG/KG_DRYWT	j
Methyl-Tert-Butyl-Ether (Mtbe)	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Naphthalene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
N-Butylbenzene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
N-Propylbenzene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
O-Xylene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
P-Isopropyltoluene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
P/M Xylene	0.007	MG/KG_DRYWT	UJ	0.0075	MG/KG_DRYWT	U	0.004	MG/KG_DRYWT	U
Sec-Butylbenzene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Styrene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Tert-Butylbenzene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Tetrachloroethene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Toluene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Trans-1,2-Dichloroethene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Trans-1,3-Dichloropropene		MG/KG_DRYWT	R		MG/KG_DRYWT	U		MG/KG_DRYWT	U
Trichloroethene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
			_		MG/KG DRYWT	U		MG/KG DRYWT	U

APPENDIX C

Station ID	AA22-F07			AA22					
Collection Date			12/11/07			12/11/07			12/11/07
Fraction	TOTAL			TOTAL			TOTAL		
QC Code	SA			REP			ТВ		
Samp ID	S-07D-AA22	-02-03		S-07D-AA22	-02-03-REP		Trip Blank		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
Vinyl Acetate	0.0035	MG/KG_DRYWT	R	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
Vinyl Chloride	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,1-Dichloroethane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,1-Dichloroethene	0.0035	MG/KG_DRYWT	UJ		MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,1-Dichloropropene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,1,1-Trichloroethane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,1,1,2-Tetrachloroethane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,1,2-Trichloroethane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,1,2,2-Tetrachloroethane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,2-Dibromoethane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,2-Dibromo-3-Chloropropane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,2-Dichlorobenzene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,2-Dichloroethane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,2-Dichloropropane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,2,3-Trichlorobenzene	0.0035	MG/KG_DRYWT	R	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,2,3-Trichloropropane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,2,4-Trichlorobenezene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	UJ	0.002	MG/KG_DRYWT	U
1,2,4-Trimethylbenzene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,3-Dichlorobenzene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,3-Dichloropropane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,3,5-Trimethylbenzene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
1,4-Dichlorobenzene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
2-Butanone	0.029	MG/KG_DRYWT		0.051	MG/KG_DRYWT		0.002	MG/KG_DRYWT	U
2-Chloroethyl Vinyl Ether	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
2-Chlorotoluene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U		MG/KG_DRYWT	U
2-Hexanone	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U		MG/KG_DRYWT	U
2,2-Dichloropropane	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
4-Chlorotoluene	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U
4-Methyl-2-Pentanone	0.0035	MG/KG_DRYWT	UJ	0.0038	MG/KG_DRYWT	U	0.002	MG/KG_DRYWT	U

Qualifiers:

J Result is estimated

R Result is rejected

U Analyte not detected at the sample specific reporting limit



Appendix D

Grain Size and Total Organic Carbon Analytical Data



Station ID	N14-F07			l1			I4-F07		
Collection Date			11/5/07	,		11/6/07			11/6/07
Fraction	TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA		
Samp ID	S-07D-0N	14-00-05		S-07D-00	l1-00-05		S-07D-00	014-00-07	
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
Ratio of clay to total sample wt (FRAC_CLAY).	24.29	PCT		29.35	PCT		30.66	PCT	
Ratio of silt to total sample wt (FRAC_SILT)	53.83	PCT		58.42	PCT		48.22	PCT	
Ratio of sand to total sample wt (FRAC_SAND)	21.88	PCT		12.23	PCT		21.12	PCT	
Ratio of gravel to total sample wt (FRAC_GRAV)	0	PCT		0	PCT		0	PCT	
Total Organic Carbon (TOC)	8.28	PCT		9.49	PCT		7.55	PCT	

Station ID	K2			N4-F07			O1		
Collection Date			11/6/07			11/6/07			11/6/07
Fraction	TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA		
Samp ID	S-07D-00	K2-00-08		S-07D-00	0N4-00-06		S-07D-00	OO1-00-06	
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
Ratio of clay to total sample wt (FRAC_CLAY).	21.75	PCT		20.63	PCT		26.51	PCT	
Ratio of silt to total sample wt (FRAC_SILT)	35.86	PCT		58.39	PCT		40.24	PCT	
Ratio of sand to total sample wt (FRAC_SAND)	42.39	PCT		20.98	PCT		33.25	PCT	
Ratio of gravel to total sample wt (FRAC_GRAV)	0	PCT		0	PCT		0	PCT	
Total Organic Carbon (TOC)	5.2	PCT		6.71	PCT		10.02	PCT	

Station ID	Q9			J14			K5			
Collection Date			11/6/07	7		11/6/07	•		11/8/07	
Fraction	TOTAL			TOTAL			TOTAL			
QC Code	SA			SA			SA			
Samp ID	S-07D-00	Q9-00-05		S-07D-0	J14-00-06		S-07D-00			
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
Ratio of clay to total sample wt (FRAC_CLAY).	30.05	PCT		24.94	PCT		23.93	PCT		
Ratio of silt to total sample wt (FRAC_SILT)	57.52	PCT		62.11	PCT		47.93	PCT		
Ratio of sand to total sample wt (FRAC_SAND)	12.43	PCT		12.95	PCT		27.51	PCT		
Ratio of gravel to total sample wt (FRAC_GRAV)	0	PCT		0	PCT		0.63	PCT		
Total Organic Carbon (TOC)	7.61	PCT		7.99	PCT		8.21	PCT		

Station ID	J10				J10			K21		
Collection Date				11/8/07			11/8/07	,		11/8/07
Fraction	TOTAL				TOTAL			TOTAL		
QC Code	REP				SA			SA		
Samp ID	S-07D-0	J10-00-07	-REP		S-07D-0	J10-00-07		S-07D-0k	(21-00-12	
Analyte	Result		Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
Ratio of clay to total sample wt (FRAC_CLAY).	26.04	PCT			22.31	PCT		25.82	PCT	
Ratio of silt to total sample wt (FRAC_SILT)	61.14	PCT			55.13	PCT		47.53	PCT	
Ratio of sand to total sample wt (FRAC_SAND)	11.16	PCT			22.56	PCT		26.65	PCT	
Ratio of gravel to total sample wt (FRAC_GRAV)	1.66	PCT			0	PCT		0	PCT	
Total Organic Carbon (TOC)	11.02	PCT			8.65	PCT		3.9	PCT	

Station ID	M17			WW24			WW41		
Collection Date			11/8/07	,		11/14/07			11/14/07
Fraction	TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA		
Samp ID	S-07D-0I	M17-00-06		S-07D-W	W24-00-08		S-07D-W	W41-00-06	
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
Ratio of clay to total sample wt (FRAC_CLAY).	26.28	PCT		31.25	PCT		12.82	PCT	
Ratio of silt to total sample wt (FRAC_SILT)	57.62	PCT		38.45	PCT		20.67	PCT	
Ratio of sand to total sample wt (FRAC_SAND)	16.1	PCT		30.2	PCT		63.14	PCT	
Ratio of gravel to total sample wt (FRAC_GRAV)	0	PCT		0.1	PCT		3.37	PCT	
Total Organic Carbon (TOC)	7.74	PCT		4.97	PCT		2.64	PCT	

Station ID	YY32			BBB23			OO26			
Collection Date			11/14/07			11/16/07			11/16/07	
Fraction	TOTAL			TOTAL			TOTAL			
QC Code	SA			SA			SA			
Samp ID	S-07D-Y	Y32-00-02		S-07D-BBB2	23-00-09		S-07D-0	O26-00-07		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
Ratio of clay to total sample wt (FRAC_CLAY).	14.46	PCT		2.89	PCT		35.79	PCT		
Ratio of silt to total sample wt (FRAC_SILT)	15.98	PCT		4.17	PCT		46.42	PCT		
Ratio of sand to total sample wt (FRAC_SAND)	66.82	PCT		86.07	PCT		15.59	PCT		
Ratio of gravel to total sample wt (FRAC_GRAV)	2.74	PCT		6.87	PCT		2.2	PCT		
Total Organic Carbon (TOC)	1.56	PCT		0.57	PCT		6.04	PCT		

Station ID	0032			OO38			SS29			
Collection Date			11/16/07	•		11/16/07	,		11/16/07	
Fraction	TOTAL			TOTAL			TOTAL			
QC Code	SA			SA			SA			
Samp ID	S-07D-O	S-07D-OO32-00-08			S-07D-OO38-00-05			S-07D-SS29-00-07		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
Ratio of clay to total sample wt (FRAC_CLAY).	31.58	PCT		39.52	PCT		33.42	PCT		
Ratio of silt to total sample wt (FRAC_SILT)	51.73	PCT		47.64	PCT		46.75	PCT		
Ratio of sand to total sample wt (FRAC_SAND)	11.56	PCT		12.84	PCT		18.46	PCT		
Ratio of gravel to total sample wt (FRAC_GRAV)	5.13	PCT		0	PCT		1.37	PCT		
Total Organic Carbon (TOC)	5.47	PCT		4.5	PCT		5.4	PCT		

Station ID	VV34			DD22			GG29			
Collection Date			11/16/07	1		11/20/07	·		11/20/07	
Fraction	TOTAL		TOTAL	TOTAL			TOTAL			
QC Code	SA		SA	SA			SA			
Samp ID	S-07D-V	S-07D-VV34-00-10			S-07D-DD22-00-11			S-07D-GG29-00-06		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
Ratio of clay to total sample wt (FRAC_CLAY).	37.06	PCT		32.77	PCT		34.42	PCT		
Ratio of silt to total sample wt (FRAC_SILT)	45.99	PCT		59.36	PCT		48.65	PCT		
Ratio of sand to total sample wt (FRAC_SAND)	16.95	PCT		7.87	PCT		16.93	PCT		
Ratio of gravel to total sample wt (FRAC_GRAV)	0	PCT		0	PCT		0	PCT		
Total Organic Carbon (TOC)	6.38	PCT		8.7	PCT		10.64	PCT		

Station ID	GG33-F0)7			HH22			1125		
Collection Date				11/20/07			11/20/07	7		11/20/07
Fraction	TOTAL				TOTAL			TOTAL		
QC Code	SA				SA			SA		
Samp ID	S-07D-G	G33-00-0)6		S-07D-HI	H22-00-10		S-07D-II2	25-00-04	
Analyte	Result		Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
Ratio of clay to total sample wt (FRAC_CLAY).	37.29	PCT			36.64	PCT		35.84	PCT	
Ratio of silt to total sample wt (FRAC_SILT)	49.46	PCT			59.61	PCT		47.22	PCT	
Ratio of sand to total sample wt (FRAC_SAND)	13.04	PCT			3.66	PCT		14.16	PCT	
Ratio of gravel to total sample wt (FRAC_GRAV)	0.21	PCT			0.09	PCT		2.78	PCT	
Total Organic Carbon (TOC)	5.45	PCT			6.81	PCT		5.44	PCT	

Station ID	II36			KK32-F0	7		LL40			
Collection Date			11/20/07	,		11/20/07			11/20/07	
Fraction	TOTAL			TOTAL			TOTAL			
QC Code	SA	SA			SA			SA		
Samp ID	S-07D-II	S-07D-II36-00-06			S-07D-KK32-00-09			S-07D-LL40-00-03		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	
Ratio of clay to total sample wt (FRAC_CLAY).	34.73	PCT		36.32	PCT		27.07	PCT		
Ratio of silt to total sample wt (FRAC_SILT)	58.26	PCT		58.72	PCT		56.41	PCT		
Ratio of sand to total sample wt (FRAC_SAND)	7.01	PCT		4.96	PCT		15.07	PCT		
Ratio of gravel to total sample wt (FRAC_GRAV)	0	PCT		0	PCT		1.45	PCT		
Total Organic Carbon (TOC)	6.95	PCT		6.07	PCT		4.53	PCT		

Station ID	MM22			MM29			DD31-F0	7	
Collection Date			11/20/07			11/20/07			11/28/07
Fraction	TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA		
Samp ID	S-07D-MM22-00-05			S-07D-MM29-00-09			S-07D-DD31-00-10		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
Ratio of clay to total sample wt (FRAC_CLAY).	37	PCT		35.46	PCT		35.86	PCT	
Ratio of silt to total sample wt (FRAC_SILT)	59.25	PCT		55.43	PCT		56.84	PCT	
Ratio of sand to total sample wt (FRAC_SAND)	3.75	PCT		7.88	PCT		4.95	PCT	
Ratio of gravel to total sample wt (FRAC_GRAV)	0	PCT		1.23	PCT		2.35	PCT	
Total Organic Carbon (TOC)	6.19	PCT		6.08	PCT		11.36	PCT	

Station ID	DD36			DD36			EE41		
Collection Date			11/28/07	,		11/28/07			11/28/07
Fraction	TOTAL			TOTAL			TOTAL		
QC Code	SA			REP			SA		
Samp ID	S-07D-DI	D36-00-10		S-07D-D	D36-00-11-REP		S-07D-E	E41-00-14	
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
Ratio of clay to total sample wt (FRAC_CLAY).	36.04	PCT		34.05	PCT		40.24	PCT	
Ratio of silt to total sample wt (FRAC_SILT)	59.14	PCT		61.67	PCT		54.23	PCT	
Ratio of sand to total sample wt (FRAC_SAND)	4.82	PCT		3.65	PCT		5.53	PCT	
Ratio of gravel to total sample wt (FRAC_GRAV)	0	PCT		0.63	PCT		0	PCT	
Total Organic Carbon (TOC)	12.5	PCT		11.6	PCT		11.47	PCT	

Station ID	AA22			AA22-F0	7	
Collection Date			12/11/07	•		12/11/07
Fraction	TOTAL			TOTAL		
QC Code	REP			SA		
Samp ID	S-07D-A	A22-10-20-REP		S-07D-A		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ
Ratio of clay to total sample wt (FRAC_CLAY).	25.4	PCT		26.77	PCT	
Ratio of silt to total sample wt (FRAC_SILT)	60.4	PCT		60.07	PCT	
Ratio of sand to total sample wt (FRAC_SAND)	14.2	PCT		13.16	PCT	
Ratio of gravel to total sample wt (FRAC_GRAV)	0	PCT		0	PCT	
Total Organic Carbon (TOC)	14.64	PCT		14.89	PCT	



Contract No. DACW33-03-D-0004

Delivery Order No. 22

June 2008

FINAL Water Quality Monitoring Summary Report 2007 Remedial Dredging





Environmental Monitoring, Sampling, and Analysis

New Bedford Harbor Superfund Site New Bedford Harbor, MA

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Environmental Monitoring, Sampling, and Analysis New Bedford Harbor Superfund Site New Bedford Harbor, MA

Submitted to:

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BattelleThe Business of Innovation

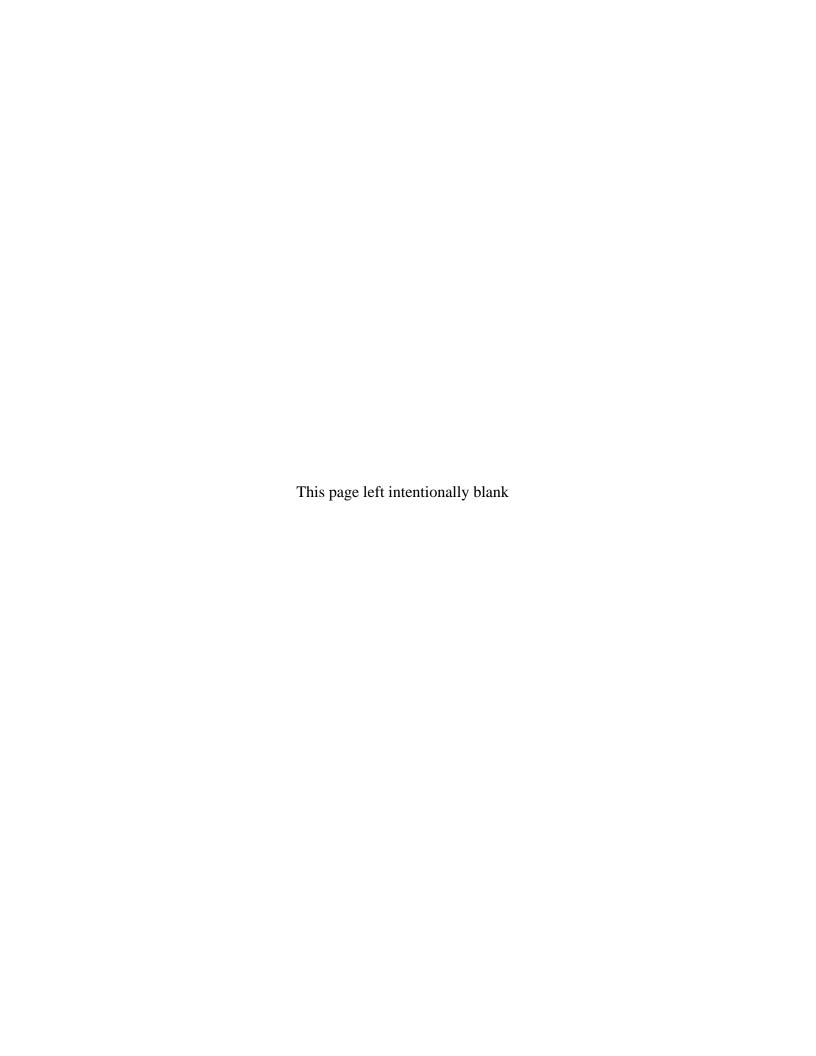






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EXECUTIVE SUMMARY

Remediation dredging was performed in New Bedford Harbor from August 6th through October 9th 2007. Dredge activities occurred primarily in two areas: 'Area G' encompassing sections of DMU-1 and DMU-102, and 'Area H' encompassing sections of DMU-9 and DMU-10, and DMU-11. The primary objective of the water quality monitoring program is to conduct boat-based monitoring to provide field reconnaissance information to the United States Army Corps of Engineers (USACE), United States Environmental Protection Agency (USEPA), and dredging operators, to gauge the extent of potential water quality impacts that may result from dredging operations. These data are used to guide project operations as necessary to minimize environmental impacts, limit potential recontamination of previously dredged areas, and ensure that the dredging activities are conducted in a manner which does not hinder the seasonal migration of anadromous fish to and from the Acushnet River.

Water quality monitoring started on August 6, 2007 prior to the dredge operations to establish background levels, and ended October 9, 2007, approximately two weeks after dredging stopped. Monitoring activities utilized YSI sondes to collect instantaneous real time data from the monitoring vessel. Additional YSI sondes were deployed on moorings to collect longer term data. Each YSI was equipped to measure turbidity, salinity, temperature, depth and dissolved oxygen. The project criterion, termed as a "reportable event", is defined as 50 Nephelometric Turbidity Units (NTU) above background measured 600 feet (ft) downstream of the dredging and associated activities. A warning level is defined as an exceedance of 50 NTU above background at 300 ft downstream of the dredging and associated activities. If the warning level was exceeded, the USACE was to be contacted immediately to determine what, if any, operational modifications might be warranted to abate the condition and to reduce the potential for a criteria exceedance at the 600-foot transect. Neither the warning level nor the project criterion was exceeded at any time during the 2007 monitoring.

Water samples were collected for turbidity and total suspended solids (TSS) analyses on six occasions during the dredge program. Samples from three of these events were also collected for polychlorinated biphenyls (PCB) and toxicity testing. Metals samples were collected during four of the sampling events and were archived for potential analysis. Samples were collected either to establish baseline conditions and/or re-establish relationships between field measurements (i.e. turbidity) and toxicity results to verify the protectiveness of the 50 NTU criteria. No samples were collected in response to an exceedance of the 50 NTU turbidity criteria. Data collected confirmed that the 50 NTU criterion continues to be ecologically protective, while still allowing remediation efforts to progress.

The deployment of the continuously recording water quality sensors (YSI sondes) provided additional information to compliment the adaptive monitoring approach discussed above. The location of sensors both north and south of the dredge areas provided information about tidal influences on sediment suspension and transport. Continuous readings provided water quality data for periods when adaptive boat-based sampling was not underway. This included inactive dredge periods such as nights and weekends, which provided a reasonable background condition for comparison.





As expected, turbidity correlated well with TSS ($R^2 = 0.9367$) in the two dredging areas. Samples collected from Area G showed higher correlation between total PCB with TSS and thus with turbidity than the samples from Area H. Dissolved PCB concentrations were generally low in both areas and did not correlate well with TSS.





1.0 INTRODUCTION

1.1 Site Description

The New Bedford Harbor Superfund Site (Site), located in Bristol County, Massachusetts (MA), extends from the shallow northern reaches of the Acushnet River estuary south through the commercial harbor of New Bedford and into 17,000 adjacent acres of Buzzards Bay (Figure 1). Industrial and urban development surrounding the harbor has resulted in sediments becoming contaminated with high concentrations of many pollutants, notably polychlorinated biphenyls (PCBs) and heavy metals. Two manufacturers in the area used PCBs while producing electronic devices from 1940 to the late 1970s, when the use of PCBs was banned by the U.S. Environmental Protection Agency (USEPA). Based on human health concerns and ecological risk assessments, USEPA added New Bedford Harbor to the National Priorities List in 1983 as a designated Superfund Site. Through an Interagency Agreement between the USEPA and the U.S. Army Corps of Engineers, New England District (USACE NAE), the USACE is responsible for carrying out the design and implementation of the remedial measures at the site. The Site has been divided into three areas – the upper, lower and outer harbors – consistent with geographical features of the area and gradients of contamination (Figure 2). All of the 2007 activities conducted under the Water Quality Monitoring occurred in the upper Harbor.

Aerovox Inc. in New Bedford, MA used PCBs in the manufacture of electrical capacitors from approximately 1940 to 1977. This facility is located in the upper harbor and is considered one of the major sources of historic PCB contamination to New Bedford Harbor. The highest concentrations of PCBs were found in sediments in a 5-acre area in the northern portion of the Acushnet River Estuary adjacent to the Aerovox facility. These 'hot spot' sediments, which contained PCBs upwards of 100,000 milligrams per kilogram (mg/kg), were removed between 1994 and 1995 as part of USEPA's 1990 "Hot Spot" Record of Decision (ROD). Full scale remediation dredging per the 1998 Upper and Lower Harbor ROD was initiated in 2004 and continued in 2005, 2006, and 2007. Another known source of PCB contamination in New Bedford Harbor is related to activities at the Cornell-Dubilier mill on the western shore of the outer harbor. In 2005, a 15 acre underwater cap pilot project (Figure 2) was implemented near Cornell-Dubilier to cap PCB contaminated sediments.

The Site is divided into a series of Dredge Management Units (DMU) based on contamination levels, contamination sources, topography, and other factors. In 2007, dredge activities were conducted at two areas: 'Area G' encompassing sections of DMU-1 and DMU-102 and 'Area H' encompassing sections of DMU-9 and DMU-10, and DMU-11 (Figure 3).

The remediation of this Site per the 1998 ROD involves the excavation and dredging of approximately 880,000 cubic yards of PCB contaminated sediment. The majority of contaminated material is being removed utilizing a hydraulic dredge that pumps dredge slurry to the project's Sawyer Street facility where it is mechanically processed to remove all sand, gravel, and debris material. The silt and clay size materials are then pumped to the Area D Dewatering Facility located on Herman Melville Boulevard where it is mechanically dewatered and transported off-site for disposal.







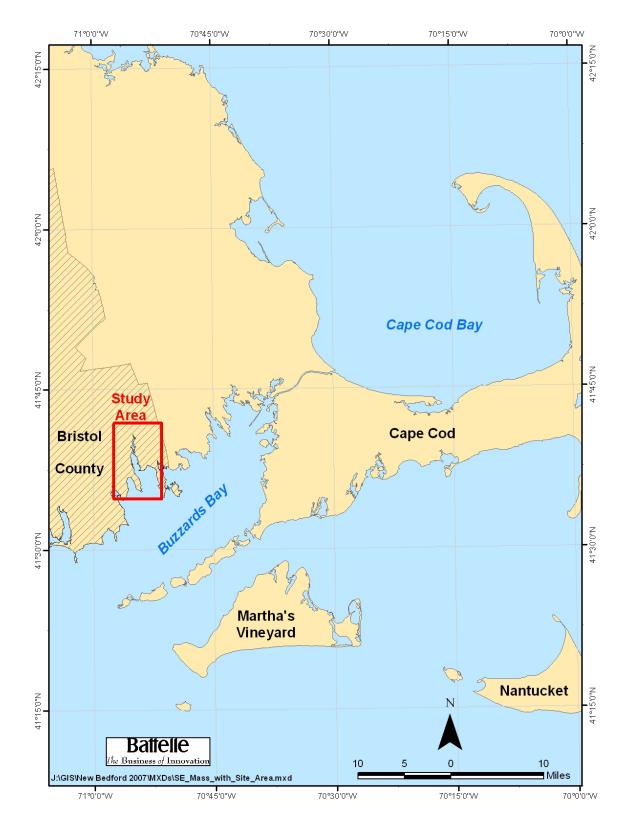


Figure 1. Location of the Site in Southeastern MA.







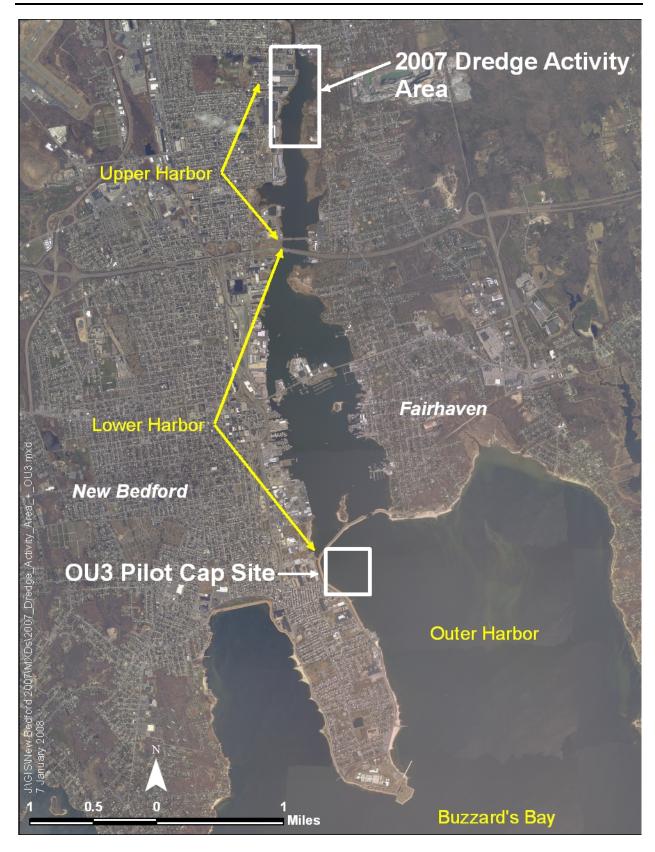


Figure 2. Location of the 2007 Dredge Activity Area within New Bedford Harbor.





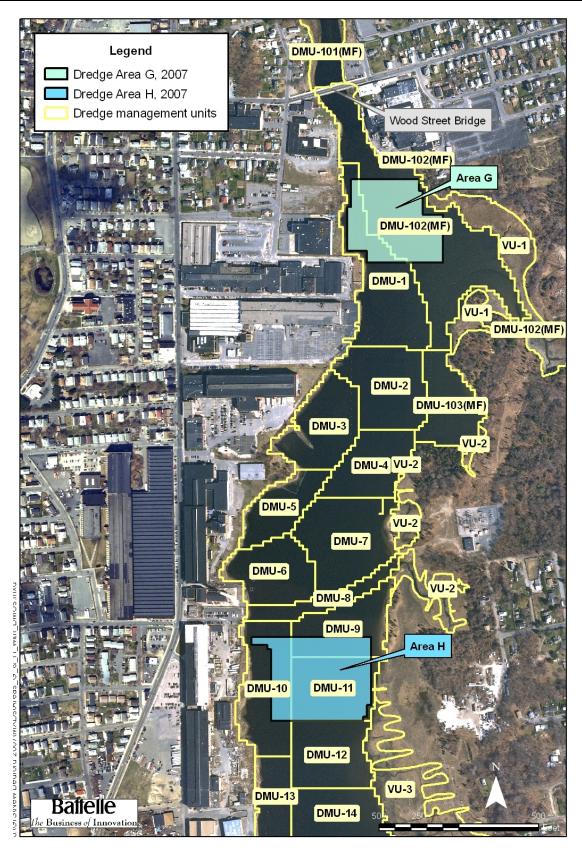


Figure 3. 2007 Dredge Areas





1.2 Project Objectives

The resuspension of sediments during dredging, and dredging related activities, can transport contaminated sediments away from the dredge area. Additionally, contaminated sediments suspended in the water column present a concern for potential toxicity to aquatic organisms in the project area. The primary objective of the 2007 monitoring effort was to conduct boat-based field monitoring to provide field reconnaissance information to the USACE, USEPA and dredging operators, to gauge the extent of water quality impacts resulting from dredging operations. This information may be used to make operational adjustments as needed to limit the dispersal of suspended sediments and their associated contaminants as well as limit the extent of biological impacts to the water column. An additional objective was to ensure that the dredging activities were conducted in a manner which did not hinder the seasonal migration of anadromous fish in the Acushnet River (i.e. fish are able to successfully navigate past dredging operations).

The project criterion, termed as a "reportable event", is defined as 50 Nephelometric Turbidity Units (NTU) above background measured 600 feet (ft) downstream of the dredging and associated activities. A warning level is defined as an exceedance of 50 NTU above background at 300 ft downstream of the dredging and associated activities. If the warning criteria was exceeded, the USACE was to be contacted immediately to determine what, if any, operational modifications may be warranted to abate the condition and to reduce the potential for a criteria exceedance at the 600-ft transect.

1.3 Water Quality Monitoring Program

The focus of the 2007 water quality monitoring program was on near-field water column impacts as well as assessment of the extent of sediment resuspension and transport away from the dredging operation. These data are used to guide project operations as necessary to minimize environmental impacts, limit potential recontamination of previously dredged areas, ensure that the dredging activities are conducted in a manner which does not hinder the seasonal migration of anadromous fish to and from the Acushnet River, and to determine the degree and extent of sediment plumes advecting away from the Site during dredging operations. To meet this objective, a tiered monitoring approach was employed which incorporated field measurements of turbidity and water quality parameters and water sampling for toxicity testing and laboratory analysis on a periodic basis as needed. Water column measurements were conducted along four transects for each of the dredge areas described below and illustrated in Figure 4. As dredging operations moved throughout the dredge areas, the monitoring locations moved relative to those activities as follows:

- **Reference:** A reference station 1,000 ft up-current of dredging operations to provide background conditions. A reference station was identified for each of the two dredge areas for both ebb and flood tide conditions.
- **Dredge Boundary:** Measurements were made at the edge of the dredge area. This is defined as a down-current location as close as practicable and as safety allows.
- **300 ft Downstream:** Defined as a transect set, 300 ft down-current from the dredging operation.
- **600 ft Downstream:** Defined as a transect set, 600 ft down-current from the dredging operation.





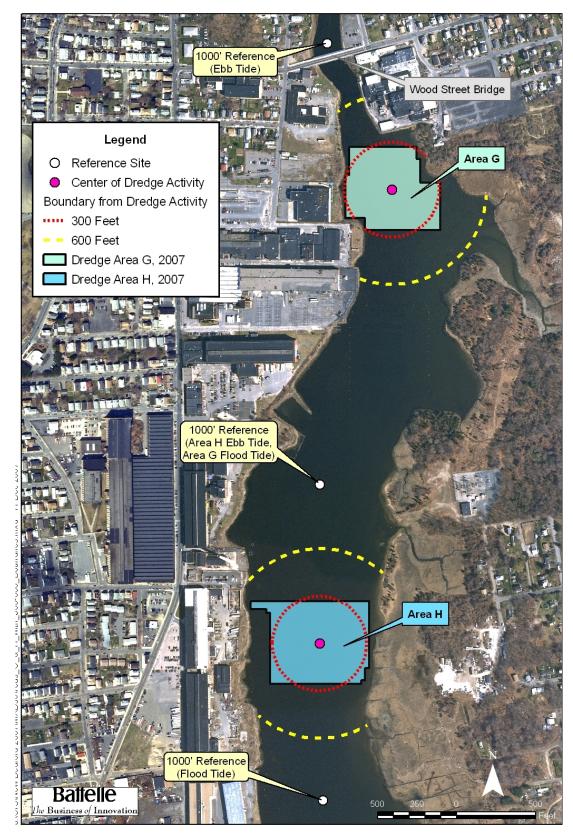


Figure 4. Example of Monitoring/Sampling Locations (Relative to Dredge Areas G & H).





2.0 METHODS

Methods used to establish the sampling approach, conduct *in-situ* measurements, and collect and analyze discrete samples are summarized below. Complete details are also provided in the project Quality Assurance Project Plan (QAPP, Battelle 2006a) and the Water Quality Field Sampling Plan (FSP) (Battelle, 2006b).

2.1 Sampling Approach

The established sampling approach for this program employs a variety of sampling methods to characterize sediment resuspension, sediment transport, and its potential impact on water quality. As with previous monitoring efforts, a tiered approach is employed using varying levels of monitoring intensity to assess and gauge project related water quality impacts as described in Section 2.1.1. Water quality monitoring is performed along transects immediately adjacent to the dredge operation, at defined distances down-current, and at an up-current reference station as described in Section 2.1.2.

2.1.1 Sampling Design

The overall approach utilizes an adaptive, criteria-based sampling scheme to monitor projectrelated water quality impacts. This is broken up into a series of sampling 'levels' which vary in the degree to which analytical samples are collected. The more intensive levels were utilized when there was greater potential for a specific dredging activity to have an impact on water quality. This was particularly true for new activities or activities in new areas. Based on information from these sampling levels, sampling was reduced to the lower intensity levels when appropriate. Sampling Levels I, II, and III are designed to collect water samples at designated distances away from the dredge operation to limit the extent of impact (Boundary, 300 ft, and 600 ft). A reference station located 1,000 feet up-current from the dredge area (see Section 2.1.2) is used to establish background turbidity readings. Based on results acquired throughout the monitoring season, a second type of sampling was added to the design. Under this approach, specific levels of turbidity were targeted for sampling regardless of their location relative to dredging. This approach was added to evaluate relationships, if any, among the turbidity, PCB, and toxicity data and to confirm that current criteria are adequately protective of the aquatic environment. These approaches are discussed below. The criteria-based sampling, which followed the decision sequence, is illustrated in Figure 5. Table 1 lists all sample collection information.

• Level I: Level I represents a sampling approach for discrete samples and was conducted for those activities considered to have the greatest potential to impact water quality or when new conditions were encountered. Initially discrete samples were collected at designated locations: Reference, Dredge Boundary, 300 ft downstream, and 600 ft downstream. At each station discrete water samples were collected for all parameters from the depth of highest turbidity, based on the *in situ* readings.

During the 2006 monitoring season it was observed that sampling under Level I, while achieving its objectives, did not capture any significant elevated turbidity levels above background at the downfield transects. As a result, Level I sampling was modified to include additional discreet sample collections at locations having a full range of turbidities (25-100 NTU) that could be used to evaluate the protectiveness of the warning



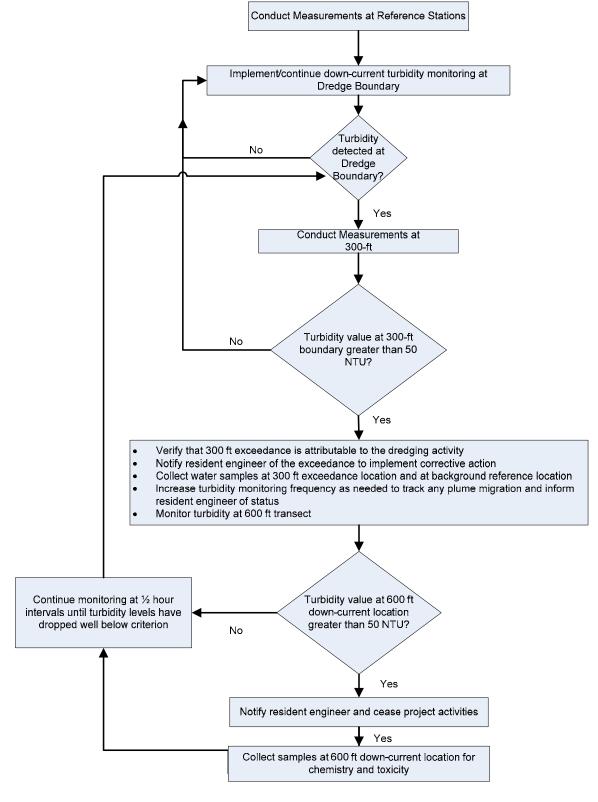


and project turbidity criterion. This sampling modification was also conducted during the 2007 monitoring season. In all cases it was necessary to sample in close proximity (<300 ft) from debris removal operations to collect high turbidity samples; samples were often collected within 75 ft from dredge operations. These samples were obtained to evaluate turbidity/PCB/toxicity relationships and did not represent exceedances of water quality criteria.

- Level II: Level II represents a lower level of monitoring intensity compared to Level I, and is performed under conditions where there is a decreased concern for water quality impacts from an activity. Similar to Level I, Level II was designed to collect samples based on distance from dredge activities although 600 ft samples are not required due to the decreased concern for far-field impact(s). Similar to Level I, modifications were made during the dredge season to adequately characterize the sediment plume which was rarely found near the pre-established transects.
- Level III: Routine *in situ* monitoring. Sampling was conditional based on results of turbidity monitoring. Furthermore, a Level III monitoring effort was contingent upon any exceedance of the project-based criterion or based on detection of sheens or plumes emanating from the project area. It should be noted that at no point during the 2007 season were any of the Level III criteria exceeded. As a result no samples were analyzed under the Level III design.
- **Field QC**: Field duplicates were collected at a frequency of approximately one per twenty samples for PCB, TSS, and Turbidity analysis. Equipment blanks for water samples were collected at a frequency of one per twenty samples for PCB, TSS, and Turbidity analysis. QC samples were collected based upon opportunity during planned sampling events.







Notes: 1:50 NTU value was defined as 50 NTU above background turbidity level

Figure 5. Decision Sequence for Water Quality Monitoring.





Table 1. Samples Collected During the 2007 Monitoring Season.

1 8/6/07	nmeters ² NA NA NA , TUR, TOX, MET
8/7/07	NA NA , TUR, TOX, MET
NA	NA , TUR, TOX, MET
Na	, TUR, TOX, MET
Residence Level I (Background)	
Solution	, TUR, TOX, MET
Background 20 NTU-Area H WQ-XXX-003-080907 DPC, TPC, TSS 55 NTU-Area H WQ-XXX-004-080907 DPC, TPC, TSS 11	
NA	, TUR, TOX, MET
NA	, TUR, TOX, MET
Wood St. Reference-Area G WQ-XXX-001-081607 TSS, T	NA
Solution Solution	NA
Area G	UR, MET
NA NA NA NA NA NA NA NA	TIR MET
Dredge Boundary, Area G WQ-XXX-003-081607 TSS, T	
S/17/07 III NA NA NA	UR, MET
NA	UR, MET
S/21/07	NA
S/22/07	NA
A 8/27/07 III NA NA NA NA NA NA N	NA
NA	NA
Wood St. Reference-Area G WQ-XXX-001-082907 TSS	NA
75 ft from Debris Removal-Area G WQ-XXX-002-082907 TSS 8/29/07 II Dredge Boundary, Area G WQ-XXX-003-082907 TSS 300 ft from Dredge Boundary, Area G WQ-XXX-004-082907 TSS 5 9/4/07 III NA NA 9/5/07 III NA NA NA 6 9/10/07 III NA NA NA Wood St. Reference-Area G WQ-XXX-001-091107 DPC, TPC, TSS 23 NTIL 75 ft from Debris NA NA Contact	NA
8/29/07 II Dredge Boundary, Area G WQ-XXX-003-082907 TSS 300 ft from Dredge Boundary, Area G WQ-XXX-004-082907 TSS 5 9/4/07 III NA NA NA NA NA NA N	S, TUR
8/29/07 II Dredge Boundary, Area G WQ-XXX-003-082907 TSS 300 ft from Dredge Boundary, Area G WQ-XXX-004-082907 TSS 5 9/4/07 III NA NA NA NA NA NA N	S, TUR
G WQ-XXX-004-082907 ISS 5 9/4/07 III NA NA 9/5/07 III NA NA 6 9/10/07 III NA NA Wood St. Reference-Area G WQ-XXX-001-091107 DPC, TPC, TSS	S, TUR
5 9/4/07 III NA NA NA 9/5/07 III NA NA NA 6 9/10/07 III NA NA NA Wood St. Reference-Area G WQ-XXX-001-091107 DPC, TPC, TSS	S, TUR
9/5/07 III NA NA NA NA NA NA N	NA
6 9/10/07 III NA NA Wood St. Reference-Area G WQ-XXX-001-091107 DPC, TPC, TSS 23 NTIL 75 ft from Debris	NA
Wood St. Reference-Area G WQ-XXX-001-091107 DPC, TPC, TSS	NA
23 NTU 75 ft from Debris	, TUR, TOX, MET
0/11/07 T 43 11 10, 13 11 110 11 12 11 10 11 12	
9/11/07 I 25 NTO, 75 R Holli Deblis WQ-XXX-002-091107 DPC, TPC, TSS	, TUR, TOX, MET
	, TUR, TOX, MET
	NA
9/14/07 III NA NA	NA
7 9/17/07 III NA NA	NA
9/19/07 III NA NA	NA
8 9/24/07 III NA NA	NA
	S, TUR
9/25/07 II 90 NTU-50 ft S of Dredge-Area H WQ-XXX-002-092507 TSS	S, TUR
	S, TUR
9 10/1/07 III NA NA	NA
10/2/07 III NA NA	NA
	, TUR, TOX, MET
	, TUR, TOX, MET
	, TUR, TOX, MET
10/9/07 III NA NA	NA

¹ Samples are collected either based on distance (i.e., 300 ft, 600 ft) or Turbidity levels (i.e., 25, 50 NTU), see Section 2.1 for further discussion on Sample Location.

² DPC =Dissolved PCB, TPC =Total PCB, TSS =Total Suspended Solids, TUR =Turbidity, TOX =Toxicity, MET =Metals NA – Not Applicable





2.1.2 Sampling Stations

Boat-based monitoring focused on the following areas:

Reference Station: At the start of each sampling day the vessel transited to the reference location located 1,000 ft up-current from the active dredge area. This location was outside the influence of any localized turbidity sources (e.g., combined sewer overflow discharges or storm water drains), and was representative of the water flowing through the deeper channel areas upcurrent of the dredge area. Water depth was measured with a lead-line and the result recorded in the field log. The *in situ* sensors were lowered slowly and allowed to equilibrate at one foot intervals through the water column with care taken to avoid placing the instruments on the sediment bottom. As the sensors were lowered, the sampling personnel observed the turbidity readings and identified the depth of the highest turbidity values. After the full "downcast" was completed, the sensors were pulled back up through the water column and held at the location of highest turbidity. The in situ readings for all parameters at this depth were recorded on the Field Log Sheet. This reading served as the background value for subsequent turbidity readings taken throughout the day. Discrete samples were collected as required (see Section 2.1). Reference locations were re-sampled if conditions changed during the day. Examples of relevant changes include change in tidal flow; change in dredge operations; and changing weather conditions such as rain events which can dramatically alter ambient water quality conditions. Re-sampling of the reference location was conducted at the field team's discretion based on real-time data feedback and field observations.

Dredge Boundary: Following the collection of *in situ* and discrete samples at the reference location, the sampling team transited to the down-current side of dredging operations. *In situ* readings were collected as close to the dredge, or other operations, as safety allowed; *in situ* readings were collected in the same manner described above for the reference location. Discrete samples were collected (Section 2.1), if required based on the sampling requirements for that survey day (i.e. Levels I, II, and III).

300 ft Downstream: 300 ft downstream from the dredge operations, the vessel operated along a transect (Figure 4) across the width of the harbor collecting *in situ* readings. Real-time data was used to identify any suspended sediment plumes. The focus was on identifying the centroid of the plume (highest turbidity readings) as well as the plume boundaries (lowest turbidity readings above background). High and low readings along the transect were recorded to show the relative intensity of the plume as well as its spatial dimensions. Once the centroid was identified, subsequent readings were concentrated at this location to identify fluctuations in the plume intensity and potential exceedances of the warning criterion. Discrete samples were collected (Section 2.1), if required based on the sampling requirements for that survey day (i.e. Levels I, II, and III).

<u>600 ft Downstream</u>: 600 ft downstream from the dredge operations, *in situ* readings were collected along a transect across the width of the river (Figure 4). Discrete samples were collected (Section 2.1), if required based on the sampling requirements for that survey day (i.e. Levels I, II, and III).





Fixed point, continuous in situ sensors: In situ data were also collected using YSI sondes (6920 water quality sensors), with internal data logging, deployed at fixed locations for extended periods of time. The sensors recorded water temperature, salinity, dissolved oxygen, and turbidity. The sensors were deployed on August 14, 2007 during the first week of dredging and remained in use until October 16, 2007, approximately 1 week after the cessation of dredge related activities. Their location and depth were primarily distributed where the majority of dredging activities would be occurring each week. The objective of *in situ* sensor was to supplement the boat-based monitoring. Deployment locations included one upstream and one downstream of the active dredge area (Figure 6). The upstream sensor was located approximately 100 to 130 ft north of the active dredge area and the downstream sensor was located approximately 100 to 130 ft south of the active dredge area. The sensors were deployed on 'J'shaped moorings with a surface marker buoy on a slack line and a subsurface buoy on a taught line from which the sensor was suspended (Figure 7). Tidal fluctuations resulted in water depths at the mooring locations ranging from approximately two to seven feet. Due to the relatively shallow water at the deployment locations and the large tidal fluctuation, a sampling configuration was designed which maximized characterization of the entire water column while keeping the sensors from resting on the bottom. Typically at low tide, the sensors were suspended within one foot of the water surface and at high tide the sensors were approximately three feet off the bottom.

The sensors were programmed to sample every 10 minutes. The instruments were retrieved and deployed as part of the boat-based monitoring program. The instruments were recovered periodically for data retrieval and routine maintenance. Between each deployment, the sensors were cleaned, recalibrated, the data were downloaded, and the batteries were replaced as needed.

2.2 In Situ Measurements

In situ measurements of depth, turbidity, temperature, salinity, and dissolved oxygen were acquired at a series of stations within the project site (see Section 2.1.2) using a YSI sonde (6920 water quality sensors) with real-time display and data logging. Monitoring combined preplanned measurements to support discrete sampling as described below and criteria-based sampling following the decision sequence in Figure 5.

The Acushnet River is tidally influenced and the tide together with variability in freshwater flow determines the current direction and its influence on transport of suspended sediments. On ebb tides, "downstream" is always to the south of dredging activities. However, on flood tides flow is often, though not always, to the north. Several times throughout the 2007 monitoring program a clear stratification of the water column was observed. In these cases lower density freshwater sat on top of higher density, more saline tidal waters. Frequently the incoming tidal water was moving north, while the freshwater lens was flowing south. These physical water properties were closely monitored throughout the day, and adjustments were made in the sampling design to accurately assess sediment resuspension and its transport in all directions. Throughout this report the terms "downstream" and "down-current" always refer to the direction of water movement relative to the dredging operations at that point in time regardless of geographical direction (north or south).





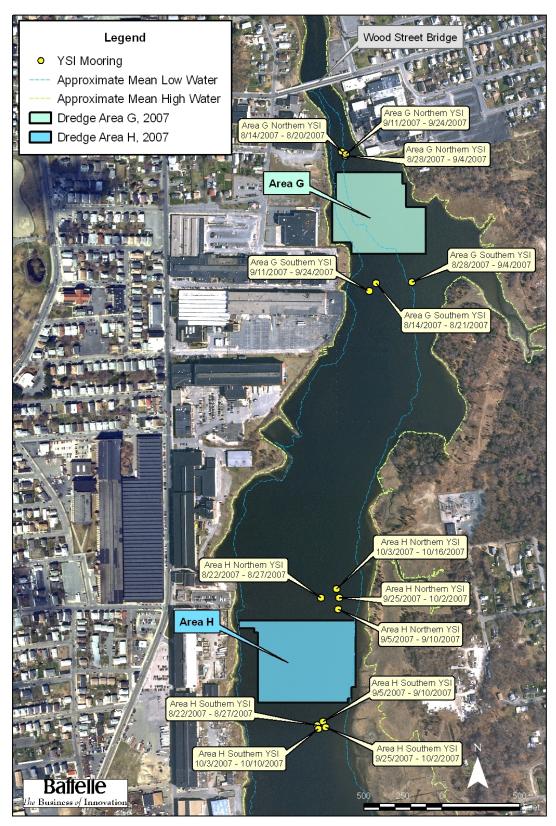


Figure 6. Location of Fixed Point, Continuous In Situ YSI Sensors







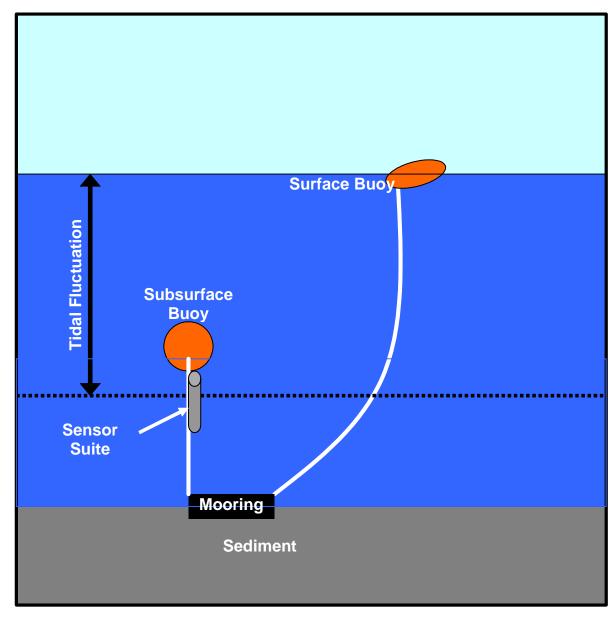


Figure 7. Depiction of the Continuous In Situ Sensor Mooring Configuration





2.3 Discrete Water Samples

Water samples collected for physical, chemical, and biological testing during the 2007 monitoring season are summarized in Table 1. The collection of discrete water quality samples was conducted using a water pump and instrument package during boat-based monitoring. Water samples were collected using a12-volt Teflon diaphragm pump and the appropriate length of Teflon® tubing. The inlet of the tubing was attached to the body of the YSI *in situ* sensors to ensure that the sensor measurements and the analytical results are representative of the same parcel of water. Prior to collecting samples at each location sample, water was pumped continuously through the system for approximately two to three minutes to purge the system. This purging ensured that the system was cleared prior to actual sample collection to avoid potential site to site cross-contamination.

Following purging, water from the pump outlet was collected directly into the appropriate sample containers for physical, chemical or biological analysis. Sample volume, container, preservation, storage conditions, holding time and participating laboratory is summarized in Table 2 for each analysis parameter. All samples collected in the field were placed in coolers on ice until transport to the field trailer. At the field trailer, samples were stored cold (4±2°C) in the sample refrigerator or on ice in the coolers until packaged for shipment to the participating laboratories. Samples were packaged in wet or blue ice and were hand delivered or shipped overnight to the appropriate laboratories.

Table 2. Sample Volumes, Containers, and Processing for Discrete Field Samples.

Parameter	Sample	Sample	Preser-	Storage	Holding	Analytical Lab
	Volume	Container	vation	Condition	Times ¹	
TSS	1 L	HDPE	Ice	4 ± 2 °C	7 Days	Alpha Woods Hole Lab 375 Paramount Drive, Suite 2 Raynham, MA 02767 Ph:508-822-9300
Turbidity		Bottle	ice	4 <u>+</u> 2 C	48 Hours	
Aqueous Total PCB	1 L	Wide-mouth Amber Glass Bottle	Ice	4 <u>+</u> 2 °C	7 Days	Battelle Duxbury ²
Aqueous Dissolved PCB ³	1 L	Wide-mouth Amber Glass Bottle	Ice	4 ± 2 °C	7 Days	397 Washington Street Duxbury, MA 02332 Ph: 781-952-5200
Total Metals	500 mL	HDPE Bottle	HN03	4 <u>+</u> 2 °C	6 Months	
Toxicity (all samples for toxicological analysis collected into one container)	5 gal	2.5 gallon Cubitainer	Ice	4 ± 2 °C	24 Hours	EnviroSystems, Inc One Lafayette Road P.O. Box 778 Hampton, NH 03843 Ph: 603-926-3345

¹ Holding time to initial Lab preparation.

² All metals samples were archived at Battelle, Duxbury. If analysis is required, samples will be analyzed by Battelle Marine Sciences Lab in Sequim, Washington.

³ Samples for dissolved analysis were filtered at the analytical laboratory.





2.4 Sample Analysis

Like the field sampling, sample analysis includes both predefined samples and contingency based samples. Figure 8 shows the laboratory based decision sequence for analysis of samples. All samples were delivered to the respective laboratories defined in Table 2.

Requirements for chemical and biological testing can be found in the project QAPP Addendum *Environmental Monitoring, Sampling, and Analysis at the New Bedford Harbor Superfund Site, New Bedford, MA* for detailed analytical requirements (Battelle, 2006a). An overview of the methods used is provided below.

2.4.1 TSS/Turbidity Analyses

In addition to in-situ, real-time turbidity monitoring (Section 2.2), lab-based analyses of discrete water samples for TSS and turbidity were conducted by Alpha Woods Hole Group (AWHG). Water samples were analyzed for TSS following AWHG SOP *Total Suspended Solids (TSS) Non-Filterable Residue*, Rev. 5.0 which is based on EPA Method 160.2. Water samples were analyzed for turbidity following AWHG SOP *Turbidity 180.1*, Rev. 2.2, which is based on EPA Method 180.1. Sample results are reported in milligrams per liter (mg/L) for TSS and NTU for turbidity.

2.4.2 PCB Analyses

PCB analyses for the 18 National Status and Trends (NS&T) congeners were conducted by Battelle, using both whole water (unfiltered) and dissolved (filtered) samples. Water samples designated for dissolved PCB analysis were filtered through pre-baked glass fiber filters (1 micron pore size) at the analytical laboratory. The sample filtration was usually conducted within 24 hours of sample collection.

All water samples (total and filtered) were extracted following modified EPA Method 3510C (Battelle SOP 5-200). Approximately one liter of the water sample (total or filtered) was spiked with surrogates and extracted three times with dichloromethane using separatory funnel techniques. The combined extract was dried over anhydrous sodium sulfate, concentrated, and treated with copper for sulfur removal. The extract was then processed through disposable Florisil columns for further clean-up. The post Florisil extract was concentrated, fortified with internal standards (IS), and then analyzed for 18 NS&T PCB congeners using gas chromatography/electron capture detector (GC/ECD) using dual column confirmation, following modified EPA Method 8082 (Battelle SOP 5-128). Sample data were quantified by the method of internal standards, using the IS compounds. Due to the highly-contaminated nature of the samples, most of the water sample extracts were diluted and analyzed again to resolve concentrations of compounds that exceeded the calibration range during the initial GC/ECD runs. Sample results are reported in micrograms per liter (µg/L).





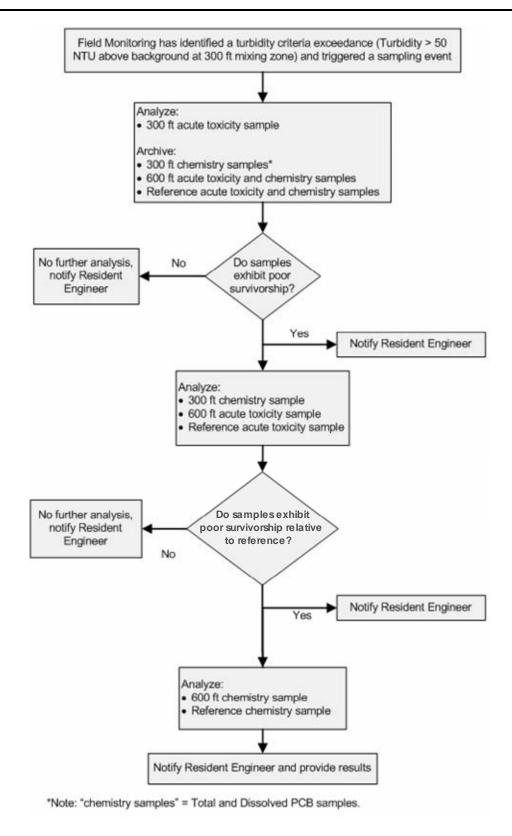


Figure 8. Decision Sequence for Sample Analysis





2.4.3 Toxicity Analyses

Acute and chronic (sub-lethal) exposure screening assays evaluating surface water samples collected from New Bedford Harbor were performed to evaluate the potential toxicity of surface water samples collected in New Bedford Harbor associated with dredging activities. Assay design included a laboratory control treatment and one or more surface water samples, generally including a site reference sample. Samples were evaluated "As Received" without dilutions. Testing was based on programs and protocols developed by the USEPA (2002) primarily designed to provide standard approaches for the evaluation of toxicological effects of discharges on aquatic organisms, and for the analysis of water samples. Testing included the following assays: modified 2 day acute and 7 day chronic assays conducted with the mysid shrimp, Americamysis bahia, and the red macro alga, Champia parvula, and 60 minute chronic fertilization assays conducted with the purple sea urchin, Arbacia punctulata. All mysid and urchin fertilization assays and a portion of the algal assays were conducted by EnviroSystems, Inc. (ESI) located in Hampton, New Hampshire. Additionally, the algal assays were conducted by the Saskatchewan Research Council, SRC, Saskatoon, Saskatchewan, Canada. Supporting data including laboratory bench sheets, full statistical reports, custody forms, sample receipt forms and water quality data are provided in Appendix D.

2.4.3.1 Test Species

A. bahia, #5 days old, were obtained from cultures maintained by Aquatic Research Organisms (ARO), Hampton, New Hampshire. Juvenile shrimp were collected daily, isolated, and placed in a rearing tank for up to 6 days. Holding tanks were maintained in a flow-through culture mode at a temperature of 25±2°C. At the start of the assays the mysids were 7 days old. Juveniles were fed #24 hour old brine shrimp on a daily basis. Water temperature, salinity, and pH were monitored on a daily basis. Prior to testing organisms were siphoned from the rearing tanks to a holding vessel, and then transferred to test chambers using a large bore pipet, minimizing the amount of water added to test solutions.

A. punctulata adults were from cultures maintained by ESI. Original stock was obtained from commercial supply. Male and female urchins were maintained in separate chambers as recommended by protocol (USEPA 2002) and ESI. Adult urchins were induced to spawn by the injection of a potassium chloride solution. The viability of gametes obtained was determined prior to their addition to the test solutions. Eggs and/or sperm that would not result in a fertilized egg were rejected from the pool of gametes used in the assay.

C. parvula biomass was obtained from stock cultures maintained by the Saskatchewan Research Council. Original stocks were obtained from the University of Texas algal collection. The male and female plants were maintained in separate culture vessels under sterile conditions. Algal cultures were maintained on an orbital shaker (100 rpm) at 23±2°C under 16 hour light: 8 hours dark at 40 to 75 foot candles light intensity. Cultures are "cropped" and transferred to fresh nutrient solutions on a weekly basis.

2.4.3.2 Surface Water Samples and Laboratory Control Water

Grab surface water samples were collected by Battelle staff on each of the three Level I surveys in the Harbor (see Toxicity in Table 1). Samples were placed in polyethylene cubitainers for





shipment to the laboratory. Two 2.5-gal cubitainers were collected for each of the chronic assays. Prior to testing in the lab, samples were evaluated to document salinity, conductivity, and total residual chlorine. Total residual chlorine was measured by amperometric titration (MDL 0.05 milligrams per liter, mg/L). Prior to use in the assays the salinity of the samples was adjusted, if necessary, to predetermined levels using artificial sea salts for *A. bahia* and *A. punctulata* assays, and GP-2 salts (USEPA 2002) for the *C. parvula* assays. The salinity of samples for the *A. bahia* acute and chronic exposure assays was adjusted to 25±2‰ while the salinity for samples used for the *A. punctulata* and *C. parvula* assays was adjusted to 30±2‰. Samples with initial salinity measurements above these levels were not adjusted.

Laboratory control water used for mysid and sea urchin assays was collected from the Hampton/Seabrook Estuary. This water is classified as SA-1 and has been used to culture marine test organisms since 1981. The laboratory control water used in the algal assay, collected from Rye, New Hampshire, is the same water used in culture maintenance. Prior to use, seawater used in the algal assays was filtered through glass fiber filters and sterilized. Dilution water used in the algal assays conducted by SRC was natural seawater collected from the West Coast of Canada. Salinity of the surface water samples was adjusted using commercial sea salts.

2.4.3.3 Bioassay Tests

Americamysis bahia Modified Acute and Chronic Exposure Bioassays

Modified acute and chronic exposure screening assays were conducted in a static renewal test mode with renewals made at 24-hour intervals. The 7 day assays were conducted at a temperature of $26 \pm 1^{\circ}\text{C}$ with a photoperiod of 16:8 hours light:dark. Mysids were maintained in 250 mL beakers containing 150 mL of test solution. Approximately 100 mL of the test solution were replaced each day. The assay incorporated 8 replicates with 5 organisms/replicate. Survival and dissolved oxygen were measured daily in each replicate prior to test solution renewal. Salinity, temperature and pH were recorded in a composite sample of the "old" test solution and in the "new" test solution prior to being added to the test chamber. Incubator temperatures were also recorded on a daily basis.

During the test, mysids were fed 24 hour old *Artemia* nauplii. On Day 7 of the assay, surviving mysids were removed from test solutions, rinsed to remove any surface detritus and salts, and transferred to tared foils and dried for 24 hours at 103°C. Foils were weighed to the nearest 0.01 mg. Mean dry weights per individual were obtained by dividing the net dry weight of all surviving organisms by the number of organisms added at the start of the assay.

Arbacia punctulata Chronic Exposure Fertilization Assays

Gametes were obtained by potassium chloride injection to induce spawning. Sperm were collected dry, diluted to achieve a concentration of approximately 5.0 x 10⁷ sperm/mL in the surface water treatments. Actual sperm concentrations are provided on laboratory bench sheets in Appendix D. Sperm solutions were added to 5 mL aliquots of each sample being evaluated and allowed to remain in the test solutions for 60 minutes before the addition of unfertilized eggs.

Each treatment incorporated a total of four replicates. After 20 minutes of exposure the assay was terminated by the addition of 0.2 mL of preservative. Aliquots of preserved solution were





counted to determine numbers of fertilized and unfertilized eggs. Fertilization was accepted based on the presence or absence of a fertilization membrane around the egg.

Champia parvula Modified Acute and Chronic Exposure Assays

The 7 day red algae assay was conducted with a 2 day exposure period to the surface waters and laboratory control treatments. Each treatment used four replicates with five female branches and one male branch per replicate. Temperature was maintained at $23\pm1^{\circ}$ C. The light source was cool white and fluorescent bulbs set on a 16:8 hours light:dark cycle, with a light intensity of 40 to 75 foot candles. Light intensity was checked at the start of each assay. Temperatures were monitored on a daily basis. Test chambers were 200 mL borosilicate glass beakers. After 2 days exposure, female branch tips were transferred to approximately 100 mL of recovery medium with added nutrients and allowed to recover and mature for 5 days. During transfer, plants were examined to determine the physical condition of the individual branches. Branches showing signs of degeneration were noted and used to establish an acute endpoint. After the recovery period, the number of cystocarps (reproductive bodies) on each female branch were counted.

2.4.3.4 Data Analysis

Statistical analysis of acute and chronic exposure data was completed using CETIS (Comprehensive Environmental Toxicity Testing System) software. The program computes acute and chronic exposure endpoints based on EPA decision tree guidelines specified in individual test methods. For chronic exposure endpoints statistical significance was accepted at "<0.05.

2.4.3.5 Quality Control

As part of the toxicity testing laboratory quality control program, standard reference toxicant assays are conducted on a regular basis for each test species to provide relative health and response data while allowing for comparison with historic data sets.





3.0 SURVEY CHRONOLOGY AND DAILY OBSERVATIONS

All turbidity readings referenced in this section are the actual values from the sensor and are not corrected for background levels. High and low tide data for each day that water quality monitoring was performed during operations is summarized below; all times are Eastern Daylight Time (EDT). Complete tide data over the course of the entire 2007 dredge season are also provided in Appendix A.

Week of August 6, 2007 (Week 1)

August 6, 2007:

- **Tidal stage:** High tide at 2:13 and 14:51 EDT; low tide at 7:38 and 20:57 EDT.
- **Dredge activity:** No active dredging, testing of dredge lines. Debris removal in Area H.
- **Monitoring activity**: First day of water quality monitoring. Monitored low water and flood tide. Shakedown of equipment, identifying sample locations, and site access.
- **Fishery and Wildlife Observations:** Bait fish active throughout area with gulls and terns feeding.
- **Results summary:** Readings collected at reference locations, values 4.5 NTU. Elevated turbidity values in close proximity to debris removal, <20 NTU from distance greater than 200'. No samples collected. Oil sheen observed around debris removal activity moving up to 1,000' North of debris removal.

August 7, 2007:

- **Tidal stage:** High tide at 3:18 and 15:55 EDT; low tide at 8:44 and 22:25 EDT.
- **Dredge activity:** No active dredging, testing of dredge lines. Debris removal in Area H.
- Monitoring activity: Level III monitoring. Monitored low water and flood tide.
- **Fishery and Wildlife Observations:** Bait fish activity noted within and outside of dredge area. 2-3 small fish were noted near southern oil boom.
- **Results summary:** Readings collected at reference location, value of 2-4 NTU, 150 ft down-current of debris removal value of 30-40 NTU, and 400 ft down-current a value of 5-10 NTU. No samples collected. Slight oil sheen observed outside boom in the morning. Oil sheen increased later in the morning, turbidity remained low.

August 8, 2007:

- **Tidal stage:** High tide at 4:23 and 16:57 EDT; low tide at 10:00 and 23:42 EDT.
- **Dredge activity:** Actively dredging in Area H. Debris removal in Area H. Dredge in Area H broken. Moved working dredge from Area G to Area H and broken dredge from Area H to dock.
- **Monitoring activity:** Level III monitoring, ebb tide to low water and 1.5 hours of flood.
- **Fishery and Wildlife Observations:** A few small fish observed outside of Area H. Numerous birds were observed South of Area H.
- **Results summary:** No significant turbidity plumes around dredge activities. Readings collected at reference locations, value 4.8 NTU, North Dredge Boundary Area value of 20.3 NTU, South Dredge Boundary Area value of 8-9 NTU, and North Dredge Boundary Area value of 30-40 NTU about 150 ft down-current of active dredge. No samples





collected. Some oil sheen observed around debris removal. Localized sheen observed North of Area H when actively dredging in morning, contained by oil booms and dissipated quickly.

August 9, 2007:

- **Tidal stage:** High tide at 5:25 and 17:55 EDT; low tide at 11:16 EDT.
- **Dredge activity:** Actively dredging in Area H. Debris removal in Area H. Dredge repair.
- Monitoring activity: Level I monitoring ebb tide.
- **Fishery and Wildlife Observations:** Birds observed above and below dredge area.
- Results summary: No significant turbidity plumes around dredge activities. In order to
 obtain consistent readings near 55 NTU, the monitoring had to get within about 100-150
 ft of debris removal area. Prop wash in shallow water resulted in spikes of 90-100 NTU,
 which dissipated very quickly. Collected toxicity, TSS, Turbidity, total and dissolved
 PCBs, and metals samples based on turbidity. No oil sheen observed.

Week of August 13, 2007 (Week 2)

August 13, 2007:

- **Tidal stage:** High tide at 8:45 and 21:06 EDT; low tide at 2:42 and 14:47 EDT.
- **Dredge activity:** Actively dredging in Area H. Debris removal in Area H.
- Monitoring activity: Level III monitoring. Monitored ebb tide.
- **Fishery and Wildlife Observations:** No negative impacts to fish passage observed, fish noted within and outside dredge area moving freely.
- **Results summary:** Turbidity readings collected at reference locations and out to 600 ft South of Dredge Area H, turbidity readings were <20 NTU (range 1.4-14.3 NTU) at all locations. Turbidity levels detected were mainly associated with debris removal. Very minor oil sheen observed around debris removal, contained by oil boom.
- Exceedances and sample collections: None.

August 14, 2007:

- **Tidal stage:** High tide at 9:28 and 21:46 EDT; low tide at 3:13 and 15:24 EDT.
- **Dredge activity:** No active dredging. Debris removal in Area G.
- **Monitoring activity**: Level III monitoring. Monitored ebb tide. Deployed moorings north and south of Area G.
- **Fishery and Wildlife Observations:** No evidence of fish damming or dead or impaired fish observed as well as any indications of fish passage obstruction observed along pipeline between the two active dredge areas or within Area G. Birds observed above and below dredge Area G.
- **Results summary:** Turbidity readings collected at Wood St. reference location and mooring locations North and South of Area G, turbidity readings were <20 NTU (range 7.3-15.8 NTU) at all locations. Oil sheen and small debris observed during debris removal, all contained by oil boom.
- Exceedances and sample collections: None.





August 16, 2007:

- **Tidal stage:** High tide at 10:50 and 23:06 EDT; low tide at 4:09 and 16:31 EDT.
- **Dredge activity:** No active dredging in Area G, dredge set up. Debris removal in Area G.
- Monitoring activity: Level II monitoring. Monitored high water, ebb and flood tide.
- **Fishery and Wildlife Observations:** Birds observed in all areas. Several dozen dead fish were observed along western shore of the Acushnet River, approximately 800-900 ft North of Wood St. A dead bird was observed tangled in the oil boom and a dead duck was observed approximately 800 ft north of Wood St.
- **Results summary:** Turbidity readings collected at Wood St. reference location, North of Wood St., 200 ft from debris removal in Area G, and dredge boundary, turbidity readings were <20 NTU (range 3.4-16 NTU) at all locations. Heavy oil sheen observed in northern part of area and migrating up river, wind dissipated sheen slightly by mid-day. Oil sheen also observed along shore line North of Wood St.; notified S. Fox, M. Gouveia, and P. L'Heureux that sheen was not being contained by oil booms and that dead fish had been observed north of Wood Street.
- Exceedances and sample collections: No exceedances of the turbidity criteria were noted. Under Level II sampling pre-planned samples were collected for TSS, turbidity, and metals analysis.

August 17, 2007:

- **Tidal stage:** High tide at 11:32 and 23:46 EDT; low tide at 4:37 and 17:04 EDT.
- **Dredge activity:** Actively dredging in Area G. Debris removal in Area G.
- Monitoring activity: Level III monitoring. Monitored high water, ebb tide.
- **Fishery and Wildlife Observations:** Schooling and feeding fish at North of Wood St. Bridge. Dead fish were noted in dredge Area G.
- **Results summary:** Turbidity readings were 20-50 NTU within 100 ft of debris removal to <20 NTU throughout the dredge area. Light to heavy oil sheen observed moving northwest to southeast corner of the dredge area from debris removal.
- Exceedances and sample collections: None.

Week of August 20, 2007 (Week 3)

August 20, 2007:

- **Tidal stage:** High tide at 1:18 and 13:54 EDT; low tide at 6:21 and 19:10 EDT.
- **Dredge activity:** Actively dredging in Area G. Debris removal in Area G.
- Monitoring activity: Level III monitoring. Monitored flood tide.
- **Fishery and Wildlife Observations:** Birds observed north and south of the dredge area. Dead fish were not observed.
- **Results summary:** Retrieved moorings from north of dredge area. Observed localized high turbidity values near dredge and debris removal (50-60 NTU with spikes of 80-100 NTU). A very thin plume layer traveled down current, as the plume reached the dredge boundary, the turbidity dropped to 15-20 NTU. Turbidity readings collected at reference location, north dredge boundary, and 300 ft down-current, turbidity readings were ≤20 NTU (range 5-20 NTU). Light oil sheen observed in the morning southwest of the debris removal, contained by oil booms.





• Exceedances and sample collections: None.

August 21, 2007:

- **Tidal stage:** High tide at 2:14 and 14:51 EDT; low tide at 7:08 and 20:11 EDT.
- **Dredge activity:** Actively dredging in Area H. Debris removal in Area H.
- Monitoring activity: Level III monitoring. Monitored flood tide.
- **Fishery and Wildlife Observations:** No evidence of fish damming or dead or impaired fish observed as well as any indications of fish passage obstruction observed along pipeline between the two active dredge areas or within Area H. Birds observed above and below dredge Area H. Fish were observed within and outside of dredge area.
- **Results summary:** Turbidity readings collected at the reference location south of Area H, the northern boundary of H, 300 ft north of Area H and 600' north of Area H. Turbidity readings were <26 NTU (range 3.2-25.1 NTU) at all locations. Small oil sheen was observed south of debris removal; all was contained by oil boom. A fairly large, but low level turbidity plume was observed during the morning but began to dissipate around 11:30am. The turbidity was around 20-25 NTU at boundary but dropped to approximately 15 NTU at 300 ft outside of the boundary.
- Exceedances and sample collections: None.

August 22, 2007:

- **Tidal stage:** High tide at 3:16 and 15:50 EDT; low tide at 8:06 and 21:25 EDT.
- **Dredge activity:** Debris removal and dredging in Area H.
- Monitoring activity: Level III monitoring. Monitored flood tide.
- **Fishery and Wildlife Observations:** Birds observed in and around area H.
- **Results summary:** North and South moorings were deployed. Turbidity readings collected at reference location south of Area H, post mooring deployment, dredge gate north, and 300 ft from gate, turbidity readings were <43 NTU (range 3.3-42.5 NTU) at all locations. No oil sheen was observed. A plume similar to the one observed on 8/21/07 was also observed. The turbidity levels were averaging around 18-25 NTU with occasional spikes to 40-60 NTU. When the plume was observed at 300 ft the turbidity dropped to 10-15 NTU and continued to drop rapidly at 550-600 ft from the boundary.
- Exceedances and sample collections: None.

Week of August 27, 2007 (Week 4)

Debris removal and push boats working in shallow waters of Area G create elevated turbidity nearing turbidity action levels. Short-lived nature of these plumes resulted in no sample collections driven by criteria exceedances. Widespread surface oil sheens generated by activities in both dredge areas.

August 27, 2007:

- **Tidal stage:** High tide at 7:39 and 19:59 EDT; low tide at 1:11 and 13:18 EDT.
- **Dredge activity:** Debris removal in Area H. Dredging in Areas H and G.
- Monitoring activity: Level III monitoring at both dredge areas. Monitored ebb tide.
- **Fishery and Wildlife Observations:** Birds seen working after bait fish between areas G & H. No obstructions to fish passage observed.





• Results summary:

- Area H: Widespread, low level suspended sediment plume coming from debris removal activities: 15-25 NTU at 300 ft downstream, 5-10 NTU at 600 ft downstream. Values returned to background levels 700-750 ft from debris removal.
- o **Area G:** Turbidity levels at 15-20 NTU within 300 ft of dredge, 5-10 NTU beyond dredge, and near background at 600 ft. Highest turbidity values associated with push boat activity in shallow water.
- Exceedances and sample collections: None.

August 28, 2007:

- **Tidal stage:** High tide at 8:23 and 20:44 EDT; low tide at 1:52 and 14:07 EDT.
- **Dredge activity:** Debris removal and dredging in Area G.
- Monitoring activity: Level III monitoring during ebb tide.
- **Fishery and Wildlife Observations:** Several small schools and individual fish noted. No obstructions to fish passage observed.
- **Results summary:** Oil sheens observed as thin films with concentrated areas near dredge and debris removal. Sheen expanded to west by wind. Heavy sheens seen when moving the debris removal equipment. Elevated turbidity was also associated with this activity. Turbidity values of 40-120 NTU were seen 200-400 ft from debris removal. Plumes were very short lived leaving no opportunity to collect elevated turbidity water samples out at the criteria distances.
- Exceedances and sample collections: None.

August 29, 2007:

- **Tidal stage:** High tide at 9:08 and 21:29 EDT; low tide at 2:33 and 14:54 EDT.
- **Dredge activity:** Debris removal and dredging in Area H. Debris removal in Area G.
- Monitoring activity: Level II during ebb tide.
- **Fishery and Wildlife Observations:** Birds seen working north and south of Area H. Observed numerous bait fish south of Areas H. Also, large numbers of bait fish observed immediately south of Wood St. bridge.
- Results summary:
 - o **Area H:** Little to no elevated turbidity associated with dredging. Moderately elevated turbidity (15-35 NTU) associated with debris removal.
 - O Area G: Oil sheen noted north of Wood St. (approximately 350 ft north of bridge). Oil sheen observed prior to peak ebb flow and not contiguous with sheens seen in dredge area. Turbidity associated with debris removal was generally low: 30-40 NTU at 75 ft from debris removal, 15-25 NTU at 300 ft, 10-15 NTU at 600 ft
- Exceedances and sample collections: No exceedances. Samples collected for TSS and turbidity.





Week of September 3, 2007 (Week 5)

Debris removal and push boats working in Area H created elevated turbidity nearing turbidity action levels. Short-lived nature of these plumes resulted in no sample collections driven by criteria exceedances. Surface oil sheens generated by debris removal activities in dredge area H.

September 4, 2007:

- **Tidal stage:** High tide at 1:55 and 14:32 EDT; low tide at 7:19 and 20:53 EDT.
- **Dredge activity:** Debris removal in Area H.
- Monitoring activity: Level III monitoring at dredge area H. Monitored flood tide.
- **Fishery and Wildlife Observations:** Birds observed above and below work area. No obstructions to fish passage observed.
- **Results summary:** Oil sheen observed northeast of debris removal. Slight, turbidity elevations associated with debris removal activities: 6-10 NTU at 75-80 ft.
- Exceedances and sample collections: None.

September 5, 2007:

- **Tidal stage:** High tide at 3:04 and 15:40 EDT; low tide at 8:35 and 22:29 EDT.
- **Dredge activity:** Debris removal and dredging in Area H.
- Monitoring activity: Level III monitoring at dredge area H. Monitored flood tide.
- **Fishery and Wildlife Observations:** Birds observed above and below work area. No obstructions to fish passage observed.
- **Results summary:** Oil sheen observed southeast of debris removal. Observed a widespread turbidity plume northeast of the debris removal. Turbidity values ranged from 25-35 NTU at 200 ft and 10-20 NTU at approximately 300 ft from the debris removal activities. Higher spikes were observed were values reached 40-50 NTU at 275-300 ft. Plumes were very short lived leaving no opportunity to collect elevated turbidity water samples out at the criteria distances.
- Exceedances and sample collections: None.

Week of September 10, 2007 (Week 6)

Localized turbidity plume observed with dredge activities in Area G, while higher turbidity values were observed with debris removal in Area H. The turbidity plumes resulted in no sample collections driven by criteria exceedances. In both areas, surface oil sheens were observed. On 9/11/07, very heavy oil sheen, high turbidity values, and fish kills were all observed. Planned samples were collected during this time-frame. Low turbidity values were measured and no oil sheens were observed the remainder of the week.

September 10, 2007:

Area G

- **Tidal stage:** High tide at 7:38 and 19:59 EDT; low tide at 1:44 and 13:54 EDT.
- **Dredge activity:** Debris removal and dredging in Area G. Debris removal barge moved to Area H in the early morning.
- Monitoring activity: Level III monitoring at dredge Area G. Monitored ebb tide.
- **Fishery and Wildlife Observations:** Large numbers of gulls were observed working in and around the dredge unit. No obstructions to fish passage observed.





- **Results summary:** Heavy oil sheen observed south of dredge area. Localized turbidity plume of 18-25 NTU observed 75-100 ft from dredge unit, however, the turbidity values returned to background beyond 100 ft.
- Exceedances and sample collections: None.

Area H

- **Tidal stage:** High tide at 7:38 and 19:59 EDT; low tide at 1:44 and 13:54 EDT.
- **Dredge activity:** Debris removal in Area H. The dredge was also moved and set-up.
- Monitoring activity: Level III monitoring at dredge Area H. Monitored ebb tide.
- **Fishery and Wildlife Observations:** Birds observed south of dredge unit. Large numbers of fish jumping in southwest corner. No obstructions to fish passage observed.
- **Results summary:** Small, but heavy oil sheen observed south of debris removal. Extra booms added to contain sheen. Turbidity values ranged from 25-35 NTU at 50 ft from the debris removal activities with higher spikes of 50-60 NTU. Furthermore, a narrow turbidity plume from debris removal was detected out to approximately 700 ft. Turbidity elevations associated with dredge activities were 10-14 NTU at approximately 200 ft and dropped rapidly.
- Exceedances and sample collections: None.

September 11, 2007:

- **Tidal stage:** High tide at 8:19 and 20:39 EDT; low tide at 2:11 and 14:28 EDT.
- **Dredge activity:** Debris removal and dredging in Area G.
- **Monitoring activity:** Level I monitoring at dredge Area G. Monitored high, ebb, and flood tide.
- **Fishery and Wildlife Observations:** Several hundred dead fish were observed within and south of the dredge area. COE was notified of fish kill and corrective action was taken immediately, including cessation of debris removal activities and deployment of additional oil booms.
- **Results summary:** Very heavy oil sheen observed, possibly associated with debris removal. Localized low-level turbidity (10-15 NTU) observed south of dredge activities. Turbidity values ranged from 23-29 NTU at 75 ft from the debris removal and higher spikes of 59-60 NTU observed beyond 75 ft from debris removal activities. Dissolved oxygen levels in dredge Area G ranged from 1.4 to 2.8 mg/L.
- Exceedances and sample collections: No exceedances. Pre-planned, discrete water samples were collected for toxicity, TSS, turbidity, total and dissolved PCBs, and metals analyses based on a gradient of *in-situ* turbidity readings (low to higher concentrations).

September 12, 2007:

Area H

- **Tidal stage:** High tide at 8:59 and 21:17 EDT; low tide at 2:37 and 14:58 EDT.
- **Dredge activity:** Debris removal and dredging in Area H. No active dredging in the morning, dredge moved in Area G in the early morning.
- Monitoring activity: Level III monitoring at dredge Area H. Monitored flood tide.
- Fishery and Wildlife Observations: Occasional fish observed swimming at surface.





- **Results summary:** No oil sheen observed. Thin band of turbidity observed 15-40 NTU associated with debris removal, decreasing north to south. Dissolved oxygen values at the north and south moorings were around 3 mg/L.
- Exceedances and sample collections: None.

Area G

- **Tidal stage:** High tide at 8:59 and 21:17 EDT; low tide at 2:37 and 14:58 EDT.
- **Dredge activity:** Dredging in Area G in early morning.
- Monitoring activity: Level III monitoring at dredge Area G. Monitored flood tide.
- **Fishery and Wildlife Observations:** Sporadic fish swimming at surface, occasional dead fish observed.
- **Results summary:** No oil sheen observed with dredge removal. Turbidity values ranged from 4-8 NTU at 100 ft from the debris removal.
- Exceedances and sample collections: None.

September 14, 2007:

- **Tidal stage:** High tide at 10:16 and 22:31 EDT; low tide at 3:28 and 15:56 EDT.
- **Dredge activity:** Dredging in Area G.
- **Monitoring activity:** Level III monitoring at dredge Area H. Monitored flood, high, and ebb tide.
- **Fishery and Wildlife Observations:** Large numbers of birds observed north of, within, and south of the dredge unit. Large numbers of fish were observed north of the bridge; many appeared strained. Low oxygen levels were measured in the area. Some dead fish were noted, but not in large numbers.
- **Results summary:** No oil sheen observed. Small turbidity plume associated with the dredge; values typically ranged from 15-25 NTU with occasional spikes to near 40 within 150 ft of dredge. Dissolved oxygen values in the overall area were low, ranging from 2.5 in the northern dredge area to 3.5 mg/L south of Area H. Oxygen values fell sharply at approximately 900' upstream from the Wood Street bridge to 1.5-1.8 mg/L.
- Exceedances and sample collections: None.

Week of September 17, 2007 (Week 7)

Slight elevated turbidity was observed in the area of the debris removal and dredge activities in Area H and Area G. No exceedances were observed, therefore, there were no sample collections driven by criteria exceedances. Oil sheen was observed in dredge Area G immediately after dredging operations had ceased on 9/19.

September 17, 2007:

- **Tidal stage:** High tide at 12:20 EDT; low tide at 5:01 and 17:42 EDT.
- **Dredge activity:** Debris removal in Area H. Dredging in Area G.
- **Monitoring activity:** Level III monitoring at dredge Area H and Area G. Monitored flood tide.
- **Fishery and Wildlife Observations:** No obstructions to fish passage observed. Large numbers of birds working above, within, and south of dredge Area G. Numerous fish observed north of Wood St. bridge.





Results summary:

- o **Area H:** No oil sheen observed. Observed narrow plume on eastern shoreline. No exceedances, turbidity at 300 ft from debris removal ranged from 25-35 NTU. Turbidity values at the southern reference site were 2.5 NTU and at 200 ft from the debris removal activities was 45 NTU. Dissolved oxygen in this area (within and outside dredge Area H) ranged from 5 to 5.5 mg/L.
- O Area G: No oil sheen observed. Turbidity values were <20 NTU; at the reference site turbidity was 2.5 NTU and at 75 ft from the dredge activities was 15 NTU. Dissolved oxygen in dredge Area G ranged from 7.5 to 8.0 mg/L; north of Wood St. values dropped to approximately 3.5 mg/L.</p>
- Exceedances and sample collections: None.

September 19, 2007:

- **Tidal stage:** High tide at 1:37 and 14:10 EDT; low tide at 6:29 and 19:28 EDT.
- **Dredge activity:** Dredging in Area G. Dredging was completed just prior to monitoring. Debris removal in Area H.
- **Monitoring activity:** Level III monitoring at dredge Area G and Area H. Monitored flood tide.
- **Fishery and Wildlife Observations:** No obstructions to fish passage observed. Fish were observed in all areas north of Area H and within dredge Area H.
- Results summary:
 - o **Area G:** Heavy oil sheen observed in area of southern boom inside the dredge boundary and a light sheen observed throughout the dredge area. No exceedances, turbidity observed in the central area of the dredge boundary were <20 NTU (range 16-18 NTU) and north of the dredge ranged from 30-40 NTU.
 - o **Area H:** No oil sheen observed. No exceedances, turbidity at 50-100 ft south of the debris removal ranged from 16-22 NTU and 50-100 ft north of the debris removal ranged from 20-40 NTU.
- Exceedances and sample collections: None.

Week of September 24, 2007 (Week 8)

Slight elevated turbidity was observed in the area of the debris removal and dredge activities in Area H and Area G during monitoring on both days. No exceedances were observed, therefore, there were no sample collections driven by criteria exceedances. However, planned level II samples (TSS/Turbidity) were collected in Area H on 9/25/07.

September 24, 2007:

- **Tidal stage:** High tide at 6:25 and 18:47 EDT; low tide at 12:08 EDT.
- **Dredge activity:** Debris removal and dredging in Area H. Dredging in Area G.
- **Monitoring activity:** Level III monitoring at dredge Area H and Area G. Monitored ebb tide.
- **Fishery and Wildlife Observations:** No obstructions to fish passage observed. Occasional fish observed on surface in Area H and Area G.
- Results summary:
 - o **Area H:** Slight sheen observed near dredge activities. High turbidity values observed close to the dredge and debris removal activities. The plume of turbidity





traveled south with the wind and tide. High turbidity associated with support vessel traffic due to low tide. Turbidity diminished away from sources and south of Area H boundary. Turbidity values observed at Area H boundary was 17 NTU, 75 ft south of debris removal was 122 NTU, and 100 ft south of debris removal was 88 NTU.

- o **Area G:** No oil sheen observed. Dredge activity ceased due to low tide. No monitoring in the area.
- Exceedances and sample collections: None.

September 25, 2007:

- **Tidal stage:** High tide at 7:11 and 19:33 EDT; low tide at 0:37 and 13:00 EDT.
- **Dredge activity:** Debris removal and dredging in Area H. Dredging in Area G.
- **Monitoring activity:** Level II monitoring at dredge Area G and Area H. Monitored ebb tide.
- **Fishery and Wildlife Observations:** No obstructions to fish passage observed. Occasional fish observed on surface in Area H and Area G.
- Results summary:
 - Area H: Occasional oil sheen noted around dredge activities. Background turbidity observed in dredge and debris removal area ranged from 5-10 NTU. Turbidity readings above background confined to dredge path. Turbidity values 50 ft south of the dredge were 90-100 NTU, 75 ft south of the dredge were 55-65 NTU, and 100 ft south of the dredge were 10-20 NTU.
 - Area G: Slight oil sheen observed to the east and northeast of dredge. Dredge working very tight in northeast corner of dredge area. Higher turbidity concentrated to the northeast area with a slight sheen observed. Turbidity dropped off to background values of 6-10 NTU approximately 50 feet to the south and east of dredge activity.
- Exceedances and sample collections: No exceedances. TSS and turbidity samples collected during monitoring in Area H.

Week of October 1, 2007 (Week 9)

Monitoring focused on area H (no activity occurred in Area G). No turbidity exceedances were observed at 300 ft or 600 ft from dredge activity. Elevated turbidity readings were observed in close proximity (within 50 ft) of dredge activities in Area H however, readings diminished with distance from the dredge activities. Occasional oil sheen was observed on 10/3/07. Planned level I samples (toxicity, TSS/Turbidity, and total and dissolved PCBs) were collected in Area H on 10/3/07 adjacent to dredging activities, at 300 ft and at 600 ft from dredging activities.

October 1, 2007:

- **Tidal stage:** High tide at 12:06 EDT; low tide at 5:06 and 18:06 EDT.
- **Dredge activity:** Debris removal and dredging in Area H.
- Monitoring activity: Level III monitoring at dredge Area H. Monitored flood tide.
- **Fishery and Wildlife Observations:** No obstructions to fish passage observed. Many fish observed on surface in Area H.
- **Results summary:** No oil sheen observed. Turbidity ranges of 75-85 NTU were confined to within dredge area and in close proximity to debris removal. Short lived plumes of





turbidity (20-60 NTU) were observed north of dredge area and in close proximity to the dredge activities. Values dropped quickly to background levels. Dissolved oxygen levels ranged from 4.5-6 mg/L throughout the dredge area.

• Exceedances and sample collections: None.

October 2, 2007:

- **Tidal stage:** High tide at 0:34 and 13:08 EDT; low tide at 6:01 and 19:16 EDT.
- **Dredge activity:** Dredging in Area H.
- Monitoring activity: Level III monitoring at dredge Area H. Monitored flood tide.
- **Fishery and Wildlife Observations:** No obstructions to fish passage observed. Large schools of fish observed in all areas of the river and transiting though the dredge area.
- **Results summary:** No oil sheen observed. Turbidity values ranged between 10-70 NTU, which corresponded with dredge pass from east to west. Elevated turbidity (70 NTU) was observed in area of support vessels. Higher turbidity values dropped off quickly with distance from dredging activities. Dissolved oxygen values ranged from 9.21-13.73 mg/L both north and south of dredge area.
- Exceedances and sample collections: None.

October 3, 2007:

- **Tidal stage:** High tide at 1:39 and 14:14 EDT; low tide at 7:07 and 20:47 EDT.
- **Dredge activity:** Dredging in Area H.
- Monitoring activity: Level I monitoring at dredge Area H. Monitored flood tide.
- **Fishery and Wildlife Observations:** No obstructions to fish passage observed. Schools of fish observed within Area H and outside dredge area.
- Results summary: Occasional oil sheen noted around dredge activities. Turbidity readings in close proximity to dredge activities (approximately 50 ft) were 15-110 NTU. There was a broad range of turbidity readings due to stop and go dredge activities. These broad ranges continued but diminished with distance away from the dredge. Turbidity values 300 ft from the dredge were 11.6-20 NTU and 600 ft from dredge area were 11-13 NTU. Dissolved oxygen ranged from 6.84-11.91 mg/L within the northern area of the dredge boundary and north of the dredge boundary with a wide-range of turbidity readings (11-110 NTU). Dissolved oxygen readings south of the dredge area ranged between 9.65-14.6 mg/L with associated lower turbidity readings.
- Exceedances and sample collections: No exceedances. Collected toxicity, TSS, Turbidity, total and dissolved PCBs, and metals samples based on turbidity.

Week of October 8, 2007 (Week 10)

Dredging was limited to Area H. No turbidity exceedances were observed at 300 ft or 600 ft from dredge activity and no samples were collected. Elevated turbidity readings were observed in close proximity (within 50 ft) of dredge activities in Area H however, readings diminished with distance from the dredge activities. No debris removal occurred although the barge was present for dredge support on 10/9/07. Occasional oil sheen was observed on both days.

October 8, 2007:

- **Tidal stage:** High tide at 6:30 and 18:52 EDT; low tide at 0:42 and 13:03 EDT.
- **Dredge activity:** Dredging in Area H. No debris removal.





- Monitoring activity: Level III monitoring at dredge Area H. Monitored Ebb tide.
- **Fishery and Wildlife Observations:** No obstructions to fish passage observed. Fish observed in all areas of the river and transiting though the dredge area.
- **Results summary:** Occasional oil sheen observed. Overall turbidity was low, ranging from 4-30 NTU within close proximity to dredge area, with an occasional spike to 50 NTU. Turbidity ranged from 3-17 NTU 50 ft from the dredge boundary. Values dropped to background levels (2.5-9.8 NTU) at 130 ft to 300 ft south of dredge area. Dissolved oxygen levels ranged from 3.5-4 mg/L throughout the dredge area and 3-6.6 mg/L outside the dredge area.
- Exceedances and sample collections: None.

October 9, 2007:

- **Tidal stage:** High tide at 7:12 and 19:32 EDT; low tide at 1:10 and 13:35 EDT.
- **Dredge activity:** Dredging in Area H. Debris removal barge present for support only.
- Monitoring activity: Level III monitoring at dredge Area H. Monitored ebb tide.
- **Fishery and Wildlife Observations:** No obstructions to fish passage observed. Occasional fish observed on the surface.
- **Results summary:** Occasional oil sheen observed. Crew did not enter dredge area due to close proximity of dredge debris removal barge and other support vessels. Highest turbidity levels (9-50 NTU) observed between 200 ft and 300 ft downstream of dredge activity. Values were dependent on dredge passage location. Turbidity values dropped off quickly at 300 ft from the dredge activity to just above background levels (4 NTU) with spikes to 26 NTU depending on dredge location. Dissolved oxygen values ranged from 5.5-6.4 mg/L within 300 ft from dredge activity.
- Exceedances and sample collections: None.





4.0 RESULTS

4.1 Dredging and Field Monitoring Summary

Dredging was conducted from mid-August to mid-October 2007. Dredging was initiated in Area H encompassing sections of DMU-9 and DMU-10, and DMU-11 and Area G, which encompasses sections of DMU-1 and DMU-102. The eastern portion of Area G (in DMU-102) is intertidal. As a result, dredging could not always be conducted in that area (dredge area G) during lower tides. To maintain efficiency a second dredge was set up. When low water prevented dredging in Area G, dredge crews moved over to the second dredge. This approach meant that the dredging location was variable from day to day and even within days. Dredging in Areas H and G was conducted in a North-South orientation during most of the dredging season. During the last two weeks of dredging in Area H, dredging was conducted East-West in the eastern portion of the dredge area only.

Once the dredge areas were determined, sheet piling was placed around the perimeter, at approximately 50 ft spacing. A perimeter cable was run around the sheet piles at approximately the high tide mark. Also along the perimeter, floating, absorbent oil booms were placed to contain any surface oil slicks. A 'gate' in the south end of the dredge area was used for all vessels entering or leaving the operation.

Dredging was performed using a Mud CatTM hydraulic dredge equipped with a horizontal auger (Figure 9). The dredge was propelled by winching itself along a transverse cable which spans the

dredge area to opposite sides of the perimeter cable. As a pass is completed, support crews relocated the cable to position for the next pass. Dredged material was pumped through a pipeline to a booster pump, then to the desanding facility at Sawyer Street. Following desanding, the remaining fine material was



Figure 9. Mud CatTM Hydraulic Dredge

pumped via a separate pipeline to the dewatering, treatment, and handling facility in the Lower Harbor. In total, Jacobs estimated that dredging removed 23,300 cubic yards of material in 2007.

Because hydraulic dredges can not process large debris it was necessary to conduct separate removal operations prior to the dredging of a particular area. Debris removal was accomplished by 'raking' the bottom with a barge-mounted excavator (Figure 10). The end of the excavator has two forked jaws that open and close. The jaws are deployed to the bottom, once on the bottom the two jaws scrape the bottom and then close into each other and capture the debris. Debris scows secured to the side of the debris removal platform stored the debris and were moved offsite as needed. Support boats were used throughout the operation to transport crews, maintain dredges, handle the pipeline, and move barges.





Water quality monitoring was conducted in an adaptive manner in response to changing operational and weather related conditions. The monitoring approach was modified as tides and

winds changed; as dredges changed areas; as debris removal activities changed; and as warranted based on support activities. The monitoring activities were also largely influenced by tidal conditions and safety. The dredge areas and the associated perimeter cable spanned most of the width of the river limiting access to northern portions of the river, including potential reference locations. Only at high tide was the east side of the river passable. At low tides it



Figure 10. Debris Removal Excavator

was often possible to pass under the perimeter cable, but sampling time was limited. All of these activities (dredging, debris removal, and support activities) had the potential to impact water quality. The monitoring program incorporated assessment of the entire operation.

4.2 Boat-based Measurements and Sample Collection

Boat-based monitoring followed the protocols outlined in Sections 2.1 and 2.2. Under these protocols the sampling teams functioned in an adaptive sampling mode, utilizing real-time *in situ* data to guide monitoring and sample collection. Depending on the objectives for each survey day, the real-time data either supported a criteria-based sampling approach (Figure 5) or guided the planned collection of water samples. Because no water quality exceedances of the established monitoring thresholds were identified at the 600-ft transect throughout the entire 2007 dredge season, no criteria-based samples were collected. However, non-exceedance data gathered within the 600-ft project boundary provides valuable information as to the potential effects of dredging and related activities on water quality during dredge operations. This is discussed further in Section 5. The results below describe the discrete sampling activities by collection date. Results of chemical and biological testing are provided in Section 4.4.

Water samples were collected either to establish baseline conditions and/or re-establish relationships between field measurements (i.e. turbidity) and toxicity results to verify the protectiveness of the 50 NTU criteria. No samples were collected in response to an exceedance of the 50 NTU turbidity criteria at the 600-ft transect. Water samples were collected for turbidity and TSS analyses on six occasions during the dredge season as detailed in the following paragraph. During three of these events samples were also collected for PCB and toxicity testing (Table 1). Metals samples were collected during four of the sampling events and were archived for potential analysis. None of the metals samples required analysis based on results of the other monitoring results.

The first sampling event was conducted on August 9, 2007 following Level I protocol (turbidity, TSS, PCBs, toxicity, and metals testing) during dredging and debris removal activities in Area H.





Four samples were collected: one reference sample, collected approximately 1,000 ft south of the dredging operations; one sample targeting the 55-60 NTU range, collected within approximately 100-150 ft from debris removal activity occurring on-site; and two samples targeting an intermediate turbidity (10-30 NTU), collected less than 300 ft south of the Area H dredge boundary.

The second sampling event was conducted on August 16, 2007 in response to observance of elevated turbidity plumes in Area G during debris removal activities (though below the 50 NTU at 300 ft criteria). Level II protocols were followed and four samples were collected for turbidity, TSS, and metals: one reference sample, collected at the Wood St. Bridge reference site; one sample collected 200 ft south of the debris removal; one sample from the Area G dredge boundary; and one sample collected 300 ft south of the Area G dredge boundary.

The third sampling event was conducted on August 29, 2007 during debris removal activities conducted at Area G. Level II protocols were followed and four samples were collected for turbidity and TSS analysis only: one sample was collected at the Wood St. Bridge reference site; one sample 75 ft from the debris removal activity; one sample at the Area G dredge boundary; and one sample 300 ft from the Area G dredge boundary.

The fourth sampling event was conducted on September 11, 2007 during dredging and debris removal activities at Area G. Level I protocols were followed and three samples were collected for the full suite of analyses. While unacceptable turbidity levels were not observed at the predefined boundary locations, the sampling team collected samples from a reference area and locations with higher turbidity close to the operations to evaluate turbidity/toxicity relationships and levels of protection. The reference sample was collected at the Wood St. Bridge, north of dredging activities. The other two samples were collected within 300 ft of dredging and debris removal activities; samples were collected from two turbidity ranges (23-29 NTU and 59-60 NTU). The team also observed several hundred dead fish south of dredge Area G. Dissolved oxygen readings in the survey area measured during this period ranged between 1.47 to 2.75 mg/L. COE was notified of fish kill and corrective action was taken immediately, including cessation of debris removal activities and deployment of additional oil booms.

The fifth sampling event was conducted at Area H on September 25, 2007 following Level II protocols. Three samples were collected for analysis of turbidity and TSS only, across a range of turbidity levels to generate a correlation curve of *in situ* turbidity readings to TSS values. Samples were collected in Area H, at locations targeting 10-20 NTU, 55-65 NTU, and 90-100 NTU during dredging activities.

The final sampling event was conducted on October 3, 2007 during dredging at Area H. Level I protocols were followed and three samples were collected for the full suite of analyses: one sample was collected approximately 50 ft, 300 ft, and 600 ft north of the dredge activities during the flood tide. Relatively low turbidity was measured in samples collected at all locations.

4.3 Continuous In Situ Data

The deployment of the continuously recording water quality sensors provided additional information that complimented the adaptive monitoring approach discussed above. The location of sensors both north and south of the dredge areas provides information regarding tidal





influences on sediment suspension and transport. The moorings were located between the 300 and 600 foot boundary lines of the active dredging area. Continuous readings provided water quality data for periods when adaptive sampling was not performed, such as inactive dredge periods (nights and weekends), thereby providing background condition for data comparison. Dredging operations frequently stopped and started due to mechanical or physical issues and the location of activities was highly variable. As a result, it is not always possible to ascertain how specific time periods in the continuous record relate to dredge activities. However, since no dredging took place on nights or weekends it is appropriate to use these time periods to define 'inactivity' and to use daytime to define 'activity' of the dredging operation. In this way, it is possible to distinguish dredging related water characteristics from background conditions. Appendix B provides plots of turbidity at both locations for the entire monitoring period. Additionally, these figures indicate tidal cycles and highlight nighttime and weekend periods. Individual examples are provided along with the results below.

In the discussion below and in the figures provided in Appendix B, a horizontal red line is indicated on each plot representing 50 NTU. A water quality criterion for the New Bedford Harbor Environmental Monitoring program has been established at 50 NTU above background, or natural turbidity. The background turbidity signal in the river is influenced by tidal conditions, stream flow, wind, and other factors. As a result the background turbidity signal can fluctuate on scales from minutes to days. In general, the background turbidity signal was between 3 and 20 NTU. Background values have NOT been removed from the continuous data presented in the following figures. As a result, the 50 NTU line should be viewed strictly as a guideline. For example, a value of 50 NTU represents a turbidity reading that is typically 40-47 NTU above background.

Turbidity signals related to dredge activity were clearly observed in the continuous *in situ* data. These signals manifest as peaks in turbidity above background. Figure 11 and Figure 12 in this section are provided as examples of these effects. The influences of tidal height and flow direction on sediment plume transport are also evident in these figures. Figure 11 shows the turbidity record from both moorings during Week 1 of dredging, including the following weekend. Nights and weekends are shaded on the figure to indicate periods of inactivity in the dredging operation. The following details water quality characteristics observed in the continuous record during this first week of dredging. The letters below correspond to the letters shown on Figure 11.

- **A.** On an incoming tide, current flow is predominately towards the north. As a result, any suspended sediment plumes related to dredging would be expected to be evident at the northern mooring and would not be expected at the southern mooring. This was observed to some extent on all three days with active dredge (8/15-8/17) where, during the rising tide, the northern turbidity was greater than the southern turbidity (labeled 'A'). The peaks observed on August 17, 2007 provide the clearest example of this, as dredging operations were active for a complete tide cycle. Note that the YSI was set to take a thirty second sample every 10 minutes.
- **B.** During the outgoing tide, the effect is reversed so that the southern mooring registers a turbidity peak ('B') while the turbidity measured at the northern mooring returns to background.





- **C.** Weak turbidity peaks seen on days with no dredging activities (8/18-8/19) are indicative of background levels of turbidity. They generally occur at low tide and may be indicative of more turbid outgoing river water or they may be a result of the fact that the sensor is nearer the bottom during low tide where any naturally occurring sediment resuspension is most evident.
- **D.** Throughout the record, occasional spurious readings are evident (narrow peaks such as the >50 NTU reading on 8/19). These are typically a single reading caused by momentary blockage of the turbidity sensor and do not indicate actual water column turbidity.

The correlation between low tide and background peaks in turbidity was occasionally very strong. This was true during extreme astronomical tides during the week of August 27, 2007. Figure 12 shows the effect of the exceptionally low tides on the turbidity signal at both moorings. Note that even during periods of no dredge activity (nights and weekend) high turbidity signals were observed during the low tides. Available weather data was reviewed for this time period, however, no apparent correlations existed between wind or precipitation and turbidity.

The 2007 dredge plan encompassed two geographic areas. These areas were active at various times during any given week as tides and other factors dictated. On occasions, the dredge would be working in one area while the debris removal was in the other area. When tides were below working conditions in the northern area, the dredge would work in the southern area. As a result, it is somewhat difficult to assess the location of dredging activities relative to particular data points in the continuous record. However, since the debris removal was active during August 16, 2007 in the southern area at high tide, and the dredge was not, it is reasonable to conclude that the relatively large plume observed by the south mooring that day was caused by the debris removal. Large turbidity plumes were also observed on October 8 and 9, 2007 at low tide in the southern section of Area H, however the debris removal barge was not operational, and only the dredge was in use. On September 14, 2007, the debris removal was not active, and the dredge crew was actively working in the northern area, however no apparent plume was observed (high tide). This indicates that both the debris removal and the dredge/support boats at times create significant turbidity plumes.







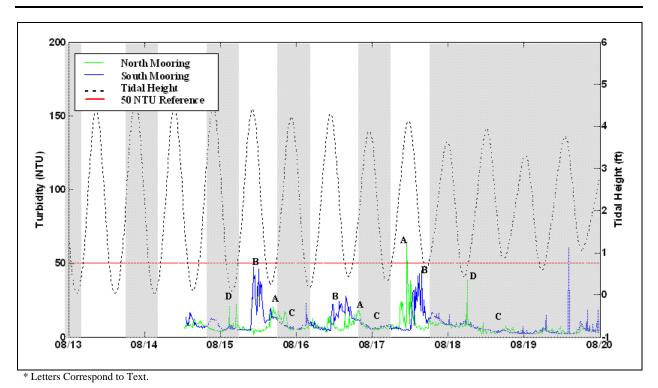


Figure 11. Example of Turbidity Signals Related to Dredging and Tidal Direction, August 2007 (shaded areas indicate nights and weekends).

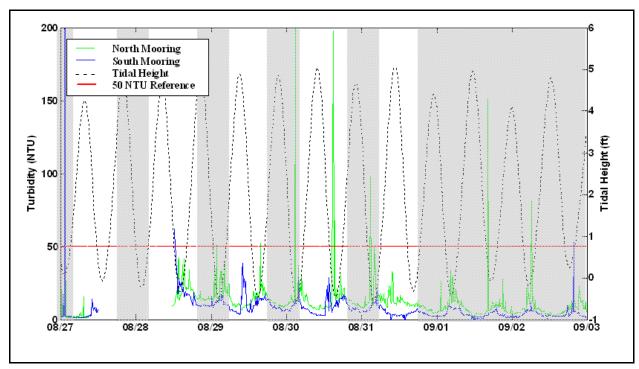


Figure 12. Example of Turbidity Signals Related to Extreme Low Tides, August and September 2007 (shaded areas indicate nights and weekends).





Continuous *in-situ* dissolved oxygen data were collected at both moorings throughout the majority of the deployments (Figure 13). Dissolved oxygen readings were typically higher during midday and decreased at night and throughout the early morning. The lowest dissolved oxygen readings recorded at the north and south moorings occurred early in the week of September 9, 2007 (Figure 13). Midday readings increased to approximately 5 mg/L, and the overnight readings decreased to approximately 2 mg/L. The low dissolved oxygen readings that occurred for 2-3 days, may have contributed to the fish kill that was observed on September 11, 2007 (see Section 5.1).

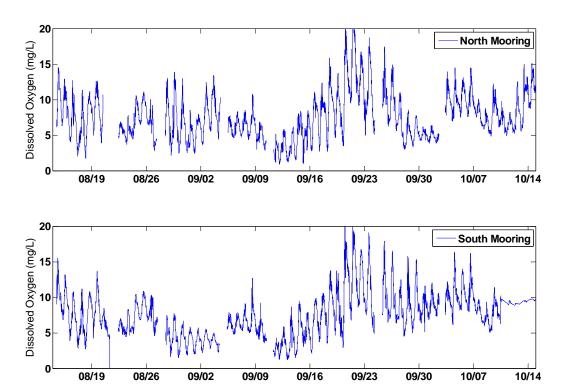


Figure 13. Continuous Dissolved Oxygen Data at the North and South Moorings, August to October, 2007.





4.4 Analysis of Discrete Water Samples

4.4.1 TSS/Turbidity Analyses

TSS and turbidity results for discrete water samples collected during the 2007 monitoring season are presented in Table 3. Field-based, *in-situ* turbidity data are also reported in Table 3 for comparison to the lab-based results. TSS and turbidity samples were collected based on distance from the dredging operation or debris removal (e.g., Reference, Boundary, 300 ft from Dredge Boundary, 200 ft from Debris Removal) and targeted turbidity levels (e.g., 13 NTU, 60 NTU).

In the field samples, TSS results ranged from 10.3 mg/L to 227 mg/L and turbidity results ranged from 4.6 NTU to 108 NTU. Samples collected from reference sites, which were generally located 1000 ft south or north of the dredging operation, showed relatively low TSS and turbidity measurements. TSS and turbidity values decreased with distance from the dredging operation (Table 3 and Figure 14). The highest TSS and turbidity values were observed in samples collected to target specific turbidity ranges (e.g., WQ-TSS/TUR-001-092507, WQ-TSS/TUR - 002-092507). These samples were collected to confirm relationship between turbidity, TSS, PCB, and toxicity as described in Section 2.1.

In addition, an equipment blank sample (WQ-TSS/TUR-005-081607-EB) was collected on August 16, 2007. The TSS and turbidity values in the equipment blank were approximately an order of magnitude lower than the lowest values observed in the field samples, indicating minimal impact of equipment and sampling procedure contamination on the field sample data. Furthermore, four field duplicate samples were collected during the dredge season. The results from the duplicate samples were similar to the sample results for both TSS and Turbidity with exception of a TSS sample collected on September 11, 2007. The duplicate TSS sample value was four times higher than the initial sample collected.

4.4.2 PCB Analyses

PCB results are presented in Table 4. Water samples for PCB analysis were collected during three of the six sampling events. Ten water samples, plus two field duplicates were analyzed for total (dissolved + particulate) PCBs (sample ID with prefix "WQ-TPC") and dissolved PCBs (sample ID with prefix "WQ-DPC"). One equipment blank sample was collected and analyzed for total PCBs.

The sum of 18 NS&T congeners (referred to as "SUM 18 CONG" in the text) for all the collected water samples are presented in Table 4. Because no appropriate multiplier is available from previous studies to correlate SUM 18 CONG to total PCB concentration in the water samples of the New Bedford Harbor, SUM 18 CONG is used in this report as an indicator of the relative level of PCB contamination in the water samples. Note that SUM 18 CONG only represents a fraction of the total PCB concentration in the water samples. The detailed analytical results of the water samples, including the concentrations for individual 18 congeners, as well as SUM 18 CONG, are presented in Appendix C. The SUM 18 CONG ranges from 0.25 μ g/L to 24 μ g/L in the total (dissolved + particulate) water samples, and from 0.12 μ g/L to 1.7 μ g/L in the dissolved phase samples (Table 4).





Table 3. Summary of TSS and Turbidity Results

					Field-based,
			Lab-b		in-situ reading
Date	Sample ID	Sample Description ¹	TSS (mg/L)	Turbidity (NTU)	Turbidity (NTU)
8/9/07	WQ-TSS/TUR-001-080907	Mid-Reference-Area H	10.5	4.6	2.2
8/9/07	WQ- TSS/TUR -002-080907	13 NTU-Area H	31.5	18	13.2
8/9/07	WQ- TSS/TUR -003-080907	20 NTU-Area H	40.7	24	19.6
8/9/07	WQ- TSS/TUR -004-080907	55 NTU-Area H	117	63	~55 ²
8/16/07	WQ- TSS/TUR -001-081607	Wood St. Reference-Area G	18.7	8.65	5.8
8/16/07	WQ- TSS/TUR -002-081607	200 ft from Debris Removal-Area G	26	14.7	16
8/16/07	WQ- TSS/TUR -003-081607	Dredge Boundary-Area G	24.5	12.4	11.1
8/10/07	WQ- 155/10R -005-08100/	300 ft S of Dredge	24.3	12.4	11.1
8/16/07	WQ- TSS/TUR -004-081607	Boundary-Area G	10.5	5.14	3.4
8/29/07	WQ- TSS/TUR -001-082907-DUP		27	12.3	9.1
8/29/07	WQ- TSS/TUR -001-082907	Wood St. Reference-Area G	24	12.1	9.1
8/29/07	WQ- TSS/TUR -002-082907	75 ft from Debris Removal- Area G	57	32.9	30.5
8/29/07	WQ- TSS/TUR -003-082907	Dredge Boundary-Area G	23.5	13.4	17.2
8/29/07	WQ- TSS/TUR -004-082907	300 ft from Dredge Boundary-Area G	24	18.4	16.7
9/11/07	`	Wood St. Reference-Area G	10.3	5.91	4.9
9/11/07	WQ- TSS/TUR -001-091107-DUP		43.8	6.04	4.9
9/11/07	WQ- TSS/TUR -002-091107	23 NTU, 75 ft from Debris Removal-Area G	41	19.2	23-29 ²
9/11/07	WQ- TSS/TUR -003-091107	60 NTU-Area G	129	52	$59-60^2$
9/25/07	WQ- TSS/TUR -001-092507	55 NTU-75 ft S of Dredge- Area H	188	63.8	57.6
9/25/07	WQ- TSS/TUR -002-092507	90 NTU-50 ft S of Dredge- Area H	227	108	94.6
9/25/07	WQ- TSS/TUR -003-092507	10 NTU-100 ft S of Dredge- Area H	27.5	13.8	13.2
9/25/07	WQ- TSS/TUR -003-092507-DUP	10 NTU-100 ft S of Dredge- Area H	34.5	12.4	13.2
10/3/07	WQ- TSS/TUR -001-100307	50 ft N of Dredge-Area H	144	71.6	$65-100^2$
10/3/07	WQ- TSS/TUR -002-100307	300 ft N of Dredge-Area H	34.3	15.5	$13-20^2$
10/3/07	WQ- TSS/TUR -002-100307-DUP	300 ft N of Dredge-Area H	28.5	16.7	$13-20^2$
10/3/07	WQ- TSS/TUR -003-100307	600 ft N of Dredge-Area H	19	14	11-13 ²
8/16/07	WQ- TSS/TUR -005-081607-EB	Equipment Blank	1	0.4	NA

Samples are collected either based on distance (e.g., 300 ft from Dredge Boundary, 200 ft from Debris Removal) or Turbidity levels (e.g., 13 NTU, 60 NTU), see Section 2.1 for further discussion on Sample Location.

² In situ readings were erratic and varied during sample collection





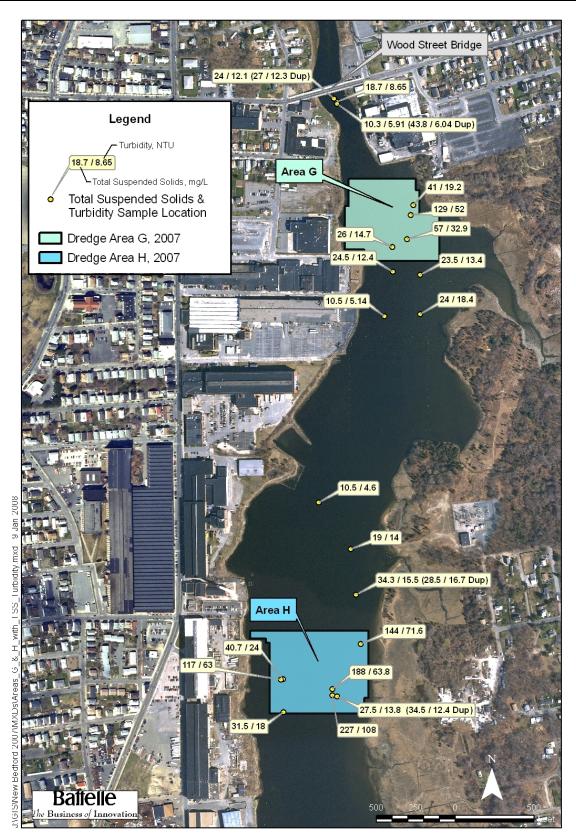


Figure 14. TSS and Turbidity Results.





The concentration of PCBs (SUM 18 CONG) measured in the equipment blank (WQ-TPC-004-091107-EB) collected on September 11, 2007 is 0.015 μ g/L, which is one or more orders of magnitude lower compared to the field samples. This indicates that the equipment and sampling procedure contamination, if any, had minimal impact on the field sample data quality. Furthermore, the results from the two duplicate samples were similar to the initial sample results.

4.4.3 Toxicity Analyses

Toxicity samples were collected following Level I protocols during 3 of the 6 sampling events (Table 1), resulting in a total of 10 samples for biological testing. All toxicity samples were collected in support of pre-planned sampling events; none were triggered by turbidity exceedances. Each sampling event included an upstream reference sample and testing included a laboratory control sample. Results for test endpoints for each sample were statistically compared to those from both the event-specific site reference sample and the laboratory control. Toxicity results, including a summary of survival, growth, development and reproduction endpoints and associated statistical analyses for all tests conducted, are presented in Table 4. Supporting data, including laboratory bench sheets, water quality data, statistical analyses and custody forms are provided in Appendix D. Review of reference toxicant data associated with the tests showed all results within the acceptable ranges.

4.4.3.1 Sea Urchin (Arbacia punctalata)

1-hr sperm cell fertilization – Percent fertilization was greater than 90% for all but two samples, and one of those was the control for the September 11, 2007 tests. Statistically, percent fertilization was never significantly lower than the laboratory control sample, however, two samples exhibited statistically significantly lower percent fertilization than the site-specific reference samples. Percent fertilization was consistently high (> 85%) indicating that while some impact relative to the reference samples was observed, the impact was relatively small.

4.4.3.2 Mysid (Americamysis bahia)

48-hr survival – All 10 samples tested for mysid 48-hr survival were within 5% of the laboratory controls and overall survival was excellent.

7-day mean survival - All but one of the samples tested for mysid 7-day survival were within 5 % of the laboratory controls. Only one sample, the 59-60 NTU sample collected on September 11, 2007, showed significant reduction in survival compared to both the laboratory control and the site reference sample. This sample contained the highest dissolved and whole water PCB concentrations collected during the monitoring period.

7-day mean growth – mean growth ranged from 0.09 to 0.58 mg/mysid. Growth was similar to/or greater than the laboratory control and site reference for all but three samples tested. Only one sample showed statistically significantly reduced growth relative to the laboratory control while all three showed reduced growth relative to the site specific reference samples.





4.4.3.3 Red alga (Champia parvula)

48-hr mean survival – All samples showed 100% survival indicating no acute impact to the alga.

7-day mean reproduction – Champia reproduction, measured as the number of cystocarps produced, was found to be statistically reduced in 5 of the 10 site samples tested. All five of these samples showed reduced reproduction relative to the laboratory controls and three of these samples also showed reduced reproduction relative to the site reference samples. In general, reduced reproduction was found associated with samples of higher turbidity or those samples collected closest to the dredging activities. Cystocarp production in the site sample collected within 50 feet of dredging activities on October 3, 2007, showed no cystocarp production at all.

									Toxicit	ty Results		
Dredge Area	Estimated Distance	Decerin-	TSS (mg/L)	Turb- idity (NTU)	Total PCB ² Results (µg/L)		Sea Urchin (A. punct- alata)	Mysid (A. bahia)			Red alga (C. parvula)	
and Sample Date	from Dredge (ft)				Total	Dissolved	mean fertilization (%)	48-hr mean surviv al (%)	7-day mean survival (%)	7-day mean growth (mg/ mysid)	48-hr mean survival (%)	7-day mean repro- duction (cysto- carp/tip)
	N/A	Lab Control	N/A	N/A	N/A	N/A	96.9	92.5	92.5	0.350	100	38.6
Area H	1000-1100	Reference	10.5	4.6	0.31	0.17	97.3	97.5	97.5	0.473	100	34.2
8/09/07	500	13 NTU	31.5	18	0.28	0.12	96.7	97.5	97.5	0.423	100	19.5 ^{3,4}
	200	20 NTU	40.7	24	0.25	0.14	97.8	97.5	95.0	0.436	100	40.4
	200	55 NTU	117	63	0.32	0.17	95.0	97.5	95.0	0.372 4	100	24.4 ³
	N/A	Lab Control	N/A	N/A	N/A	N/A	86.3	100	100	0.278	100	19.0
Area G 9/11/07	570	Reference	10.3 (43.8 ⁵)	5.91 (6.04 ⁵)	(1.5^5)	1.1 (0.91 ⁵)	92.7	100	98.8	0.322	100	20.8
	75	23-29 NTU	41	19.2	5.9	1.5	94.1	100	98.8	0.283 4	100	27.4
	140	59-60 NTU	129	52	24	1.7	84.8 4	100	45 ^{3,4}	0.090 3,4	100	5.45 ^{3,4}
	N/A	Lab Control	N/A	N/A	N/A	N/A	93.2	97.5	97.5	0.352	100	16.55
A II	50	50 ft.	144	71.6	8.2	1	94.7	100	100	0.580	100	0 3,4
Area H 10/03/07	300	300 ft.	34.3 (28.5 ⁵)	15.5 (16.7 ⁵)	1.7 (1.9 ⁵)	1.7 (0.75^5)	92.3 4	100	97.5	0.431	100	9.65 ³
	600	600 ft.	19	14	1.8	0.68	95.5	100	100	0.415	100	11.4
N/A Not An	N/A	Equipment Blank	1	0.4	0.015	N/A	N/A	N/A	N/A	N/A	N/A	N/A



N/A – Not Applicable

Samples are collected either based on distance (e.g., 300 ft from Dredge Boundary, 200 ft from Debris Removal) or Turbidity levels (e.g., 13 NTU, 60 NTU), see Section 2.1 for further discussion on Sample Location.

Sum of 18 NS&T congeners.

Bold values are significantly different from associated laboratory control sample.

Bold values are significantly different from associated reference sample.

⁵ Replicate value.

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5.0 DISCUSSION

The field monitoring program was designed to assess the potential impacts of dredging on water quality with an ultimate goal of minimizing harm to biological components of the system. To achieve that goal the monitoring was carried out in several ways;

- Adaptive *in situ* monitoring was used to track sediment plumes in real-time. This design allowed for immediate feedback to the dredging operation so that potential issues could be addressed before ecological harm was incurred.
- Pre-defined sampling provided guidelines for collection of analytical samples. The results of these analyses provide critical data regarding the chemical and biological impacts of dredging related activities on the system.
- Continuous data collection provided long-term information during periods when humanbased sampling was not possible and when potential anthropogenic disturbances to the systems were minimal.
- Observational monitoring was conducted during all aspects of the program. This included anecdotal observations of fish passage and behavior, and observations of non-targeted parameters such as oil sheens and air quality. Like the adaptive *in situ* monitoring, observational monitoring provides rapid feedback to managers and operators and can help to minimize ecological risk.

5.1 Fishery and Wildlife Observations

Information pertaining to fish passage and behavior are based on visual observations recorded by field staff throughout the 2007 monitoring season. Throughout the dredge season large numbers of fish were observed in the study area. Lower trophic level baitfish were consistently observed moving throughout the river from Sawyer St. to Wood Street. Larger predatory fish such as striped bass and bluefish were also sporadically seen. Heron, egret, and other wading birds were observed feeding along the shoreline during these weeks. Terns, cormorants, and gulls were seen in fairly large numbers as well (Figure 15). During this time period, when fish were most abundant, there appeared to be no restriction of movement past the dredge area.



Figure 15. A Flock of Seagulls Observed in Area of Dredging Operations.





During the water quality monitoring, sporadic dead fish were observed in the dredge areas. On September 11, 2007, several hundred dead fish were observed south of dredge Area G and corrective action was taken as described in Section 3.0. Dissolved oxygen readings at Area G measured during this period ranged between 1.47 to 2.75 mg/L. While sensitivity to low levels of dissolved oxygen is species specific, most species of fish are distressed when levels decrease to 2-4 mg/L and mortality usually occurs at levels below 2 mg/L. The dissolved oxygen level and duration of the oxygen depletion event will impact the number of fish that can die. Larger fish are usually impacted by low dissolved oxygen before smaller fish (http://edis.ifas.ufl.edu/FA002). Approximately 10 days after the fish kill on September 11, 2007, the dissolved oxygen readings increased to above 15 mg/L (Figure 13). Based on routine observations dredging operations did not appear to impact fish passage.

5.2 Suspended Sediment and Sediment Transport from Dredging Activities

As in previous years a project-specific warning level of 50 NTUs above background 300 ft down current of dredging operations was set as a threshold for sample collection and assessment of operations. A project criterion of 50 NTUs above background at 600 ft down current was set as a threshold for immediate cessation of operations related to the exceedance. During the 2007 dredge season there were no exceedances of either the warning level or the project turbidity criterion.

During operations there were three general activities with potential to generate suspended sediment plumes; 1) dredging, 2) debris removal, and 3) support activities. Dredging itself created virtually no measurable sediment plumes. When safety allowed, the monitoring team worked in tight radiuses (<30 ft) around the active dredges. Debris removal generated the most consistent suspended sediment plumes. The act of 'raking' the bottom generated smaller plumes that tended to settle quickly. The largest impacts were associated with pulling the equipment (with or without debris) up through the water column (Figure 16). As sediment cascaded off of the equipment, sediment plumes could be seen down current. This was particularly true for the sediment fractions which were often observed in the upper water column (above the halocline) for extended periods and distances. Because the sampling effort was targeting areas of elevated turbidity, some of the of water quality monitoring was focused around debris removal activities. Support activities included transport of people and gear, dredge maintenance, and moving of debris removal equipment both on routine basis and as a result of inclement weather. This last activity required greater propeller power from the larger boats and was the only support activity which tended to re-suspend sediments. This was generally only a problem at low tide when prop wash reached the bottom. While this was an infrequent problem it tended to generate the largest, most sustained turbidity plumes.

Turbidity plumes generated by all activities tended to be extremely short lived, both spatially and temporally. Suspended sediment plumes related to debris removal tended to be pulsed in nature. For example, monitoring crews would conduct radial transects around the operation at approximately 100 ft. When the debris removal bucket would come up through the water column turbidity would quickly begin to increase. Sensors towed from the bow of the boat at slow speeds (<2 knots) were used to obtain real-time readings to track the movement of the plume away from the source towards the criterion boundaries. In general, turbidity would drop back down to background levels well before the 300 ft line was reached. In cases where elevated turbidity persisted out towards the boundary, the readings would generally persist for less than 5-





10 minutes. Even within close proximity to operations, the plumes tended to be of short duration. A good example of this was observed on August 9, 2007. On this date, sampling crews targeted elevated turbidity for sample collection, and operated in close proximity to the dredge and debris removal to find high values. One sample was collected within 50 ft and two samples were collected within 100 ft south of the dredge and debris removal activities. The first sample was collected in a high turbidity (55-60 NTU) condition with final TSS concentrations of 117 mg/L. In the two samples that were collected within 100 ft of the dredge and debris removal activities, the turbidity values decreased to 13-20 NTU and TSS values were an order of magnitude lower (30-40 mg/L). In an effort to characterize the toxicity effect of elevated turbidity (discussed previously) the team attempted to target the high NTU areas for discrete sample collection. However, this sampling effort proved to be fairly difficult as turbidity plumes did not usually persist for long enough to collect a full suite of discrete samples.



Figure 16. Debris Removal Generated the Majority of Turbidity Plumes

The short term, pulsed nature of the suspended sediment plumes is also observed in the continuous *in situ* data record (Figures 11 and 12). Turbidity peaks at the northern and southern mooring locations between the 300 ft and 600 ft lines were always below 50 NTU when compared to background. On an incoming tide, current flow is predominately towards the north and as a result, any suspended sediment plumes related to dredging was observed at the northern mooring. During the outgoing tide, the effect was reversed so that any suspended sediment plumes were observed at the southern mooring. Weak turbidity peaks seen on days with no dredging activities are indicative of background levels of turbidity. They generally occur at low tide and may be indicative of more turbid outgoing river water or they may be a result of the fact that the sensor was nearer the bottom during low tide where any naturally occurring sediment resuspension is most evident. Individual spikes are visible in the record above 50 NTU, but as discussed earlier, these are spurious single readings caused by momentary blockage of the turbidity sensor and not representative of water column turbidity. The only extended periods of





elevated turbidity occurred during extreme low tides. However, comparable signals were seen during inactive dredge periods.

As noted in the 2006 Water Quality Monitoring report (Battelle, 2007), one of the more subtle characteristics of sediment transport observed during the monitoring period was the tendency for very fine sediments to become entrained in the upper water column. This was first observed visually during the monitoring program. Sampling crews observed 'clouds' of fine sediment and targeted these features for in situ readings. This revealed a thin layer of elevated turbidity associated with the low salinity surface water. Immediately below this layer turbidity declined to background levels. The lighter surface layer usually only represented about the upper one foot of the water column. The elevated turbidity associated with this layer was often even thinner, comprising only a few inches resting on top of the sharp density gradient. This may have been caused by shear in the water column where the surface layer was moving in a different direction or at a different speed than the bottom layer. Alternatively, the estuarine turbidity maximum (ETM) is a common property of estuaries resulting as tidal water moves upriver creating turbulence and resuspending sediments from the bottom while particulates in the outflowing river are trapped against the density gradient, adding to the turbidity levels. Additionally, as the freshwater contacts the more saline water dissolved material can flocculate creating more particulates which add to the turbidity levels. In either case, turbidity readings in these surface layers were generally only about 15-30 NTU, well below the warning criterion, but at times these levels persisted for several hundred feet away from the source.

5.3 Impacts to the Water Column

As expected, turbidity correlated well with TSS (R² = 0.9367) in the two dredging areas (Figure 17). Samples collected from Area G (Figure 18) showed better correlation between total PCB (as SUM 18 CONG) and TSS, and thus with turbidity, than the samples from Area H (Figure 19). This may be an indication of different levels of PCB contamination in the sediments from the two dredging areas. Resuspended sediments from Area G may be relatively contaminated, resulting in the total PCB increase with TSS (Figure 18). On the other hand, Area H sediment may be less contaminated, and therefore a TSS and total PCB correlation was not apparent in the water samples from the area (Figure 19). As observed in the 2006 Water Quality Monitoring program, dissolved PCB concentrations were generally low and did not correlate well with TSS (Figure 20).





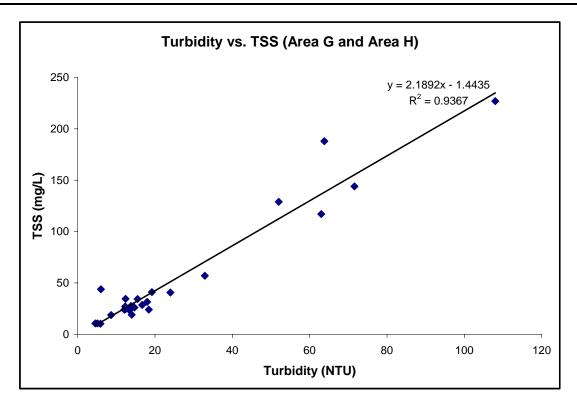


Figure 17. Turbidity vs. TSS Plot (Area G and Area H)

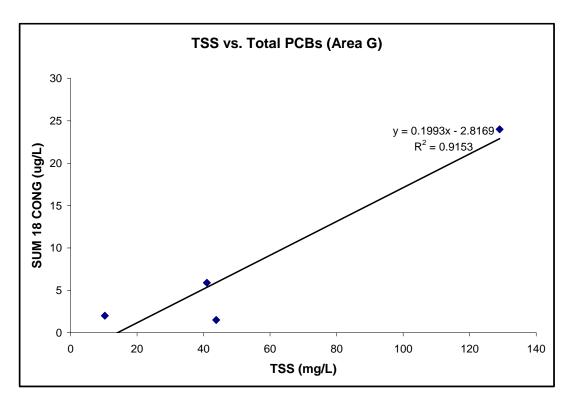


Figure 18. TSS vs. Total PCB Plot (Area G)





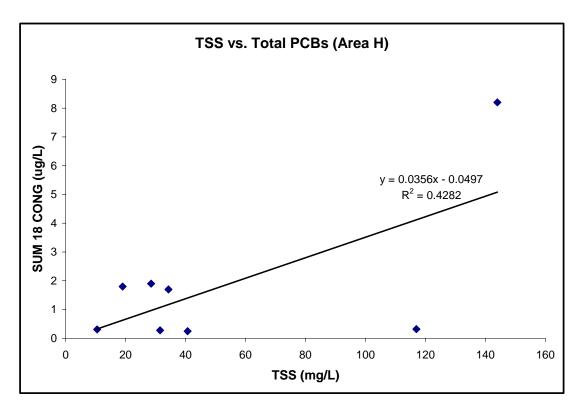


Figure 19. TSS vs. Total PCB Plot (Area H)

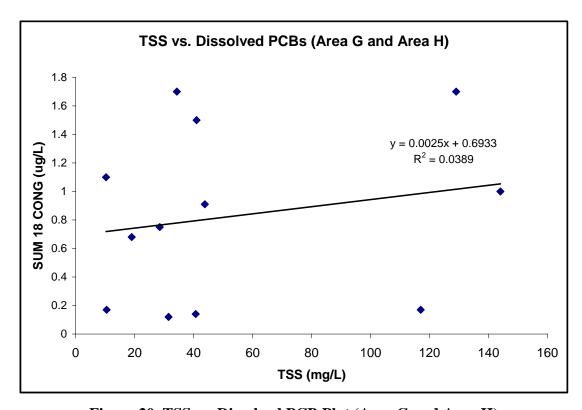


Figure 20. TSS vs. Dissolved PCB Plot (Area G and Area H)





Toxicity testing showed limited significant reduction in endpoints for all species (Table 4). Mean survival in the 48-hr mysid and red alga tests were not significantly different compared to reference (or laboratory control), indicating that there were no measurable acute impacts from exposure of the test species, A. bahia and C. parvula, to surface water collected at Areas H and G during dredging activities. In contrast, sublethal effects were observed for the 60-minute fertilization and 7-day survival, growth and reproduction tests. For example, A. punctalata fertilization was significantly lower than reference for the two surface water samples with the highest concentrations of dissolved PCBs (Table 4), albeit the magnitude of the reductions was small. Americamysis bahia mean survival and mean growth and C. parvula mean reproduction were significantly lower than reference (and control) for the surface water sample collected at Area G on September 11, 2007. Notably, this sample had the highest turbidity, TSS, and PCB (total and dissolved) concentrations measured during the monitoring season (at dredge Area G). Moreover, several hundred dead fish were observed south of Area G on this date. *Champia* parvula exposed to surface water collected 50-ft down-current of dredging activities at Area H on October 3, 2007 had the lowest cystocarp production. While there does appear to be measurable water column impacts, they appear to be limited to samples containing elevated turbidity, TSS and PCBs, and to areas well within the acceptable project boundaries.

As noted previously, *in situ* turbidity measurements indicated that these turbidity plumes, representing high suspended solids loads and elevated total PCB concentrations, were isolated to the area immediately adjacent to dredging and debris removal and were also relatively short lived. Total PCB concentrations remained relatively low at the dredge boundary and beyond. Dissolved PCBs, which are thought to be the fraction that causes direct toxicity to marine organisms and may be subjected to long range transport, remained low even in the samples with the highest TSS and total PCB concentrations. Overall, no exceedances of the turbidity criterion of 50 NTU above background were observed outside of the 300 ft boundary. While measurable water column impacts were observed based on toxicity testing, these were isolated to samples collected well within the project boundaries. Data collected confirmed that the 50 NTU criterion continues to be ecologically protective, while still allowing remediation efforts to progress.





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6.0 REFERENCES

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Appendix A

Water Quality Monitoring Field Logs and Tide Data



Battelle Daily Field Summa	ary Sheet for Water Quality Monitoring
Date:	D(ed) & p) 9 & 200 400 Feet
Turbidity Summary Location Turbidity Sensor/water (NTU) Depth (ft) Ref. 4.5 2.4	* we pout at gate N 2704335. E: 815345 South sutugate Set - 6650 D.5.
Oil sheen/ Debris: Sheen moving up to 1,000 N of de Fish Passage: but fish out we thou Samples Collected for Laboratory Ana TSS (1L) Total PCB (1L) Toxicity (21L) Notes:	ughout orea of Gulls and Terms feeding.

No active deed in the time lines. Debis semova in Accourt only activity.
Tubidity elevated in alose proximity to DR, but <20 greater than 200

Sampling Crew: T. Himmer, M. Walsh, A. Man f.eld
Chief Scientist Signature: J. Myster

Baffelle

Water Quality Monitoring In situ Data Field Form

Dredging Location	Arra H			
Dredging Description	Debris Remail, Pipeline testing			
Survey Vessel				
Chief Scientist	A. Mansfield			
Sampling Technician	7. Himmer			
Vessel Captain	Hike Walsh			
Other Personnel	N/A			
Weather conditions	5 wind sunny but budding clouds, winder			

Date	8/6/07
Page	/ of /

Tide information			
High	2:13 Am	3.61	
Low	7:38 Am	0.2'	
High	14:51 PM	4.5'	
Low	20:57	0.7'	

Station Number	Time	Latitude N	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO ing/L	Temp			otes	İ	
REF	10:10	2704009.6	815183.99	5.5'	2.4'	4.5	30.8	91.69	25.6	0	320	upc	uvvent	st s
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YSI Calibration Form Daily 2007 WQ Monitoring for New Bedford Harbor – G606422

Instrument Model #_	6920	S/N#	NA

Date: 8/4/07	Initials:	JM H		
DO membrane changed? Y (N)		Turbidity Wiper	Changed?	
Battery Voltage:	Turbio	dly wiper parks 1	80° from optics?	
Parameter	Initial Reading	Calibrated Reading	Calibration Data (acceptable range)	
Conductivity (mS/cm)	0.8	1.0	Cell constant (4.55 – 5.45)	
Depth (ft)	0.3	0.0	Pressure offset, vented (0 ± 6)	
Turbidity (NTU) 0	_5.2	0.0	Turbidity Offset:	
Turbidity (NTU) 123	127.0	123.0		
D.O. (% Sat)		101.6 TH	D.O. Gain (0.7 - 1.4)	
pH 4	4.09	4.01		
pH 7	6.89	7-01		
Comments:				

Date: 8/7/07	Initials:	MV		
DO membrane changed?	Turbidity Wiper Changed?			
Y (N)	Turbidle	Y (90° from antioo?	
Battery Voltage: 4/%	Turbiai	wiper parks in \bigcirc N	80° from optics?	
Parameter	Initial Reading	Calibrated Reading	Calibration Data (acceptable range)	
Conductivity (mS/cm)	1000	1000	Cell constant (4.55 - 5.45)	
Depth (ft)	-0.059	-0.000	Pressure offset, vented (0 ± 6)	
Turbidity (NTU) 0	1,0	ს, 0	Turbidity Offset:	
Turbidity (NTU) 123	123.1	123.0		
D.O. (% Sat)	100.2	100.2	D.O. Gain (0.7 - 1.4)	
pH 4	4.20	4.00		
pH 7	ር _ነ ላን	7.00		
Comments:				
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Daily Field Summary Sheet for Water Quality Monitoring

Date: 8/7/07 Weather: Ovurust / Hunid		0 200 400 Feet		
Tides: 1		water_lines 2007_area_H		
Monitoring Period: From: 0930 To: 1230 Tidal Stage: HWS Ebb (WS Flood)		wind for		
Dredging Activity: Dumz Runoval Aran H Pipling Tusting	5- 1-4 portu			
	Tiebris Rannal			
Turbidity Summary Location Turbidity Sensor/water (NTU) Depth (ft) Ref. South 2-4 0.5-2.0' 150' up current 30-40 -1.5' of liabris (Ref. South 2-4 0.5-2.0' All 150' up current 30-40 -1.5'	John James			
100' up curue 5-10 21.5'	REFERENCE	1		
Oil sheen/ Debris: Heavy Sheen noted mid outsu Fish Passage: Bait tish activit	to late morning SW o	f depris veneral		
Samples Collected for Laboratory Ana TSS (1L)	alysis – Sample IDs: Turbidity (500ml)			
Notes: O slight oil sheen outside boom in morning; observed 2.3 and Herring near				
Southern oil boom-crippled. (1) Oil sheen increased into later morning Ishown in sketch) - turbidity remained 100. (3) Lots of but fish activity within and outside dredge area H Sampling Crew: MMISH T. Himmen				
Chief Scientist Signature:				

Water Quality Monitoring In situ Data Field Form

Dredging Location	ALEA H
Dredging Description	Debriz Remarcal Africa H
Survey Vessel	Gale Force
Chief Scientist	T. Himmer
Sampling Technician	mwalsh
Vessel Captain	m. wx15h/T. ftinung
Other Personnel	
Weather conditions	orneast

Date	8/7/07
Page	e of e

Tide information					
High	3:18	3.4'			
Low	8:44	0-41			
High	3:55	4.51			
Low	10:25	0.7'			

Station Number	Time	Latitude	Longitude	Water depth₁↓↓	Sample Depth	Turbidity	Salinity	DO ma/L	Temp	Notes
REFSouth	9:40	2703674	815262	6.7' 4.3	0.51	2.3	29.42	4.16	25.3	
REFSouth		; ((I	47 43	201	4.0	30.58	3.42	25.4	
308 South 44	10.52			5.4	1.0'	4.2	301	3.5	25.5	
200' Nof Dela	ی				- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1				T	, , , , , , , , , , , , , , , , , , ,
Remnal	12:30	<u> </u>		5.5	1.5	150	29.6	2.9	25.6	
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Daily Field Summary Sheet for Water Quality Monitoring

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,	Weather: 3 toing early an								
	Weather: Stormy early am. Tides: windy, kumid						w	ater_lines	
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J. •	0.41 @ 10:00 Am	1		4.8	n A.M	(5)			'
	u. 6' @ 16:57					\	1/2	N	
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	Manitanina Daniada	"				4]]]		~
	Monitoring Period:	-	}}	10 1014		 	/ <u>\</u>		
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	4 12:30		1 1	0-15-NIN		{ /		1	
	Tidal Stage: HWS Ebb LWS Flood	ļ!		12×17					
				DINITU_	30-40	istu with	en bre	age "	
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	Debris Removal in Area H;		1 11 7 1/2	¥. V.	Small				
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	broken dredge tran Area H						7		
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	Location Turbidity Sensor/water	})			}}		3 //	ŀ
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	S. Treage Bound 8-9 0.3'							4	5
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	Oil sheen/ Debris:								
	Very small localized sh	aci	n seen in	maria	a M	יממי נמי	· cont	mod	4.
	allowing also noted	æ	mileter .	5//(5)	below	> , , , , , , , , , , , , , , , , , , ,	, /		
	Fish Passage noted a few Care	<i>O</i>	and barriers	Note 1	area t	1 - nu	Movor	c bind	· Soute
	very small, localized she oil booms & diss, paked Fish Passage: noted a tew crip	gase.	200 10011100	of Area	i di	, , , , , ,		0114	<u> </u>
					1 55		/		
	Samples Collected for Laboratory Ana		707 1		M1\			~	
	TSS (1L)	ζ,	Turb				- ρ(<u></u>
	Total PCB (1L) Toxicity (21L)	<u> </u>	Disso	olved PC	CB (2x1)	L) <u>/_</u> \	JE AM		
	Toxicity (21L)		Meta	ıls (500n	nl)				
						, ,	1-1-		
	Notes: gusty winds resulted in a	Li t	thoulty man	nuser	ng bo	at m	i alto		
٠,	0 '-				1				
	marning.		in I down a	went	of dr	edge	•		
ı	U. Saw readings of 30-40 MM	<u>, </u>	120 Gown C	a ash	uller	dred	geng		
1	1. Saw readings of 30-40 NTU 2) Small orl sheen noted Novy	71	of H whe	n wil	,		U O		
	Sampling Crew: M. Walsh . TM	ĖJ	Il amaly						
		<u> </u>	11 Pyriva -						<u>_</u>
	Chief Scientist Signature:	<u> </u>		•					

Water Quality Monitoring In situ Data Field Form

Dredging Location
Dredging Description
Survey Vessel
Chief Scientist
Sampling Technician
Vessel Captain
Other Personnel
Weather conditions

Debris Removal Area H

Debris Removal Area H

Debris Removal Area H

Debris Removal Area H

Debris Removal Area H

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Debris Removal Area H

Debris Removal Area

Date	8/8/07
Page	_ / of /

Tide information					
High	423am	3.4ft			
Low	1000	,4F4			
High	457 pm	4.6			
Low	1147 om	,5			

	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO mg/L	Temp	Notes
Ref	Mid CABLE	10:00	2705783 2764951 2703743,4 2764951 2705047	815397	depth 3 .0ff	Depth . 800	4.8 Mu	29.97	2.86	35,98	stack high tide
N. Dreda	e Boundary H	10:25	2764951	815144	3.9FT	1.8	20.3 NM	30.25	336	25.94	. —
·	Ref South	1250	2703743.4	815240.1	6.0ft 5.8ft	1.8	8.1	31.07	3.37	25.8	swapping dredge.
N. DYEDG	or boundary	1334	2764951	815144			20.4	30.4	3.06	25.9	swapping dredge.
100 N	of DreogB.	14:33	2705047	815083	5.7'	0.2	37.7	30.4	297	26.1	~ 150' Not Dreage
									<u> </u>		
			-								
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		-					_				
l						·			İ	<u> </u>	

YSI Calibration Form Daily 2007 WQ Monitoring for New Bedford Harbor – G606422

Date: 8/8/2009	Initials:	mw						
DO membrane changed? Y		Turbidity Wiper Y	Changed?					
Battery Voltage: <i>NA</i>	Turbid	Turbidly wiper parks 180° from optics?						
Parameter	Initial Reading	Calibrated Reading	Calibration Data (acceptable range)					
Conductivity (mS/cm)	990	1000	Cell constant (4.55 – 5.45)					
Depth (ft)	-0.156	-0-001	Pressure offset, vented (0 ± 6)					
Turbidity (NTU) 0	-0.6	0-0	Turbidity Offset:					
Turbidity (NTU) 123	123.0	123.D						
D.O. (% Sat)	99.8	99.8	D.O. Gain (0.7 - 1.4)					
pH 4	4.06	4,00						
pH 7	6.85	7.00						
Comments:								

Date: 8/9/2	067 11	nitials:	MW			
DO membrane changed?		Turbidity Wiper Changed?				
Y (0)			Y (N	D		
Battery Voltage: V4		Turbidly	wiper parks 1	80° from optics?		
Parameter		Initial Reading	Calibrated Reading	Calibration Data (acceptable range)		
Conductivity (mS/cm)		017	1000	Cell constant (4.55 – 5.45)		
Depth (ft)	0	176	0.000	Pressure offset, vented (0 ± 6)		
Turbidity (NTU) 0		1.1	0-D	Turbidity Offset:		
Turbidity (NTU) 123		1220	123.0			
D.O. (% Sat)	1	100-4	100.4	D.O. Gain (0.7 - 1.4)		
pH 4		4.06	4.00			
pH 7		6.97	7.80			
Comments:						
Comments.			.			

Daily Field Summary Sheet for Water Quality Monitoring

	Date: 8/9/87		* REF (MCCRI.VG) 0 200 400 Feet
/	Date: 8/7/87 Weather: Sunny, NNE wind @ 5-10 Tides: kts		
	Tides:		water_lines
	3.6' @ 5:75 Am		/ 2007_area_H
	0404 04'@ 1116 Am		
	4.7' @ 5-3 17:55 Am		
	Monitovina Dovied.	"	
	Monitoring Period: From: _0 foo To: _/0:30	\vdash	
	From:10:		'
	Tidal Stage: HW (Ebb) LWS Flood		
	Dredging Activity:		W W S S S S S S S S S S S S S S S S S S
	Debris Removal Dredge repair + dredging.		John Marie M
	Dredge resair + alreaging.		
	<u> </u>		DR= Debris Renewo
			DR=Debris Remove
			\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
			2 TONTU
	The LAMP C	ŀ	
	Turbidity Summary Location Turbidity Sensor/water		I JONTU
-\	Location Turbidity Sensor/water (NTU) Depth (ft)	Ì	
	REF 2 1.5'		
	13NTU 13 1.8		
	19.6NTU 19.6 2.2		
	55 NTM 55 1.5'	-	
S.Bou	undary of H 10 1-1.5'		
		_	17186
		L	
	Oil sheen/ Debris:		
	None noted today		
	Fish Passage: Birds working abo	·v-l	18 : below briedge Area.
	Samples Collected for Laboratory Ana	aly	lysis – Sample IDs:
	TSS (1L)		Turbidity (500ml) Dissolved PCB (2x1L)
	Total PCB (1L)		Dissolved PCB (2x1L)
	TSS (1L) Total PCB (1L) Toxicity (21L)		Metals (500ml)
	Name collisted Damples tov		themstry based on turbidity. Needled to bris removed to get consistent headings snailow water (from pushing boats) resulted of 100 NTM - these dissoperated very quickly.
	Notes: Co	cl	bris remived to get consistent headings
	act working to the	5	snailon water (from sushing boats) resulted
١	nial 55NTH. Prop woods	4/5	- 100 NTH - they dillacrated ways cinchly
	in v. ephendral Apriles 37	ĮΟ	1 - 100 15 101 - These tress from Vity for
	Sampling Crew: Walsh T. Chief Scientist Signature: DM You	Hi	limmer
	Chief Scientist Signature: 7M Yu		

Water Quality Monitoring In situ Data Field Form

Dredging Location	Dridging & Debis Removal - Avea H
Dredging Description	J + 7H
Survey Vessel	Gale Force
Chief Scientist	T. Himmen
Sampling Technician	U. walsh
Vessel Captain	M.Walsh
Other Personnel	N/A .
Weather conditions	sunny - NE wind e 5-10 kts.

Date	819/07
Page	/of /

Tide information					
High	5:25 Am	3,6'			
Low	11:16 am	0.4'			
High	17:55 pm	4.7'			
Low	•				

	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes 74
MID	RET 080907	8:40	2705729.6	8153707	3.4	1.5'	2.2	29.61	2.88		WQ-001-XXX-080907
			2704398.2		4.0'	1.8'	13.2	29.6			WG-662-XXX-680907
20	NTU 0 8090	79.30	2704605.5	815145.7	3.8	P32.2'	19.4	99.29.4	2.96	25.40	WQ-003-XXX-080907
55	WTU 0 8090	7 10:05	270 4603.0	815131,9	3.8'	1.5'	~55 NTU	29.3	2.99	25.2	WO-004-XXX-080907
						-3-					TH - Numbers should
j				· · · · · · · · · · · · · · · · · ·							be thead of be him
			,				_		_		XXX .
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Daily Field Summary Sheet for Water Quality Monitoring

Date: 8/13 /07	0 200 400 Feet						
Weather: 0 verce st : 12 cc Tides: 4.4' @ \$.45 0.0' @ 2:1947 1.7' @ 21:04	Mooring water_lines						
$ \begin{array}{c cccc} & Q & Q' & @ & 2 \neq 19 & 47 \\ \hline & 4 & 7' & @ & 21 & 0 & \\ \end{array} $ Monitoring Period:							
From: <u>0930</u> To: <u>14:15</u> Tidal Stage: HWS Ebb LWS Flood							
Dredging Activity: Driaging Area 4 Debris Kemwal Kreat							
Depris Kemirol treat							
	ТН						
Turbidity Summary Location Turbidity Sensor/water (NTU) Depth (ft)	IDE TO TS NTU						
MID Reference 2.1 1.3 WOO'South 1.4 6.7 100'South 14.3 0.9	ion south						
Brundary M.M.	1.4074						
Oil sheen/ Debris:	Moe						
V. MINOV Sheen noted A	ext to debris removal - Contained by oil						
Fish Passage: No registive impus: w/m land outside Samples Collected for Laboratory An	Is to fish pissage observed fish noted and allowing friend, allowing sample IDs:						
TSS (1L)	Turbidity (500ml)						
Total PCB (1L) Dissolved PCB (2x1L) Metals (500ml)							
Notes: any ther bidety defected mainly associated w/dibris removal.							
Sampling Crew: J. Hummer Chief Scientist Signature:	M. Walsh						

Water Quality Monitoring In situ Data Field Form

Dredging Location	AreaH
Dredging Description	Dredging
Survey Vessel	Gair Face
Chief Scientist	T. Himmer
Sampling Technician	M. Walsh
Vessel Captain	n. wash
Other Personnel	N/A
Weather conditions	Ramy NIVCast

Date	8113107	
Page	of	

Tide information					
High	8:45	4.4'			
Low	14:47	5.0'			
High	21:00	4.7			
Low					

	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO Mg/L	Temp	Notes
MIBREF	081307	0940	2705727	815393	6.5'	1.3'	2.1	27.96	7.96	25.1	
GOV	Senta	10:00	2703730.	815 208.	8.0'	0.7	1.4	30.7	5.04	24.6	
100	fis of Dyedge	11:30	2704224	815130	6.5'	0.9'	14.3	30.0	5.94	25.0	
	Boundary										
	5 Dredge	Z	2704328	815 270	3.7	0.9	5.1	29.9	6.48	25.7	
	Boundary	14:10									
		-									
							j"				
	<u> </u>			-							
											
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Battelle Daily Field Summary Sheet for Water Quality Monitoring

Date: 8//4/04	Vivos		1	1 2	 	00 Feet
Weather: sunny, light breeze	* woods	REF	N '		F]
Tides:		KEI		wote	er_lines	
<u>0.0</u> @ 0313		<u> </u>	_		'_area_G	
94 @ 9728 01 @ 15:24	11/1	\	:	2007	_area_G	
01 @ 15:24	 }	<u> </u>		Auro	directi	
Manitarina Dariada		\		E V Wine	awer	
Monitoring Period:						<u> </u>
From: <u>6945</u> To: <u>//30</u>						
Tidal Stage: HWS Ebb LWS Flood	} {			ł'		
Tidal Stage: TIWS COULTWS Flood		d				
Dredging Activity:				\ 		
Debrus Removal dinne	{<	4	Į (
high that: 44 barge Mired Back to HOO 11:30] }{			}		
MANA MAIL TO HOR 11:30						
prived buch to the	1 / /	}}			(
	1	{([
	\ \					
		10				
			NDE			(
T1:1:4 C			Poten			
Turbidity Summary Location Turbidity Sensor/water			15 30 Vil			
Location Turbidity Sensor/water (NTU) Depth (ft)			15/17			
WOOD ST. RER 8.2 1.0'		1	7-10117		_	
KEDGE BOWNSHY 15-30 0.8	1		1 12 10			
200' FROM 7+10 08'						
DLEDGE)	
BOUNDARY						
Certinalist		<i>y</i> //				
	<u> </u>	4_/	TIBE	 	7	
			1	2	}	
	ا ا	1	W	151		
Oil sheen/ Debris:	حج			//		
Sugar I small debes seen	turino dobi	(.: -5.01	wal - a	11 conta	mod i	by orl
Treating Spread accords 3241 i	The tray the ex	13 PEIN	view a	, . , . ,		1 000
Fish Passage: No Fish Damming ab	or fish kell	s abse	wed: b	irals We	sking	5000
a b	we + below.	dilda	alia	161		
Samples Collected for Laboratory Ana	dysis – Sample l	IDs: Ø	~·		_	
TSS (1L)	Turb	idity (500	ml)_			
Total PCB (1L)	Disse	olved PCI	3(2x1L)			
Toxicity (21L)	Met:	als (500ml) -			
TSS (1L) Total PCB (1L) Toxicity (21L)		\	. —			
Notes: Fran Looked along pip passage; no indicators of Level III Montang	Time for our	dundo	af ahet	ructed	fish	
Trien Court agong pip	abstraction	1 5 - 11 - 2	J 0001	i ci ci ci	,001	
passage; no indicators of	OBSTITUTE OF	0520172				
Land TIT Mondering						
Sampling Crew: T. Himmer Chief Scientist Signature: DWYU	M. WALSH					
Chief Scientist Signature: DM Yu						

Water Quality Monitoring In situ Data Field Form

Dredging Location	AKEA G
Dredging Description	Debris Remival
Survey Vessel	GALE FORCE
Chief Scientist	T. HIMMER
Sampling Technician	M. WAISH
Vessel Captain	M. WOISH
Other Personnel	<i>P</i> /4
Weather conditions	SUNNY MILD

Date	8/14/07
Page	/ of /

Tide information					
High	0928	4.4'			
Low	15:24	0,0			
High					
Low					

	Station	Time	Latitude	Longitude	Water	Sample	Turbidity	Salinity	DO	Temp	Notes
	Number				depth	Depth					
W	CEUSTREF	10:10	2708245	815451	75'	1.0	8.2	29.1	9.60	24.4	
MOOZING	Morth of G Sourada	12:40		815599	5.9'	0.5'	7.3	29.86	9.07	24.5	
MUSRING	Southold	13:00	2707076	815819	5,0	0.5'	15.8	29.8	10.11	24.9	
	•										
										-	
				,							
			* * * * * * * * * * * * * * * * * * * *								
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Battelle	Daily Field Summary Sheet for Water Qua
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Battelle Dail	y Field Summary	y Sheet for W		-	_	
Date: 8/16/07 Weather: 0 vev cast h Tides: 4.4' @	10:09 15:58 22:26		-8 -1 NTU	N O	200 water_line 2007_area	1 1 1
Monitoring Period: From: <u>09.40</u> To: _ Tidal Stage: HWS Ebb)				oil sheer	v: heavy	w/, ^
Dredging Activity: Debris Removal - i				Along	booms, ou escape organdary	ng and a North war
			pero	DK 200	from DR	
Turbidity Summary Location Turbidity WOOD STERNEE 6.1 200' from DE 110 DREDGE BOUND. 11.1 BLEDGE BOUND. 3.4	Sensor/water Depth (ft) O.9 1.0'	DEVATED _ TURBIDITY (3.	X X X X X X X X X X X X X X X X X X X	DRESS BOUND	-6 ATU
Oil sheen/ Debris: Howy Sheen No. Fish Passage: Birds	oted in north	hern par	MODRING REF t Of a	LEQ & MIL	current : 5.	priverw/ wind: Sipated slig by 11.2
Samples Collected for L TSS (1L) \(\frac{\lambda \cdot a \lambda \lambda}{\lambda}\) Total PCB (1L)	ehed	Turb	oidity (500) <i>(^</i> -,1T \	attach	nd
Notes: went N. of we from surface. No acusanet Liver Also noted some of Lucil I Montage Sampling Crew: Him Chief Scientist Signatur	ted several Higher De il sheen along mer, Walsh	dozen dead dozen dead readings a Shove in	Noes	amplina	location =	3.1011

Water Quality Monitoring In situ Data Field Form

Dredging Location	Area G
Dredging Description	Debris Remnal - Dridge Set up
Survey Vessel	GALEFORCE
Chief Scientist	T. Hummer
Sampling Technician	J. HARDY
Vessel Captain	M. WALSH
Other Personnel	
Weather conditions	overcast / humid.

Date	8/16/07
Page	of

Tide information						
High	10:09	4.41				
Low	15:58	0.3'				
High ·	10-22:26	4,2'				
Low						

	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes	
	WOOD ST.	10.22	2709149	815362	4.8'	1.1	8.8	29.38	3,1	24.9	@ 800' NOT WOOD ST -	see below a
wee		11:10	2708277	815487	7.2	1.0'	5.8	28.2	7.9	24.8	WQ-TSS/TUR-ODI-	081607
	(REF)										WQ-MET-001-081	
	IP BLANK		11	H	1)A	NA	NA	NA	NA		WQ-735/TUR-005-	
2001 1			2707352	815838	4.4'	0.9	16	, 28.7	7.0		WO-755/THR -002	
	Removal)		h	11	,,	11	'n	u	()		WG-MET-002-08.	1
DESO	he bounda	CH 12/00	270498	815841	6.3	1.0'	1/5/	28.8	7.5	25.2	WO-755/TUR-003-0	1
			11	11	7.5		- 1	71	4	a)	WA-MET = 003 -08	1604
			2706913	815789	'æ. 5'	1,6'	3.4	29,2	82	25.3	WG-755/112-004-	C 81607
	BOUNDARY		4 .:	(T	r	4 %	•("	'1	• •	WA -MET - 004-0	51607
							<u>,</u>					
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				1 (

() several dayer shad acad (juvenele along shore line)

(%)	
	Dattollo
Ø	Battelle

Daily Field Summary Sheet for Water Quality Monitoring

Date: 8/17/07	
Weather: Overcast	N 0 200 400 Feet
Tides:	water_lines
Lourid 0.3 @ 0437 An	2007_area_G
High File 4.1 @ 1/32 Am	wid
	www g
Monitoring Period:	Dinitary Forth House
From: <u>/042</u> To: <u>1230</u>	The sound court there is
Tidal Stage: (HWS Ebb) LWS Flood	Forth House Sheen There Sheen mornly SE
I idai Stage: (I WS Ebb L WS Flood	morning
Dredging Activity:	
Dredging middle wist voking to north	Diego 1
, ·	
Debris Removal North middle	The state of the s
working to North	The state of the s
	The state of the s
Turbidity Summary	The state of the s
Location Turbidity Sensor/water	
(NTU) Depth (ft)	
W. Cida Nacèwa 8:5 6	
	Tide Hood ()
	divation of surply
	Surperio
	
	* RAY
Oil sheen/ Debris:	ZE (**)
Miny NW to SE from Dibris Re	moral
V	.
Fish Passage: <u>Schooling</u> and Fudi	my Fish At N. St Bridge / Spoonder level fish noted in
Complex Callested for Laboratory Ave	I drudge Area
Samples Collected for Laboratory Ana TSS (1L)	
	Turbidity (500ml) Dissolved PCB (2x1L)
	Metals (500ml)
• • • • • • • • • • • • • • • • • • • •	, , , , , , , , , , , , , , , , , , ,
Notes: Light to Henry Sheer in	romy to south East corm of Dridge AMA within 100 ft of debris remova ion to high teens throughout dudge Area. to as Jou us 3.8 mg/L.
(Wind W-NW) - Trush	widity ranges 20-50 NTM within 100 ft of debris remova
5-10 to L	on to high teens throughout Indge AREA.
Dissolved Oz range 5.5 mg/L.	to as journe 3.8 mg/L.
Sampling Crew: Mike Walsh	Walsh
Chief Scientist Signature: With	Walsh ?
=	

Water Quality Monitoring In situ Data Field Form

_		
Dredging Location	aug G	
Dredging Description	Dehis Romoval, directing	
Survey Vessel	Gale Frace	
Chief Scientist	M. Walsh	
Sampling Technician	1. Fales	
Vessel Captain	M. Walsh	
Other Personnel		
Weather conditions	award War ~ 5	

Date	8-17-07
Page	/ of /

Tide information						
High	0437 0.3					
Low	0437 0.3					
High	1137. 4.1					
Low	1704 O.b					

Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes
W Cable Mode	1055			6	. 98	8.5	30.6	5.26	24.79	Reference
W. ST Bridge	1202			8,6	.98	9,0	ar.2	6.37	75,3	Reference Ref
				-						
-										
										
										·
					-					

Rep

Daily Field Summary Sheet for Water Quality Monitoring

Date: $8/20/07$				
		N	Ò 200	400 Feet
Weather:	1,47			
Tides: 0.7 @ 0621	/ // /		water_lines	
<u> </u>				<u>. </u>
3 4 @ 1354	111			<u></u>
12 @ 1910	1 1 18 8			
		\300 from D	vedge Boundave	<i>i</i>]
Monitoring Period:		} \	vedge Boundare 5-LENTH WI	MP
From: 10:00 To: 13:30				//15
	\ \.\}		~ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	·
Tidal Stage: HWS Ebb LWS Flood			1	
Than bage. ITWO LOO LWO LOOK		520 NM	atlaredge Bounda	ins
Dredging Activity:				
Debris Removal	{ { }			
			7 7	
Dudge Placement : Active				
Dridging				
0 1				
			<u></u>	.
			50-60 NTU @ 275	
		L GAZ	from DR.	
		1 1 xx	oce spike to	
Turbidity Summary		X XXX	-80-100 N74	
Location Turbidity Sensor/water			- 80-100 10,14	
(NTU) Depth (ft)		sheen		Remodel
CABLE MODELN4 6.5-6.9 0.5 /4'		noted	3 IX	
N DREDGE 15-20 NTU WI'		A.m -		
BOUNGARY				
300'DANN 5-6 -1'			boom -	
CURRENT			-	
		V //		
		1 //		
4	/		[A] A]	
]]]	6.5-6	0.700	.
0.00	جي ا	CARLENA, REI	= / (TIDE	<u>' </u>
Oil sheen/ Debris:	111		Λ = :	-
LIGHT OIL SHEEN NOTED IN	AMI. SOMIH	WEST OF D	R XMIRLY-	WELL
CONTAINED BY OIL BOOMS.	1/2071/2	-i - > > > > > >	CT Dimin No	5-1
Fish Passage: BIRDS NORKING.	MORIE? SOU	14 OF DRED	GE AKEA NO	DEAD
FISH MUNED				
Samples Collected for Laboratory Ana	ılysis – Sample 1	Ds:	,	
TSS (1L)	Turb	idity (500ml)		
Total PCB (1L)	Disse	olved PCB (2x1L)	
Tovicity (21L)	Meta	als (500ml)		
		` '	1 11.01 -	TUDDESTA
Notes: Retrieved magiving from 1	1. of Dredge	Avea Saw 1	OCALIZES MIGH	IMERIANI,
Notes: Retrieved mourings. from IN VALUES V. NEAR DETAIL DES V. THIN PLUME TRAVELLE TO 15-20 By TIME PLUME REPE	DIS DEMANA	/ Aur -	HALL LANGE	to 80-100 NTU
VALLE V NEAR OCTOBE DED	O PORTUTO	14V9 50-60	MIN MISTIRES	
V. THIN PLUME TRAVELLED to	penter	DOWN CHEREN	1; TURBIDITY ?	PROPPED P
15:72 P. TIME PLUME REAK	HED DEFINA	e boundary.		
Sampling Crew: T. Himmer;	H WALCH			
Sampling Crew: / Propriet	· · · · · · · · · · · · · · · · · · ·		<u></u>	
Chief Scientist Signature:				

Water Quality Monitoring In situ Data Field Form

Dredging Location	ARIA H G
Dredging Description	DREDGING WEST OF GATE; ALOVE DEBRIS REMAINETO "6"
Survey Vessel	
Chief Scientist	T. HIMMEL
Sampling Technician	4. WALSH
Vessel Captain	M. WALSH
Other Personnel	N/A.
Weather conditions	SILMAY MILD, LIGHT WIND (5-10KTS) OUT OF NE,

Date	8/20/07
Page	of

Tide information							
High	0.710	0/18					
Low	0021	0.71					
High	1354	36'					
Low	1910	1.2'					

	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes	
BEF SOU	TI	1000	27073714	815217	10.01	45'	4.9	30.50	5.67	22.2		
	i r	11	lı	,1	(1	0.3	1.4	29.83	4.87	22.2		
	BLE MOCKENG	10:36	2705751	815360	4.01	0.5'	6.6 NTM	29.61	4.04	22.7		
~ 75	NOF	12:13	2707908	815574	4.5	0.8	19.7	28.51	9.07	24.1		
	DRFISGE											
	BOUM)								9.06	πí		
N.OF	V00D5T	12:20	2709063	815389	3.5	0.8'	6.2	27.47	7.84	24.5	DO RANGED FROM 9.	10 20
											TRANSECT N. OF	accid
ان کا ان	EXCE		7	p TH	22'	0.41	21.7	29.32	675	24.5		57.
10	BOUNDARY	1247	2709780	815824								
i									<u> </u>			
		_										
i												
		_										
į												
									L.,			

1.3

	•			II (***)		
	Date: 8/21/07		+ CABLE MOORING		5	
1	Weather: Sunny Blees		=6-7 NM			
	Tides:		1/42/9	/ \\	water_lines	
	0.9'@7:08				2007_area_H	
	36' @ 14:51				<u> </u>	
	1.3' @ 20:11			ر ا ال	(ς Ι	
			3001/4/15			
	Monitoring Period:	 	1			**
	From: <u>0930</u> To: 012 210	,				
	Tidal Stage: HWS Ebb LWS Flood		1/3	#		•
	Tidal Stage. 11W5 Loo LW5 1100d		W1 128 -35 NITH			
	Dredging Activity:		W/1/1/1/1/1/1/2	Brunda:	MIND	
	Debris Remval : Dredging in Area H				7 5-10 Kts	
	in AveaH	1		111 %	250 from undary, then	
			1 / / AMAMA		vops off rapidly	
					voro on rapiaiq	
		5 5				
			De De	11/2		
		}	1	7/ < \		
		1 5	small area	1 /2		
	Turbidity Summary	 	south west of. DR			
	Location Turbidity Sensor/water	1 1)}	of. D.R	<u>}</u>		,
) ca	(NTU) Depth (ft) 3.2 7'/+1'/4'	<u> </u>				
	ATH RET 3.2 7-1+1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-				72-	
-	FRUM BOWNS 15 NTY 1.1 /4.0°	1 // //	<u>_</u>			
	EMODRING 6-7 NTU 1.1 /40	 	* REF 3.2			
			3.2	DTU (1 77	
		\				
		1 1	+	IDE	8	
					177	
	Oil sheen/ Debris:					SER OIS
	NONE OBSERVED NORTH O REMOVING CONTAINED BY OIL BODY	F DREDGE	AKEA-SMALL	AREA NO	LD SOUTH OF	TEDEC
	REMOVED SONTHINED BY SIL BOT	<i>r</i> o.		- a .		
	Fish Passage: BILDS WORKING IN DREDGE AREA	N : OUISIN	E DILEDGE AIREA	SAW BA	55 81 (TSIDE OF	
	DREDGE AREA Somples Collected for Laboratory An	BAIT FISH	TIMPING WAN	DRENGE A	Ke#1	
	Samples Collected for Laboratory And TSS (1L)	-	pie 1Ds: Furbidity (500ml)		1 56	
	Total PCB (1L)		Dissolved PCB (2x1I	7	No Me	
			Metals (500ml)	"/	 	
	Notes: OBSERVED FATRLY LAKE	E RIT IX	WIEVEZ TURBIN	Ty Plum	RE DURING THE	
	MAN NING WALLES	- NELL	DOLALANDIA '	NIS ALTIA	0 3411 Am	
	MORNING VALUES WERE 20-2 BOUNDARY. PLUINE BEGAN TO I	45 MILL AT	MOUNTED 3	SENVITIVE	DELAIL TO	
		अस्मपा दहार	MCDUND 11.50 7	VEHOIN 47	BEDIN 1	
	DREP	1				
	Sampling Crew: HI MMEN, WALS	H				
	Chief Scientist Signature:		····			

Dredging Location	AREA H
Dredging Description	DEBRIS REMOVAL : DKENGPAIG
Survey Vessel	R.V GALL FORLE
Chief Scientist	T. HIMMER
Sampling Technician	M. WALSH
Vessel Captain	HIM NER
Other Personnel	N/A
Weather conditions	SUNNY BREEZY ENE WIND 5-106ts.

Date	8/21/07	
Page	of	

Tide information						
High	2:14	2.91				
Low	7:08	0.9'				
High	14:51	3.01				
Low	20:11	1.31				

Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes
	9:35	27073748	815/66	7′	1.6	3.2	29.8	5,68	21.74	
MORTH BELLIN	dey	,		15						
OF H	10:45	2704979	815 307	5.3	1.1	2.525.1	30.11	4.99	22.42	
2 300' N.								<u></u>		
of Boundar	10:51	27075271	815312	4.0'	1. 1	15.1	30.01	5.05	22.43	
OF H										
"100' N	10:57	2705585	81553 815376	4.0'	1.1'	13.0	29.86	5.00	22.4	
of Bounda	47		<u>'</u>							
					<u> </u>					
								<u></u>		

Date: 8/22/07							 400 Feet	
Weather:		({	, , , ,					
Tidos.			*	- 10-	1	— wate	er_lines	
Tides: @ 3:16			Approa	china		u	7_area_H	
1.0' @ 8:04			Back	morina				
<u>3 u' @ 15:50</u>	7		0/600			7,	N	
			1000	1900		1/	▲ .	
Monitoring Period:	L	10-13	* 30	from	gove			
From: <u>0930</u> To: <u>/200</u>		1 1 20				, , , , , , , , , , , , , , , , , , , ,	, 	
						KNE.][]	
Tidal Stage: HWS Ebb LWS Flood	⊢ار	1 1	acquin "	7	37	. genet		
		(CDRE	XE ZOU	MIDAKY	<u> </u>	5-10	L45°.	
Dredging Activity:		1 \						
DREDGING ! DEBRIS REMOVELL		1 31			 			
		 	19					
		//	PR			7)		•
Fulfar in 17		2		4.		7	,	
			11		<i> </i> -	}		
	L		<u> </u>			1		
	n	ا کہ ﴿ ا			//	<		
					Y/ 1	2	α	
Turbidity Summary	\vdash	 	<u> </u>		 			
Location Turbidity Sensor/water		}}]}\			
(NTU) Depth (ft)		\ \{\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			{}			
Ret - South 3.6 11/49		 	<u> </u>				7	
BOUNDARY (NORTH) 21.4 15/42"			S	outh	1		19	
300' from			1	eterene	e N			
BOUNDARY 13.6 1.1/37'				3.60N	TZ()}			
		(
	_	<u> </u>				7	/}	
		1 1	1	-				
	L	<u> </u>	17	IDE	;			
Oil sheen/ Debris:								
None Noted								
7000 1000	5 A I		J		THAL T	VTXC+	1000	
Fish Passage: BIRAS NOTED WA	3 KK	CING ALBOVE	BELON	$0, \omega$	HIV PI	CEXISE.	ARtH	
Samples Callested for Laboratory A.	nalı	vaia Comple I	D _a ,					
Samples Collected for Laboratory A	nary	_		10m1)				
TSS (1L)			idity (50	-	T) /	TM		
Total PCB (1L)			lved PC	-	L)	<u> </u>	_ 	
Toxicity (21L)		Meta	ls (500n	III <i>)</i>	,		1 1 1	
Notes Similar to True fay 8/21	07.	Maringal wid	espead	but,	helative	ly law	level pres	ne.
Tridada a trada la cont	(,)	1 19	~. x., > < 1/	ו לנגו נוד	consul	enal of	uhes to	
Turbiary Coanage Soundary typical	eey	averagea le	, CK (11-		tide 1/1	lues dre	spe d
40-60 NTY. at 300' The Turbidity	, h	ad dropped	TO 10-	15 NIL	1, DIPE	JULIA 1 1 TO		•
Notes: Similar to Thereday 8/21/ Turbidity & directly boundary typical 40-60 NTU at 300' the turbidity off Mapidly between 550 -400' tr	om	Boundary	•					
Sampling Crew. M. WASU : TH	mz	NER						
Sampling Crew: M. WALSH ; T. H. Chief Scientist Signature:	11							
chief Scientist Signature:	+"							

Dredging Location	AREA H
Dredging Description	DREDGING : DEBRIS REMOVAL
Survey Vessel	GALE FORCE
Chief Scientist	T. HIMMER
Sampling Technician	M. WALSH
Vessel Captain	walsh
Other Personnel	NIA
Weather conditions	SUNNY NE WIND 5-10 Kts.

Date	8/22/07
Page	/ of /

Tide in	formation	
High	2.8' @ 3:16	
Low	10' C 8:00	
High	361 @ -3:50-15	50
Low	1.3' C.421:25	

Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes
H.	9:39	2703718	815192	4.9'	1.0'	3.6	29.59	5.46	20.83	
OSRING Deploy	nert.	2704242	815441	4.2'	1.5'	3.3	30.1	5.65	21.2	
South 2012 ING Depl. North		2705061	815446	4.21	1.51	21.4	29.71	5.07	21.43	
Methy Guli	i1-170	2704986	115365	4.2	1.7'	42.5	29.84	4.94	21.44	
301 from GATE	11:14	2705266	815286	3.7	1.1	13.4	29.44	5.14	21.42	

Date: 8/27/07	Cable Moortral
Weather:	mid reference — water_lines
Tides: (a) 7:39	2007_area_H
-0.1' @ (318	
48' @ 1959 (
Monitoring Period:	
From: 8:45 To: 12:00	
THE LOW TOWN OF THE PARTY OF TH	1) wints
Tidal Stage: HWS Ebb LWS Flood	
Dredging Activity:	10 jets
Depris Removal area H	
Dredging in later	
marnily 3) and the
}	
	5 15-25 NTU / CT
	3 3 3 1 2 1
Turbidity Summary	
Location Turbidity Sensor/water (NTU) Depth (ft)	
REF-CARLE 14 12	300'
	10-15- 4
Dream 211 O.66	Social Spiles to
300' 10-15 NTU O.Leb'	\$ 600' 5-10 NOTE
	1 600' 5-10 NT
	VIDE S
Oil sheen/ Debris: Now observed.	
Non observed.	
Fish Passage: BIRDS WORKING ZETTL	HEN AVERS 6541
Fish Lassage.	There's Green
Samples Collected for Laboratory Analysis -	Sample IDs:
TSS (1L)	Turbidity (500ml)
Total PCB (IL)	Turbidity (500ml) Dissolved PCB (2x1L) Metals (500ml) My (on level plume w/ 15.25 NTUE)
Toxicity (21L)	Metals (500ml)
Notes: Wi Desplead but tow general	elly low level plume w/ 15.25 NTUE
Druda boundary: 10-15 NTU C:	300' down current is 5-10 NTUE God'
21 20 30 1 60 60	is trilledite values returned to refever
Extreen 100-150, trom poundar	of turbidity values returned to referen
Sampling Crown T Hummer T	lardy
Sampling Crew: T. Hummer J. f. Chief Scientist Signature: Drugh	
Cinci ocicinist Signature.	

Date: 8/27/07 Weather: Sunny NW wyol. Tides: -0.1' @ 7.39 -0.1' @ 1318 -4.8' @ 1959	N 0 200 400 Feet
Monitoring Period: From: 0845 To: 10:45	
Tidal Stage: HWS Ebb LWS Flood	
Dredging Activity: Dredging only Debrus removal in Circa H	
Turbidity Summary Location Turbidity Sensor/water (NTU) Depth (ft) South Boundary 0.7-23.5 0.72 Boundary 5-10 0.72 Oil sheen/ Debris:	15-20 NTU @ BOUNDARY 5-10 NTU
None observed.	
Notes: 15-20 HTM @ boundy to being used; @ 300' dropped off after 600'	lysis - Sample IDs: Turbidity (500ml)Dissolved PCB (2x1L)
Sampling Crew: T. Himmer Chief Scientist Signature: DMY	J. Havdy

Dredging Location	AREA & G
Dredging Description	Debris Remival : Dredging
Survey Vessel	GALE FORCE
Chief Scientist	T. Himmer
Sampling Technician	J. HAKDY
Vessel Captain	T. HIMMER
Other Personnel	A/A
Weather conditions	DUNNY N. NE wind @ 10 kts

Date	8/27/07	
Page	of	

High	43'	0	7.39
Low	-0.1'	0	13:18
High	4.8'	0	19.59
High Low	4.8	6	19.5

Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes
	0903	2705578.6	815282.82	5.0	1,24	1.4	30.96	NA	24.02	
Cable Mooning	44	Ç-	1		144	6	95	7	4.5	
if	9:28	11	16	5.0	1.1	1.0	30.1	3.75	24.12	4SI from Warm Hour
Bourdag	11:26	2704292	815141	4.4'	0,66	21.1	30.23	3.73	24.72	11
South		No.	Xv.	45	\	(,		15	(A)	
300st Foundate	11:46	2704035	815308	7.0	0.55	342.1	30.18	4.58	24.94	
										•
						3				
						F I				
					4					

Weather: Sunny E/WE 5-10 Tides: high @ 0823 Weather: Man	water_lines 2007_area_G
Monitoring Period: From: 0930 To: 1250	2007_area_G
Monitoring Period: From: 0930 To: 1250	2007_area_G
Monitoring Period: From: 0930 To: 1250	Remark
From: 0930 To: 1250	Remark
From: 0930 To: 1250	Removal
Tidal Stage: HWS Ebb LWS Flood	
	N. pris
Dredging Activity:	Dreety
Dridge working middle east to	
I'd Nath	A LIVE TO THE REAL PROPERTY OF THE PROPERTY OF
Debos Ringoval NE Corny	
	80-120 NTU moving
	Dadaganon
about Aller Sea	Dubris Rum
Turbidity Summary Location Turbidity Sensor/water	40-60NTU
Enerde Cake (NTU) Depth (ft)	
South fra 6 30.0 .86/5.0	
Just 50 mth 40-60 .91/Approx.	
OFARA G	
Kuntania di Parancia di Parancia	
	3
Oil sheen/ Debris:	check commentated to Daday + Debois Principle
Area (sublew)	ches concentrated to Aredge + Debris Removal
Fish Passage: Sound Small Sch	ools and individual fish noted
Samples Collected for Laboratory Anal	vsis - Sample IDs:
TSS (1L)	Turbidity (500ml)
Total PCB (1L)	Dissolved PCB (2x1L)
Toxicity (21L)	Metals (500ml)
Notes: Sheen expanded to wes	t as East North East word hoveloped.
11 30 yeary sheer and Turb	dity counts on Didge Area when morning
debris Removal - Co	rents continued high off Acrovax but dirumished
Sampling Crew: MA-WIA LAVA	1 (00 00)
Chief Scientist Signature:	1 Walser



Dredging Location	
Dredging Description	Middle East Section of Area Vorking to North
Survey Vessel	Gale Force
Chief Scientist	Mike Walsh
Sampling Technician	Jessica Hardy
Vessel Captain	Mikewalsh
Other Personnel	
Weather conditions	Sunny

Date	8-28-07	
Page	of	

Tide information		
High	0823	
Low	1407	
High	2044	
Low		

	Station lumber	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes		
wood	St. Briles	1008	8154607	270 8264.1	5.7	.99	10.0	29.5	5.1	25.9			
- Moon	ilg NG	1077	815621.9		4.0	. 84	8.9	29.7	3.8	24.71	morning Site North	42	9
Gale 5	outh 6	0953	815972.8	2707236.6	5.0	. 86	30.0	29.9	4.68	24.5			
of Moon	mg 56	1155	816048.9	2707082.3	3.4	.91	21.4	30-1	3,9	24.8	Mooring Site South (21	2
							L. Ye						

Date: 8/29/07 Weather: Sunny, Steward @ 5 #	Ref = 22	00 400 Feet
Tides: -0.5' @ 1454 -9.8' @ 2129	1 //	vater_lines 2007_area_H
Monitoring Period: From: 11-30 To: 12:40		
Tidal Stage: HWS Ebb LWS Flood		
Dredging Activity: Dredging + Debris Removal Debris removal only from a 11:45 to 12 30	D-DR D-DR D-DR D-DR D-DR D-DR D-DR D-DR	1
Turbidity Summary Location Turbidity Sensor/water (NTU) Depth (ft) 22 OA/47	Small Sheen assacrated 250 = 26 NTH = BALLED	A Tar
Boundary 4-6 NTU 0.7'		1
Boundary 15:35 NTU 07 NEW DYS REMOVED	I TIDE S	
Fish Passage: birds working New baut fuch South of Aven H. Samples Collected for Laboratory Ans		n ~60' from
TSS (1L)	Turbidity (500ml) Dissolved PCB (2x1L)	
Toxicity (21L)	Metals (500ml)	the readings
notes: Do Pata not collected a	we to faulty sensor. Highest turbed eval. Dredge only appeared to	increase
turbedity by 2-4 linets.		
	Tilande	
Sampling Crew: T. Himmer Chief Scientist Signature:	hate _	
0		E.

ed 1 -	* was - oil sheen N of was St.
Date: 8/29/07	N 0 200 400 Feet
Weather: Sunny, minimal wind	147
Tiucs.	water_lines
<u>4.9'</u> @ 0908 -0.5' @ 1454	2007_area_G
-0.51 @ 1454 4.87 @ 2129	
- 2.01	
Monitoring Period:	
From: 0920 To: 11:30	
Tidal Stage: HWS Ebb LWS Flood	Twind
Develois Auticition	3-5 6 15
Debris Removal	18 8
DEDYS LEMINA	
	757
What have a second and a second	4 38 40 NTU
	The series of th
Furbidity Summary	
ocation Turbidity Sensor/water	15-25 NTH
Wood St Beiose 9. (Depth (ft) 07/7'	
from Dibru 305 0.9/3,4	Aug /
Kemeval	300' * YO-15NTU .)
Wedg Boundary 17.2 0.7/5,1	
- 15 ID: - 15	
00' from 10-15 NTM 0.9/5.4	
Boundary	1 Tipe
211 1 (D.1.1	5 (V // (
Oil sheen/ Debris:	(long 5 / 2 2 / Marth 1 2 1 1) de- 1 1 1 1 1 1 1
Street agent porter of	COS ST (-350 NOTTING DUAGE) BUT HAVE
Fish Passage: Large numbers	bait fish working immediately south of wood.
or o	3
Samples Collected for Laboratory Ana	alysis – Sample IDs:
rss (1L) wa - 755/7412 - 001 - 004	- 082907 Turbidity (500ml) - See loft.
Fotal PCB (1L)	Dissolved PCB (2x1L)
Foxicity (21L)	Dissolved PCB (2x1L) Metals (500ml)
Notes Do Data not collected due	to bad sensor. Values energed 15.25 NTHE with distance drivin current. No exceedences no
votes: 2011 dary : denuosed of	with distance drivin current. No exceedences no
orenge with	
Sampling Crew: T. Hemmer	JHardy
Chief Scientist Signature:	



Water Quality Monitoring In situ Data Field Form

AKEA H & AREAG **Dredging Location** Dredging & Debris Renoval -**Dredging Description** Dredging in Survey Vessel GALF FORCE Debris Remnal in by **Chief Scientist** T. Himmer Sampling Technician THardy Vessel Captain THIMMEN NIA Other Personnel Weather conditions from Swind @ =5 Kts

Date	8/29/07	
Page	of /	

Tide in	formatio	n	
High	4.9'	e	0908
Low	-0.5'	0	1454
High	4.8'	0	2/29
Low			

/	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes	
000	D ST REF	10:10	2708297	815468	7,0	0.7	9.1	3019	NAO	24.7	W9-TSS/TUK-001-08	290
	- lı	10:12	4	- +	· ·	+	U	4	¥	L	WO - TSS/ FUX - 001 - 03	
ARE	A6 , 75	10:35	2707 403	815 930	3.6	0.9	36.5	30.5	NA	25.0	100-755 /TUR-002-082	90:
1	From Debis				all la							
	Remove	4		2 84								
7	Bound.	11 00	2707174	816015	5_1	0.7	17.2	30.5	ישע	35.2	NO - TSS/THR - 003-05	-294
	300' from Dredge	11:21	2706926	816015	5.4	0.9	16.7	30.5	_	25.5	WA-TSS/TUR. 004-08	290
	Bowld		-							L ex.		
0	MODEING REF	11:35	2705426	815278	4.7	0.7	2.2	30.7	-	24.8	UA	
	Ac.											
								New York				

@ Bad Do sensor, Aleorouge Do duta not collected. TH 8/29/07

Date: 9/9/07	0 200 400 Feet
Weather: Mostly Luny Wind NO 5	
Tides:	water_lines
<u>0.4</u> @ <u>0719</u> 4.4 @ 1432	2007_area_17
4.4 @ 1432 0.8 @ 2053	
016	
Monitoring Period: From: <u>0930</u> To: <u>/3 40</u>	
Tidal Stage: HWS Ebb LWS Flood	slightshear for .
Dredging Activity:	Te-10 N to 75' Louend director
Debris Remercal from	A Property of the Control of the Con
2/1:15 to 13:30	Romand Sauthed
	1 }} \ to win
	afternoon
Turbidity Summary	
Location Turbidity Sensor/water	
(NTU) Depth (ft) 3.2 0.6/5.8	
75 tran 6-10 1.0	
Debris	* REF = 3.2 NTU
Removal	
	TIDE S
Oil sheen/ Debris:	
ugat Ohun noted Norther	out of debris lemenal
Fish Passage: <u>Fayos noted</u> (U)	e and below work area.
Samples Collected for Laboratory And TSS (1L)	alysis – Sample IDs: Turbidity (500ml)
Total PCB (1L)	Dissolved PCB (2x1L)
Toxicity (21L)	Metals (500ml)
•	,
Notes: Due to holiday dreage	observations on troubledly seen association of NTI G 75-86' away).
1 such astronod Sugart	alwature in turbiday seen association
g were parameter. It for	12. 0 m en
with debits Almoral (6)	10 NIM (N 7) -86, away)
	\sim
Sampling Crew: T. Homes M. k. Chief Scientist Signature:	MON
Uniei Scientist Signature:	



Dredging Location	Area H
Dredging Description	on Huld
Survey Vessel	Gall Force
Chief Scientist	T. Himney
Sampling Technician	M. Valsh
Vessel Captain	M. Walsh
Other Personnel	
Weather conditions	Mostly Surry Wind - NOS

Date	9/4/07
Page	of

Tide information						
High	55' GUSS					
Low	0.4' @ 7:19					
High	4.4' @ 19.3Z					
Low	081 C2053					

Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes
Ref South	1122	3703685.5	815258.0	5,8	.6	3.2	31.29	2.93	73.1	
								1		
	1									
 	 									
	 							1		
	 							1	 	
								 	<u> </u>	
			<u> </u>						1	
<u> </u>										
 	 							1	†	
							<u> </u>	<u> </u>	1	

Date: 9/5/07	0 200 400 Feet
Weather:	
Tides: 3.3' @ 0.304	υπτ — water_lines Cuτ — 2007_area_H
	70 750'
<u> </u>	from N
Monitoring Period:	DECORED TO
From: 9 30 To: 12.50	<10 after 250
Tidal Stage: HWS Ebb LWS Flood	
Dredging Activity:	2 300' = 10-20 July 10 10 10 10 10 10 10 10 10 10 10 10 10
	SPIRES TO
HUSTLY DEBRIS REMOVAL, DREDGE WASN'T ACTIVE	25-35 70 70 70 70 70 70 70 70 70 70 70 70 70 7
ENTIVE TIME.	0 200
SOLO DA KINE	TREASE TREASE
	1 22 Light // S
Turbidity Summary	Sheen
Location Turbidity Sensor/water	
(NTU) Depth (ft)	
REF. 4.4 0.7 147	
200' from 30 NTH 0.8	M = M = M = M = M = M = M = M = M = M =
DEPRES REMARK	***************************************
DONE BOAR	244 North
300' from 15 NTU 0.7	
DEBRIS	
REMOVAL	I TIDE S
Oil sheen/ Debris:	LATE MERNING TO SOUTH & WEST OF DEBRIS VE : BELOW DREDGE WALT.
KERMONAL - PONTAINED BY REOMS.	CHIC PRENING A SCHOOL COLORS
Fish Passage: BIRDS WORKING ABO	VE BELOW DREDGE HALT
Samples Collected for Laboratory Ana	Turbidity (500ml)
11/1/1/1/1/	Dissolved PCR (0v11)
Total PCB (1L)	Dissured I CD (ZAIL)
Total PCB (1L) Toxicity (21L)	Metals (500ml)
TSS (1L) Total PCB (1L) Toxicity (21L)	Metals (500ml)
Notes Att METONED A WINESPETAD	THE BIDITY PLUME TO THE MARTH! WEST TAST IF
Notes: Det CESER VID A MIDE SPEED TO	THE BIDITY PLUME TO THE WARTH! WEST TAST IT
Notes: DE CECEPIAD A MINISPEEND THE DEBRIS REMOVAL THEBIDITY	THE BIDITY PLUME TO THE NORTH ! WEST TAST IN LANGED FROM 25 35 WILL 2001
Notes: DET CEEFIND A MINISPREND THE DEBRIS REMOVAL THEBIDITY AND 16-20 NTM AT 4300 - IVON Y WERE OBSERVED WERE VALUES	THE BIDITY PLUME TO THE WARTH : WEST TAST IT WHILES THE PICALLY RANGED FROM 25 35 NIME 2007 INI DOWNS NATURAL. ECA OCCASORNAL HIGHER SPIKES REALHED 40 50 NTU at 275 to 300', THESE SPIKES
Notes: DET CEEFIND A MINISPREND THE DEBRIS REMOVAL THEBIDITY AND 16-20 NTM AT 4300 - IVON Y WERE OBSERVED WERE VALUES	THE BIDITY PLUME TO THE WARTH : WEST TAST IT WHILES THE PICALLY RANGED FROM 25 35 NIME 2007 INI DOWNS NATURAL. ECA OCCASORNAL HIGHER SPIKES REALHED 40 50 NTU at 275 to 300', THESE SPIKES
Notes: DET CEEFIND A MINISPREND THE DEBRIS REMOVAL THEBIDITY AND 16-20 NTM AT 4300 - IVON Y WERE OBSERVED WERE VALUES	THE BIDITY PLUME TO THE WARTH : WEST TAST IT WHILES THE PICALLY RANGED FROM 25 35 NIME 2007 INI DOWNS NATURAL. ECA OCCASORNAL HIGHER SPIKES REALHED 40 50 NTU at 275 to 300', THESE SPIKES
Notes: DET CEEFIND A MINISPREND THE DEBRIS REMOVAL THEBIDITY AND 16-20 NTM AT 4300 - IVON Y WERE OBSERVED WERE VALUES	THE BIDITY PLUME TO THE WARTH : WEST TAST IT WHILES THE PICALLY RANGED FROM 25 35 NIME 2007 INI DOWNS NATURAL. ECA OCCASORNAL HIGHER SPIKES REALHED 40 50 NTU at 275 to 300', THESE SPIKES
Notes: DET CEEFIND A MINISPREND THE DEBRIS REMOVAL THEBIDITY AND 16-20 NTM AT 4300 - IVON Y WERE OBSERVED WERE VALUES	THE BIDITY PLUME TO THE NORTH: WEST TAST IN LAKE THE TOTHE VALUES THE PLUME TO THE NORTH: WEST TAST IN 2000' THESE SPIKES REALHED 40 50 NTU at 275 to 300', THESE SPIKES



Dredging Location	TAKEN H
Dredging Description	MOSTLY DEBRIS REMENAL; SINE DIEDGING
Survey Vessel	PV GALE FORCE
Chief Scientist	T. HIMMY L
Sampling Technician	Jessica Hardy
Vessel Captain	T. Himiania
Other Personnel	NA.
Weather conditions	Sunity N wind up to 10kts.

Date	9/5/07
Page	/ of /

Tide information						
High	0304	3. 3				
Low	0232	0.6'				
High	1540	4.31				
Low	2229	0.71				

Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes	
REF	0930	2703527	815441	4.7	0.7	- 44	31.7	5.27	22.17	apairent ref	
H SOUTH MODRING	0444	27042619	815478.3	3.1	0.8	4.0	3(.53	5 73	2179	MOZZING Deployen	ad
H NORTH MOERING	12.34	270:1988	8155749	3 T	08	12.4	31.76	5.99	23 27	,,	
											l

0/0/12	N. of was 57 = 5.1 NTU
Date: 9/10/07	N 0 200 400 Feet
Weather: EVERCHST RAINY	REK = 6.2
Tides:	water_lines
<u> 4.4' @ 7.38</u> <u> 0.1' @ 13.54</u>	2007 area G
<u> </u>	
7.5	
Monitoring Period:	
From: 0900 To: 10:15	
Tidal Stage: HWS Ebb LWS Flood	
Dredging Activity:	
DREDGING; SOME DEBRIS	
REMARL FAILLY ON,	
DEBRIS REMOVAL BARGE	
MOVED TO AREAH @ 9:45	
	75' tron
Turbidity Summary	DREDGE Auga 18-
Location Turbidity Sensor/water	25 N74-
(NTU) Depth (ft)	RAPEDLY DROPPED
REF 6.2 0.7	SHEEN- D BACKGROUND
75' from 18-25 0.7'	AFTER S- 16/ DISTING
DEDGE	DEBEIS /
	REMOVAL
	MOVED TO 3
	AVEA H
	\$ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
Oil sheen/ Debris:	
HEAVY SHEEN OBSERVED SOU	TH OF DRENGE AREA;
ELD JANGE NUMBER	F GULLS WERLING IN AND AROUND
DREDGE UNIT.	AUCO WORLZING IN AND ARBUND
Samples Collected for Laboratory Anal	veie Sample IDe
TSS (1L)	ysis – Sample 113s Turbidity (500ml)
Total PCB (1L)	Dissolved PCB (2x1L)
Toxicity (21L)	
Toxicity (21L)	Metals (500ml)
Notes: /xame ==	und nated 25 care
LUMELES / WESISTED PO	ume noted 75-100 from breage; buyind
1/50 buils returned quick	ly to background.
\mathcal{C}_{\bullet}	J
territoria de la companya de la companya de la companya de la companya de la companya de la companya de la comp	
Sampling Crew: T. HIMMER, J.C. H.	IKD4
Chief Scientist Signature: 2Mb	
Chici scienusi signature:	

Date: 9/10/07		REF		400 Feet
Weather: DVERCAST,	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			
Tides:		2.1 MT	water_l	
4.4' @ 7:38 0.1' @ 13:54			2007_a	rea_H
0. @ 3:54 4.5' @ 9:59			N A	300000000000000000000000000000000000000
Manitanina Dania J.				/m
Monitoring Period: From: <u>10:15</u> To: <u>12:45</u>	}	<u> </u>		7
From: 10:75 10: 15:15	,		1 1 '	16
Tidal Stage: HWS Ebb LWS Flood	/ }		11 -	
			[]	WIND Y
Dredging Activity:		1040		e portion
DEBRIS REMOVAL;		: E D 9E)		No. coperate Management Control of the Control of t
MOVE : SET UP DREDGE,			\	
MOVING GATES.		<u> </u>	(47)	
	55	-34 U	1)	erote and making the second of
		244	RANGED	
		THE WAY	25 35 W	hits as lugha
		10-14 -AVA	30 NT4 8 - 50	from 50 t
		-/==	$ \langle \langle \rangle \rangle$	D.K.
Turbidity Summary		321		Made and the second sec
Location Turbidity Sensor/water (NTU) Depth (ft)		A	2 1 2 2 2 2 2	l
REF 2.1 Depth (ft)		53 (1)	~18 NTU (MI	D 15 - 29 Nru)
			AT 300 fr	درساعد صدر
200' SOUTH			rem	
OF DEED, 12 0.8/4.3		<u> </u>		+
		7		77
50' SouTH 29 0.8/32		1 -	DROPPED P	BELOW
OF DEBRIS		TIDE	TO NTH	The same of the sa
REMAK		W . -C	90	DK
Oil sheen/Debris: SMALL, BUT HEAVY SHEEN OF BOOMS ADDED.				
Fish Passage: BIRDS WORKING OF FISH JUMPING IN SOUTH	SOUTH OF	DREDGE UT	WIT LAKE	E Numbers
OF FISH JUMPING IN SOUTH	WEST CORNER	Y .	,	
Samples Collected for Laboratory Ana	ılysis – Sample ID	s:	•	
TSS (1L)	Turbid	ity (500ml)		
Total PCB (1L)	Dissolv	ved PCB (2x1L)		
Toxicity (21L)	Metals	(500ml)		
Notes: DO. VALUES RANGED - NALPOW TURBIDITY PLUME F	From 3-4;	generally	3.5 to 3.7 m	3/4
- NARRIW TURBIDITY PLUME F	ROM DEBRIS	CEMOVAL DETE	ETED OUT TO	العجد ال
-TURBIDITY ASSOC'D W/DREDG				
DEOPPED RAPIDLY.	· -			•
Sampling Craw. JC HARDY.	TM. HIMME	z		
Sampling Crew: JC. HARDY: Chief Scientist Signature:	<u></u>			
Chici Delenior Dignature.				



Dredging Location	DEEDLANG + DEBRIS ECTIONAL IN GREAG
Dredging Description	V man man
Survey Vessel	GALE FORCE
Chief Scientist	THIMINOU
Sampling Technician	JO. HAKDY
Vessel Captain	T. HIMMEL.
Other Personnel	R/A
Weather conditions	EVERCUST RAINY

Date	9/10/07
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Tide information				
High	4.4' @ 7:38			
Low	011@ 1354			
High	451 @ 1959			
Low				

Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes	e de la companya de la companya de la companya de la companya de la companya de la companya de la companya de
Notlieus	918	.225916	815413	5.5	0.72	5.1	39.53	1.7	23.76	-lesel Hot has	ن آر د
WOOD ST	0932	2708266	815447	6.7	0.75	4.4	27.84	2.39	23.41		
REF											
ANCED H	10:20	2705721	815 557	4.8	0.74	2.8	30.95	3.74	23.04	AT CABLE CROSS	MG
AREA H REF											
			<u> </u>								
								<u> </u>			
	<u> </u>							<u> </u>			
								 	-		

0 200 400 Feet
N
1 was DST
=4.9 water_lines
N7U 2007_area_G
(DA)
1 175' 23-29 NTU
SPIKE
HEAVY
SHEEN (
LOUNTED
THE BITH
10-15 NTU
10" P NIG
TIDE / CABLE CROSSING
1.3 NTU
PPEARED TO DE ASSID MOSTIGN WITHE
PPENDED TO BE ASSID MOSTLY W/ THE SEND HERRING; POSSIBLE MENHADEN WITHIN !
DEAD HERRING , POSSIBLE MENHADEN WITHIN ?
TO TO THE PERMIT
sis – Sample IDs:
Turbidity (500ml) See left
19/107 Dissolved PCB (2x1L) <u>ωω - DPC - 203 - 09/109</u> 109/107 Metals (500ml) ω Q - MET - 264 - 69/109
Metals (500ml) <u> </u>
ISH KILL Debris Removal shut down;
is De Values varied
15H KILL; Debris Removal shut down; yd. Diss. Dry Valued ranged. TL.
71-
1 — "
•
16h



Dredging Location	Area 6
Dredging Description	Ordgray + Deris Removal
Survey Vessel	Gale Fire
Chief Scientist	T. Himmer
Sampling Technician	M. Walsh
Vessel Captain	M. Wen (4h
Other Personnel	
Weather conditions	ovencast

Date	9/11/0	7
Page	C	of

Tide information				
High	4.5 @ 0819			
Low	0.1@ 1428			
High	4.4@ 2039			
Low				

	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes	
Q.	f mid	0751	2705780.03	815591.00	6.2	.72	1.3	29.95	2.40	22.15		
Mooring	6 South	0807	270 70 26.83	816098.40	7.0	. 3	1,4	29.67	2.07	72.4	Wa het for Mooning Gort	À
		1	1	}	6.0	,6	3.5	29.7	2.75	22.41		ļ
Refu	ad St Bridge	0857	2708263.77	815486.44	7.1	.6	4.9	29.5	2.49	22.28	WO-001-091107 = 9-0	-
3511 1)6-	415 NIU	IGJZ	2707619	510-977	4.01	1.2	- 23 90 1	29.69	147	22 32	WQ-XXX-001 091107- DU	P(I)
10 Hours	13-29 NT		770701	813 172	7.0		23-29101		1.1.3			
	WITHOU	10-15	2707557	13 315953.3	4.0	1.2	59-6	29.80	1.79	72.35	WQ-XXX-003-091107	
'	EQ Black	10:50		- L							W9-PCB-004-091107-6	B
											- MET-	
									<u> </u>			

Dups to PCB+ TSS/TUR

Chief Scientist Signature: _ myn Wolsh

Ë

Date: 9/12/2007 wist/N Weather: Sunny/Clim Breezy 10-15 Tides: 6 0859 0.1 @ 1458 4.3 @ 2117	N A	0 200 400 Feet
Monitoring Period: From: つかた To: 1055 Tidal Stage: HWS Ebb LWS Flood		7
Dredging Activity: Middle working North to South 1055 Depart for Area H	W15+/NW 15-25	no stun
Turbidity Summary Location Turbidity Sensor/water (NTU) Depth (ft) 100 East of May 4-8 NTU 1.0/14.		
Oil sheen/ Debris: No sheen Assocrated with Dodge Fish Passage: Sporadic Fish passage	c - Occasional dead Fish	<u> </u>
Samples Collected for Laboratory Analy TSS (1L) Total PCB (1L) Toxicity (21L)		
Notes: Turbidity from Druge Sampling Crew: 1 Valsh, J. Hardy	<i>,</i>	ound (7. Cu)tu
Chief Scientist Signature: The Wind		



Date	9/12/2007	
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Tide in	formation	
High	4.6 @	0 8 5
Low	0.10	145
High	4.30	711
Low		

Dredging Location	Area G
Dredging Description	
Survey Vessel	Gall Force
Chief Scientist	M. Walsh
Sampling Technician	J. Hardy
Vessel Captain	M. Walsh
Other Personnel	
Weather conditions	Sunny Clan Breezy

	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes
04	south H	0807	270 3720.57	815263.89	9.7	.74	2.6	30.30	2.9	21.72	
~ \$			"			A 45 3	7.6	71-19-		21.71	WE MW
1 wes	ast Bridge	0951	3708270,23	815466.89	7.0	,57	7.6	21.19	2.97	21.71	
Γ.											
		<u> </u>									
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		ļ									
			<u> </u>			<u> </u>			<u> </u>		

Battelle Daily Field Summ	nary Sheet for Water Quality Monitoring + 5.7 NTU Novtu of wood St. (1)
Date: 9/14/07	S.7 NIA PETRICE (COCE SI. C.)
Weather: Sunny; to w	N 0 200 400 Feet
Tides·	water_lines
0.1' @ 3.78 4.4 @ 10.16 0.4' @ 15.36	water_intes 2007_area_G
0.4' @ 15:5Le	
Monitoring Period:	
From: <u>0845</u> To: <u>////5</u>	
Tidal Stage: HWS Ebb LWS Flood	
Dredging Activity: Nedgency in Avea G	
	1 - turbdoy
	15-25 w/ac
	somes to 10
Turbidity Summary	within 100 to
Location Turbidity Sensor/water	150' of drodgy Do = 2.5-2.7 mg/L
Ref-South 2.8 NTU 0.8/to	1 00 = 7.5- 2.7 mg/L
7.01	
Normal 57 NTU 07 60	
wood St	
	DO: 34-37 mg/L
	1 * 2 8 NHU
Oil sheen/ Debris:	£ (
	within ; seretie of Dridge area
	<i>'</i>
Samples Collected for Laboratory Ana TSS (1L)	alysis – Sample IDs: Turbidity (500ml)
Total PCB (1L)	Dissolved PCB (2x1L)
Toxicity (21L)	Metals (500ml)
Notes: Approximately 850-900'	Novan of Wood St Forday the Do values.
dropped to 15 Psmall V	'englaved numbers of fish present, appeared
Stramed - were startaung frequ	North of Wood St Poridge the DO vacues leng large numbers of fish present, appeared mently. Noted some dead tish floating, but numbe muly more not significant given the large numbe muly special fish in area.
	were not significant given the lang number
Sampling Crew: T. Hardy Hir	umer stated tish in avoa.
Uniei Scientist Signature:	



Water Quality Monitoring In situ Data Field Form

Dredging Location	Debris Removal in H. Dredgers in G
Dredging Description	see above
Survey Vessel	RV GALE FORCE
Chief Scientist	Himmer
Sampling Technician	J. HARDY
Vessel Captain	Himmer
Other Personnel	NIA
Weather conditions	Sunny, sut out of south

Date	9/14/07
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Tide information					
High					
Low	0.1 @ 378				
High	4.4 @ 10.16				
Low	04 @ 15:56				

	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes
	SRet	8:51	2703821 2705834 2708619	815340	4.0	0.832	2.4	31,92	3.69	20.18	
	Mis Ret	8:59	2705534	815587	7.0	0.74	2.8	31.28	374	20.34	
*	NWOODST	10:23	2708619	815430	6.0	0.71	5.7	28.33	3.64	21.08	
71	*										
[
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Ī											
-											
		1									

10ts of fish a a few dead ones (bluebocks of journal mentions) fish appearstressed w/ lessons on their sides in Front dozen

Battelle Daily Field Sumi	mary Sheet for Water Quality Monitoring
Banene	@ 1000 - 70 2NTU DO = 6 8mg/c
Date: 9/17/67	0 200 400 Feet
Weather: Sunny Nawn 5-14	
Tides:	water_lines
05' @ 5.01 3.7 @ 12.20 071 @ 17.42	2007_area_H
3.7 @ /2.20	
<u> </u>	C450 + 10m
Monitoring Period:	Boundary &
From: 6400 To: 10:40	TURBIOITY -
- Tarren	Chemin Services
Tidal Stage: HWS Ebb LWS Flood	
Dredging Activity:	
DREDGING DEBRIS	@ 300' 25-32 W.NO V
REMOVAL	
A C / / C	40-45 NALE 200 250'
	200250' 5.5 mg/
Turbidity Summary	
Location Turbidity Sensor/water (NTU) Depth (ft)	
(NTU) Depth (ft) 2.5 0.7/5.9	
200 from 45 NTU 03/40	
Debrisklineral	
	* REF SOLOH
	- 2.5 M
	1 TIDE D.O. 5.5 hy/L
Off all and Dalaster	·
Oil sheen/ Debris:	
/ ore species	
Fish Passage: No ovidence	of fish damming observed
	V
Samples Collected for Laboratory Air TSS (1L)	· · · · · · · · · · · · · · · · · · ·
Total PCB (1L)	Turbidity (500ml) Dissolved PCB (2x1L)
Toxicity (21L)	Metals (500ml)
Notes: Observed varrow	plume that bugged eastern shoveling
No executives turbic	Liter B 3/D from diples Very val
hypitally ranged for	uty @ 300 from dibrus. remaral in 25-32NTU. DISS. Dry un area ranged in mor turn 5 to 5.5 mg/L
	The service of
Sampling Crew: J. Haray, T. Hu	100m) to J. Jag /L
Chief Scientist Signature:	<i>J</i>



Date: 1. +10 7	
Date: 9: +10 ? Weather: Sumy some clauds	N 0 200 400 Feet
Tides:	
6.5 @ 5:01	water_lines
37 @ 12 20 09 @ 17.42	2007_area_G
<u> </u>	
75 df 14	
Monitoring Period: From: <u>1242</u> To: <u>12:30</u>	
From: 779. 10: 72.30	
Tidal Stage: HWS Ebb LWS Flood	& wind
Tidal Stage. 11WB Edd EW ST 1000	
Dredging Activity:	
DREDGING	Doration
	Do ranged from 75-8.0
	731-8.5
	12-18 NTU
	between
	75-102
	them singe
Turbidity Summary	Die g
Location Turbidity Sensor/water (NTU) Depth (ft)	w/occ SPIKES to
REF 2-5 0.8	115 303
75' from 15 0.8'	
Dreixe	
	() TIDE
	5 (1 MID REX) + 25 WTU
Oil sheen/ Debris:	
DONE OBSLEVED	
Eigh Passage 7 225 Wallet W	Addition of the second of the
rish rassage: Birds Worlding	ABOVE, WITHIN & SOUTH OF DREWSE UNIT
Samples Collected for Laboratory Anal	vsis – Sample IDs:
TSS (1L)	Turbidity (500ml)
Total PCB (1L)	Dissolved PCB (2x1L)
Toxicity (21L)	Metals (500ml)
AC CHAMOST - TUB=	7-725 DD-25
Notes: Vot was	
Down Dudgeauga new.	Turbidity (500ml) Dissolved PCB (2x1L) Metals (500ml) 5525 DD = 35 254 frm 7.5 to 8.0 mg/L; North of 3.5 mg/L. Numerous tish seen north glavdy Bridge
San	X Trim 40 to 8.0 mg/L; North of
WOUD ST. VALUES SUPPER TO	5.3.5 mg/L. Nunevous tensera north a
Sampling Com T Huminary Til	land
Chief Scientist Signature	Dicie
Chief Scientist Signature:	



Dredging Location	AKERA
Dredging Description	Dredging Debris Removal
Survey Vessel	GAME FORCE
Chief Scientist	HIMMER
Sampling Technician	J. HARDY
Vessel Captain	HIMMER
Other Personnel	NA
Weather conditions	Sunny, N. wind @ 5-10 lets

Date	9/17/07	
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Tide information					
High	12:20	+37'			
Low	17.42	+0.7'			
High					
Low					

	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes
1-1	South REF	0900	2705631	815462	5.9	072	2.5	30.18	5.5	18.73	
	200' from	933	2704783	815604	3.8	0 85	2545	29.84	5.0	18.25	
	PR										
									<u> </u>		
									<u> </u>		
									<u> </u>	<u> </u>	
		-									
									<u> </u>		
									 		
		†									
		1									

Date: 9/19/2007 Weather: 5www.t/wn.d North.5-10 Tides: 2.9 @ 1:20 1.0 @ 0430 3.9 @ 1349	N 0 200 400 Feet
Monitoring Period: From: 1140 To: 1330	
Tidal Stage: HWS Ebb LWS Flood	
Dredging Activity: None while Present	Dredge 30-40 f
	20
Turbidity Summary Location Turbidity (NTU) Central area 16-18 Doedye 30-40 TD-7/40	henry Sheen
Oil sheen/ Debris:	oom lite sheen throughout wear
Fish Passage: Fish found in	all areas North of Area H + in dredge are
Samples Collected for Laboratory Anal TSS (1L) Total PCB (1L) Toxicity (21L)	ysis – Sample IDs: Turbidity (500ml) Dissolved PCB (2x1L)
Sampling Crew: _M_WAGMM. F.) Chief Scientist Signature: _M_WAGM	zpubnih

Date: 9/19/07 Weather: Overcas + /4nd N 5-10		0 200 400 Feet
Tides: 29 @ 21 10 @ 0430 3.4 @ 1349		water_lines 2007_area_H
Monitoring Period: From: 1140 To: 1330		
Tidal Stage: HWS Ebb LWS (Flood)		
Dredging Activity: Active Debeis removal	Dredge (inactive)	20-40 abris Removel 20 NTU
Turbidity Summary Location Turbidity Sensor/water (NTU) Depth (ft) 50-100' South 16-22 72 73.8 50-100' North 20-40 77 4.8 For Debris removed Oil sheen/ Debris:		0-20
None		
Fish Passage: Nothing which		
Samples Collected for Laboratory Ana TSS (1L)	Turbidity (500m	
Total PCB (1L) Toxicity (21L)	Dissolved PCB (Metals (500ml)	2x1L)
Notes:		
		· · · ·
Sampling Crew: M. Walsh, M. Fitz Chief Scientist Signature: M. Walsh	publich, J. Hardy	



Dredging Location	Army Inst operations
Dredging Description	Disis Removed in area G
Survey Vessel	Galc Force
Chief Scientist	Mwaish
Sampling Technician	MERIPHACK, S. Hurch
Vessel Captain	in walsh
Other Personnel	
Weather conditions	invitat

Date	9/19/2007
Page	of

Tide in		
High	121 27 27 RAPE	121
Low	1.0 @ 6630	
High	3.4 @ 1349	
Low	1.2@ 28 04pm	

Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes
Ref South	1142	2703790 57	815241.04	7. <i>0</i>	•73	5.0	30.11	()	18.48	
Ref South	1146	11	1	1\	6.5	3,2	30.33	6.7 6.2	18.63	
Area H	1245	2707762.12	815773.91	3.2	.65	35.3	28,99	10.34	18.93	
N Bounday										
							•			

	Date: 9/24/07	1		ما ال	200 400 Feet	
).		((1 / j	400 7661	
	Weather: Mitty Sunny / with WWW 5-10 Tides:	1 1 1	Y		- water_lines	
			5-10	& N	2007_area_H	
	9.0 @ 0619 0.3 @ 1204		1		3,200,24,042,1	
	4.4 @ 1845		1 \ /	1	N	
			A	1 / 2		
	Monitoring Period:		·	2125/		
	From: 0950 To: 1245			Removal		
	TILLS INVO FILL WO FILL] } }		7		
	Tidal Stage: HWS Ebb LWS Flood	18		//		
	Dredging Activity:	\\	- A	/ (
	Dredge - Middle working North		3 d	1 1 12	12.12/14	
	Diagramma Marin	\mathcal{X}	# F	3		
))				
	Pebrs Removal NE corner	+ $+$ $+$ $+$ $-$	- 65		-88.4NT4	
	The state of the state of	(
	AND THE PARTY OF T					
		1 3		7 2		
		(5				
	Turbidity Summary	- J. J		17.4 NFU	-45 Nru	
	Location Turbidity Sensor/water	<u> </u>			4	
	(NTU) Depth (ft),	. (1		<i>(</i>)		
0	Area boundary 17.4 .7/2.6 -	111		#		
(3)	75' South of DR 192.1 .76/ 2.0' -	1118		11	13	
3	103' southy OK 88.4 .76/2.0' -	11 23 1		1		
		1		V		
		1 11		1	~ (K ~	
	L			<u>I</u>		
	Oil sheen/ Debris:	7				
	No show observed with Dobris	Riveral / 8	listife ham dear	ablate t	Darker.	
	to a suffer all some of the property	May 1	The orang 1/2200	race will	rage	
	Fish Passage: Occasional Fish w	· surface				
	Samples Collected for Laboratory Anal	ysis – Sample II	Ds:			
	TSS (1L)		그 아니다 아이들은 어디를 하는데 살아 있는데 얼마나 나는 생각이다.			
	Total PCB (1L)		lved PCB (2x1I			
	Toxicity (21L)	Metal	ls (500ml)			
	Notos	Ĭ	, , ,			
	High Turbidity close	to sources	L (Oreage/DU	bits however)	Travellel	
	south with und and Tro	4. Lightu	vlaidity ase	sounded i	rith support	
	vessel trate due to 15tro	nomitally 101	ev tol. Di	wind Shites	Turktifyannu	6
	Notes: High turbidity close south with und and Tro vessel trahe due to 15the from sources and south	of Arcalla	oundry. Elev	ated AFT	is and Do. I	Ac
	Sampling Crew: M. Walsh J. Hard.	,	No	ted soute	of Ann BU	
	Chief Scientist Signature: Thurse	Walsh			3 Tital	
					_1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	

Date: 1/24/67		N 0 200 400 Feet
Weather: worty Sunny word NAW 5-10		
Tides:		water_lines
<u>4.0</u> @ 0619 _0.3		2007_area_G
4.4 @ 1845		nd l
		INW
Monitoring Period:		5-10
From: 0840 To: 0720		
Tidal Stage: HWS Ebb LWS Flood		Predge
Dredging Activity: , ,		
Predging NE auddrant		1
- 3)	
- Activity Stopped due to		
Tide 1		
Turbidity Summary		
Location Turbidity Sensor/water		
(NTU) Depth (ft)		\ \
)/ \
	250	
Oil sheen/ Debris: No Ghum Obsmad		
Fish Passage: Occasional Fish	in surface	
Samples Collected for Laboratory Anal	voia Comple IDa	
Samples Collected for Laboratory Anal	-)
TSS (1L)	Turbidity (500ml Dissolved PCB (2	
Total PCB (1L)		ZXIL)
Toxicity (21L)	Metals (500ml)	
Notes: Druge Activity stopped	due to low Trde.	No recordings taken
Nuded to retrieve	15I morrys before	low trobe.
a . a hall to		
Sampling Crew: M. Walsh J. Hard Chief Scientist Signature: Mulling	4	
Chief Scientist Signature:	1 Wish	



Dredging Location Dredging Description Survey Vessel Chief Scientist Sampling Technician Vessel Captain Other Personnel Weather conditions Aug H Duris Remark Area 6 MEDDIL Each Area 6 Solve Free Weather conditions		1	
Survey Vessel Chief Scientist Sampling Technician Vessel Captain Other Personnel	Dredging Location	Aren H / Debris Removal	Aru 6
Chief Scientist Sampling Technician Vessel Captain Other Personnel	Dredging Description	North East Area H / MEDDIC East	free 6
Sampling Technician Vessel Captain Other Personnel S. Harry M. Walsh	Survey Vessel	GAL Fire	
Vessel Captain M. Valsh Other Personnel —	Chief Scientist	Mewelsh	
Other Personnel —	Sampling Technician	J. Hardy	
	Vessel Captain	M. Walsh	
Weather conditions Mostly Juney knyl NW 5-10	Other Personnel		
	Weather conditions	mostly Juney kind NW 5-	10

Date	9/24/	07
Page		of

Tide in	formation		(ii)	
High	030	12:4	4.0	60019
Low	0.30	1204		
High	4.4 @	1845		
Low				

	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes
Mooring 514	e North	0916	270 7984,12	815623.24	3.6	0.716	3.6	29.77	6.17	21.09	USED AS RU
Ry made/o	able crossing	0949	2705579.59	815292.75	3.0	0,66	3.1	30,28	7.78	20.49	
		,									

Date: 1/25/67		0 200 400 Feet
Weather: Swyny Crear would wsw 10-3		water_lines
11des: 4.5 @ 0707 -0.1 @ 17.57 4.6 @ 1932		2007_area_H
4.6 @ 1432		N N
Monitoring Period: From: 1066 To: 1730)	Dimis
)	
Tidal Stage: HWS Ebb LWS Flood		* meaning applyed
Dredging Activity:		10 1 1 1
1006 - 1025 NO Advity		
1025 - 1230 Producing in progress 1006 - 1230 NO DR		
1006 - 1730 NO DR		
	}) Druge	
		3
) 2	* Necessary Deployed
Turbidity Summary		
Location Turbidity Sensor/water		
(NTU) Depth (ft)		
15 Strate of Daily 90" 100 NTN 381 / 2.6	1157	72
75 south of Dauge 55-65 NTU 0.81/2.6- South of Dauge 90-100 NTU .79/2.6- 0'South of Dredge 10-20 NTU .82/2.3-	197 192	
	ener con manufactura de la companya de la companya de la companya de la companya de la companya de la companya	
Oil sheen/ Debris:		
Occasional slight sheen noted arou-	nd Dadge	
Fish Passage: Occasional Fish a	, *	
Samples Collected for Laboratory Ana	lysis – Sample IDs:	
TSS (1L) <u>WQ-TSS/TUR-001-09256</u>	7 Turbidity (50	
Fotal PCB (1L)		
Foxicity (21L)	Metals (500m	11)
Notes: Back a mid Turk Ail		
The day of the state of the	urrage and Vebis Kendy	Docker Pott Part I I I Language
Notes: Background Turbichity in 1 Turbidity readings above backgr	onna arginal to	vicage rain (see his billing summar
Sampling Crew: M. Walsh, J. Ha. Chief Scientist Signature: Muckel	rdy	
Chief Scientist Signature:	Wary	

Date: 9/25/07	0 200 400 Feet
Weather: Sunny / wond - WSW 5-10	
Tides: ' @ 0707	— water_lines
-0.1 @ 1757	2007_area_G
4.6 @ 1932	
Monitoring Poriods	
Monitoring Period: From: <u>0836</u> To: <u>1000</u>	
10. 1000	
Tidal Stage: HWS (Ebb) LWS Flood	Dridge
	3 mag
Dredging Activity:	
Middle East working North	
Dredging Activity: Middle East welling North 0836 - 0918 Dredge on Stand B no definite	M A A A A A A A A A
71	
1918-1000 - Dredge working 1003 Dat for Aven H	
JOS DIA PAR MICHELLI	wind
	W5W /
Turbidity Summary	
ocation Turbidity Sensor/water	
O'East of Druge 6-10 NTU .94/3.5'-	ogis \
0 1871 Amade D. 10 NIA .111 212	
	N C X
oil sheen/ Debris:	r laid t l B - l.
Slight sheen observed on	East NWTH East Downly.
ish Passage: Occasional Figh	on Surface
amples Collected for Laboratory Ana	
SS (1L) Total PCB (1L)	Turbidity (500ml) Dissolved PCB (2x1L)
Toxicity (21L)	Metals (500ml)
• • • • • • • • • • • • • • • • • • • •	
lotes: Dridge activity very final.	into NE corner - Higher NTU's concentrated to that U values dropped off to background values of 6-10N dge,
Area with a slight sheen 1/11	U values dropped off in touckaround values of 6-113 as
to the south and east or Dre	See.
to the source and see the	4 - 1
ampling Crows 11 March 7 Hard	1.,
ampling Crew: <u>M. Walsh</u> , J. Hard Chief Scientist Signature: <u>Millar</u>	V4 7. 6. 1. 1.
mei ocientist orgnature:/www.	I W WIN



Water Quality Monitoring In situ Data Field Form

Dredging Location	Area G	Debris Run	roal Army H	
Dredging Description	middle East	working North	Debris Renoval	NE Colum
Survey Vessel	Gala From			
Chief Scientist	My. Walsh			
Sampling Technician	J. Hardy			
Vessel Captain	M. WMISH			
Other Personnel				
Weather conditions	Surry Clan	/ wing wsw	5-10	.,

Date	9/25/07	
Page	of	

Tide information						
High	4.5@ 0707					
Low	-0.1 @ 1257					
High	4.6@ 1932					
Low						

	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes	
MOONY	South H	07.55	2704231	815493.90	6.6	0.89	25	31.39	6.85		Mooring Deployment was	
MOON	Worth H	0821	2705055.87 2708262.9	815580.17	6.2	0.88	3.1	31.46	6.54	21.28	Moorary Deployment was	un Description
Ref 1		1006		7 81558 8.16		0.71	6.4	30.7	9.51	20.90		
•	55-65 NTU		270454531		2.6	0.81	57.6	30.86	5.4		TSS/Turb sample Take	D w 55-65AUTL
	70-100 NTU		270 4502,56		2.6	179	94.6	30.59	6.31	2159	135/Turb sample PA	90-100
	10-20 NTU		2704495.6		2.3	. 82	13.2	30.47	7.51	21.69	Wa-TS/Turb-002-0925 TSS/Turb Samples Taken	श्री श्री
		I WITE	(1.5,1								WQ-755/TURB-003-09	2507
												2)
		1					 		 	 		

Date: 16/1/07 Weather: Snang Clad / Colon 35E 5-10 Tides: -0.2 @ 5458 -0.3 @ 1759 Monitoring Period: From: 0810 To: 1310 Tidal Stage: HWS Ebb LWS Flood	15 NTL 0 200 400 Feet 15 15 15 15 15 15 15 1
Dredging Activity: 0845 - Dredging Inauhul to 0915 0915 - Dredging Inauhul to 0915 0915 - Dredging Inauhul 1245 0910 For in Progress to 1030 Turbidity Summary	75-85 NTU 100 4178 mg/1 Dean3 Removal
Location Turbidity Sensor/water (NTU) Depth (ft) 150 N J Au H 20.9 0.73/4.5	Ry H south (Bridge round) Two. 2.6 NTU Two. 7.16 mg/1
Oil sheen/Debris: _No_rot.roble_sheen	
Total PCB (1L) Toxicity (21L)	Turbidity (500ml) Dissolved PCB (2x1L) Metals (500ml)
Notes: Turbindity Rangue of 75 Close proximity to Debris Run proximity to Drudge, short live dropped of guildy to Just als Sampling Crew: M. Valsh, J. Marche Chief Scientist Signature: Mich. 27	-85 NTU confield to within Dreyke Amer and in word and Dridge. North of Dredge Area in Close I plumes of 20-60 NTU were monitored. Counts our background. Dissolved Oxygen kinds Range 4.5-6 mg/L hornyhoul dridge 48600



Dredging Location	Arra H
Dredging Description	moving bridge / Debris Keneval middle cast South
Survey Vessel	Gale Force
Chief Scientist	14. Valsa
Sampling Technician	J. Harlin
Vessel Captain	m. Walsh
Other Personnel	
Weather conditions	Survey Clear - Wind Color

Date	10/107	
Page	of	

Tide information								
High								
Low	-0.2 @ 0458							
High	4.5 @ 1207							
Low	6.3 @ 1759							

i i	tation ımber	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes
Ref 5mt		0830	270 3733.28	815310-12	7.0	.77	7.6	30.9	7.16	18.45	Ph-7.87
150 Worth	40R	0915	270 4786.33	815647.16	3.5	.78	88.2	31.15	4.78	18.66	Pa-7.60
Areny 15 mg	only	0153.00 0953	2705675.D	815570.12	4,5	0.78	15.5	31.41	4.95	18.99	Ph-7.79
									_		

	Date: 10/2/07	1 18	My Kiroli	0 200	400 Feet
	Weather: Mistly Cloudy / und calm		34 05 VV	1	- 1
	Tides:	11/	36,50)) N	er_lines 7_area_H
	9.3 @ 1367	1/15	120°		
	9.2 @ 1367 0.6 @ 1719		10-70 NTU	1 25	N
			10 701	1 / 1	
	Monitoring Period:	 	$-$ \		
	From: 0845 To: 1440	 , }	1	Dregge	18
	Tidal Stage: HWS Ebb LWS Flood	[] [] [\		
					u
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Dredging Activity:		7 / / / /		
Only	East to West \$5' south of Area Hnorth Boundry			711 V	
	Aura H North Delmary			1 8 m	0
		+/+		H 1	rbris Removal
	Polars Removal Southerst comm	\ \ \		1/1	
	of three M Debris Remaral Done				
	Debris Removal Done	1		7/ <	
		7	*	11	7
	Turbidity Summary Location Turbidity Sensor/water			wound 112 page	
	Location Turbidity Sensor/water (NTU) Depth (ft)			Mrs 11 200 Mm 1 200 M	_2\
	130 south of hout 3.7 1.2/3.5			JUND Walt	4
	30 WAK & Frat 321 12/3.0'			8 00)3
	V	a) 1	> * WIN		
Morning	North Retrieve 10.5 0.8/5.5 (4)		1mp 2.29 1016		57
*	South Februar 11.5 0.8/6.0 (143	a)	00,10)\
Maring	7.5 0.9700				
				5	8 -

	Oil sheen/ Debris:				
	10 Sheen Observed				and a second second
	Fish Passage: Faca, Schools of Fo	shoot obs	week on all mus	of River. No	Arurant abtraction
	Fish Passage: Large Schools of For		from Dr	edging or Debris 1	Remoral
	bampies concered for Laboratory in	ilysis - ban	ipic ibs.	3 0	
	TSS (1L)		Turbidity (500ml)		
	Total PCB (1L)		Dissolved PCB (2x1		
	Toxicity (21L)		Metals (500ml)	-/-	2. 5. y
	Notes: Due to inaccesability to 1	Double A	weath new work	min WB was	not conducted
	The close proximity to so	nrus. H	wever, Both Dred	le and Debris	Kentral WIN
	working edges of Boundry.	Turbidity	Values alonge A	true ANATH BON	inely ranged
	Notes: Due to inaccesability to the close proximity to so working edges of Bounday. between just about background with dredge pass from wast	A NTUS	(10 NFU) +8 (70	NT4) which co	responded
	Sampling Crew: M. Walk h. M. M.	111	Elevated NTW3 ((70 NTU) were	observed.
	Chief Scientist Signature: M. WALSE	· · · ·	due to supp		
Vir			rigua NTUS dop		ly with
7.51	moorings Retrieved Area H	* -		L. Al Der	/
Sedi	ment Tops Deployed North of Area 6	te	distance.		

Water Quality Monitoring In situ Data Field Form

Dredging Location	Area H
Dredging Description	Northcast Carner Area H / Debns Removal Southeast come Area H
Survey Vessel	Bale i-aru
Chief Scientist	M. Walsh
Sampling Technician	M. McKul
Vessel Captain	M- Walsh
Other Personnel	
Weather conditions	Prff, Cldy / wmd calm

Date	10/2/07	
Page	of	

Tide in	formation
High	agul .
Low	0552 0300552
High	4.2 @ 13:09
Low	0.6 @ 19:19

	Station	Time	Latitude	Longitude	Water	Sample	Turbidity	Salinity	DO	Temp	Notes	
	Number				depth	Depth						
24	f south	0700	2703755.0	815238.99	6.7	1,0	2.4	30.22	12.29	18.0	Ph 2.85	
woodst. Bu	PRST Ø3	1344	2708189.74	815545.62	6.7mw 3.6 5.5	7.07	7.0	30.02	9.21	20.30	Ph 8.45	0
Amat N	orth Moore	1418	2705058.87	815545.62	3.6 5.5	0.85	10,5	31.04	13.73	19.72	Ph 8.45 Ph 7.97 MODERNY RU	riwal
	1	}	}								-	
AJUH &	outh Moorning	1432	2704271.30	815493.90	6.0	0.8	11:5	31,40	11-14	19.74	Ph 7.82	1
71.0001	\\											į
										 		
										ļ		
		 								ļ		1
		-								 		
					<u></u>					 		
		 		*					 	 	-	
:									 			
					<u> </u>	٥.		<u> </u>	 	<u> </u>		
1							T					
N .	!			,			*			,	* "	
								1				
]

Date: 10/3/07	0 200 400 Feet
Weather: Foggy / why culmysts	water_lines 200 400 Feet — water_lines 2007_area_H
Tides:	water_lines Turb-11.GNTU 2007_area_H
<u> </u>	
39 @ 1415 0.7 @ 2132	
<u> </u>	310/3+20 mi
Monitoring Period:	20:640
From: <u>0855</u> To: <u>1230</u>	
	15-110 NTU
Tidal Stage: HWS Ebb LWS Flood	Dredge 1
Dredging Activity:	
Area H middle North work East to West	
- Debris Removal Finished	
Turbidity Summary	
Location Turbidity Sensor/water	Turb - 4.0 MTW
(NTU) Depth (ft)	Turb-4:0 My
50' 15-110 1.95/3.8 300' 13-20 2.00/3.8	DO - 9.65 mg/1
50' 15-110 1.95/3.8 300' 13-20 2.00/3.8 400' 11-13 1.95/4.8	
100 110 110	
130'south houndry 410 0.70/410	Refrence (Background)
130' North boundary 11.6 0.71 / 3.0	Refrence (Background) Turb-4.0NTU 00-14.16 1/L
600 south bounday 4.0 0.74/4.9	Jan Jan Jan Jan Jan Jan Jan Jan Jan Jan
m necessime A district	ty sheen seen around to chedge.
· · · · · · · · · · · · · · · · · · ·	
Schools of Fish Observed without	redge Mand outside dredge Area. No obstruction observed
From Diedying Activities	redgettand outside dredge Area. No obstruction observed
Fish Passage:	
Samples Collected for Laboratory Ana	lycic - Samula IDe•
	Turbidity (500ml) wa-tos/tur-xxx-101367
	7 Dissolved PCB (2x1L) wa- 200 ××× - 100367
Toxicity (21L) wa-Tox-xxx-1003	67 Metals (500ml) wa-MET-XXX-100307
Natara in transfer of Affron	di e a al a comittato de lue asolit and
notes: 15-110 Natu Turbianty ra	any in close proximing to arrange so req. Broad range
on readings are to stop and	go Activity of theigh, the book ranges commiss
but anymout a will out take	dings in close proximity to dudge ~50 feet. Broad range go tetroity of Directge. These broad Panyer continued from Ordge as seen at 300 with 11.6-20 NTM. Le closer and diminished agorn (11-13 NTM). Dissobel Orygun Mars Control
AT 600 from arrayer langua tigro wi	Make a control of the
Sampling Crew: M. Walsh J. Hardy	Short the the
Chief Scientist Signature: Ming Wr	by



Water Quality Monitoring In situ Data Field Form

Dredging Location Arca H **Dredging Description** Middle North Working West to East **Survey Vessel** Gale Force **Chief Scientist** m. Walsh Sampling Technician J. Harry **Vessel Captain** m. Walsh **Other Personnel** Weather conditions Foggy 35E 5 I would calm

Date	10/3/07
Page	of

Tide information				
High				
Low	0.6 @ 5750			
High	3.9 @ 1415			
Low	0.7 @ 2172			

	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes	~# >
Mooring	south H	0855	2704221.41	815447.12	4,0	0.70	4.0	30.27	9.65	j .	~130' South of Oredge Area	
Moor is	y North H	0911	2705116.73	815563.25	3.0	0.71	11.6	30.63	11.41	19.66	-130' North of Dridge Ann.	H (A. 7.91)
50	on Ref	0926	2703744.15	615189.42	4.9	0.74	4.0	30.62	14.16		600' South of Dridge have	4 (ph 835)
50'Nat	h of Source	1100	2704830.16	815638.56	3.8	1.95	65-100	31.16	6.84	14.47	p.: 7.73	
300 Nag	1450WL	11.50	2705144.22	815606.61	3,8	2.00	13-20	3123	6.46	20.12	P1: 7:79	
600' WA	ag source	1228	270.5434.1	815573.26	4.8	1.95	11-13	31. 29	7.76	20.26	Ph: 7.88	

	Date: 10/8/07	200 400 Feet
	Weather: om (ast/lan/land 5-155) Tides: 3,7 @ 0626	R 2.3 NTUTUMO water_lines 2007_area_H
	0.2 @ 1311 4.0 @ 1846	
	Monitoring Period: From: 0820 To: 1245	wooding with
	Tidal Stage: HWS Ebb LWS Flood	
	Dredging Activity: Working Middle west to East	Drulge
		background 26 NTU Furb (3-17 NTU)
	Turbidity Summary Location Turbidity Sensor/water (NTU) Depth (ft) 2.3 0.4 5.9	* 300 salter of source
* 300	South of Source 9.8 0.8/4.9 South of Source 2.5 0.7/4.0 Meetly South 2.6 0.8/64	3.8 m/ ao. 3.8 m/ ao.
	Oil sheen/ Debris:	with dredge fetivity
	Fish Passage: Fished observed in	all arens/No Apparent obstruction from drage throrty
	Samples Collected for Laboratory Ana TSS (1L) Total PCB (1L) Toxicity (21L)	alysis – Sample IDs: Turbidity (500ml) Dissolved PCB (2x1L) Metals (500ml)
	Notes: Orviall Turbitlity quite observed in close proximity 50 NTU. From 50'h the dudge values dropped off to back gro	y to dridge (source) with an occasional higher spike to boundry turbidity Ranged from 3-17 NTUS. Turbidity and and just afone beyond the 130'-300' Mark (25-98 NTO Dissolved Oxygen ranged between
	Sampling Crew: M. Walsh T. H. m. Chief Scientist Signature: Muhy	Total 3.5-4 mg/1 movide the dudged area to 3-6.6 mg/1 outside the Druge free.
		ų



Water Quality Monitoring In situ Data Field Form

Dredging Location	Area H
Dredging Description	working west to East (middle)
Survey Vessel	Gele fine
Chief Scientist	•
Sampling Technician	
Vessel Captain	M. Walsh
Other Personnel	
Weather conditions	Ourcast fain I wind SSW 5-15

Date	10/8/07	
Page	of	

Tide information					
High	3.9 @ 0626				
Low	0.2@ 1311				
High	4.0@ 1846				
Low					

	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes
THE MOOVE	ny H Sth	0820	2704243.29	815486-1	6.4	U, 8	2.6	31.10	6.63	19.98	
Q	ef North	0837	2705623.2	815365.7	5.9	.4	2.3	30-78	4.00	19.96	
300	N of Bounda	0830	2705251.6	815580.1	5.7	.5	2-6	30.95	4-18	19.82	
300/501	y Source	0844	2704305.4	815473.8	4.9	-8	9.8	31.25	3.8	19.92	
600' south	of source	0847	2703997.8	815540.1	4.0	. 7	2.5	30.35	4.18	19.96	
170 south	of Source	0932	2704447.2	815607.0	4.5	, 9	10.8	30.61	4.28	19.75	
i de la companya de l											
1											

Date: 10/9/07	Worth 10-15 kts 0 200 400 Feet
Weather: Pitty Gloudy / wind N 10-15	— water_lines
Tides: @ 0706	1000 North 2007_area_H
O-2 @ 1337	Ret 2
4.0 @ 1926	Tue-2.3 mmy 20 7.39 my
Monitoring Period:	20731my,
From: <u>0845</u> To: <u>1345</u>	
Tidal Stage: HWS Ebb LWS Flood	
Dredging Activity:	Dodge
Middle South working west to East - Debits Removal Barge for support	(Source)
- Vebri3 Removal Darge for support	
	Delay P
	Debris Removal Barge
	9-50 aty 00, 5.5-6.4my/
Turbidity Summary	4-26 NTH 00 5,5-6.13mg/
Location Turbidity Sensor/water (REF/WG) (NTU) Depth (ft)	600
1000 NAH ASONIC 2.3 1.03/4.8	Com tourse Darkgionnel 22 - 8:2 NAY
4HBm/200 South of Source 39,8 1.08/3.9	Do. 5.2-5.8 mg/
normy 300 south forme 26.4 1.06/3.8	from source
1000' South y sovie 2.2 1.04/7,2	
Oil sheen/ Debris:	
Occasional spotty shin	
Fish Passage: Occasional Fish	in Surface / No obvious obscuction from Overlyny Activity
Samples Collected for Laboratory An	
TSS (1L)	Turbidity (500ml)
Total PCB (1L)	Dissolved PCB (2x1L)
Toxicity (21L)	Metals (500ml)
Notes: - Sampling Cruw tid no	I enter Dredge Area Due to Close proximity of Dredges
Dibris Kimoval and Sup	t enter Dredge Area Due to Close proximity of Dredges port vessile. Highest Thebodity readings observed between a. Armages between 9-30 NTM with spikes to 50 NTM depending rat. Outside of 300' Turbridity dropped off to Just whene apriles to the midtwenties (26 NTM). This too was dependent
200 and 300 heunstran	n. Hrunges between 9-30NTh with spikes to SONTH depending
brickyround (4NTU) with &	in unione of 500 7 which by dropped off to just about a pikes to the mid furnities As control of
Chief Scientist Signature: The n	on maye Toratra.
	v



Dredging Location	Aren H
Dredging Description	middle South working wist to East /Debno Rimonal Barge Support Onl
Survey Vessel	GAL Force
Chief Scientist	M. Walsh
Sampling Technician	M. Mikec
Vessel Captain	M. Walsh
Other Personnel	
Weather conditions	Party Cloudy Jury N 10-15

Date	10/9/07	
Page	of	

Tide information						
High	4.1 @ 6706					
Low	0.2@ 1337					
High	4.0@ 1476					
Low						

	Station Number	Time	Latitude	Longitude	Water depth	Sample Depth	Turbidity	Salinity	DO	Temp	Notes	
1000 north	Ret worth	0951	2705736.68	815613-24	ય . ક	1.03	7.3	30.52	7.39	19.34	Ph 7,29	
302 south	of Source	1017	270 4228,50	815499.11	5.2	0,98	13.4	31.03	6.39	19.53	Ph 243 manual Activi	chielge
600's outh	of source	1030	2703920.44	815444.69	6.1	1,13	4,0	31.00	6.13	19.51	Ph 7.46	7
			2704316.30	815447.20	3.9	1.08	39.8	30.71	5.60	19.58	Ph 7.50	
accidently	of Source		2704221,39	815 497,76	3.8	1,06	26.4	30.75	5.89	19.56	A 7.50 Morning Sift	
g 00 south			2703927.61	४१५५०५, ४१	5.4	1.07	9.3	30.78	5.85	19.54	Ph. 7-49	
(800' fut So	uth of Source	1146	2703526.61	815360,88	7. 3	1.04	2.2	30.71	5.26	19:48	Ph 7.44	
												
									ļ			
								<u> </u>				

Tidal Stage Date Time Time Zone Tidal Height High Tide: 8/6/2007 2:13 EDT 3.6 Low Tide: 8/6/2007 7:38 EDT 0.2 High Tide: 8/6/2007 14:51 EDT 4.5 Low Tide: 8/7/2007 3:18 EDT 3.4 Low Tide: 8/7/2007 3:48 EDT 0.4 High Tide: 8/7/2007 15:55 EDT 0.7 High Tide: 8/7/2007 22:25 EDT 0.7 High Tide: 8/8/2007 15:55 EDT 0.7 High Tide: 8/8/2007 10:00 EDT 0.7 High Tide: 8/8/2007 10:00 EDT 0.4 Low Tide: 8/8/2007 5:25 EDT 0.5 High Tide: 8/9/2007 5:25 EDT 3.6 Low Tide: 8/10/2007 15:55 EDT 4.7 Low Tide: 8/10/2007 12:23 EDT		.,	14111 1010	. 0.00	
Low Tide:	Tidal Stage	Date	Time	Time Zone	Tidal Height
High Tide:	High Tide:	8/6/2007	2:13	EDT	3.6
Low Tide:	Low Tide:	8/6/2007	7:38	EDT	0.2
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Low Tide: 8/7/2007 8:44 EDT 0.4 High Tide: 8/7/2007 15:55 EDT 4.5 Low Tide: 8/7/2007 22:25 EDT 0.7 High Tide: 8/8/2007 10:00 EDT 0.4 High Tide: 8/8/2007 10:00 EDT 0.4 High Tide: 8/8/2007 16:57 EDT 4.6 Low Tide: 8/8/2007 23:42 EDT 0.5 High Tide: 8/9/2007 5:25 EDT 3.6 Low Tide: 8/9/2007 11:16 EDT 0.4 High Tide: 8/9/2007 17:55 EDT 4.7 Low Tide: 8/10/2007 6:22 EDT 0.4 High Tide: 8/10/2007 12:23 EDT 0.2 High Tide: 8/10/2007 12:23 EDT 0.2 High Tide: 8/11/2007 12:28 EDT 0.2 High Tide: 8/11/2007 13:18 EDT	Low Tide:	8/6/2007	20:57	EDT	0.7
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	High Tide:	8/16/2007	10:50	EDT	4.3
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	High Tide:	8/16/2007	23:06	EDT	3.9

Tidal Stage Date Time Time Zone Tidal Height Low Tide: 8/17/2007 4:37 EDT 0.3 High Tide: 8/17/2007 11:32 EDT 4.1 Low Tide: 8/17/2007 17:04 EDT 0.6 High Tide: 8/18/2007 5:08 EDT 0.4 High Tide: 8/18/2007 12:15 EDT 0.4 High Tide: 8/18/2007 12:15 EDT 0.9 High Tide: 8/19/2007 0:29 EDT 0.9 High Tide: 8/19/2007 13:02 EDT 0.6 High Tide: 8/19/2007 13:02 EDT 0.6 High Tide: 8/19/2007 13:02 EDT 0.6 High Tide: 8/20/2007 13:02 EDT 0.6 High Tide: 8/20/2007 13:18 EDT 0.7 High Tide: 8/20/2007 13:54 EDT 0.7 High Tide: 8/20/2007 13:54		.,	<u> </u>	. 0.00	
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High Tide: 8/22/2007 15:50 EDT 3.6 Low Tide: 8/22/2007 21:25 EDT 1.3 High Tide: 8/23/2007 4:18 EDT 2.9 Low Tide: 8/23/2007 9:13 EDT 1 High Tide: 8/23/2007 16:47 EDT 3.8 Low Tide: 8/23/2007 22:42 EDT 1.1 High Tide: 8/24/2007 5:15 EDT 3.1 Low Tide: 8/24/2007 10:25 EDT 0.8 High Tide: 8/24/2007 17:40 EDT 4.1 Low Tide: 8/24/2007 17:40 EDT 0.7 High Tide: 8/25/2007 6:07 EDT 3.5 Low Tide: 8/25/2007 6:07 EDT 3.5 Low Tide: 8/26/2007 18:29 EDT 0.4 High Tide: 8/26/2007 12:27 EDT 0.2 High Tide: 8/26/2007 19:15 EDT	High Tide:	8/22/2007		EDT	2.8
High Tide: 8/22/2007 15:50 EDT 3.6 Low Tide: 8/22/2007 21:25 EDT 1.3 High Tide: 8/23/2007 4:18 EDT 2.9 Low Tide: 8/23/2007 9:13 EDT 1 High Tide: 8/23/2007 16:47 EDT 3.8 Low Tide: 8/23/2007 22:42 EDT 1.1 High Tide: 8/24/2007 5:15 EDT 3.1 Low Tide: 8/24/2007 10:25 EDT 0.8 High Tide: 8/24/2007 17:40 EDT 4.1 Low Tide: 8/24/2007 17:40 EDT 0.7 High Tide: 8/25/2007 6:07 EDT 3.5 Low Tide: 8/25/2007 6:07 EDT 3.5 Low Tide: 8/26/2007 18:29 EDT 0.4 High Tide: 8/26/2007 12:27 EDT 0.2 High Tide: 8/26/2007 19:15 EDT	Low Tide:	8/22/2007	8:06	EDT	1
High Tide: 8/23/2007 4:18 EDT 2.9 Low Tide: 8/23/2007 9:13 EDT 1 High Tide: 8/23/2007 16:47 EDT 3.8 Low Tide: 8/23/2007 22:42 EDT 1.1 High Tide: 8/24/2007 5:15 EDT 3.1 Low Tide: 8/24/2007 10:25 EDT 0.8 High Tide: 8/24/2007 17:40 EDT 4.1 Low Tide: 8/24/2007 23:42 EDT 0.7 High Tide: 8/25/2007 6:07 EDT 3.5 Low Tide: 8/25/2007 11:31 EDT 0.6 High Tide: 8/25/2007 18:29 EDT 0.4 How Tide: 8/26/2007 0:29 EDT 0.4 High Tide: 8/26/2007 12:27 EDT 0.2 High Tide: 8/26/2007 19:15 EDT 4.6 Low Tide: 8/27/2007 7:39 EDT 4.3 Low Tide: 8/27/2007 7:39 EDT 4.3 <td>High Tide:</td> <td>8/22/2007</td> <td>15:50</td> <td>EDT</td> <td>3.6</td>	High Tide:	8/22/2007	15:50	EDT	3.6
Low Tide: 8/23/2007 9:13 EDT 1 High Tide: 8/23/2007 16:47 EDT 3.8 Low Tide: 8/23/2007 22:42 EDT 1.1 High Tide: 8/24/2007 5:15 EDT 3.1 Low Tide: 8/24/2007 10:25 EDT 0.8 High Tide: 8/24/2007 17:40 EDT 4.1 Low Tide: 8/24/2007 23:42 EDT 0.7 High Tide: 8/25/2007 6:07 EDT 3.5 Low Tide: 8/25/2007 11:31 EDT 0.6 High Tide: 8/25/2007 18:29 EDT 0.4 Low Tide: 8/26/2007 0:29 EDT 0.4 High Tide: 8/26/2007 12:27 EDT 0.2 High Tide: 8/26/2007 19:15 EDT 4.6 Low Tide: 8/27/2007 1:11 EDT 0.1 High Tide: 8/27/2007 7:39 EDT	Low Tide:	8/22/2007	21:25	EDT	1.3
High Tide: 8/23/2007 16:47 EDT 3.8 Low Tide: 8/23/2007 22:42 EDT 1.1 High Tide: 8/24/2007 5:15 EDT 3.1 Low Tide: 8/24/2007 10:25 EDT 0.8 High Tide: 8/24/2007 17:40 EDT 4.1 Low Tide: 8/24/2007 23:42 EDT 0.7 High Tide: 8/25/2007 6:07 EDT 3.5 Low Tide: 8/25/2007 11:31 EDT 0.6 High Tide: 8/25/2007 18:29 EDT 4.4 Low Tide: 8/26/2007 0:29 EDT 0.4 High Tide: 8/26/2007 6:54 EDT 3.9 Low Tide: 8/26/2007 19:15 EDT 4.6 Low Tide: 8/27/2007 1:11 EDT 0.1 High Tide: 8/27/2007 7:39 EDT 4.3 Low Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.	High Tide:	8/23/2007	4:18	EDT	2.9
Low Tide: 8/23/2007 22:42 EDT 1.1 High Tide: 8/24/2007 5:15 EDT 3.1 Low Tide: 8/24/2007 10:25 EDT 0.8 High Tide: 8/24/2007 17:40 EDT 4.1 Low Tide: 8/24/2007 23:42 EDT 0.7 High Tide: 8/25/2007 6:07 EDT 3.5 Low Tide: 8/25/2007 11:31 EDT 0.6 High Tide: 8/25/2007 18:29 EDT 4.4 Low Tide: 8/26/2007 0:29 EDT 0.4 High Tide: 8/26/2007 6:54 EDT 3.9 Low Tide: 8/26/2007 12:27 EDT 0.2 High Tide: 8/26/2007 19:15 EDT 4.6 Low Tide: 8/27/2007 7:39 EDT 4.3 Low Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.8	Low Tide:	8/23/2007	9:13	EDT	1
High Tide: 8/24/2007 5:15 EDT 3.1 Low Tide: 8/24/2007 10:25 EDT 0.8 High Tide: 8/24/2007 17:40 EDT 4.1 Low Tide: 8/24/2007 23:42 EDT 0.7 High Tide: 8/25/2007 6:07 EDT 3.5 Low Tide: 8/25/2007 11:31 EDT 0.6 High Tide: 8/25/2007 18:29 EDT 4.4 Low Tide: 8/26/2007 0:29 EDT 0.4 High Tide: 8/26/2007 6:54 EDT 3.9 Low Tide: 8/26/2007 12:27 EDT 0.2 High Tide: 8/26/2007 19:15 EDT 4.6 Low Tide: 8/27/2007 7:39 EDT 4.3 Low Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.8	High Tide:	8/23/2007	16:47	EDT	3.8
Low Tide: 8/24/2007 10:25 EDT 0.8 High Tide: 8/24/2007 17:40 EDT 4.1 Low Tide: 8/24/2007 23:42 EDT 0.7 High Tide: 8/25/2007 6:07 EDT 3.5 Low Tide: 8/25/2007 11:31 EDT 0.6 High Tide: 8/25/2007 18:29 EDT 4.4 Low Tide: 8/26/2007 0:29 EDT 0.4 High Tide: 8/26/2007 6:54 EDT 3.9 Low Tide: 8/26/2007 12:27 EDT 0.2 High Tide: 8/26/2007 19:15 EDT 4.6 Low Tide: 8/27/2007 1:11 EDT 0.1 High Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.8	Low Tide:	8/23/2007	22:42	EDT	1.1
High Tide: 8/24/2007 17:40 EDT 4.1 Low Tide: 8/24/2007 23:42 EDT 0.7 High Tide: 8/25/2007 6:07 EDT 3.5 Low Tide: 8/25/2007 11:31 EDT 0.6 High Tide: 8/25/2007 18:29 EDT 4.4 Low Tide: 8/26/2007 0:29 EDT 0.4 High Tide: 8/26/2007 6:54 EDT 3.9 Low Tide: 8/26/2007 12:27 EDT 0.2 High Tide: 8/26/2007 19:15 EDT 4.6 Low Tide: 8/27/2007 1:11 EDT 0.1 High Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.8	High Tide:	8/24/2007	5:15	EDT	3.1
Low Tide: 8/24/2007 23:42 EDT 0.7 High Tide: 8/25/2007 6:07 EDT 3.5 Low Tide: 8/25/2007 11:31 EDT 0.6 High Tide: 8/25/2007 18:29 EDT 4.4 Low Tide: 8/26/2007 0:29 EDT 0.4 High Tide: 8/26/2007 6:54 EDT 3.9 Low Tide: 8/26/2007 12:27 EDT 0.2 High Tide: 8/26/2007 19:15 EDT 4.6 Low Tide: 8/27/2007 7:39 EDT 4.3 Low Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.8	Low Tide:	8/24/2007	10:25	EDT	0.8
High Tide: 8/25/2007 6:07 EDT 3.5 Low Tide: 8/25/2007 11:31 EDT 0.6 High Tide: 8/25/2007 18:29 EDT 4.4 Low Tide: 8/26/2007 0:29 EDT 0.4 High Tide: 8/26/2007 6:54 EDT 3.9 Low Tide: 8/26/2007 12:27 EDT 0.2 High Tide: 8/26/2007 19:15 EDT 4.6 Low Tide: 8/27/2007 1:11 EDT 0.1 High Tide: 8/27/2007 7:39 EDT 4.3 Low Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.8	High Tide:	8/24/2007	17:40	EDT	4.1
Low Tide: 8/25/2007 11:31 EDT 0.6 High Tide: 8/25/2007 18:29 EDT 4.4 Low Tide: 8/26/2007 0:29 EDT 0.4 High Tide: 8/26/2007 6:54 EDT 3.9 Low Tide: 8/26/2007 12:27 EDT 0.2 High Tide: 8/26/2007 19:15 EDT 4.6 Low Tide: 8/27/2007 1:11 EDT 0.1 High Tide: 8/27/2007 7:39 EDT 4.3 Low Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.8	Low Tide:	8/24/2007	23:42	EDT	0.7
Low Tide: 8/25/2007 11:31 EDT 0.6 High Tide: 8/25/2007 18:29 EDT 4.4 Low Tide: 8/26/2007 0:29 EDT 0.4 High Tide: 8/26/2007 6:54 EDT 3.9 Low Tide: 8/26/2007 12:27 EDT 0.2 High Tide: 8/26/2007 19:15 EDT 4.6 Low Tide: 8/27/2007 1:11 EDT 0.1 High Tide: 8/27/2007 7:39 EDT 4.3 Low Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.8	High Tide:	8/25/2007	6:07	EDT	3.5
High Tide: 8/25/2007 18:29 EDT 4.4 Low Tide: 8/26/2007 0:29 EDT 0.4 High Tide: 8/26/2007 6:54 EDT 3.9 Low Tide: 8/26/2007 12:27 EDT 0.2 High Tide: 8/26/2007 19:15 EDT 4.6 Low Tide: 8/27/2007 1:11 EDT 0.1 High Tide: 8/27/2007 7:39 EDT 4.3 Low Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.8		8/25/2007	11:31	EDT	0.6
High Tide: 8/26/2007 6:54 EDT 3.9 Low Tide: 8/26/2007 12:27 EDT 0.2 High Tide: 8/26/2007 19:15 EDT 4.6 Low Tide: 8/27/2007 1:11 EDT 0.1 High Tide: 8/27/2007 7:39 EDT 4.3 Low Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.8	High Tide:	8/25/2007		EDT	
High Tide: 8/26/2007 6:54 EDT 3.9 Low Tide: 8/26/2007 12:27 EDT 0.2 High Tide: 8/26/2007 19:15 EDT 4.6 Low Tide: 8/27/2007 1:11 EDT 0.1 High Tide: 8/27/2007 7:39 EDT 4.3 Low Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.8				EDT	
Low Tide: 8/26/2007 12:27 EDT 0.2 High Tide: 8/26/2007 19:15 EDT 4.6 Low Tide: 8/27/2007 1:11 EDT 0.1 High Tide: 8/27/2007 7:39 EDT 4.3 Low Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.8	High Tide:	8/26/2007		EDT	3.9
Low Tide: 8/27/2007 1:11 EDT 0.1 High Tide: 8/27/2007 7:39 EDT 4.3 Low Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.8	Low Tide:	8/26/2007	12:27	EDT	0.2
Low Tide: 8/27/2007 1:11 EDT 0.1 High Tide: 8/27/2007 7:39 EDT 4.3 Low Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.8	High Tide:	8/26/2007	19:15	EDT	4.6
Low Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.8		8/27/2007	1:11	EDT	0.1
Low Tide: 8/27/2007 13:18 EDT -0.1 High Tide: 8/27/2007 19:59 EDT 4.8	High Tide:	8/27/2007	7:39	EDT	4.3
	•			EDT	-0.1
	High Tide:	8/27/2007	19:59	EDT	4.8
	Low Tide:	8/28/2007	1:52	EDT	-0.2

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Tidal Stage	Date	Time	Time Zone	Tidal Height
High Tide:	8/28/2007	8:23	EDT	4.6
Low Tide:	8/28/2007	14:07	EDT	-0.3
High Tide:	8/28/2007	20:44	EDT	4.9
Low Tide:	8/29/2007	2:33	EDT	-0.4
High Tide:	8/29/2007	9:08	EDT	4.9
Low Tide:	8/29/2007	14:54	EDT	-0.5
High Tide:	8/29/2007	21:29	EDT	4.8
Low Tide:	8/30/2007	3:14	EDT	-0.6
High Tide:	8/30/2007	9:54	EDT	5
Low Tide:	8/30/2007	15:42	EDT	-0.5
High Tide:	8/30/2007	22:15	EDT	4.7
Low Tide:	8/31/2007	3:56	EDT	-0.5
High Tide:	8/31/2007	10:41	EDT	5.1
Low Tide:	8/31/2007	16:31	EDT	-0.3
High Tide:	8/31/2007	23:03	EDT	4.4
Low Tide:	9/1/2007	4:40	EDT	-0.4
High Tide:	9/1/2007	11:32	EDT	5
Low Tide:	9/1/2007	17:22	EDT	-0.1
High Tide:	9/1/2007	23:55	EDT	4.1
Low Tide:	9/2/2007	5:26	EDT	-0.2
High Tide:	9/2/2007	12:27	EDT	4.8
Low Tide:	9/2/2007	18:19	EDT	0.2
High Tide:	9/3/2007	0:52	EDT	3.7
Low Tide:	9/3/2007	6:18	EDT	0.1
High Tide:	9/3/2007	13:27	EDT	4.6
Low Tide:	9/3/2007	19:27	EDT	0.6
High Tide:	9/4/2007	1:55	EDT	3.5
Low Tide:	9/4/2007	7:19	EDT	0.4
High Tide:	9/4/2007	14:32	EDT	4.4
Low Tide:	9/4/2007	20:53	EDT	0.8
High Tide:	9/5/2007	3:04	EDT	3.3
Low Tide:	9/5/2007	8:35	EDT	0.6
High Tide:	9/5/2007	15:40	EDT	4.3
Low Tide:	9/5/2007	22:29	EDT	0.7
High Tide:	9/6/2007	4:11	EDT	3.4
Low Tide:	9/6/2007	10:07	EDT	0.6
High Tide:	9/6/2007	16:43	EDT	4.3
Low Tide:	9/6/2007	23:40	EDT	0.6
High Tide:	9/7/2007	5:12	EDT	3.6
Low Tide:	9/7/2007	11:29	EDT	0.5
High Tide:	9/7/2007	17:41	EDT	4.4
Low Tide:	9/8/2007	0:31	EDT	0.4
High Tide:	9/8/2007	6:06	EDT	3.9

Tidal Stage	Date	Time	Time Zone	Tidal Height
Low Tide:	9/8/2007	12:29	EDT	0.3
High Tide:	9/8/2007	18:32	EDT	4.5
Low Tide:	9/9/2007	1:11	EDT	0.3
High Tide:	9/9/2007	6:55	EDT	4.1
Low Tide:	9/9/2007	13:15	EDT	0.2
High Tide:	9/9/2007	19:18	EDT	4.5
Low Tide:	9/10/2007	1:44	EDT	0.2
High Tide:	9/10/2007	7:38	EDT	4.4
Low Tide:	9/10/2007	13:54	EDT	0.1
High Tide:	9/10/2007	19:59	EDT	4.5
Low Tide:	9/11/2007	2:11	EDT	0.1
High Tide:	9/11/2007	8:19	EDT	4.5
Low Tide:	9/11/2007	14:28	EDT	0.1
High Tide:	9/11/2007	20:39	EDT	4.4
Low Tide:	9/12/2007	2:37	EDT	0.1
High Tide:	9/12/2007	8:59	EDT	4.6
Low Tide:	9/12/2007	14:58	EDT	0.1
High Tide:	9/12/2007	21:17	EDT	4.3
Low Tide:	9/13/2007	3:02	EDT	0.1
High Tide:	9/13/2007	9:37	EDT	4.5
Low Tide:	9/13/2007	15:27	EDT	0.2
High Tide:	9/13/2007	21:54	EDT	4.1
Low Tide:	9/14/2007	3:28	EDT	0.1
High Tide:	9/14/2007	10:16	EDT	4.4
Low Tide:	9/14/2007	15:56	EDT	0.4
High Tide:	9/14/2007	22:31	EDT	3.8
Low Tide:	9/15/2007	3:56	EDT	0.2
High Tide:	9/15/2007	10:55	EDT	4.2
Low Tide:	9/15/2007	16:28	EDT	0.5
High Tide:	9/15/2007	23:10	EDT	3.5
Low Tide:	9/16/2007	4:26	EDT	0.4
High Tide:	9/16/2007	11:35	EDT	4
Low Tide:	9/16/2007	17:02	EDT	0.7
High Tide:	9/16/2007	23:52	EDT	3.2
Low Tide:	9/17/2007	5:01	EDT	0.5
High Tide:	9/17/2007	12:20	EDT	3.7
Low Tide:	9/17/2007	17:42	EDT	0.9
High Tide:	9/18/2007	0:39	EDT	3
Low Tide:	9/18/2007	5:41	EDT	0.7
High Tide:	9/18/2007	13:11	EDT	3.6
Low Tide:	9/18/2007	18:29	EDT	1.1
High Tide:	9/19/2007	1:37	EDT	2.8
Low Tide:	9/19/2007	6:29	EDT	0.9

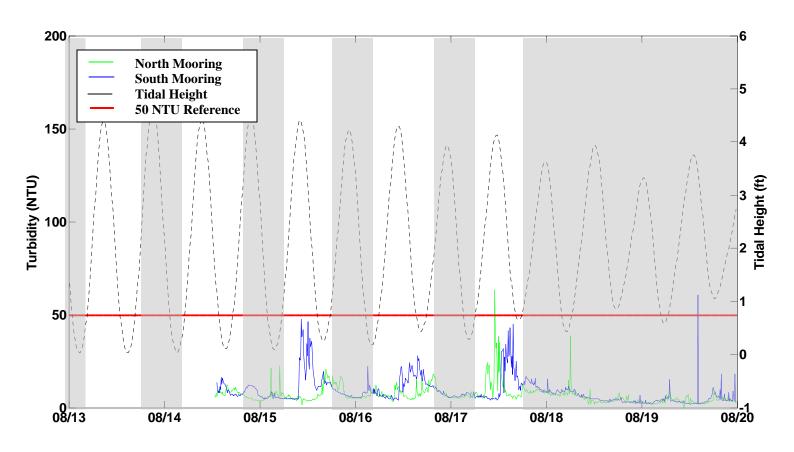
Tidal Stage	Date	Time	Time Zone	Tidal Height
High Tide:	9/19/2007	14:10	EDT	3.5
Low Tide:	9/19/2007	19:28	EDT	1.2
High Tide:	9/20/2007	2:42	EDT	2.8
Low Tide:	9/20/2007	7:29	EDT	1
High Tide:	9/20/2007	15:13	EDT	3.5
Low Tide:	9/20/2007	20:40	EDT	1.1
High Tide:	9/21/2007	3:47	EDT	2.9
Low Tide:	9/21/2007	8:42	EDT	1
High Tide:	9/21/2007	16:14	EDT	3.7
Low Tide:	9/21/2007	21:56	EDT	0.9
High Tide:	9/22/2007	4:45	EDT	3.2
Low Tide:	9/22/2007	9:59	EDT	0.8
High Tide:	9/22/2007	17:09	EDT	3.9
Low Tide:	9/22/2007	23:00	EDT	0.6
High Tide:	9/23/2007	5:37	EDT	3.7
Low Tide:	9/23/2007	11:09	EDT	0.4
High Tide:	9/23/2007	17:59	EDT	4.2
Low Tide:	9/23/2007	23:51	EDT	0.2
High Tide:	9/24/2007	6:25	EDT	4.2
Low Tide:	9/24/2007	12:08	EDT	0.1
High Tide:	9/24/2007	18:47	EDT	4.5
Low Tide:	9/25/2007	0:37	EDT	-0.1
High Tide:	9/25/2007	7:11	EDT	4.6
Low Tide:	9/25/2007	13:00	EDT	-0.3
High Tide:	9/25/2007	19:33	EDT	4.7
Low Tide:	9/26/2007	1:20	EDT	-0.5
High Tide:	9/26/2007	7:56	EDT	5
Low Tide:	9/26/2007	13:49	EDT	-0.6
High Tide:	9/26/2007	20:18	EDT	4.8
Low Tide:	9/27/2007	2:03	EDT	-0.7
High Tide:	9/27/2007	8:42	EDT	5.3
Low Tide:	9/27/2007	14:37	EDT	-0.7
High Tide:	9/27/2007	21:05	EDT	4.8
Low Tide:	9/28/2007	2:47	EDT	-0.8
High Tide:	9/28/2007	9:29	EDT	5.4
Low Tide:	9/28/2007	15:26	EDT	-0.7
High Tide:	9/28/2007	21:52	EDT	4.6
Low Tide:	9/29/2007	3:31	EDT	-0.7
High Tide:	9/29/2007	10:18	EDT	5.3
Low Tide:	9/29/2007	16:15	EDT	-0.5
High Tide:	9/29/2007	22:42	EDT	4.3
Low Tide:	9/30/2007	4:17	EDT	-0.5
High Tide:	9/30/2007	11:10	EDT	5.1

Tidal Stage	Date	Time	Time Zone	Tidal Height
Low Tide:	9/30/2007	17:08	EDT	-0.2
High Tide:	9/30/2007	23:35	EDT	4
Low Tide:	10/1/2007	5:06	EDT	-0.2
High Tide:	10/1/2007	12:06	EDT	4.8
Low Tide:	10/1/2007	18:06	EDT	0.2
High Tide:	10/2/2007	0:34	EDT	3.6
Low Tide:	10/2/2007	6:01	EDT	0.2
High Tide:	10/2/2007	13:08	EDT	4.5
Low Tide:	10/2/2007	19:16	EDT	0.5
High Tide:	10/3/2007	1:39	EDT	3.4
Low Tide:	10/3/2007	7:07	EDT	0.5
High Tide:	10/3/2007	14:14	EDT	4.2
Low Tide:	10/3/2007	20:47	EDT	0.7
High Tide:	10/4/2007	2:48	EDT	3.3
Low Tide:	10/4/2007	8:36	EDT	0.7
High Tide:	10/4/2007	15:21	EDT	4
Low Tide:	10/4/2007	22:18	EDT	0.7
High Tide:	10/5/2007	3:54	EDT	3.4
Low Tide:	10/5/2007	10:19	EDT	0.7
High Tide:	10/5/2007	16:24	EDT	4
Low Tide:	10/5/2007	23:21	EDT	0.6
High Tide:	10/6/2007	4:53	EDT	3.6
Low Tide:	10/6/2007	11:31	EDT	0.5
High Tide:	10/6/2007	17:20	EDT	4
Low Tide:	10/7/2007	0:07	EDT	0.5
High Tide:	10/7/2007	5:45	EDT	3.9
Low Tide:	10/7/2007	12:22	EDT	0.4
High Tide:	10/7/2007	18:09	EDT	4.1
Low Tide:	10/8/2007	0:42	EDT	0.3
High Tide:	10/8/2007	6:30	EDT	4.2
Low Tide:	10/8/2007	13:03	EDT	0.2
High Tide:	10/8/2007	18:52	EDT	4.1
Low Tide:	10/9/2007	1:10	EDT	0.2
High Tide:	10/9/2007	7:12	EDT	4.4
Low Tide:	10/9/2007	13:35	EDT	0.1
High Tide:	10/9/2007	19:32	EDT	4.1

Appendix B

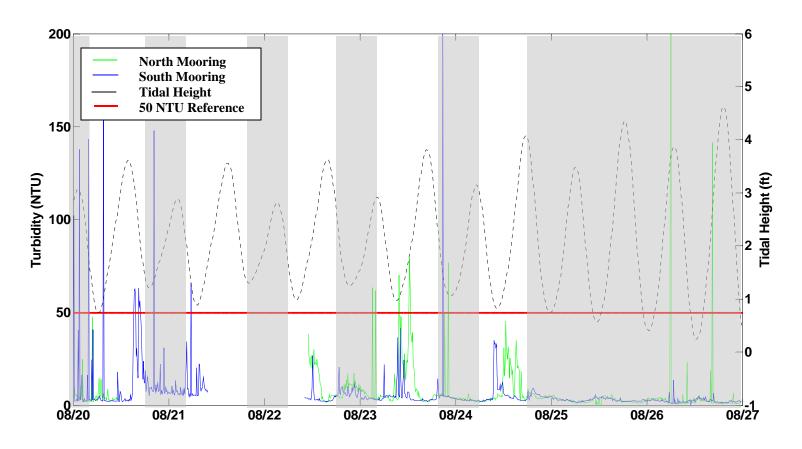
Continuous In Situ Water Quality Data





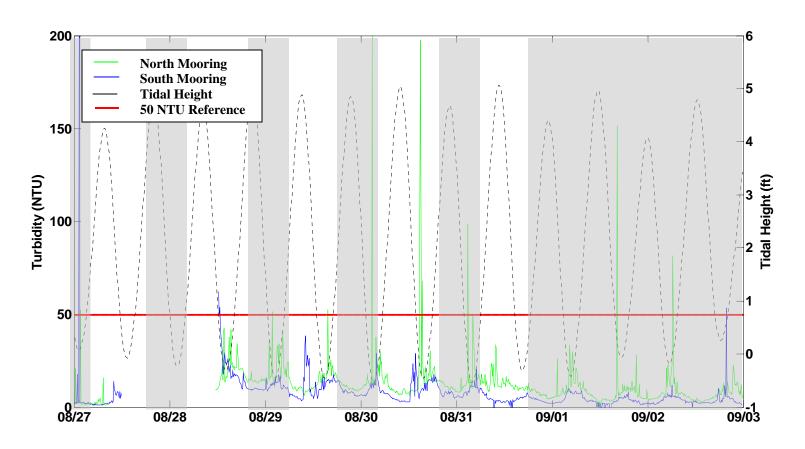
^{*}Shaded areas represent nights and weekends.

Figure B-1. Turbidity Monitoring at New Bedford Harbor Superfund Site 8/13/2007 to 8/20/2007.



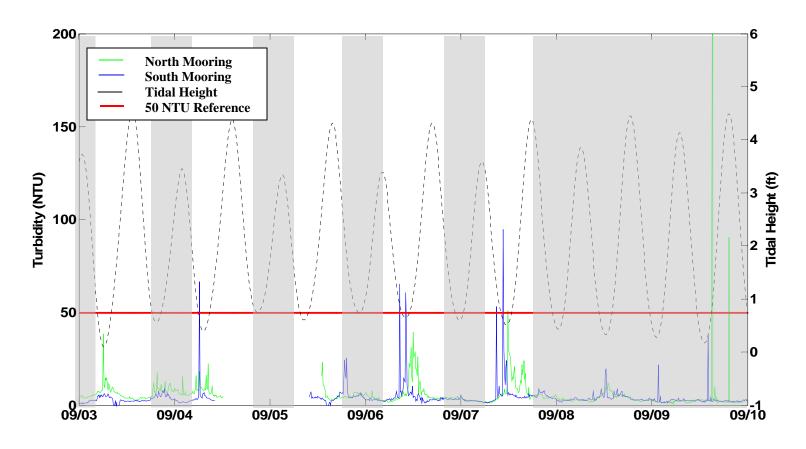
^{*}Shaded areas represent nights and weekends.

Figure B-2. Turbidity Monitoring at New Bedford Harbor Superfund Site 8/20/2007 to 8/27/2007.



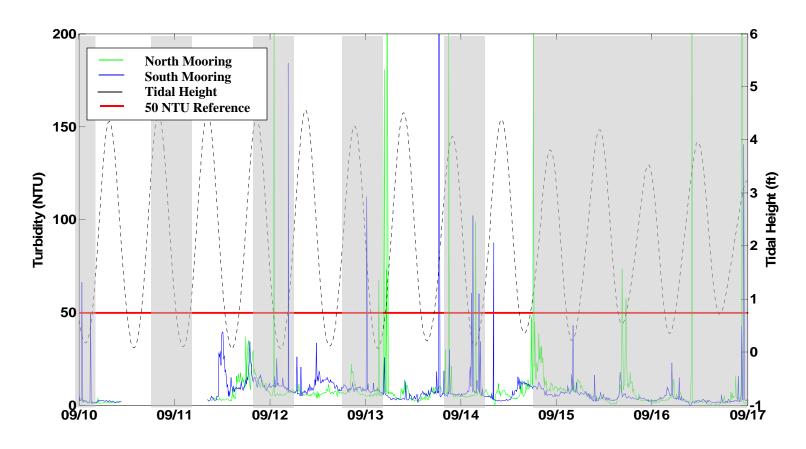
^{*}Shaded areas represent nights and weekends.

Figure B-3. Turbidity Monitoring at New Bedford Harbor Superfund Site 8/27/2007 to 9/3/2007.



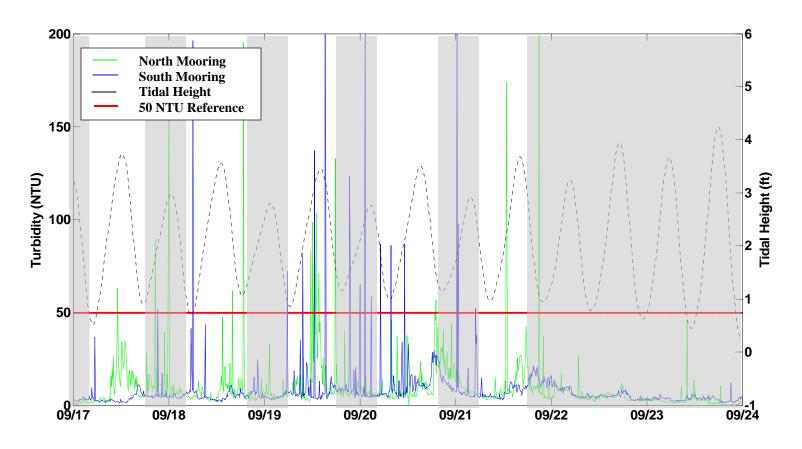
^{*}Shaded areas represent nights and weekends.

Figure B-4. Turbidity Monitoring at New Bedford Harbor Superfund Site 9/3/2007 to 9/10/2007.



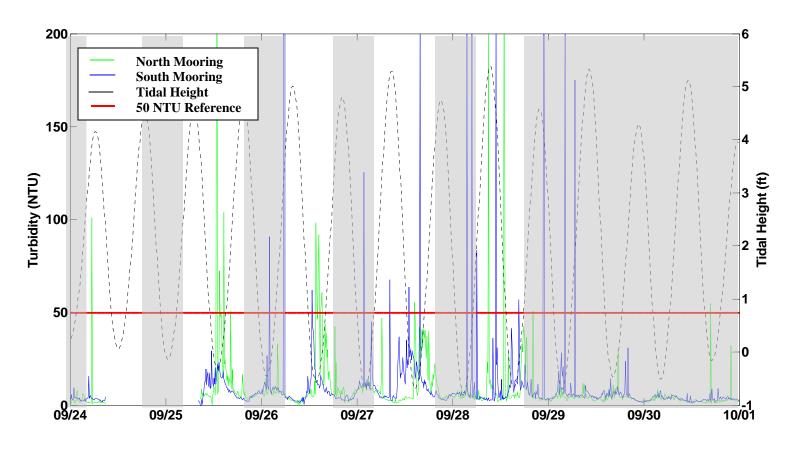
^{*}Shaded areas represent nights and weekends.

Figure B-5. Turbidity Monitoring at New Bedford Harbor Superfund Site 9/10/2007 to 9/17/2007.



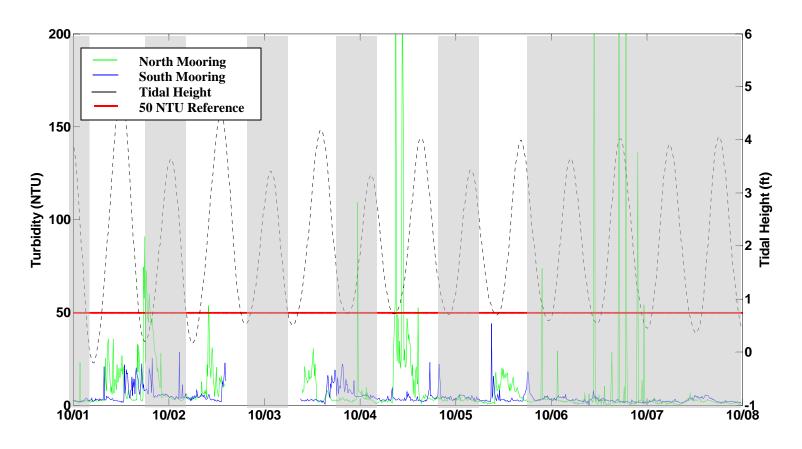
^{*}Shaded areas represent nights and weekends.

Figure B-6. Turbidity Monitoring at New Bedford Harbor Superfund Site 9/17/2007 to 9/24/2007.



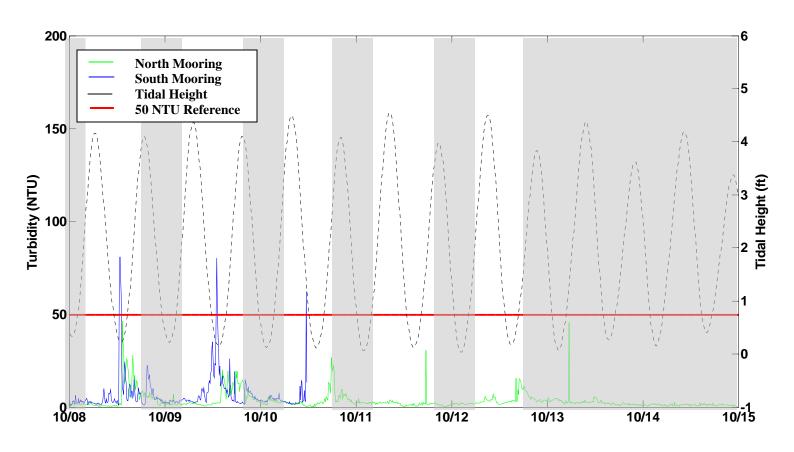
^{*}Shaded areas represent nights and weekends.

Figure B-7. Turbidity Monitoring at New Bedford Harbor Superfund Site 9/24/2007 to 10/1/2007.



^{*}Shaded areas represent nights and weekends.

Figure B-8. Turbidity Monitoring at New Bedford Harbor Superfund Site 10/1/2007 to 10/8/2007.



^{*}Shaded areas represent nights and weekends.

Figure B-9. Turbidity Monitoring at New Bedford Harbor Superfund Site 10/8/2007 to 10/15/2007.



Appendix C Total and Dissolved PCB Analytical Data



APPENDIX C

Individual Congener and Sum of Congeners Results

Station ID	Station ID	MIDREF0	80907		MIDREFO	80907		13NTU08	13NTU080907				13NTU080907			
Collected	Collected	8/9/2007					8/9/2007		8/9/2007				8/9/2007			
Fraction	Fraction	TOTAL			DISS			TOTAL			DISS					
QC Code	QC Code	SA			SA			SA			SA					
Sample ID	Sample ID	WQ-TPC-001-080907		WQ-DPC	-001-08	80907	WQ-TPC	WQ-TPC-002-080907			WQ-DPC-002-080907					
Param Name	Param Code	Result	Unit	Final Q	Result	Unit	Final Q	Result	Unit	Final Q	Result	Unit	Final Q			
2,4'-Dicb (PCB 8)	34883-43-7	0.0200	UG/L	D	0.0160	UG/L	D	0.0160	UG/L	D	0.0200	UG/L	D			
2,2',5-Tricb (PCB 18)	37680-65-2	0.0250	UG/L	D	0.0180	UG/L	D	0.0230	UG/L	D	0.0220	UG/L	D			
2,4,4'-Tricb (PCB 28)	7012-37-5	0.0220	UG/L	D	0.0100	UG/L	D	0.0270	UG/L	D	0.0130	UG/L	D			
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	0.0080	UG/L	D	0.0730	UG/L		0.0150	UG/L	D	0.0035	UG/L	D			
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	0.0230	UG/L	D	0.0078	UG/L	D	0.0270	UG/L	D	0.0079	UG/L	D			
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	0.0500	UG/L		0.0140	UG/L		0.0049	UG/L	D	0.0170	UG/L				
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	0.0034	UG/L	D	0.0150	UG/L		0.0099	UG/L	D	0.0200	UG/L				
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.0046	UG/L		0.0005	UG/L	U	0.0210	UG/L		0.0005	UG/L	U			
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	0.0480	UG/L		0.0058	UG/L		0.0044	UG/L	D	0.0074	UG/L				
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.0027	UG/L		0.0005	UG/L	U	0.0180	UG/L	р	0.0005	UG/L	U			
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	0.0360	UG/L		0.0017	UG/L		0.0025	UG/L	D	0.0020	UG/L	р			
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	0.0540	UG/L		0.0041	UG/L		0.0055	UG/L	D	0.0046	UG/L				
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.0035	UG/L		0.0005	UG/L	U	0.0240	UG/L	р	0.0005	UG/L	U			
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.0052	UG/L		0.0005	UG/L	U	0.0320	UG/L	р	0.0005	UG/L	U			
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.0064	UG/L		0.0005	UG/L	U	0.0390	UG/L	р	0.0005	UG/L	U			
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.0005	UG/L	U	0.0005	UG/L	U	0.0026	UG/L	р	0.0005	UG/L	U			
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.0005	UG/L	U	0.0005	UG/L	U	0.0034	UG/L	р	0.0005	UG/L	U			
DecaCB (PCB 209)	2051-24-3	0.0005	UG/L	U	0.0005	UG/L	U	0.0005	UG/L	U	0.0005	UG/L	U			
Sum of 18 NOAA Congeners (SUM 18 CONG)		0.31	UG/L		0.17	UG/L		0.28	UG/L		0.12	UG/L				

APPENDIX C

Individual Congener and Sum of Congeners Results

Station ID	Station ID	20NTU080	0907		20NTU08	0907		55NTU08	55NTU080907				55NTU080907			
Collected	Collected	8/9/2007 TOTAL SA WQ-TPC-003-080907			7		8/9/2007		8/9/2007	7 8/9/2007 DISS						
Fraction	Fraction				DISS			TOTAL								
QC Code	QC Code				SA			SA		SA						
Sample ID	Sample ID				WQ-DPC-	-003-08	0907	WQ-TPC	0907	WQ-DPC-004-080907						
Param Name	Param Code	Result	Unit	Final Q	Result	Unit	Final Q	Result	Unit	Final Q	Result	Unit	Final Q			
2,4'-Dicb (PCB 8)	34883-43-7	0.0160	UG/L	D	0.0220	UG/L	D	0.0180	UG/L	D	0.0300	UG/L	D			
2,2',5-Tricb (PCB 18)	37680-65-2	0.0240	UG/L	D	0.0230	UG/L	D	0.0260		D	0.0300		D			
2,4,4'-Tricb (PCB 28)	7012-37-5	0.0250	UG/L	D	0.0140	UG/L	D	0.0310	UG/L	D	0.0170	UG/L	D			
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	0.0130	UG/L	D	0.0038	UG/L	D	0.0160	UG/L	D	0.0050	UG/L	D			
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	0.0250	UG/L	D	0.0087	UG/L	D	0.0280	UG/L	D	0.0096	UG/L	D			
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	0.0044	UG/L	D	0.0180	UG/L		0.0053	UG/L	D	0.0210	UG/L				
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	0.0097	UG/L	D	0.0270	UG/L		0.0140	UG/L	D	0.0310	UG/L				
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.0180	UG/L		0.0005	UG/L	U	0.0460	UG/L	р	0.0005	UG/L	U			
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	0.0044	UG/L	D	0.0099	UG/L		0.0064	UG/L	D	0.0120	UG/L				
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.0170	UG/L	р	0.0005	UG/L	U	0.0440	UG/L	р	0.0005	UG/L	U			
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	0.0019	UG/L	D	0.0035	UG/L		0.0034	UG/L	D	0.0050	UG/L				
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	0.0052	UG/L	D	0.0068	UG/L		0.0072	UG/L	D	0.0100	UG/L				
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.0230	UG/L	р	0.0005	UG/L	U	0.0590	UG/L	р	0.0005	UG/L	U			
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.0310	UG/L	р	0.0005	UG/L	U	0.0005	UG/L	DUH	0.0005	UG/L	U			
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.0330	UG/L	р	0.0005	UG/L	U	0.0005	UG/L	DUH	0.0005	UG/L	U			
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.0022	UG/L	р	0.0005	UG/L	U	0.0076	UG/L	р	0.0005	UG/L	U			
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.0027	UG/L	р	0.0005	UG/L	U	0.0086	UG/L	р	0.0005	UG/L	U			
DecaCB (PCB 209)	2051-24-3	0.0005	UG/L	U	0.0005	UG/L	U	0.0008	UG/L	р	0.0005	UG/L	U			
Sum of 18 NOAA Congeners (SUM 18 CONG)		0.25	UG/L		0.14	UG/L		0.32	UG/L		0.17	UG/L				

APPENDIX C

Individual Congener and Sum of Congeners Results

Station ID	Station ID	WOODRO		WOODR	09110	7	WOODR	091107	7	WOODR091107				
Collected	Collected	9/11/2007			9/11/2007					9/11/2007	9/11/2007			
Fraction	Fraction			DISS			TOTAL			DISS				
QC Code	QC Code			SA			REP			REP				
Sample ID	Sample ID	WQ-TPC-	WQ-TPC-001-091107		WQ-DPC-001-091107			WQ-TPC	WQ-TPC-001-091107-DUP			WQ-DPC-001-091107-DUP		
Param Name	Param Code	Result	Unit	Final Q	Result	Unit	Final Q	Result	Unit	Final Q	Result	Unit	Final Q	
2,4'-Dicb (PCB 8)	34883-43-7	0.3410	UG/L	D	0.2560	UG/L	D	0.2720	UG/L	D	0.2180	UG/L	D	
2,2',5-Tricb (PCB 18)	37680-65-2	0.5150	UG/L	D	0.3370	UG/L	D	0.4060	UG/L	D	0.2940	UG/L	D	
2,4,4'-Tricb (PCB 28)	7012-37-5	0.3550	UG/L	D	0.1890	UG/L	D	0.2810	UG/L	D	0.1520	UG/L	D	
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	0.1270	UG/L	D	0.0480	UG/L		0.0930	UG/L	D	0.0510	UG/L		
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	0.4380	UG/L	D	0.1830	UG/L	D	0.3400	UG/L	D	0.1600	UG/L	D	
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	0.0270	UG/L		0.0072	UG/L		0.0210	UG/L		0.0074	UG/L		
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	0.0560	UG/L		0.0140	UG/L		0.0440	UG/L		0.0150	UG/L		
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.0020	UG/L		0.0005	UG/L	U	0.0012	UG/L		0.0005	UG/L	U	
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	0.0330	UG/L		0.0072	UG/L		0.0260	UG/L		0.0071	UG/L		
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.0017	UG/L		0.0005	UG/L	U	0.0008	UG/L		0.0005	UG/L	U	
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	0.0270	UG/L		0.0039	UG/L		0.0210	UG/L		0.0038	UG/L		
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	0.0410	UG/L		0.0081	UG/L		0.0310	UG/L		0.0067	UG/L		
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.0016	UG/L		0.0005	UG/L	U	0.0009	UG/L		0.0005	UG/L	U	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.0036	UG/L		0.0005	UG/L	U	0.0022	UG/L		0.0005	UG/L	U	
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.0053	UG/L		0.0005	UG/L	U	0.0037	UG/L		0.0005	UG/L	U	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.0005	UG/L	U	0.0005	UG/L	U	0.0005	UG/L	U	0.0005	UG/L	U	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.0005	UG/L	U	0.0005	UG/L	U	0.0005	UG/L	U	0.0005	UG/L	U	
DecaCB (PCB 209)	2051-24-3	0.0005	UG/L	U	0.0005	UG/L	U	0.0005	UG/L	U	0.0005	UG/L	U	
Sum of 18 NOAA Congeners (SUM 18 CONG)		2	UG/L		1.1	UG/L		1.5	UG/L		0.91	UG/L		

Station ID	Station ID	23NTU09	23NTU091107 23			TU091107 60NTU091107			60NTU091107					
Collected	Collected			9/11/2007		9/11/2007			9/11/2007			9/11/2007		
Fraction	Fraction	TOTAL			DISS		TOTAL	TOTAL			DISS			
QC Code	QC Code	SA			SA	SA		SA	SA			SA		
Sample ID	Sample ID	WQ-TPC	-002-09	1107	WQ-DPC	C-002-09	91107	WQ-TPC	WQ-TPC-003-091107			WQ-DPC-003-091107		
Param Name	Param Code	Result	Unit	Final Q	Result	Unit	Final Q	Result	Unit	Final Q	Result	Unit	Final Q	
2,4'-Dicb (PCB 8)	34883-43-7	0.7210	UG/L	D	0.4350	UG/L	D	2.3070	UG/L	D	0.5420	UG/L	D	
2,2',5-Tricb (PCB 18)	37680-65-2	1.2140	UG/L	D	0.5020	UG/L	D	4.8040	UG/L	D	0.5540	UG/L	D	
2,4,4'-Tricb (PCB 28)	7012-37-5	0.8800	UG/L	D	0.2020	UG/L	D	3.8780	UG/L	D	0.2470	UG/L	D	
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	0.4310	UG/L	D	0.0640	UG/L		1.8580	UG/L	D	0.0730	UG/L		
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	1.8200	UG/L	D	0.2570	UG/L	D	7.9340	UG/L	D	0.2860	UG/L	D	
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	0.0110	UG/L	D	0.0064	UG/L		0.2770	UG/L	D	0.0050	UG/L		
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	0.2290	UG/L	D	0.0150	UG/L		0.8310	UG/L	D	0.0140	UG/L		
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.0140	UG/L		0.0005	UG/L	U	0.0430	UG/L	р	0.0005	UG/L	U	
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	0.0980	UG/L	D	0.0057	UG/L		0.3360	UG/L	D	0.0053	UG/L		
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.0150	UG/L		0.0005	UG/L	U	0.0440	UG/L	р	0.0005	UG/L	U	
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	0.0870	UG/L	D	0.0037	UG/L		0.4040	UG/L	D	0.0033	UG/L		
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	0.2160	UG/L	D	0.0077	UG/L		1.0110	UG/L	D	0.0071	UG/L		
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.0240	UG/L	р	0.0005	UG/L	U	0.0430	UG/L	D	0.0005	UG/L	U	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.0330	UG/L	р	0.0005	UG/L	U	0.1010	UG/L	D	0.0005	UG/L	U	
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.0460	UG/L	р	0.0005	UG/L	U	0.2710	UG/L	D	0.0005	UG/L	U	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.0047	UG/L	р	0.0005	UG/L	U	0.0170	UG/L	р	0.0005	UG/L	U	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.0063	UG/L	р	0.0005	UG/L	U	0.0190	UG/L	р	0.0005	UG/L	U	
DecaCB (PCB 209)	2051-24-3	0.0016	UG/L	р	0.0005	UG/L	U	0.0050	UG/L	р	0.0005	UG/L	U	
Sum of 18 NOAA Congeners (SUM 18 CONG)		5.9	UG/L		1.5	UG/L		24	UG/L		1.7	UG/L		

Station ID	Station ID	50N10030	50N100307 50)7		300N100	300N100307			300N100307			
Collected	Collected			10/3/2007	,	10/3/2007			10/3/2007			10/3/2007			
Fraction	Fraction	TOTAL			DISS	DISS		TOTAL	TOTAL			DISS			
QC Code	QC Code	SA	SA S		SA		SA	SA			SA				
Sample ID	Sample ID	WQ-TPC-	001-100	307	WQ-DPC-	-001-10	0307	WQ-TPC	WQ-TPC-002-100307			WQ-DPC-002-100307			
Param Name	Param Code	Result	Unit	Final Q	Result	Unit	Final Q	Result	Unit	Final Q	Result	Unit	Final Q		
2,4'-Dicb (PCB 8)	34883-43-7	0.6590	UG/L	D	0.2800	UG/L	D	0.2530	UG/L	D	0.2550	UG/L	D		
2,2',5-Tricb (PCB 18)	37680-65-2	1.3910	UG/L	D	0.3720	UG/L	D	0.4610	UG/L	D	0.4100	UG/L	D		
2,4,4'-Tricb (PCB 28)	7012-37-5	1.4920	UG/L	D	0.1850	UG/L	D	0.3660	UG/L	D	0.3110	UG/L	D		
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	0.6520	UG/L	D	0.0420	UG/L	D	0.0920	UG/L	D	0.1220	UG/L	D		
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	1.9500	UG/L	D	0.1670	UG/L	D	0.4550	UG/L	D	0.3440	UG/L	D		
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	0.2340	UG/L	D	0.0052	UG/L	DU	0.0240	UG/L	DU	0.0250	UG/L	D		
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	0.6680	UG/L	D	0.0052	UG/L	DU	0.0650	UG/L	D	0.0840	UG/L	D		
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.0250	UG/L	DU	0.0052	UG/L	DU	0.0240	UG/L	DU	0.0049	UG/L	DU		
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	0.4530	UG/L	D	0.0053	UG/L	DU	0.0250	UG/L	Dp	0.0490	UG/L	D		
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.0250	UG/L	DU	0.0052	UG/L	DU	0.0240	UG/L	DU	0.0049	UG/L	DU		
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	0.2280	UG/L	D	0.0053	UG/L	DU	0.0250	UG/L	DU	0.0230	UG/L	Dp		
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	0.4950	UG/L	D	0.0052	UG/L	DU	0.0240	UG/L	DpJ	0.0560	UG/L	D		
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.0250	UG/L	DU	0.0052	UG/L	DU	0.0240	UG/L	DU	0.0049	UG/L	DU		
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.0250	UG/L	DU	0.0052	UG/L	DU	0.0240	UG/L	DU	0.0049	UG/L	DU		
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.0250	UG/L	DU	0.0052	UG/L	DU	0.0240	UG/L	DU	0.0049	UG/L	DU		
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.0250	UG/L	DU	0.0052	UG/L	DU	0.0240	UG/L	DU	0.0049	UG/L	DU		
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.0250	UG/L	DU	0.0052	UG/L	DU	0.0240	UG/L	DU	0.0049	UG/L	DU		
DecaCB (PCB 209)	2051-24-3	0.0250	UG/L	DU	0.0052	UG/L	DU	0.0240	UG/L	DU	0.0049	UG/L	DU		
Sum of 18 NOAA Congeners (SUM 18 CONG)		8.2	UG/L		1	UG/L		1.7	UG/L		1.7	UG/L			

Station ID	Station ID	300N100	300N100307 3			00307 60			600N100307			600N100307		
Collected	Collected			10/3/2007			10/3/2007		10/3/2007			10/3/2007		
Fraction	Fraction	TOTAL			DISS			TOTAL	TOTAL			DISS		
QC Code	QC Code	REP	REP F			REP			SA			SA		
Sample ID	Sample ID	WQ-TPC	-002-10	0307-DUP	WQ-DPC	-002-10	00307-DUP	WQ-TP	WQ-TPC-003-100307			WQ-DPC-003-100307		
Param Name	Param Code	Result	Unit	Final Q	Result	Unit	Final Q	Result	Unit	Final Q	Result	Unit	Final Q	
2,4'-Dicb (PCB 8)	34883-43-7	0.2440	UG/L	D	0.1730	UG/L	D	0.244	0 UG/L	D	0.1750	UG/L	D	
2,2',5-Tricb (PCB 18)	37680-65-2	0.4860	UG/L	D	0.2550	UG/L	D	0.472	0 UG/L	D	0.2390	UG/L	D	
2,4,4'-Tricb (PCB 28)	7012-37-5	0.4360	UG/L	D	0.1560	UG/L	D	0.386	0 UG/L	D	0.1320	UG/L	D	
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	0.1110	UG/L	D	0.0360	UG/L	D	0.096	0 UG/L	D	0.0260	UG/L	D	
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	0.5040	UG/L	D	0.1300	UG/L	D	0.443	0 UG/L	D	0.1110	UG/L	D	
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	0.0250	UG/L	DU	0.0050	UG/L	UJ	0.024	0 UG/L	DU	0.0049	UG/L	DU	
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	0.0250	UG/L	UJ	0.0050	UG/L	DU	0.062	0 UG/L	D	0.0049	UG/L	DU	
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.0250	UG/L	DU	0.0050	UG/L	DU	0.024	0 UG/L	DU	0.0049	UG/L	DU	
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	0.0370	UG/L	Dp	0.0051	UG/L	DU	0.020	0 UG/L	DpJ	0.0050	UG/L	DU	
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.0250	UG/L	DU	0.0050	UG/L	DU	0.024	0 UG/L	DU	0.0049	UG/L	DU	
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	0.0250	UG/L	DU	0.0051	UG/L	UJ	0.024	0 UG/L	DU	0.0050	UG/L	DU	
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	0.0530	UG/L	Dp	0.0050	UG/L	DU	0.027	0 UG/L	Dp	0.0049	UG/L	DU	
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.0250	UG/L	DU	0.0050	UG/L	DU	0.024	0 UG/L	DU	0.0049	UG/L	DU	
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.0250	UG/L	DU	0.0050	UG/L	DU	0.024	0 UG/L	DU	0.0049	UG/L	DU	
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.0250	UG/L	DU	0.0050	UG/L	DU	0.024	0 UG/L	DU	0.0049	UG/L	DU	
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.0250	UG/L	DU	0.0050	UG/L	DU	0.024	0 UG/L	DU	0.0049	UG/L	DU	
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.0250	UG/L	DU	0.0050	UG/L	DU	0.024	0 UG/L	DU	0.0049	UG/L	DU	
DecaCB (PCB 209)	2051-24-3	0.0250	UG/L	DU	0.0050	UG/L	DU	0.024	0 UG/L	DU	0.0049	UG/L	DU	
Sum of 18 NOAA Congeners (SUM 18 CONG)		1.9	UG/L		0.75	UG/L		1.	8 UG/L		0.68	UG/L		

Station ID	Station ID	EB091107				
Collected	Collected			9/11/2007		
Fraction	Fraction	TOTAL				
QC Code	QC Code	SA				
Sample ID	Sample ID	WQ-TPC	-004-09	91107-EB		
Param Name	Param Code	Result	Unit	Final Q		
2,4'-Dicb (PCB 8)	34883-43-7	0.0039	UG/L			
2,2',5-Tricb (PCB 18)	37680-65-2	0.0056	UG/L			
2,4,4'-Tricb (PCB 28)	7012-37-5	0.0015	UG/L			
2,2',3,5'-Tetracb (PCB 44)	41464-39-5	0.0005	UG/L	U		
2,2',5,5'-Tetracb (PCB 52)	35693-99-3	0.0042	UG/L			
2,3',4,4'-Tetracb (PCB 66)	32598-10-0	0.0005	UG/L	U		
2,2',4,5,5'-Pentacb (PCB 101)	37680-73-2	0.0005	UG/L	U		
2,3,3',4,4'-Pentacb (PCB 105)	32598-14-4	0.0005	UG/L	U		
2,3',4,4',5-Pentacb (PCB 118)	31508-00-6	0.0005	UG/L	U		
2,2',3,3',4,4'-Hexacb (PCB 128)	38380-07-3	0.0005	UG/L	U		
2,2',3,4,4',5'-Hexacb (PCB 138)	35065-28-2	0.0005	UG/L	U		
2,2',4,4',5,5'-Hexacb (PCB 153)	35065-27-1	0.0005	UG/L	U		
2,2',3,3',4,4',5-Heptacb (PCB 170)	35065-30-6	0.0005	UG/L	U		
2,2',3,4,4',5,5'-Heptacb (PCB 180)	35065-29-3	0.0005	UG/L	U		
2,2',3,4',5,5',6-Heptacb (PCB 187)	52663-68-0	0.0005	UG/L	U		
2,2',3,3',4,4',5,6-Octacb (PCB 195)	52663-78-2	0.0005	UG/L	U		
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	40186-72-9	0.0005	UG/L	U		
DecaCB (PCB 209)	2051-24-3	0.0005	UG/L	U		
Sum of 18 NOAA Congeners (SUM 18 CONG)		0.015				

PCB Data Qualifiers

Qualifiers:

D	Dilution run. Initial run outside linear range of instrument
J	Analyte detected below the sample specific reporting limit
p	The relative percent difference (RPD) between the values obtained from the dual columns is >40%.
U	Analyte not detected at 3:1 signal:noise ratio. Reporting limit is reported.

Appendix D Toxicity Analytical Data



Biomonitoring of Surface Water Samples New Bedford Harbor New Bedford, Massachusetts

Fall 2007

Prepared for

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Prepared by

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August-October 2007 Reference Number: Battele16150,16234,16391

Biomonitoring of Surface Water Samples New Bedford Harbor, New Bedford, Massachusetts

Fall 2007

1.0 INTRODUCTION

This report provides a summarization of data generated from a series of acute and chronic exposure screening assays evaluating surface water samples collected from New Bedford Harbor. Toxicity tests were conducted on grab surface water samples collected from the specified areas in the harbor. Assay design included a laboratory control treatment and one or more surface water samples. Samples were evaluated "As Received" without dilutions. Assays were conducted based on water quality levels in the vicinity of dredging operations. Samples were collected by Battelle personnel from the Duxbury, Massachusetts office. Testing was based on programs and protocols developed by the US EPA (2002) and included the following assays; modified 2 day acute and 7 day chronic assays conducted with the mysid shrimp, *Americamysis bahia*, and the red macro alga, *Champia parvula*, and 60 minute chronic fertilization assays conducted with the purple sea urchin, *Arbacia punctulata*. All mysid and urchin fertilization assays and a portion of the algal assays were conducted by ESI at its Hampton, New Hampshire facility. Additionally, the algal assays were conducted by the Saskatchewan Research Council, SRC, Saskatoon, Saskatchewan, Canada.

2.0 MATERIALS AND METHODS

2.1 General Methods

Toxicological and analytical protocols used in this program followed procedures primarily designed by the EPA to provide standard approaches for the evaluation of toxicological effects of discharges on aquatic organisms, and for the analysis of water samples.

2.2 Test Species

A. bahia, \le 5 days, were obtained from cultures maintained by Aquatic Research Organisms (ARO), Hampton, New Hampshire. Juvenile shrimp were collected daily, isolated, and placed in a rearing tank for up to 6 days. Holding tanks were maintained in a flow-through culture mode at a temperature of 25 \pm 2°C. At the start of the assays the mysids were 7 days old. Juveniles were fed \le 24 hour old brine shrimp on a daily basis. Water temperature, salinity, and pH were monitored on a daily basis. Prior to testing, organisms were siphoned from the rearing tanks to a holding vessel, and then transferred to test chambers using a large bore pipet, minimizing the amount of water added to test solutions.

A. punctulata adults were from cultures maintained by ESI. Original stock was obtained from commercial supply. Male and female urchins are maintained in separate chambers as recommended by protocol (EPA 2002) and ESI. Adult urchins were induced to spawn by the injection of a potassium chloride solution. The viability of gametes obtained was determined prior to their addition to the test solutions. Eggs and/or sperm that would not result in a fertilized egg were rejected from the pool of gametes used in the assay.

C. parvula biomass was obtained from stock cultures maintained by the Saskatchewan Research Council. Original stocks were obtained from the University of Texas algal collection. The male and female plants are maintained in separate culture vessels under sterile conditions. Algal cultures were maintained on an orbital shaker (100 rpm) at 23±2°C under 16 hour light: 8 hours dark at 40 to 75 foot candles light intensity. Cultures are "cropped" and transferred to fresh nutrient solutions on a weekly basis.

2.3 Surface Water Samples and Laboratory Control Water

Grab surface water samples were collected by Battelle staff on three occasions in the Harbor, Table 1. Samples were placed in polyethylene cubitainers for shipment to the laboratory. Two, 2.5 gallon cubitainers were collected for each of the chronic assays. Prior to testing, samples were evaluated to document salinity, conductivity, and total residual chlorine. Total residual chlorine was measured by amperometric titration (MDL

0.05 mg/L). Prior to use in the assays, the salinity of the samples was adjusted, if necessary, to predetermined levels using artificial sea salts for *A. bahia* and *A. punctulata* assays, and GP-2 salts (EPA 2002) for the *C. parvula* assays. The salinity of samples for the *A. bahia* acute and chronic exposure assays were adjusted to 25±2‰ while samples used for the *A. punctulata* and *C. parvula* assays were adjusted to 30±2‰. Samples with "as received" salinity above these levels were not adjusted.

Laboratory control water used for mysid and sea urchin assays was collected from the Hampton/Seabrook Estuary. This water is classified as SA-1 and has been used to culture marine test organisms since 1981. The laboratory control water used in the algal assay, collected from Rye, New Hampshire, is the same water used in culture maintenance. Prior to use, seawater used in the algal assays was filtered through glass fiber filters and sterilized. Dilution water used in the algal assays conducted by SRC was natural seawater collected from the West Coast of Canada. Salinity of the surface water samples was adjusted using commercial sea salts.

2.4 Bioassays

2.4.1 Americamysis bahia Modified Acute and Chronic Exposure Bioassays

Modified acute and chronic exposure screening assays were conducted in a static renewal test mode with renewals made at 24-hour intervals. The 7 day assays were conducted at a temperature of 26±1°C with a photoperiod of 16:8 hours light:dark. Mysids were maintained in 250 mL beakers containing 150 mL of test solution. Approximately 100 mL of the test solution were replaced each day. The assay incorporated 8 replicates with 5 organisms/replicate. Survival and dissolved oxygen were measured daily in each replicate prior to test solution renewal. Salinity, temperature and pH were recorded in a composite sample of the "old" test solution and in the "new" test solution prior to being added to the test chamber. Incubator temperatures were also recorded on a daily basis.

During the test, mysids were fed \leq 24 hour old *Artemia* nauplii. On Day 7 of the assay, surviving mysids were removed from test solutions, rinsed to remove any surface detritus and salts, and transferred to tared foils and dried for 24 hours at 103°C. Foils were weighed to the nearest 0.01 mg. Mean dry weights per individual were obtained by dividing the net dry weight of all surviving organisms by the number of organisms added at the start of the assay.

2.4.2 Arbacia punctulata Chronic Exposure Fertilization Assays

Gametes were obtained by potassium chloride injection to induce spawning. Sperm were collected dry, diluted to achieve a concentration of approximately 5.0 x 10⁷ sperm/mL in the surface water treatments. Actual sperm concentrations are provided on laboratory bench sheets in Appendix A. Sperm solutions were added to 5 mL aliquots of each sample being evaluated and allowed to remain in the test solutions for 60 minutes before the addition of unfertilized eggs. Each treatment incorporated a total of four (4) replicates. After 20 minutes exposure, the assay was terminated by the addition of 0.2 mL of preservative. Aliquots of preserved solution were counted to determine numbers of fertilized and unfertilized eggs. Fertilization was accepted based on the presence or absence of a fertilization membrane around the egg.

2.4.3 Champia parvula Modified Acute and Chronic Exposure Assays

The 7 day red algae assay was conducted with a 2 day exposure period to the surface waters and laboratory control treatments. Each treatment used four replicates with five female branches and one male branch per replicate. Temperature was maintained at 23±1°C. The light source was cool white and fluorescent bulbs set on a 16:8 hours light:dark cycle, with a light intensity of 40 to 75 foot candles. Light intensity was checked at the start of each assay. Temperatures were monitored on a daily basis. Test chambers were 200 mL borosilicate glass fleakers. After 2 days exposure, female branch tips were transferred to approximately 100 mL of recovery medium with added nutrients and allowed to recover and mature for 5 days. During transfer, plants were examined to determine the physical condition of the individual branches. Branches showing signs of degeneration were noted and used to establish an acute endpoint. After the recovery period, the number of cystocarps (reproductive bodies) on each female branch were counted.

2.5 Data Analysis

Statistical analysis of acute and chronic exposure data was completed using CETIS, Comprehensive Environmental Toxicity Testing System, software. The program computes acute and chronic exposure endpoints based on EPA decision tree guidelines specified in individual test methods. For chronic exposure endpoints statistical significance was accepted at \approx <0.05.

2.6 Quality Control

As part of the laboratory quality control program, standard reference toxicant assays are conducted on a regular basis for each test species. These results, summarized in Table 7, provide relative health and response data while allowing for comparison with historic data sets.

2.7 Protocol Deviations and Unacceptable Assays

Review of data collected from the three sets of assays conducted during the monitoring period documented no protocol deviations.

3.0 RESULTS SUMMARY

Table 2 provides a summary of test acceptability for the three rounds of assays conducted during this monitoring period. Tables 3-5 provide summaries of survival, growth, development and reproduction endpoints and associated statistical analyses. Table 6 provides a summary of basic water quality data associated with the assays. Support data, including laboratory bench sheets, are provided in Appendix A.

4.0 REFERENCES

APHA. 1998. Standard Methods for the Examination of Water and Wastewater, 20th edition. Washington D.C.

US EPA. 2002. Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms. Fourth Edition. EPA-821-R-02-012.

US EPA. 2002. Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. EPA-821-R-02-013.

Table 1. Summary of Sample Collection Data. New Bedford Harbor Surface Water Monitoring Program. Fall 2007.

Sample ID	Lab Code	Collec	Collected		ived	Temperature °C
WQ-TOX-001-080907	16150-001	08/09/07	0840	08/09/07	1455	6
WQ-TOX-002-080907	16150-002	08/09/07	0915	08/09/07	1455	6
WQ-TOX-003-080907	16150-003	08/09/07	0930	08/09/07	1455	6
WQ-TOX-004-080907	16150-004	08/09/07	1005	08/09/07	1455	6
WQ-TOX-001-091107	16234-001	09/11/07	0901	09/11/07	1600	5
WQ-TOX-002-091107	16234-002	09/11/07	0945	09/11/07	1600	5
WQ-TOX-003-091107	16234-003	09/11/07	1015	09/11/07	1600	5
WQ-TOX-001-100307	16391-001	10/03/07	1100	10/03/07	1432	6
WQ-TOX-001-100307 WQ-TOX-002-100307	16391-002	10/03/07	1150	10/03/07	1432	6
WQ-TOX-002-100307 WQ-TOX-003-100307	16391-003	10/03/07	1228	10/03/07	1432	6
119 197 000 100001	10001 000	10/00/01	.220	10,00,01	. 702	0

Table 2. Summary of Assay Acceptability. New Bedford Harbor Surface Water Monitoring Program. Fall 2007.

	American	nysis bahia	Champia	parvula	Arbacia punctulata	
Lab Code	Acute Exposure	Chronic Exposure	Acute Exposure	Chronic Exposure	Chronic Exposure	
16150-001	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	
16150-002	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	
16150-003	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	
16150-004	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	
16234-001	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	
16234-002	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	
16234-003	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	
16391-001	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	
16391-002	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	
16391-003	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	

Table 3. Endpoint Summary Table - New Bedford Harbor Water Quality Monitoring August 09, 2007 Sampling Event. New Bedford Harbor Surface Water Monitoring Program. Fall 2007.

Sample ID	Reps	Mean	Min	Max	CV	Significant Difference vs					
						p Value	Lab	p Value	Ref		
Arbacia punctulata			Portion F	ertilized							
Lab Control		96.9%	95.2%	98.1%	1.45%	-	-	_	-		
TOX-001-080907		97.3%	96.2%	98.1%	0.93%	0.6832	NO	-	-		
TOX-002-080907	4	96.7%	95.2%	99.0%	1.69%	0.4592	NO	0.3084	NO		
TOX-003-080907		97.8%	97.1%	98.1%	0.49%	0.8642	NO	0.7947	NO		
TOX-004-080907		95.0%	90.1%	100.0%	4.67%	0.3293	NO	0.2616	NO		
Americamysis bahia)										
, , , , , , , , , , , , , , , , , , , ,			Day 2 S	urvival							
Lab Control		92.5%	60.0%	100.0%	16.09%	-	-	-	-		
TOX-001-080907		97.5%	80.0%	100.0%	7.25%	0.6395	NO	-	-		
TOX-002-080907	8	97.5%	80.0%	100.0%	7.25%	0.6395	NO	0.4796	NO		
TOX-003-080907		97.5%	80.0%	100.0%	7.25%	0.6395	NO	0.4796	NO		
TOX-004-080907		97.5%	80.0%	100.0%	7.25%	0.6395	NO	0.4796	NO		
			D 70								
Lab Control		02.50/	Day 7 S		16.000/						
Lab Control		92.5%	60.0%	100.0% 100.0%	16.09%	0.6205	- NO	-	-		
TOX-001-080907 TOX-002-080907	8	97.5% 97.5%	80.0% 80.0%	100.0%	7.25% 7.25%	0.6395 0.6395	NO NO	0.4796	- NO		
TOX-002-080907	0	95.0%	80.0%	100.0%	9.75%	0.5204	NO	0.4790	NO		
TOX-003-080907		95.0%	80.0%	100.0%	9.75%	0.5204	NO	0.3605	NO		
10/100100007		00.070	00.070	100.070	0.7070	0.0201	110	0.0000	110		
		Day 7	Dry Weigh	nt Biomass	s - mg						
Lab Control		0.350	0.138	0.448	30.72%	-	-	-	-		
TOX-001-080907		0.473	0.330	0.660		0.9753	NO	-	-		
TOX-002-080907	8	0.423	0.314	0.610		0.9195	NO	0.1789	NO		
TOX-003-080907	Ü	0.436	0.274	0.536	18.13%	0.9550	NO	0.2403	NO		
TOX-004-080907		0.372	0.328	0.402	7.19%	0.6998	NO	0.0267	YES		
Champia parvula											
			Day 2 S	urvival							
Lab Control		100.0%	100.0%	100.0%	0.00%	-	-	-	-		
TOX-001-080907		100.0%	100.0%	100.0%	0.00%	0.4796	NO	-	-		
TOX-002-080907	4	100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO		
TOX-003-080907		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO		
TOX-004-080907		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO		
		Da	y 7 Mean #	# Cystocar	ps						
Lab Control		38.55	29.6	43.2	16.18%	-	-	_	-		
TOX-001-080907		34.15	26.6	42.8	24.46%	0.2155	NO	_	-		
TOX-002-080907	4	19.5	13.6	24.4	24.29%	0.0014	YES	0.0112	YES		
TOX-003-080907		40.35	33.8	46.6	16.32%	0.6474	NO	0.8561	NO		
TOX-004-080907		24.35	10.4	36.2	43.79%	0.0306	YES	0.0990	NO		

Table 4. Endpoint Summary Table - New Bedford Harbor Water Quality Monitoring September 11, 2007 Sampling Event. New Bedford Harbor Surface Water Monitoring Program. Fall 2007.

Sample ID	Reps	s Mean Min Max CV				Significant Difference vs					
						p Value	Lab	p Value	Ref		
Arbacia punctulata			Portion F	ertilized							
Lab Control		86.3%	78.0%	92.0%	7.19%	_	_	_	_		
TOX-001-091107		92.7%	90.0%	97.2%	2.08%	0.9592	NO	_	_		
TOX-002-091107	4	94.1%	91.7%	96.2%	2.46%	0.9789	NO	0.8224	NO		
TOX-003-091107		84.8%	79.2%	90.0%	6.23%	0.3130	NO	0.0098	YES		
					0.2070				•		
Americamysis bahia	a										
•			Day 2 S	Survival							
Lab Control		100.0%	100.0%	100.0%	0.00%	-	-	-	-		
TOX-001-091107	0	100.0%	100.0%	100.0%	0.00%	0.4796	NO	-	-		
TOX-002-091107	8	100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO		
TOX-003-091107		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO		
			Day 7 S	Survival							
Lab Control		100.0%	100.0%	100.0%	0.00%	-	-	-	-		
TOX-001-091107	8	98.8%	90.0%	100.0%	3.58%	0.3605	NO	-	-		
TOX-002-091107	0	98.8%	90.0%	100.0%	3.58%	0.3605	NO	0.4796	NO		
TOX-003-091107		45.0%	30.0%	70.0%	35.63%	0.0001	YES	0.0001	YES		
			Dry Weigh		-						
Lab Control		0.278	0.249	0.293		-	-	-	-		
TOX-001-091107		0.322	0.291	0.356		0.9999	NO	-	-		
TOX-002-091107	8	0.283	0.241	0.312		0.6718	NO	0.0021	YES		
TOX-003-091107		0.090	0.040	0.150	37.10%	0.0000	YES	0.0000	YES		
Champia parvula											
Lab Octob		400.00/	Day 2 S		0.000/						
Lab Control		100.0%	100.0%	100.0%	0.00%	- 4700	-	-	-		
TOX-001-091107	4	100.0%	100.0%	100.0%	0.00%	0.4796	NO	- 4700	-		
TOX-002-091107		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO		
TOX-003-091107		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO		
		Da	y 7 Mean #	t Cyctoca	rne						
Lab Control		19.00	15.0	22.6	17.45%	_	_	_	_		
TOX-001-091107		20.80	17.4	24.4	13.80%	0.7785	NO	_	_		
TOX-001-091107	4	27.35	23.6	29.4	9.39%	0.7763	NO	0.9928	NO		
TOX-002-091107 TOX-003-091107	7	5.45	1.6	8.2	51.58%	0.0004	YES	0.9928	YES		
10/1000-031107		0.40	1.0	0.2	01.0070	0.0004	120	0.0001	120		
						I		I			

Table 5. Endpoint Summary Table - New Bedford Harbor Water Quality Monitoring October 13, 2007 Sampling Event. New Bedford Harbor Surface Water Monitoring Program. Fall 2007.

Sample ID	Reps	s Mean Min Max CV				Sigi	nificant D	Difference v	/S
						p Value	Lab	p Value	Ref
Arbacia punctulata			Portion F	ertilized					
Lab Control		93.2%	88.5%	100.0%	5.53%	_	_	_	_
TOX-003-100307		95.5%	92.6%	98.0%	2.35%	0.6532	NO	_	_
TOX-002-100307	4	92.3%	90.0%	95.0%	2.40%	0.2961	NO	0.0464	YES
TOX-001-100307		94.7%	88.9%	100.0%	5.04%	0.6240	NO	0.5019	NO
10/1001		0 111 70	00.070	1001070	0.0170	0.02.10		0.0010	
Americamysis bahia									
•			Day 2 S	Survival					
Lab Control		97.5%	80.0%	100.0%	7.25%	-	-	-	-
TOX-003-100307	0	100.0%	100.0%	100.0%	0.00%	0.6395	NO	-	-
TOX-002-100307	8	100.0%	100.0%	100.0%	0.00%	0.6395	NO	0.4796	NO
TOX-001-100307		100.0%	100.0%	100.0%	0.00%	0.6395	NO	0.4796	NO
			Day 7 S	Survival					
Lab Control		97.5%	80.0%	100.0%	7.25%	-	-	-	-
TOX-003-100307	8	100.0%	100.0%	100.0%	0.00%	0.6395	NO	-	-
TOX-002-100307	0	97.5%	80.0%	100.0%	7.25%	0.4796	NO	0.3605	NO
TOX-001-100307		100.0%	100.0%	100.0%	0.00%	0.6395	NO	0.4796	NO
		-	Dry Weigh		•				
Lab Control		0.352	0.214		17.53%	-	-	-	-
TOX-003-100307		0.415	0.348	0.456	8.47%	0.9875	NO	-	-
TOX-002-100307	8	0.431	0.360	0.514		0.4796	NO	0.7666	NO
TOX-001-100307		0.580	0.516	0.664	8.29%	1.0000	NO	1.0000	NO
Champia parvula			D 0 0	N					
Lab Control		100.00/	Day 2 S		0.000/				
Lab Control		100.0%	100.0%	100.0%	0.00%	0.4700	-	_	-
TOX-003-100307	4	100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4700	-
TOX-002-100307 TOX-001-100307		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO NO
107-001-100307		100.0%	100.0%	100.0%	0.00%	0.4796	NO	0.4796	NO
		Da	y 7 Mean #	+ Cystoca	rne				
Lab Control		16.55	y 7 Mean <i>+</i> 12.40	# Cysloca 19.40	18.10%	_	_	_	_
TOX-003-100307		11.40	8.00	17.80	38.41%	0.0501	NO	_	_
TOX-003-100307	4	9.65	6.60	12.60	27.04%	0.0066	YES	0.2590	NO
TOX-002-100307	7	0.00	0.00	0.00	0.00%	0.0000	YES	0.2330	YES
10/1001 100007		0.00	0.00	5.00	0.0070	0.0000	. 20	0.0010	0
						I		1	

Table 6. Summary of "As Received" Sample Physical and Chemical Characteristics. New Bedford Harbor Surface Water Monitoring Program. Fall 2007.

Sample ID	Lab Code	Ammonia (mg/L)	pH (SU)	Salinity (‰)	Specific Conductance (µmhos/cm)	Total Residual Chlorine (mg/L)
WQ-TOX-001-080907	16150-001	<0.1	7.36	30	44910	<0.05
WQ-TOX-002-080907	16150-002	<0.1	7.26	30	45100	<0.05
WQ-TOX-003-080907	16150-003	<0.1	7.38	30	45260	<0.05
WQ-TOX-004-080907	16150-004	<0.1	7.39	30	44960	<0.05
WQ-TOX-001-091107	16234-001	<0.1	6.96	31	45540	<0.05
WQ-TOX-002-091107	16234-002	<0.1	6.99	31	47230	<0.05
WQ-TOX-003-091107	16234-003	<0.1	6.99	31	47740	<0.05
WQ-TOX-001-100307	16391-001	0.16	7.51	31	41300	<0.05
WQ-TOX-002-100307	16391-002	0.12	7.66	30	41200	<0.05
WQ-TOX-003-100307	16391-003	<0.1	7.72	31	41200	<0.05

Table 7. Reference Toxicant Summary. New Bedford Harbor Surface Water Monitoring Program. Fall 2007.

Date	Endŗ	ooint	Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
A. bahia						
08/08/07	Survival	LC-50	19.4	21.2	16.4 - 26.0	SDS (mg/L)
09/04/07	Survival	LC-50	25.1	21.2	6.26 - 26.18	SDS (mg/L)
10/02/07	Survival	LC-50	17.2	21.0	15.8 - 26.3	SDS (mg/L)
08/08/07	Survival	C-NOEC	15.0	15.0	10.0 - 25.0	SDS (mg/L)
08/08/07	Growth	C-NOEC	15.0	10.0	5.0 - 15.0	SDS (mg/L)
A. Punctula	ata					
08/17/07	Fertilization	C-NOEC	40.0	20.0	10.0 - 40.0	Copper (µg/L)
08/17/07	Fertilization	IC-25	80.0	45.0	0.0 - 101.8	Copper (µg/L)
10/04/07	Fertilization	C-NOEC	20.0	20.0	10.0 - 40.0	Copper (µg/L)
10/04/07	Fertilization	IC-25	43.7	45.0	0.0 - 101.8	Copper (µg/L)
08/29/07	Cystocarp	IC-50	0.08	0.12	0.0 - 0.27	SDS (mg/L)
10/17/07	Cystocarp	IC-50	0.06	0.12	0.0 - 0.27	SDS (mg/L)

Mean and Acceptable Ranges based on most recent 20 reference toxicant assays (NELAP standard)

APPENDIX A SUPPORT DATA

Contents	# Pages
Methods Summary	1
Study 16150: Sample Date 08/08/07	
A. bahia Bench Sheets & Statistical Analysis Report	22
A. punctulata Bench Sheets and Statistical Analysis Report	9
C. parvula Bench Sheets and Statistical Analysis Report	9
Water Quality Bench Sheets and Dilution Prep Sheets	5
Study 16234: Sample Date 09/11/07	
A. bahia Bench Sheets & Statistical Analysis Report	17
A. punctulata Bench Sheets and Statistical Analysis Report	8
C. parvula Bench Sheets and Statistical Analysis Report	11
Water Quality Bench Sheets and Dilution Prep Sheets	4
Study 16391: Sample Date 10/03/07	
A. bahia Bench Sheets & Statistical Analysis Report	22
A. punctulata Bench Sheets and Statistical Analysis Report	8
C. parvula Bench Sheets and Statistical Analysis Report	11
Water Quality Bench Sheets and Dilution Prep Sheets	4
"As Received" Ammonia Data Report	1
Sample Receipt Records	3
Chain of Custody	3
Total Appendix Pages	138

METHODS USED IN NPDES PERMIT BIOMONITORING TESTING

Parameter	Method
Acute Exposure Bioassays:	
Ceriodaphnia dubia, Daphnia pulex	EPA-821-R-02-012
Pimephales promelas	EPA-821-R-02-012
Americamysis bahia	EPA-821-R-02-012
Menidia beryllina, Cyprinodon variegatus	EPA-821-R-02-012
Chronic Exposure Bioassays:	
Ceriodaphnia dubia	EPA-821-R-02-013 1002.0
Pimephales promelas	EPA-821-R-02-013 1000.0
Cyprinodon variegatus	EPA-821-R-02-014 1004.0
Menidia beryllina	EPA-821-R-02-014 1006.0
Arbacia punctulata	EPA-821-R-02-014 1008.0
Champia parvula	EPA-821-R-02-014 1009.0
Trace Metals:	
ICP Metals	EPA 200.7/SW 6010
Hardness	Standard Methods 20 th Edition - Method 2340 B
Wet Chemistries:	
Alkalinity	EPA 310.2
Chlorine, Residual	Standard Methods 20 th Edition - Method 4500CLD
Total Organic Carbon	Standard Methods 20th Edition - Method 5310C
Specific Conductance	Standard Methods 20 th Edition - Method 2510B
Nitrogen - Ammonia	Standard Methods 20 th Edition - Method 4500NH3G
рН	Standard Methods 20 th Edition - Method 4500H+B
Solids, Total (TS)	Standard Methods 20 th Edition - Method 2540.B
Solids, Total Suspended (TSS)	Standard Methods 20 th Edition - Method 2540D
Dissolved Oxygen	Standard Methods 20 th Edition - Method 4500-O G

Americamysis bahia 7 DAY CHRONIC ASSAY SURVIVAL & OLD WATER QUALITIES

STUDY: \ע	150	CLIEN Battel				LOCA	TION: BEDF		EK Q	LAB	CONTI PTON		ARY		ANISM CH/LOT	#
				NUMBE	R OF	SURV	IVORS				OLD D	ISSOL	VED C	XYGE	N (mg/	L)
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
	Α	5	IJ	Ç	5	5	5	5	5	5,8	6.0	5.9	6.0	5.6	52	6.6
	В	5	3	3_	3	3	3	3	3	5.8	6.1	(p.D	6.0	5.6	5.6	6.5
	С	5	5	5	5	5	5	5	5	5.8	5.1	5.6	5.9	5.5	5-6	6.5
Lab	D	5	_5_	5	5	5	5	5	5	5.9	5.4	5.6	5.7	<u>5.6</u>	55	6.4
Control	E	5	5	5	5	5	5	5	5	5.9	5.9	5.8	5.7	5.4	5.5	6.4
	F	5	5	5	5	5	5	5	5	5.8	5.1	5.1	5.6	5.6	5.4	6.4
	G	5	5	4	4	4	4	4	4_	5.8	5.4	5.5		5.6	4.6	6.4
	Н	5	5	5	5	5	5	5	5	5.9	<u>5</u> .5	5.6	5,4	5.6	5.0	6.5
	Α	5	4		<u>ا</u>	4	닉	4	4	5.9	5.7	5.6	5.6	5.6	5.5	6.4
	В	5	5	5	5	5	5	5	5	5.9	5.7	5.6	5.6	5.5	4.9	6.3
	С	5	5	5	5	5	5	5	5	5.8	5.5	5.5	5.4	5.3	4.4	6.3
-001	D	5	5	5	5	5	5	5	5	5.7	5.3	5.4	5.4	5.3	4.9	6.4
		5	5	5	5	5	5	5	5	5.7	6.3	5.4	5.4	5,4	5.1	6.4
	F -	:5	5	5	5_	5	5	5	5	5.7	5.5	5.4	5.5	5.3	50	6,4
	G	5	5	5	5	5	5	5	5	5.6	5.6	5.5	5.6	5.4	4.7	6.3
	Н	5	5	ゴ	5	5	5	5	5	5.8	5.5	5.6	5.4	5,4	4.4	6.3
	Α	5	5	5	5	5	5	5	5	5.9	5.6	5.7	5.5	<u> </u>	50	6.3
i I	В ——	5	5	5	5_	5	5	5	5	5,9	ما .5	5.7	5.5		4.7	6.2
	С	5	5	4	4	4	4	4	4	5.8	5.8	5.7		54.7		
-002	D	5	5	5	5_	5	5	5	5	5,8	5.7		5.6			6.3
	E 	5	5	5	5	5	5	5	5	5.9	5.7	5.6			<u>S.o</u>	6.3
	F ———	5	5	5	5	5	5	5	5	5.8	5.7		5,5	 	50	6.3
	G	5	5	5	5	5	5	5	5	5.8	53	5.5	55	$\overline{}$	4.9	6.4
	Н	5	5	5	5_	5	5	5	5	5.8	5,8	5.7	5.6	5.2	20	6.3
INC TEMP:		25.	260	26	26	26	26	76	26							
DATE:		8/9/07		8/11		8(13	8114	1	8/16							
TIME:		 :	0845	 		1100	1000	1515	1045							
INITIALS:		55	PLAM	CS	SJ	કડ	RAM	dm)	<u>SJ</u>						علام	_

on Air 915

Americamysis bahia 7 DAY CHRONIC ASSAY SURVIVAL & OLD WATER QUALITIES

STUDY: (U. 150		CLIEN Battel				LOCA	TION: BEDFO		ERG	LAB	CONTI PTON		\RY	ORGANISM BATCH/LOT#		
				NUMBI	ER OF	SURV	IVORS		<u> </u>		OLD E	ISSOL	VED C	XYGE	N (mg/	L)
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
	Α	5	5	5	5_	5	5	5	5	5.8	5.3	5.4	5.6	5.3	50	6.1
	В	5	5	5	5_	5_	5	5	5	5.7	5.3	5.4		5,4	4.6	6.2
	С	5_	5	5	5	5	5	5	5	<u>5.7</u>	5.2	5.3	5.5	5.4	4.9	6.3
-003	D	5	5	5	5	5_	5	5	5	5.7	5.1	5.4	5.4	5,5	5.0	6.4
	E	5	5	24	4	4	4	4	4	5.8	5.4	5.4	5.4	5,5	22	6.4
	F	5	5	5	5_	5	5	5	5	5.7	5.2	5.3	5.3	5,5	4.6	6.3
	G	5	5	4	4	4	4	4	Ч	5.7	5.0	5.2	5.2	5,5	4.0	6.4
	Н	5_	5	5	5	5	5	5	5	5.7	5.2	5.2	5.2	4.5	4-1	6.4
	A	5	5	5	5_	5	5	5	5	59	5.6	5.4	5.3	5,2	4.5	6.4
	В	5	5	ゴ	5	5	5	5	5	<u>5.8</u>	<i>5</i> .5	5.6	5.2	5,2	50	6.5
1	,C	5	5	コ	5	5	5	5	5	5.8	5.5	5.4	53	5.2	5,0	6.4
-004	. D	5_	5	5	5_	5	5	5	5	5.9	55	5.4	5.4	5,0	50	6.4
55.	_E	5	4	4	4_	4	1	7	4	5,9	5.4	5.3	5.6	5.3	20	6.2
	F	5	5	5	5	5	5	5	5	5,9		5.7	5.7	5.3	50	6.1
	G	5	5	5	4	4	4	4	4	5.9	5.8	5.1	5.6	4.6	80	6.2
	Н	5	5	5	5	5	5	5	5	5,9	5.4	5.3	5.le	5,1	4.4	6.2
INC TEMP:			26	26	26	26	26_	76_	26							
DATE:		8/4/७७		8111		8 13			8/16						<u> </u>	
TIME:		1620		1349			1000		1045							
INITIALS:		55	RAM	CS	SJ	SJ	RAM	gn/	55							

Americamysis bahia 7 DAY CHRONIC ASSAY ORGANISM WEIGHTS

CLIENT: BATT	ELLE - NE	EW BEDFORD		TEST DATES	: 8/9/07	- 8 16	07	***
STUDY#: \U	2150			SPECIES: A.		1		
CONC	REP	TARE WEIGHT (g)	SHRIMP + FOIL (g)	NET WEIGHT (mg)	# SHRIMP DAY 0	MEAN WEIGHT (mg) DAY 0	# SHRIMP DAY 7	MEAN WEIGHT (mg) DAY 7
	Α	0.20791	0.20978					
	В	0.20911	v. 20980					
	С	0.20854	0.21069		-			
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	D	0.21283	0.21069 0.21475 0.21043 3					
Lab	E		8.21139 6.21139 6.21139 6					
	F	0.20692	0.20916					
	G	0.20988	0.21117					
	H		0,21012 0,201(3)					
	Α	0.20948	0.21136					
	В		0.20980					
			0.21092					
~001	<u>D</u>		0.21148 0 .2114 3					
\	<u>E</u>		0.21133					
	F	0.20972	0.21226					
	G		0.21197					
:	H		0.21100					
	A B	0.20969	0.21166				,	
		0.20921	0.21135					
	D	0.20766						
_1/	E		0.21219					
~90°			0.21038					
′		0.20964	0.20858					
	Н	0.20791						
DATE		1 1	8/18/07					
TIME		1005	1330					-
INITIALS		ST	RAM					

Americamysis bahia 7 DAY CHRONIC ASSAY ORGANISM WEIGHTS

					alal	- 8/16	07	
CLIENT: BATT		W BEDFORD			:8/9/07	- 8/16	[0]	
STUDY#: \U	150	1		SPECIES: A.	bahia I			
CONC	REP	TARE WEIGHT (g)	SHRIMP + FOIL (g)	NET WEIGHT (mg)	#SHRIMP DAY 0	MEAN WEIGHT (mg) DAY 0	#SHRIMP DAY7	MEAN WEIGHT (mg) DAY 7
	Α	0.20952	0.21186					
	В	0.20951	0.21167					
	С	0.20928	0.21165					-
3	D		0.21131					
,0°5	Е	0.20825	0.21015					
	F	0.20882	0.21106					
	G	0.20780	0.20917					
	Н	0.20785	0.21053					
	Α	0:20961	0.21144					
	В	0.20947	0.21128					
	С	0.20660	0.20860					
_પ	D	0.20679	0.20879					
oou	E	0.21002	0.21178 0.20 (E)					
'	F	0.20846						
	G	0.21030	0.71194			- · · · · · · · · · · · · · · · · · · ·		
	Н	0.20961	0.2143				<u> </u>	
	Α							
	В							
	С							
	D							
	Е							
	F							
	G							
	Н							
DATE			08118107					
TIME			1330]			
INITIALS			RAM		<u> </u>			



Aquatic Research Organisms

DATA SHEET

[_	Organism I	History
	Species:	AMERICAMYSIS BAhiA
٠	Source:	Lab reared Hatchery reared Field collected
		Hatch date 8-2-07 Receipt date
		Lot number 080207 HS Strain
		Brood Origination Floraida
II.	Water Qua	lity
		Temperature 25 °C Salinity ~30 ppt DO
	•	pH7.8 Hardness ppm
III.	Culture Co	onditions
		System: RECIRC
		Diet: Flake Food Phytoplankton Trout Chow
		Brine Shrimp Rotifers Other Every Shring Die T
		Prophylactic Treatments:
		Comments:
IV.	Shipping I	nformation
		Client: # of Organisms: 2007
		Carrier: Date Shipped: <u>8-9-07</u>
Bio	logist:	Hart Boxengurts

1 - 800 - 927 - 1650

CETIS Test Summary

Report Date:

21 Aug-07 2:04 PM

Link:

09-0394-9498

Americamysis	7-d Survival, Growth an	d Fecundity	Test		EnviroSystems, Inc.
Test No: Start Date: Ending Date: Setup Date:	07-1279-8610 09 Aug-07 04:20 PM 16 Aug-07 10:45 AM 09 Aug-07 04:20 PM	Test Type: Protocol: Dil Water: Brine:	Growth-Survival-Fec (7d) EPA/821/R-02-014 (2002) Not Applicable Not Applicable	Duration: Species: Source:	6d 18h Americamysis bahla ARO - Aquatic Research Organisms, N
Sample No: Sample Date: Receive Date: Sample Age:	06-6444-1965 09 Aug-07 04:00 PM 09 Aug-07 04:00 PM 20m	Material: Code: Source: Station:	Surface Water 16150-000 New Bedford Harbor Dredge Monitorin Laboratory Water Control	Client: Project:	Battelle Labs Ecological Risk Assessment
Sample No: Sample Date: Receive Date: Sample Age:	14-0079-4493 09 Aug-07 08:40 AM 09 Aug-07 02:55 PM 8h	Material: Code: Source: Station:	Surface Water 16150-001 New Bedford Harbor Dredge Monitorin WQ-TOX-001	Client: Project:	Battelle Labs Ecological Risk Assessment
Sample No: Sample Date: Receive Date: Sample Age:	18-5933-9189 09 Aug-07 09:15 AM 09 Aug-07 02:55 PM 7h	Material: Code: Source: Station:	Surface Water 16150-002 New Bedford Harbor Dredge Monitorin WQ-TOX-002	Client: Project:	Battelle Labs Ecological Risk Assessment
Sample No: Sample Date: Receive Date: Sample Age:	08-7827-7773 09 Aug-07 09:30 AM 09 Aug-07 02:55 PM 7h	Material: Code: Source: Station:	Surface Water 16150-003 New Bedford Harbor Dredge Monitorin WQ-TOX-003	Client: Project:	Battelle Labs Ecological Risk Assessment
Sample No: Sample Date: Receive Date: Sample Age:		Material: Code: Source: Station:	Surface Water 16150-004 New Bedford Harbor Dredge Monitorin WQ-TOX-004	Client: Project:	Battelle Labs Ecological Risk Assessment

CETIS Test Summary

Report Date:

21 Aug-07 2:04 PM

Link:

09-0394-9498

2d Proportion Survive	ed Summary							
Sample Code	Reps	Mean	Minimum	Maximum	SE	SD	CV	
16150-000	8	0.92500	0.60000	1.00000	0.05261	0.14880	16.09%	
16150-001	8	0.97500	0.80000	1.00000	0.02500	0.07071	7.25%	
16150-002	8	0.97500	0.0008.0	1.00000	0.02500	0.07071	7.25%	
16150-003	8	0.97500	00008.0	1.00000	0.02500	0.07071	7.25%	
16150-004	8	0.97500	0.80000	1.00000	0.02500	0.07071	7.25%	
7d Proportion Survive	ed Summary							
Sample Code	Reps	Mean	Minimum	Maximum	SE	SD	cv	
16150-000	8	0.92500	0.60000	1.00000	0.05261	0.14880	16.09%	
16150-001	8	0.97500	0.80000	1.00000	0.02500	0.07071	7.25%	
16150-002	8	0.97500	0.80000	1.00000	0.02500	0.07071	7.25%	
16150-003	В	0.95000	0.80000	1.00000	0.03273	0.09258	9.75%	
16150-004	8	0.95000	0.80000	1.00000	0.03273	0.09258	9.75%	
Mean Dry Biomass-m	g Summary							
Sample Code	Reps	Mean	Minimum	Maximum	SE _	SD	cv	
16150-000	8	0.35025	0.13800	0.44800	0.03804	0.10759	30.72%	
16150-001	8	0.47325	0.33000	0.66000	0.04271	0.12081	2 5.53%	
16150-002	8	0.42300	0.31400	0.61000	0.03114	0.08806	20.82%	
16150-003								
	8	0.43625	0.27400	0.53600	0.02796	0.07908	18.13%	
16150-004	8 8	0.43625 0.37175	0.27400 0.32800	0.53600 0.40200	0.02796 0.00945	0.07908 0.02674	18.13% 7.19%	
16150-004 Mean Dry Weight-mg	8							
	8							
Mean Dry Weight-mg	8 Summary	0.37175	0,32800	0.40200	0.00945	0.02674	7.19%	
Mean Dry Weight-mg Sample Code	8 Summary Reps	0.37175 Mean	0.32800 Minimum	0.40200 Maximum	0.00945 SE	0.02674 SD	7.19% CV	
Mean Dry Weight-mg Sample Code 16150-000	8 Summary Reps 8	0.37175 Mean 0.36981	0.32800 Minimum 0.23000	0.40200 Maximum 0.44800	0.00945 SE 0.02661	0.02674 SD 0.07526	7.19% CV 20.35%	
Mean Dry Weight-mg Sample Code 16150-000 16150-001	Summary Reps 8 8	0.37175 Mean 0.36981 0.48500	0.32800 Minimum 0.23000 0.33000	0.40200 Maximum 0.44800 0.66000	0.00945 SE 0.02661 0.04045	0.02674 SD 0.07526 0.11440	7.19% CV 20.35% 23.59%	

Page 3 of 3

CETIS Test Summary

Report Date: Link: 21 Aug-07 2:04 PM 09-0394-9498

2d Proportion Survive	d Detail							,	
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	
16150-000	1.00000	0.60000	1.00000	1.00000	1.00000	1.00000	0.80000	1.00000	
16150-001	0.80000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	
16150-002	1.00000	1.00000	0.80000	1.00000	1.00000	1.00000	1.00000	1.00000	
16150-003	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	0.80000	1.00000	
16150-004	1.00000	1.00000	1.00000	1.00000	0.80000	1.00000	1.00000	1.00000	
7d Proportion Survive	d Detail			" 	. <u></u>	<u>-</u>			
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	
16150-000	1.00000	0.60000	1.00000	1.00000	1.00000	1.00000	0.80000	1.00000	
16150-001	0.80000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	
16150-002	1.00000	1.00000	0.80000	1.00000	1.00000	1.00000	1.00000	1.00000	
16150-003	1.00000	1.00000	1.00000	1.00000	0.80000	1.00000	0.80000	1.00000	
16150-004	1.00000	1.00000	1.00000	1.00000	0.80000	1.00000	0.80000	1.00000	
Mean Dry Biomass-mg	g Detail		·						
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	
16150-000	0.37400	0.13800	0.43000	0.38400	0.44600	0.44800	0.25800	0.32400	
16150-001	0.37600	0.33000	0.66000	0.62800	0.47000	0.50800	0.44800	0.36600	
16150-002	0.39400	0.42800	0.39400	0.61000	0.37400	0.31400	0.39600	0.47400	
16150-003	0.46800	0.43200	0.47400	0.47800	0.38000	0.44800	0.27400	0.53600	
16150-004	0.36600	0.36200	0.40000	0.40000	0.35200	0.40200	0.32800	0.36400	
Mean Dry Weight-mg I	Detail								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	
16150-000	0.37400	0.23000	0.43000	0.38400	0.44600	0.44800	0.32250	0.32400	
16150-001	0.47000	0.33000	0.66000	0.62800	0.47000	0.50800	0.44800	0.36600	
16150-002	0.39400	0.42800	0.49250	0.61000	0.37400	0.31400	0.39600	0.47400	
16150-003	0.46800	0.43200	0.47400	0.47800	0.47500	0.44800	0.34250	0.53600	
16150-004	0.36600	0.36200	0.40000	0.40000	0.44000	0.40200	0.41000	0.36400	

Group Comparisons

Comparisons: Report Date:

Page 3 of 7

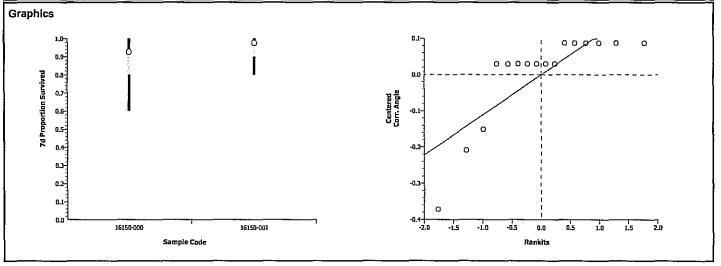
21 Aug-07 1:46 PM

CE 115 Ar	15 Analysis Detail								A	nalysis:			06-7387-259
Americamysis	s 7-d Survival, Growth	and F	ecundity Te	st								Enviro	Systems, Inc.
Test No:	07-1279-8610		est Type: G						ation:	6d 18h			
Start Date:	09 Aug-07 04:20 PM				2-014 (2002))		-	cies:	American	-		
Ending Date:				ot Applicabl				Sou	rce:	ARO - Ac	quatic I	Research	Organisms, N
Setup Date:	09 Aug-07 04:20 PM	В	rine: N	ot Applicabi	e 								
Endpoint		Analysi	s Type		Sample Li	ink	Control	Link	Date	Analyzed		Version	1
7d Proportion	Survived (Compa	ison		09-0394-9	498	09-0394	-9498	21 A	ug-07 1:42	PM	CETIS	1.026
Method		Alt H	Data Tra	nsform	Z	NC	EL L	OEL	To	cic Units	Ch	7	MSDp
Mann-Whitney	/ U (C > T	Angular (Corrected)					N/A				
ANOVA Assu	mptions			·····									<u> </u>
Attribute	Test		St	atistic	Critical		P Level		Decis	ion(0.01)			
Variances	Variance Ratio		4.	6757	8.88539		0.07923		Equal	Variances			
Distribution	Shapiro-Wilk V	7	0.0	67052	0.84420		0.00001		Non-r	ormal Dist	ributior	1	
ANOVA Table													
Source	Sum of Squar	es M	ean Square	DF	F Statisti	C	P Level		Decis	ion(0.05)			
Retwoon	0.0131704		0131704	4	0.72		0.41055		Non-9	ignificant l	ffect		

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0131794	0.0131794	1	0.72	0.41055	Non-Significant Effect	
Error	0.2564119	0.0183151	14				
Total	0.26959125	0.0314945	15	_			

Sample	VS	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)
16150-000		16150-001	27.5		0.6395	2	Non-Significant Effect

Data Summary	,		Original Data			Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
16150-000	8	0.92500	0.60000	1.00000	0.14880	1.25812	0.88608	1.34528	0.17188	
16150-001	88	0.97500	0.80000	1.00000	0.07071	1.31552	1.10715	1.34528	0.08419	



Comparisons:

Page 1 of 7 21 Aug-07 1:46 PM

Report Date:

CETIS An	alys	sis Detail					A	nalysis:	2111	04-4557-4091
Americamysis	7-d S	urvival, Growth and	d Fecundity	Test					EnviroS	ystems, Inc.
Test No: Start Date: Ending Date: Setup Date:	09 Au 16 Au	279-8610 ug-07 04:20 PM ug-07 10:45 AM ug-07 04:20 PM	Test Type: Protocol: Dil Water: Brine:	Growth-Survi EPA/821/R-0 Not Applicabl Not Applicabl	2-014 (2002) e		Duration: Species: Source:	6d 18h Americamy ARO - Aqu	rsis bahla atic Research	Organisms, N
Endpoint		Anal	ysis Type	7 - 2 - 10 - 10 - 10 - 10 - 10 - 10 - 10	Sample Li	nk Control	Link Dat	e Analyzed	Version	
7d Proportion S	Survive	ed Com	parison	,	09-0394-94	498	-9498 21 <i>/</i>	Aug-07 1:42 F	PM CETISV	1.026
Method		Alt i	·	ransform	Z	NOEL L	OEL To	xic Units	ChV	MSDp
Mann-Whitney	U	C > 1	Angula	r (Corrected)			N//	4		
ANOVA Assun	nption	ıs								
Attribute		Test		Statistic	Critical	P Level	Decis	sion(0.01)		
Variances		Variance Ratio		4.16757	8.88539	0.07923	Equa	l Variances		
Distribution		Shapiro-Wilk W		0.67052	0.84420	0.00001	Non-ı	normal Distrib	oution	
ANOVA Table		·								
Source		Sum of Squares	Mean Squa	re DF	F Statistic	c P Level	Decis	sion(0.05)		
Between		0.0131794	0.0131794	1	0.72	0.41055	Non-	Significant Eff	ect	
Error		0.2564119	0.0183151	14						
Total		0.26959125	0.0314945	15						
Group Compa	risons	<u> </u>								
Sample	VS	Sample	Statistic	Critical	P Level	Ties	Decis	sion(0.05)		
16150-000		16150-002	27.5		0.6395	2	Non-	Significant Eff	fect	
Data Summar	у			Origin	al Data			Transfo	ormed Data	
Sample Code		Count	Меап	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16150-000		8	0.92500	0.60000	1.00000	0.14880	1.25812	0.88608	1.34528	0.17188
16150-002		8	0.97500	0.80000	1.00000	0.07071	1.31552	1.10715	1.34528	0.08419
Graphics										
7d Proportion Survived 6.0		O 850 tr	1		į	Contered Corr. Angle	000	0 0 0 0 0	0000	

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0.5

16150-000

Sample Code

16150-002

Comparisons: Report Date:

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Analysis:

6d 18h

08-8976-5697

Americamysis 7-d Survival, Growth and Fecundity Test

EnviroSystems, Inc.

Test No: Start Date: 07-1279-8610

09 Aug-07 04:20 PM

Test Type: Growth-Survival-Fec (7d)

Protocol: EPA/821/R-02-014 (2002)

Species:

Source:

Americamysis bahia

Ending Date: Setup Date:

16 Aug-07 10:45 AM 09 Aug-07 04:20 PM

Dil Water: Not Applicable Brine: Not Applicable

Duration:

ARO - Aquatic Research Organisms, N

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
7d Proportion Survived	Comparison	09-0394-9498	09-0394-9498	21 Aug-07 1:42 PM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Mann-Whitney U	C > T	Angular (Corrected)				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	2.43108	8.88539	0.26405	Equal Variances
Distribution	Shapiro-Wilk W	0.66203	0.84420	0.00001	Non-normal Distribution

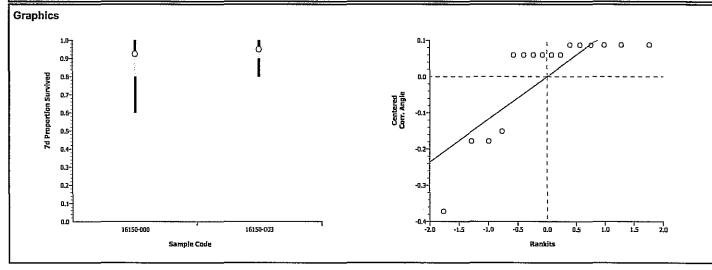
ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0030545	0.0030545	1	0.15	0.70763	Non-Significant Effect
Error	0.2918543	0.0208467	14			
Total	0.29490886	0.0239013	15	_		

Group Comparisons

Sample	vs	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)
16150-000		16150-003	31		0.5204	2	Non-Significant Effect

Data Summary	Data Summary			Original Data			Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
16150-000	8	0.92500	0.60000	1.00000	0.14880	1.25812	0.88608	1.34528	0.17188	
16150-003	8	0.95000	0.80000	1.00000	0.09258	1.28575	1.10715	1.34528	0.11023	



Comparisons: Report Date:

Page 7 of 7

Analysis:

21 Aug-07 1:46 PM

17-4342-8281

Americamysis 7-d Survival, Growth and Fecundity Test

EnviroSystems, Inc.

Test No: 07-1279-8610 Start Date:

09 Aug-07 04:20 PM

Test Type: Growth-Survival-Fec (7d) Protocol:

EPA/821/R-02-014 (2002)

Duration: Species:

6d 18h Americamysis bahia

Source:

ARO - Aquatic Research Organisms, N

Ending Date: 16 Aug-07 10:45 AM Setup Date:

Endpoint

09 Aug-07 04:20 PM

Dil Water: Not Applicable Brine:

Analysis Type

Comparison

Not Applicable

Sample Link	Control Link	Date Analyzed	Version
09-0394-9498	09-0304-0498	21 Aug-07 1:42 PM	CETISV1 028

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Mann-Whitney U	C>T	Angular (Corrected)				N/A		

ANOVA Assumptions

7d Proportion Survived

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	2.43108	8.88539	0.26405	Equal Variances
Distribution	Shapiro-Wilk W	0.66203	0.84420	0.00001	Non-normal Distribution

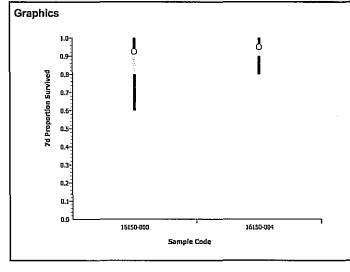
ANOVA Table

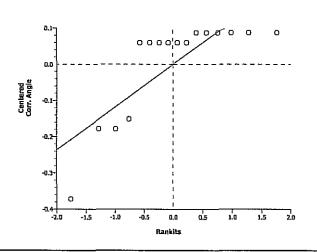
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0030545	0.0030545	1	0.15	0.70763	Non-Significant Effect	
Error	0.2918543	0.0208467	14				
Total	0.29490886	0.0239013	15	_			

Group Comparisons

Sample	VS_	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)
16150-000		16150-004	31		0.5204	2	Non-Significant Effect

Data Summary			Origi	nal Data		Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16150-000	8	0,92500	0.60000	1.00000	0.14880	1.25812	0.88608	1.34528	0.17188
16150-004	8	0.95000	0.80000	1.00000	0.09258	1.28575	1.10715	1.34528	0.11023





0.2

15150-001

Sample Code

Comparisons:

Page 2 of 7 21 Aug-07 1:46 PM

Report Date:

CE H2 AU	aiysis Detaii					Α	nalysis:		05-6437 - 740
Americamysis	7-d Survival, Growth a	and Fecundity	Test			_		EnviroS	/stems, Inc.
Ending Date:	07-1279-8610 09 Aug-07 04:20 PM 16 Aug-07 10:45 AM 09 Aug-07 04:20 PM	Test Type: Protocol: Dil Water: Brine:	Growth-Surviv EPA/821/R-0 Not Applicabl Not Applicabl	2-014 (2002) e)	Duration: Species: Source:	6d 18h Americamys ARO - Aqua	sis bahia atic Research	Organisms, N
Endpoint 7d Proportion S		nalysis Type Imparison		Sample L 09-0394-9			e Analyzed Aug-07 1:42 P	Version M CETISv1	.026
Method Mann-Whitney I			ransform or (Corrected)	Z	NOEL L	OEL To:		ChV	MSDp
ANOVA Assum Attribute Variances Distribution	Test Variance Ratio Shapiro-Wilk W		Statistic 1.00000 0.39803	Critical 8.88539 0.84420	P Level 1.00000 0.00000	Equa	sion(0.01) I Variances normal Distribi	ution	
ANOVA Table Source Between Error Total	Sum of Squares 0 0.0992388 0.09923882	Mean Squa 0 0.0070885 0.0070885	nre DF 1 14 15	F Statisti	c P Level		sion(0.05) Significant Effe	ect	
Group Compar Sample 16150-001	risons vs Sample 16150-002	Statistic 32	Critical	P Level 0.4796	Ties 2		s ion(0.05) Significant Effe	ect	
Data Summary	7		Origin	al Data			Transfo	rmed Data	
Sample Code 16150-001 16150-002	Count 8 8	Mean 0.97500 0.97500	Minimum 0.80000 0.80000	Maximum 1.00000 1.00000	SD 0.07071 0.07071	Mean 1.31552 1.31552	Minimum 1.10715 1.10715	Maximum 1.34528 1.34528	SD 0.08419 0.08419
Graphics 1.07 0.9- 1.07 0.9- 1.07 0.06- 1.07 0.07 0.07 0.07 0.07 0.07 0.07 0.07	•	ļ			Control Contro	000	0 0 0 0 0 0		

-1.5

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Rankits

16150-002

Comparisons:

Page 5 of 7 21 Aug-07 1:46 PM

Report Date:

CETIS Analys	sis Detail						nalysis:	217	15-7086-8898
Americamysis 7-d S	Survival, Growth an	d Fecundity	Test					EnviroS	ystems, Inc.
Start Date: 09 A Ending Date: 16 A	279-8610 ug-07 04:20 PM ug-07 10:45 AM ug-07 04:20 PM	Test Type: Protocol: Dil Water: Brine:	Growth-Surviv EPA/821/R-02 Not Applicable Not Applicable	-014 (2002)		Duration: Species: Source:	6d 18h Americamys ARO - Aqua	sis bahia atic Research	Organisms, N
Endpoint 7d Proportion Survivo		lysis Type iparison		Sample Lin 09-0394-949			e Analyzed \ug-07 1:42 P	Version M CETISv1	.026
Method Mann-Whitney U	Alt C >		ransform r (Corrected)	Z	NOEL L	OEL To		ChV	MSDp
ANOVA Assumption Attribute Variances Distribution	Test Variance Ratio Shapiro-Wilk W		Statistic 1.71429 0.61116	Critical 8.88539 0.84420	P Level 0.49388 0.00000	Equa	sion(0.01) Variances normal Distribi	ution	
ANOVA Table Source Between Error Total	Sum of Squares 0.0035442 0.1346813 0.1382255	Mean Squa 0.0035442 0.0096201 0.0131643	1 14 15	F Statistic 0.37	P Level 0.55358		sion(0.05) Significant Effe	ect	
Group Comparison Sample vs 16150-001	s Sample 16150-003	Statistic 36	Critical	P Level 0.3605	Ties 2		sion(0.05) Significant Effo		
Data Summary			Origina					rmed Data	
Sample Code 16150-001 16150-003	Count 8 8	Mean 0.97500 0.95000	Minimum 0,80000 0,80000	Maximum 1.00000 1.00000	0.07071 0.09258	Mean 1.31552 1.28575	Minimum 1.10715 1.10715	Maximum 1.34528 1.34528	0.08419 0.11023
0.9- 1.0 7 0.9- 0.8- 0.8- 0.7- 0.7- 0.6- 0.5- 0.4- 0.3- 0.2- 0.1-	Č	ļ		Contered	-0.10- -0.05- -0.10- -0.15-	0 0	0000		

Rankits

Sample Code

Comparisons:

Page 6 of 7 21 Aug-07 1:46 PM 17-2897-7763

Report Date: Analysis:

	HO	MIIC	แห่งเจ	DC	lall
Δma	ricam	weie 7	ad Survi	ival G	irowi

Americamysis	7-d Survival, Growth a	nd Fecundity	Test				**	EnviroS	ystems, Inc.
Start Date: Ending Date:	07-1279-8610 09 Aug-07 04:20 PM 16 Aug-07 10:45 AM 09 Aug-07 04:20 PM	Test Type: Protocol: Dil Water: Brine:	Growth-Surviv EPA/821/R-02 Not Applicable Not Applicable	2-014 (2002) e		Duration: Species: Source:	6d 18h Americamys ARO - Aqua	is bahia tic Research	Organisms, N
Endpoint	An	alysis Type		Sample Lir	ık Control	Link Dat	e Analyzed	Version	
7d Proportion S	urvived Co	mparison		09-0394-94	98 09-0394	1-9498 217	Aug-07 1:42 P	V CETISV1	.026
Method	Ait		ransform	z	NOEL L	OEL To	xic Units	СhV	MSDp
Mann-Whitney l	U C:	> T Angula	r (Corrected)			N//	4		·-·
ANOVA Assum	nptions							_	
Attribute	Test		Statistic	Critical	P Level	Decis	sion(0.01)		
Variances	Variance Ratio		1.71429	8.88539	0.49388		l Variances		
Distribution	Shapiro-Wilk W		0.61116	0.84420	0.00000	Non-	normal Distribu	ıtion	
ANOVA Table									
Source	Sum of Squares	Mean Squa	re DF	F Statistic	P Level	Decis	sion(0.05)		
Between	0.0035442	0.0035442	1	0.37	0.55358	Non-	Significant Effe	ect	
Error	0.1346813	0.0096201	14						
Total	0.1382255	0.0131643	15						
Group Compar	risons					-, American			
Sample	vs Sample	Statistic	Critical	P Level	Ties	Deci	sion(0.05)		
16150-001	16150-004	36		0.3605	2	Non-	Significant Effe	ect	
Data Summary	1		Origina	al Data		···	Transfo	rmed Data	
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16150-001	8	0.97500	0.80000	1.00000	0.07071	1.31552	1.10715	1.34528	0.08419
16150-004	8	0.95000	0.80000	1.00000	0.09258	1.28575	1.10715	1.34528	0.11023
Graphics 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.		ļ		Contered	0.10-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1		0000		·
0.0 1					-0.25-}	1.5 -LO -C	0.5 0.0 0 <u>.5</u>	1.0 1.5	7.0 2.0
****	15150-001	16150-0	104		-20 -	15 -LO -C	ביח היח כיו	1.0 1.3	2.11

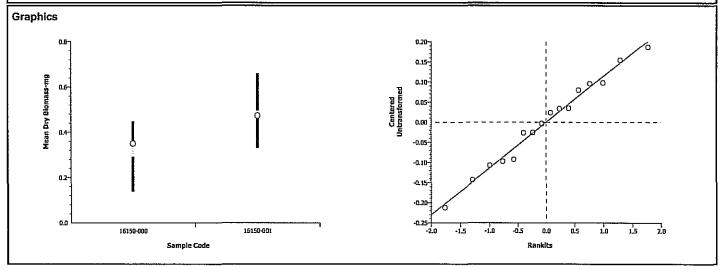
Comparisons: Report Date:

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21 Aug-07 1:47 PM 08-2298-0895

Analysis: Americamysis 7-d Survival, Growth and Fecundity Test EnviroSystems, Inc. Test No: 07-1279-8610 Test Type: Growth-Survival-Fec (7d) **Duration:** 6d 18h Start Date: 09 Aug-07 04:20 PM Protocol: EPA/821/R-02-014 (2002) Species: Americamysis bahia Ending Date: 16 Aug-07 10:45 AM Dil Water: Not Applicable ARO - Aquatic Research Organisms, N Source: Setup Date: 09 Aug-07 04:20 PM Brine: Not Applicable Endpoint Sample Link Control Link Date Analyzed Analysis Type Version Mean Dry Biomass-mg Comparison 09-0394-9498 09-0394-9498 21 Aug-07 1:42 PM **CETISv1.026** Method Alt H **Data Transform** Z NOEL LOEL **Toxic Units** ChV MSDp Equal Variance t C > T Untransformed N/A **ANOVA Assumptions Attribute** Test Statistic Critical Decision(0.01) P Level Variance Ratio Variances 1.26068 8.88539 0.76768 Equal Variances Distribution Shapiro-Wilk W 0.98100 0.84420 0.95262 Normal Distribution ANOVA Table Source **Sum of Squares** Mean Square DF F Statistic P Level Decision(0.05) Between 0.0605160 0.0605160 1 4.62 0.04947 Significant Effect Error 0.1831949 0.0130854 14 Total 0.24371094 0.0736014 15 **Group Comparisons** Sample Statistic Critical MSD Decision(0.05) Sample P Level 16150-000 16150-001 -2.1505 0.9753 Non-Significant Effect 1.76131 0.10074

Data Summary		Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
16150-000	8	0.35025	0.13800	0.44800	0.10759					
16150-001	8	0,47325	0.33000	0.66000	0.12081					



Comparisons: Report Date:

Page 2 of 7 21 Aug-07 1:47 PM

06-9799-4703

Analysis:

Americam	veie 7	7_d	Sumival	Growth	and	Facundib	Toct
runen (cann	yolo 1	-u	outvival,	GIOWIII	anu	recumung	y rest

EnviroSystems, Inc.

Test No: Start Date:

Ending Date:

Setup Date:

07-1279-8610

09 Aug-07 04:20 PM

16 Aug-07 10:45 AM

09 Aug-07 04:20 PM

Test Type: Growth-Survival-Fec (7d)

Protocol: EPA/821/R-02-014 (2002)

Dil Water: Not Applicable

Brine:

Not Applicable

Duration: 6d 18h

Species: Americamysis bahia

ARO - Aquatic Research Organisms, N Source:

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	09-0394-9498	09-0394-9498	21 Aug-07 1:43 PM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C>T	Untransformed				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	1.49270	8.88539	0.61022	Equal Variances	
Distribution	Shapiro-Wilk W	0.97774	0.84420	0.91772	Normal Distribution	

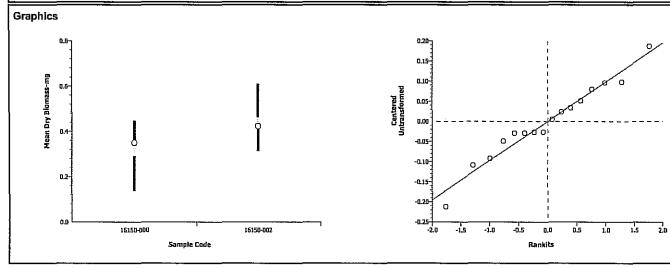
ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0211702	0.0211702	1	2.19	0.16104	Non-Significant Effect	
Error	0.1353234	0.009666	14				
Total	0.15649364	0.0308362	15				

Group Comparisons

Sample	V\$	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
16150-000		16150-002	-1.4799	1.76131	0.9195	0.08658	Non-Significant Effect

Data Summary		Original Data					Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD		
16150-000	8	0.35025	0.13800	0.44800	0.10759			·			
16150-002	8	0.42300	0.31400	0.61000	0.08806						



Comparisons: Report Date:

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Analysis:

16-6124-1024

Americamysis 7-d Survival, Growth and Fecundity Test EnviroSystems, Inc. Test Type: Growth-Survival-Fec (7d) Test No: 07-1279-8610 **Duration:** 6d 18h Start Date: 09 Aug-07 04:20 PM Protocol: EPA/821/R-02-014 (2002) Species: Americamysis bahia **Ending Date:** 16 Aug-07 10:45 AM Dil Water: Not Applicable Source: ARO - Aquatic Research Organisms, N 09 Aug-07 04:20 PM Not Applicable Setup Date: Brine: Endpoint Analysis Type

Lindpoint		0 1 JPC	Odinbic E		JOILLIOI LIIIK	Date Analyzed	7.	131011
Mean Dry Biomass-mg	Сотраг	ison	09-0394-	9498 C	9-0394-9498	21 Aug-07 1:43	PM CE	TISv1.026
Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

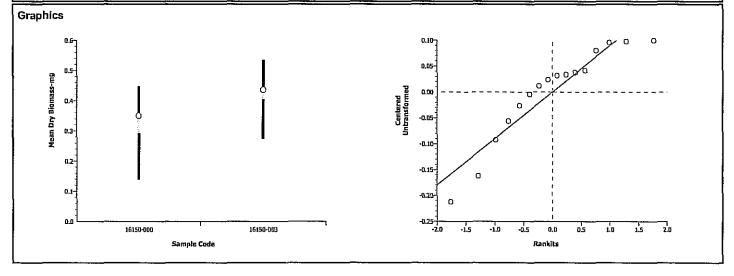
Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		
				L				

ANOVA Assumptions Statistic **Attribute** Critical P Level Decision(0.01) Variances Variance Ratio 1.85133 8.88539 0.43514 Equal Variances Distribution Shapiro-Wilk W 0.88621 0.84420 0.04823 Normal Distribution

Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
0.029584	0.029584	1	3.32	0.08993	Non-Significant Effect
0.124807	0.0089148	14			
0.15439094	0.0384988	15	-		
	0.029584 0.124807	0.029584 0.029584 0.124807 0.0089148	0.029584 0.029584 1 0.124807 0.0089148 14	0.029584 0.029584 1 3.32 0.124807 0.0089148 14	0.029584 0.029584 1 3.32 0.08993 0.124807 0.0089148 14

Group Comp	anso	ns						
Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16150-000		16150-003	-1.8217	1.76131	0.9550	0.08315	Non-Significant Effect	

Data Summary			Origi	nal Data			Transfo	rmed Data		
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
16150-000	8	0.35025	0.13800	0.44800	0.10759					
16150-003	8	0.43625	0.27400	0.53600	0.07908					



Comparisons:

Page 1 of 7 21 Aug-07 1:47 PM

Analysis:

Report Date: 06-6482-8280

					Milalysis.	00-0402-0200
Americamysis 7-d Survival, G	owth and Fecundity	y Test				EnviroSystems, Inc.
Test No: 07-1279-8610 Start Date: 09 Aug-07 04:24 Ending Date: 16 Aug-07 10:44 Setup Date: 09 Aug-07 04:24	Protocol: AM Dil Water:		02-014 (2002) ble		Duration: 6d 18h Species: Americamy Source: ARO - Aqua	sis bahia atic Research Organisms, N
Endpoint	Analysis Type		Sample Lir	ık Control	Link Date Analyzed	Version
Mean Dry Biomass-mg	Comparison		09-0394-94	98 09-0394	-9498 21 Aug-07 1:43 P	M CETISv1.026
Method Unequal Variance t		Transform Insformed	Z	NOEL L	OEL Toxic Units N/A	ChV MSDp
ANOVA Assumptions						
Attribute Test		Statistic	Critical	P Level	Decision(0.01)	
Variances Variance	Ratio	16.19568	8.88539	0.00157	Unequal Variances	
Distribution Shapiro-V	Vilk W	0.87975	0.84420	0.03789	Normal Distribution	
ANOVA Table						
Source Sum of S	quares Mean Squ	ıare DF	F Statistic	P Level	Decision(0.05)	
Between 0.001849	0.001849	1	0.30	0.59198	Non-Significant Eff	ect
Епог 0.086039	0.0061456	5 14				
Total 0.087887	98 0.0079946	15				
Group Comparisons						
Sample vs Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16150-000 16150-004	-0.5485	1.89458	0.6998	0.07426	Non-Significant Eff	ect
Data Summary		Origi	nal Data		Transfo	rmed Data
Sample Code	Count Mean	Minimum	Maximum	SD	Mean Minimum	Maximum SD
16150-000	8 0,35025	0.13800	0.44800	0.10759		
16150-004	8 0.37175	0.32800	0.40200	0.02674		
Graphics						
0.4- 0.4- 0.2- 0.1-	{	}	Centered	0.05- 0.05- -0.10- -0.15- -0.20- 0	0000	

-0.5

Rankits

0.5

1.0

2.0

1.5

16150-000

Sample Code

16150-004

Comparisons:

Page 5 of 7 21 Aug-07 1:47 PM 08-2567-3574

Report Date: Analysis:

	•						Allalysis.		00 200, 00,
Americamysis	7-d Survival, Growt	h and Fecundity	Test	-				EnviroS	ystems, Inc.
Test No: Start Date: Ending Date: Setup Date:	07-1279-8610 09 Aug-07 04:20 PM 16 Aug-07 10:45 AM 09 Aug-07 04:20 PM	Protocol: Dil Water:	Growth-Surv EPA/821/R-0 Not Applicab	02-014 (2002) le	·	Duration Species Source:	: Americamy	sis bahia alic Research	Organisms, I
Endpoint		Analysis Type		Sample Li	nk Contre	ol Link D	ate Analyzed	Version	
Mean Dry Biom	nass-mg	Comparison		09-0394-94	98 09-039	94-9498 2	1 Aug-07 1:43 P	M CETISV	1.026
Method Equal Variance			Fransform Isformed	Z	NOEL		Toxic Units N/A	ChV	MSDp
ANOVA Assur	nptions						<u></u>		·
Attribute	Test		Statistic	Critical	P Level	De	cision(0.01)		
Variances	Variance Ratio		1.88181	8.88539	0.42325	Eq	ual Variances		
Distribution	Shapiro-Wilk V	N	0.90448	0.84420	0.09508	No	rmal Distribution		
ANOVA Table Source Between Error Total	Sum of Squar 0.0101003 0.1564474 0.16654767	0.0101003 0.0111748 0.0212751	are DF 1 14 15	F Statistic	P Level 0.35788		cision(0.05) n-Significant Effe	ect	
Group Compa								<u> </u>	
Sample 16150-001	vs Sample 16150-002	0.95071	1.76131	P Level 0.1789	MSD 0.09309		cision(0.05) n-Significant Effe		
	· · · · · · · · · · · · · · · · · · ·	0.33071			0.03303	NO		- 	·
Data Summar	-			nal Data			Transfo	rmed Data	
Sample Code			Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16150-001 16150-002	8 8	0,47325 0,42300	0.33000 0.31400	0.66000 0.61000	0.12081 0.08806				
Graphics G.B. G.W. Ssempla Aug usaw G.A. G.A. G.A.		Ö			0.20 - 0.15 - 1 - 0.05 0.05				

0.0 Rankits

16150-001

Sample Code

15150-002

Comparisons:

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EnviroSystems, Inc.

08-1150-9228

Report Date: Analysis:

Americamysis 7-c	Survival.	Growth and	Fecundity T	est

07-1279-8610 09 Aug-07 04:20 PM Test Type: Growth-Survival-Fec (7d) Protocol: EPA/821/R-02-014 (2002)

Ending Date: 16 Aug-07 10:45 AM Dil Water: Not Applicable 09 Aug-07 04:20 PM Brine: Not Applicable Duration: 6d 18h

Species: Americamysis bahia ARO - Aquatic Research Organisms, N Source:

Endpoint	Analysis	Туре	Sample L	ink (Control Link	Date Analyzed	<u> </u>	Version
Mean Dry Biomass-mg	Compari	son	09-0394-9	498	09-0394-9498	21 Aug-07 1:4:	3 PM	CETISv1.026
Method	Alt H	Data Transform	Z	NOE	L LOEL	Toxic Units	ChV	/ MSDp

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed	_			N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	2.33393	8.88539	0.28596	Equal Variances
Distribution	Shapiro-Wilk W	0.96721	0.84420	0.75694	Normal Distribution

ANOVA Table

Test No:

Start Date:

Setup Date:

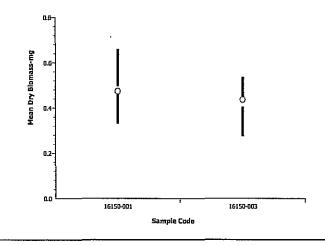
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0054760	0.0054760	1	0.53	0.48051	Non-Significant Effect
Error	0.1459309	0.0104236	14			
Total	0.15140696	0.0158997	15	_		
1						

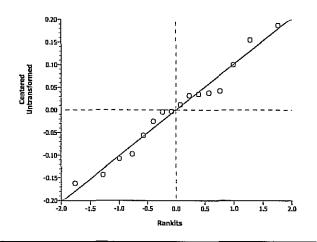
Group Comparisons

Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
16150-001		16150-003	0.72481	1.76131	0.2403	0.08991	Non-Significant Effect

Data Summary		Original Data				Transformed Data					
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD		
16150-001	8	0.47325	0.33000	0.66000	0.12081						
16150-003	8	0.43625	0.27400	0.53600	0.07908						

Graphics





Comparisons: Report Date: Page 6 of 7 21 Aug-07 1:47 PM 08-5124-9044

EnviroSystems, Inc.

Report Date:
Analysis:

Americamysis 7-d Survival, Growth and Fecundity Test

Test No: 07-1279-8610 Test Type: Growth-Survival-Fec (7d) Duration: 6d 18h

Start Date: 09 Aug-07 04:20 PM Protocol: EPA/821/R-02-014 (2002) Species: Americamysis bahia

Ending Date: 16 Aug-07 10:45 AM Dil Water: Not Applicable Source: ARO - Aquatic Research Organisms, N Setup Date: 09 Aug-07 04:20 PM Brine: Not Applicable

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	-	09-0394-9498	21 Aug-07 1:43 PM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Unequal Variance t	C > T	Untransformed				N/A		

ANOVA Assumptions

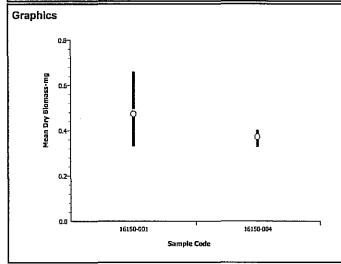
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	20.41750	8.88539	0.00075	Unequal Variances	
Distribution	Shapiro-Wilk W	0.91808	0.84420	0.15659	Normal Distribution	

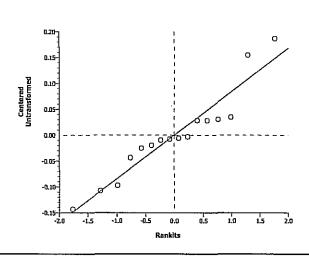
ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0412090	0.0412090	1	5.38	0.03594	Significant Effect
Error	0.107163	0.0076545	14			
Total	0.14837201	0.0488635	15	_		

Sample	٧s	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16150-001		16150-004	2.32027	1.89458	0.0267	0.08288	Significant Effect	

Data Summary	Original Data					Transformed Data					
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD		
16150-001	8	0.47325	0.33000	0.66000	0.12081						
16150-004	8	0.37175	0.32800	0.40200	0.02674						





Arbacia punctulata Chronic Fertilization Assay

SAMPLE USE RECORD

STUDY: 16150	CLIENT: B Bedford	attelle - New		
SPECIES: A. punctu	lata			
	Day:	3		
SAMPLE	Volume Used (mL)	ESI Cube ID		
Lab Control	700	4/4		
-001	1	_0"1		
-002		~00°.		
-003		-007_		
-004		100 V		
INITIALS:	BB			
TIME:	1545			
DATE:	8/9/27			

FERTILIZATION COUNTS

STUDY	CLIENT BATTELLE	LOCATION New Bedford		DATE 8/10/07
		REPLICA	ATE VIAL	
	1_	_ 2	3	4
SAMPLE	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL
Lab Control	100/105	100/102	100/104	101/103
-001	100/102	100/104	101/104	101/103
-002	100/104	100/105	101/102	102/106
-003	100/102	100/103	100/102	101/103
-004	102/105	101/09	100/103	100/111

Report Date:

21 Aug-07 1:59 PM

02-1118-1875 Link:

Arbacia Sperm	bacia Sperm Cell Fertilization Test									
Test No: Start Date: Ending Date: Setup Date:	03-9154-3054 09 Aug-07 04:20 PM 09 Aug-07 05:40 PM 09 Aug-07 04:20 PM	Test Type: Protocol: Dil Water: Brine:	Not Applica	EPA/821/R-02-014 (2002) Not Applicable Not Applicable			80m Arbacia punctulata In-House Culture			
•	06-6444-1965 09 Aug-07 04:00 PM 09 Aug-07 04:00 PM 20m	Material: Code: Source: Station:		ter d Harbor Dred Water Control	=	Client: Project:	Battelle Labs Ecological Risk Assessment			
•	14-0079-4493 09 Aug-07 08:40 AM 09 Aug-07 02:55 PM 8h	Material: Code: Source: Station:	Surface Water 16150-001 New Bedford Harbor Dredge Monitorin WQ-TOX-001			Client: Project:	Battelle Labs Ecological Risk Assessment			
-	18-5933-9189 09 Aug-07 09:15 AM 09 Aug-07 02:55 PM 7h	Material: Code: Source: Station:	Surface Water 16150-002 New Bedford Harbor Dredge Monitorin WQ-TOX-002			Client: Project:	Battelle Labs Ecological Risk Assessment			
-	08-7827-7773 09 Aug-07 09:30 AM 09 Aug-07 02:55 PM 7h	Material: Code: Source: Station:	16150-003 New Bedfor	Surface Water			Battelle Labs Ecological Risk Assessment			
Sample No: Sample Date: Receive Date: Sample Age:	04-4490-4090 09 Aug-07 10:05 AM 09 Aug-07 02:55 PM 6h	Material: Code: Source: Station:	Surface Wa 16150-004 New Bedfor WQ-TOX-0	rd Harbor Dred	dge Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment			
Proportion Fe	rtilized Summary									
Sample Code 16150-000 16150-001 16150-002 16150-003 16150-004	Reps 4 4 4 4 4	Mean 0.96872 0.97342 0.96659 0.97806 0.94960	Minimum 0.95238 0.96154 0.95238 0.97087 0.90090	Maximum 0.98058 0.98058 0.99020 0.98058 1.00000	SE 0.00704 0.00453 0.00818 0.00240 0.02216	SD 0.01409 0.00906 0.01636 0.00479 0.04432	CV 1.45% 0.93% 1.69% 0.49% 4.67%			
Proportion Fertilized Detail										
Sample Code 16150-000 16150-001 16150-002 16150-003 16150-004	Rep 1 0.95238 0.98039 0.96154 0.98039 1.00000	0.96154 0.95238 0.97087	Rep 3 0.96154 0.97115 0.99020 0.98039 0.97087	Rep 4 0.98058 0.98058 0.96226 0.98058 0.90090	<u> </u>					

Comparisons: Report Date:

Page 2 of 7 21 Aug-07 2:00 PM

EnviroSystems, Inc.

Analysis:

04-9034-4208

Arbacia Sperm Cell Fertilization Test

Test No: 03-9154-3054 Start Date: 09 Aug-07 04:20 PM

Ending Date:

Group Comparisons

Setup Date:

09 Aug-07 05:40 PM

09 Aug-07 04:20 PM

Test Type: Fertilization

EPA/821/R-02-014 (2002) Protocol:

Dil Water: Not Applicable Brine: Not Applicable Duration: 80m

Species:

Arbacia punctulata

Source:

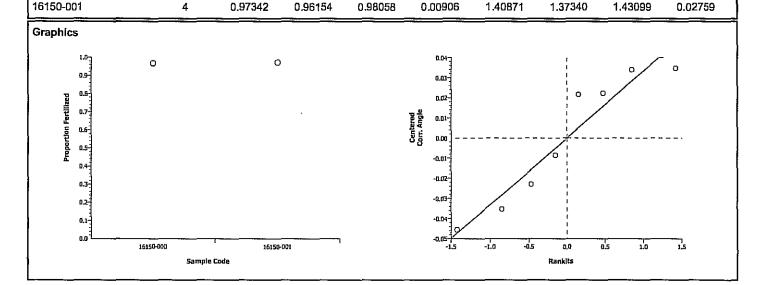
In-House Culture

	Endpoint	Analysis	Туре	Sample L	ink (Control Link	Date Analyzed		Version	
Proportion Fertilized		Comparison		02-1118-1875 (02-1118-1875	13 Aug-07 3:10 PM		CETISv1.026	
	Method	Alt H	Data Transform	Z	NOE	L LOEL	Toxic Units	ChV	MSDp	=-
	Equal Variance t	C>T	Angular (Corrected)				N/A			

ANOVA Assumptions									
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)				
Variances	Variance Ratio	2.16955	47.46723	0.54107	Equal Variances				
Distribution	Shapiro-Wilk W	0.88468	0.74935	0.20206	Normal Distribution				

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0003040	0.0003040	1	0.25	0.63352	Non-Significant Effect	
Error	0.0072375	0.0012062	6				
Total	0.00754151	0.0015103	7				

Sample vs	Sample	Statistic	Critical	P Level	MSD	Deci	sion(0.05)		
16150-000	16150-001	-0.5021	1.94318	0.6832	0.04772	.04772 Non-Significant Effect		ect	
Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16150-000	A	0.96872	0.05238	0.98058	0.01409	1 39638	1 35081	1./3000	0.04064



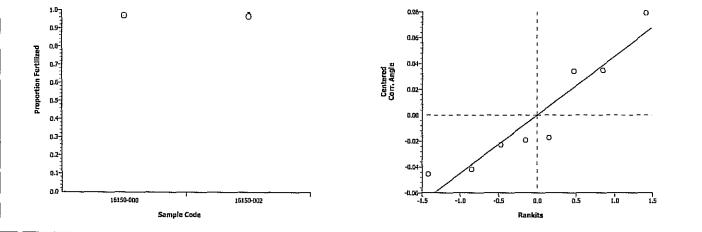
Comparisons: Report Date:

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Analysis:

1 Aug-07 2:00 PM 05-6243-2709

Arbacia Sperm Cell Fertilization Test EnviroSystems, Inc. 80m Test No: 03-9154-3054 Test Type: Fertilization **Duration:** EPA/821/R-02-014 (2002) Arbacia punctulata Start Date: 09 Aug-07 04:20 PM Protocol: Species: **Ending Date:** 09 Aug-07 05:40 PM Dil Water: Not Applicable Source: In-House Culture 09 Aug-07 04:20 PM Not Applicable Setup Date: Brine: **Endpoint Analysis Type** Sample Link Control Link **Date Analyzed** Version Proportion Fertilized 02-1118-1875 02-1118-1875 13 Aug-07 3:10 PM CETISv1.026 Comparison Method Alt H **Data Transform** Z NOEL LOEL **Toxic Units** ChV MSDp Equal Variance t C > T Angular (Corrected) N/A ANOVA Assumptions Attribute Statistic Critical P Level Decision(0.01) Variance Ratio 1.74776 47.46723 0.65783 Equal Variances Variances Shapiro-Wilk W 0.88162 0.74935 0.18999 Normal Distribution Distribution **ANOVA Table** Source Sum of Squares Mean Square DF F Statistic P Level Decision(0.05) 0.91844 Non-Significant Effect Between 2.587E-05 2.587E-05 1 0.01 Error 0.0136125 0.0022687 6 0.01363833 0.0022946 Total 7 **Group Comparisons** Decision(0.05) P Level MSD Sample Sample Statistic Critical 1.94318 0.4592 16150-000 16150-002 0.10679 0.06545 Non-Significant Effect **Data Summary Original Data Transformed Data** Sample Code Count Mean Minimum Maximum SD Minimum Maximum SD Mean 16150-000 4 0.96872 0.95238 0.98058 0.01409 1.39638 1.35081 1.43099 0.04064 16150-002 4 0.96659 0.95238 0.99020 0.01636 1.39278 1.35081 1.47162 0.05372 Graphics o 0 Ō 0.06 0.04



Test No:

Start Date:

Setup Date:

Comparisons:

Page 4 of 7 21 Aug-07 2:00 PM

EnviroSystems, Inc.

08-2590-7150

Report Date: Analysis:

Arbacia	Sperm Cell	Fertilization	Test

Ending Date: 09 Aug-07 05:40 PM

09 Aug-07 04:20 PM

09 Aug-07 04:20 PM

03-9154-3054

Test Type: Fertilization

Protocol: EPA/821/R-02-014 (2002)

Dil Water: Not Applicable Brine: Not Applicable

80m Duration:

Species: Arbacia punctulata

Source: in-House Culture

			····			Ξ
Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version	
Proportion Fertilized	Comparison	02-1118-1875	02-1118-1875	13 Aug-07 3:10 PM	CETISv1.026	_

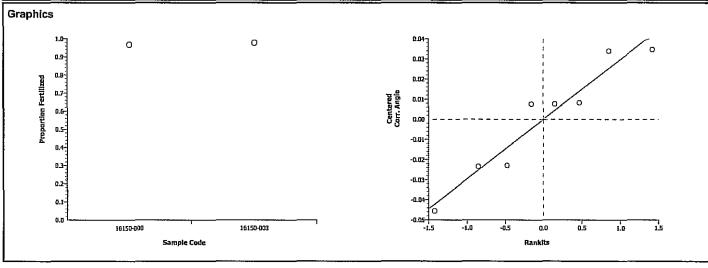
Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C>T	Angular (Corrected)				N/A		

ANOVA Assumptions Attribute Test Statistic Critical P Level Decision(0.01) Variance Ratio 47.46723 Variances 6.76388 0.15074 Equal Variances Distribution Shapiro-Wilk W 0.91479 0.74935 0.36413 Normal Distribution

ANOVA Table	-						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0013884	0.0013884	1	1.46	0.27166	Non-Significant Effect	
Error	0.0056864	0.0009477	6				
Total	0.00707484	0.0023361	7	-			

Group Companisons										
Sample	٧s	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)			
16150-000		16150-003	-1.2103	1.94318	0.8642	0.04230	Non-Significant Effect			

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16150-000	4	0.96872	0.95238	0.98058	0.01409	1.39638	1.35081	1.43099	0.04064
16150-003	4	0.97806	0.97087	0.98058	0.00479	1.42273	1.39929	1.43099	0.01562



Comparisons:

Page 6 of 7 21 Aug-07 2:00 PM 10-6892-8809

Report Date: Analysis:

EnviroSystems, Inc.

Arbacia Sperm Cell Fertilization Test

Test No: 09 Aug-07 04:20 PM Start Date:

03-9154-3054

Test Type: Fertilization

Duration: 80m

Species:

Arbacia punctulata

Setup Date:

Ending Date: 09 Aug-07 05:40 PM

Protocol: EPA/821/R-02-014 (2002)

Dil Water: Not Applicable

Source:

In-House Culture

Setup Date:	09 Aug-07 04:20 PM	Brine:	Not Applicable
l	-		

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Vers <u>ion</u>
Proportion Fertilized	Comparison	02-1118-1875	02-1118-1875	13 Aug-07 3:10 PM	CETISv1.026

Met	hod	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equ	al Variance t	C > T	Angular (Corrected)				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	8.75630	47.46723	0.10793	Equal Variances
Distribution	Shapiro-Wilk W	0.94788	0.74935	0.65313	Normal Distribution

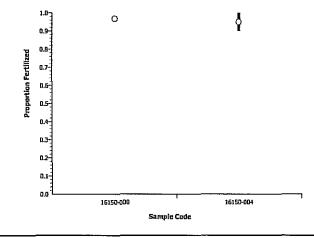
ANOVA Table

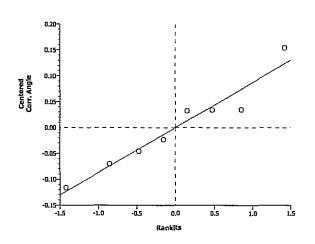
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0017389	0.0017389	1	0.22	0.65859	Non-Significant Effect	
Error	0.0483329	0.0080555	6				
Total	0.05007182	0.0097944	7	_			

Sample	VS	Sample	Statistic	Critical	P Level	MSD_	Decision(0.05)
16150-000		16150-004	0.46461	1.94318	0.3293	0.12332	Non-Significant Effect

Data Summary			Original Data			Original Data Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16150-000	4	0.96872	0.95238	0.98058	0.01409	1.39638	1.35081	1.43099	0.04064
16150-004	4	0.94960	0.90090	1.00000	0.04432	1.36689	1.25055	1.52127	0.12025







Comparisons:

Page 7 of 7 21 Aug-07 2:00 PM

13-1479-5850

Report Date: Analysis:

CETIS Analysis Detail

EnviroSystems, Inc.

Arbacia Sperm Cell Fertilization Test

Test No: Start Date: 03-9154-3054 09 Aug-07 04:20 PM Test Type: Fertilization

Protocol: EPA/821/R-02-014 (2002)

Duration: Species:

80m

Arbacia punctulata

Setup Date:

Ending Date: 09 Aug-07 05:40 PM

Dii Water: Not Applicable

Source:

In-House Culture

09 Aug-07 04:20 PM Not Applicable Brine:

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Fertilized	Comparison	02-1118-1875	02-1118-1875	13 Aug-07 3:10 PM	CETISv1.026
		<u> </u>			

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Angular (Corrected)				N/A		

ANOVA Assumptions

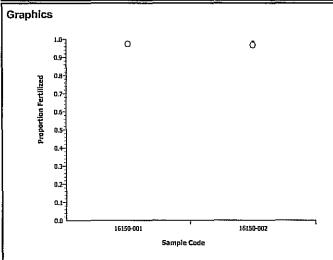
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	3.79185	47.46723	0.30260	Equal Variances
Distribution	Shapiro-Wilk W	0.89537	0.74935	0.25002	Normal Distribution

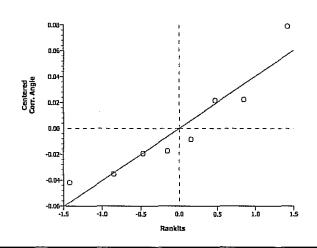
ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0005073	0.0005073	1	0.28	0.61682	Non-Significant Effect
Error	0.0109419	0.0018236	6			
Total	0.01144916	0.0023309	7			

Sample	VS_	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
16150-001		16150-002	0.52743	1.94318	0.3084	0.05868	Non-Significant Effect

Data Summary		Original Data			Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16150-001	4	0.97342	0.96154	0.98058	0.00906	1.40871	1.37340	1.43099	0.02759
16150-002	4	0.96659	0.95238	0.99020	0.01636	1.39278	1.35081	1.47162	0.05372





Comparisons:

Page 1 of 7 21 Aug-07 2:00 PM 04-6560-4440

Report Date: Analysis:

EnviroSystems, Inc.

14	₹rbacia	a Sperm	Cell	Fertil	ization	Tes
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Ending Date: 09 Aug-07 05:40 PM

Test No: Start Date: 03-9154-3054

Test Type: Fertilization Protocol:

EPA/821/R-02-014 (2002)

Not Applicable

Dil Water:

Duration: 80m

Source:

Species:

Arbacia punctulata In-House Culture

Setup	Date:
Endpo	int

Proportion Fertilized

09 Aug-07 04:20 PM

09 Aug-07 04:20 PM

Brine:

Analysis Type

Comparison

Not Applicable

Control Link	Date Analyzed	Version
02-1118-1875	13 Aug-07 3:10 PM	CETISv1.026

		<u></u>						
Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C>T	Angular (Corrected)	_			N/A		

Sample Link

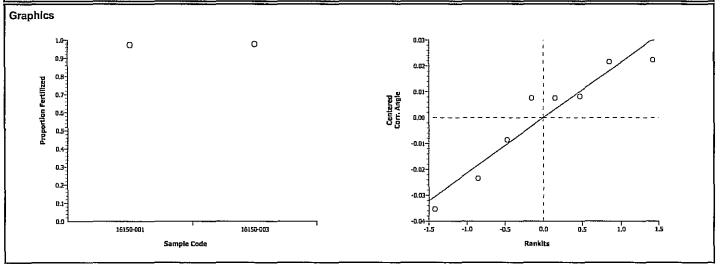
02-1118-1875

		Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	3.11764	47.46723	0.37533	Equal Variances	
Distribution	Shapiro-Wilk W	0.89800	0.74935	0.26335	Normal Distribution	
ANOVA Table						

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.000393	0.000393	1	0.78	0.41060	Non-Significant Effect
Error	0.0030159	0.0005026	6			
Total	0.00340885	0.0008956	7			

Group Com	haitan	113						
Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16150-001		16150-003	-0.8842	1.94318	0.7947	0.03081	Non-Significant Effect	

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16150-001	4	0.97342	0.96154	0.98058	0.00906	1.40871	1.37340	1.43099	0.02759
16150-003	4	0.97806	0.97087	0.98058	0.00479	1.42273	1.39929	1.43099	0.01562



Comparisons: Report Date:

Page 5 of 7 21 Aug-07 2:00 PM 10-3611-9046

EnviroSystems, Inc.

Analysis:

ن	E	115	Ana	iysis	Detail	
	_					

MLng	ria Shei	ini Cen	reiunz	anou i	esi					

Test Type: Fertilization Test No: 03-9154-3054 Duration: 80m

09 Aug-07 04:20 PM Protocol: EPA/821/R-02-014 (2002) Start Date: Species: Arbacia punctulata Ending Date: 09 Aug-07 05:40 PM Dil Water: Not Applicable Source: In-House Culture Setup Date: 09 Aug-07 04:20 PM Brine: Not Applicable

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Fertilized	Comparison	02-1118-1875	02-1118-1875	13 Aug-07 3:11 PM	CETISv1.026

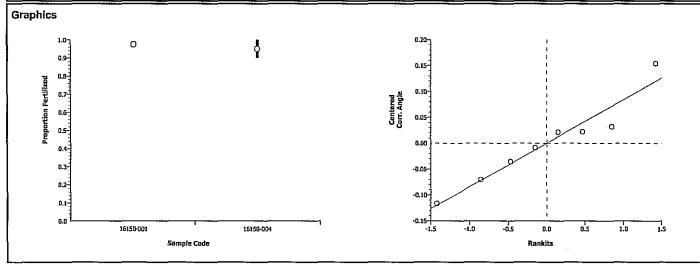
Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Angular (Corrected)				N/A		

ANOVA Assumptions Attribute Test Statistic Critical P Level Decision(0.01) Variance Ratio 18.99722 47.46723 0.03739 Variances Equal Variances 0.65926 Distribution Shapiro-Wilk W 0.94847 0.74935 Normal Distribution

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0034972	0.0034972	1	0.46	0.52311	Non-Significant Effect	,
Error	0.0456624	0.0076104	6				
Total	0.04915951	0.0111076	7				

Group Comp	panso	ns						
Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16150-001		16150-004	0.67788	1.94318	0.2616	0.11987	Non-Significant Effect	

Data Summary	Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16150-001	4	0.97342	0.96154	0.98058	0.00906	1.40871	1.37340	1.43099	0.02759
16150-004	4	0.94960	0.90090	1.00000	0.04432	1.36689	1.25055	1.52127	0.12025





Saskatchewan Research Council

15 Innovation Boulevard, Saskatoon, SK S7N 2X8 Phone: 306-933-5469

Sample Identification

16150-001 16150-002 16150-003 16150-004

Analyst

Mary Moody

SRC#

E 556, 557, 558, 559

E	556 to 559				• ' •				-	ATT 1000
Date	Aug 14/07	Ì				[İ	
			Суstocaл	ps per bra	nch		Mean	SD	Group mean	Comments
Marketina weekseen 1994 in 199	S TOOL CANNOT BEING TO ARRAY TO A STATE OF THE STATE OF T					<u> </u>	ì		and SD	
Control	NSW	41	37	42	51	41	42.4	5.2	38.6	Healthy red colour
	•	29	19	32	24	44	29.6	9.4	11.8	Normal growth
	Ì	41	52	63	27	33	43.2	14.5		
		61	42	30	26	36	39.0	13.7		
	16150-001	46	39	49	24	41	39.8	9.7	34.2	Healthy red colour
		21	26	30	21	39	27.4	7.5	10.5	Normal growth
		21	39	22	29	22	26.6	7.6		
		40	51	40	49	34	42.8	7.0		
	16150-002		tocarps on a				22.0	nc	19.5	Branches white with red tips.
			ocams on al				13.6	nc	пс	Branches fragmented.
			ocarps on al				18.0	nc		
		122 cys	tocarps on a	all 5 branch	1es		24.4	nc		Aught Aught Aught Aught Aught Market
	16150-003	50	39	54	46	44	46.6	5.7	40.4	Branches white with red tips.
700 THE STATE OF T		37	30	33	41	28	33.8	5.3	8.3	Some and a second distriction of the second
		54	43	40	45	45	45.4	5.2		
		24	30	46	39	39	35.6	8.6		
	16150-004	26	25	20	31	32	26.8	4.9	24.4	Branches white with red tips.
		6	13	10	8	15	10.4	3.6	10.8	
		28	35	41	44	33	36.2	6.4		
		24	22	20	18	36	24.0	7.1		

nc: not calculable

Submitted by:	Date:	

Report Date: Link:

21 Aug-07 3:55 PM 06-9683-0298

Champia parvi	ula Red Macroalga Sexu		Saskatchewan Research Council				
Test No: Start Date: Ending Date: Setup Date:	04-7828-8134 13 Aug-07 12:00 PM 20 Aug-07 12:00 PM 13 Aug-07 12:00 PM	Test Type: Protocol: Dil Water: Brine:	-			Duration: Species: Source:	7d 0h Champia parvula In-House Culture
'	06-6444-1965 09 Aug-07 04:00 PM 09 Aug-07 04:00 PM 92h	Material: Code: Source: Station:		ter d Harbor Drec Water Control	_	Client: Project:	Battelle Labs Ecological Risk Assessment
Sample No: Sample Date: Receive Date: Sample Age:	14-0079-4493 09 Aug-07 08:40 AM 09 Aug-07 02:55 PM 4d 3h	Material: Code: Source: Station:	Surface Wa 16150-001 New Bedfor WQ-TOX-0	d Harbor Dred	lge Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment
Sample No: Sample Date: Receive Date: Sample Age:	18-5933-9189 09 Aug-07 09:15 AM 09 Aug-07 02:55 PM 4d 2h	Material: Code: Source: Station:	Surface Wa 16150-002 New Bedfor WQ-TOX-00	d Harbor Dred	lge Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment
Sample No: Sample Date: Receive Date: Sample Age:	08-7827-7773 09 Aug-07 09:30 AM 09 Aug-07 02:55 PM 4d 2h	Material: Code: Source: Station:	Surface Wa 16150-003 New Bedfor WQ-TOX-0	d Harbor Dred	ige Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment
Sample No: Sample Date: Receive Date: Sample Age:	04-4490-4090 09 Aug-07 10:05 AM 09 Aug-07 02:55 PM 4d 1h	Material: Code: Source: Station:	Surface Wa 16150-004 New Bedfor WQ-TOX-0	d Harbor Dred	ige Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment
Mean Cystoca	rps Summary						
Sample Code 16150-000 16150-001 16150-002	Reps 4 4 4	Mean 38.55 34.15 19.5	Minimum 29.6 26.6 13.6	Maximum 43.2 42.8 24.4	3.11916 4.17642 2.36854	6.23832 8.35284 4.73709	CV 16.18% 24.46% 24.29%
16150-003 16150-004 Mean Cystoca	4 4	40,35 24.35	33.8 10.4	46.6 36.2	3.29178 5.33190	6.58357 10.6638	16.32% 43.79%
Sample Code	rps Detail Rep 1	Rep 2	Rep 3	Rep 4			
16150-000 16150-001 16150-002 16150-003	42.4 39.8 22 46.6	29.6 27.4 13.6 33.8	43.2 26.6 18 45.4	39 42.8 24.4 35.6			
16150-004	26,8	10.4	36.2	24			

Ending Date: 20 Aug-07 12:00 PM

Comparisons: Report Date:

Page 5 of 7 21 Aug-07 3:56 PM

Analysis:

11-3763-8324

Champia parvula Red Macroalga Sexual Reproduction Test

Saskatchewan Research Council

Test No:

04-7828-8134

13 Aug-07 12:00 PM

Test Type: Champia

Protocol:

EPA/600/4-91/003 (1994)

Duration: 7d 0h

Species: Champia parvula

	• • •	•
ource:	In-House	Culture

Endpoi	int	
⊏iinhoi	ILL	

13 Aug-07 12:00 PM Brine:

Dil Water: Not Applicable Not Applicable

Control Link

Date Analyzed Version

ChV

Mean Cystocarps

Start Date:

Setup Date:

Analysis Type Comparison

06-9683-0298

Sample Link

Z

06-9683-0298 21 Aug-07 3:54 PM CETISv1.026

Method Equal Variance t Alt H C > T

Data Transform Untransformed

NOEL LOEL **Toxic Units** N/A

MSDp

ANOVA Assumptions

Attribute	Test
Variances	Variance Rat

Statistic tio 1.79281 Shapiro-Wilk W 0.88694

Critical P Level 47.46723 0.64348 0.74935 0.21144

Equal Variances Normal Distribution

Decision(0.01)

ANOVA Table

Distribution

Source	Sum of Squares	Mean Square	DF
Between	38.72	38.72	1
Error	326.06	54.34333	6
Total	364.779999	93.063335	7

0.71

P Level 0.43098 Decision(0.05) Non-Significant Effect

Group Comparisons

Sample Sample 16150-001 16150-000

Statistic 0.84410

Critical 1.94318 P Level 0.2155

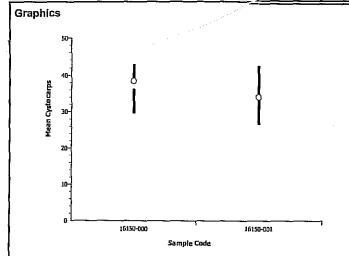
F Statistic

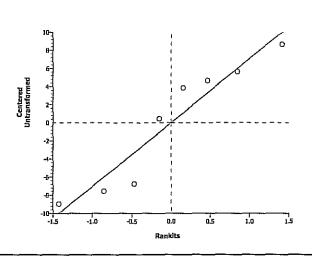
MSD 10.1291

Decision(0.05)

Non-Significant Effect

Data Summary		Originai Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
16150-000	4	38.5500	29.6	43.2	6.23832					
16150-001	4	34.15	26.6	42.8	8.35284					





Comparisons:

Page 4 of 7

21 Aug-07 3:56 PM

Report Date: Analysis:

10-7116-6050

Champia parvula Red Macroa	ilga Sexual Reproduction Test
----------------------------	-------------------------------

Saskatchewan Research Council

Test No:

04-7828-8134

Test Type: Champia

Duration:

Start Date:

13 Aug-07 12:00 PM

7d 0h

Ending Date:

20 Aug-07 12:00 PM

EPA/600/4-91/003 (1994) Protocol:

Species:

Champia parvula

Setup Date:

13 Aug-07 12:00 PM

Brine:

Dil Water: Not Applicable Not Applicable

Source:

In-House Culture

Endpoint Analysis Type		Sample Lir	nk C	ontrol Link	Date Analyzed		Version	
Mean Cystocarps	Comparison		06-9683-02	06-9683-0298 06-9683-0298		8 21 Aug-07 3:54 PM CETISv1.0		CETISv1.026
Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C>T	Untransformed				N/A		

ANOVA Assumptions

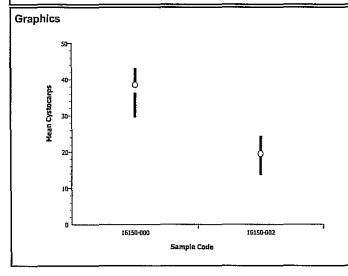
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.73425	47.46723	0.66224	Equal Variances
Distribution	Shapiro-Wilk W	0.88559	0.74935	0.20579	Normal Distribution

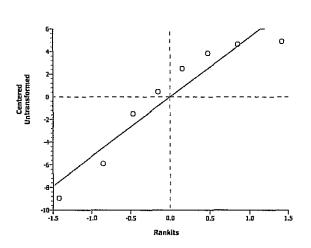
ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	725.805	725.805	1	23.66	0.00281	Significant Effect
Епог	184.07	30.67833	6			
Total	909.875	756.48333	7	_		

Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16150-000		16150-002	4.86401	1.94318	0.0014	7.61051	Significant Effect	

Data Summary	a Summary Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16150-000	4	38.5500	29.6	43.2	6.23832				
16150-002	4	19.5	13.6	24.4	4.73709				





Comparisons:

Page 2 of 7

21 Aug-07 3:56 PM 05-8701-8857

Report Date: Analysis:

Saskatchewan Research Council

Citampia	parvuia iteu i	Macioniga Sexual	Kehioduction	I Cat

Test No: Start Date: 13 Aug-07 12:00 PM

04-7828-8134

Test Type: Champia

Protocol:

EPA/600/4-91/003 (1994)

Duration: Species:

7d 0h

Champia parvula

Ending Date: Setup Date:

20 Aug-07 12:00 PM

13 Aug-07 12:00 PM

Brine:

Dil Water: Not Applicable Not Applicable Source:

In-House Culture

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Cystocarps	Comparison	06-9683-0298	06-9683-0298	21 Aug-07 3:54 PM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	1.11375	47.46723	0.93152	Equal Variances	
Distribution	Shapiro-Wilk W	0.87545	0.74935	0.16764	Normal Distribution	

ANOVA Table

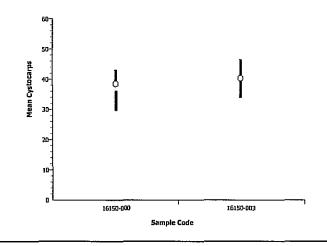
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	6.48	6.48	1	0.16	0.70516	Non-Significant Effect	
Error	246.78	41.13	6				
Total	253,259999	47.610001	7	_			

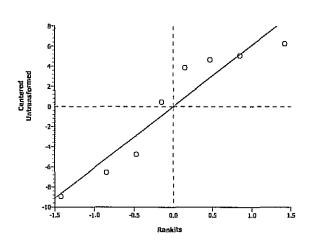
Group Comparisons

Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16150-000		16150-003	-0.3969	1.94318	0.6474	8.81206	Non-Significant Effect	_

Data Summary	Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16150-000	4	38.5500	29.6	43.2	6.23832				
16150-003	4	40.35	33.8	46.6	6.58356				

Graphics





Comparisons:

Page 1 of 7

Analysis:

21 Aug-07 3:56 PM 05-6330-3008

Saskatchewan Research Council

Report Date:

Champia parvula Red	l Macroalga S	exual Reproduction	1 Test

13 Aug-07 12:00 PM

Test No: Start Date: 04-7828-8134

Test Type: Champia

Protocol: Dil Water:

EPA/600/4-91/003 (1994)

Species:

Duration:

7d Oh Champia parvula

20 Aug-07 12:00 PM **Ending Date:** 13 Aug-07 12:00 PM

Brine:

Not Applicable

In-House Culture Source:

Not Applicable Setup Date:

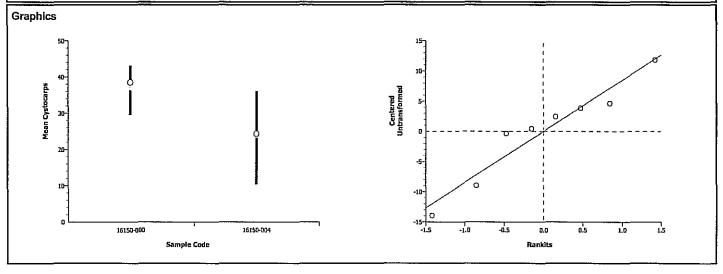
Endpoint	Analysis	Analysis Type		Sample Link Control Link		Date Analyzed		Version	
Mean Cystocarps	Comparison		06-9683-0298 06-968		06-9683-0298	83-0298 21 Aug-07 3:55 PM		CETISv1.026	
Method	Alt H	Data Transform	Z	NOE	LOEL	Toxic Units	ChV	MSDp	
Equal Variance t	C>T	Untransformed				N/A			

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	2.92206	47.46723	0.40199	Equal Variances	
Distribution	Shapiro-Wilk W	0.94134	0.74935	0.58692	Normal Distribution	

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	403.28	403.28	1	5.28	0.06120	Non-Significant Effect
Erro r	457.9	76.31667	6			
Total	861,179993	479.59666	7	_		

Group Comp	ariso	115						
Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16150-000		16150-004	2,29876	1.94318	0.0306	12.0035	Significant Effect	

Data Summary			Origi	nal Data	Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16150-000	4	38.5500	29.6	43.2	6.23832				
16150-004	4	24.35	10.4	36.2	10.6638				



Comparisons:

Page 3 of 7

21 Aug-07 3:56 PM 06-0868-6784

Champia parvula Red Macroalga Sexual Reproduction Test

Report Date: Analysis:

Test No:

04-7828-8134 Test Type: Champia

13 Aug-07 12:00 PM 20 Aug-07 12:00 PM

Protocol: EPA/600/4-91/003 (1994) Dil Water:

Not Applicable

Not Applicable

Saskatchewan Research Council

7d Oh Duration:

Species: Champia parvula In-House Culture Source:

Brine: Setup Date: 13 Aug-07 12:00 PM

Endpoint	Analysis	Туре	Sample L	ink	Control Link	Date Analyzed	i	Version
Mean Cystocarps	Compari	son	06-9683-0	298	06-9683-0298	21 Aug-07 3:55	5 PM	CETISv1.026
Method	Alt H	Data Transform	Z	NOE	L LOEL	Toxic Units	ChV	MSDp

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C>T	Untransformed			-	N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	3.10918	47.46723	0.37642	Equal Variances
Distribution	Shapiro-Wilk W	0.90637	0.74935	0.30999	Normal Distribution

ANOVA Table

Start Date:

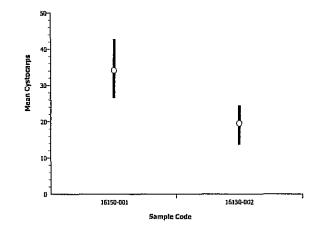
Ending Date:

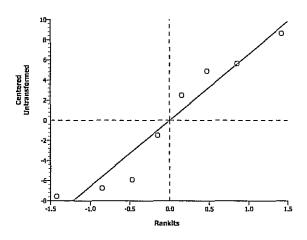
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	429.245	429.245	1	9.31	0.02248	Significant Effect
Error	276.63	46.105	6			
Total	705.875	475.34999	7			

Sample	Vs_	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
16150-001		16150-002	3.05126	1.94318	0.0112	9.3298	Significant Effect

Data Summary			Origi	nal Data			Transfo	rmed Data	d Data		
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD		
16150-001	4	34.15	26.6	42.8	8.35284						
16150-002	4	19.5	13.6	24.4	4.73709						







Comparisons: Report Date:

Page 6 of 7

Saskatchewan Research Council

Analysis:

21 Aug-07 3:56 PM 11-6036-9162

Champia parvula Red Macroalga Sexual Reproduction Test

Test No: 04-7828-8134 Test Type: Champia Start Date: 13 Aug-07 12:00 PM Protocol: 20 Aug-07 12:00 PM **Ending Date:**

Shapiro-Wilk W

EPA/600/4-91/003 (1994)

Duration: 7d 0h Species:

Champia parvula

Setup Date: 13 Aug-07 12:00 PM

Distribution

Brine:

Dil Water: Not Applicable

0.81143

In-House Culture Source:

Normal Distribution

Not Applicable

Endpoint	Analysi	s Туре	Sample L	ink	Control Link	Date Analyzed		Version
Mean Cystocarps	Compar	ison	06-9683-0	298	06-9683-0298	21 Aug-07 3:55	PM	CETISv1.026
Method	Alt H	Data Transform	Z.	NOE	L LOEL	Toxic Units	ChV	MSDp
Fouel Variance t	CST	Untransformed		1		N/Δ		

Method	Alt	H Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance	t C>	T Untransformed				N/A		
ANOVA Assum	ptions						<u>—·-</u>	
Attribute	Test	Statistic	Critical	P Leve	1	Decision(0.01)		
Variances	Variance Ratio	1,60971	47.46723	0.7052	6	Equal Variances		

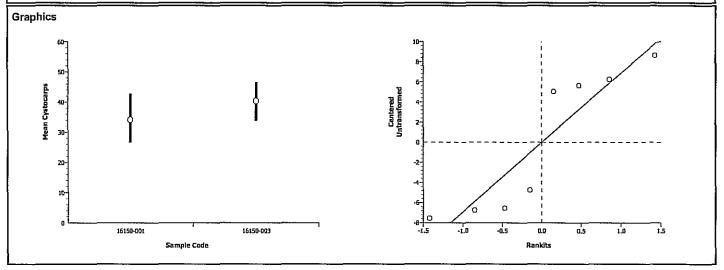
ANOVA Table			***				**
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	76.88	76.88	1	1.36	0.28790	Non-Significant Effect	
Error	339.34	56.55667	6				
Total	416.219994	133.43666	7				

0.74935

0.04292

Group Comp	pariso	ns					
Sample	VS_	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
16150-001		16150-003	-1.1659	1.94318	0.8561	10.3333	Non-Significant Effect

Data Summary	Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16150-001	4	34.15	26.6	42.8	8.35284				
16150-003	4	40.35	33.8	46.6	6.58356				



Comparisons: Report Date:

Page 7 of 7

21 Aug-07 3:56 PM

Analysis:

14-7313-1797

Saskatchewan Research Council

Test No: Start Date:

04-7828-8134

Test Type: Champia

Protocol: EPA/600/4-91/003 (1994)

Dil Water: Not Applicable

Duration: 7d 0h

Species: Champia parvula

Setup Date:

13 Aug-07 12:00 PM

13 Aug-07 12:00 PM

Ending Date: 20 Aug-07 12:00 PM

Brine:

Not Applicable

Source:

In-House Culture

Totap -uto.	 , ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
	 		
Endpoint	Ana	alvsis Type	

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Cystocarps	Comparison	06-9683-0298	06-9683-0298	21 Aug-07 3:55 PM	CETISv1.026
					<u> </u>

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed		1		N/A	"	

ANOVA Assumptions

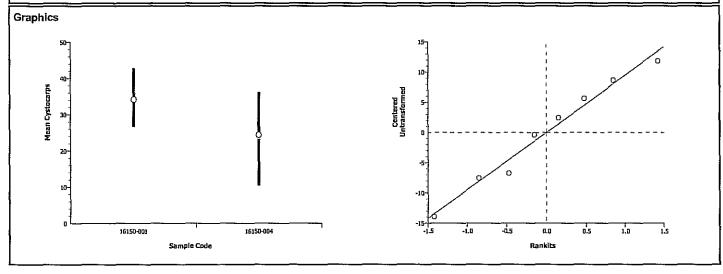
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	_
Variances	Variance Ratio	1.62988	47.46723	0.69799	Equal Variances	
Distribution	Shapiro-Wilk W	0.96589	0.74935	0.84219	Normal Distribution	

ANOVA Table

1.0.0.1						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	192.08	192.08	1	2.09	0.19806	Non-Significant Effect
Error	550.46	91.74333	6			
Total	742.540024	283.82333	7.	· 		
ľ						

Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16150-001		16150-004	1.44695	1.94318	0.0990	13.1609	Non-Significant Effect	

Data Summary			Original Data				Transformed Data		
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16150-001	4	34.15	26.6	42.8	8.35284				
16150-004	4	24.35	10.4	36.2	10.6638				



SALTWATER ASSAYS

A. bahia, A. punctulata, C. parvula

STUDY:	LOCATION: Nev	w Bedford Harbor			
		-			
CHEMISTRY	Lab Salt Control	-001	-002	-003	-004
AMMONIA	-007	-005	- 00 6	-007	-008
AS RECEIVED WATER QUALITIES	Lab Salt Control	-001	-002	-003	-004
SALINITY (ppt)	30	30	30	30	30
pH (SU)	7.95	7.36	7.26	7.38	7.39
TRC (mg/L)	20.05	20.05	40.05	40.05	40.05
DO (mg/L)	6.8	6.8	(0.6	7.2	5.8
S/C (µmhos/cm)	44630	B)44630110	45100	45240	44960
WQ STATION USED	1				
INITIALS	SJ	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
A. bahia SALINITY					
A. Dania SALIMITY ADJUSTMENT RECORD	Lab Salt Control	-001	-002	-003	-004
SAMPLE (mLs)					*******
SEA SALT (g)					
DATE:					
TIME:					
JINITIALS:					

Sample ID	ESI Cube ID
-001	-001
-002	-002
-003	-003
-004	-004

Americamysis bahia 7 DAY CHRONIC ASSAY NEW WATER QUALITIES

STUDY:	ن	CLIEN BATTI		. <u>.</u>			OCATION: LAB CONTROL: HAMPTON ESTUARY									
			NEW D)ISSOL	VED OX	(YGEN	(mg/L)				NEW	SALINI	ΓΥ (ppt)		~	
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6	
LAB	Α	68	6.6	6.4	6.9	6.8	6.8	6.4	795	29	30	29	30	29	29	
-001	Α	63	6.3	6.4	6.6	6.7	7.2	6.5	730	29	30	29	29	29	zg	
-002	Α_	6-6	6.7	6.6	6.7	6.5	7.1	6-7	7.84	29	30	29	29	28	29	
-003	Α	7.2	6.8	6.7	6.8	6.6	6.8	7.6	788	29	29	29	30	29	29	
-004	Α	5.8	6.0	6.0	5.9	6.5	7.1	7.0	789	29	29	29	30	29	29	
			NEV	V pH (S	U)				ভিৰ্মাণ NEW TEMPERATURE (°C)							
CONC	REP	. 0	1	2	3	4	5	6	0	1	2	3	4	5	6	
LAB	Α	7.95	7.85	7.89	7.72	7.75	7.86	771	25	25	25	25	25	25	25	
-001	Α_	7.34	7.20	7.36	7.30	7.19	7.14	7.10	25	25	25	25	25	25	25	
-002	Α	7.26	7.06	7.24	7.23	7.16	7.19	6.94	25	25	25	25	25	25	25	
-003	Α	7.38	7.14	7.31	7.30	7.25	7.33	7.((25	25	25	25	25	25	25	
-004	A	7.35	7.19	7.28	7.31	7.28	7,38	7.21	25	25	25	25	25	25	25	
INC TEN	/IP:	25	26	26	26	24	26	76_								
DATE:		8901	8/10	8111	8/12	8 13	8114	8115								
TIME:		1600	0190	1410	1010	1125	1040	1223								
INIT:		SJ	RAM	<u>(</u> 'S	ST	55	RAM	5h								

		N	EW WATE	R QUALITIE:	JSED S			
	0	1	2	3	4	5	6	\ 7
Water Quality Station #		2	1			1		
Initials		RAM	CS.	SJ	55	RAM	Ths	
Date	8907	8110	8/11	812	8/13	8114	XIZ	

Americamysis bahia 7 DAY CHRONIC ASSAY OLD WATER QUALITIES

			OLD WATER C												
STUDY:		CLIEN			1	TION:			LAB CONTROL: HAMPTON ESTUARY						
16150		BATT	ELLE		NEW	BEDF	ORD		HAM	PTON	ESTU	ARY			
			D S AI	INITY ('nnt\				010 -11 (01)						
									OLD pH (SU)						
Conc	Rep	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Control	Α	29	29	29	29	28	29	30	7.85	7.69	7.85	7.81	7.98	761	7.97
-001	Α		29	29	30	30	30	30	7.68	7.80	7.73	7.78	7.85	7.50	7.93
-002	Α	29	29	29	30	30	30	30	סד.ר	7.72	7.75	7.80	181	7.44	7.91
-003	Α	29	29	29	30	30	30	30	7.67	7.71	7.74	7.82	7.88	7.71	7.97
-004	Α	29	29	29	30	30	30	30	7.81	7:80	7.76	7:30	7.88	7.61	7.98
		OLD T	EMPE	RATU	RE (°C)									
Conc	Rep	1	2	3	4	5	6	7							
Control	Α	25	25	25	25	25	25	25							
-001	Α	25	25	25	25	25	25	15							
-002	Α	25	25	25	25	25	25	25							
-003	Α	25	25	25	25	25	25	25							
-004	Α	25	25	25	25	25	75	25							
			•			,)								
INC TEMP	?:	26	26	26	26	26	26	24							
DATE:		8/10/07	8/11	8/12	- L		8115	8/16							
TIME:		0815	1355	0840	1035	OF30		1030							
INITIALS:		RAM	CS	53	55	RAM	加山	55							

GENERAL NOTES - for additional information refer to SOP #1411 or EPA manual 600/4-91/003

- •Test vessels will be 250 mL glass beakers containing a minimum of 150 mL of solution
- •8 replicates per site with 5 organisms each

•Test Temperature: 26±1°C

•Salinity: 25 ±2ppt

•Dissolved Oxygen: >4.3 mg/L

•Photoperiod will be 16 hours light and 8 hours dark.

•Passing criteria require ≥80% survival and average dry weight of ≥0.20 mg/organism in the control vessels.

		WAI	OLD WATER	QUALITIES				
	0	1	2	3	4	5	6	7
Water Quality Station #		2	l	<u> </u>		ı		1
Initials		RAM	CS	SJ	SJ	RAM	Ons	SJ
Date	890	Sholar	8/11/07	8/12	813	8114	815	8/16

Arbacia punctulata Chronic Fertilization Assay Water Quality and Gamete Preparation Data

STUDY: /4/50	CLIENT: BATTELLE	LOCATION: New Bedford		DATE: 8 (7157 313
SALINITY ADJUSTMENT I	RECORD:	mL -001 +	g SALT		
SALINITY ADJUSTMENT I	RECORD:	mL -002 +	gSALT	@ N/A	
SALINITY ADJUSTMENT I	RECORD:	mL -003 +	g SALT	70/9/8225	
SALINITY ADJUSTMENT I	RECORD:	mL -004 +	g SALT		
SALINITY ADJUSTED SAMPLE	D.O. (mg/L)	pH (SU)	SPEC COND (µmhos)	TEMP (°C)	SALINITY (ppt)
Lab Control	6.8	7.95	44630	22	29
-001	6.3	7.36	9544910	22	29
-002	6.6	7.26	45100	22	29
-003	7.2	7.38	45260	72	29
-004	5.8	7.39	44960	22	29

METERS USED

DO meter # 19 DO probe # 12 pH meter # 1047 pH probe # 50 S/C meter # 15530 C S/C probe # 15530 C

DATE & INITIALS FOR GAMETE PREPARATION: 38 8 19 37 SPERM DILUTIONS:

HEMACYTOMETER COUNT, E: SPERM CONCENTRATIONS:

 $\begin{array}{rcl} 12 & \times 10^4 & = & \text{SPM SOLUTION E} = 1.25 \times 10^6 \\ \hline & \text{SOLUTION E X } 40 = \text{SOLUTION A} = \underbrace{5 \circ \times 10^7}_{\text{SPM}} \text{SPM} \\ & \text{SOLUTION E X } 20 = \text{SOLUTION B} = \underbrace{2 \cdot 5 \times 10^7}_{\text{SPM}} \text{SPM} \\ & \text{SOLUTION E X } 5 = \text{SOLUTION C} = \underbrace{6.25 \times 10^6}_{\text{SPM}} \text{SPM} \\ \end{array}$

FINAL COUNTS:

FINAL SPERM COUNT: 5. 5 × 15 FINAL EGG COUNT: 2800

TEST TIMES:

SPERM COLLECTED: 1600
EGGS COLLECTED: 1600
SPERM ADDED: 1620
EGGS ADDED: 1720
FIXATIVE ADDED: 1740

See ESI SOP #1412 for additional information

Americamysis bahia 7 DAY CHRONIC ASSAY SAMPLE USE RECORD

STUDY: 10/50)	CLIENT: BA	TTELLE - Nev	w Bedford	<u> </u>		l			
SPECIES: A. bal		OLILIT. DA	TEST: chroi							
	Day: 0	· ·	Day: 1		Day: 2					
Sample	Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID	Day	Date	Time	Init
Lab Control	1200	n/a	1000	n/a	1000	n/a	0	8/9/07	(555	SJ
-001		-001		-001		-001	1	8/10	~~~	RAM
-002		-002		~002		-002	2	8/11	1410	cs
-003		-003		~003		-003	3	8/12	1005	SJ
-004		-004		-004	\checkmark	-004	4	8/13	1115	SJ
							5	8/14	1015	RAM
							6	X15	1545	NS
	Day: 3	-	Day: 4		Day: 5					
Sample	Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID				
Lab Control	1600	n/a	1000	n/a	1000	n/a				
-001		-001		-001		-001				
-002		_ 002		-002		-002				
-003		-003		-00B		-∞3				
-004	<u> </u>	-004	10	-004	4	~004				
	Day: 6									
Sample	Volume Used (mL)	ESI Cube ID	:							
Lab Control	lan	n/a								
Lab Control		-00					N. T.			
		~007					N.			
-001		-00					No.			

Americamysis bahia 7 DAY CHRONIC ASSAY SURVIVAL & OLD WATER QUALITIES

STUDY:		CLIEN				LOCA	TION:			LAB	CONT				NISM	
16234		Battel	е		<u>-</u>	NEW	BEDFO	DRD		HAM	PTON	ESTUA	RY	BATC	H/LOT	#
				NUMBI	ER OF	· · · · · · · · · · · · · · · · · · ·	VORS	A			OLD [DISSOL	VED C	XYGE	N (mg/l	_)
SAMPLE	Rep	0	1	2	3	4 X	5	6	7.	1	2	3	4	5	6	7
	Α	10	iv	10	10	10	10	10	10	6.6	$\dot{\varphi}_i \mathcal{O}$	5.3	5.8	5.7	5.2	5.8
	В	10	סו	70	10	10	10	10	10	6.4	6.0	5.0	5.4	5.4	4.9	5.9
	С	10	jō	10	10	10	10	10	10	6.5	5.9	5.1	5.3	5.3	5.1	5.9
Lab	D	16	ſΟ	10	10	10	10	10	10	6.7	5.9	5.2	5.4	5-1	5.2	5,8
Control	E	lΟ	Ol	10	10	10	10	10	10	6.6	(O. D	5.5	5.4	4.9	5.1	5.8
	F	10	10	10	10	10	10	t o	10	6.5	0.0	5.4	5.4	4.9	5.0	5.8
	G	10	GI	סן	10	10	(0	10	10	6.6	U.O	5.5	5,6	5.0	5.0	5.7
	Н	16	D	10	10	10	10	10	10	6.8	6.0	5.6	5.6	5.1	5.1	5.7
	Α	10	10	10	10	10	10	10	10	6.4	4.9	4.3	5.1	5.1	5.0	52
	В	/0	0	10	10	10	10	10	10	5.8	4.5	4.6	5.2	4.9	4.8	5.2
	С	10	B	10	10	10	10	10	10	5.7	4.7	5.0	5.1	4.9	4.6	5.2
001	D	10	P	16	10	10	0	10	0	6.1	4.7	5.1	5.4	4.8	4.6	5.3
	Е	10	10	9	9	9	9	9	9	6.2	4.7	5.1	5.3	4.6	4.7	54
<i>t'</i>	F	10	10	10	10	10	10	[0	10	5.8	4.5	5.0	5.1	4.7	4.9	5.4
••"	G	ιo	10	10	10	10	[0	10	10	5.9	4.5	5.0	5.1	4.6	4.8	5.3
	Н	10	OI.	10	10	ID	10	(7)	10	6.2	4.6	4.9	4.8	4.7	4.8	5.3
	Α	10	10	ΙÔ	10	10	10	(0	10	6.4	5.5	4.9	5.0	4.9	4.9	5.3
	В	10	10	10	10	10	[0	10	10	67	5.6	4.7	5.1	4.9	49	5.3
,	С	10	10	16	10	10	10	10	10	6.8	5,5	5.2	5.3	5.1	4.7	5.3
-002	D	10	P	10	10	10	10	10	10	F. 2	5,5	50	5.1	5.1	4.6	5.3
-002	Е	10	10	10	10	10	2	10	10	7.0	5.4	5.3	5,1	5.3	49	55
	F	10	P	16	10	9	9	9	9	7.1	6.4	5.3	5.2	5.4	5.1	5.5
	G	10	10	10	10	10	16	10	10	7.0	54	5.1	5.1	54	5.1	5.5
	Н	10	10	10	10	10	10	19	10	7. o	6.5	5.1	5.1	5.3	4.9	5.5
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Americamysis bahia 7 DAY CHRONIC ASSAY SURVIVAL & OLD WATER QUALITIES

STUDY: _16234		CLIEN Battell				LOCA	TION:			LAB	CONTE PTON	ROL: ESTUA	RY	ORGA BATC	NISM H/LOT	#
,			i	NUMBE	R OF	SURVI	VORS				OLD E	DISSOL	VED C	OXYGEN (mg/L)		
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
	Α	10	O	10	10	b	Е	7	7	6.6	5.1	50	5.1	5.2	4.9	5.6
	В	10	\D	10	10	10	9	8	4	6.7	5.2	5.1	5.6	5.2		5.6
	С	10	GI	10_	10	10	10	9	4		54	5.2	5.4		4.9	5.5
-003	D	Įυ	GI	10	10	10	10	8		6,9	5.4	5.2		5,3	4.7	5.3
	E	10	σl	10	10	10	10	8	4	6.4	5.5	5.1	54	5.4	4.6	
	F	[0	0	10	10	9	9	7	3	6.8	54	5.1	<u>5.4</u>		4.6	5.2
	G	10	O	10	10	10	10	4	4	6.7	5,2	5.2	\vdash	<u>5,4</u>	4.8	
	Н	lu	10	/6_	10	b	10_	Г	3	6.8	5.4	53	5.2	5.4	4.6	5.3
	A						_									
	B ———									<u>-</u>						
	С		1								-					
-004	D														<u> </u>	
	E										<u> </u>					
	F		<u> </u>												_	
	G	<u> </u>						,		V						_
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		AND THE PROPERTY OF THE PROPER	A CONTRACT OF THE PROPERTY OF	make to the control of the control o	and the control of th	AND AND AND AND AND AND AND AND AND AND	The second secon	and the second s		Approximate the second of the	Approximate Forms	manufact of conditions of the condition	Proceedings of the Control of the Co	A Company of the Comp	A Company of the Comp	The second secon
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INC TEMP:	A Company of the Comp	7.5	26	26	26	11n	26	26	26	The second section of the second seco	A AMADEM TO THE PROPERTY OF TH	The second of th	Service of the servic	and the first of the second of	The control of the co	The process of the control of the co
DATE:		9/12	26 9]13		9115		9/17	9/18	919	de la companya del companya de la companya del companya de la companya de la companya del comp	The second secon		The second secon	CONTRACTOR OF THE PROPERTY OF	A APP TO THE PROPERTY OF THE P	A second
TIME:		1515	1545	1065		0950		7 .	0850				The second secon	The American Control of the Control	The second secon	And the second s
INITIALS:		AK	PA	LB	RAM		55	SJ	RAM	And physical and a second and a	A CONTROL OF THE PROPERTY OF T	A STATE OF THE PROPERTY OF THE	Berlin 1992 Service State Control of the Control of	AND AND AND AND AND AND AND AND AND AND	A Particular Confession of the	A series of the control of the contr

Americamysis bahia 7 DAY CHRONIC ASSAY ORGANISM WEIGHTS

CLIENT: BATT	ELLE - NE	W BEDFORD		TEST DATES	:		- F	
STUDY#: \G	234			SPECIES: A.	bahia			
CONC	REP	TARE WEIGHT (g)	SHRIMP + FOIL (g)	NET WEIGHT (mg)	# SHRIMP DAY 0	MEAN WEIGHT (mg) DAY 0	# SHRIMP DAY 7	MEAN WEIGHT (mg) DAY 7
	Α	0.21012	0.21291					
	В	0.20835	0.21104					
	С	0.20875	0.21158					
Lab	D	0.20840	0.21132					
	E	0.20753	0.21046					
	F	0.21050	0.21321		 			
	G	0.20882	0.21131					
	Н	0.20888	0.21177					
·	Α	0.20844	0.21170					
	В	0.20762	0.21071					
	С	0.20778						
-001	D	0.20903	0.21259					
	E	0.20995					<u> </u>	
	F	0.21090	0.21425					
	G	0.20880	0.21217				,,,,,,	
	Н	0.20933						<u> </u>
	A	0.20657	1.20965					
	В	0.20814	0.21103				<u></u>	·
	С	0.20774	0.21086					
-002	D	0.21034	0.21309					
	E	0.20828		}				
	F		0:21096					
	G	0.20977	0.21270					
	H	0.20856						
DATE		9119107	9/20/07				ļ <u>-</u>	
TIME		0930	0.935				<u> </u>	
INITIALS		RAM	<u> </u>					

Americamysis bahia 7 DAY CHRONIC ASSAY ORGANISM WEIGHTS

CLIENT: BATT	ELLE - NE	W BEDFORD		TEST DATES	:		· <u></u>	
STUDY#: \G1	234 <u> </u>			SPECIES: A.	bahia			
CONC	REP	TARE WEIGHT (g)	SHRIMP + FOIL (g)	NET WEIGHT (mg)	# SHRIMP DAY 0	MEAN WEIGHT (mg) DAY 0	# SHRIMP DAY 7	MEAN WEIGHT (mg) DAY 7
	Α	0.20904	0.21024					
	В	0.20981	0.21072					
	C	0.20977	0.21050					
-003	D	0.20789	0.20939	······································				
	Е	0.20772	0.20852			_		
	F	0.20872	0.20912					
	G	0.20830	0.20923					
	Н	0.20766	0.20837			<u></u>		
	Α							
	В							
	С							
	D							
	Ε							
	F							
	G							
	Н							
	Α							
	В				#h			· · · · · · · · · · · · · · · · · · ·
	С							
	D							
	E				 			
	F							
	G]			
	Н		- 1 - 1 ·					1"""
DATE		9/19/07	0/20/07		<u> </u>			1
TIME		0930	0935					
INITIALS		RAM	SJ					

CETIS Test Summary

Report Date: Link: 20 Sep-07 10:36 AM

03-1251-8257

Mysidopsis 7-c	i Survival, Growth and	Fecundity Te	st				EnviroSystems, Inc.
Test No: Start Date: Ending Date: Setup Date:	02-9890-7741 12 Sep-07 03:40 PM 19 Sep-07 09:50 AM 12 Sep-07 03:40 PM	Test Type: Protocol: Dil Water: Brine:)	Duration: Species: Source:	6d 18h Mysidopsis bahia ARO - Aquatic Research Organisms, N
•	07-3947-2649 12 Sep-07 03:00 PM 12 Sep-07 03:00 PM 40m	Material: Code: Source: Station:	Surface Wa 16234-000 New Bedford WQ-TOX-La	d Harbor Drec	ige Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment
-	10-1282-1229 11 Sep-07 09:01 AM 11 Sep-07 04:00 PM 31h	Material: Code: Source: Station:				Client: Project:	Battelle Labs Ecological Risk Assessment
	06-2367-6386 11 Sep-07 09:45 AM 11 Sep-07 04:00 PM 30h	Material: Code: Source: Station:				Client: Project:	Battelle Labs Ecological Risk Assessment
-	12-6128-6246 11 Sep-07 10:15 AM 11 Sep-07 04:00 PM 29h	Material: Code: Source: Station:				Client: Project:	Battelle Labs Ecological Risk Assessment
7d Proportion	Survived Summary					<u></u>	
Sample Code 16234-000 16234-001 16234-002 16234-003	Reps 8 8 8 8	Mean 1.00000 0.98750 0.98750 0.45000	Minimum 1.00000 0.90000 0.90000 0.30000	Maximum 1.00000 1.00000 1.00000 0.70000	SE 0.00000 0.01250 0.01250 0.05669	0.00000 0.03536 0.03536 0.16036	CV 0.00% 3.58% 3.58% 35.63%
_	mass-mg Summary						
Sample Code 16234-000 16234-001 16234-002 16234-003	Reps 8 8 8 8	Mean 0.27813 0.32238 0.28287 0.08975	Minimum 0.24900 0.29100 0.24100 0.04000	0.29300 0.35600 0.31200 0.15000	SE 0.00524 0.00724 0.00904 0.01177	0.01483 0.02048 0.02556 0.03329	5.33% 6.35% 9.04% 37.10%
	ght-mg Summary						
Sample Code 16234-000 16234-001 16234-002 16234-003	Reps 8 8 8	Mean 0.27813 0.32642 0.28636 0.19978	Minimum 0.24900 0.30700 0.24100 0.13333	Maximum 0.29300 0.35600 0.31200 0.23666	0.00524 0.00570 0.00788 0.01263	0.01483 0.01613 0.02229 0.03571	5.33% 4.94% 7.78%

Page 2 of 2

CETIS Test Summary

Report Date: Link: 20 Sep-07 10:36 AM 03-1251-8257

7d Proportion Survived Detail Sample Code Rep 1 Rep 2 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 Rep 3 16234-000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 16234-001 1.00000 1.00000 1.00000 1.00000 0.90000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 1.00000 0.90000 1.00000 1.00000 16234-002 0.70000 0.40000 0.40000 0.70000 0.40000 0.30000 0.40000 0.30000 16234-003 Mean Dry Biomass-mg Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 0.26900 0.29300 0.28900 16234-000 0.27900 0.28300 0.29200 0.27100 0.24900 16234-001 0.32600 0.30900 0.31800 0.35600 0.29100 0.33500 0.33700 0.30700 16234-002 0.30800 0.28900 0.31200 0.27500 0.24100 0.25100 0.29300 0.29400 16234-003 0.12000 0.09100 0.07300 0.15000 0.08000 0.04000 0.09300 0.07100 Mean Dry Weight-mg Detail Sample Code Rep 1 Rep 2 Rep 3 Rep 4 Rep 5 Rep 6 Rep 7 Rep 8 0.27900 0.26900 0.28300 0.29200 0.29300 0.27100 0.24900 0.28900 16234-000 0.32333 16234-001 0.32600 0.30900 0.31800 0.35600 0.33500 0.33700 0.30700 16234-002 0.30800 0.28900 0.31200 0.27500 0.24100 0.27889 0.29300 0.29400 16234-003 0.17143 0.22750 0.18250 0.21429 0.20000 0.13333 0.23250 0.23666

Comparisons: Report Date:

Page 3 of 5

Analysis:

20 Sep-07 10:38 AM 11-8957-6453

Mysidopsis 7-d Survival, Growth and Fecun	dity Test

Test No:

02-9890-7741

12 Sep-07 03:40 PM

Test Type: Growth-Survival-Fec (7d)

Duration: 6d 18h

EnviroSystems, Inc.

Start Date:

Protocol:

Mysidopsis bahia

Ending Date: 19 Sep-07 09:50 AM

Analysis Type

EPA/821/R-02-014 (2002) Dil Water: Not Applicable

Species: Source:

ARO - Aquatic Research Organisms, N

Setup Date:

Endpoint

12 Sep-07 03:40 PM

Brine:

Not Applicable

Control Link Date Analyzed Version 03-1251-8257 20 Sep-07 10:34 AM | CETISy1 026

7d Proportion Survived	Compar	ison	03-1251-8	257 03-	03-1251-8257 20 Sep-07 10:34 AM		4 AM CE	CETISv1.026	
Method	Alt H	Data Transform	Z	NOEL.	LOEL	Toxic Units	ChV	MSDp	
Mann-Whitney U	C>T	Angular (Corrected)				N/A			

Sample Link

ANOVA Assumptions

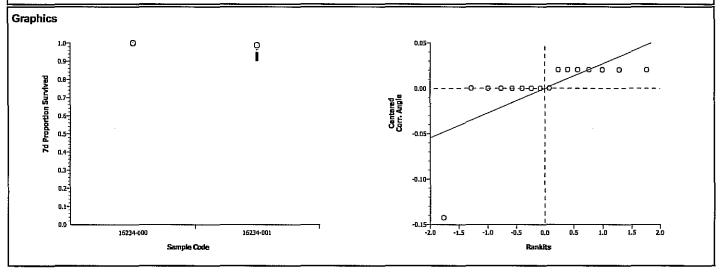
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	13082630000	8.88539	0.00000	Unequal Variances
Distribution	Shapiro-Wilk W	0.46890	0.84420	0.00000	Non-normal Distribution

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.00166	0.00166	1	1.00	0.33428	Non-Significant Effect	
Error	0.0232394	0.00166	14			•	
Total	0.02489937	0.0033199	15				

Sample	VS	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)	
16234-000		16234-001	36		0.3605	1	Non-Significant Effect	

Data Summary	Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD'	Mean	Minimum	Maximum	SD
16234-000	8	1.00000	1.00000	1.00000	0.00000	1.41202	1.41202	1.41202	0.00025
16234-001	8	0.98750	0.90000	1.00000	0.03536	1.39164	1.24905	1.41202	0.05762



Comparisons: Report Date:

Page 4 of 5

20 Sep-07 10:38 AM

13-7819-7995

My	sidopsis	7-d Surv	ival, Grow	th and Fo	ecundity Tes
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Analysis:

EnviroSystems, Inc.

mysiuopsis	r-u Suivivai,	Grown: and	recuitality	IGSL

Test No:

Duration: 6d 18h

Start Date:

02-9890-7741

Test Type: Growth-Survival-Fec (7d)

Mysidopsis bahia

Ending Date: 19 Sep-07 09:50 AM

12 Sep-07 03:40 PM

EPA/821/R-02-014 (2002) Protocol:

Species: Source:

ARO - Aquatic Research Organisms, N

Setup Date:

12 Sep-07 03:40 PM

Brine:

Dil Water: Not Applicable Not Applicable

> **Date Analyzed** Version

Endpoint Analysis Type Sample Link Control Link 7d Proportion Survived Comparison 03-1251-8257 03-1251-8257 20 Sep-07 10:34 AM CETISv1.026

Data Transform **NOEL Toxic Units** ChV Method Alt H Z LOEL MSDp Mann-Whitney U C > T Angular (Corrected) N/A

ANOVA Assumptions

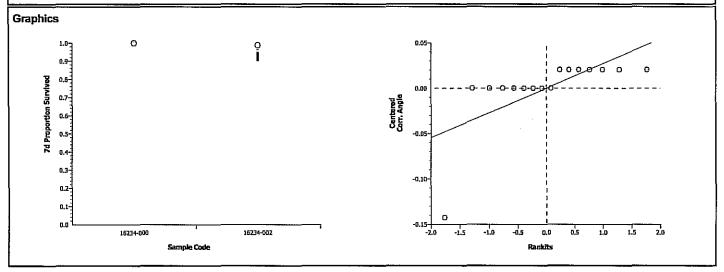
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	13082630000	8.88539	0.00000	Unequal Variances
Distribution	Shapiro-Wilk W	0.46890	0.84420	0.00000	Non-normal Distribution

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.00166	0.00166	1	1.00	0.33428	Non-Significant Effect
Error	0.0232394	0.00166	14			
Total	0.02489937	0.0033199	15	_		

Sample	VS	Sample	,	Statistic	Critical	P Level	l Ties	Decision	(0.05)	<u> </u>
16234-000		16234-002	3	36		0.3605	1	Non-Sign	ificant Effect	

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16234-000	8	1.00000	1.00000	1.00000	0.00000	1.41202	1.41202	1.41202	0.00025
16234-002	8	0.98750	0.90000	1.00000	0.03536	1.39164	1.24905	1.41202	0.05762



Comparisons:

Page 1 of 5

Report Date:

20 Sep-07 10:38 AM

Analysis:

01-3547-7941

Mysidopsis 7-d Survival, Growth and Fecundity Test EnviroSystems, Inc. Test Type: Growth-Survival-Fec (7d) Test No: 02-9890-7741 Duration: 6d 18h

Start Date: 12 Sep-07 03:40 PM Ending Date: 19 Sep-07 09:50 AM

EPA/821/R-02-014 (2002) Protocol:

Species:

Mysidopsis bahia

Setup Date: 12 Sep-07 03:40 PM Dil Water: Not Applicable Brine: Not Applicable Source:

ARO - Aquatic Research Organisms, N

Endpoint Analysis Type Sample Link Control Link **Date Analyzed** Version 7d Proportion Survived Comparison 03-1251-8257 03-1251-8257 20 Sep-07 10:35 AM CETISv1.026

NOEL Method Alt H Data Transform Z LOEL **Toxic Units** ChV MSDp Mann-Whitney U C > T Angular (Corrected) N/A

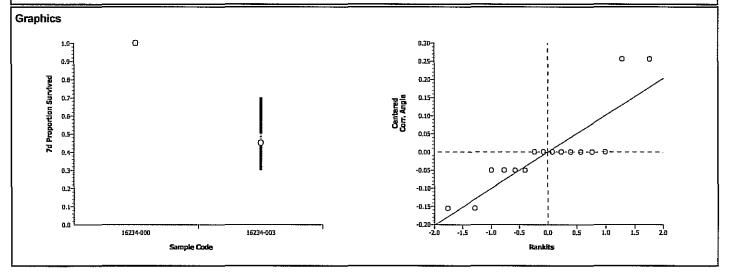
ANOVA Accumptions

ANOVA ASSUMPTIONS									
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)				
Variances	Variance Ratio	10674580000	8.88539	0.00000	Unequal Variances				
Distribution	Shapiro-Wilk W	0.75452	0.84420	0.00033	Non-normal Distribution				

ANOVA Table Source Sum of Squares Mean Square DF F Statistic P Level Decision(0.05) 1.833085 1.833085 135.34 0.00000 Significant Effect Between 1 0.1896186 0.0135442 Еггог 14 Total 2.02270404 1.8466296 15

Group Comparisons Sample Statistic Critical P Level Decision(0.05) Sample VS Ties 16234-000 16234-003 64 0.0001 4 Significant Effect

Original Data **Data Summary** Transformed Data Sample Code Count Mean Minimum Maximum SD Mean Minimum Maximum SD 16234-000 1.41202 0.00025 8 1.00000 1.00000 1.00000 0.00000 1.41202 1.41202 16234-003 8 0.45000 0.30000 0.70000 0.16036 0.73506 0.57964 0.99116 0.16459



Comparisons: Report Date:

Page 5 of 5 20 Sep-07 10:38 AM

Analysis:

15-1673-4402

EnviroSystems, Inc.

Mysidopsis 7-d Survival, Growth and Fecundity Test

02-9890-7741

Test Type: Growth-Survival-Fec (7d)

12 Sep-07 03:40 PM Ending Date: 19 Sep-07 09:50 AM

Protocol: EPA/821/R-02-014 (2002)

Dil Water: Not Applicable

Not Applicable

Duration:

Species:

Source:

6d 18h

Mysidopsis bahia

ARO - Aquatic Research Organisms, N

Setup Date: 12 Sep-07 03:40 PM Brine:

Endpoint Sample Link Control Link **Date Analyzed Analysis Type** Version 03-1251-8257 20 Sep-07 10:35 AM 7d Proportion Survived Comparison 03-1251-8257 CETISv1.026

Method Alt H Data Transform Z NOEL LOEL **Toxic Units** ChV MSDp Mann-Whitney U C > T Angular (Corrected) N/A

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.00000	8.88539	1.00000	Equal Variances
Distribution	Shapiro-Wilk W	0.39803	0.84420	0.00000	Non-normal Distribution

ANOVA Table

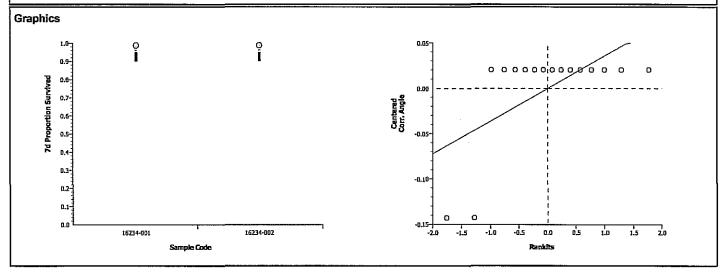
Test No:

Start Date:

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0	0	1	0.00	1.00000	Non-Significant Effect	
Error	0.0464788	0.0033199	14				
Total	0.04647883	0.0033199	15	_			

Sample	vs	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)
16234-001		16234-002	32		0.4796	2	Non-Significant Effect

Data Summary	Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	ŞD	Mean	Minimum	Maximum	SD
16234-001	8	0.98750	0.90000	1.00000	0.03536	1.39164	1.24905	1.41202	0.05762
16234-002	8	0.98750	0.90000	1.00000	0.03536	1.39164	1.24905	1.41202	0.05762



Comparisons: Report Date:

Page 2 of 5 20 Sep-07 10:38 AM

EnviroSystems, Inc.

Analysis:

08-7906-3079

Mysidopsis 7-	d Survival,	Growth and	Fecundity 1	Test

02-9890-7741

Test Type: Growth-Survival-Fec (7d)

Duration:

6d 18h

Mysidopsis bahia

Start Date:

Test No:

12 Sep-07 03:40 PM Ending Date: 19 Sep-07 09:50 AM

Analysis Type

Comparison

EPA/821/R-02-014 (2002) Protocol: Dil Water: Not Applicable

Species: Source:

ARO - Aquatic Research Organisms, N

Setup Date:

Endpoint

12 Sep-07 03:40 PM

Brine:

Not Applicable

Sample Link	Control Link	Date Analyzed	Version
03-1251-8257	03-1251-8257	20 Sep-07 10:35 AM	CETISv1.026

Method	Alt H	Data Transform	Z.	NOEL	LOEL	Toxic Units	ChV	MSDp
Mann-Whitney U	C>T	Angular (Corrected)				N/A		

ANOVA Assumptions

7d Proportion Survived

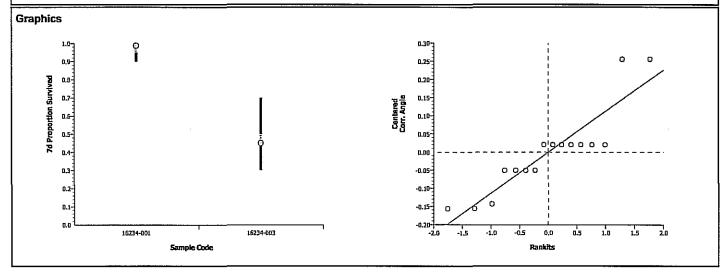
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	8.15935	8.88539	0.01284	Equal Variances
Distribution	Shapiro-Wilk W	0.82785	0.84420	0.00541	Non-normal Distribution

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	1.724421	1.724421	1	113.42	0.00000	Significant Effect
Error	0.212858	0.0152042	14			
Total	1.93727942	1.7396255	15	_		

Sample	VS	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)
16234-001		16234-003	64		0.0001	4	Significant Effect

Data Summary	Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16234-001	8	0.98750	0.90000	1.00000	0.03536	1.39164	1.24905	1.41202	0.05762
16234-003	8	0.45000	0.30000	0.70000	0.16036	0.73506	0.57964	0.99116	0.16459



Comparisons:

Page 1 of 5

EnviroSystems, Inc.

Analysis:

Report Date:

20 Sep-07 10:40 AM 01-2002-6068

Mysid <u>opsis 7-d S</u>	Survival, Growti	n and Fecundi	ty Test
--------------------------	------------------	---------------	---------

Test No: Start Date: 02-9890-7741

12 Sep-07 03:40 PM

Test Type: Growth-Survival-Fec (7d)

Duration: wi6dyst8his, Inc.

Ending Date: 19 Sep-07 09:50 AM

Protocol:

EPA/821/R-02-014 (2002) Dil Water: Not Applicable

Species One Mysticops Spahla
Species P.O. Box 778
Source: Hampion, NAquatic, Research Organisms, N

Setup Date: 12 Sep-07 03:40 PM

Brine:

Not Applicable

(603) 926-3345 • (603) 926-3521 Fax

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	03-1251-8257	03-1251-8257	20 Sep-07 10:35 AM	CETISv1.026

Method	Ait H	Data Transform	Z.	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

ANOVA Assumptions

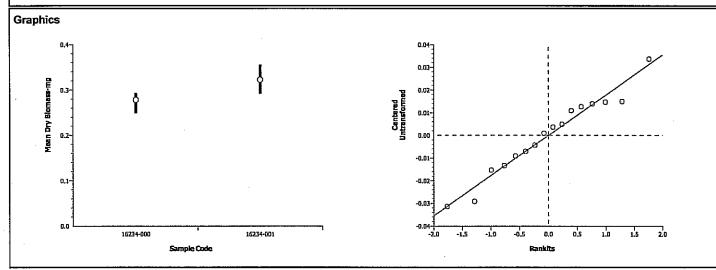
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	1.90761	8.88539	0.41349	Equal Variances	
Distribution	Shapiro-Wilk W	0.96597	0.84420	0.73539	Normal Distribution	

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0078322	0.0078322	1	24.50	0.00021	Significant Effect
Error	0.0044748	0.0003196	14			
Total	0.01230705	0.0081519	15	-		

Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
16234-000		16234-001	-4.9501	1.76131	0.9999	0.01574	Non-Significant Effect

Data Summary		Original Data			Transformed Data					
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
16234-000	8	0.27813	0.24900	0.29300	0.01483		*			
16234-001	8	0.32238	0.29100	0.35600	0.02048					



Comparisons: Report Date:

Page 2 of 5 20 Sep-07 10:40 AM

Analysis:

03-4657-3352

EnviroSystems, Inc.

Mysidepsis 1 di Survival, Growth and Fecundity Test

02-9890-7741

12 Sep-07 03:40 PM Ending Date: 19 Sep-07 09:50 AM 12 Sep-07 03:40 PM Test Type: Growth-Survival-Fec (7d) Protocol: EPA/821/R-02-014 (2002)

Dil Water: Not Applicable Brine: Not Applicable Duration non-6 dyst8his, Inc.

Species ne Mysldöpsís báhia Source: P.O. ARO 778 quatic Research Organisms, N Hampton, N.H. 03843-0778 (603) 926-3345 • (603) 926-3521 Fax

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	03-1251-8257	03-1251-8257	20 Sep-07 10:35 AM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		11.00

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	2.97248	8.88539	0.17393	Equal Variances
Distribution	Shapiro-Wilk W	0.92827	0.84420	0.22590	Normal Distribution

ANOVA Table

Test No:

Start Date:

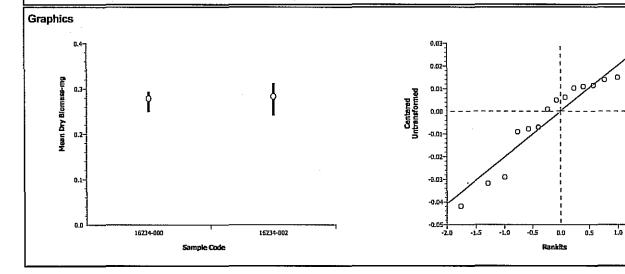
Setup Date:

							-
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	9.024E-05	9.024E-05	1	0.21	0.65638	Non-Significant Effect	
Ептог	0.0061137	0.0004367	14				
Total	0.00620392	0.0005269	15	_			

Group Comparisons

Sample	VS	Sample	Statistic	Critical	P Level	MSD _	Decision(0.05)
16234-000		16234-002	-0.4546	1.76131	0.6718	0.01840	Non-Significant Effect

Data Summary			Origi	Original Data			Transformed Data		
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16234-000	8	0.27813	0.24900	0.29300	0.01483				
16234-002	8.	0.28287	0.24100	0.31200	0.02556				



1,0

2.0

1.5

Comparisons:

Page 4 of 5

20 Sep-07 10:40 AM

EnviroSystems, Inc.

Report Date: Analysis:

12-8058-8834

Mysidepsis 7 d Survival, Growth and Fecundity Test

Test No:

Start Date:

Ending Date:

02-9890-7741

12 Sep-07 03:40 PM

19 Sep-07 09:50 AM

Protocol:

Test Type: Growth-Survival-Fec (7d)

EPA/821/R-02-014 (2002)

Duration hvir 6 dys18 h.s. Inc.

Species ne Mysidopsis bahia

Source: P.O. ARO - Aquatic Research Organisms, N Hampton, N.H. 03843-0778

(603) 926-3345 • (603) 926-3521 Fax

Setup Date: 12 Sep-07 03:40 PM

Brine:

Dil Water: Not Applicable Not Applicable

Endpoint	Analysis Type	Sample Link	Control Link	www.envirosystems.co	Version
Mean Dry Biomass-mg	Comparison	03-1251-8257	03-1251-8257	20 Sep-07 10:35 AM	CETISv1.026

Method	Alt H	Data Transform	z _	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	5.04200	8.88539	0.04879	Equal Variances	
Distribution	Shapiro-Wilk W	0.96203	0.84420	0.66666	Normal Distribution	

ANOVA Table

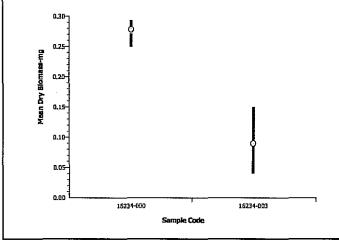
Source	Sum of Squares	Mean Square	DF	F Statistic	P Levei	Decision(0.05)
Between	0.141941	0.141941	1	213.70	0.00000	Significant Effect
Error	0.0092987	0.0006642	14			
Total	0.15123966	0.1426052	15	_		

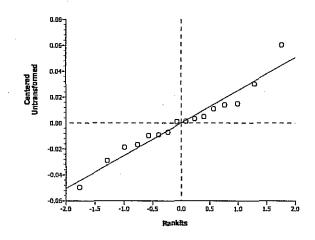
Group Comparisons

Sample	V\$	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16234-000		16234-003	14.6187	1.76131	0.0000	0.0227	Significant Effect	

Data Summary	Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16234-000	8	0.27813	0.24900	0.29300	0.01483			,	
16234-003	8	0.08975	0.04000	0.15000	0.03329				

Graphics





Comparisons:

Page 3 of 5

Report Date:

20 Sep-07 10:40 AM

Analysis:

07-0641-0034

Mysidopsis 7-ti Survival, Growth and Fecundity Test

EnviroSystems, Inc.

Test No:

02-9890-7741

Test Type: Growth-Survival-Fec (7d)

Duration vir 6 dysl. 8 hrs., Inc.

Start Date:

12 Sep-07 03:40 PM

Ending Date: 19 Sep-07 09:50 AM Protocol: EPA/821/R-02-014 (2002) Dil Water: Not Applicable

Species One Mysidops is 8 dahia
Source: Hampton, T.A. quatic, Research Organisms, N

Setup Date:

12 Sep-07 03:40 PM

Brine:

Not Applicable

(603) 926-3345 • (603) 926-3521 Fax

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	03-1251-8257	03-1251-8257	20 Sep-07 10:35 AM	CETISv1.026
	A16 13 Dete T6	7 100	ri LOCI	Tavia II-iI- Oh	W Men-

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.55823	8.88539	0.57273	Equal Variances
Distribution	Shapiro-Wilk W	0.95931	0.84420	0.61969	Normal Distribution

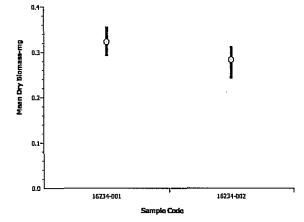
ANOVA Table

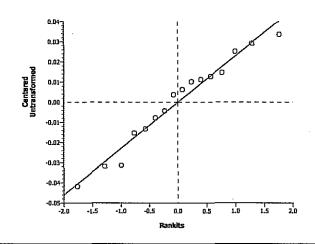
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0062411	0.0062411	1	11.63	0.00422	Significant Effect
Error	0.0075105	0.0005365	14			
Total	0.01375157	0.0067775	15			

Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16234-001		16234-002	3.41083	1.76131	0.0021	0.0204	Significant Effect	

Data Summary	Original Data			Transformed Data					
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16234-001	8	0.32238	0.29100	0.35600	0.02048				
16234-002	8	0.28287	0.24100	0.31200	0.02556				







Comparisons:

Page 5 of 5

Report Date:

20 Sep-07 10:40 AM

15-1918-6347

d Survival, Growth and Fecundity Test

Analysis:

EnviroSystems, Inc.

Test No: Start Date:

Ending Date:

Setup Date:

02-9890-7741

12 Sep-07 03:40 PM 19 Sep-07 09:50 AM

12 Sep-07 03:40 PM

Brine:

Test Type: Growth-Survival-Fec (7d)

EPA/821/R-02-014 (2002)

Protocol: Dil Water: Not Applicable Not Applicable Durationavir6flys18his, Inc.

Species ne Mýšiďopšis bahia
P.O. Boy 778
Source: Hampion N. H. U.3043-0778
Hampion N. H. U.3043-0778

(603) 926-3345 • (603) 926-3521 Fax

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Dry Biomass-mg	Comparison	03-1251-8257		20 Sep-07 10:35 AM	
g					

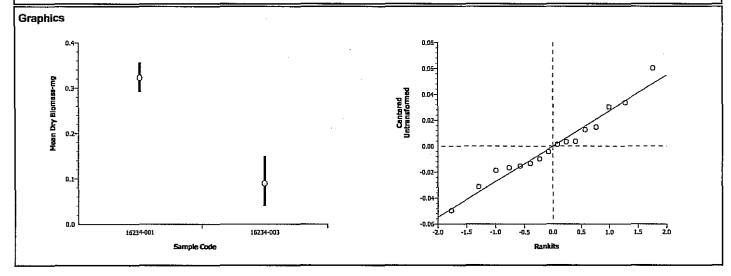
Method	AIt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

ANOVA Assum	ANOVA Assumptions									
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)					
Variances	Variance Ratio	2.64310	8.88539	0.22304	Equal Variances					
Distribution	Shapiro-Wilk W	0.97426	0.84420	0.87102	Normal Distribution					

ANOVA Table						•	4
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	—.
Between	0.2164579	0.2164579	1	283.34	0.00000	Significant Effect	
Error	0.0106955	0.000764	14				
Total	0.22715343	0.2172219	15	_			

Group Comp	oariso	ns						
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16234-001		16234-003	16.8326	1.76131	0.0000	0.02434	Significant Effect	

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean.	Minimum	Maximum	SD
16234-001	8	0.32238	0.29100	0.35600	0.02048				
16234-003	8	0.08975	0.04000	0.15000	0.03329				





Aquatic Research Organisms

DATA SHEET

I.	Organism I	listory
	Species:	AMERICAMYSIS bahia
•	Source:	Lab reared
		Hatch date 9-5-67 Receipt date
		Lot number 090507HS Strain
		Brood Origination Floring
II.	Water Qua	lity
		Temperature 25 °C Salinity = 30 ppt DO
	•	pH_7.8 Hardnessppm
III.	Culture Co	nditions
		System: RECIZC
		Diet: Flake Food Phytoplankton Trout Chow_
		Diet: Flake Food Phytoplankton Trout Chow Brine Shrimp Rotifers Other & CAD Shreing Die 7
		Prophylactic Treatments:
		Comments:
IV.	Shipping I	nformation
	·	Client: # of Organisms: 320 /
		Carrier: Date Shipped: 9-12-07
Dia:	logisti	Mark De constitution
DΙΟ	logist:	- I won't from the

1 - 800 - 927 - 1650

Arbacia punctulata Chronic Fertilization Assay Water Quality and Gamete Preparation Data



study: 16234	CLIENT: BATTELLE	LOCATION: New Bedford		DATE: 9/12/07 INITIALS: CB						
SALINITY ADJUSTMENT RECORD: 100 mL -001 + 0 g SALT										
SALINITY ADJUSTMENT RECORD: 1000 mL -002 + 0 g SALT										
SALINITY ADJUSTMENT	SALINITY ADJUSTMENT RECORD: 1000 mL -003 + 6 g SALT									
SALINITY ADJUSTMENT RECORD: 1000 mL -004 + 0 g SALT										
SALINITY ADJUSTED SAMPLE	D.O. (mg/L)	pH (SU)	SPEC COND (µmhos)	TEMP (°C)	SALINITY (ppt)					
Lab Control	6.6	7.76	47400	21	31					
-001 L	35.69	7.11	46400	21	30					
-002	6.6	7.09	46800	21	30					
-003	6.0	7.05	46800	21	30					
004					1,,5					

METERS USED

DO meter #<u>19</u> DO probe #<u>12</u> pH meter #<u>470</u> pH probe #<u>48</u> S/C meter #<u>6130</u>C S/C probe #<u>45130</u>C S/C probe #<u>45130</u>C

DATE & INITIALS FOR GAMETE PREPARATION: 9/12/07 LB SPERM DILUTIONS:

HEMACYTOMETER COUNT, E: 12 X 10⁴= SPM SOLUTION E = 1.21 X 10 SPERM CONCENTRATIONS: SOLUTION E X 40 = SOLUTION A = 4.54 X 10⁷ SPM SOLUTION A = 4.54

SOLUTION E X 40 = SOLUTION A = 4.84×10^{-7} SPM SOLUTION E X 20 = SOLUTION B = 2.42×10^{-7} SPM SOLUTION E X 5 = SOLUTION C = (6.05×10^{-6}) SPM

FINAL COUNTS:

FINAL SPERM COUNT: 4.84 X10 Z300

TEST TIMES:

SPERM COLLECTED: 1415
EGGS COLLECTED: 1415
SPERM ADDED: 1135
EGGS ADDED: 1735
FIXATIVE ADDED: 1755



Arbacia punctulata Chronic Fertilization Assay

SAMPLE USE RECORD

STUDY: 16234		CLIENT: Battelle - New Bedford				
SPECIES: A. punctu	lata					
) .				
!						
SAMPLE	Volume	Used (mL)	ESI Cube ID			
Lab Control	10	0	16263			
-001			-001			
-002			-007			
-003			-co3			
-004						
INITIALS:	lB					
TIME:	1356					
DATE:	9/12/0	7				

FERTILIZATION COUNTS

STUDY 16234	CLIENT BATTELLE	LOCATION New Bedford		DATE 9/13/07 INITIALS LB
	1	_2_	3	4
SAMPLE	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL
Lab Control	98/09	88/103	85/109	92/100
-001	99/110	94/100	97/103	99/107
-002	100/104	100/108	99/108	96/100
-003	90/100	106/114	100/124	84/104
-004				

CETIS Test Summary

Report Date:

13 Sep-07 9:26 PM

Link:

17-8040-2040

Arbacia Sperm	Cell Fertilization Test						EnviroSystems, Inc.
Test No: Start Date: Ending Date: Setup Date:	17-8705-3341 12 Sep-07 04:35 PM 12 Sep-07 05:55 PM 12 Sep-07 04:35 PM	Test Type: Protocol: Dil Water: Brine:	Fertilization EPA/821/R Not Applica Not Applica	-02-014 (2002 ible)	Duration: Species: Source:	80m Arbacia punctulata In-House Culture
, ,	07-3947-2649 12 Sep-07 03:00 PM 12 Sep-07 03:00 PM 95m	Material: Code: Source: Station:	Surface Water 16234-000 New Bedford Harbor Dredge Monitorin WQ-TOX-Lab Control			Client: Project:	Battelle Labs Ecological Risk Assessment
	10-1282-1229 11 Sep-07 09:01 AM 11 Sep-07 04:00 PM 32h	Material: Code: Source: Station:	Surface Wa 16234-001 New Bedfo WQ-TOX-0	rd Harbor Dred	lge Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment
. ,	06-2367-6386 11 Sep-07 09:45 AM 11 Sep-07 04:00 PM 31h	Material: Code: Source: Station:	Surface Wa 16234-002 New Bedfo WQ-TOX-0	rd Harbor Dred	dge Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment
	12-6128-6246 11 Sep-07 10:15 AM 11 Sep-07 04:00 PM 30h	Material: Code: Source: Station:	Surface Wa 16234-003 New Bedfo WQ-TOX-0	rd Harbor Dred	ige Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment
Proportion Fe	rtilized Summary	**					
Sample Code 16234-000 16234-001 16234-002 16234-003	Reps 4 4 4 4	Mean 0.86332 0.92675 0.94103 0.84402	Minimum 0.77982 0.90000 0.91667 0.79245	Maximum 0.92000 0.94175 0.96154 0.90000	SE 0.03102 0.00965 0.01155 0.02631	SD 0.06203 0.01931 0.02311 0.05261	CV 7.19% 2.08% 2.46% 6.23%
Proportion Fe	rtilized Detail			****			
Sample Code 16234-000 16234-001 16234-002 16234-003	Rep 1 0.89908 0.90000 0.96154 0.90000	0.94000 0.92593	Rep 3 0.77982 0.94175 0.91667 0.80645	Rep 4 0.92000 0.92523 0.96000 0.79245			

Comparisons: Report Date: Analysis:

Page 1 of 5 13 Sep-07 9:26 PM 06-8630-7781

EnviroSystems, Inc.

Arbacia Sperm Cell Fertilization Test

Test No:

17-8705-3341

Test Type: Fertilization

Protocol: EPA/821/R-02-014 (2002)

80m **Duration:** Species:

Arbacia punctulata Source: In-House Culture

Ending Date: 12 Sep-07 05:55 PM Setup Date:

Start Date:

12 Sep-07 04:35 PM

12 Sep-07 04:35 PM

Dil Water: Not Applicable Not Applicable Brine:

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version	
Proportion Fertilized	Comparison	17-8040-2040	17-8040-2040	13 Sep-07 9:25 PM	CETISv1.026	
Proportion Fertilized	Comparison	17-8040-2040	17-8040-2040	13 Sep-07 9:25 PM	CET	'ISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Angular (Corrected)	_			N/A		

ANOVA Assumptions

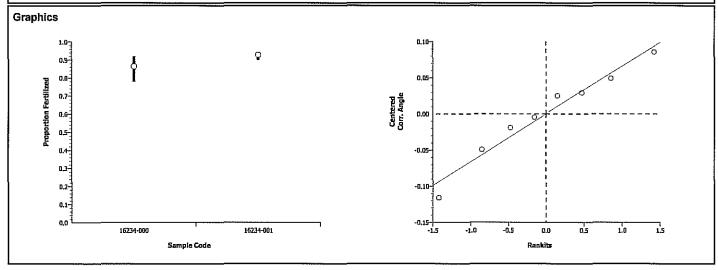
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	6.04834	47.46723	0.17352	Equal Variances
Distribution	Shapiro-Wilk W	0.96933	0.74935	0.87570	Normal Distribution

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0200063	0.0200063	1	4.37	0.08157	Non-Significant Effect
Error	0.0274746	0.0045791	6			
Total	0.04748086	0.0245854	7	_		

Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
16234-000		16234-001	-2,0902	1.94318	0.9592	0.09298	Non-Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16234-000	4	0.86332	0.77982	0,92000	0.06203	1.19830	1.08237	1.28404	0.08865
16234-001	4	0.92675	0.90000	0.94175	0.01931	1.29831	1.24905	1.32703	0.03605



Comparisons: Report Date: Analysis:

Page 5 of 5 13 Sep-07 9:26 PM

EnviroSystems, Inc.

11-0659-7912

	Arbacia	Sperm	Cell	Fertilization	Test
--	---------	-------	------	---------------	------

17-8705-3341

Test No:

Start Date:

Ending Date:

12 Sep-07 04:35 PM 12 Sep-07 05:55 PM

Test Type: Fertilization

EPA/821/R-02-014 (2002) Protocol: Dil Water: Not Applicable

Duration: 80m

Arbacia punctulata Species: Source: In-House Culture

Setup Date: 12 Sep-07 04:35 PM Brine: Not Applicable

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Fertilized	Comparison	17-8040-2040	17-8040-2040	13 Sep-07 9:25 PM	CETISv1.026

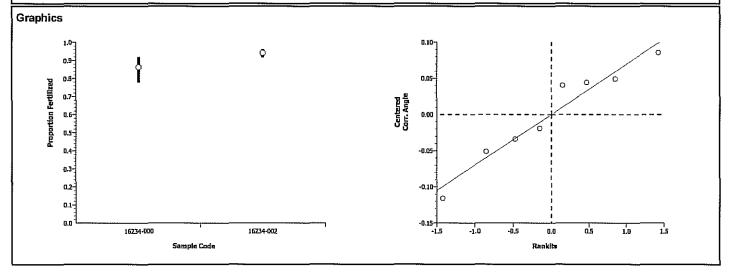
Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Angular (Corrected)				N/A		

ANOVA Assumptions									
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)				
Variances	Variance Ratio	3.20421	47.46723	0.36444	Equal Variances				
Distribution	Shapiro-Wilk W	0.94247	0.74935	0.59816	Normal Distribution				

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0341604	0.0341604	1	6.63	0.04211	Significant Effect	
Error	0.0309346	0.0051558	6				
Total	0.06509499	0.0393162	7	_			

Group Compa	ariso	ns						
Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16234-000		16234-002	-2.5740	1.94318	0.9789	0.09866	Non-Significant Effect	

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16234-000	4	0.86332	0.77982	0.92000	0.06203	1.19830	1.08237	1.28404	0.08865
16234-002	4	0.94103	0.91667	0.96154	0.02311	1.32899	1.27795	1.37340	0.04952



Test No:

Start Date:

Ending Date:

Comparisons: Report Date: Analysis: Page 2 of 5 13 Sep-07 9:26 PM

EnviroSystems, Inc.

ate: 13 Sep-07 9:26 PM 07-8728-6560

Arbacia Sperm Cell Fertilization Test

17-8705-3341

12 Sep-07 04:35 PM

12 Sep-07 05:55 PM

Test Type: Fertilization

Protocol: EPA/821/R-02-014 (2002)

Dil Water: Not Applicable

Duration: 80m

Species: Arbacia punctulata Source: In-House Culture

Setup Date: 12 Sep-07 04:35 PM Brine: Not Applicable

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Fertilized	Comparison	17-8040-2040	17-8040-2040	13 Sep-07 9:25 PM	CETISv1.026

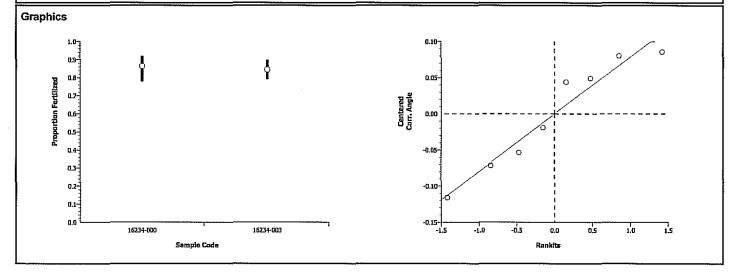
Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Angular (Corrected)				N/A		

ANOVA Assum	ANOVA Assumptions										
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)						
Variances	Variance Ratio	1.44805	47.46723	0.76828	Equal Variances						
Distribution	Shapiro-Wilk W	0.91859	0.74935	0.39111	Normal Distribution						

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0017504	0.0017504	1	0.26	0.62608	Non-Significant Effect	
Error	0.0398582	0.0066430	6				
Total	0.04160862	0.0083934	7	_			

Group Comparisons										
Į	Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)		
	16234-000		16234-003	0.51332	1.94318	0.3130	0.11199	Non-Significant Effect		

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16234-000	4	0.86332	0.77982	0,92000	0.06203	1.19830	1.08237	1.28404	0.08865
16234-003	4	0.84402	0.79245	0.90000	0.05261	1.16871	1.09778	1.24905	0.07367



Comparisons: Report Date: Analysis:

Page 3 of 5 13 Sep-07 9:26 PM

09-6777-5538

EnviroSystems, Inc.

Arbacia Sperm Cell Fertilization Test

17-8705-3341

Test Type: Fertilization

EPA/821/R-02-014 (2002) Protocol:

Duration: 80m

Arbacia punctulata Species:

Ending Date: 12 Sep-07 05:55 PM

Test No:

Start Date:

Dil Water: Not Applicable

Source:

In-House Culture

Setup Date:

12 Sep-07 04:35 PM

12 Sep-07 04:35 PM

Brine:

Not Applicable

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Fertilized	Comparison	17-8040-2040	17-8040-2040	13 Sep-07 9:26 PM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Angular (Corrected)				N/A		

ANOVA Assumptions

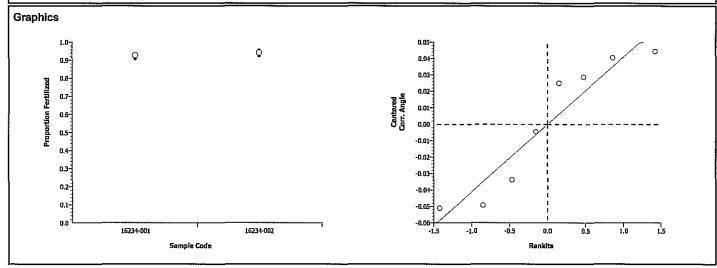
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	1.88762	47.46723	0.61487	Equal Variances	
Distribution	Shapiro-Wilk W	0.86563	0.74935	0.13703	Normal Distribution	

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.001882	0.001882	1	1.00	0.35521	Non-Significant Effect
Error	0.0112560	0.0018760	6			
Total	0.01313802	0.003758	7	_		

Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16234-001		16234-002	-1,0016	1.94318	0.8224	0.05951	Non-Significant Effect	

Data Summary			Original Data			Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16234-001	4	0.92675	0.90000	0.94175	0.01931	1.29831	1.24905	1.32703	0.03605
16234-002	4	0.94103	0.91667	0.96154	0.02311	1.32899	1.27795	1.37340	0.04952



Test No:

Start Date:

Ending Date: Setup Date:

Comparisons: Report Date:

Page 4 of 5 13 Sep-07 9:26 PM

Analysis:

09-8828-1331

EnviroSystems, Inc.

Arbacia	Sperm	Cell	Fertilization	Test
---------	-------	------	---------------	------

17-8705-3341

Test Type: Fertilization

12 Sep-07 04:35 PM 12 Sep-07 05:55 PM 12 Sep-07 04:35 PM Protocol:

EPA/821/R-02-014 (2002) Dil Water: Not Applicable

Brine: Not Applicable Duration: 80m

Arbacia punctulata Species:

Source: In-House Culture

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Fertilized	Comparison	17-8040-2040	17-8040-2040	13 Sep-07 9:26 PM	CETISv1.026

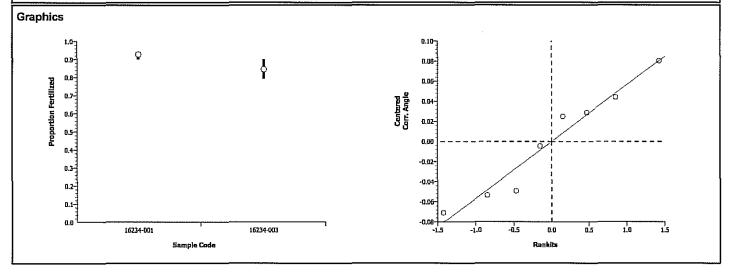
Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Angular (Corrected)		ll .		N/A		

ANOVA ASSUM	ptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	4.17689	47.46723	0.27093	Equal Variances	
Distribution	Shapiro-Wilk W	0.93882	0.74935	0.56247	Normal Distribution	

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0335920	0.0335920	1	9.99	0.01956	Significant Effect	
Error	0.0201797	0.0033633	6				
Total	0.05377168	0,0369553	7	<u> </u>			

Group Comp	ariso	ins						
Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16234-001		16234-003	3.16036	1.94318	0.0098	0.07969	Significant Effect	

Data Summary			Original Data			Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16234-001	4	0.92675	0.90000	0.94175	0.01931	1.29831	1.24905	1.32703	0.03605
16234-003	4	0.84402	0.79245	0.90000	0.05261	1.16871	1.09778	1.24905	0.07367





15 Innovation Boulevard, Saskatoon, SK S7N 2X8
Phone: 306-933-5469

Champia parvula Sexual Reproduction Test Quality Assurance Summary

Client	ESI Ltd.	SRC Sample #	E 565, 566, 567
File#	MM478	Test Initiation Date	Sept 13/07
Analyst	M. Moody	Test Completion Date	Sept 20/07
Sample Identity	0901-001, 0945-002, 1015-003, (all also labeled 091107)	·	

Test Type: Chronic, Definitive, Single-concentration (100%)

Test Organisms Species: *Champia parvula*, sexually mature male and female branches, in good health, males having sori with spermatia, females having trichogynes.

Test Conditions (additional information on following page)

Method: EPA-821-R-02-014 Method 1009.0, (Third edition, October 2002) static, non-renewal; 2-day effluent exposure followed by 5 to 7 day recovery period in control medium for cystocarp development.

Exposure/Dilution Medium: natural seawater collected at Pacific Environmental Science Centre, North Vancouver, B.C., filtered to 0.2μm and autoclaved before use, adjusted to salinity 30 ppt. and enriched with 10 ml/L Test Nutrient Solution, Table 1 of method cited.

Recovery Medium: natural seawater (same as for exposure medium), enriched with 10 ml/L Culture Nutrient Solution (method section 16.10.1.3).

Reference Toxicant Test

Method: EPA-821-R-02-014, Method 1009.0, static, non-renewal; 2-day exposure followed by 5 to 7 day recovery period in control medium for cystocarp development. See control performance and reference toxicant charts for additional information.

Test conditions: performed under same experimental conditions as effluent sample.

Compound: sodium dodecyl sulphate mg/L

Date of test: Aug 29/07	 Historic value, warning limits ±2SD
IC ₅₀ (95 % CL) mg/L 1.22 (1.08 - 1.30)	1.32 (1.06 - 1.64)

Quality Control Data

Control mortality: no control mortality was observed in any control solution during observation periods.

Mean number of cystocarps per plant counted in this test (must be >10 to be acceptable).

mean control cystocarps per female	19.0
% survival in Control	100

Cystocarp Counts (mean per female branch)

Control, natural seawater	19.0
0901-001 (091107)	20.8
0945-002 (091107)	27.4
1015-003 (091107)	5.5
Signature: Con morely De	ite: 100 1/07



15 Innovation Boulevard, Saskatoon, SK S7N 2X8 Phone: 306-933-5469

Test Data Summary

Samples	1			SR	LC#	E565, 566, 56	7 ·
Identification/Type	0901-001, 0945-0	002, 1015-003, (all als	o labeled 091107)	An	alyst	Mary Moody	
Date/Time Received	Sept 12/07 @ 1600 hr	Date Shipped	Sept 11/07	Temperatur Receipt (°C	•	3 with ice pac	ks
Test Initiation Date	Sept 13/07		Test Completion	n Date Se	pt 20/07		
Organism Inform	ation						
Species		Champia parvula	Appearar	ice/Health of C	hampia	excellent	
Source sexually r	nature male and femal	e branches, obtained from	m USEPA, Hatfield	Marine Science	Center, N	Vewport, Oregon, 19	195
Females, Presence of	Trichogynes	yes	Males, Presenc	e of Sori with S	Spermati	a yes	
Test Conditions			•				
Test Method	EPA-821-R-02-0	14, Method 1009.0	Ďilutior	/control water	Natur	ral Seawater	
	definitive single cor			, out of training			
Test Vessels (Exposu	-		L transparent pol	ystyrene cups. 1	ranspare	ent polystyrene lid:	S
Exposure	2 /		Recove				
Volume / Depth	100 mL / 4.5 cm			e / Depth	200 п	nL / 7.3 cm	
Replicates/Conc.	4		No. of a	organisms (fem	ale/male)	5	/1
Number and Concent Solutions (%v/v)	rations of Test	Controls: natural Tests: 100	sea water				
Chemicals added to c	ontrol/dilution water	Test ?	Nutrients as descri	bed in method	cited at 1	10 ml/L, analytical	grade
ample Treatment							•
D.O. before salinity a	djustment (mg/L)	see page 3	D.O. at test s	start (mg/L)			see page 3
Aeration (duration/rat			— Filtration	поп	e	pH Adjustment	none
Salinity Adjustment	not requ	aired, all samples were	at salinity of 30 ±				
	 -						" -
Exposure Period (48 h	•	1					
Temperature, pH, D.C	_						
Photoperiod (L:D h)	16:8	Agitation of tests and	d controls	gentle	rotary s	haking	
	4)						
Recovery Period (5-7	-)						
• `	eration supplied						
• `	eration supplied	ining 10 ml/L Culture	Nutrients (section	16.10.1.3 of c	ited metl	hod)	
Aeration gentle a	eration supplied	ining 10 ml/L Culture	Nutrients (section	16.10.1.3 of c	ited metl	hod)	
Aeration gentle a	eration supplied	ining 10 ml/L Culture	Nutrients (section	16.10.1.3 of c	ited metl	nod)	



15 Innovation Boulevard, Saskatoon, SK S7N 2X8 Phone: 306-933-5469

Water Quality Data

Sample Identification

0901-001, 0945-002, 1015-003, (all also labeled 091107)

SRC# E 565, 566, 567

INITIAL WATER QUALITY		SAMPLES at test start		TEST MEDIUM	RECOVERY MEDIUM
sample #	0901-001	0945-002	1015-003		-
Temperature (°C)	22	22	22	23	23
Dissolved Oxygen (mg/L)	901	8.8	7.3	7.8	7.8
pН	7.03	6.97	6.81	8.6	8.4
Salinity (ppt)	31	31	31	30	30
Description of sample	colorless	colorless	colorless		

Length of Recovery Period (days)

5

Water Quality Data during Exposure Period (0, 24, 48 hr)

Sample	Temperature (°C)		Dissolved Oxygen (mg/L)			рН			Salinity (ppt)			
	0	24	48	0	24	48	0	24	48	0	24	48
Control-NSW*	23 ·	23	23	7.8	7.8	7.9	8.5	8.4	8.4	30	30	30
0901-001	23	23	23	7.8	7.8	7.8	7.5	8.3	8.4	31	31	-31
0945-002	23	23	23	7.8	7.8	7.8	7.5	7.9	8.2	31	31	31
1015-003	23	23	23	7.8	7.8	7.8	6.4	8.0	8.3	31	31	31

^{*}Natural Sea Water

Appearance of branches after 48 hours exposure

Condition of female branches	Control NSW	0901-001	0945-002	1015-003	
description	normal*	normal	branches slightly paler	branches slightly paler	
	L		than control	than control	

^{*} Branches red (no green areas), firm but flexible

Champia (female) Mortality at end of Recovery Period

Condition of female branches	Control NSW	0901-001	0945-002	1015-003	
# dead	0	0	0	0	
% mortality	0	0	0	0	
description	normal*	normal	normal	white with red	

^{*} Branches red (no green areas), firm but flexible

Initial/Date 900



15 Innovation Boulevard, Saskatoon, SK S7N 2X8 Phone: 306-933-5469

RECOVERY PERIOD - TEMPERATURE MONITORING (initial daily entries)

Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	
23	23	23	23	23	23	

Test Data

Sample Identification

0901-001, 0945-002, 1015-003, (all also labeled 091107)

Analyst

Mary Moody

SRC#

E 565, 566, 567

				Champia	Raw Dal	a					
	Date	Sept 22/07									
				Cystocar	os per pla	nt		Mean	SD	Group mear	1 Comments
	Control	NSW	12	23	18	20	40	22.6	10.5	19.0	Healthy red colour
			19	21	20	19	24	20.6	2.1	6.7	Normal growth
			27	13	22	12	15	17.8	6.5		
			10	20	16	16	13				
	SRC#	% V/V									
0901-001	565	100	29	25	26	23	19	24.4	3.7	20,8	Healthy red colour
		100	26	28	28	7	13	20.4	9.8	6.4	Normal growth
		100	19	22	13	18	15	17.4	3.5		
		100	15_	20	32	20	18	21.0	6.5		
0912-002	566	100	18	24	11	41	24	23.6	11.1	27.4	Healthy red colour
		100	20	20	38	41	23	28.4	10.3	9.7	Normal growth
		100	36	40	12	40	19	29.4	13.0		
		100	27_	33	29	30	21	28.0	4.5		
1015-003	567	100	3	8	8	2	6	5.4	2.8	5.5	Branches white with red tips
		100	8	7	10	11	5	8.2	2.4	3.6	
		100	1	2	3	0	2	1.6	1.1		
		100	2	12	3	8	8	6.6	4.1		

SD: Standard Deviation

C	L	itte	.a 1	
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Conmordy

Date:

nw 1/07

CETIS Test Summary

Report Date: Link:

23 Sep-07 10:38 PM

12-6968-3452

Champia parvi	ula Red Macroalga Sex		Saskatchewan Research Council				
Test No: Start Date: Ending Date: Setup Date:	tart Date: 14 Sep-07 12:00 PM Protocol: nding Date: 21 Sep-07 12:00 PM Dil Water:			Champia EPA/600/4-91/003 (1994) Not Applicable Not Applicable			7d 0h Champia parvula In-House Culture
	07-3947-2649 12 Sep-07 03:00 PM 12 Sep-07 03:00 PM 45h	Material: Code: Source: Station:				Client: Project:	Battelle Labs Ecological Risk Assessment
1 '	10-1282-1229 11 Sep-07 09:01 AM 11 Sep-07 04:00 PM 75h	Material: Code: Source: Station:				Client: Project:	Battelle Labs Ecological Risk Assessment
1 '	06-2367-6386 11 Sep-07 09:45 AM 11 Sep-07 04:00 PM 74h	Material: Code: Source: Station:	Surface Water 16234-002 New Bedford Harbor Dredge Monitorin WQ-TOX-002			Client: Project:	Battelle Labs Ecological Risk Assessment
1 ,	12-6128-6246 11 Sep-07 10:15 AM 11 Sep-07 04:00 PM 74h	Material: Code: Source: Station:	Surface Wa 16234-003 New Bedfo WQ-TOX-0	rd Harbor Dred	dge Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment
Mean Cystoca	rps Summary						
Sample Code 16234-000 16234-001 16234-002 16234-003	Reps 4 4 4 4	Mean 19 20.8 27.35 5.45	Minimum 15 17.4 23.6 1.6	Maximum 22.6 24.4 29.4 8.2	SE 1.65731 1.43527 1.2842 1.40564	3.31461 2.87054 2.5684 2.81129	CV 17.45% 13.80% 9.39% 51.58%
Mean Cystoca	rps Detail	·					
Sample Code 16234-000 16234-001 16234-002 16234-003	Rep 1 22.6 24.4 23.6 5.4	Rep 2 20.6 20.4 28.4 8.2	Rep 3 17.8 17.4 29.4 1.6	Rep 4 15 21 28 6.6			

Comparisons:

Page 4 of 5

Report Date:

23 Sep-07 10:39 PM 08-1548-0324

Analysis:

Saskatchewan Research Council

Champia parvula Red Macroalga Sexual Reproduction Test

Test No: Start Date: 09-2886-5307

14 Sep-07 12:00 PM

Test Type: Champia

Ending Date: 21 Sep-07 12:00 PM

Protocol: EPA/600/4-91/003 (1994)

Dil Water: Not Applicable

7d 0h Duration:

Species: Source:

Champia parvula In-House Culture

Setup Date:	14 Sep-07	12.00 PW	Brine:	NO! AP	biicable
Endnoine		Ana	lucie Tuno		

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Cystocarps	Comparison		12-6968-3452	23 Sep-07 10:38 PM	CETISv1.026
Method	Alt H Data Transform	Z NO	EL LOEL	Toxic Units ChV	/ MSDn

Method	Alt H	Data Transform	_	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C>T	Untransformed				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	1.33333	47.46723	0.81873	Equal Variances	
Distribution	Shapiro-Wilk W	0.93303	0.74935	0.50867	Normal Distribution	

ANOVA Table

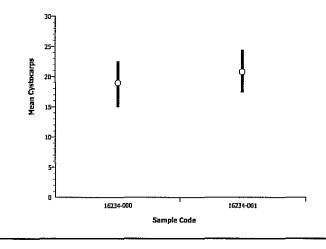
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	6.48	6.48	1	0.67	0.44303	Non-Significant Effect	
Error	57.68	9.613334	6				
Total	64.1600003	16.093334	7	_			

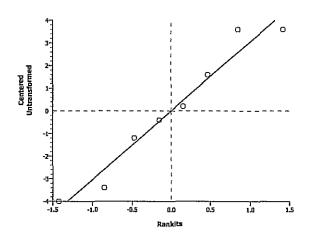
Group Comparisons

Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16234-000		16234-001	-0.8210	1.94318	0.7785	4.26025	Non-Significant Effect	

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16234-000	4	19	15	22.6	3.31461				
16234-001	4	20.8	17. 4	24.4	2.87054				

Graphics





Comparisons:

Page 1 of 5

7d 0h

23 Sep-07 10:39 PM

Report Date: Analysis:

02-3719-0631

Champia parvula Red Macroalga Sexual Repro	luction Test
--	--------------

Test No: Start Date: 09-2886-5307

Test Type: Champia

Protocol:

EPA/600/4-91/003 (1994)

Duration: Species:

Champia parvula

Setup Date:

14 Sep-07 12:00 PM Ending Date: 21 Sep-07 12:00 PM 14 Sep-07 12:00 PM

Brine:

Dil Water: Not Applicable Not Applicable

Source:	

In-House Culture

Setup Date.	1- Och-01	12.00 1 10	Dinie.	140t Abbuon
Endpoint		Ап	alvsis Type	

Lindbourt	Allelysis type
Mean Cystocarps	Comparison

Sample Link 12-6968-3452

Control Link 12-6968-3452

Version **Date Analyzed** 23 Sep-07 10:38 PM CETISv1.026

Method	Alt H	Data Transform	Z	N
Equal Variance t	C>T	Untransformed		

IOEL LOEL **Toxic Units** N/A

ChV MSDp

Saskatchewan Research Council

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	1.66549	47.46723	0.68545	Equal Variances	
Distribution	Shapiro-Wilk W	0.91440	0.74935	0.36146	Normal Distribution	<u></u>

ANOVA Table

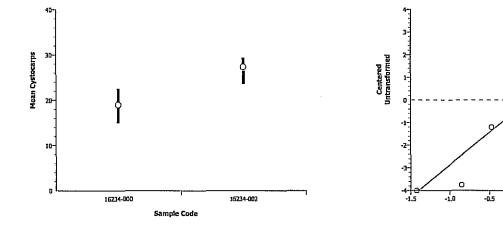
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	139.445	139.445	1	15.86	0.00726	Significant Effect
Error	52.75	8.791667	6			
Total	192.195007	148.23667	7			

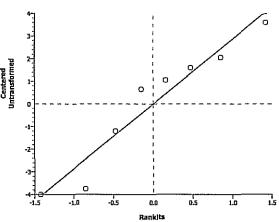
Group Comparisons

Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
16234-000		16234-002	-3.9826	1.94318	0.9964	4.07412	Non-Significant Effect

Data Summary			Origi	nal Data			Transfo	rmed Data		
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
16234-000	4	19	15	22.6	3.31461					
16234-002	4	27.35	23.6	29.4	2.5684					

Graphics





Comparisons:

Page 5 of 5

Report Date:

23 Sep-07 10:39 PM

Saskatchewan Research Council

Analysis:

12-3925-4913

Champia parvula Red Macroalga Sexual Reproduction Tes

Test No: Start Date:

Ending Date:

Setup Date:

09-2886-5307

Test Type: Champia

14 Sep-07 12:00 PM 21 Sep-07 12:00 PM

14 Sep-07 12:00 PM

Protocol:

Brine:

EPA/600/4-91/003 (1994)

Dil Water: Not Applicable Not Applicable

7d 0h Duration:

Species:

Champia parvula

Source:

In-House Culture

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Cystocarps	Comparison	12-6968-3452	12-6968-3452	23 Sep-07 10:38 PM	CETISv1.026

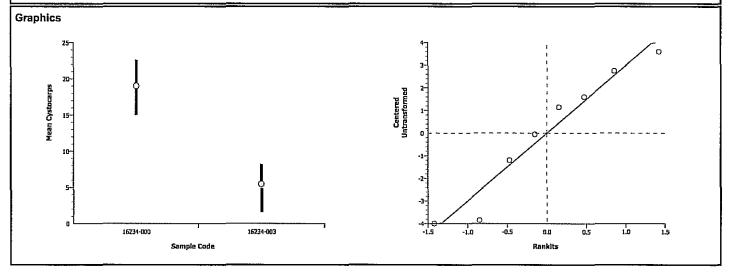
Method	Alt H	Data Transform	Z	NOEL	LOEL.	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed	_			N/A		

ANOVA Assumptions Decision(0.01) **Attribute** Test Statistic Critical P Level Variances Variance Ratio 1.39013 47.46723 0.79310 **Equal Variances** Distribution Shapiro-Wilk W 0.92576 0.74935 0.44646 Normal Distribution

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	367.205	367.205	1	38.88	0.00079	Significant Effect	
Error	56.67	9.445	6				
Total	423,874985	376.64999	7	_			

Group Comb	ariso	115						
Sample	VS_	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16234-000		16234-003	6.23524	1.94318	0.0004	4.22279	Significant Effect	

Data Summary			Original Data				Transfo	rmed Data	
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16234-000	4	19	15	22.6	3.31461	1971			
16234-003	4	5.45	1.6	8.2	2.81129				



Comparisons: Report Date:

Page 3 of 5

Analysis:

23 Sep-07 10:39 PM 07-2166-5817

Champia parvula Red Macroalga Sexual Reproduction Test

Saskatchewan Research Council

Test No:

09-2886-5307

Test Type: Champia

7d 0h

Duration:

Champia parvula

Start Date: Ending Date: 21 Sep-07 12:00 PM

14 Sep-07 12:00 PM

Protocol: EPA/600/4-91/003 (1994) Species:

Dil Water: Not Applicable

Source:

In-House Culture

Setu	μ	ט	ate	•	
				_	

14 Sep-07 12:00 PM

Brine:

Not Applicable

Control Link Date Analyzed

Version

Endpoint	Analysis Type	Sample	Link C	Control Link	Date Analyzed	. <u>v</u>	ersion	
Mean Cystocarps	Comparison	12-6968-	3452 1	2-6968-3452	23 Sep-07 10:3	BPM C	ETISv1.026	
Method	Ait H Data Transfor	m 7	NOFI	LOFI	Toxic Units	ChV	MSD	= n

Method	Ait H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C>T	Untransformed	_			N/A		72277

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.24912	47.46723	0.85926	Equal Variances
Distribution	Shapiro-Wilk W	0.93485	0.74935	0.52515	Normal Distribution

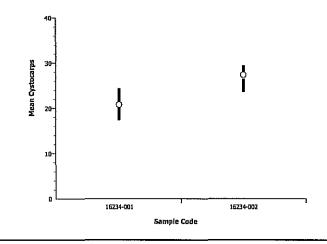
ANOVA Table

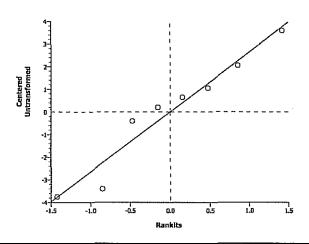
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	85,805	85.805	1	11.57	0.01448	Significant Effect
Error	44.51	7.418334	6			
Total	130.314999	93.223334	7	_		

Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
16234-001		16234-002	-3.401	1.94318	0.9928	3.74241	Non-Significant Effect

Data Summary			Origi	nal Data		Transformed Data						
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD			
16234-001	4	20.8	17.4	24.4	2.87054				"			
16234-002	4	27.35	23.6	29.4	2.5684							







Jetail

Comparisons:

Page 2 of 5

07-0627-1376

Report Date: Analysis:

23 Sep-07 10:39 PM

Nacroalga Sexual Reproduction Test

Saskatchewan Research Council

Alt H

86-5307 Sep-07 12:00 PM Test Type: Champia

Protocol: EPA/600/4-91/003 (1994)

Dil Water: Not Applicable

Duration: 7d 0h Species:

Champia parvula

¿ Sep-07 12:00 PM 14 Sep-07 12:00 PM

Brine:

Not Applicable

Data Transform

Source:

LOEL

In-House Culture

ChV

Analysis Type Sample Link Control Link Date Analyzed Version 12-6968-3452 12-6968-3452 ucarps Comparison 23 Sep-07 10:38 PM **CETISV1.026**

Z

NOEL

C > T Untransformed N/A

Toxic Units

MSDp

OVA Assumptions

Variance t

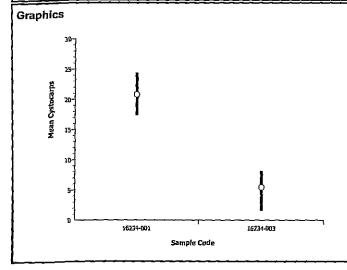
.ttribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	1.04260	47.46723	0.97345	Equal Variances	
Distribution	Shapiro-Wilk W	0.93767	0.74935	0.55147	Normal Distribution	

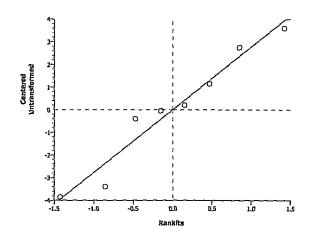
ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	471.245	471.245	1	58.38	0.00026	Significant Effect
Error	48.43	8.071667	6			
Total	519.674995	479.31666	7			

16234-001 16234-003 7.64085 1.94318 0.0001 3.90373 Significant Effect		Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
1020, 22, 32, 32, 32, 32, 32, 32, 32, 32, 32	į	16234-001		16234-003	7.64085	1.94318	0.0001	3.90373	Significant Effect	

Data Summary			Origi	nai Data		Transformed Data					
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD		
16234-001	4	20.8	17.4	24.4	2.87054						
16234-003	4	5.45	1.6	8.2	2.81129						





SALTWATER ASSAYS

A. bahia, A. punctulata, C. parvula

STUDY: 16234	LOCATION: New	/ Bedford Harbor			
CHEMISTRY	Lab Salt Control	-001	-002	-003	- BA
AMMONIA	-008	100%	-004	-00.36	10-
				(6)	
AS RECEIVED WATER QUALITIES	Lab Salt Control	-001	-002	-003	-004
SALINITY (ppt)	31	31	31	31	
pH (SU)	7.95	6.96	6.99	6.99	
TRC (mg/L)	20.05	\$ 20.05	L0.05	L0.05	A,
DO (mg/L)	4.9	5.3	5.\	4.7 6	19
S/C (µmhos/cm)	48720	45640	47230	472300	6
WQ STATION USED	1	\		1	
INITIALS	55	SJ	SJ	SJ	
A. bahia SALINITY			- · · · · · · · · · · · · · · · · · · ·	· · · · ·	
ADJUSTMENT RECORD	Lab-Salt Control	-001	-002	-003	-004
SAMPLE (mLs)					
SEA SALT (g)					1/8
DATE:	9/11/07				17
TIME:	1600				
INITIALS:	55				

Sample ID	ESI Cube ID
-001	-001
-002	-002
-003	-003
-004	-004

Americamysis bahia 7 DAY CHRONIC ASSAY NEW WATER QUALITIES

STUDY:	STUDY: CLIENT: BATTELLE						LOCATION: NEW BEDFORD				LAB CONTROL: HAMPTON ESTUARY					
			NEW D	ISSOL\	VED OX	XYGEN (mg/L)				NEW SALINITY (ppt)						
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6	
LAB	Α	6.6	7.0	6.8	65	66	64	6.6	31	31	39	30	30	30	30	
-001	Α	5.5	5.5	4.9	5.3	6.5	5.9	6.4	33	28	36	30	30	30	30	
-002	Α	5.9	6.7	(e.\	5.8	6.4	5.8	6.4	33	29	3	31	31	31	31	
-003	Α	6.9	6.0	6.1	G.5	4.7	6.1	6.5	33	28	31	31	30	30	30	
-004	-A															
		NEW pH (SU)								N	W TEI	MPERA	TURE (°C)		
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6	
LAB	А	7.95	7,79	7.90	7,70	7.76	7.64	7.86	25	25	24	25	25	25	25	
-001	Α	6.79	6.96	6.89	6.82	6.9le	6.94	6.97	25	રડ	26	25	25	25	25	
-002	Α	6.94	7,09	7.06	698	7.09	7.06	7.08	25	25	25	25	25	25_	25	
-003	А	7.03	7.65	7,65	6,93	7.00	7.02	7.15	25	25	25	25	25	25	25	
004	A								25							
INC TEN	/IP:	25	26	26	20	24	26			The state of the s	Company of the compan	The second secon	der gegenen geweine Auf Bereite Gegenen aus der Gegenen der Gegene	And the second s	The second secon	
DATE:		9/12	9/13	9/14	9115	9/16	9/1		programmed (Printer Street Control of Street Con	And Andrew of Control			A proper comment of the comment of t	A CONTRACTOR OF THE CONTRACTOR	percent 1 a. 1000. The second of the second	
TIME:		1515	1605	1105			1215		and the second of the second o	The second secon	Section 1 and 1 an		Section 1 Sectio	A CONTROL OF THE PROPERTY OF T	Section 2012 and Sectio	
INIT:		AK	ĵP\$	B	RAM	ST	51		A second section of the section of the section	Approximate the property of th	Application of the second of t	The second secon	The second secon	The second secon	The second secon	

				Y METERS L R QUALITIE:				
	0	1	2	3	4	5	6	7
Water Quality Station #	//////	26	1	N.		1		1/~
Initials		PA	UB	RAM	SJ	SJ	SI	1/4
Date	9120	9/13	9/14	915	9/16	9/17	9/18	

Americamysis bahia 7 DAY CHRONIC ASSAY OLD WATER QUALITIES

		WEILIF													
STUDY:		CLIEN BATT			LOCATION: NEW BEDFORD			LAB CONTROL: HAMPTON ESTUARY							
16234															
:		OL	D SAL	NITY (ppt)			*	OLD pH (SU)						
Conc	Rep	12	7 3	284	<i>4</i> ′5	Б С	Ø7	λl	#2	23	84	#5	<i>5</i> 6	øΠ	
Control	Α	31	30	30	29	30	31		7,83	7.72	7.74	7.68	7.63	7.83	
-001	Α	31	<u>გ</u>	31	3],	31	31		7.38	7,28	7.44			7.59	
-002	Α	31	31	31	31	31	31		7.52	7.22	7.54	7.45	7.38	7.64	
-003	Α	3	31	31	31	30	31		7.49	7.44	7.62	7.48	7.43	7.61	
-004	Α														
		OLD 1	EMPE	RATU	RE (°C))			general company of a company company company of the company of the company company of the compan	from the small test of the sma	A comment of the property of t	A STATE OF THE PROPERTY OF THE	And the second s	April 1 and 1 and 2 and	The second secon
Conc	Rep	12	23	8 4	4 5	56	ßТ	X	The second secon	A Company of the control of the cont	principal de la companya del companya del companya de la companya del companya de la companya del companya de la companya de la companya de la companya de la companya del c	promote and an experience of the second seco	The second secon		The second secon
Control	A	24	25	26	26	26	25			AND THE CONTRACT OF THE CONTRA	quantitative and a second seco	proceeding of the control of the con	The second secon	The second secon	(A) (A) (A) (A) (A) (A) (A) (A) (A) (A)
-001	Α	24	25	24	26	26	25		Part of the second seco		Hart Andrews are made and the control of the contro		property and the property con- property of the property con- representation of the property con- representation of the property con- traction of the property con- traction of the property con- traction of the property con-	minute in the control of the control	A THE COUNTY OF
-002	Α	24	25	26	24	26	25			The second secon	As a full control of the control of	The second secon		Control of the Contro	The second secon
-003	Α	24	25	26	26	26	25		and the second s	Proceedings of the Control of the Co	Application of the second of t	Management of the second of th	Company of the compan	process of the control of the contro	Total Age Total
-004	Α									The second secon	and a service of the	And the second s	The state of the s	International Programmer Community of Commun	And a second of the second of
									We will be the second of the s	A STATE OF THE PROPERTY OF THE	The state of the s	The second secon	and the property of the proper	property and the comments of t	A CONTROL OF THE PARTY OF THE P
INC TEMP):	26	26	26	26	26	26		The second secon	A CONTROL OF THE PARTY OF THE P	And the second of the second o	A SECURITY OF THE PROPERTY OF	and All Processing Congress of the Congress of	2 / 1 / 2 / 2 / 2 / 2 / 2 / 2 / 2 / 2 /	110 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
DATE:		9/14	9115	9/16	9/17	9/18	9119		And the second s	AND THE PROPERTY OF THE PROPER	A Secretary of the Control of the Co	The second secon	The state of the s	The second secon	For many the second sec
TIME:		1030	1215		1140	D955	0830		The second secon	AND THE RESERVE OF THE PROPERTY OF THE PROPERT	The second secon		A CONTROL OF THE PARTY OF THE P	With A Property of the Control of th	AND THE RESERVE OF THE PROPERTY OF THE PROPERT
INITIALS:		B	RAM	ST	SI	5.7	RAM		and the second s			AND THE PROPERTY OF THE PROPER	And the second s		A CONTROL OF THE PROPERTY OF T

GENERAL NOTES - for additional information refer to SOP #1411 or EPA manual 600/4-91/003

•Test vessels will be 250 mL glass beakers containing a minimum of 150 mL of solution

•8 replicates per site with 5 organisms each

•Test Temperature: 26±1°C

•Salinity: 25 ±2ppt

•Dissolved Oxygen: >4.3 mg/L

•Photoperiod will be 16 hours light and 8 hours dark.

•Passing criteria require ≥80% survival and average dry weight of ≥0.20 mg/organism in the control vessels.

WATER QUALITY METERS USED **OLD WATER QUALITIES** <u> 20</u>7 Y K 0 1 2 20 Water Quality Station # SJ SJ Initials RAM RAM 9/15 Date

Americamysis bahia 7 DAY CHRONIC ASSAY SAMPLE USE RECORD

				SE RECURL	<u></u>		1			
STUDY: 1623	Ц	CLIENT: BA	TELLE - New	/ Bedford	·					
SPECIES: A. ba	hia		TEST: chror	ic renewal						
	Day: 0		Day: 1		Day: 2 9/1					
Sample	Volume ESI Cube Used (mL) ID		Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID	Day	Date	Time	Init
Lab Control	1600	n/a	1600	n/a	1200	n/a	0	9/120	1500	AK
-001		-001		-001		-001	1	9/13	1 545	PI
-002		-602		_ 00)		-002	2	9/14	1105	US
-003		-003		-007	\downarrow	-003	3	9/15		RAM
-904	4	004	4	-			4	19/16	1015	SI
Section 1 Miles 1 Mile		Experiment of the control of the con	The second secon		parameters of the second secon		5	9/17	1210	SJ
		And the second s	The state of the s	and the second s	The second secon		6	7/18	1145	ST
	Day: 3		Day: 4		Day: 5				<u> </u>	
1		<u> </u>	<u> </u>			г	ł			
1	41		II		II	1				
Sample	Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID	Volume Used (mL)	ESI Cube ID				
Sample Lab Control	II .	1	II .		II					
	Used (mL)	ID .	Used (mL)	ID	Used (mL)	ID				
Lab Control	Used (mL)	ID n/a	Used (mL)	ID n/a	Used (mL)	ID n/a				
Lab Control	Used (mL)	n/a	Used (mL)	n/a - 00	Used (mL)	n/a -00				
Lab Control -001 -002	1200	n/a	Used (mL)	n/a -001 -002	Used (mL)	n/a -00 -00 2				
Lab Control -001 -002 -003	1200	n/a	Used (mL)	n/a -001 -002	Used (mL)	n/a -00 -00 2			T ₂	
Lab Control -001 -002 -003	1200	n/a	Used (mL)	n/a -001 -002	Used (mL)	n/a -00 -00 2			42	
Lab Control -001 -002 -003	Used (mL)	n/a -001 -002 -003	Used (mL)	n/a -001 -002	Used (mL)	n/a -00 -00 2			47.	
Lab Control -001 -002 -003	1200	n/a	Used (mL)	n/a -001 -002	Used (mL)	n/a -00 -00 2				
Lab Control -001 -002 -003 -004	Day: 6	ID n/a -001 -002 -003	Used (mL)	n/a -001 -002	Used (mL)	n/a -00 -00 2			The state of the s	
Lab Control	Day: 6 Volume Used (mL)	ID n/a -001 -002 -003 ESI Cube ID	Used (mL)	n/a -001 -002	Used (mL)	n/a -00 -00 2				
Lab Control -001 -002 -003 -004 Sample Lab Control	Day: 6 Volume Used (mL)	ID n/a	Used (mL)	n/a -001 -002	Used (mL)	n/a -00 -00 2				
Lab Control	Day: 6 Volume Used (mL)	ID n/a -001 -002 -003 ESI Cube ID n/a -001	Used (mL)	n/a -001 -002	Used (mL)	n/a -00 -00 2				

-004

Americamysis bahia 7 DAY CHRONIC ASSAY SURVIVAL & OLD WATER QUALITIES

STUDY:	1/	CLIENT: Battelle				LOCATION: NEW BEDFORD				LAB CONTROL: HAMPTON ESTUARY				ORGANISM BATCH/LOT#		
		NUMBER OF SURVIVORS						OLD DISSOLVED OXYGEN (mg/L)								
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
	Α	5	5	7	4	4	Ц	T	I	6,2	6.3	6.1	6.3	6.8	6.0	७.3
	В	5	5	5	5	5	5	5	5	6.0	6.3	6.1	62	6.8	5.8	63
	С	5	5	5	5	5	5	S	5	5,9	6.3	6.1	4.1	0.7	ς.9	6.7
Lab	D	5	5	5	5	5	5	5	5		6.3	6.0	6.1	6.7	5.8	6.1
Control	Е	5	5	5	5	5	5	5	5	5,9	6.3	6.0	6.2	6.7	5.8	6.2
	F	5	5	5	5	5	5	5	5	6.0	6.3	6.0	4,2	6.6	5.8	6.2
	G	5	5	5	5	5	5	5	5	6.1	6.3	6.0	6.3	6.6	5.9	6.1
	Н	5	5	5	5	5	5	ζ	5	6.2	6.3	6.1	6.0	6.6	5-8	6.2
	Α	5	5	5	5	5	5	5	5	5,6	6.3	5.9	6.2	6.6	5.7	6.2
	В	5	5	5	5	5	5	5	IJ	5.4	6.1	5.8	61	6.5	55	6.1
	С	5	5	5	5	5	5	5	5	5.6	6.1	5.8	6.1	6.6	5.6	6.1
-001	D	15	5	5	5	5	5	5	ഗ	5,5	ا، ف	5,7	6.1	6.6	517	6.1
-001	E	5	5	5	5	כט	5	5	IJ	4,9	6.1	5.4	5.9	6.5	5.6	6.0
	F	5	5	5	5	5	5	5	5	5.1	6.0	5.6	5.9	6.4	5.5	5.8
	G	5	5	5	5	5	5	5	15	5,3	59	5.6	5.9	6.4	5.6	5,9
	Н	5	5	5	5	5	5	5	15	5.5	5.9	5.6	5.9	6.4	5.7	5,8
	Α	5	5	5	5	5	5	5	15	4.8	6.0	5.7	5.9	6.4	5.1	6.2
	В	5	5	5	5	5	5	5	5	5.7	6.0	5.6	5.9	6.3	5.4	6.0
	С	5	5	5	5	5	5	5	Ŋ	5.6	6.0	5.7	5.9		5.6	5.9
-002	D	5	5	.5	5	5	5	5	5		6.0	5.1	5.8	6.3	5.6	5.7
-002	E	5	5	5	5	5	5	5	5	5,6	5.9	5.7	58	0.4	5.7	5.9
	F	5	5	5	5	5	5	5	5			5.6	5.8	6.3	5.4	5.9
	G	5	5	5	5	4	버	4	4	5.g	5.7	5.6	5.7	6.3	5.6	5,9
	Н	5	5	5	5	5	5	Ś	5	5,9	5,9	5.7	5.7	6.4	5.5	5,9
INC TEMP:		26	Z 6	26	26	26	25	<u>ع</u> و	26	ĺ						
DATE:		10 4 07	10/5	1016	10/7	10/8	1019	10/10	njor							
TIME:		1330	1245	০৭৮০	0920	1125	1020	1350	1120							
INITIALS:	٠	22	AK	RAM	SJ	55	RAM	PA)	RAM							

Americamysis bahia 7 DAY CHRONIC ASSAY SURVIVAL & OLD WATER QUALITIES

STUDY:		CLIENT: Battelle			OICVI	LOCA	ATION: BEDF			LAB	CONT		ARV	ORGANISM BATCH/LOT#		
ועסיני	<u> </u>					SURVIVORS				HAMPTON ESTUARY OLD DISSOLVED (1		
SAMPLE	Rep	0	1	2	3	4	5	6	7	1	2	3	4	5	6	7
	Α	5	5	5	5	5	5	5	5	5.7	5.5	5.4	5.7	6.5	5.6	5.6
	В	5	5	5	5	5	5	5	5	_	5.6	5.3	5.6	1	5.5	5.7
	С	5	5	5	5	5	5	5	5		5.7	5.3		6.6		5.6
000	D	5	5	5	5	5	5	ζ	5	55		5.4		6.2		5.7
-003	Е	5	5	5	5	5	5	5	5		5.8	5.5			5.7	5.9
	F	5	5	5	5	5	5	5	5		5.9	5.3			5.4	5.8
	G	5	5	5	5	5	5	5	5		5.8	5.4	 	1	5.5	5.8
	Н	5	5	5	5	5	5	5	5	5.3	5.8	5.6	5.4	6.5	5.6	5.6
	Α	Š														
	В	5			F											
	iC.	5			(E	3)										
-004	D	5			/	SJ		101						/		
-004	E	5					10/4	10.								
	F	5														
	G	5														
	Н	5														
INC TEMP:		26		26	26	24	25	26	26							
DATE:		10/4/07		1016	191	1	10)9	Idio	10/11							
TIME:		1330		OP40	0920	1/25	1020	1320	1120							
INITIALS:		53		RAM		55	RAM	<u></u>	RAM							

Americamysis bahia 7 DAY CHRONIC ASSAY ORGANISM WEIGHTS

CLIENT: BATT	ELLE NE	W DEDEODD	· · · · · · · · · · · · · · · · · · ·	TEGT DATES							
STUDY#: 104		W BEDFORD		TEST DATES:							
CONC	REP	TARE WEIGHT (g)	SHRIMP + FOIL (g)	NET WEIGHT (mg)	# SHRIMP DAY 0	MEAN WEIGHT (mg) DAY 0	# SHRIMP DAY 7	MEAN WEIGHT (mg) DAY 7			
	Α	0.20956									
	В	0.20876	11.1.13								
	O	0.21053	212,31								
Lab	D	0.20715	20927								
	Ε	0.20767	262.48								
	F	0.20701	208-97								
	G	0.20822	209.93			: :					
	Н	0.20780	209.69								
	Α	0.20771	209.45								
	В	0.20979									
	С	0.20851	210.79								
-001	D	0.20908		211.12		_					
	E	0.20858	210.55	<u>-</u>	-						
	F	0.21266	214.93								
	G	0.20754	809.75								
	Н	0.20927	211.33								
	A	0.20871	211.07	 -		 -					
	В	0.20768				-					
	С	0.20699	309,71								
-002	D	0.20804	410,04			<u>.</u>					
	F	0.20731	909,26			. <u>.</u>					
	G	0.21024	212.45								
	Н	0.20970	211,20								
DATE	11		, ,								
TIME		10/11/07	1530								
INITIALS		1020 RAM	*NAX								
	-	[[77-117]	1100		L		<u> </u>	<u> </u>			

Americamysis bahia 7 DAY CHRONIC ASSAY ORGANISM WEIGHTS

CLIENT: BATT	EW BEDFORD		TEST DATES:								
STUDY#: 10	T		SPECIES: A. bahia								
CONC	REP	TARE WEIGHT (g)	SHRIMP + FOIL (g)	NET WEIGHT (mg)	# SHRIMP DAY 0	MEAN WEIGHT (mg) DAY 0	# SHRIMP DAY 7	MEAN WEIGHT (mg) DAY 7			
	Α	0.20946	212,04								
	В	0.20799	211.31								
	С	0.20977	212- 4 3								
-007	D	0.21031									
-003	E	0.20951	212,14								
	F	0.20918	212-21								
	G	0.21110	213,86								
	Н	0.20807	211.08								
	Α			•							
	В										
	С	Evel	0.034	. chuck &	lauk						
	D										
	Е										
	F		:								
	G		:								
	Н							··			
	Α										
1	В										
	С										
	D										
	Е										
	F										
	G										
	Н										
DATE		10/11/07	10/11/07								
TIME		1020	1530								
INITIALS		RAM	KMY								

CETIS Test Summary

Report Date: Link:

12 Oct-07 4:11 PM

09-2103-8475

Americamysis	7-d Survival, Growth a	nd Fecundity	Test				EnviroSystems, Inc.
Test No: Start Date: Ending Date: Setup Date:	11-8903-7394 04 Oct-07 01:30 PM 11 Oct-07 11:20 AM 04 Oct-07 01:30 PM	Protocol:	EPA/821/R-02-014 (2002)			Duration: Species: Source:	6d 21h Americamysis bahla ARO - Aquatic Research Organisms, N
Sample No: Sample Date: Receive Date: Sample Age:	14-3480-7020 04 Oct-07 11:00 AM 2h	Material: Code: Source: Station:	Surface Water 13691-000 New Bedford Harbor Dredge Monitorin WQ-TOX-Lab Control			Client: Project:	Battelle Labs Ecological Risk Assessment
Sample No: Sample Date:	07-4978-4743 03 Oct-07 11:00 AM 03 Oct-07 04:00 PM	Material: Code: Source: Station:	Surface Wa 16391-001	ter d Harbor Drec	ige Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment
_	08-9714-4177 03 Oct-07 11:50 AM 03 Oct-07 04:00 PM 26h	Material: Code: Source: Station:	Surface Water Clin 16391-002 Pro New Bedford Harbor Dredge Monitorin WQ-TOX-002				Battelle Labs Ecological Risk Assessment
_	09-9353-6734 03 Oct-07 12:28 PM 03 Oct-07 04:00 PM 25h	Material: Code: Source: Station:				Client: Project:	Batteile Labs Ecological Risk Assessment
7d Proportion	Survived Summary			<u>-</u>			
Sample Code 13691-000 16391-003 16391-002 16391-001	Reps 8 8 8 8	Mean 0.97500 1.00000 0.97500 1.00000	Minimum 0.80000 1.00000 0.80000 1.00000	Maximum 1.00000 1.00000 1.00000 1.00000	SE 0.02500 0.00000 0.02500 0.00000	0.07071 0.00000 0.07071 0.00000	7.25% 0.00% 7.25% 0.00%
Mean Dry Bio	mass-mg Summary						
Sample Code 13691-000 16391-003 16391-002 16391-001	Reps 8 8 8 8	Mean 0.35200 0.41500 0.43125 0.57975	Minimum 0.21400 0.34800 0.36000 0.51600	Maximum 0.42400 0.45600 0.51400 0.66400	SE 0.02181 0.01242 0.01782 0.01699	0.06169 0.03513 0.05039 0.04804	CV 17.53% 8.47% 11.69% 8.29%
Mean Dry Wei	ght-mg Summary						
Sample Code 13691-000 16391-003 16391-002 16391-001	Reps 8 8 8 8	Mean 0.35869 0.41500 0.44506 0.57975	Minimum 0.26750 0.34800 0.36000 0.51600	Maximum 0.42400 0.45600 0.55250 0.66400	SE 0.01602 0.01242 0.02347 0.01699	0.04532 0.03513 0.06637 0.04804	CV 12.64% 8.47% 14.91% 8.29%

Analyst:____

Page 2 of 2

CETIS Test Summary

Report Date: Link:

12 Oct-07 4:11 PM 09-2103-8475

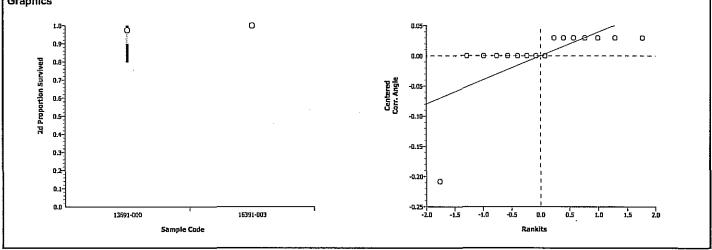
7d Proportion Survived Deta	3i[
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	
13691-000	0.80000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	
16391-003	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	
16391-002	1.00000	1.00000	1.00000	1.00000	1.00000	0.80000	1.00000	1.00000	
16391-001	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	
Mean Dry Biomass-mg Deta	iſ								
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	
13691-000	0.21400	0.35400	0.35600	0.42400	0.35600	0.39200	0.34200	0.37800	
16391-003	0.34800	0.41200	0.45600	0.40800	0.39400	0.45400	0.43600	0.41200	
16391-002	0.47400	0.41600	0.45600	0.40600	0.38200	0.44200	0.36000	0.51400	
16391-001	0.51600	0.66400	0.59200	0.58000	0.52600	0.60600	0.55200	0.60200	
Mean Dry Weight-mg Detail									
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	
13691-000	0.26750	0.35400	0.35600	0.42400	0.35600	0.39200	0.34200	0.37800	
16391-003	0.34800	0.41200	0.45600	0.40800	0.39400	0.45400	0.43600	0.41200	
16391-002	0.47400	0.41600	0.45600	0.40600	0.38200	0.55250	0.36000	0.51400	
16391-001	0.51600	0.66400	0.59200	0.58000	0.52600	0.60600	0.55200	0.60200	

Comparisons:

Page 4 of 5 12 Oct-07 4:19 PM

Report Date:

Analysis: 08-3472-7466 Americamysis 7-d Survival, Growth and Fecundity Test EnviroSystems, Inc. Test Type: Growth-Survival-Fec (7d) **Test No:** 11-8903-7394 **Duration:** 6d 21h EPA/821/R-02-014 (2002) Species: Start Date: 04 Oct-07 01:30 PM Protocol: Americamysis bahia **Ending Date:** 11 Oct-07 11:20 AM Dil Water: Not Applicable Source: ARO - Aquatic Research Organisms, N Setup Date: 04 Oct-07 01:30 PM Brine: Not Applicable **Control Link Endpoint** Analysis Type Sample Link **Date Analyzed** Version 2d Proportion Survived 12 Oct-07 4:18 PM Comparison 09-2103-8475 09-2103-8475 **CETISv1.026** NOEL Method **Data Transform** LOEL **Toxic Units** Alt H Z ChV MSDp Mann-Whitney U C > T Angular (Corrected) N/A ANOVA Assumptions Attribute Statistic Critical Decision(0.01) Test P Level Variances Modified Levene 1.00000 8.86159 0.33428 **Equal Variances** Distribution Shapiro-Wilk W 0.46890 0.84420 0.00000 Non-normal Distribution ANOVA Table Source Mean Square DF Decision(0.05) Sum of Squares F Statistic P Level 0.0035442 Non-Significant Effect Between 0.0035442 1 1.00 0.33428 Error 0.0496194 0.0035442 14 0.0070885 15 Total 0.05316365 **Group Comparisons** Statistic Critical Decision(0.05) Sample ٧S Sample P Level Ties 13691-000 16391-003 28 0.6395 Non-Significant Effect **Data Summary** Original Data **Transformed Data** Sample Code Count Mean Minimum Maximum SD Mean Minimum SD Maximum 13691-000 8 0.97500 0.80000 1.00000 0.07071 1.31552 1.10715 1.34528 0.08419 16391-003 8 1,00000 1.00000 1.00000 0.00000 1.34528 1.34528 0.00019 1.34528 Graphics



Comparisons:

Page 1 of 5

Analysis:

12 Oct-07 4:19 PM 03-7800-0423

Report Date:

Americamysis	7-d Survival, Growth an	d Fecundity	Test					EnviroS	ystems, Inc.
Start Date: Ending Date:	11-8903-7394 04 Oct-07 01:30 PM 11 Oct-07 11:20 AM 04 Oct-07 01:30 PM	Test Type: Protocol: Dil Water: Brine:	Growth-Surviv EPA/821/R-02 Not Applicable Not Applicable	2-014 (2002) e		Durat Speci Sourc	es: Americamys		Organisms, N
Endpoint		lysis Type		Sample Li		ol Link	Date Analyzed	Version	
2d Proportion S	urvived Con	nparison		09-2103-84	175 09-210	3-8475	12 Oct-07 4:18 PM	M CETISV	1.026
Method	Alt		ransform	Z	NOEL	LOEL		ChV	MSDp
Mann-Whitney l) C>	T Angula	r (Corrected)				N/A		_
ANOVA Assum	ptions				,,,				
Attribute	Test		Statistic	Critical	P Level		Decision(0.01)		
Variances	Modified Levene		1.00000	8.86159	0.33428	E	qual Variances		
Distribution	Shapiro-Wilk W		0.46890	0.84420	0.00000	1	Von-normal Distribเ	ution	
ANOVA Table									<u></u>
Source	Sum of Squares	Mean Squa	re DF	F Statistic	P Level	1	Decision(0.05)		
Between	0.0035442	0.0035442	1	1.00	0.33428	1	Non-Significant Effe	act	
Error	0.0496194	0.0035442	14						
Total	0.05316365	0.0070885	15	-					
Group Compar	isons		*****						
Sample	vs Sample	Statistic	Critical	P Level	Ties		Decision(0.05)		
13691-000	16391-002	28		0.6395	1	<u> </u>	Von-Significant Effe	ect	
Data Summary	•		Origin	al Data			Transfo	rmed Data	
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
13691-000	8	0.97500	0.80000	1.00000	0.07071	1.3155	2 1.10715	1.34528	0.08419
16391-002	8	1,00000	1.00000	1.00000	0.00000	1.3452	8 1.34528	1.34528	0.00019
Graphics									
24 Proportion Survived	13691-000	16391-0			0.00		-0.5 0.0 0.5	1.0 1.5	2.0
	Sample Co	de					Rankits		

Comparisons: Report Date:

Page 3 of 5

12 Oct-07 4:19 PM 08-2581-1011

Analysis:

EnviroSystems, Inc.

Americamysis .	7-d Survivai,	Growth and	г несипану те	S

Test No:

11-8903-7394

Test Type: Growth-Survival-Fec (7d)

Duration:

6d 21h

Start Date: Ending Date: 11 Oct-07 11:20 AM

04 Oct-07 01:30 PM

Protocol: EPA/821/R-02-014 (2002) Species:

Americamysis bahia

Setup Date:

04 Oct-07 01:30 PM

Brine:

Dil Water: Not Applicable Not Applicable Source:

ARO - Aquatic Research Organisms, N

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
2d Proportion Survived	Comparison	09-2103-8475	09-2103-8475	12 Oct-07 4:18 PM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Mann-Whitney U	C > T	Angular (Corrected)				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Modified Levene	1.00000	8.86159	0.33428	Equal Variances
Distribution	Shapiro-Wilk W	0.46890	0.84420	0.00000	Non-normal Distribution

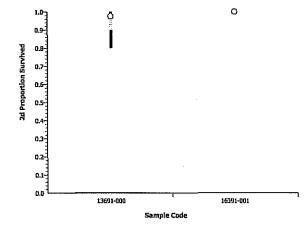
ANOVA Table

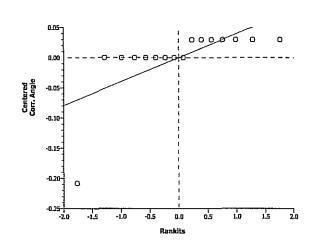
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0035442	0.0035442	1	1.00	0.33428	Non-Significant Effect	
Error	0.0496194	0.0035442	14				
Total	0.05316365	0.0070885	15				

Sample	vs_	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)
13691-000		16391-001	28		0.6395	1	Non-Significant Effect

Data Summary		Original Data			Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
13691-000	8	0.97500	0.80000	1.00000	0.07071	1.31552	1.10715	1.34528	0.08419
16391-001	8	1.00000	1.00000	1.00000	0.00000	1.34528	1.34528	1.34528	0.00019







Comparisons: Report Date:

Page 5 of 5 12 Oct-07 4:19 PM

Analysis:

20-5624-5901

Americamysis 7-d Survival, Growth and Fecundity Test EnviroSystems, Inc. Test Type: Growth-Survival-Fec (7d) Duration: 6d 21h Test No: 11-8903-7394 Start Date: 04 Oct-07 01:30 PM Protocol: EPA/821/R-02-014 (2002) Species: Americamysis bahia Ending Date: 11 Oct-07 11:20 AM Dil Water: Not Applicable Source: ARO - Aquatic Research Organisms, N Setup Date: 04 Oct-07 01:30 PM Brine: Not Applicable Sample Link Control Link Version **Endpoint** Analysis Type **Date Analyzed** 09-2103-8475 09-2103-8475 CETISv1.026 2d Proportion Survived Comparison 12 Oct-07 4:18 PM NOEL Toxic Units Method Alt H Data Transform Z. LOEL ChV MSDp Mann-Whitney U C > TAngular (Corrected) N/A **ANOVA Assumptions** Critical Decision(0.01) Attribute Test Statistic P Level Modified Levene 65535.00000 8.86159 Variances 0.00000 Unequal Variances ANOVA Table Source Sum of Squares Mean Square DF F Statistic P Level Decision(0.05) 0 1 65535.0 0.00000 Significant Effect Between 0 Error 0 0 14 Total 0 0 15 **Group Comparisons** Sample ٧s Sample Statistic Critical P Level Ties Decision(0.05) 16391-003 16391-002 32 0.4796 Non-Significant Effect 1 **Original Data Transformed Data Data Summary** Count Mean Minimum Maximum SD Mean Minimum Sample Code Maximum SD 16391-003 8 1.00000 1,00000 1.00000 0.00000 1.34528 1.34528 1.34528 0.00019 16391-002 8 1.00000 1.00000 1.00000 0.00000 1.34528 1.34528 1.34528 0.00019 Graphics O O 0.8 2d Proportion Survived 0,7 0.6 0.5 0.4 0.4 0.3 0.2 0.2-0.1 0.0 16391-003 16391-002

Sample Code

Comparisons: Report Date:

Page 2 of 5 12 Oct-07 4:19 PM

05-1240-9933

Analysis:

Americamysis 7-	d Survival, Growth an	d Fecundity	Test					EnviroS	ystems, Inc.
Start Date: 04 Ending Date: 11	-8903-7394 Oct-07 01:30 PM Oct-07 11:20 AM Oct-07 01:30 PM	Test Type: Protocol: Dil Water: Brine:	Growth-Surviv EPA/821/R-02 Not Applicable Not Applicable	2-014 (2002) e		Duration: Species: Source:	6d 21h Americamys ARO - Aqua		Organisms, N
Endpoint		lysis Type		Sample Li			e Analyzed	Version	
2d Proportion Sur	vived Con	nparison		09-2103-84	75 09-2103	-8475 12 (Oct-07 4:18 PI	M CETISv1	.026
Method	Alt		Transform	<u>Z</u>	NOEL L			ChV	MSDp
Mann-Whitney U	C >	T Angula	ar (Corrected)			N/A	\		
ANOVA Assumpt	ions					4			
Attribute	Test		Statistic	Critical	P Level		ion(0.01)		
Variances	Modified Levene		65535.00000	8.86159	0.00000	Uneq	ual Variances		
ANOVA Table									
Source	Sum of Squares	Mean Squa		F Statistic			ion(0.05)		
Between	0	0	1	65535.0	0.00000	Signit	icant Effect		
Error Total	0	0	14 15	-			4		
<u> </u>						<u></u>		_	
Group Comparis									
Sample vs 16391-003	Sample 16391-001	Statistic 32	Critical	P Level 0.4796	Ties 1		sion(0.05) Significant Effe		
	10001-001	JE			1				
Data Summary				al Data				rmed Data	 -
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16391-003 16391-001	8 8	1.00000 1.00000	1.00000 1.00000	1.00000 1.00000	0.00000	1.34528 1.34528	1.34528 1.34528	1.34528 1.34528	0.00019 0.00019
		1.00000	1.0000				7.07020		
Graphics 1.0-7 0.9- 0.8- 0.7- 0.6- 0.5- 0.4- 0.3- 0.4- 0.4- 0.5- 0.4- 0.5- 0.4- 0.5- 0.4- 0.5- 0.4- 0.5- 0.4- 0.5- 0.4- 0.5- 0.4- 0.5- 0.4- 0.5- 0.4- 0.5- 0.4- 0.5- 0.4- 0.5- 0.4- 0.5- 0.4- 0.5- 0.4- 0.5- 0.4- 0.5- 0.4- 0.5- 0.4- 0.5- 0	C C 16391-003	16391- ¹	,		0.4- 0.4- 0.4- 0.4- 0.4-	8 	 	- 	

Comparisons:

Page 2 of 5

Analysis:

05-6962-4030

Report Date:

12 Oct-07 4:06 PM

Americamys	Americamysis 7-d Survival, Growth and Fecundity Test					
Test No:	11-8903-7394	Test Type: Growth-Survival-Fec (7d)	Duration: 6d 21h			

Start Date: 04 Oct-07 01:30 PM Ending Date: 11 Oct-07 11:20 AM

EPA/821/R-02-014 (2002) Protocol:

Species:

Americamysis bahia

Setup Date: 04 Oct-07 01:30 PM

Brine:

Dil Water: Not Applicable Not Applicable Source:

ARO - Aquatic Research Organisms, N

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
7d Proportion Survived	Comparison	09-2103-8475	09-2103-8475	12 Oct-07 4:04 PM	CETISv1.026

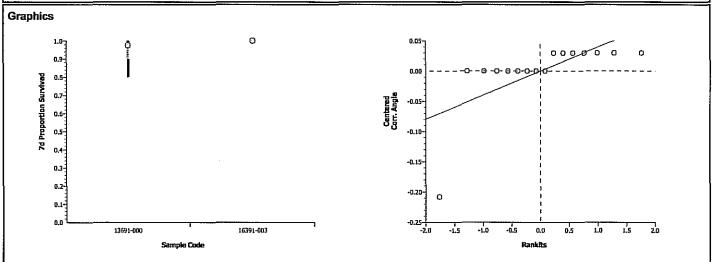
Method **Data Transform** NOEL LOEL **Toxic Units** ChV **MSDp** Alt H Z Mann-Whitney U C > T Angular (Corrected) N/A

ANOVA Assumptions Critical Decision(0.01) Attribute Test Statistic P Level Variances Modified Levene 1.00000 8.86159 0.33428 **Equal Variances** Distribution Shapiro-Wilk W 0.46890 0.84420 0.00000 Non-normal Distribution

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0035442	0.0035442	1	1.00	0.33428	Non-Significant Effect	
Error	0.0496194	0.0035442	14				
Total	0.05316365	0.0070885	15				

Group Comparisons												
Sample	VS	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)	•				
13691-000		16391-003	28		0.6395	1	Non-Significant Effect					

Data Summary		Original Data					Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
13691-000	8	0.97500	0.80000	1.00000	0.07071	1.31552	1.10715	1.34528	0.08419	
16391-003	8	1.00000	1.00000	1.00000	0.00000	1.34528	1.34528	1.34528	0.00019	



Comparisons: Report Date:

Page 1 of 5

Analysis:

12 Oct-07 4:06 PM 03-3478-4727

EnviroSystems, Inc.

Americamysis 7-d Survival, Growth and Fecundity Test

11-8903-7394

Test Type: Growth-Survival-Fec (7d)

04 Oct-07 01:30 PM Ending Date: 11 Oct-07 11:20 AM

Protocol: EPA/821/R-02-014 (2002)

Dil Water: Not Applicable

Not Applicable

Duration:

Species:

Source:

6d 21h

Americamysis bahia

ARO - Aquatic Research Organisms, N

Setup Date: 04 Oct-07 01:30 PM Brine:

Endpoint Analysis Type 7d Proportion Survived Comparison

Sample Link Control Link Date Analyzed Version 09-2103-8475 09-2103-8475 12 Oct-07 4:04 PM CETISv1.026

Method Alt H **Data Transform** Z NOEL LOEL **Toxic Units** ChV MSDp Mann-Whitney U C > T Angular (Corrected) N/A

ANOVA Assumptions										
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)					
Variances	Variance Ratio	1.00000	8.88539	1.00000	Equal Variances					
Distribution	Shapiro-Wilk W	0.39803	0.84420	0.00000	Non-normal Distribution					

ANOVA Table

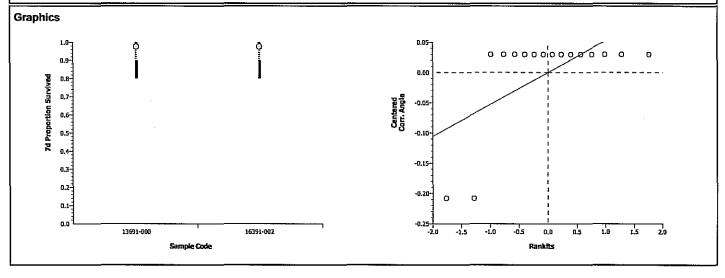
Test No:

Start Date:

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0	0	1	0.00	1.00000	Non-Significant Effect	
Епог	0.0992388	0.0070885	14				
Total	0.09923882	0.0070885	15	_			

Sample	vs_	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)	
13691-000		16391-002	32		0.4796	2	Non-Significant Effect	

Data Summary	Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
13691-000	8	0.97500	0.80000	1.00000	0.07071	1.31552	1.10715	1.34528	0.08419
16391-002	8	0.97500	0.80000	1.00000	0.07071	1.31552	1.10715	1.34528	0.08419



Comparisons:

Page 4 of 5

12 Oct-07 4:06 PM 10-6778-0258

Report Date:

	Alialysis.	10-0776-0230
Americamysis 7-d Survival, Growth and Fecundity Test		EnviroSystems, Inc.

Test No:

11-8903-7394

Test Type: Growth-Survival-Fec (7d)

Duration: 6d 21h

Start Date:

Americamysis bahia

04 Oct-07 01:30 PM Ending Date: 11 Oct-07 11:20 AM

Protocol: EPA/821/R-02-014 (2002) Dil Water: Not Applicable

Species:

Setup Date:

04 Oct-07 01:30 PM

Brine:

Not Applicable

Source:

ARO - Aquatic Research Organisms, N

Endpoint	Analysis	Туре	Sample L	.ink	Control Link	Date Analyze	∌d	Version	
7d Proportion Survived	Comparis	SON	09-2103-8	3475	09-2103-8475	12 Oct-07 4:0)4 PM	CETISv1	.026
Method	Δit H	Data Transform	7	NOF	I LOFI	Toxic Units	Ch\	v	MSDn

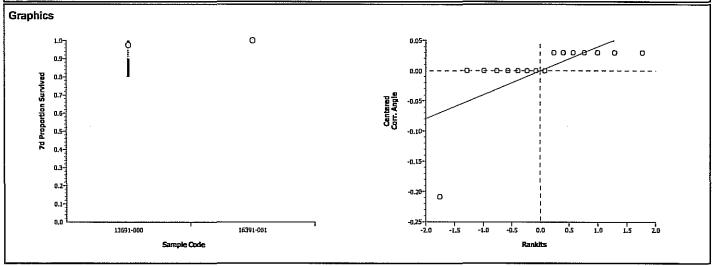
Method		Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Mann-Whit	ney U	C > T	Angular (Corrected)				N/A		

ANOVA Assumptions Attribute Statistic Critical P Level Decision(0.01) Variances Modified Levene 1.00000 8.86159 0.33428 Equal Variances Distribution Shapiro-Wilk W 0.46890 0.84420 0.00000 Non-normal Distribution

ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0035442	0.0035442	1	1.00	0.33428	Non-Significant Effect	
Error	0.0496194	0.0035442	14			•	
Total	0.05316365	0.0070885	15	-			

Gloup Companisons										
Sample	VS	Sample	Statistic	Critical	P Level	Ties	Decision(0.05)			
13691-000		16391-001	28		0.6395	1	Non-Significant Effect	<u></u>		

Data Summary			Original Data			Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
13691-000	8	0.97500	0.80000	1.00000	0.07071	1.31552	1.10715	1.34528	0.08419	
16391-001	8	1.00000	1.00000	1.00000	0.00000	1.34528	1.34528	1.34528	0.00019	



Comparisons: Report Date:

Page 5 of 5

EnviroSystems, Inc.

Analysis:

12 Oct-07 4:06 PM 13-8429-1277

Americamysis 7-d Survival, Growth and Fecundity Test

Test No: Start Date:

Ending Date:

11-8903-7394

Test Type: Growth-Survival-Fec (7d)

04 Oct-07 01:30 PM 11 Oct-07 11:20 AM

Protocol: EPA/821/R-02-014 (2002)

Dil Water: Not Applicable Not Applicable

Duration:

6d 21h

Americamysis bahia

ARO - Aquatic Research Organisms, N

Setup Date: 04 Oct-07 01:30 PM Brine:

7d Proportion Survived Comparison Sample Link

Species: Source:

Endpoint Control Link Date Analyzed Version Analysis Type 09-2103-8475 09-2103-8475 12 Oct-07 4:04 PM CETISv1.026

Method Alt H Data Transform Z NOEL LOEL **Toxic Units** ChV **MSDp** Mann-Whitney U C > T Angular (Corrected) N/A

ANOVA Assumptions

Attribute Test Statistic Critical P Level Decision(0.01) Variances Modified Levene 1.00000 8.86159 0.33428 Equal Variances Shapiro-Wilk W 0.46890 Distribution 0.84420 0.00000 Non-normal Distribution

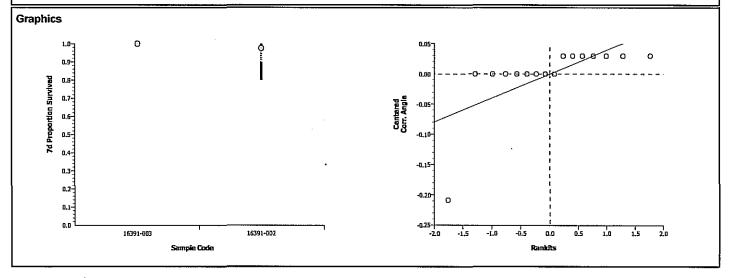
ANOVA Table

Source **Sum of Squares** Mean Square DF F Statistic P Level Decision(0.05) Belween 0.0035442 0.0035442 1 1.00 0.33428 Non-Significant Effect Error 0.0496194 0.0035442 14 Total 0.05316365 0.0070885 15

Group Comparisons

Statistic Critical Decision(0.05) Sample Sample P Level Ties 16391-003 16391-002 0.3605 Non-Significant Effect 36 1

Data Summary	Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16391-003	8	1.00000	1.00000	1.00000	0.00000	1.34528	1.34528	1.34528	0.00019
16391-002	8	0.97500	0.80000	1.00000	0.07071	1.31552	1.10715	1.34528	0.08419



Comparisons:

Page 3 of 5

Report Date:

Analysis:

12 Oct-07 4:06 PM 07-2297-6030

Americamysis 7-d Survival, Growth and Fecundity Test EnviroSystems, Inc. Test No: Test Type: Growth-Survival-Fec (7d) Duration: 6d 21h 11-8903-7394 04 Oct-07 01:30 PM Start Date: Protocol: EPA/821/R-02-014 (2002) Species: Americamysis bahia Ending Date: 11 Oct-07 11:20 AM Dil Water: Not Applicable Source: ARO - Aquatic Research Organisms, N Not Applicable Setup Date: 04 Oct-07 01:30 PM Brine: **Endpoint Analysis Type** Sample Link Control Link **Date Analyzed** Version 12 Oct-07 4:04 PM 7d Proportion Survived 09-2103-8475 09-2103-8475 Comparison CETISv1.026 Alt H Method **Data Transform** Z NOEL LOEL **Toxic Units** ChV **MSDp** Mann-Whitney U Angular (Corrected) C > TN/A **ANOVA Assumptions Attribute** Test Statistic Critical P Level Decision(0.01) Modified Levene Variances 65535.00000 8.86159 0.00000 Unequal Variances **ANOVA Table** Source DF F Statistic Decision(0.05) Sum of Squares Mean Square P Level Between Ö 0 1 65535.0 0.00000 Significant Effect Error 0 0 14 0 o Total 15 **Group Comparisons** Critical Sample Sample Statistic P Level Ties Decision(0.05) 16391-003 16391-001 0.4796 Non-Significant Effect 32 1 **Data Summary Original Data Transformed Data** Sample Code Count Mean Minimum Maximum SD Mean Minimum Maximum SD 16391-003 8 1,00000 1.00000 1.00000 0.00000 1.34528 1.34528 1.34528 0.00019 16391-001 8 1.00000 1.00000 1.00000 0.00000 1.34528 1.34528 1.34528 0.00019 Graphics Φ 0 7d Proportion Survived 0.5 0.3 0.1-16391-003 16391-001 Sample Code Rankits

Comparisons: Report Date:

Page 1 of 10

12 Oct-07 4:11 PM 00-6385-3977

Americamysis 7-d Survival, Growth and Fecundity Test

Analysis:

EnviroSystems, Inc.

Test No:

11-8903-7394

Test Type: Growth-Survival-Fec (7d)

Duration:

6d 21h

Start Date: Ending Date: 11 Oct-07 11:20 AM

04 Oct-07 01:30 PM

Protocol: EPA/821/R-02-014 (2002)

Species:

Americamysis bahia

Setup Date:

04 Oct-07 01:30 PM

Brine:

Dil Water: Not Applicable Not Applicable Source:

ARO - Aquatic Research Organisms, N

CETISv1.026

Endpoint	Analysis Type
Mean Dry Biomass-mg	Comparison

Sample Link

Control Link Date Analyzed Version 09-2103-8475 12 Oct-07 4:10 PM

Method Alt H **Data Transform** Z NOEL LOEL **Toxic Units** ChV MSDp Equal Variance t C>T Untransformed N/A

09-2103-8475

ANOVA Assumptions

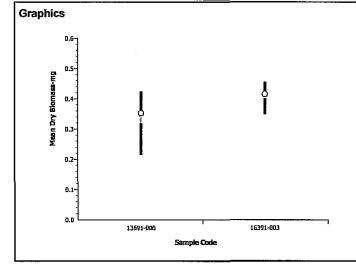
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	3.08333	8.88539	0.16052	Equal Variances	
Distribution	Shapiro-Wilk W	0.86042	0.84420	0.01837	Normal Distribution	

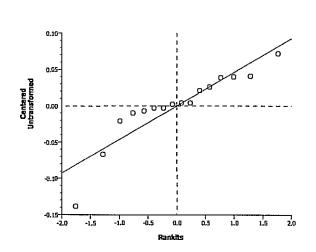
ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0158760	0.0158760	1	6.30	0.02498	Significant Effect
Еггог	0.0352800	0.0025200	14			
Total	0.05115604	0.0183960	15	-		

Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
13691-000		16391-003	-2,51	1.76131	0.9875	0.04421	Non-Significant Effect

Data Summary		Original Data			Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
13691-000	8	0.35200	0.21400	0.42400	0.06169				
16391-003	8	0.41500	0.34800	0.45600	0.03513				





Comparisons: Report Date:

Page 4 of 10 12 Oct-07 4:11 PM

CETIS Analy	ysis Detail						\nalysis:		03-3478-4727
Americamysis 7-d	Survival, Growth an	d Fecundity	Test					EnviroS	ystems, Inc.
Start Date: 04 Ending Date: 11	8903-7394 Oct-07 01:30 PM Oct-07 11:20 AM Oct-07 01:30 PM	Protocol: Dil Water:	Growth-Surviv EPA/821/R-02 Not Applicabl Not Applicabl	2-014 (2002) e		Duration: Species: Source:	Americamys		Organisms, N
Endpoint		ysis Type		Sample Li			te Analyzed	Version	
7d Proportion Surv	ived Com	parison		09-2103-84	75 09-2103	J-8475 12	Oct-07 4:04 PN	M CETISv1	.026
Method	Alt		ransform	Z	NOEL L			ChV	MSDp
Mann-Whitney U	C>.	T Angula	r (Corrected)			N/	Α		
ANOVA Assumpti	ons								
Attribute	Test	;	Statistic	Critical	P Level	Deci	sion(0.01)		
Variances	Variance Ratio		1.00000	8.88539	1.00000	Equa	I Variances		
Distribution	Shapiro-Wilk W	{	0.39803	0.84420	0.00000	Non-	normal Distribu	ution	
ANOVA Table									
Source	Sum of Squares	Mean Squa	re DF	F Statistic	: P Level	Deci	sion(0.05)		
Between	0	0	1	0.00	1.00000		Significant Effe	 ect	
Error	0.0992388	0.0070885	14				_		
Total	0.09923882	0.0070885	15	_					
Group Compariso	ens								
Sample vs	Sample	Statistic	Critical	P Level	Ties	Deci	sion(0.05)		
13691-000	16391-002	32	Gildodi	0.4796	2		Significant Effe	ect	·
Data Summary	-19 tun-		Origin	ai Data			Transfo	rmed Data	
Sample Code	Count	Mean	Minimum	Maximum	SD	.——— Mean	Minimum	Maximum	\$D
13691-000	8	0.97500	0.80000	1.00000	0.07071	1.31552	1.10715	1.34528	0.08419
16391-002	8	0.97500	0.80000	1.00000	0.07071	1.31552	1.10715	1.34528	0.08419
Graphics									
0.9- 0.9- 0.9- 0.9- 0.9- 0.9- 0.9- 0.9-		Ones			0.05 0.00	0 0 0) - - ·

0,0

Rankits

13691-000

Sample Code

16391-002

Comparisons: Report Date:

Page 2 of 10 12 Oct-07 4:11 PM

EnviroSystems, Inc.

Analysis:

02-4273-5140

Americamysis 7-d Survival, Growth and Fecundity Test

Shapiro-Wilk W

11-8903-7394

Test Type: Growth-Survival-Fec (7d)

EPA/821/R-02-014 (2002) Protocol:

Duration:

6d 21h

Species:

Americamysis bahia Source:

Normal Distribution

ARO - Aquatic Research Organisms, N

Ending Date: 11 Oct-07 11:20 AM Setup Date:

Mean Dry Blomass-mg

Group Comparisons

Endpoint

Distribution

Test No:

Start Date:

04 Oct-07 01:30 PM

04 Oct-07 01:30 PM

Brine:

Analysis Type

Comparison

Dil Water: Not Applicable

Not Applicable

0.92688

Sample Link	Control Link	Date Analyzed	Version
09-2103-8475	09-2103-8475	12 Oct-07 4:10 PM	CETISv1.026

Method	Ait H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

ANOVA Assumptions Attribute Test Statistic Critical P Level Decision(0.01) Variance Ratio 1.64897 8.88539 0.52520 Equal Variances Variances

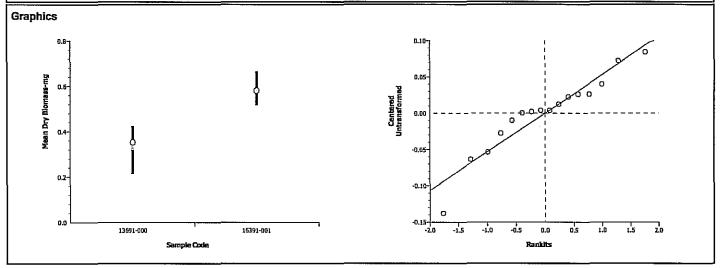
ANOVA Table							
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.2074802	0.2074802	1	67.87	0.00000	Significant Effect	
Error	0.0427956	0.0030568	14				
Total	0.25027578	0.2105370	15	-			

0.84420

0.21502

Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
13691-000		16391-001	-8.2386	1.76131	1.0000	0.04869	Non-Significant Effect
Data Summai	ry			Origi	nal Data		Transformed Data

Data Summary			Origi	nal Data			Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
13691-000	8	0.35200	0.21400	0.42400	0.06169					
16391-001	8	0,57975	0.51600	0.66400	0.04804					



Comparisons: Report Date:

Page 3 of 10 12 Oct-07 4:11 PM 02-9233-6443

Analysis:

CETIS Analysis Detail Americamysis 7-d Survival, Growth and Fecundity Test

EnviroSystems, Inc.

Duration: 6d 21h

Species: Americamysis bahia

Source: ARO - Aquatic Research Organisms, N

Test Type: Growth-Survival-Fec (7d) Test No: 11-8903-7394 Start Date: 04 Oct-07 01:30 PM

Ending Date: 11 Oct-07 11:20 AM

Protocol: EPA/821/R-02-014 (2002) Dil Water: Not Applicable

Setup Date: 04 Oct-07 01:30 PM Brine: Not Applicable

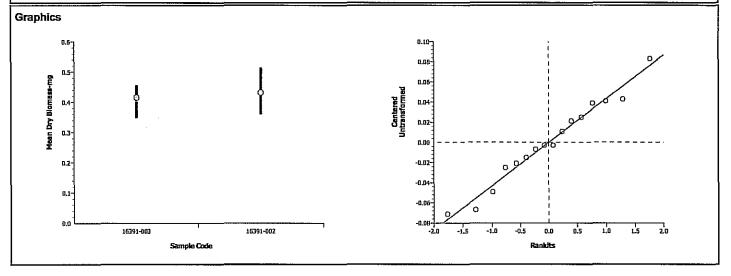
Endpoint	Analysis	s Туре	Sample	Link	Conf	ro! Link	Date Analyzed	l	Version
Mean Dry Biomass-mg	Compar	son	09-2103	-8475	09-2	103-8475	12 Oct-07 4:10	РМ	CETISv1.026
Method	Alt H	Data Transform	Z	NO	EL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C>T	Untransformed					N/A		

ANOVA Assum	ptions					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	2.05735	8.88539	0.36196	Equal Variances	******
Distribution	Shapiro-Wilk W	0.97515	0.84420	0.88372	Normal Distribution	

Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
0.0010563	0.0010563	1	0.56	0.46672	Non-Significant Effect
0.0264155	0.0018868	14			
0.02747174	0.0029431	15			
	0.0010563 0.0264155	0.0010563 0.0010563 0.0264155 0.0018868	0.0010563 0.0010563 1 0.0264155 0.0018868 14	0.0010563 0.0010563 1 0.56 0.0264155 0.0018868 14	0.0010563 0.0010563 1 0.56 0.46672 0.0264155 0.0018868 14

i	Group Comp	ariso	ins						
	Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	_
	16391-003		16391-002	-0.7482	1.76131	0.7666	0.03825	Non-Significant Effect	

Data Summary			Origi	nal Data			Transfo	rmed Data		
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
16391-003	8	0.41500	0.34800	0.45600	0.03513					
16391-002	8	0.43125	0.36000	0.51400	0.05039					



Comparisons:

Page 8 of 10 12 Oct-07 4:11 PM 09-2309-0239

Report Date: Analysis:

Americamysis 7-d Survival, Growth and F	ecundity Test

EnviroSystems, Inc.

Test No:

11-8903-7394

Test Type: Growth-Survival-Fec (7d)

Duration: 6d 21h

Start Date:

04 Oct-07 01:30 PM

EPA/821/R-02-014 (2002) Protocol:

Americamysis bahia

Ending Date: 11 Oct-07 11:20 AM

Dil Water: Not Applicable

Species:

Setup Date:

04 Oct-07 01:30 PM

Brine:

Not Applicable

Source:

ARO - Aquatic Research Organisms, N

Endpoint	Analysis	Туре	Sample L	ink	Control Link	Date Analyzed	i	Version
Mean Dry Biomass-mg	Compari	son	09-2103-8	475	09-2103-8475	12 Oct-07 4:10	PM	CETISv1.026
Method	Alt H	Data Transform	Z.	NO	L LOEL	Toxic Units	ChV	MSDp

N/A Equal Variance t C > T Untransformed

ANOVA Assumptions

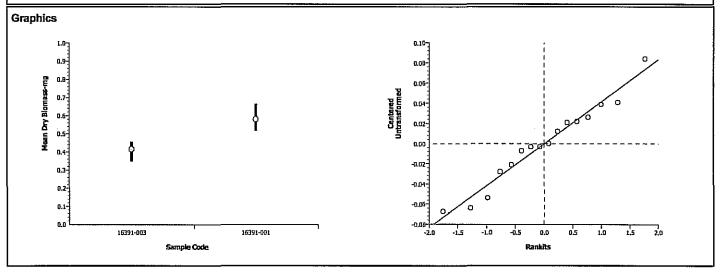
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	1.86985	8.88539	0.42787	Equal Variances	
Distribution	Shapiro-Wilk W	0.96678	0.84420	0.74945	Normal Distribution	

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.1085702	0.1085702	1	61.30	0.00000	Significant Effect	
Error	0.0247955	0.0017711	14			•	
Total	0.13336574	0.1103413	15				

Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16391-003		16391-001	-7.8295	1.76131	1.0000	0.03706	Non-Significant Effect	

Data Summary			Origi	nal Data			Тгалѕбо	rmed Data	.=
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16391-003	8	0.41500	0.34800	0.45600	0.03513				
16391-001	8	0.57975	0.51600	0.66400	0.04804				





Aquatic Research Organisms

DATA SHEET

65c/1/01

I.	Organism .	History
	Species:	AMERICAMYSIS BAHIA
•	Source:	
		Hatch date 9-27-67 Receipt date
		Lot number 092767MS Strain
		Brood Origination FloriDA
II.	Water Qua	ality
		Temperature 25 °C Salinity ~30 ppt DO
		pH7.8 Hardness ppm
III.	Culture Co	onditions
		System: TEC IRC
		Diet: Flake Food Phytoplankton Trout Chow
		Brine Shrimp Rotifers Other ENCAP. Shrimp Die
		Prophylactic Treatments:
		Comments:
IV.	Shipping I	nformation
		Client: EST # of Organisms: 400 +
		Carrier: Date Shipped: 10-4-07
		Mark Hornard
Biol	ogist:	Mark Closengorto

1 - 800 - 927 - 1650

Arbacia punctulata Chronic Fertilization Assay Water Quality and Gamete Preparation Data

STUDY: 16391	CLIENT: BATTELLE	LOCATION: New Bedford		DATE: 10141 INITIALS: LB	107		
SALINITY ADJUSTMENT I	RECORD:	mL -001 +	g SALT		"		
SALINITY ADJUSTMENT I	RECORD:	mL -002 +	g SALT				
SALINITY ADJUSTMENT I	SALINITY ADJUSTMENT RECORD: mL -003 + g SALT						
SALINITY ADJUSTMENT I	RECORD:	mL -004+	g SALT				
SALINITY ADJUSTED SAMPLE	D.O. (mg/L)	pH (SU)	SPEC COND (µmhos)	TEMP (°C)	SALINITY (ppt)		
Lab Control	u.7	9,5792	38400	20	29		
-001	7.1	7.52	41300	20	31		
-002	7.6	7.67	341606	20	31		
-003	7.5	7.72	41600	20	31		
004		ANTENNA TRANSPORTE ANTENNA TRANS) and the same of				

METERS USED

DO meter # 19 DO probe # 12 pH meter # 1097 pH probe # 50 S/C meter # 330 S/C probe # 330 SALINITY meter # 5 M 11-E

DATE & INITIALS FOR GAMETE PREPARATION: 10/4/07 1/6 SPERM DILUTIONS:

HEMACYTOMETER COUNT, E: $1/\sqrt{0}$ X 10⁴ = SPM SOLUTION E = $1/\sqrt{0}$ SPERM CONCENTRATIONS: SOLUTION E X 40 = SOLUTION A = $1/\sqrt{0}$ X 10⁴ = SPM SOLUTION A = $1/\sqrt{0}$ X 10⁴ = $1/\sqrt{0}$ X 10⁴ = SPM SOLUTION A = $1/\sqrt{0}$ X 10⁴ = SPM SOLUTION A = $1/\sqrt{0}$ X 10⁴ = SPM SOLUTION A = $1/\sqrt{0}$ X 10⁴ = SPM SOLUTION A = $1/\sqrt{0}$ X 10⁴ = $1/\sqrt{0}$ X 10⁴ = $1/\sqrt{0}$ X 10⁴ = $1/\sqrt{0}$ X 10⁴ = $1/\sqrt{0}$ X 10⁴ = $1/\sqrt{0}$ X 10⁴ = $1/\sqrt{0}$ X 10⁴ = $1/\sqrt{0}$ X 10⁴ = $1/\sqrt{0}$ X 10⁴ = $1/\sqrt{0}$ X 10⁴ = $1/\sqrt{0}$ X 10⁴ = $1/\sqrt{0}$ X 10⁴ = $1/\sqrt{0}$ X 10⁴ =

SOLUTION E X 20 = SOLUTION B = $\frac{174.107}{2.2 \times 107}$ SPM SOLUTION E X 5 = SOLUTION C = $\frac{5.5 \times 10^{4}}{5.5 \times 10^{4}}$ SPM

FINAL COUNTS:

.

FINAL SPERM COUNT: 44

FINAL EGG COUNT: 2400

TEST TIMES:

SPERM COLLECTED: ///5
EGGS COLLECTED: ///5
SPERM ADDED: //40
EGGS ADDED: //245
FIXATIVE ADDED: //3/5

See ESI SOP #1412 for additional information

Arbacia punctulata Chronic Fertilization Assay

SAMPLE USE RECORD

STUDY: 16391	CLIENT: Ba Bedford	attelle - New				
SPECIES: A. punctulata						
	Day: (0				
SAMPLE	Volume Used (mL)	ESI Cube ID				
Lab Control	100					
-001	1	_ 00)				
-002		-002				
-003		-00Z -003				
-004	@ V					
INITIALS:	B					
TIME:	1010					
DATE:	68 10/4/07					

FERTILIZATION COUNTS

STUDY	CLIENT BATTELLE	LOCATION	-	DATE 10/4/07
	DATTELLE	New Bedford		INITIALS LO
		REPLICA	ATE VIAL	
	1	2	3	_4_
SAMPLE	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL	FERT/TOTAL
Lab Control	100/111	100/104	100/100	92/104
-001	146/151	98/109	95/102	96/108
-002	90/100	92/101	95/160	108/114
-003 101/16/e		100/108	99/101	96/100
-004				

Page 1 of 1

CETIS Test Summary

Report Date: Link: 04 Oct-07 4:09 PM

10-4800-1516

Arbacia Sperm Cell Fertilization Test EnviroSystems, Inc.									
Test No: Start Date: Ending Date: Setup Date:	04-3470-1502 04 Oct-07 11:40 AM 04 Oct-07 01:15 PM 04 Oct-07 11:40 AM	Test Type: Protocol: Dil Water: Brine:		-02-014 (2002) ble)	Duration: Species: Source:	95m Arbacia punctulata In-House Culture		
Sample No: Sample Date: Receive Date: Sample Age:	14-3480-7020 04 Oct-07 11:00 AM 40m	Material: Code: Source: Station:	Surface Wa 13691-000 New Bedfor WQ-TOX-L	d Harbor Drec	ige Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment		
	07-4978-4743 03 Oct-07 11:00 AM 03 Oct-07 04:00 PM 25h	Material: Code: Source: Station:	Surface Wa 16391-001 New Bedfor WQ-TOX-0	rd Harbor Dred	lge Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment		
•	08-9714-4177 03 Oct-07 11:50 AM 03 Oct-07 04:00 PM 24h	Material: Code: Source: Station:	Surface Wa 16391-002 New Bedfor WQ-TOX-0	rd Harbor Dred	ige Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment		
_	09-9353-6734 03 Oct-07 12:28 PM 03 Oct-07 04:00 PM 23h	Material: Code: Source: Station:	Surface Wa 16391-003 New Bedfor WQ-TOX-0	rd Harbor Dred	ige Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment		
Proportion Fe	rtilized Summary								
Sample Code	Reps	Mean	Minimum	Maximum	SE	SD	cv		
13691-000 16391-003 16391-002 16391-001	4 4 4 4	0.93223 0.95474 0.92298 0.94679	0.88462 0.92593 0.90000 0.88889	1.00000 0.98020 0.95000 1.00000	0.02577 0.01122 0.01106 0.02385	0.05153 0.02243 0.02213 0.04770	5.53% 2.35% 2.40% 5.04%		
Proportion Fe	rtilized Detail						The second secon		
Sample Code	Rep 1	Rep 2	Rep 3	Rep 4					
13691-000 16391-003 16391-002	0.90090 0.95283 0.90000	0.92593	1.00000 0.98020 0.95000	0.88462 0.96000 0.93103					
16391-001	0.96689	1.00000	0.93137	0.88889					

Comparisons: Report Date:

Page 2 of 5 04 Oct-07 4:09 PM

EnviroSystems, Inc.

Analysis:

10-1796-5557

Arbacia Sperm Cell Fertilization Test

04-3470-1502

04 Oct-07 11:40 AM

Test Type: Fertilization

Protocol: EPA/821/R-02-014 (2002) Dil Water: Not Applicable

95m **Duration:**

Species:

Arbacia punctulata Source: In-House Culture

Ending Date: Setup Date:

Endpoint

Test No:

Start Date:

04 Oct-07 01:15 PM 04 Oct-07 11:40 AM

Brine:

Analysis Type

Not Applicable

Control Link Date Analyzed Version

Mathad	Alt LI Data Transfer	<u> </u>	E LOE	Toxic Units Ch	.v. 1100-
Proportion Fertilized	Comparison	10-4800-1516	10-4800-1516	04 Oct-07 4:08 PM	CETISv1.026

Sample Link

Data Transform Method Alt H Toxic Units Equal Variance t C > T Angular (Corrected) N/A

ANOVA Assumptions

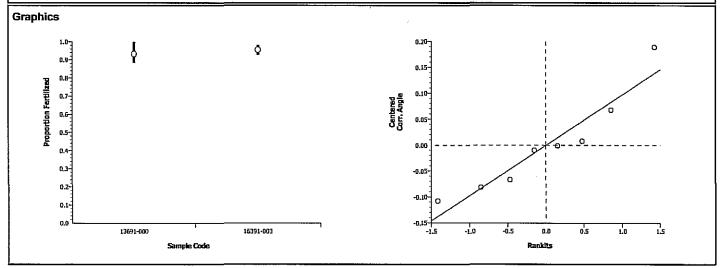
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	5.85974	47.46723	0.18049	Equal Variances	
Distribution	Shapiro-Wilk W	0.91366	0.74935	0.35640	Normal Distribution	

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)	
Between	0.0017984	0.0017984	1	0.17	0.69356	Non-Significant Effect	
Error	0.0630851	0.0105142	6				
Total	0.06488351	0.0123126	7	_			

Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
13691-000		16391-003	-0.4136	1.94318	0.6532	0.14089	Non-Significant Effect	

Data Summary	Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
13691-000	4	0.93223	0.88462	1.00000	0.05153	1.33153	1.22422	1.52078	0.13403
16391-003	4	0.95474	0.92593	0.98020	0.02243	1.36152	1.29515	1.42961	0.05537



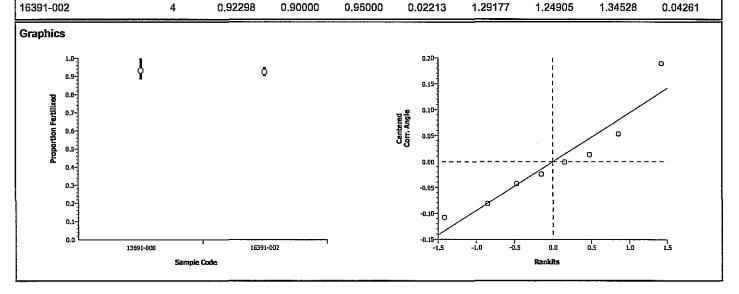
Comparisons: Report Date:

Page 4 of 5

04 Oct-07 4:09 PM

Analysis: 14-3718-3627 Arbacia Sperm Cell Fertilization Test EnviroSystems, Inc. Test No: Test Type: Fertilization Duration: 95m 04-3470-1502 Arbacia punctulata Start Date: 04 Oct-07 11:40 AM EPA/821/R-02-014 (2002) Species: Protocol: Ending Date: 04 Oct-07 01:15 PM Dil Water: Not Applicable Source: In-House Culture Not Applicable Setup Date: 04 Oct-07 11:40 AM Brine: Sample Link Control Link **Date Analyzed** Version **Endpoint Analysis Type** 04 Oct-07 4:08 PM Proportion Fertilized 10-4800-1516 10-4800-1516 CETISv1.026 Comparison Method Alt H Data Transform Z NOEL LOEL **Toxic Units** ChV **MSDp** Angular (Corrected) N/A Equal Variance t C>T **ANOVA Assumptions** Statistic Critical Attribute Test P Level Decision(0.01) 9.89345 47.46723 0.09179 Variances Variance Ratio **Equal Variances** Distribution Shapiro-Wilk W 0.91570 0.74935 0.37043 Normal Distribution **ANOVA Table** Decision(0.05) Source Sum of Squares Mean Square DF F Statistic P Level Between 0.0031625 0.0031625 1 0.32 0.59224 Non-Significant Effect Error 0.0593356 0.0098893 6 Total 0.06249808 0.0130517 7 **Group Comparisons** Statistic Critical P Level MSD Decision(0.05) Sample VS Sample 13691-000 16391-002 0.5655 1 0/318 በ 2961 0.13664 Non-Significant Effect

13091-000	10381-002	351-002 0.3033 1.54310 0.2501 0.13004					Non-Significant Effect				
Data Summary			Original Data				Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD		
13691-000	4	0.93223	0.88462	1.00000	0.05153	1.33153	1.22422	1.52078	0.13403		
1											



Comparisons: Report Date:

Page 5 of 5

Analysis:

04 Oct-07 4:09 PM 14-9782-5702

Arbacia Sperm Cell Fertilization Test

EnviroSystems, Inc.

Test No:

04-3470-1502

Test Type: Fertilization

Duration: 95m

Start Date:

04 Oct-07 11:40 AM

Protocol: EPA/821/R-02-014 (2002)

Species:

Arbacia punctulata

Setup Date:

Ending Date: 04 Oct-07 01:15 PM

Dil Water: Not Applicable

Source:

In-House Culture

04 Oct-07 11:40 AM

Brine:

Not Applicable

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Fertilized	Comparison	10-4800-1516	10-4800-1516	04 Oct-07 4:09 PM	CETISv1.026

Toxic Units Method Alt H Data Transform Z NOEL LOEL ChV MSDp C > T Angular (Corrected) Equal Variance t N/A

ANOVA Assumptions

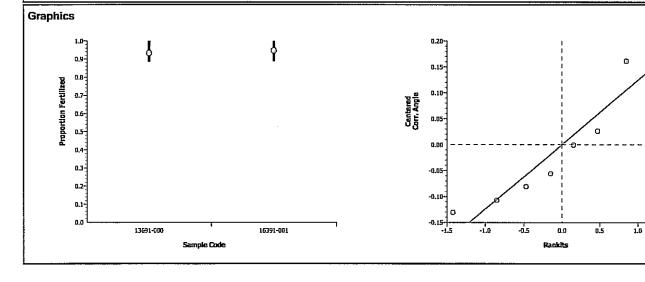
1	•					
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Variance Ratio	1.14931	47.46723	0.91162	Equal Variances	
Distribution	Shapiro-Wilk W	0.89536	0.74935	0.25001	Normal Distribution	

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0018383	0.0018383	1	0.11	0.75202	Non-Significant Effect
Error	0.1007766	0.0167961	6			
Total	0.10261487	0.0186344	7	_		

Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)
13691-000		16391-001	-0.3308	1.94318	0.6240	0.17807	Non-Significant Effect

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
13691-000	4	0.93223	0.88462	1.00000	0.05153	1.33153	1.22422	1.52078	0.13403
16391-001	4	0.94679	0.88889	1.00000	0.04770	1.36185	1.23096	1.52289	0.12502



Comparisons: Report Date:

Page 3 of 5

04 Oct-07 4:09 PM

12-7659-3935

EnviroSystems, Inc.

Analysis:

Arbacia Sperm Cell Fertilization Test

Ending Date: 04 Oct-07 01:15 PM

04-3470-1502

04 Oct-07 11:40 AM

04 Oct-07 11:40 AM

Test Type: Fertilization

Brine:

EPA/821/R-02-014 (2002)

Protocol: Dil Water: Not Applicable

Not Applicable

Duration: 95m

Species:

Arbacia punctulata

Source:

In-House Culture

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Proportion Fertilized	Comparison	10-4800-1516	10-4800-1516	04 Oct-07 4:09 PM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Angular (Corrected)				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.68838	47.46723	0.67758	Equal Variances
Distribution	Shapiro-Wilk W	0.97238	0.74935	0.90329	Normal Distribution

ANOVA Table

Test No:

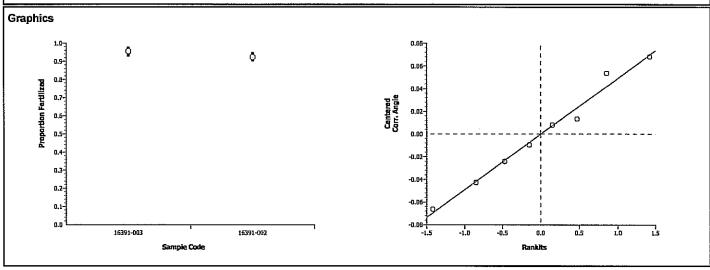
Start Date:

Setup Date:

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	0.0097305	0.0097305	1	3.99	0.09284	Non-Significant Effect
Error	0.0146433	0.0024406	6			
Total	0.02437385	0.0121711	7	_		

Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16391-003		16391-002	1.99675	1.94318	0.0464	0.06788	Significant Effect	

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16391-003	4	0.95474	0.92593	0.98020	0.02243	1.36152	1.29515	1.42961	0.05537
16391-002	4	0.92298	0.90000	0.95000	0.02213	1.29177	1.24905	1.34528	0.04261



Comparisons: Report Date:

Page 1 of 5 04 Oct-07 4:09 PM

EnviroSystems, Inc.

05-5428-8037

Analysis:

Arbacia Sperm Cell Fertilization Test

04-3470-1502 Test Type: Fertilization

04 Oct-07 11:40 AM Ending Date: 04 Oct-07 01:15 PM Protocol: EPA/821/R-02-014 (2002)

Dil Water: Not Applicable

Duration: 95m

Source:

Species:

Arbacia punctulata In-House Culture

Setup Date: 04 Oct-07 11:40 AM Not Applicable Brine:

Endpoint	Analysis Type
Proportion Fertilized	Comparison

Sample Link

Control Link Version **Date Analyzed**

Proportion Fertilized Comparison		SON	10-4800-1516	10-4800-1516	04 OCI-07 4:09 F	-M -	1 CE11SV1.026	
Method	Alt H	Data Transform	Z NO	EL LOEL	Toxic Units	ChV	MSDn	

Equal Variance t C>T Angular (Corrected) N/A

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	5.09849	47.46723	0.21401	Equal Variances
Distribution	Shapiro-Wilk W	0.98055	0.74935	0.96309	Normal Distribution

ANOVA Table

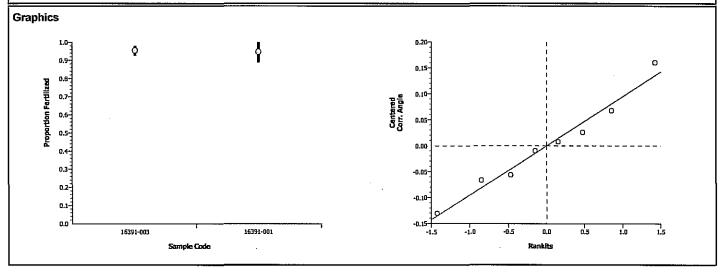
Test No:

Start Date:

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	2.190E-07	2.190E-07	1	0.00	0.99629	Non-Significant Effect
Error	0.0560843	0.0093474	6			•
Total	0.05608453	0.0093476	7	_		

Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16391-003		16391-001	-0.0048	1.94318	0.5019	0.13284	Non-Significant Effect	

Data Summary		Original Data			Transformed Data				
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	ŞD
16391-003	4	0.95474	0.92593	0.98020	0.02243	1.36152	1.29515	1.42961	0.05537
16391-001	4	0.94679	0.88889	1.00000	0.04770	1.36185	1.23096	1.52289	0.12502





Saskatchewan Research Council

15 Innovation Boulevard, Saskatoon, SK S7N 2X8 Phone: 306-933-5469

Champia parvula Sexual Reproduction Test Quality Assurance Summary

Client	ESI Ltd.	SRC Sample #	568, 569, 570
File#	MM478	Test Initiation Date	Oct 9/07
Analyst	M. Moody	Test Completion Date	Oct 16/07
Sample Identity	001, 002, 003 (also labeled Batelle)		

Test Type: Chronic, Definitive, Single-concentration (100%)

Test Organisms Species: *Champia parvula*, sexually mature male and female branches, in good health, males having sori with spermatia, females having trichogynes.

Test Conditions (additional information on following page)

Method: EPA-821-R-02-014 Method 1009.0, (Third edition, October 2002) static, non-renewal; 2-day effluent exposure followed by 5 to 7 day recovery period in control medium for cystocarp development.

Exposure/Dilution Medium: natural seawater collected at Pacific Environmental Science Centre, North Vancouver, B.C., filtered to 0.2μm and autoclaved before use, adjusted to salinity 30 ppt. and enriched with 10 ml/L Test Nutrient Solution, Table 1 of method cited.

Recovery Medium: natural seawater (same as for exposure medium), enriched with 10 ml/L Culture Nutrient Solution (method section 16.10.1.3).

Reference Toxicant Test

Method: EPA-821-R-02-014, Method 1009.0, static, non-renewal; 2-day exposure followed by 5 to 7 day recovery period in control medium for cystocarp development. See control performance and reference toxicant charts for additional information.

Test conditions: performed under same experimental conditions as effluent sample.

Compound: sodium dodecyl sulphate mg/L

Date of test: Oct 17/07	Historic value, warning limits ±2SD
IC ₅₀ (95 % CL) mg/L 1.17 (1.06 - 1.24)	1.30 (1.06 - 1.61)

Quality Control Data

Control mortality: no control mortality was observed in any control solution during observation periods.

Mean number of cystocarps per plant counted in this test (must be >10 to be acceptable).

mean control cystocarps per female	16.6
% survival in Control	100

Cystocarp Counts (mean per female branch)

Control, natural seawater	16.6
001	0
002	9.7
003	11.4
Signature: My mordy	Date: Two//07



Saskatchewan Research Council

15 Innovation Boulevard, Saskatoon, SK S7N 2X8 Phone: 306-933-5469

Test Data Summary

Samples				*.	SRC#	568, 569, 570	
Identification/Type	001, 002, 003 (also	o labeled Batelle)	<u>.</u>		Analyst	Mary Moody	
Date/Time Received	Oct 9/07@ 0800	Date Shipped	Oct 4/07	•	erature Upoi pt (°C)	8 with ice pac	ks
Test Initiation Date	Oct 9/07	·	Test Complet	ion Date	Oct 16/07	7	
Organism Inform	ation						
Species		Champia parvula	Appea	rance/Health	of Champio	excellent	
Source sexually n	nature male and female	branches, obtained fro	m USEPA, Hatfi	eld Marine Sc	ience Center,	Newport, Oregon, 19	95
Females, Presence of	Trichogynes	yes	Males, Prese	nce of Sori v	vith Sperma	tia yes	
Test Conditions				*			
Test Method	EPA-821-R-02-01	14, Method 1009.0	Dilut	ion/control v	vater Nat	ural Seawater	
Test Type Chronic	definitive single con	centration				1.	•
Test Vessels (Exposur	re & Recovery)	270 r	nL transparent p	olystyrene c	ups, transpa	rent polystyrene lid	S
Exposure Volume / Depth	100 mL / 4.5 cm		Reco Volu	very ime / Depth	200	mL / 7.3 cm	
Replicates/Conc.	4		No. c	f organisms	(female/mal	e)5	/1
Number and Concentr Solutions (%v/v)	rations of Test	Controls: natural Tests: 100	sea water				
Chemicals added to co	ontrol/dilution water	Test	Nutrients as des	cribed in me	thod cited a	t 10 ml/L, analytical	grade
Sample Treatment	*	•	DO 44				
D.O. before salinity ac		see page 3	,	st start (mg/L	•	***	see page 3
Aeration (duration/rat			Filtration		none	. pH Adjustment	none
Salinity Adjustment	not requ	ired, all samples wer	e at salinity of 3	0 ±2 ppt	-		
Exposure Period (48 h).						
Temperature, pH, D.C). and Salinity of test	solutions and control	s on following p	oage			
Photoperiod (L:D h)	16:8	Agitation of tests an	d controls	_ {	gentle rotary	shaking	
Recovery Period (5-7 (4)						
-	eration supplied					•	
Recovery Medium: na		ning 10 ml/L Culture	Nutrients (sect	ion 16.10.1.3	of cited me	ethod)	
	Dur vittor voiliti					·	
C.,L.,M., J D.,.	-			Doto			
Submitted By:		mond	7	Date:		nw1/07	



Saskatchewan Research Council

15 Innovation Boulevard, Saskatoon, SK S7N 2X8 Phone: 306-933-5469

Water Quality Data

Sample Identification

001, 002, 003 (also labeled Batelle)

SRC# 568, 569, 570

INITIAL WATER QUALITY		SAMPLES at test start		TEST MEDIUM	RECOVERY MEDIUM
sample #	001	002	003		
Temperature (°C)	23	23	23	23	23
Dissolved Oxygen (mg/L)	7.8	7.8	7.8	7.8	7.8
pН	7.32	7.45	7.34	8.17	8.44
Salinity (ppt)	31	31	31	30	30
Description of sample	colorless	coloriess	colorless		

Length of Recovery Period (days)

5

Water Quality Data during Exposure Period (0, 24, 48 hr)

Sample	Tem	peratur	e (°C)	Diss	Dissolved Oxygen pH S			pН		Sa	ılinity (_l	ppt)
	0	24	48	0	24	48	0	24	48	0	24	48
Control-NSW*	23	23	23	7.8	8.0	8.0	8.17	8.11	8.10	30	30	30
001	23	23	23	7.8	8.0	- 8.0	7.28	7.71	7.98	31	31	31
002	23	23	23	7.8	8.0	8.0	7.31	7.67	7.99	31	31	31
003	23	23	23	7.8	8.0	8.0	7.31	7.78	7.95	31	31	31

^{*}Natural Sea Water

Appearance of branches after 48 hours exposure

Condition of female branches	Control NSW	001	002	003
description	normal*	pale and limp	normal	normal

^{*} Branches red (no green areas), firm but flexible

Champia (female) Mortality at end of Recovery Period

	(**************************************										
Condition of female branches	Control NSW	001	002	003							
# dead	0	0	0	0							
% mortality	0	0	- 0	0							
description	normal*	white with red tips	normal	normal							

^{*} Branches red (no green areas), firm but flexible

Initial/Date

nw1/07



Sample Identification

003

SD: Standard Deviation

Saskatchewan Research Council

15 Innovation Boulevard, Saskatoon, SK S7N 2X8 Phone: 306-933-5469

RECOVERY PERIOD - TEMPERATURE MONITORING (initial daily entries)

Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	
23	23 ·	23	23	23	23	

Test Data

Analyst

Mary Moody

SRC#

568, 569, 570

Healthy red colour

Normal growth

001, 002, 003 (also labeled Batelle)

100

100

100

100

100

570

6

7

14

15

12

11

7

15

14

6

18

5

5

29

6

Champia Raw Data Date Oct 9/07 Cystocarps per plant SD Mean Group mean Comments and SD Control NSW 10 22 16 23 17.8 5.2 Healthy red colour 18 16.6 Normal growth 20 22 21 16 18 19.4 2.4 4.5 10 15 3.4 11 9 17 12.4 16.6 22 20 15 15 11 4.4 SRC# % V/V 001 568 100 0 Ö 0 0 ō 0.0 0.0 0.0 branches white with red tips 100 0 0.0 0.0 0 0 0 0 0.0 100 0 0 0 0 0 0.0 0.0 100 0 0 0.0 0.0 0 0 0 100 002 569 5 16 6 11 5 8.6 4.8 9.7 Healthy red colour 100 5 5 6 7 6.6 2.1 4.4 Normal growth 10 100 12 9 15 11 7 10.8 3.0

18

11

8

15

12

10

10

10

16

12.6

8.0

10.4

17.8

9.4

5.3

2.4

4.2

6.3

3.1

11.4

5.5

Submitted by:	mmords	Date:	Ca unila
Submitted by:	10 morag	Date:	nav1/07

CETIS Test Summary

Report Date: Link: 16 Oct-07 9:32 AM

04-5941-1906

Champia parv	ula Red Macro		Saskatchewan Research Council					
Test No: Start Date: Ending Date: Setup Date:	06-7702-5981 07 Oct-07 12:0 12 Oct-07 12:0 07 Oct-07 12:0	0 PM	Test Type: Protocol: Dil Water: Brine:	-			Duration: Species: Source:	5d 0h Champia parvula In-House Culture
Sample No: Sample Date: Receive Date: Sample Age:	14-3480-7020 04 Oct-07 11:0 73h	00 AM	Material: Code: Source: Station:	Surface Wa 13691-000 New Bedfor WQ-TOX-La	d Harbor Drec	ige Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment
i '	07-4978-4743 03 Oct-07 11:0 03 Oct-07 04:0 4d 1h		Material: Code: Source: Station:	Surface Wa 16391-001 New Bedfor WQ-TOX-00	d Harbor Drec	ige Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment
	08-9714-4177 03 Oct-07 11:5 03 Oct-07 04:0 4d 0h		Material: Code: Source: Station:	Surface Wa 16391-002 New Bedfor WQ-TOX-00	d Harbor Drec	ige Monitorin	Client: Project:	Battelle Labs Ecological Risk Assessment
	09-9353-6734 03 Oct-07 12:2 03 Oct-07 04:0 96h		Material: Code: Source: Station:	Surface Water 16391-003 New Bedford Harbor Dredge Monitorin WQ-TOX-003			Client: Project:	Battelle Labs Ecological Risk Assessment
Mean Cystoca	rps Summary							
Sample Code		Reps	Mean	Minimum	Maximum	SE	SD	cv
13691-000 16391-003 16391-002 16391-001		4 4 4	16.55 11.4 9.65 0	12.4 8 6.6 0	19.4 17.8 12.6 0	1.4975 2.18937 1.3048 0	2,995 4,37874 2,6096 0	18.10% 38.41% 27.04% 0.00%
Mean Cystoca	rps Detail							
Sample Code 13691-000 16391-003 16391-002 16391-001		Rep 1 17.8 8 8.6 0	Rep 2 19.4 10.4 6.6 0	Rep 3 12.4 17.8 10.8	Rep 4 16.6 9.4 12.6			

Comparisons: Report Date:

Page 1 of 5

Saskatchewan Research Council

Analysis:

16 Oct-07 9:33 AM 09-1668-6981

Champia parvula Red Macroalga Sexual Reproduction Test

06-7702-5981

Analysis Type

Start Date: 07 Oct-07 12:00 PM Ending Date: 12 Oct-07 12:00 PM

Test No:

Endpoint

Test Type: Champia

Protocol: EPA/600/4-91/003 (1994) Dil Water: Not Applicable

Duration: 5d 0h

Source:

Species:

Champia parvula In-House Culture

Setup Date: 07 Oct-07 12:00 PM

Not Applicable Brine:

Control Link	Date Analyzed	Version

Mean Cystocarps	Comparison	04-5941-1906	04-5941-1906	16 Oct-07 9:31 AM	CETISv1.026
Mathad	Alt H Data Transform	7 NC	DEL LOEL	Toyle Units Ch	V MSDn

Sample Link

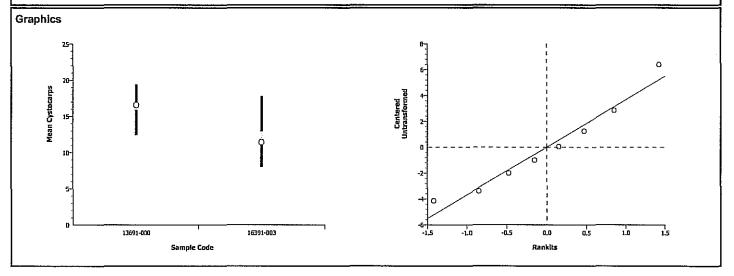
Method	Alt H	Data Transform	<u>Z</u>	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C>T	Untransformed				N/A		

ANOVA Assumptions Attribute Test Statistic Critical P Level Decision(0.01) 47.46723 Variances Variance Ratio 2.13750 0.54871 Equal Variances Distribution Shapiro-Wilk W 0.95676 0.74935 0.74701 Normal Distribution

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	53.045	53.045	1	3.77	0.10023	Non-Significant Effect
Error	84,43	14.07167	6			
Total	137 474998	67 116665	7	_		

Group Comparisons										
	Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)		
	13691-000		16391-003	1.94155	1.94318	0.0501	5.15431	Non-Significant Effect		

Data Summary		Original Data			Transformed Data					
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
13691-000	4	16.55	12.4	19.4	2.99499				•	
16391-003	4	11.4	8	17.8	4.37874					



Comparisons: Report Date:

Page 3 of 5

Analysis:

16 Oct-07 9:33 AM 10-4382-4123

Saskatchewan Research Council

Champia parvula Red Macroalga Sexual Reproduction Test

06-7702-5981 Start Date: 07 Oct-07 12:00 PM Ending Date: 12 Oct-07 12:00 PM

Test Type: Champia

Protocol: EPA/600/4-91/003 (1994) Dil Water: Not Applicable

Duration: Species:

Source:

5d Oh

Champia parvula In-House Culture

07 Oct-07 12:00 PM Not Applicable Brine:

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Cystocarps	Comparison	04-5941-1906	04-5941-1906	16 Oct-07 9:31 AM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C>T	Untransformed				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Variance Ratio	1.31718	47.46723	0.82626	Equal Variances
Distribution	Shapiro-Wilk W	0.92749	0.74935	0.46075	Normal Distribution

ANOVA Table

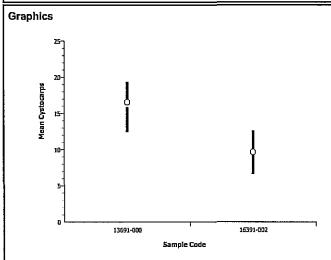
Test No:

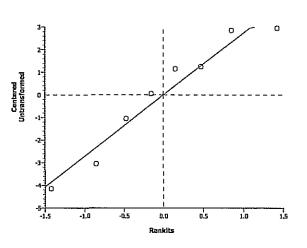
Setup Date:

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	95.22	95.22	1	12.07	0.01324	Significant Effect
Error	47.34	7.89	6			
Total	142.560001	103.11000	7	=		

Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
13691-000		16391-002	3,47397	1.94318	0.0066	3.85955	Significant Effect	

Data Summary		Original Data				Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
13691-000	4	16.55	12.4	19.4	2.99499				
16391-002	4	9.65000	6.6	12.6	2.6096				





Comparisons: Report Date:

Page 5 of 5

Analysis:

16 Oct-07 9:33 AM 16-1554-3473

Saskatchewan Research Council

Champia parvula Red Macroalga Sexual Reproduction Test

Start Date: 07 Oct-07 12:00 PM Ending Date: 12 Oct-07 12:00 PM

Test Type: Champia Protocol:

EPA/600/4-91/003 (1994) Dil Water: Not Applicable

Duration: Species:

Source:

5d 0h

Champia parvula

Setup Date:

Test No:

07 Oct-07 12:00 PM

06-7702-5981

Not Applicable Brine:

In-House Culture

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Cystocarps	Comparison	04-5941-1906	04-5941-1906	16 Oct-07 9:31 AM	CETISv1.026
		11			

Method Alt H **Data Transform** Ζ NOEL LOEL **Toxic Units** ChV MSDp C>T N/A Equal Variance t Untransformed

ANOVA Assumptions

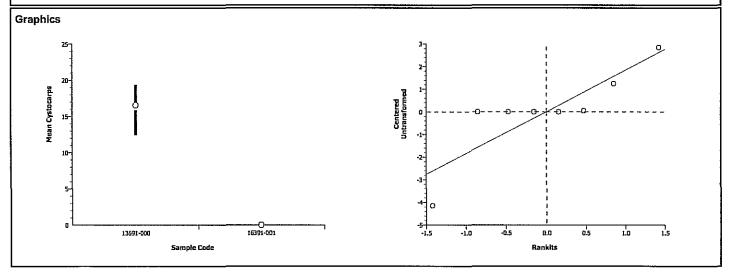
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)	
Variances	Modified Levene	4.27735	13.74502	0.08410	Equal Variances	
Distribution	Shapiro-Wilk W	0.80027	0.74935	0.03342	Normal Distribution	

ANOVA Table

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	547.805	547.805	1	122.14	0.00003	Significant Effect
Error	26.91	4.485	6			
Total	574.714993	552.28999	7	_		

Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
13691-000		16391-001	11.0518	1.94318	0.0000	2.90991	Significant Effect	

Data Summary	Original Data				Transformed Data					
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD	
13691-000	4	16.55	12.4	19.4	2,99499					
16391-001	4	0	0	0	0					



Comparisons: Report Date:

Page 2 of 5 16 Oct-07 9:33 AM

Saskatchewan Research Council

Analysis:

10-2486-5564

Champia parvula Red Macroalga Sexual Reproduction Test

Analysis Type

Comparison

Test No: Start Date: 07 Oct-07 12:00 PM Ending Date: 12 Oct-07 12:00 PM

06-7702-5981

Test Type: Champia EPA/600/4-91/003 (1994) Protocol:

Dil Water: Not Applicable

Duration:

Species:

Champia parvula Source: In-House Culture

Setup Date:

Mean Cystocarps

Endpoint

07 Oct-07 12:00 PM

Brine: Not Applicable

Control Link	Date Analyzed	Version
04-5941-1906	16 Oct-07 9:31 AM	CETISv1.026

									
Method	Ait H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp	
Equal Variance t	C>T	Untransformed				N/A			

Sample Link

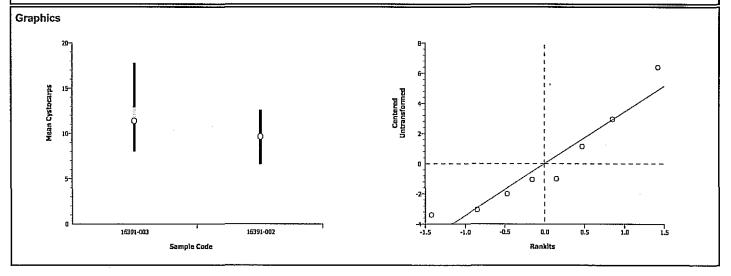
04-5941-1906

ANOVA Assumptions									
Attribute	Test	Statistic	Critical	P Level	Decision(0.01)				
Variances	Variance Ratio	2.81547	47.46723	0.41788	Equal Variances				
Distribution	Shapiro-Wilk W	0.90115	0.74935	0.28010	Normal Distribution				

ANOVA Table						
Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	6.125	6.125	1	0.47	0.51796	Non-Significant Effect
Error	77.95	12.99167	6			
Total	84.0749969	19.116667	7			

Group Comparisons									
Sample	vs	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)		
16391-003		16391-002	0.68663	1.94318	0.2590	4.95257	Non-Significant Effect		

Data Summary			Original Data			Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16391-003	4	11.4	8	17.8	4.37874		•		
16391-002	4	9.65000	6.6	12.6	2.6096				



Comparisons: Report Date: Page 4 of 5

Analysis:

16 Oct-07 9:33 AM 11-5457-3384

Saskatchewan Research Council

Champia parvula Red Macroalga Sexual Reproduction Test

06-7702-5981 Test Type: Chan

Start Date: 07 Oct-07 12:00 PM Ending Date: 12 Oct-07 12:00 PM

Test Type: Champia
Protocol: EPA/600/4-91/003 (1994)

Dil Water: Not Applicable

Duration: 56 Species: C

Source:

5d Oh

Champia parvula In-House Culture

Setup Date: 07 Oct-07 12:00 PM Brine: Not Applicable

Endpoint	Analysis Type	Sample Link	Control Link	Date Analyzed	Version
Mean Cystocarps	Comparison	04-5941-1906	04-5941-1906	16 Oct-07 9:31 AM	CETISv1.026

Method	Alt H	Data Transform	Z	NOEL	LOEL	Toxic Units	ChV	MSDp
Equal Variance t	C > T	Untransformed				N/A		

ANOVA Assumptions

Attribute	Test	Statistic	Critical	P Level	Decision(0.01)
Variances	Modified Levene	2.34154	13.74502	0.17684	Equal Variances
Distribution	Shapiro-Wilk W	0.78932	0.74935	0.02602	Normal Distribution

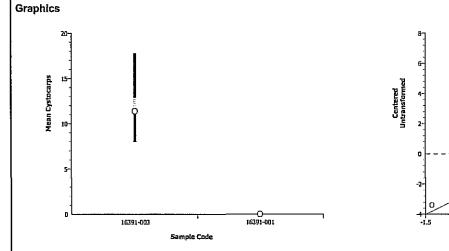
ANOVA Table

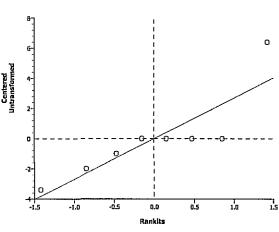
Test No:

Source	Sum of Squares	Mean Square	DF	F Statistic	P Level	Decision(0.05)
Between	259.92	259.92	1	27.11	0.00200	Significant Effect
Error	57.52	9,586667	6			
Total	317.440014	269.50668	7			

Sample	VS	Sample	Statistic	Critical	P Level	MSD	Decision(0.05)	
16391-003		16391-001	5,20698	1.94318	0.0010	4.25434	Significant Effect	

Data Summary			Original Data			Transformed Data			
Sample Code	Count	Mean	Minimum	Maximum	SD	Mean	Minimum	Maximum	SD
16391-003	4	11.4	8	17.8	4.37874				
16391-001	4	0	0	0	0				





SALTWATER ASSAYS

A. bahia, A. punctulata, C. parvula

STUDY: 16391	LOCATION: Nev	v Bedford Harbor					
CHEMISTRY	Lab Salt Control	-001	-002	-003	-004		
AMMONIA	- 007	-004	- 005	- 006			
AS RECEIVED WATER QUALITIES	Lab Salt Control	-001	-002	(ref.) @844 -003	-004		
SALINITY (ppt)	31	31	30	31	/		
pH (SU)	8.00	7.51	7.66	7.72			
TRC (mg/L)	<0.05	40.05	۷٥.05	40.05	/		
DO (mg/L)	6.6	G.5	6.8	6.8			
S/C (µmhos/cm)	43500	41300	41200	41200			
WQ STATION USED	2	2	2	2	/		
INITIALS	RAM	RAM	RAM	RAM			
A. bahia SALINITY		• • • • • • • • • • • • • • • • • • • •			/		
ADJUSTMENT RECORD	Lab Salt Control	-001	-002	-003	-004		
SAMPLE (mLs)							
SEA SALT (g)							
DATE:							
TIME:							
INITIALS:							

Sample ID	ESI Cube ID
-001	-001
-002	-002
-003	-003
-004	-004

Americamysis bahia 7 DAY CHRONIC ASSAY NEW WATER QUALITIES

STUDY:	91	CLIEN BATTE				LOCA NEW I	TION: BEDFO	RD		LAB CONTROL: HAMPTON ESTUARY						
			NEW D)ISSOL	VED OX	(YGEN	(mg/L)				NEW S	SALINIT	Y (ppt)			
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6	
LAB	А	6.7	5.5	<u>ر</u> ق	6.5	69	6.6	6.7	29	29	30	29	29	31	31	
-001	Α_	7.0	5.2	G. 2	6.6	6.7	6.2	63	31	30	30	29	29	30	30	
-002	Α_	7.5	5,2	6.2	6.5	6.7	6.3	G, Y	30	30	30	29	19	30	29	
-003	Α	7.5	5,0	J G	6.4	ما. يا	6.3	62	30	30	30	29	29	30	29	
004	A				- ,											
			NEV	/ pH (S	U)					NE	EW TEN	/PERA	TURE (,C)		
CONC	REP	0	1	2	3	4	5	6	0	1	2	3	4	5	6	
LAB	Α	7,85	7.82	7 7	7.82	8.02	7.92	7.94	25	25	26	26	26	26	à6	
-001	Α	7.58	7.48	7.51	7.65	7.62	7.52	7.49	25	25	26	24	26	26	26	
-002	A	7.09	7.59	7.60	7.60	7.67	7,58	7.57	25	25	26	26	26	26	3.6	
-003	A	7.73	7.57	7.52	7.50	7.62	7.46	7.52	25	25	26	24	26	26	26	
-004	A									<u> </u>		<u> </u>				
INC TEN	/IP:	26	26	26	26	26	恕	26								
DATE:		1014101	10/5/07	ыl	10/7	10/8	1019	10/10								
TIME:		०ठ०	1310	0955	0945											
INIT:		RAM	AK	RAM	M ST ST RAM PX											

		NE.	W WATER	R QUALITIES	3			
	0	1	2	3	4	5	6	7 /
Water Quality Station #	T	\				1	ļ ļ	/
Initials		AK	RAM	SJ	SJ	RAM	PA	
Date	1014107	10/5/07	1016	1017	1018	1019	10/10	

Americamysis bahia 7 DAY CHRONIC ASSAY OLD WATER QUALITIES

STUDY:		CLIEN BATT				ATION: BEDF		in Qu	LAB CONTROL: HAMPTON ESTUARY							
		OL	D SAL	INITY (ppt)						OL	D pH ((SU)			
Conc	Rep	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
Control	Α	25	30	29	29	28	31	31	7.97	7.78	7.90	7.87	7.80	7.91	7.88	
-001	Α	27	30	29	29	28	30	30	7.81	7.64	780	7.80		7.90	7.73	
-002	Α	27	30	29	29	31	30	30	7.85	סד.ד	7.79	7.79		7.88	7.74	
-003	Α	27	30	29	29	31	30	30	7.86	7.64	7.15	7.76	7.73	7.79	7.77	
-004	A															
		OLD T	EMPE	RATU	RE (°C)										
Conc	Rep	1	2	3	4	5	6	7								
Control	Α	25	26.	26	26	25	26	26								
-001	Α	26	26	26	26	25	ə 6	26								
-002	Α	26	26	1	24	25	26	26								
-003	Α	26	26	26	26	25	26	26								
004	_A															
				ant of many												
INC TEMP):	೩೮	26	26	26	25	26	26								
DATE:		10/5	1016	1017	10/8	1010	DID	10/11								
TIME:		1230	0925	0920	1166	1000	1305	1110								
INITIALS:								RAM								

GENERAL NOTES - for additional information refer to SOP #1411 or EPA manual 600/4-91/003

- •Test vessels will be 250 mL glass beakers containing a minimum of 150 mL of solution
- •8 replicates per site with 5 organisms each
- •Test Temperature: 26±1°C
- •Salinity: 25 ±2ppt
- •Dissolved Oxygen: >4.3 mg/L
- •Photoperiod will be 16 hours light and 8 hours dark.
- •Passing criteria require ≥80% survival and average dry weight of ≥0.20 mg/organism in the control vessels.

			LD WATER	R QUALITIES				
	0	1	2	3	4	5	6	7
Water Quality Station #						2	ı	1
Initials		Αĸ	RAM	82	SJ	RAM	PA	RAM
Date	1014107	10/5/07	1016	107	10/8	1019	14/10	10/11

Americamysis bahia 7 DAY CHRONIC ASSAY SAMPLE USE RECORD

i .		I											
study: 163	1		CLIENT: BAT	TTELL	.E - Nev	w Bedford							
SPECIES: A. bal	nia			TEST	Γ: chroı	nic renewal							
	Day: 0)		Day:	1		Day:	2					
Sample	Volu Used		ESI Cube ID	•	lume d (mL)	ESI Cube ID		lume d (mL)	ESI Cube ID	Day	Date	Time	lnit
Lab Control	1,2	00	n/a	8	00	n/a	රි	∞	n/a	0	1014167	1000	RAM
-001			± 001		}	-001			-001	1	10 5	1300	AK
-002			-002			- 002			-002	2	610	0950	RAM
-003			- 003			- 003		Ţ	-003	3	10/7	0940	SJ
-004					ļ					4	10/8	1130	SJ
		V								5	1019	1030	RAM
										6	10/10	1323	PA
			<u> </u>	-				_	***************************************		11 /10		<u>!</u>
	Day: 3	3		Day:	4		Day:	5					
Sample	Volu Used	ıme (mL)	ESI Cube ID		lume d (mL)	ESI Cube ID		lume d (mL)	ESI Cube ID				
Lab Control	800)	n/a	80	0	n/a	8	00	n/a				
-001	1		-001			-001			-001				
-002			-002			-062	!		~002				
-003	J		-003		Ø	-003	,		-003				
004													
	Day: 6									ı			
Sample	Volu Used		ESI Cube ID										
Lab Control	8-0	O	n/a										
-001			~00 l										
-002			-005										
-003	V	'	~pO]										
←-004													

EnviroSystems, Inc. One Lafayette Road P.O. Box 778 Hampton, NH 03843-0778 Telephone: 603-926-3345

SAMPLE RECEIPT RECORD

ESI STUDY NUMBER: 6150 CLIE	NT: Batelle
SAMPLE RECEIPT: 6907 TIME	: <u> 455</u> BY: <u>ST</u>
DELIVERED VIA: FEDEX CLIENT	ESI - UPS - OTHER
LOGGED INTO LAB: 7 9 07 TIME	: 1455 BY: SJ
SAMPLE CONDITION:	
CHAIN OF CUSTODY:	∰ YES □ NO
CHAIN OF CUSTODY SIGNED:	YES DNO
CHAIN OF CUSTODY COMPLETE	: ⊠ YES □ NO
SAMPLE DATE: SAMPLE TIME RECORDED SAMPLE TYPE IDENTIFIED	
CUSTODY SEAL IN PLACE:	Ď YES ☐ NO
SHIPPING CONTAINER INTACT:	¥ YES □ NO
SAMPLE TEMPERATURE (AT ARI	RIVAL): <u>6 °C</u>
DOES CLIENT NEED NOTIFICATI	ON OF TEMPERATURE? ☐ YES NO
SAMPLE ARRIVED ON ICE:	Ä YES □ NO
COMMENTS: See (6)	
<u> </u>	

Battelle

The Business of Innovation

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16150

397 Washington Street Duxbury, MA 02332 Phone: 781-952-5200 Fax: 781-934-2124

Proj. No		Proj. Name]														
Gleon	422	New Bea	I ford Harbor															
SAMPLERS	S: Signature	New Bea					LYSIS REQUESTED → ÆBER OF CONTAINERS"	ST	g.	H PRINT	н	А	T	ALS	1	FIED	RVED	umber ainers
DATE	TIME	BATTELLE ID	CLIENT ID		MIGREF	0869B	SCRIPTION 17	PEST	PCB	TPH FINGERPRINT	PAH	VOA	TBT	METALS	まなり	ACIDIFIED	PRESERVED	Total Number of Containers
89107	8:40		WQ-TOX-001-08	0967		R	eferencewater 2NTH								-			\overline{a}
•	9:15		WQ-TOX-002-08	6907	13NTU 0	8090	7											
,	9:30		WQ-TDK-003-08		20 NTUC	5 <u>809</u> 6	7											
	10:05		WO-TOX-004-0.	80907	55 NTU	08090	07								J			
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Comments:												-						——

Battelle

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Proj. Name

Proj. No

Chain of Custody

16150

397 Washington Street Duxbury, MA 02332 Phone: 781-952-5200 Fax: 781-934-2124

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Proj. No		Proj. Name			. The second	raping by the transfer in the				,									
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DATE	TIME	BATTELLE ID	CLIENT ID		SAMPI MIOREFO	LE DESCRIPTION				正							—		
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EnviroSystems, inc.
One Lafayette Road
P.O. Box 778
Hampton, NH 03843-0778
Telephone: 603-926-3345

SAMPLE RECEIPT RECORD

11724	1-01/0	
esi study number: 16234 client: Ba	rerie	
SAMPLE RECEIPT: 9/11/07 TIME: 1360	<u>р </u>	DG_
DELIVERED VIA: FEDEX CLIENT ESI	□ UPS	□ OTHER
DATE: 9 11 07 TIME: 1600	BY: _	SJ
SAMPLE CONDITION:		
CHAIN OF CUSTODY:	ÆS .	□NO
CHAIN OF CUSTODY SIGNED: 均 Y	'ES	□NO
CHAIN OF CUSTODY COMPLETE: 域 Y	ÆS	□NO
SAMPLE DATE: 域 Y SAMPLE TIME RECORDED: 风 Y SAMPLE TYPE IDENTIFIED: 风 Y	ÆS ÆS ÆS	□ NO □ NO □ NO
CUSTODY SEAL IN PLACE:	′ES □ NA	□NO
SHIPPING CONTAINER INTACT: 每Y	ES .	□NO
SAMPLE TEMPERATURE (AT ARRIVAL):	5 ∘c	<u>.</u>
DOES CLIENT NEED NOTIFICATION OF TEM \Box Y	PERATURE? ÆS	⊠ио
SAMPLE ARRIVED ON ICE:	ÆS	□NO
COMMENTS:		
	,	

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397 Washington Street Duxbury, MA 02332 Phone: 781-952-5200 Fax: 781-934-2124

Proj. No Proj. Name New Bedford Harbor 6606422 SAMPLERS: Signature TPH FINGERPRINT ANALYSIS REQUESTED → Total Number of Containers PRESERVED ACIDIFIED METALS "NUMBER OF CONTAINERS" PEST PCB PAH DATE TIME BATTELLE ID CLIENT ID SAMPLE DESCRIPTION 9/11/07 9:01 WO-TOX-001-091107 Reference 49 NTU 2 WO-TOX-002-091107 WO-TOX-X03-091107 9:45 23-29 NTU 10:15 59-60 NTU Relinquished by: Received by: Date/Time 9/11/07 12:00 Relinquished by: Received by: Date/Time Date/Time 600 Comments:



EnviroSystems, inc.
One Lafayette Road
P.O. Box 778
Hampton, NH 03843-0778
Telephone: 603-926-3345

SAMPLE RECEIPT RECORD

ESI STUDY NUMBER: 16391 CLIENT:	Battelle	<u> </u>	
SAMPLE RECEIPT: DATE: 1013107 TIME: 1	432	_ BY:	DG
DELIVERED VIA: ☐ FEDEX ☑ CLIENT ☐	ESI	□ UPS	□ OTHER
LOGGED INTO LAB: DATE: 1014107 TIME: C	945	_ BY:	RAM
SAMPLE CONDITION:			
CHAIN OF CUSTODY:	☑ YES		□ NO
CHAIN OF CUSTODY SIGNED:	⊠ YES		□NO
CHAIN OF CUSTODY COMPLETE:	⊠ YES		□NO
SAMPLE DATE: SAMPLE TIME RECORDED: SAMPLE TYPE IDENTIFIED:	Ø YES Ø YES Ø YES		□ NO □ NO □ NO
CUSTODY SEAL IN PLACE:	☐ YES	⊠ NA	□NO
SHIPPING CONTAINER INTACT:	₩ YES		□NO
SAMPLE TEMPERATURE (AT ARRIVA	.L): <u> </u>	0	<u>C</u>
DOES CLIENT NEED NOTIFICATION (OF TEMPERA ☐ YES	ATURE?	⊠ NO
SAMPLE ARRIVED ON ICE:	⊠ YES		□NO
COMMENTS:			

Battelle

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Chain of Custody

397 Washington Street Duxbury, MA 02332 Phone: 781-952-5200 Fax: 781-934-2124

16391 Proj. No New Bedford Harbor G606422-07WQ SAMPLERS: Signature Michael Walsh TPH FINGERPRINT ANALYSIS REQUESTED → ACIDIFIED METALS "NUMBER OF CONTAINERS" PAH PCB DATE TIME BATTELLE ID CLIENT ID SAMPLE DESCRIPTION WA-TOX-001-100307 Sowel 65-100NIU 10f2 11:00 from 20f2 11:00 WR-TOX-001-100307 50 ft SOWILL GS-100 NTM Wa-TOX-002-100307 Somile 13-2014 10+2 11:50 from Source 13-20 NTU 2 of 2 11:50 W/Q-TOX-00A-100307 300 from WQ-TOX-003-100307 10f 2 Source 11-13 NTU 013/07 12:28 WQ-TOX-003-100307 0/3/07 12 28 Sowce 11-13NTU 20f2 600 Relinguished by: Received by: Date/Time Date/Time Relinquished by:

Wester Hardy Jessica Hardy 10/3/07 134/ 1341 Received by: Date/Time 10/3/07

Voice: 603-926-3345 FAX: 603-923-3521 ESI Job No:

CHAIN OF CUSTODY DOCUMENTATION

Client: En	virosuster	ms Inc		Contact:	Ken S	Simo	ns_	F	roject Nam	e:NB			Page I of	1	
	Ken Sin			Address:		fayet	_	1 1	roject Num		,391				
	Jean Su			Address:		1		I .				imons		•-	
	3-9210-33			l .	3-92		•	I .			15/04/	nvirosusk	β.O. No:	Quote No:	
Protocol:	RCRA	SDWA	NF	PDES	USC	COE		Other			CC	γγ\ -			A second
Lab Number (assigned by lab)	Your Field ID: (must agree with container)			Date Sampled	Time Sampled	Sampled By	Grab or com- posit (G/C)	Container Size (ml.)	Container Type (P/G/T)	Field Preser- vation	Matrix S≃Solid W=Water	Filter N=Not needed F=Done In fleid L=Lab to do	Analyses Requeste Special Instructions	d\ :	-
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Appendix E

Total Suspended Solids and Turbidity Analytical Data





ANALYTICAL REPORT

Prepared for:
Battelle
Duxbury Operations
397 Washington Street

Duxbury, MA 02332

Project:

New Bedford Harbor

ETR:

0708096

Report Date:

August 27, 2007

Certifications and Accreditations

Massachusetts M-MA030
Connecticut PH-0141
New Hampshire 2206
Rhode Island LAO00289
New Jersey MA015
Maine MA0030
New York 11627
Louisiana 03090
Florida E87814
Pennsylvania 68-02089
Army Corps of Engineers
Department of the Navy

This report shall not be reproduced except in full, without written approval from the laboratory.



CASE NARRATIVE Alpha Woods Hole Labs

ETR: 0708096

Project: New Bedford Harbor

All analyses were performed according to Alpha Woods Hole Labs quality assurance program and documented Standard Operating Procedures (SOPs). The analytical results contained in this report were performed within holding time, and with appropriate quality control measures, except where noted. A summary of all state and federal accreditations is provided within this report. Blank correction of results is not performed in the laboratory for any parameter. Soil/sediment samples are reported on a dry weight basis unless otherwise noted. Tissue and sediment samples are not certifiable under the NELAC accreditation.

The enclosed results of analyses are representative of the samples as received by the laboratory. Alpha Woods Hole Labs makes no representations or certifications as to the method of sample collection, sample identification, or transporting/handling procedures used prior to the receipt of samples by Alpha Woods Hole Labs. To the best of my knowledge, the information contained in this report is accurate and complete.

Approved by: Manager Date: 8/27/07

Sample ID Cross Reference

Client:

Battelle

Project:

New Bedford Harbor

Lab Code: MA00030

ETR: 0708096

Lab Sample ID	Client Sample ID
0708096-01	WQ-001-080907
0708096-02	WQ-002-080907
0708096-03	WQ-003-080907
0708096-04	WQ-004-080907



Client:

Battelle

New Bedford Harbor

Client ID: Matrix:

N/A SDG: WQ-001-080907

N/A

Water

Lab Code: MA00030 ETR: 0708096

Lab ID: 0708096-01

Date Collected: 08/09/07 Date Received: 08/09/07

			Date	Analytical				
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	10.5		1.00	1	08/16/07	mg/L	160.2	JAD
Turbidity - 180.1	4.60		0.400	1	08/11/07	NTU	180.1	NAR

N/A - Not Applicable

Client: Project:

ient: Battelle

New Bedford Harbor

SDG:

Lab Code: MA00030

ETR: 0708096

WOODS HOLE LABSCase:

Client ID:

Matrix:

N/A

N/A

WQ-002-080907

Water

Lab ID: 0708096-02 Date Collected: 08/09/07

Date Received: 08/09/07

			Reporting		Date		Analytical		
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst	
TSS - Membrane	31.5		1.00	1	08/16/07	mg/L	160.2	JAD	
Turbidity - 180.1	18.0		0.400	1	08/11/07	NTU	180.1	NAR	

N/A - Not Applicable

Client: Project:

Battelle

New Bedford Harbor

N/A

WOODS HOLE LABSCase: Client ID:

SDG: N/A WQ-003-080907

Matrix: Water Lab Code: MA00030

ETR: 0708096

Lab ID: 0708096-03 Date Collected: 08/09/07

Date Received: 08/09/07

		Reporting				Analytical		
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	40.7		1.00	1	08/16/07	mg/L	160.2	JAD
Turbidity - 180.1	24.0		0.400	1	08/11/07	NTU	180.1	NAR

N/A - Not Applicable

Client:

Project:

Battelle

New Bedford Harbor

SDG:

Lab Code: MA00030

ETR: 0708096

sCase:

N/A

N/A

Client ID: Matrix:

WQ-004-080907 Water

Lab ID: 0708096-04

Date Collected: 08/09/07

Date Received: 08/09/07

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	117	_	1.00	1	08/16/07	mg/L	160.2	JAD
Turbidity - 180.1	63.0		0.400	1	08/11/07	NTU	180.1	NAR

Blank Inorganics

Client: Project:

lient: Battelle

New Bedford Harbor

Lab Code: MA00030

ETR: 0708096

ODE HOLE LABSCase:

N/A

SDG: N/A

Lab ID: WW081707B01 Date Collected: N/A

Client ID: Blank Matrix: Water

Date Collected: N/A
Date Received: N/A

		Reporting			Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	1.00	U	1.00	1	08/16/07	mg/L	160.2	JAD

N/A - Not Applicable

U - The analyte was analyzed for but not detected at the sample specific level reported.

Blank Inorganics

Client: Project:

Battelle

New Bedford Harbor

Lab Code: MA00030

ETR: 0708096

₽ gCase: Client ID: Blank

N/A

SDG:

N/A

Lab ID: WW081407B31 Date Collected: N/A

Matrix: Water

Date Received: N/A

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
Turbidity - 180.1	0.400	U	0.400	1	08/11/07	NTU	180.1	NAR

N/A - Not Applicable

U - The analyte was analyzed for but not detected at the sample specific level reported.

Laboratory Control Sample Inorganics

Client: Project:

Battelle

New Bedford Harbor

ETR: 0708096

∌ €Case:

N/A

SDG:

N/A Client ID: Laboratory Control Sample

Lab ID: WW081707L01 Date Collected: N/A

Lab Code: MA00030

Matrix: Water Date Received: N/A

	i		% Recovery
Parameter	Conc.	% Recovery	Limits
TSS - Membrane	489	98	80-120

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values 08/20/07 19:36 are calculated from the unrounded results.

Laboratory Control Sample Inorganics

Client: Project:

Battelle

New Bedford Harbor

N/A SDG:

Client ID: Laboratory Control Sample

Matrix: Water

Lab Code: MA00030

ETR: 0708096

Lab ID: WW081407L02 Date Collected: N/A

Date Received: N/A

			% Recovery
Parameter	Conc.	% Recover	y Limits
Turbidity - 180.1	20.0	100	80-120

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded results.

08/20/07 19:46

Battelle

The Business of Innovation

Chain of Custody

0708096

397 Washington Street Duxbury, MA 02332 Phone: 781-952-5200 Fax: 781-934-2124

Proj. No New Bedford Harbor SAMPLERS: Signature ANALYSIS REQUESTED → Total Number of Containers PRESERVED ACIDIFIED OTHER "NUMBER OF CONTAINERS" PCB DATE TIME BATTELLE ID CLIENT ID SAMPLE DESCRIPTION 819 107 8:40 WQ-755-001-080907 MISREFOROGOT - Reference 2NTU 9:15 WO-755.002-080907 13 NTU 080907 WO-755.003-080807 20 NTU 080907 9:30 WQ-755-00\$-080907 55 NTU 080907 10:05 8:40 WQ-TUR-001-080907 MIDREF 080907 - Reference 2NT4 9:15 WQ-TUR-002 -080907 13NTU 080907 20 NTU 080907 55 NTU 080907 909:30 Wa-TUR +03-080967 10:05 1.00-TUR-004-080907 Relinquished by: Received by: Date/Time Date/Time 8/9/07 1215 Relinquished by: Date/Time Date/Time

Sample Receipt Checklist Page 1 of___/ Client: Receipt Date: Log-in Date: Project: 10 Inspection by: ETR#: Login by: Comments / Notes ALL SECTIONS BELOW MUST BE COMPLETED Were samples shipped? Yes. FedEx / UPS / Other: Sample storage refrigerator #: No, WHG Courier pick-up / Hand delivered Sample storage freezer #: Is bill of lading retained? Yes, Tracking #: No, Unavailable (NA) Number of coolers received for this project delivery: Indicate cooler temperature upon opening (if multiple coolers, record all temps): Cooler 3: Note: If all coolers are 2-6°C, use one checklist, if NOT, use separate checklists and note Cooler 4: Cooler 5: all samples received above 6°C. Cooler 1: Cooler 1: Temperature(s) taken from: 3 IR Gun, Cooler 6: Cooler 7: Temp. Blank, / NA More: Were samples received on ice? (Yes)/ No Chain-of-Custody present? Yes) No Complete? (Yes)/ No Yes / Custody seals present on Cooler? on Bottles? Yes / No / (NA) Intact? Note: Affix custody seals to back of this page. Were sample containers intact? Yes / No If No, list samples: → Did VOA/VPH waters contain headspace (>5mm)? Yes / No (NA) If Yes, list samples: → Were 5035 VOA soils, or VPH soils, covered with MeOH? No Yes If No, list samples. Was a sufficient amount of sample received for each test indicated on the COC? Yes / No If No, list samples: → Chemical preservation OK for ALL If chemical preservation is appropriate samples? Were samples field preserved? Yes / No / C=HCI M=MeOH S=H₂SO4 Yes / No / H=NaOH ☐ N=HNO₃ Other: ☐ U= Unknown If No, list samples below: Preservation (pH) verified at lab for EVERY bottle? (Not: VOA / VPH / Sulfide) >12 (CN) W If No, why?: (Yes) No If No, list samples: -> Were samples received within hold time?

Yes / No

If Yes, list samples: →

Date: 8/13/07

Discrepancy between samples rec'd & COC?

Project Manager Acknowledgement:

Was the Project Manager notified of any other problems? Yes / No /

Please use back for any additional notes!

سمند المخالف أنقح البرة بمعالعهم ليميم إمروج ورباع

Certificate/Approval Program Summary



Method numbers assume the most recent EPA revisions. For a complete listing of analytes for the referenced methods please contact your Alpha Woods Hole Lab Project Manager or the Quality Assurance Manager.

Connecticut Department of Public Health Certificate/Lab ID: PH-0141 - Wastewater (General Chemistry: EPA 120.1, 150.1, 160.1, 160.2, 180.1, 300.0, 310.1, 335.2, 365.2; Metals: 200.8, 245.1; Organics: 608, 624, 625, ETPH) Solid Waste/Soil (General Chemistry: 1010, 9010/9014, 9045, 9060; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270, ETPH).

Florida Department of Health Certificate/Lab ID: E87814 - Primary NELAP Accreditation Authority for Air & Emissions. Secondary NELAP Accreditation for Wastwater and Solid & Hazardous Waste. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 335.2, 365.2, SM2320B, SM2340B, SM2540G, SM4500NH3; Metals: 245.1; Organics: 608, 624, 625). Solid and Hazardous Waste (General Chemistry: 9010/9014, 9045, 9050, 9056, 9065, Reactivity 7.3; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

Louisiana Department of Environmental Quality Certificate/Lab ID: 03090 - Primary NELAP Accrediting Authority for Wastewater, Solid & Hazardous Waste. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1, 6020; Organics: 608, 624, 625, 8015-DRO/GRO, 8081, 8082, 8260, 8270). Solid and Hazardous Waste (General Chemistry: 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060, Reactivity 7.3; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270).

Maine Department of Human Services Certificate/Lab ID: MA0030 - Wastewater (General Chemistry: EPA 120.1/SM2510B, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: 608, 624)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA030 - Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: EPA 608, 624).

New Hampshire Department of Environmental Services Certificate/Lab ID: 2206 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, SM2540G; Metals: 200.8, 245.4; Organics: 608, 624, 625).

New Jersey Department of Environmental Protection Certificate/Lab ID: MA015 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1 6020; Organics: 608, 624, 625, 8081, 8082, 8260, 8270). Solid & Hazardous Waste (General Chemistry: EPA 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

New York Department of Health Certificate/Lab ID: 11627 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 365.2, 376.2; Metals: 245.1; Organics: 608, 624, 625). Solid and Hazardous Waste (General Chemistry: EPA 1010, 1311; :245.1; 6020, 7041; Organics: 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

Rhode Island Department of Health Certificate/Lab ID: LAO00289 - Chemistry: Organic and Inorganic in Non-Poratable Water, Wastewater/Sewage and Soil (Refer to LADEO and MADEP certificates for method numbers.)

Pennsylvania Department of Environmental Protection Certificate/Lab ID: 68-02089 - Registered laboratory

U.S. Army Corps of Engineers

Department of the Navy



ANALYTICAL REPORT

Prepared for:

Battelle
Duxbury Operations
397 Washington Street
Duxbury, MA 02332

Project:

New Bedford Harbor

ETR:

0708155

Report Date:

August 27, 2007

Certifications and Accreditations

Massachusetts M-MA030
Connecticut PH-0141
New Hampshire 2206
Rhode Island LAO00289
New Jersey MA015
Maine MA0030
New York 11627
Louisiana 03090
Florida E87814
Pennsylvania 68-02089
Army Corps of Engineers
Department of the Navy

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CASE NARRATIVE Alpha Woods Hole Labs

ETR: 0708155

Project: New Bedford Harbor

All analyses were performed according to Alpha Woods Hole Labs quality assurance program and documented Standard Operating Procedures (SOPs). The analytical results contained in this report were performed within holding time, and with appropriate quality control measures, except where noted. A summary of all state and federal accreditations is provided within this report. Blank correction of results is not performed in the laboratory for any parameter. Soil/sediment samples are reported on a dry weight basis unless otherwise noted. Tissue and sediment samples are not certifiable under the NELAC accreditation.

The enclosed results of analyses are representative of the samples as received by the laboratory. Alpha Woods Hole Labs makes no representations or certifications as to the method of sample collection, sample identification, or transporting/handling procedures used prior to the receipt of samples by Alpha Woods Hole Labs. To the best of my knowledge, the information contained in this report is accurate and complete.

Approved by: Manay Whole Title: Project Manager Date: 8/27/07

Sample ID Cross Reference

Client:

Battelle

Project:

New Bedford Harbor

Lab Code: MA00030

ETR: 0708155

Lab Sample ID	Client Sample ID
0708155-01	WQ-TSS/TUR-001-081607
0708155-02	WQ-TSS/TUR-002-081607
0708155-03	WQ-TSS/TUR-003-081607
0708155-04	WQ-TSS/TUR-004-081607
0708155-05	WQ-TSS/TUR-005-081607

Client: Project:

Battelle

New Bedford Harbor

Lab Code: MA00030

ETR: 0708155

WOODS HOLE LABSCase: Client ID:

N/A

WQ-TSS/TUR-001-081607

SDG:

Lab ID: 0708155-01 Date Collected: 08/16/07

Date Received: 08/16/07

Matrix: Water

	Daily 110	00,100	,,,,,
		Analytical	
ed	Unit	Method	Analyst

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	18.7		1.00	1	08/16/07	mg/L	160.2	JAD
Turbidity - 180.1	8.65		0.400	1	08/16/07	NTU	180.1	JAD

Client:
Project:

ent: Battelle

New Bedford Harbor

Lab Code: MA00030

ETR: 0708155

WOODS HOLE LADSCase:

N/A

SDG: N/A

Client ID: WQ-TSS/TUR-002-081607

Matrix: Water

Lab ID: 0708155-02 Date Collected: 08/16/07 Date Received: 08/16/07

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	26.0	and the second s	1.00	1	08/16/07	mg/L	160.2	JAD
Turbidity - 180.1	14.7		0.400	1	08/16/07	NTU	180.1	JAD

N/A

Client: Project:

Battelle

New Bedford Harbor

Lab Code: MA00030

ETR: 0708155

WOODS HOLE LABSCASE:

N/A

SDG:

Client ID: WQ-TSS/TUR-003-081607

Lab ID: 0708155-03 Date Collected: 08/16/07

Matrix: Water

Date Received: 08/16/07

Parameter			Reporting		Date	Analytical		
	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	24.5		1.00	1	08/16/07	mg/L	160.2	JAD
Turbidity - 180.1	12.4		0.400	1	08/16/07	NTU	180.1	JAD

Client:

Battelle

Project: New Bedford Harbor

Lab Code: MA00030

ETR: 0708155

WOODS HOLE LABSCASE:

N/A SDG: N/A

Client ID: WQ-TSS/TUR-004-081607 Matrix: Water

Lab ID: 0708155-04 Date Collected: 08/16/07 Date Received: 08/16/07

		Reporting			Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	10.5		1.00	1	08/16/07	mg/L	160.2	JAD
Turbidity - 180.1	5.14		0.400	1	08/16/07	NTU	180.1	JAD

Client: Project:

Matrix:

Battelle

New Bedford Harbor

Lab Code: MA00030

ETR: 0708155

WOODS HOLE LABSCase:

N/A

SDG: N/A

Client ID: WQ-TSS/TUR-005-081607

Water

Lab ID: 0708155-05 Date Collected: 08/16/07

Date Received: 08/16/07

Parameter			Reporting		Date	Analytical		
	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	1.00	U	1.00	1	08/16/07	mg/L	160.2	JAD
Turbidity - 180.1	0.400	U	0.400	1	08/16/07	NTU	180.1	JAD

N/A - Not Applicable

U - The analyte was analyzed for but not detected at the sample specific level reported.

Blank Inorganics

Client: Project:

ent: Battelle

New Bedford Harbor

Lab Code: MA00030

ETR: 0708155

WOODS HOLE LADSCase:

N/A

SDG:

N/A

Lab ID: WW081607B23

Date Collected: N/A
Date Received: N/A

Client ID: Blank Matrix: Water

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
Turbidity - 180.1	0.400	U	0.400	1	08/16/07	NTU	180.1	JAD

N/A - Not Applicable

U - The analyte was analyzed for but not detected at the sample specific level reported.

Blank Inorganics

Client: Project:

Battelle

New Bedford Harbor

Lab Code: MA00030

ETR: 0708155

WOODS HOLE LABSCase: Client ID: Blank

N/A

SDG:

N/A

Lab ID: WW081707B01 Date Collected: N/A

Matrix: Water Date Received: N/A

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	1.00	U	1.00	1	08/16/07	mg/L	160.2	JAD

N/A - Not Applicable

U - The analyte was analyzed for but not detected at the sample specific level reported.

Client: Project:

Battelle

New Bedford Harbor

Lab Code: MA00030

ETR: 0708155

SDG: N/A

Client ID: Laboratory Control Sample Matrix:

Lab ID: WW081607L07 Date Collected: N/A

Water

Date Received: N/A

		The state of the s	% Recovery
Parameter	Conc.	% Recovery	Limits
Turbidity - 180.1	19.9	100	80-120

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values 08/20/07 19:37 are calculated from the unrounded results.

Client: Project:

lient: Battelle

New Bedford Harbor

Client ID: Laboratory Control Sample

/A SDG: N/A

Matrix: Water

Lab Code: MA00030

ETR: 0708155

Lab ID: WW081707L01
Date Collected: N/A
Date Received: N/A

***************************************	<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>		% Recovery
Parameter	Conc.	% Recovery	Limits
TSS - Membrane	489	98	80-120

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded results.

O8/20/07 19:37

Battelle

The Business of Innovation

Chain of Custody

397 Washington Street Duxbury, MA 02332 Phone: 781-952-5200 Fax: 781-934-2124

Proj. No	122	Proj. Name New B	ed tra Ha	vbor WQ)		2. •										
SAMPLERS	: Signature NHU					ANALYSIS REQUESTED → "NUMBER OF CONTAINERS	,,	۳ ا	H	H	 	1	ALS	ER	FIED	RVED	umber ainers
DATE	TIME	BATTELLE ID	CLIENT ID		ANALYSIS REQUESTED — "NUMBER OF CONTAINERS" SAMPLE DESCRIPTION ANALYSIS REQUESTED — BU HAR HAR HAR HAR HAR HAR HAR HAR HAR HAR							METALS	OTHER	ACIDIFIED	PRESERVED	Total Number of Containers	
शाक्ष	11:10	WQ-TSS WQ-TSS	TUR-001-081	F04 1607 - F041	wood of from	ST BRIDGE REVEKENO Debris Romanal	e					1					2
	12:00	wo-Ts	5/TUR-003-08	1607 Dr	eage A	rea G Boundary of Dredge Avea G E											
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Sample Receipt Checklist Page 1 of Client: Receipt Date: MATDUX Log-in Date: Project: KUUJOT ETR#: Inspection by: Login by: 0708155 LINR ALL SECTIONS BELOW MUST BE COMPLETED Comments / Notes Were samples shipped? Yes, FedEx / UPS / Other: Sample storage refrigerator #: WHG Courier pick-up / Hand delivered Sample storage freezer #: Is bill of lading retained? Yes, Tracking #: No, Unavailable / NA Number of coolers received for this project delivery: Cooler 2: _____ Indicate cooler temperature upon opening (if multiple coolers, record all temps): Cooler 3: Note: If all coolers are 2-6°C, use one checklist, if NOT, use separate checklists and note Cooler 4: Cooler 5: all samples received above 6°C. Cooler 1: Cooler 6: Cooler 7:_____ Temperature(s) taken from: [] IR Gun, Temp. Blank, / NA More: ____ Were samples received on ice? Chain-of-Custody present? (Yes) / No Complete? Custody seals present on Cooler? No on Bottles? Intact? No / NA Note: Affix custody seals to back of this page Were sample containers intact? Yes No If No, list samples: → Did VOA/VPH waters contain headspace (>5mm)? Yes / No /(NA) If Yes, list samples: → No Were 5035 VOA soils, or VPH soils, covered with MeOH? If No, list samples: Was a sufficient amount of sample received for each test indicated on the COC? If No, list samples: \rightarrow Chemical preservation OK for ALL If chemical preservation is appropriate samples? Were samples field preserved? Yes / No / C=HCl M=MeOH S=H₂SO4 Yes / No / Other: U= Unknown □ N=HNO₃ H=NaOH If No, list samples below: Preservation (pH) verified at lab for EVERY bottle? (Not: VOA / VPH / Sulfide) YES: <2 >12 (CN) NO If No. why?: Were samples received within hold time? If No, list samples: →

Yes / No

Yes /

Date:

If Yes, list samples: →

Discrepancy between samples rec'd & COC?

Project Manager Acknowledgement:

Was the Project Manager notified of any other problems?

Please use back for any additional notes!

Certificate/Approval Program Summary



Method numbers assume the most recent EPA revisions. For a complete listing of analytes for the referenced methods please contact your Alpha Woods Hole Lab Project Manager or the Quality Assurance Manager.

Connecticut Department of Public Health Certificate/Lab ID: PH-0141 - Wastewater (General Chemistry: EPA 120.1, 150.1, 160.1, 160.2, 180.1, 300.0, 310.1, 335.2, 365.2; Metals: 200.8, 245.1; Organics: 608, 624, 625, ETPH) Solid Waste/Soil (General Chemistry: 1010, 9010/9014, 9045, 9060; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270, ETPH).

Florida Department of Health Certificate/Lab ID: E87814 - Primary NELAP Accreditation Authority for Air & Emissions. Secondary NELAP Accreditation for Wastwater and Solid & Hazardous Waste. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 335.2, 365.2, SM2320B, SM2340B, SM2540G, SM4500NH3; Metals: 245.1; Organics: 608, 624, 625). Solid and Hazardous Waste (General Chemistry: 9010/9014, 9045, 9050, 9056, 9065, Reactivity 7.3; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

Louisiana Department of Environmental Quality Certificate/Lab ID: 03090 - Primary NELAP Accrediting Authority for Wastewater, Solid & Hazardous Waste. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1, 6020; Organics: 608, 624, 625, 8015-DRO/GRO, 8081, 8082, 8260, 8270). Solid and Hazardous Waste (General Chemistry: 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060, Reactivity 7.3; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270).

Maine Department of Human Services Certificate/Lab ID: MA0030 - Wastewater (General Chemistry: EPA 120.1/SM2510B, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: 608, 624)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA030 - Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: EPA 608, 624).

New Hampshire Department of Environmental Services Certificate/Lab ID: 2206 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, SM2540G; Metals: 200.8, 245.4; Organics: 608, 624, 625).

New Jersey Department of Environmental Protection Certificate/Lab ID: MA015 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1 6020; Organics: 608, 624, 625, 8081, 8082, 8260, 8270). Solid & Hazardous Waste (General Chemistry: EPA 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

New York Department of Health Certificate/Lab ID: 11627 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 365.2, 376.2; Metals: 245.1; Organics: 608, 624, 625). Solid and Hazardous Waste (General Chemistry: EPA 1010, 1311; :245.1; 6020, 7041; Organics: 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

Rhode Island Department of Health Certificate/Lab ID: LAO00289 - Chemistry: Organic and Inorganic in Non-Poratable Water, Wastewater/Sewage and Soil (Refer to LADEQ and MADEP certificates for method numbers.)

Pennsylvania Department of Environmental Protection Certificate/Lab ID: 68-02089 - Registered laboratory

U.S. Army Corps of Engineers

Department of the Navy



ANALYTICAL REPORT

Prepared for:
Battelle
Duxbury Operations
397 Washington Street
Duxbury, MA 02332

Project:

New Bedford Harbor

ETR:

0708232

Report Date:

September 17, 2007

Certifications and Accreditations

Massachusetts M-MA030
Connecticut PH-0141
New Hampshire 2206
Rhode Island LAO00289
New Jersey MA015
Maine MA0030
New York 11627
Louisiana 03090
Florida E87814
Pennsylvania 68-02089
Army Corps of Engineers
Department of the Navy

This report shall not be reproduced except in full, without written approval from the laboratory.



CASE NARRATIVE Alpha Woods Hole Labs

ETR: 0708232

Project: New Bedford Harbor

All analyses were performed according to Alpha Woods Hole Labs quality assurance program and documented Standard Operating Procedures (SOPs). The analytical results contained in this report were performed within holding time, and with appropriate quality control measures, except where noted. A summary of all state and federal accreditations is provided within this report. Blank correction of results is not performed in the laboratory for any parameter. Soil/sediment samples are reported on a dry weight basis unless otherwise noted. Tissue and sediment samples are not certifiable under the NELAC accreditation.

The enclosed results of analyses are representative of the samples as received by the laboratory. Alpha Woods Hole Labs makes no representations or certifications as to the method of sample collection, sample identification, or transporting/handling procedures used prior to the receipt of samples by Alpha Woods Hole Labs. To the best of my knowledge, the information contained in this report is accurate and complete.

Approved by:	Juna	1aRose	Title:	Date:	
	/ /	7	1		

Sample ID Cross Reference

Client:

Battelle

Project:

New Bedford Harbor

Lab Code: MA00030

ETR: 0708232

Lab Sample ID	Client Sample ID
0708232-01	WQ-TSS/TUR-001-082907
0708232-02	WQ-TSS/TUR-002-082907
0708232-03	WQ-TSS/TUR-003-082907
0708232-04	WQ-TSS/TUR-004-082907
0708232-05	WQ-TSS/TUR-001-082907-DUP

Client: Project: **Battelle**

Water

New Bedford Harbor

N/A

SDG:

N/A

Matrix:

Client ID: WQ-TSS/TUR-001-082907

Lab ID: 0708232-01

Date Collected: 08/29/07 Date Received: 08/29/07

Lab Code: MA00030

ETR: 0708232

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	24.0		1.00	1	09/05/07	mg/L	160.2	JAD
Turbidity - 180.1	12.1		0.400	1	08/29/07	NTU	180.1	JAD

ZLPHA Pro

Client: Project:

Matrix:

Battelle

New Bedford Harbor

SDG:

TAT / A

Client ID: \

N/A

: WQ-TSS/TUR-002-082907

Water

N/A

Lab Code: MA00030

ETR: 0708232

Lab ID: 0708232-02

Date Collected: 08/29/07

Date Received: 08/29/07

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	57.0		1.00	1	09/05/07	mg/L	160.2	JAD
Turbidity - 180.1	32.9		0.400	1	08/29/07	NTU	180.1	JAD

N/A

ZYPHA Cli

Client: Project:

Battelle

Water

New Bedford Harbor

WQ-TSS/TUR-003-082907

Lab Code: MA00030

ETR: 0708232

WOODS HOLE LABSCase:

N/A SDG:

Lab ID: 0708232-03

Client ID: Matrix:

Date Collected: 08/29/07

Date Received: 08/29/07

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	23.5		1.00	1	09/05/07	mg/L	160.2	JAD
Turbidity - 180.1	13.4		0.400	1	08/29/07	NTU	180.1	JAD

Client: Project:

Battelle

Water

New Bedford Harbor

Lab Code: MA00030

ETR: 0708232

SDG: N/A N/A

Lab ID: 0708232-04

Client ID: Matrix:

WQ-TSS/TUR-004-082907

Date Collected: 08/29/07 Date Received: 08/29/07

Reporting Date Analytical **Parameter** Result Qualifier Dilution Analyzed Unit Method Analyst Limit 09/05/07 JAD TSS - Membrane 24.0 1.00 160.2 mg/L Turbidity - 180.1 18.4 0.400 08/29/07 NTU 180.1 JAD

Project:

Client:

Battelle

New Bedford Harbor

SDG:

N/A AB gCase: Client ID:

N/A

WQ-TSS/TUR-001-082907-DUP

Matrix: Water Lab Code: MA00030

ETR: 0708232

Lab ID: 0708232-05 Date Collected: 08/29/07

Date Received: 08/29/07

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	27.0		1.00	1	09/05/07	mg/L	160.2	JAD
Turbidity - 180.1	12.3		0.400	1	08/29/07	NTU	180.1	JAD

Blank Inorganics

Client: Project: **Battelle**

New Bedford Harbor

Lab Code: MA00030

ETR: 0708232

N/A

SDG:

N/A

Client ID: Blank Matrix: Water Lab ID: WW083007B01 Date Collected: N/A

Date Received: N/A

			Reporting		Date			
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
Turbidity - 180.1	0.400	U	0.400	1	08/29/07	NTU	180.1	JAD

N/A - Not Applicable

U - The analyte was analyzed for but not detected at the sample specific level reported.

Blank **Inorganics**

N/A

Client: Project:

Battelle

N/A

New Bedford Harbor

SDG:

Lab Code: MA00030

ETR: 0708232

Client ID: Blank

Lab ID: WW090507B24 Date Collected: N/A

Date Received: N/A

Matrix: Water

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	1.00	U	1.00	1	09/05/07	mg/L	160.2	JAD

N/A - Not Applicable

U - The analyte was analyzed for but not detected at the sample specific level reported.



Client: Project:

Battelle

New Bedford Harbor

ETR: 0708232

N/A

N/A

Lab ID: WW083007L01 Date Collected: N/A

Lab Code: MA00030

Client ID: Matrix:

SDG: **Laboratory Control Sample**

Date Received: N/A

Water

Parameter	Conc.	% Recovery	% Recovery Limits
Turbidity - 180.1	20.0	100	80-120



Battelle

New Bedford Harbor

N/A

N/A

Client ID: Matrix:

SDG: **Laboratory Control Sample**

Water

Lab Code: MA00030

ETR: 0708232

Lab ID: WW090507L04

Date Collected: N/A Date Received: N/A

			% Recovery
Parameter	Conc.	% Recovery	Limits
TSS - Membrane	476	95	80-120

Battelle The Business of Innovation

Chain of Custody

397 Washington Street Duxbury, MA 02332 Phone: 781-952-5200 Fax: 781-934-2124

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	10:35		55/TUR-002-08	1907 AKEAG . 7	15' from Debris Removed 305	Nu									1	
	11:00	wa-	TSS/TUR-003-C	82907 ALEAGO	REDGE ROUNDARY ~17.2 NTU											
<u> </u>	11:21	L ⊌Q-	TSS/TUR-004 -4	982907 3001 tron	n Dredge Boundary Ke7N' up - wood St Ref area 9.1NM	שו										
₩	10:12	66-1	55/TUR-001-08	2907-DUP Field be	up - wood St Ref area 9.1NM	1	. 4									
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Certificate/Approval Program Summary



Method numbers assume the most recent EPA revisions. For a complete listing of analytes for the referenced methods please contact your Alpha Woods Hole Lab Project Manager or the Quality Assurance Manager.

Connecticut Department of Public Health Certificate/Lab ID: PH-0141 - Wastewater (General Chemistry: EPA 120.1, 150.1, 160.1, 160.2, 180.1, 300.0, 310.1, 335.2, 365.2; Metals: 200.8, 245.1; Organics: 608, 624, 625, ETPH) Solid Waste/Soil (General Chemistry: 1010, 9010/9014, 9045, 9060; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270, ETPH).

Florida Department of Health Certificate/Lab ID: E87814 - Primary NELAP Accreditation Authority for Air & Emissions. Secondary NELAP Accreditation for Wastwater and Solid & Hazardous Waste. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 335.2, 365.2, SM2320B, SM2340B, SM2540G, SM4500NH3; Metals: 245.1; Organics: 608, 624, 625). Solid and Hazardous Waste (General Chemistry: 9010/9014, 9045, 9050, 9056, 9065, Reactivity 7.3; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

Louisiana Department of Environmental Quality Certificate/Lab ID: 03090 - Primary NELAP Accrediting Authority for Wastewater, Solid & Hazardous Waste. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1, 6020; Organics: 608, 624, 625, 8015-DRO/GRO, 8081, 8082, 8260, 8270). Solid and Hazardous Waste (General Chemistry: 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060, Reactivity 7.3; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270).

Maine Department of Human Services Certificate/Lab ID: MA0030 - Wastewater (General Chemistry: EPA 120.1/SM2510B, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: 608, 624)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA030 - Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: EPA 608, 624).

New Hampshire Department of Environmental Services Certificate/Lab ID: 2206 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, SM2540G; Metals: 200.8, 245.4; Organics: 608, 624, 625).

New Jersey Department of Environmental Protection Certificate/Lab ID: MA015 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1 6020; Organics: 608, 624, 625, 8081, 8082, 8260, 8270). Solid & Hazardous Waste (General Chemistry: EPA 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

New York Department of Health Certificate/Lab ID: 11627 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 365.2, 376.2; Metals: 245.1; Organics: 608, 624, 625). Solid and Hazardous Waste (General Chemistry: EPA 1010, 1311; :245.1; 6020, 7041; Organics: 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

Rhode Island Department of Health Certificate/Lab ID: LAO00289 - Chemistry: Organic and Inorganic in Non-Poratable Water, Wastewater/Sewage and Soil (Refer to LADEQ and MADEP certificates for method numbers.)

Pennsylvania Department of Environmental Protection Certificate/Lab ID: 68-02089 - Registered laboratory

U.S. Army Corps of Engineers

Department of the Navy



ANALYTICAL REPORT

Prepared for:
Battelle
Duxbury Operations
397 Washington Street
Duxbury, MA 02332

Project:

New Bedford Harbor

ETR:

0709042

Report Date:

September 24, 2007

Certifications and Accreditations

Massachusetts M-MA030
Connecticut PH-0141
New Hampshire 2206
Rhode Island LAO00289
New Jersey MA015
Maine MA0030
New York 11627
Louisiana 03090
Florida E87814
Pennsylvania 68-02089
Army Corps of Engineers
Department of the Navy

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CASE NARRATIVE Alpha Woods Hole Labs

ETR: 0709042

Project: SBPF - Nearshore Turbidity

All analyses were performed according to Alpha Woods Hole Labs quality assurance program and documented Standard Operating Procedures (SOPs). The analytical results contained in this report meet all applicable agency and/or NELAC standards, were performed within holding time, and with appropriate quality control measures, except where noted. Blank correction of results is not performed in the laboratory for any parameter. Soil/sediment samples are reported on a dry weight basis unless otherwise noted. Tissue and sediment samples are not certifiable under the NELAC accreditation.

The enclosed results of analyses are representative of the samples as received by the laboratory. Alpha Woods Hole Labs makes no representations or certifications as to the method of sample collection, sample identification, or transporting/handling procedures used prior to the receipt of samples by Alpha Woods Hole Labs. To the best of my knowledge, the information contained in this report is accurate and complete.

Approved by: Managuer Date: 9/84/07

Sample ID Cross Reference

Client:
Project:

: Battelle

Project: New Bedford Harbor

Lab Code: MA00030

ETR: 0709042

Lab Sample ID	Client Sample ID
0709042-01	WQ-TSS/TUR-001-091107
0709042-02	WQ-TSS/TUR-001-091107
0709042-03	WQ-TSS/TUR-002-091107
0709042-04	WQ-TSS/TUR-003-091107

N/A

Client: Project:

Battelle

New Bedford Harbor

Lab Code: MA00030

ETR: 0709042

WOODS HOLE LABSCase: Client ID: WQ-TSS/TUR-001-091107

SDG: N/A

Lab ID: 0709042-01

Matrix: Water Date Collected: 09/11/07 Date Received: 09/11/07

		Reporting		Date		Analytical		
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	10.3		1.00	1	09/18/07	mg/L	160.2	JAD
Turbidity - 180.1	5.91		0.400	1	09/11/07	NTU	180.1	JAD

Client: Project:

Battelle

New Bedford Harbor

Lab Code: MA00030

ETR: 0709042

WOODS HOLE LABSCASE:

SDG: N/A

N/A

Client ID: WQ-TSS/TUR-001-091107 Matrix: Water

Lab ID: 0709042-02

Date Collected: 09/11/07

Date Received: 09/11/07

		Reporting			Date	Analytical		
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	43.8		1.00	1	09/18/07	mg/L	160.2	JAD
Turbidity - 180.1	6.04		0.400	1	09/11/07	NTU	180.1	JAD

Client: Project:

Battelle New Bedford Harbor Lab Code: MA00030

ETR: 0709042

Case:

N/A

N/A

Client ID: WQ-TSS/TUR-002-091107

SDG:

Matrix: Water Lab ID: 0709042-03 Date Collected: 09/11/07 Date Received: 09/11/07

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	41.0		1.00	1	09/18/07	mg/L	160.2	JAD
Turbidity - 180.1	19.2		0.400	1	09/11/07	NTU	180.1	JAD

Client: Project:

Battelle New Bedford Harbor Lab Code: MA00030

ETR: 0709042

a Case:

N/A

SDG:

N/A Client ID: WQ-TSS/TUR-003-091107

Matrix: Water Lab ID: 0709042-04 Date Collected: 09/11/07 Date Received: 09/11/07

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	129		1.00	1	09/18/07	mg/L	160.2	JAD
Turbidity - 180.1	52.0		0.400	1	09/11/07	NTU	180.1	JAD

Blank Inorganics

N/A

Client:
Project:

lient: Battelle

New Bedford Harbor

SDG:

Lab Code: MA00030

ETR: 0709042

OODS HOLE LABSCase: N/A

Lab ID: WW091207B16

Client ID: Blank Matrix: Water

Date Collected: N/A
Date Received: N/A

			Reporting		Date		Analytical	
Parameter	Result	Qualifier		Dilution	Analyzed	Unit	Method	Analyst
Turbidity - 180.1	0.400	Ų	0.400	1	09/11/07	NTU	180.1	JAD

N/A - Not Applicable

U - The analyte was analyzed for but not detected at the sample specific level reported.

Client: Project:

Battelle

Water

New Bedford Harbor

Lab Code: MA00030

ETR: 0709042

N/A

SDG: N/A

Lab ID: WW091207L02 Date Collected: N/A

Client ID: Laboratory Control Sample Matrix:

Date Received: N/A

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
Turbidity - 180.1	20.2	S	0.400	1	09/11/07	NTU	180.1	JAD

N/A - Not Applicable S - Spike compound.

Blank Inorganics

N/A

Client: Project:

Battelle

New Bedford Harbor

Lab Code: MA00030

ETR: 0709042

Client ID:

N/A Blank SDG:

Lab ID: WW091807B20 Date Collected: N/A

Date Received: N/A

Matrix: Water

		:	Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	1.00	U	1,00	1	09/18/07	mg/L	160.2	JAD

N/A - Not Applicable

U - The analyte was analyzed for but not detected at the sample specific level reported.

Client: Project:

Battelle

New Bedford Harbor

Lab Code: MA00030

ETR: 0709042

WOODS HOLE LABSCase:

N/A

N/A

Client ID: **Laboratory Control Sample** Matrix: Water

SDG:

Date Collected: N/A Date Received: N/A

Lab ID: WW091807L04

Reporting Date Analytical Qualifier Method Result Limit Dilution Analyzed Unit Analyst **Parameter** 508 S 1.00 09/18/07 160.2 JAD TSS - Membrane 1 mg/L

N/A - Not Applicable S - Spike compound.

Client: Project:

lient: Battelle

New Bedford Harbor

Lab Code: MA00030

ETR: 0709042

WOODS HOLE LASSCase: Client ID:

N/A SDG: N/

N/A SDG: N/A Laboratory Control Sample

Matrix: Water

Date Collected: N/A
Date Received: N/A

Lab ID: WW091207L02

Parameter	Conc.	% Recovery	% Recovery Limits
Turbidity - 180.1	20.2	101	80-120

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded results.

O9/21/07 18:21

Client: Project:

Battelle

New Bedford Harbor

Lab Code: MA00030

ETR: 0709042

WOODS HOLE LABSCase:

N/A

SDG: N/A

Matrix:

Client ID: Laboratory Control Sample

Water

Date Collected: N/A Date Received: N/A

Lab ID: WW091807L04

			% Recovery
Parameter	Conc.	% Recovery	Limits
TSS - Membrane	508	102	80-120

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded results. 09/21/07 18:21

Battelle

The Business of Innovation

Chain of Custody

397 Washington Street Duxbury, MA 02332 Phone: 781-952-5200 Fax: 781-934-2124

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Proj. No Proj. Name New Bed for d Harbar WO MPLERS: Signature MULINIA PROJ. Name New Bed for d Harbar WO				ALYSIS REQUESTED → JMBER OF CONTAINERS"	L L	PCB	I	H			TIS	R /	TED	(VED	mber		
DATE	TIME	BATTELLE ID	CLIENT ID			DESCRIPTION	PEST PEST		TPH	PAH	VOA	TBT	METALS	четнев.	ACIDIFIED	PRESERVED	Total Number of Containers
1103	9:01	(136	ma-Istrue	001-091107	Re	firence 4.9 NTU								1			2
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i ·	9:45	ω	O-TSS/TUR-OU D-TSS/TUR-	002-091107	22	1-29 NTU											2
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Pagents:				<u> </u>									J		- 1		
<u>1</u>																	
/ 1																	

Sample Receipt Checklist

		Page 1 of
Client: BATDUX	Receipt Date: 9	11107
Project: NB Horbox	Log-in Date:	- h
ETR#: 070904 <u>2</u>	Inspection by: W	Login by: 4
ALL SECTIONS BELOW MUST BE COMPLI	ETED	Comments / Notes
Were samples shipped? Yes, FedEx / UPS / Other:		Sample storage refrigerator #: Fz
No, WHG Courier pick-up / Hand	denvered	
Is bill of lading retained? Yes, Tracking #:		Sample storage freezer #:
No, Unavailable / NA		!
Number of coolers received for this project delivery:		
Indicate cooler temperature upon opening (if multiple coolers, record	all temps):	Cooler 2: Cooler 3:
Note: If all coolers are 2-6°C, use one checklist, if NOT, use separat all samples received above 6°C.	Cooler 4: Cooler 5:	
Cooler 1: Temperature(s) taken from: 5 IR Gun, Temp. Bl	ank, / NA	Cooler 6: Cooler 7:
Were samples received on ice? Yes / No		More:
Chain-of-Custody present? Yes / No		
Complete? (Yes) / No		
Custody seals present on Cooler? Yes / No		
on Bottles? Yes / No		
Intact? Yes / No / Note: Affix custody seals to back of this page.		
Were sample containers intact? Yes / No	If No, list samples: →	
Did VOA/VPH waters contain headspace (>5mm)? Yes / No (NA)	If Yes, list samples: →	
Were 5035 VOA soils, or VPH soils, covered with MeOH? Yes	/ No / (NA) If No, list samples: →	
Was a sufficient amount of sample received for each test indicated of Yes / No	n the COC? If No, list samples: →	
If chemical preservation is appropriate - Were samples field preserved? Yes / No /		Chemical preservation OK for ALL samples?
□C=HCl □ M=MeOH □ S=H ₂ SO4		Yes / No / MA
H=NaOH N=HNO ₃ Other: U= Unk	I I	
Preservation (pH) verified at lab for EVERY bottle? (Not: VOA / VP	If No, list samples below:	
YES: <2 or >12 (CN) or NO	I	
If No, why?:		
Were samples received within hold time? Ves No If	'No, list samples: →	
	Yes, list samples: →	
Was the Project Manager notified of any other problems? Yes /	No / NA	
Project Manager Acknowledgement:	1/1/07	Please use back for any additional notes!

Certificate/Approval Program Summary



Method numbers assume the most recent EPA revisions. For a complete listing of analytes for the referenced methods please contact your Alpha Woods Hole Lab Project Manager or the Quality Assurance Manager.

Connecticut Department of Public Health Certificate/Lab ID: PH-0141 - Wastewater (General Chemistry: EPA 120.1, 150.1, 160.1, 160.2, 180.1, 300.0, 310.1, 335.2, 365.2; Metals: 200.8, 245.1; Organics: 608, 624, 625, ETPH) Solid Waste/Soil (General Chemistry: 1010, 9010/9014, 9045, 9060; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270, ETPH).

Florida Department of Health Certificate/Lab ID: E87814 - Primary NELAP Accreditation Authority for Air & Emissions. Secondary NELAP Accreditation for Wastwater and Solid & Hazardous Waste. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 335.2, 365.2, SM2320B, SM2340B, SM2540G, SM4500NH3; Metals: 245.1; Organics: 608, 624, 625). Solid and Hazardous Waste (General Chemistry: 9010/9014, 9045, 9050, 9056, 9065, Reactivity 7.3; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

Louisiana Department of Environmental Quality Certificate/Lab ID: 03090 - Primary NELAP Accrediting Authority for Wastewater, Solid & Hazardous Waste. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1, 6020; Organics: 608, 624, 625, 8015-DRO/GRO, 8081, 8082, 8260, 8270). Solid and Hazardous Waste (General Chemistry: 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060, Reactivity 7.3; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270).

Maine Department of Human Services Certificate/Lab ID: MA0030 - Wastewater (General Chemistry: EPA 120.1/SM2510B, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: 608, 624)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA030 - Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: EPA 608, 624).

New Hampshire Department of Environmental Services Certificate/Lab ID: 2206 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, SM2540G; Metals: 200.8, 245.4; Organics: 608, 624, 625).

New Jersey Department of Environmental Protection Certificate/Lab ID: MA015 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1 6020; Organics: 608, 624, 625, 8081, 8082, 8260, 8270). Solid & Hazardous Waste (General Chemistry: EPA 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

New York Department of Health Certificate/Lab ID: 11627 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 365.2, 376.2; Metals: 245.1; Organics: 608, 624, 625). Solid and Hazardous Waste (General Chemistry: EPA 1010, 1311; :245.1; 6020, 7041; Organics: 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

Rhode Island Department of Health Certificate/Lab ID: LAO00289 - Chemistry: Organic and Inorganic in Non-Poratable Water, Wastewater/Sewage and Soil (Refer to LADEQ and MADEP certificates for method numbers.)

Pennsylvania Department of Environmental Protection Certificate/Lab ID: 68-02089 - Registered laboratory

U.S. Army Corps of Engineers

Department of the Navv



ANALYTICAL REPORT

Prepared for:
Battelle
Duxbury Operations
397 Washington Street
Duxbury, MA 02332

Project:

New Bedford Harbor

ETR:

0709133

Report Date:

October 09, 2007

Certifications and Accreditations

Massachusetts M-MA030
Connecticut PH-0141
New Hampshire 2206
Rhode Island LAO00289
New Jersey MA015
Maine MA0030
New York 11627
Louisiana 03090
Florida E87814
Pennsylvania 68-02089
Army Corps of Engineers
Department of the Navy

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CASE NARRATIVE Alpha Woods Hole Labs

ETR: 0709133

Project: New Bedford Harbor

All analyses were performed according to Alpha Woods Hole Labs quality assurance program and documented Standard Operating Procedures (SOPs). The analytical results contained in this report were performed within holding time, and with appropriate quality control measures, except where noted. A summary of all state and federal accreditations is provided within this report. Blank correction of results is not performed in the laboratory for any parameter. Soil/sediment samples are reported on a dry weight basis unless otherwise noted. Tissue and sediment samples are not certifiable under the NELAC accreditation.

The enclosed results of analyses are representative of the samples as received by the laboratory. Alpha Woods Hole Labs makes no representations or certifications as to the method of sample collection, sample identification, or transporting/handling procedures used prior to the receipt of samples by Alpha Woods Hole Labs. To the best of my knowledge, the information contained in this report is accurate and complete.

Approved by: Mancy A.Rose

itle: Pujul No

 \mathbf{t}

Date.

Sample ID Cross Reference

Client:

Battelle

Project:

New Bedford Harbor

Lab Code: MA00030

ETR: 0709133

Lab Sample ID	Client Sample ID
0709133-01	WQ-TSS/TUR-001-092507
0709133-02	WQ-TSS/TUR-002-092507
0709133-03	WQ-TSS/TUR-003-092507
0709133-04	WO-TSS/TUR-003-092507-DUP

Client: Project:

Battelle

New Bedford Harbor

SDG: N/A N/A

WOODS HOLE LABSCase: Client ID: WQ-TSS/TUR-001-092507

> Matrix: Water

Lab Code: MA00030

ETR: 0709133

Lab ID: 0709133-01 Date Collected: 09/25/07

Date Received: 09/25/07

		Reporting		Date		Analytical		
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	188		1.00	1	09/28/07	mg/L	160.2	JAD
Turbidity - 180.1	63.8		0.400	1	09/25/07	NTU	180.1	JAD

Client: Project: WOODS HOLE LABSCASE:

Battelle

New Bedford Harbor

SDG: N/A

WQ-TSS/TUR-002-092507 Client ID:

N/A

Matrix: Water Lab Code: MA00030

ETR: 0709133

Lab ID: 0709133-02 Date Collected: 09/25/07 Date Received: 09/25/07

		Reporting			Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	227		1.00	1	09/28/07	mg/L	160.2	JAD
Turbidity - 180.1	108		0.400	1	09/25/07	NTU	180.1	JAD

N/A - Not Applicable

10/08/07 19:01

Client: Project:

ent: Battelle

New Bedford Harbor

SDG:

N/A

N/A

Client ID: WQ-TSS/TUR-003-092507

Matrix: Water

Lab Code: MA00030

ETR: 0709133

Lab ID: 0709133-03 Date Collected: 09/25/07 Date Received: 09/25/07

		Reporting			Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	27.5		1.00	1	09/28/07	mg/L	160.2	JAD
Turbidity - 180.1	13.8		0.400	I	09/25/07	NTU	180.1	JAD

Client: Project:

Battelle

Water

New Bedford Harbor

Lab Code: MA00030

ETR: 0709133

WOODS HOLE LABSCase:

SDG: N/A

N/A

Client ID: Matrix:

WQ-TSS/TUR-003-092507-DUP

Date Collected: 09/25/07 Date Received: 09/25/07

Lab ID: 0709133-04

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	34.5		1.00	ì	09/28/07	mg/L	160.2	JAD
Turbidity - 180.1	12.4		0.400	1	09/25/07	NTU	180.1	JAD

Blank Inorganics

Client: Project:

lient: Battelle

New Bedford Harbor

WOODS HOLE LABSCASE:

N/A SDG:

N/A

Client ID: Blank Matrix: Water Lab Code: MA00030

ETR: 0709133

Lab ID: WW092807B06

Date Collected: N/A
Date Received: N/A

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
Turbidity - 180.1	0.400	U	0.400	1	09/25/07	NTU	180.1	JAD

N/A - Not Applicable

U - The analyte was analyzed for but not detected at the sample specific level reported.

10/08/07 19:01

Blank Inorganics

N/A

Client: Project:

lient: Battelle

New Bedford Harbor

Client ID:

N/A SDG:

Client ID: Blank Matrix: Water Lab Code: MA00030

ETR: 0709133

Lab ID: WW092807B13

Date Collected: N/A
Date Received: N/A

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	1.00	U	1.00	1	09/28/07	mg/L	160.2	JAD

N/A - Not Applicable

U - The analyte was analyzed for but not detected at the sample specific level reported.

10/08/07 19:01

Laboratory Control Sample Inorganics

Client: Project:

Battelle

New Bedford Harbor

ETR: 0709133

WOODS HOLE LABSCase:

Client ID:

N/A

N/A

Lab ID: WW092807L01

Lab Code: MA00030

Matrix:

Laboratory Control Sample

SDG:

Date Collected: N/A

Matrix: Water

Date Received: N/A

			% Recovery
Parameter	Conc.	% Recovery	Limits
Turbidity - 180.1	21.0	105	80-120

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded results.

Laboratory Control Sample **Inorganics**

Client:

Battelle

New Bedford Harbor

N/A

Client ID:

SDG: **Laboratory Control Sample**

Matrix: Water Lab Code: MA00030

ETR: 0709133

Lab ID: WW092807L02

Date Collected: N/A Date Received: N/A

######################################			% Recovery
Parameter	Conc.	% Recovery	Limits
TSS - Membrane	501	100	80-120

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded results. 10/08/07 19:02

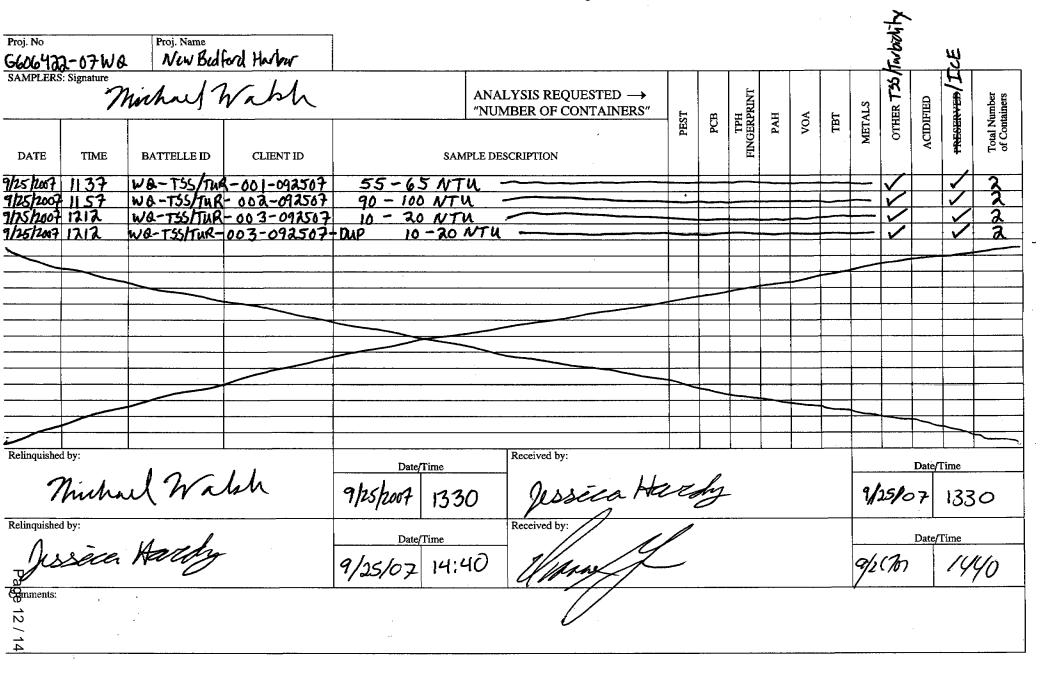
Battelle

The Business of Innovation

Chain of Custody

397 Washington St

Duxbury, MA 02332 Phone: 781-952-5200 Fax: 781-934-2124



Sample Receipt Checklist

Client: RATOUX	Receipt Date: C	1/25/07
Project: NB Harbon	Log-in Date:	7-36-7
ETR#: , 1209133	Inspection by:	Login by: 4
ALL SECTIONS BELOW MUST BE COMPLE	ETED	Comments / Notes
Were samples shipped? Yes, FedEx / UPS / Other:		01
No, WHG Courier pick-up & Hanc	delivered	Sample storage refrigerator #:
Is bill of lading retained? Yes, Tracking #:		Sample storage freezer #:
No, Unavailable / NA		
Number of coolers received for this project delivery:	· · · · · · · · · · · · · · · · · · ·	
Indicate cooler temperature upon opening (if multiple coolers, record	d <u>all</u> temps):	Cooler 2: Cooler 3:
Note: If all coolers are 2-6°C, use one checklist, if NOT, use separated all samples received above 6°C.	te checklists and note	Cooler 4: Cooler 5:
Cooler 1: Temperature(s) taken from: 3 IR Gun, 3 Temp. Bl	ank, / NA	Cooler 6: Cooler 7:
Were samples received on ice? Yes / No		More:
Chain-of-Custody present? (es) / No		
Complete? (es) / No		
		· .
Custody seals present on Cooler? Yes / Yo on Bottles? Yes / Yo		
Intact? Yes / No / NA		
Note: Affix custody seals to back of this page.		
Were sample containers intact? Yes / No	If No, list samples: →	
Did VOA/VPH waters contain headspace (>5mm)? Yes / No /NA	If Yes, list samples: →	
Were 5035 VOA soils, or VPH soils, covered with MeOH? Yes	/ No / NA If No, list samples: →	
Was a sufficient amount of sample received for each test indicated o	n the COC? If No, list samples: →	
If chemical preservation is appropriate - Were samples field preserved? Yes / No /	(NA)	Chemical preservation OK for ALL samples?
□C=HCl □ M=MeOH □ S=H ₂ SO4		Yes / No / (N/A)
H=NaOH N=HNO ₃ Other: U= Uni	cnown	If No, list samples below:
Preservation (pH) verified at lab for EVERY bottle? (Not: VOA / VF	PH / Sulfide)	,
YES: <2 or >12 (CN) or No If No, why?:		
Were samples received within hold time? Yes / No	f No, list samples: →	
	Yes, list samples: →	
	No / NA	
Project Manager Acknowledgement: nanga Rose Date: 9	126/07	Please use back for any additional notes!

Certificate/Approval Program Summary



Method numbers assume the most recent EPA revisions. For a complete listing of analytes for the referenced methods please contact your Alpha Woods Hole Lab Project Manager or the Quality Assurance Manager.

Connecticut Department of Public Health Certificate/Lab ID: PH-0141 - Wastewater (General Chemistry: EPA 120.1, 150.1, 160.1, 160.2, 180.1, 300.0, 310.1, 335.2, 365.2; Metals: 200.8, 245.1; Organics: 608, 624, 625, ETPH) Solid Waste/Soil (General Chemistry: 1010, 9010/9014, 9045, 9060; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270, ETPH).

Florida Department of Health Certificate/Lab ID: E87814 - Primary NELAP Accreditation Authority for Air & Emissions. Secondary NELAP Accreditation for Wastwater and Solid & Hazardous Waste. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 335.2, 365.2, SM2320B, SM2340B, SM2540G, SM4500NH3; Metals: 245.1; Organics: 608, 624, 625). Solid and Hazardous Waste (General Chemistry: 9010/9014, 9045, 9050, 9056, 9065, Reactivity 7.3; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

Louisiana Department of Environmental Quality Certificate/Lab ID: 03090 - Primary NELAP Accrediting Authority for Wastewater, Solid & Hazardous Waste. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1, 6020; Organics: 608, 624, 625, 8015-DRO/GRO, 8081, 8082, 8260, 8270). Solid and Hazardous Waste (General Chemistry: 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060, Reactivity 7.3; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270).

Maine Department of Human Services Certificate/Lab ID: MA0030 - Wastewater (General Chemistry: EPA 120.1/SM2510B, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: 608, 624).

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA030 - Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: EPA 608, 624).

New Hampshire Department of Environmental Services Certificate/Lab ID: 2206 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, SM2540G; Metals: 200.8, 245.4; Organics: 608, 624, 625).

New Jersey Department of Environmental Protection Certificate/Lab ID: MA015 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1 6020; Organics: 608, 624, 625, 8081, 8082, 8260, 8270). Solid & Hazardous Waste (General Chemistry: EPA 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

New York Department of Health Certificate/Lab ID: 11627 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 365.2, 376.2; Metals: 245.1; Organics: 608, 624, 625). Solid and Hazardous Waste (General Chemistry: EPA 1010, 1311; 245.1; 6020, 7041; Organics: 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

Rhode Island Department of Health Certificate/Lab ID: LAO00289 - Chemistry: Organic and Inorganic in Non-Poratable Water, Wastewater/Sewage and Soil (Refer to LADEQ and MADEP certificates for method numbers.)

Pennsylvania Department of Environmental Protection Certificate/Lab ID: 68-02089 - Registered laboratory

U.S. Army Corps of Engineers

Department of the Navy



ANALYTICAL REPORT

Prepared for:

Battelle Duxbury Operations 397 Washington Street Duxbury, MA 02332

Project:

New Bedford Harbor

ETR:

0710028

Report Date:

October 12, 2007

Certifications and Accreditations

Massachusetts M-MA030
Connecticut PH-0141
New Hampshire 2206
Rhode Island LAO00289
New Jersey MA015
Maine MA0030
New York 11627
Louisiana 03090
Florida E87814
Pennsylvania 68-02089
Army Corps of Engineers
Department of the Navy

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CASE NARRATIVE Alpha Woods Hole Labs

ETR: 0710028

Project: New Bedford Harbor

All analyses were performed according to Alpha Woods Hole Labs quality assurance program and documented Standard Operating Procedures (SOPs). The analytical results contained in this report were performed within holding time, and with appropriate quality control measures, except where noted. A summary of all state and federal accreditations is provided within this report. Blank correction of results is not performed in the laboratory for any parameter. Soil/sediment samples are reported on a dry weight basis unless otherwise noted. Tissue and sediment samples are not certifiable under the NELAC accreditation.

The enclosed results of analyses are representative of the samples as received by the laboratory. Alpha Woods Hole Labs makes no representations or certifications as to the method of sample collection, sample identification, or transporting/handling procedures used prior to the receipt of samples by Alpha Woods Hole Labs. To the best of my knowledge, the information contained in this report is accurate and complete. For any questions regarding this report, please contact the signatory below at 508-822-9300.

M. alla			
Approved by: //anay a Ko Le	Title: Project Manager	Date: _	10/12/07
Nancy A./Rose			

Sample ID Cross Reference

Client:

Battelle

Project:

New Bedford Harbor

Lab Code: MA00030

ETR: 0710028

Lab Sample ID	Client Sample ID
0710028-01	WQ-TSS/TURB-001-100307
0710028-02	WQ-TSS/TURB-002-100307
0710028-03	WQ-TSS/TURB-002-100307-DUP
0710028-04	WQ-TSS/TURB-003-100307

Client: Project:

Battelle

New Bedford Harbor

WOODS HOLE LABSCase:

SDG: N/A

N/A

Client ID: WQ-TSS/TURB-001-100307

Matrix: Water Lab Code: MA00030

ETR: 0710028

Lab ID: 0710028-01

Date Collected: 10/03/07

Date Received: 10/03/07

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	144		1.00	1	10/10/07	mg/L	160.2	JAD
Turbidity - 180.1	71.6		0.400	1	10/03/07	NTU	180.1	JAD

Client: Project:

Battelle

New Bedford Harbor

ETR: 0710028

Lab Code: MA00030

Lab ID: 0710028-02

N/A

Water

N/A

Client ID: Matrix:

SDG: WQ-TSS/TURB-002-100307

Date Collected: 10/03/07

Date Received: 10/03/07

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	34.3		1.00	1	10/10/07	mg/L	160.2	JAD
Turbidity - 180.1	15.5		0.400	1	10/03/07	NTU	180.1	JAD

N/A

Client: Project:

ient: Battelle

New Bedford Harbor

WOODS HOLE LABSCASE:

N/A SDG:

Client ID: WQ-TSS/TURB-002-100307-DUP

Matrix: Water

Lab Code: MA00030

ETR: 0710028

Lab ID: 0710028-03

Date Collected: 10/03/07 Date Received: 10/03/07

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	28.5		1.00	l	10/10/07	mg/L	160.2	JAD
Turbidity - 180.1	16.7	- 1	0.400	1	10/03/07	NTU	180.1	JAD

Client: Project:

Battelle

New Bedford Harbor

WQ-TSS/TURB-003-100307

WOODS HOLE LABSCASE:

SDG: N/A

ETR: 0710028

Client ID:

N/A

Lab ID: 0710028-04 Date Collected: 10/03/07

Lab Code: MA00030

Matrix:

Water

Date Received: 10/03/07

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	19.0		1.00	1	10/10/07	mg/L	160.2	JAD
Turbidity - 180.1	14.0		0.400	l	10/03/07	NTU	180.1	JAD

Blank Inorganics

N/A

Client: Project:

lient: Battelle

N/A

New Bedford Harbor

WOODS HOLE LABSCase: Client ID:

SDG:

Client ID: Blank Matrix: Water Lab Code: MA00030

ETR: 0710028

Lab ID: WW100507B12

Date Collected: N/A
Date Received: N/A

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
Turbidity - 180.1	0.400	U	0.400	1	10/03/07	NTU	180.1	JAD

N/A - Not Applicable

U - The analyte was analyzed for but not detected at the sample specific level reported.

Laboratory Control Sample Inorganics

Client: Project:

Battelle

New Bedford Harbor

SDG:

Lab Code: MA00030

ETR: 0710028

WOODS HOLE LABSCase:

N/A

N/A

Client ID: **Laboratory Control Sample**

Date Collected: N/A

Matrix: Water Date Received: N/A

Lab ID: WW100507L05

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
Turbidity - 180.1	20.4	S	0.400	i	10/03/07	NTU	180.1	JAD

N/A - Not Applicable S - Spike compound.

Blank Inorganics

Client: Project:

nt: Battelle

New Bedford Harbor

WOODS HOLE LABSCase:

N/A

SDG:

N/A

Client ID: Matrix: Blank Water Lab Code: MA00030

ETR: 0710028

Lab ID: WW101007B46

Date Collected: N/A
Date Received: N/A

			Reporting		Date		Analytical	
Parameter	Result	Qualifier	Limit	Dilution	Analyzed	Unit	Method	Analyst
TSS - Membrane	1.00	U	1.00	1	10/10/07	mg/L	160.2	JAD

N/A - Not Applicable

U - The analyte was analyzed for but not detected at the sample specific level reported.

Laboratory Control Sample Inorganics



Battelle

New Bedford Harbor

Client ID:

N/A SDG: N/A

Laboratory Control Sample

Matrix: Water

Lab Code: MA00030

ETR: 0710028

Lab ID: WW100507L05

Date Collected: N/A
Date Received: N/A

Parameter	Conc.	% Recovery	% Recovery Limits
Turbidity - 180.1	20.4	102	80-120

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded results.

Laboratory Control Sample Inorganics

Client: Project: WOODS HOLE LABSCase:

Battelle

New Bedford Harbor

Client ID: Matrix:

SDG: **Laboratory Control Sample**

Water

Lab Code: MA00030

ETR: 0710028

Lab ID: WW101007L17 Date Collected: N/A

Date Received: N/A

Parameter	Conc.	% Recovery	% Recovery Limits
TSS - Membrane	501	100	80-120

N/A - Not Applicable

Concentrations reported as calculated values, which includes rounding for significant figures. Percent recoveries and RPD values are calculated from the unrounded results. 10/12/07 08:47 Sample Receipt Checklist

_		Page of
Client: BATOUX		10 3 07
Project: NB Harbon	Log-in Date:	4
ETR#: 07/0028	Inspection by:	Login by: W
ALL SECTIONS BELOW MUST BE COMPL	ETED	Comments / Notes
Were samples shipped? Yes, FedEx / UPS / Other:	>	Sample storage refrigerator #: C2
No, WHG Courier pick-up / Hand	delivered	Sample storage renigerator ".
Is bill of lading retained? Yes, Tracking #:		Sample storage freezer #:
No, Unavailable / NA		
Number of coolers received for this project delivery:)		
Indicate cooler temperature upon opening (if multiple coolers, record	_ · ·	Cooler 2: Cooler 3:
Note: If <u>all</u> coolers are 2-6°C, use one checklist, if NOT, use separated all samples received above 6°C.	e checklists and note	Cooler 4: Cooler 5:
Cooler 1: Temperature(s) taken from: IR Gun, Temp. Bl	ank, / NA	Cooler 6: Cooler 7:
Were samples received on ice? (Yes) / No		More:
Chain-of-Custody present? (Yes) / No		
Complete? Yes / No		
Custody seals present on Cooler? Yes / (No		
Intact? Yes / No / NA Note: Affix custody seals to back of this page.		·
Were sample containers intact? Yes / No	If No, list samples: →	
Did VOA/VPH waters contain headspace (>5mm)? Yes / No (NA)	If Yes, list samples: →	
Were 5035 VOA soils, or VPH soils, covered with MeOH? Yes	/ No / NA If No, list samples:	
Was a sufficient amount of sample received for each test indicated or Yes No	n the COC? If No, list samples: →	
If chemical preservation is appropriate - Were samples field preserved? Yes / No /	(NA)	Chemical preservation OK for ALL samples?
□C=HCl □ M=MeOH □ S=H ₂ SO4		Yes / No / N/A
☐H=NaOH ☐ N=HNO ₃ ☐ Other: ☐ U= Unk	nown	If No, list samples below:
Preservation (pH) verified at lab for EVERY bottle? (Not: VOA / VP	H / Sulfide)	II TO, Incomplete open.
YES: <2 or >12 (CN) or NO If No, why?:		
Were samples received within hold time? Yes No If	No, list samples: ->	
Discrepancy between samples rec'd & COC? Yes / No) If	Yes, list samples: →	
Was the Project Manager notified of any other problems? Yes /	No / NA	-
Project Manager Acknowledgement: // Door Date://	1/3/07	Please use back for any additional notes!

Battelle

The Business of Innovation

Chain of Custody

07/0028

397 Washington Street Duxbury, MA 02332 Phone: 781-952-5200 Fax: 781-934-2124

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NO 06422-07W	Proj. Name NW Bd	farl Harbor									·	atss/tur		भूल,	
Milba	I Walsh			ANALYSIS REQUESTED → "NUMBER OF CONTAINERS"	H	В	H PRINT	н	-	T			FIED	KVED 🗸	umber
ATE TIME	BATTELLE ID	CLIENT ID	SAMI	PLE DESCRIPTION	PEST	PCB	TPH FINGERPRINT	PAH	VOA	TBT	METALS	OTHER	ACIDIFIED	PRESERVED	Total Number of Containers
107 1100	WA-TSS/TWO	-001-100307	50' feet from Sour	CE 65-100NTY 10f2		11	+			1	1		T		1
107 1110	WA - T55/TUA	-001-100307	50' feet from 50m				++-						77	7	i
107 1150		1002-100307		source 13-20 NT4 10f2		11							\top		1
107 1150		-002-100307		source 13-20 NTy 2082								1		V .	1
107 1150		-002-100307-		Source 13-20MM 10f2										V	<u> </u>
07 1150	WQ-135/TUR-	002-100307-1		Source 13-20 NTY 20+2										/	_i
07 1228		00 3-100307	600 feet from Sour	ce 11-13 NTU 10f2							Ц.	V	\perp	√,	
07 1228	WA-TSSITUR	-003-100307	600 feet from 500	UCL 11-13 WTU 20+2			$oldsymbol{\perp}oldsymbol{\downarrow}$	<u> </u>				V		<u>/</u>	1
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Certificate/Approval Program Summary



Method numbers assume the most recent EPA revisions. For a complete listing of analytes for the referenced methods please contact your Alpha Woods Hole Lab Project Manager or the Quality Assurance Manager.

Connecticut Department of Public Health Certificate/Lab ID: PH-0141 - Wastewater (General Chemistry: EPA 120.1, 150.1, 160.1, 160.2, 180.1, 300.0, 310.1, 335.2, 365.2; Metals: 200.8, 245.1; Organics: 608, 624, 625, ETPH) Solid Waste/Soil (General Chemistry: 1010, 9010/9014, 9045, 9060; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270, ETPH).

Florida Department of Health Certificate/Lab ID: E87814 - Primary NELAP Accreditation Authority for Air & Emissions. Secondary NELAP Accreditation for Wastwater and Solid & Hazardous Waste. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 335.2, 365.2, SM2320B, SM2340B, SM2540G, SM4500NH3; Metals: 245.1; Organics: 608, 624, 625). Solid and Hazardous Waste (General Chemistry: 9010/9014, 9045, 9050, 9056, 9065, Reactivity 7.3; Metals: 6020, 7470, 7471; Organics: 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

Louisiana Department of Environmental Quality Certificate/Lab ID: 03090 - Primary NELAP Accrediting Authority for Wastewater, Solid & Hazardous Waste. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1, 6020; Organics: 608, 624, 625, 8015-DRO/GRO, 8081, 8082, 8260, 8270). Solid and Hazardous Waste (General Chemistry: 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060, Reactivity 7.3; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270).

Maine Department of Human Services Certificate/Lab ID: MA0030 - Wastewater (General Chemistry: EPA 120.1/SM2510B, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: 608, 624).

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA030 - Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 335.2, 365.2; Metals: EPA 245.1; Organics: EPA 608, 624).

New Hampshire Department of Environmental Services Certificate/Lab ID: 2206 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 365.2, 376.2, SM2540G; Metals: 200.8, 245.4; Organics: 608, 624, 625).

New Jersey Department of Environmental Protection Certificate/Lab ID: MA015 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 180.1, 300.0, 310.1/SM2320B, 335.2, 376.2, 9010/9014, 9056, SM2540G; Metals: 200.8, 245.1 6020; Organics: 608, 624, 625, 8081, 8082, 8260, 8270). Solid & Hazardous Waste (General Chemistry: EPA 1010, 1311, 9010/9014, 9040, 9045, 9056, 9060; Metals: 6020, 7196, 7470, 7471; Organics: 8015-DRO/GRO, 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

New York Department of Health Certificate/Lab ID: 11627 - Secondary NELAP Accreditation. Wastewater (General Chemistry: EPA 120.1/SM2510B, 150.1, 160.1/SM2540C, 160.2/SM2540D, 300.0, 310.1/SM2320B, 365.2, 376.2; Metals: 245.1; Organics: 608, 624, 625). Solid and Hazardous Waste (General Chemistry: EPA 1010, 1311; 245.1; 6020, 7041; Organics: 8081, 8082, 8260, 8270). Air & Emissions (Organics: EPA TO-15).

Rhode Island Department of Health Certificate/Lab ID: LAO00289 - Chemistry: Organic and Inorganic in Non-Poratable Water, Wastewater/Sewage and Soil (Refer to LADEQ and MADEP certificates for method numbers.)

Pennsylvania Department of Environmental Protection Certificate/Lab ID: 68-02089 - Registered laboratory

U.S. Army Corps of Engineers

Department of the Navy



Contract No. DACW33-03-D-000		Š
Delivery Order No. 2	# 1120	
June 200	See On	

FINAL North of Wood Street Monitoring Summary Report 2007 Remedial Dredging



Environmental Monitoring, Sampling, and Analysis

New Bedford Harbor Superfund Site New Bedford Harbor, MA

FINAL REPORT

North of Wood Street Monitoring Summary Report 2007 Remedial Dredging

Environmental Monitoring, Sampling, and Analysis New Bedford Harbor Superfund Site New Bedford Harbor, MA

Submitted to:

Department of the Army U.S. Army Corps of Engineers North Atlantic Division New England District

Contract Number: DACW33-03-D-0004 Delivery Order Number: 22

Prepared by:

Battelle 397 Washington Street Duxbury, MA 02332 (781) 934-0571

June 2008

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Appendix A: Sediment Sampling Logs and Core Photographs Appendix B: PCB Analytical Data







EXECUTIVE SUMMARY

Environmental sampling and analysis was performed at the North of Wood Street (NWS) area in November and December 2007 in support of remedial dredging activities at the New Bedford Harbor Superfund Site. In 2002-2003 approximately 15,000 cubic yards of material was removed from the NWS area. The NWS area was remediated using a dry excavation method to eliminate the potential for sediment resuspension and recontamination. Annual investigations have been conducted since 2004 to assess the effectiveness of prior remediation and potential recontamination of this area due to sediment transport from unremediated areas. Post-remediation sampling conducted in 2004 identified a shoreline area in Acushnet that should have been included in the 2002–2003 cleanup but which was inadvertently missed (this missed area was then remediated in 2005). Additional studies in the NWS area are planned for 2008.

Twenty-one stations in the NWS area were sampled in 2007, including 14 river sediment locations and 7 marsh soil locations along the eastern and western shores of the river. River sediments were generally comprised of a layer of fine black silt underlain by sand, clay or silt. River sediments located closer to the shore and further upstream were comprised of brown organic sand and silt underlain by gravel and/or sand. Shoreline soils were generally comprised of brown organic silt and sand underlain by sand or gravel, silt and sand.

In 2007, total PCB concentrations in river sediment samples ranged from 0.4 milligrams per kilograms (mg/kg) to 270 mg/kg dry weight. The highest concentrations of total PCB (>100 mg/kg) were measured in sediment at stations C007-039, C007-055, and C007-033. The lowest concentrations (<5 mg/kg total PCB) were measured in sediment collected closer to the shoreline and further upstream. Total PCB concentrations were below the applicable recreational cleanup criteria (25 mg/kg) at all shoreline locations in 2007.

Sediment data from the 2003–2007 monitoring period show that total PCB concentrations in river sediment at the NWS area are spatially and temporally variable, which may reflect differences in bulk sediment characteristics and the highly dynamic nature of the system. Total PCB concentrations in 2003 were among the lowest measured during the monitoring period. Total PCB concentrations increased at most stations following the remediation of the NWS area in the winter of 2002-2003. The post-remediation increase was relatively small at some stations (C007-016, 023, 040, 049, 062) and larger at others (C007-028, 033, 038, 039, 048, and 055). The apparent increase could have resulted from contaminant transport from the upper harbor during dredging activities or natural transport (e.g., sediment resuspension and transport during tidal cycles and/or high winds) of contaminated sediment from unremediated areas of the harbor that are subject to dynamic sediment movement.

Shoreline soil data from the 2006–2007 monitoring period suggest that the remediation was effective, in that total PCB concentrations were below the 25 mg/kg recreational shoreline land use criteria for this area at all stations.







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1.0 INTRODUCTION

The New Bedford Harbor Superfund Site (Site), located in Bristol County, Massachusetts (MA), extends from the shallow northern reaches of the Acushnet River estuary south through the commercial harbor of New Bedford and into 17,000 adjacent acres of Buzzards Bay (Figure 1). Industrial and urban development surrounding the harbor has resulted in sediments becoming contaminated with high concentrations of many pollutants, notably polychlorinated biphenyls (PCBs) and heavy metals. Two manufacturers in the area used PCBs while producing electronic devices from the 1940s to the late 1970s, when the use of PCBs was banned by the U.S. Environmental Protection Agency (USEPA). Based on human health concerns and ecological risk assessments, USEPA added New Bedford Harbor to the National Priorities List in 1983 as a designated Superfund Site. Through an Interagency Agreement between the USEPA and the U.S. Army Corps of Engineers, New England District (USACE NAE), the USACE is responsible for carrying out the design and implementation of the remedial measures at the site. The Site has been divided into three areas – the upper, lower and outer harbors – consistent with geographical features of the area and gradients of contamination (Figure 2).

Aerovox Inc. located in New Bedford, MA used PCBs in the manufacture of electrical capacitors from approximately 1940 to 1977. This facility is located in the upper harbor and is considered one of the major sources of historic PCB contamination to New Bedford Harbor. The highest concentrations of PCBs were found in sediments in a 5-acre area in the northern portion of the Acushnet River Estuary adjacent to the Aerovox facility. These 'hot spot' sediments, which contained PCBs upwards of 100,000 milligrams per kilogram (mg/kg), were removed between 1994 and 1995 as part of USEPA's 1990 "Hot Spot" Record of Decision (ROD). Full scale remediation dredging per the 1998 Upper and Lower Harbor ROD was initiated in 2004 and continued in 2005, 2006, and 2007. Another known source of PCB contamination in New Bedford Harbor is related to activities at the Cornell-Dubilier mill on the western shore of the outer harbor (Figure 2). In 2005, a 15 acre underwater cap pilot project was implemented near Cornell-Dubilier to cap PCB-contaminated sediments.

Located at the far northern end of the Upper Harbor are areas which were prioritized for restoration activities based on their proximity to shoreline residential and recreational land use areas. The North of Wood Street (NWS) area includes in-river sediments and marsh soils on the eastern and western shores of the river. The NWS study area extends from approximately 250-ft south of the Wood Street bridge to approximately 0.25 miles north of the bridge. Sediments and marsh soils at the NWS area previously had PCB concentrations as high as 46,000 mg/kg. The 1998 ROD established the following clean up criteria: 1 mg/kg for residential shoreline areas, 10 mg/kg for the sub-tidal sediments, 25 mg/kg for the top foot of recreational land use shoreline soils and 50 mg/kg for shoreline soils deeper than the top foot in residential and recreational land use areas.

In the winter of 2002-2003 approximately 15,000 cubic yards of material was removed from the NWS area. The site was remediated using temporary dams and pumps to divert river water around the site. This allowed excavation activities to be conducted on dry sediments and soils, thus eliminating the potential for sediment resuspension and recontamination. Clean fill was





used to restore the river banks, but sub-tidal areas were left at the depth of excavation (i.e., not backfilled). Marsh and upland vegetation was planted above the low water line to stabilize and restore the shoreline. In August of 2004 post-remediation sampling revealed elevated PCB concentrations on the eastern shoreline of the NWS area, and in certain sub-tidal locations. Elevated concentrations were found above the high tide line suggesting that incomplete remediation was a more likely cause than recontamination from in-river sources. Additional remediation and restoration efforts were conducted in December 2005 to remove the remaining contamination. Samples collected before and after this effort showed an improvement in shoreline PCB concentrations (ENSR, 2006).

Additional sampling was conducted in 2006 and 2007 to assess the effectiveness of prior remediation and potential recontamination of this area due to sediment transport from unremediated areas. Twenty-one (21) locations were sampled, including 14 sediment stations in the river, 5 soil locations in the remediated marsh area on the east side of the river south of River View Park, and 2 shoreline stations on the lumber yard site on the west side of the river (Figure 3).

This report presents results from the November/December 2007 investigation and evaluates the results with respect to earlier investigations conducted at the NWS area. A description of the 2007 sampling and analysis methods is provided in Section 2.0. Results of the 2007 investigation, including physical characteristics of the river sediment and shoreline soils and sample chemistry, are provided in Section 3.0. A discussion of the NWS results is provided in Section 4.0. References are provided in Section 5.0







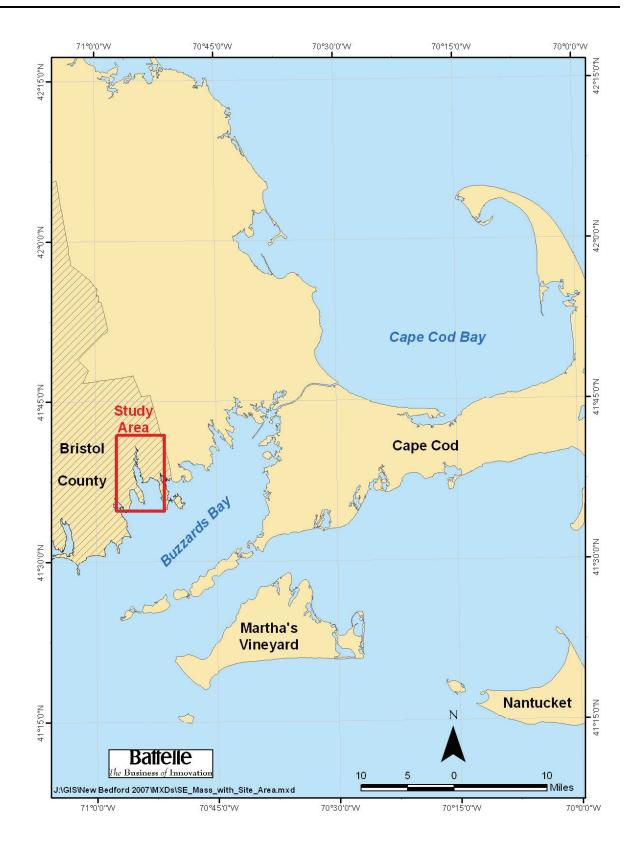


Figure 1. Location of the Site in Southeastern, MA.







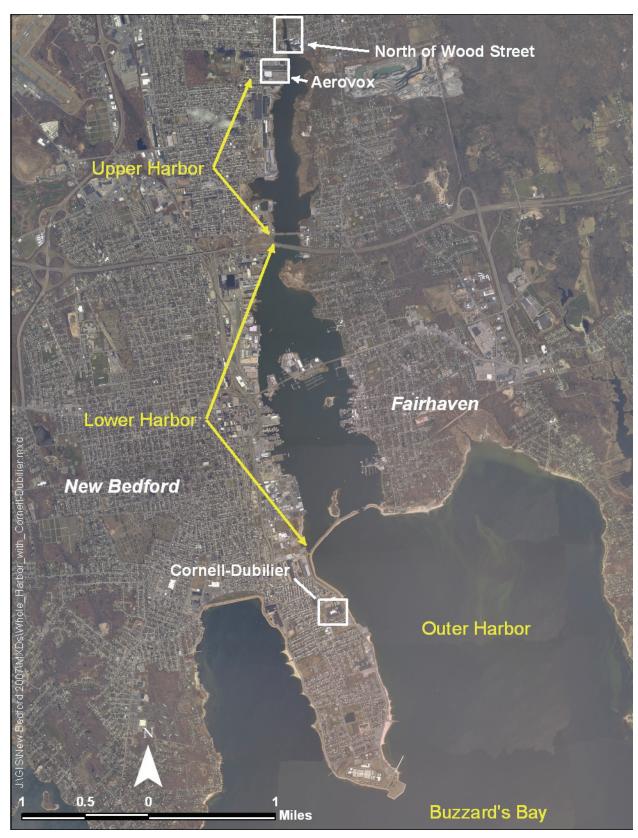


Figure 2. New Bedford Harbor Project Areas.









Figure 3. Locations of 2007 NWS Sampling Stations







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2.0 METHODS

Environmental sampling and analysis methods utilized for the November/December 2007 investigation are summarized below and described in detail in the project work plans (Battelle, 2006a, b, and c). Twenty-one (21) locations were sampled in 2007, including 14 sediment stations in the river and 7 soil stations located at recreational land use shoreline soil areas along the east and west side of the river (Figure 3). Station locations were based on locations sampled previously in 2006.

2.1 Sediment and Shoreline Soil Collections

In-river sediments were collected in LexanTM core barrels attached to a stainless steel push core sampler. In all cases, a one foot core was targeted. Samples in deeper waters were collected from a boat, while shallow water samples were collected by wading. The push core sampler is designed to securely hold one end of a pre-cut length of core barrel. The stainless steel socket which holds the core liner was attached to a suitable length of push rod based on the water depths for the sampling effort. A piston assembly inside the core barrel was used to create suction during retrieval of the sample so that no sediment was lost from the bottom the barrel. The piston assembly was positioned just inside the leading end of the core liner and the piston line was held loosely on deck. The device was lowered into the water until the leading end of the core bore barrel contacted the sediment surface. The piston attachment line was then tied off securely on the deck, thus fixing the elevation of the piston assembly. In driving the push-core into the sediment, the piston created a syringe effect as the core liner was driven past the fixed elevation of the piston. The sampler was recovered onto the deck of the survey vessel. The bottom end of the core barrel was fitted with a plastic cap, after which the sediment on the external body of the sampler was rinsed off. After thoroughly cleaning the sampling device the core liner was removed from the socket assembly, the piston assembly was then removed, and the top of the core liner was fitted with a plastic end cap. Shoreline soil samples were collected in LexanTM core barrels inserted into a soil auger. Sample collection data, including collection date and time, station coordinates, and sample ID, were documented on Sediment Sampling Log forms. All cores were kept intact in the liners and returned to the Sawyer Street field trailer for processing (Section 2.2).

2.2 Core Processing

Core processing was performed at the Sawyer Street field trailer. Each core was photo-documented, visually characterized, and subsampled for chemical analysis.

All cores were documented with digital photographs. Digital photographs of the cores were uploaded to the New Bedford Harbor project database. These photographs are linked in the database to the location information and to the analytical results and can be viewed individually. Each photograph contains the following elements in the frame:

- The sediment core. Photographing was done through the clear liner.
- *Measurement reference*. A tape measure (or equivalent) marked in decimal feet ran parallel to length of the core.





- Sample identifier. A card, paper, whiteboard, or equivalent was placed next to the core with the following written information:
 - o Sample ID an alpha numeric code that identifies sample matrix, sampling year, station location, and depth interval sampled
 - o Sample Collection Date

Each core was visually characterized and physical characteristics, including material type, color, consistency, particle size, and odor, was documented on the Sediment Sampling Log forms. Each core was then subsampled for chemical analysis. Two 6-inch composite samples were taken from each core, homogenized, and placed into sample containers. The sample from the 0.0-0.5 foot interval was submitted for PCB analysis. The sample from the 0.5-1.0-foot interval was frozen and archived at the Site until further notice. Samples were collected into pre-cleaned, 8-oz glass jars with Teflon lined lids. All samples were held on ice while in the field and frozen upon receipt at the laboratory. Copies of the sample field logs and custody records are maintained with the project files at Battelle.

2.3 Chemical Analysis

All river sediment and shoreline soil samples were analyzed for PCB congeners and a subset of the samples were also analyzed for PCB homologues. PCB analyses were performed by Battelle, located in Duxbury, MA. Samples were mixed in the container, and approximately 10 g was removed, placed on aluminum foil, and air-dried overnight in a fume hood to ensure percent solids in the samples were >50%. Approximately 5 g of the air-dried sample was spiked with surrogates and extracted using Accelerated Solvent Extraction (ASE) following modified EPA Method 3545. The extracts were processed through activated copper for sulfur removal and then received disposable Florisil column clean-up. The post-Florisil extract was concentrated, fortified with internal standards (IS), and submitted for analysis.

All sample extracts were analyzed for the 18 NOAA PCB congeners using gas chromatography/ electron capture detection (GC/ECD) using dual column confirmation, following modified EPA Method 8082. Sample data were quantified by the method of internal standards, using the IS compounds. Positive congener results were confirmed by a secondary column confirmation analysis with the higher of the two results reported, unless analyst discretion required otherwise (e.g. the result without an interference signal was reported).

Approximately 7.5% of the samples were analyzed for PCB homologues using gas chromatography/mass spectrometry (GC/MS), following modified EPA Method 8270C. Sample data were quantified by the method of internal standards, using the IS compounds.

PCB congener and homologue results are reported in mg/kg dry weight and to two significant figures in this report. Concentrations of total PCB were calculated using the congener and homologue results. First, total PCB was calculated as the sum of the 18 NOAA congeners multiplied by the project-specific factor of 2.6. Next, total PCB was calculated as the sum of the homologues. A value of zero (0) was used in the summation for non-detects.







3.0 RESULTS

3.1 Sediment and Shoreline Soil Collections

A total of 15 surface sediment samples (14 field samples + 1 field duplicate) were collected from the Acushnet River in the NWS area (Figure 3). A total of eight shoreline soil samples (seven field samples + one field duplicate) were also collected; five samples were collected from the eastern shoreline and two from the western shoreline (Figure 3). Sample collection data, including station ID, collection date and station coordinates are summarized in Table 1.

Table 1. Summary of Samples Collected at the NWS Area, November/December 2007.

	Sample	Collection	Collection	Northing (NAD 83	Easting (NAD 83
Station ID	Type	Date	Time	MA ft)	MA ft)
C007-010		11/14/2007	10:28	2709127	815353
C007-016		11/9/2007	8:21	2708950	815396
C007-023		11/9/2007	8:38	2708814	815411
C007-028		11/9/2007	8:55	2708703	815400
C007-030E		11/8/2007	13:24	2708683	815499
C007-030W		11/9/2007	11:44	2708653	815363
C007-033	River	11/12/2007	11:33	2708614	815412
C007-038	Sediment	11/9/2007	9:53	2708516	815383
C007-039	Scament	11/9/2007	9:30	2708513	815412
C007-040		11/9/2007	9:19	2708514	815462
C007-048		11/14/2007	9:16	2708385	815413
C007-049		11/14/2007	9:30	2708402	815468
C007-049 Dup		11/14/2007	9:37	2708402	815468
C007-055		11/14/2007	9:04	2708267	815460
C007-062		11/14/2007	8:50	2708165	815565
07-NWS-33		11/9/2007	10:58	2709040	815330
07-NWS-34		11/9/2007	11:15	2708923	815338
07-NWS-35	Shoreline Soil	11/8/2007	12:28	2708761	815503
07-NWS-36		11/8/2007	12:12	2708761	815516
07-NWS-37		11/8/2007	12:40	2708682	815535
07-NWS-38		11/8/2007	13:45	2708819	815500
07-NWS-39		12/6/2007	11:45	2708819	815509
07-NWS-39 Dup		12/6/2007	11:50	2708819	815509

3.2 Physical Characteristics

River sediments and shoreline soils were visually characterized and physical characteristics, including material type, color, consistency, particle size, and odor, are documented on the Sediment Sampling Log forms provided in Appendix A. Digital photographs of the cores are also provided in Appendix A.







3.2.1 River Sediments

The physical characteristics of surface sediments collected at most river stations were similar, and were characterized by a layer (0.2-0.8 feet) of fine black silt underlain by sand, clay or silt. The physical characteristics of sediment located closer to the shoreline and further upstream were different compared to in-river sediment locations. For example, station C007-030W, located near the western shore of the river, was comprised of medium to fine, brown sand with organic material underlain by sand. Station C007-030E, located near the eastern shore of the river, was comprised of fine to coarse, dark brown organic sand and silt underlain by gravel and sand. Station C007-010, located at the northern boundary of the NWS area, was comprised of fine to coarse, grey-black sand and gravel.

3.2.2 Shoreline Soils

Soils located along the western shore were generally comprised of fine to medium, firm brown organic material with sand underlain by sand. Soils located along the eastern shore were generally comprised of fine to coarse, loose brown organic silt and sand underlain by gravel, silt and sand. Shoreline soils at stations NWS-34, NWS-35, and NWS-37 had a more uniform composition within the top one foot.

3.3 Polychlorinated Biphenyls

Total PCB concentrations measured in river sediments and shoreline soils collected at the NWS area in November/December 2007 are summarized in Table 2 and shown in Figure 4. Complete PCB congener and homologue results are provided in Appendix B.

Table 2. Total PCB Concentrations in Sediment and Shoreline Soil at the NWS Area, November/December 2007

River Sec	diment	Shoreli	ne Soil
Station ID	Total PCB (a) (mg/kg dry)	Station ID	Total PCB (a) (mg/kg dry)
C007-010	4.5	07-NWS-33	0.089
C007-016	29	07-NWS-34	7.4
C007-023	23	07-NWS-35	0.19
C007-028	78	07-NWS-36	0.31
C007-030E	0.44	07-NWS-37	4.5
C007-030W	0.4	07-NWS-38	0.26
C007-033	120	07-NWS-39	0.035
C007-038	68	07-NWS-39 Dup	0.06
C007-039	270		
C007-040	20		
C007-048	43		
C007-049	25		
C007-049 Dup	32		
C007-055	190		
C007-062	23		

⁽a) Sum of 18 congeners x 2.6







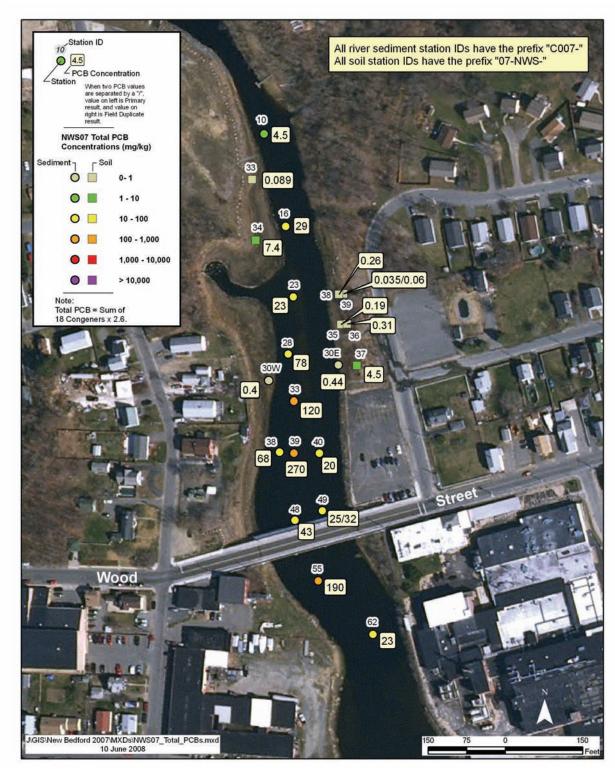


Figure 4. Total PCB Concentrations in River Sediment and Shoreline Soil Samples at the NWS Area, November/December 2007







3.3.1 River Sediments

Total PCB concentrations in river sediment samples ranged from 0.4 mg/kg to 270 mg/kg (Table 2). The highest concentrations of total PCB (> 100 mg/kg) were measured in surface sediment at station C007-039, followed by C007-055, and C007-033 (Figure 4). Lower concentrations of total PCB (< 5 mg/kg) were measured in sediment collected closer to the shoreline (C007-030W and C007-030E) and further upstream (C007-010) (Figure 4, Table 2).

3.3.2 Shoreline Soils

Total PCB concentrations in the shoreline soils ranged from 0.035 mg/kg to 7.4 mg/kg (Table 2). The highest concentrations of total PCB were measured in surface soil at station 07-NWS-34 (7.4 mg/kg), located on the west shore (Figure 4). The next highest concentration of total PCB was measured in surface soil at station 07-NWS-37 (4.5 mg/kg), located on the east shore (Figure 4). Total PCB concentrations were below 1 mg/kg in all other surface soil samples (Table 2).

3.4 PCB Homologue Comparison

All river sediment and shoreline soils were analyzed for PCB congeners and 3 of the 23 samples (2 river sediment and 1 shoreline soil) were also analyzed for PCB homologues. A comparison of the total PCB concentrations, calculated using both the congener and homologue data, is summarized in Table 3. Total PCB concentrations calculated by both methods are comparable for two of the three samples. Total PCB concentrations are considerably different for one of samples, with a higher value calculated using the congener method (Table 3). A larger number of samples from the harbor-wide sediment program were collected for congener-homologue comparison and those data are discussed in the Sediment Monitoring Summary Report for 2007 Remedial Dredging (Battelle, 2008).

Table 3. Total PCB Concentrations Calculated by Congener and Homologue Results

	Sample	Tot	al PCB (mg/kg dry)	
Station ID	Type	Sum 18 Congeners (a)	Sum Homologue (b)	RPD
C007-016	River	29	30	3.4
C007-039	Sediment	270	160	51
07-NWS-34	Shoreline Soil	7.4	6.9	7.0

⁽a) Sum of 18 congeners x 2.6, non-detect = 0 mg/kg.

RPD, relative percent difference.

⁽b) Sum of 10 homologue groups, non-detect = 0 mg/kg.





4.0 DISCUSSION

Several investigations have been conducted to characterize PCB contamination at the NWS area following remediation activities conducted in 2002-2003 to remove PCB-contaminated sediments and soils from the river and surrounding shoreline (TTFW, 2004). A confirmatory sampling event was conducted by TTFW immediately following the remediation in February 2003 (see North of Wood Street Cleanup Zone Map, available at http://www.epa.gov/ne/nbh/). ENSR conducted four sampling events in the area to evaluate changes in river sediment PCB concentrations that may have occurred due to seasonal influence and/or dredging/ remediation activities, as follows: August 2004 (pre-dredging), May 2005 (spring flow conditions), September 2005 (pre-dredging, late summer flow), and January 2006 (post-dredging). Battelle conducted two post-dredging sampling events in November 2006 and November/December 2007 to further assess potential recontamination of the NWS area.

4.1 River Sediments

Total PCB concentrations measured in river sediments at the NWS area between 2003 and 2007 are summarized in Table 4. Station-specific and system-wide average ¹ concentrations of total PCB between 2003 and 2007 are shown in Figures 5 and 6, respectively. Sediment data from the 2003–2007 monitoring period show that total PCB concentrations in river sediment at the NWS area are spatially and temporally variable (Figures 5 and 6), which makes it difficult to discern clear trends in the data. The lowest concentrations of total PCB in river sediment were measured in 2003, immediately following the remediation of the NWS area in the winter of 2002-2003 (Figures 5 and 6). A post-remediation increase in total PCB concentrations was observed in 2004 (Figures 5 and 6). While total PCB concentrations decreased in subsequent sampling events, post-remediation levels in 2007 remain elevated at most stations compared to 2003 (Figure 5). The post-remediation increase between 2003 and 2007 was small ² at some stations (C007-016, 023, 040, 049, 062) and larger ³ at other stations (C007-028, 033, 038, 039, 048, and 055) (Figure 5). System-wide average concentrations of total PCB in sediment at the NWS area have decreased since the 2004 post-remediation increase, and have ranged ⁴ from 16 mg/kg in 2005 to 53 mg/kg in 2007.

The NWS area is characterized by heterogeneous sediments, and the variability among the PCB data likely reflects differences in bulk sediment characteristics (e.g., grain size and organic carbon content). The NWS area is also subject to dynamic sediment movement, and the apparent increase in PCB concentrations at some stations could have resulted from contaminant transport from the upper harbor during dredging activities or natural transport (i.e., non-dredging related such as sediment resuspension and transport during tidal cycles and/or high winds) of contaminated sediment from unremediated areas. Annual sediment monitoring will continue at the NWS area as needed to assess the potential for recontamination from the unremediated harbor areas immediately to the south.

¹ The system-wide concentration is an area-wide average concentration calculated as the average PCB concentration across all stations within a given sampling event.

² Small increase - 2007 values typically less than six times 2003 values.

³ Larger increase – 2007 values typically two orders of magnitude higher compared to 2003 values.

⁴ Range values are based on 'common' set of stations sampled consistently across all sampling events.





Table 4. Total PCB Concentrations in River Sediment at the NWS Area, 2003 to 2007.

Station			Total	PCB (a) (mg/k	g dry)		
ID	Jan/Feb-2003	Aug-2004	May-2005	Sep-2005	Jan-2006	Nov-2006	Nov/Dec-2007
C007-010	6.1D	20	=	81	0.99	2.4	4.5
C007-016	4.6D	13	-	18	16	15	29/30 ^(c)
C007-023	8.3D	22	3.8	2	6.6	8.5	23
C007-028	0.49DU	63	9.8	0.22	11	18	78
C007-030E	-	-	-	0.7 (b)	88	0.72	0.44
C007-030W	-	-	-	0.4 (b)	5.2	0.16	0.4
C007-033	0.39DU	64	22	1.1	17	93	120
C007-038	0.45DU	36	-	4.7	8.6	1.8	68
C007-039	0.54DU	64	4.6	-	-	13	270/160 ^(c)
C007-040	2.9D	72	79	73	190	47	20
C007-048	0.43DU	23	9	-	-	100	43
C007-049	12D	160	36	5.9	3.6	12	25
C007-055	0.42DU	61	-	7	20	9.6	190
C007-062	7.4D	19	-	0.87	1.3	40	23

D: result from dilution analysis; U: non-detect, detection limit reported.

⁽c) Total PCB result based on homologue analysis (see Table 3).

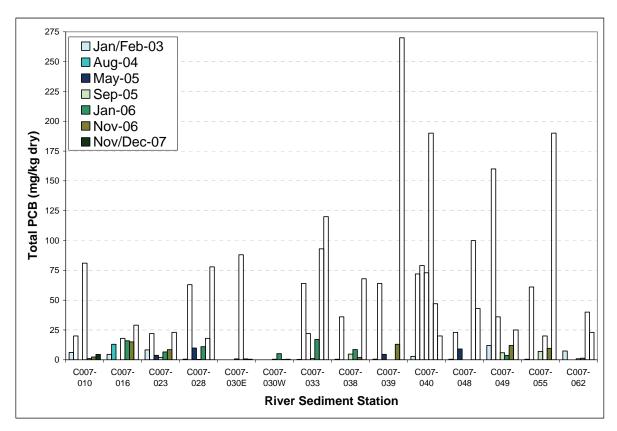


Figure 5. Station-specific Trends in Total PCB Concentrations in Sediment at the NWS Area, 2003 to 2007

⁽a) Sum of 18 congeners x 2.6

⁽b) Data were not in the New Bedford Harbor Database. Total PCB values from ENSR (2006).





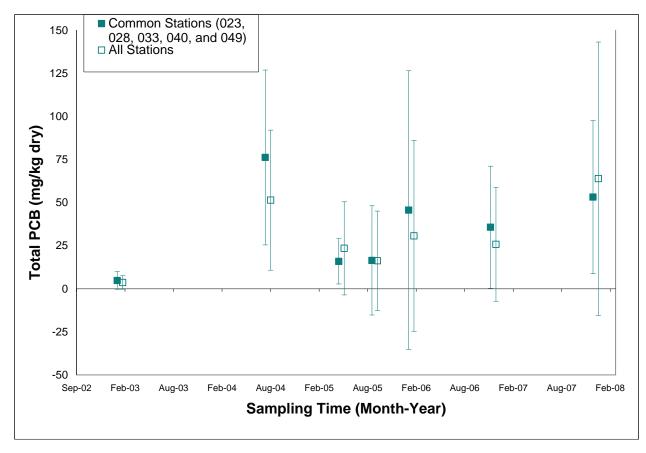


Figure 6. System-wide Trends in Total PCB Concentrations in Sediment at the NWS Area, 2003 to 2007. The system-wide concentration is the average concentration of all data for a given sampling event. System-wide average concentrations are presented for 'common stations' and 'all stations'. Common stations are a sub-set of the sampling stations that were sampled consistently across all sampling events (i.e., C007-023, 028, 033, 040, and 049). The 'all station' average is based on all available data from all stations (the number of stations sampled varies by sampling event, ranging from 7 stations sampled in 2003 to 14 stations sampled in 2006 and 2007). The errors bars represent one standard deviation.

4.2 Shoreline Soils

Total PCB concentrations in shoreline soils is summarized in Table 5 and shown in Figure 7. In December 2005, Jacobs Engineering performed additional remediation at the eastern shoreline of the NWS area to remove contaminated soils/sediments that were inadvertently missed during the 2002-2003 remediation. PCB results from post-remediation sampling conducted in 2006 and 2007 suggest that the remediation was effective, in that total PCB concentrations were below the 25 mg/kg recreational shoreline land use criteria for this area at all stations (Table 5, Figure 7). Substantive changes in shoreline total PCB concentrations between the 2006 and 2007 sampling events were not observed, except at station NWS-37 where the concentration increased by an order of magnitude in 2007 compared to 2006. Even so, the PCB concentration measured in 2007 was well below the 25 mg/kg cleanup criteria for this area.







Table 5. Total PCB Concentrations in Shoreline Soil at the NWS Area, 2006 and 2007.

	Total PCB	(a) (mg/kg dry)
Station	Nov-2006	Nov/Dec-2007
Western Shoreline		
07-NWS-33	0.014	0.089
07-NWS-34	3.4	7.4
Eastern Shoreline		
07-NWS-35	0.27	0.19
07-NWS-36	0.14	0.31
07-NWS-37	0.35	4.5
07-NWS-38	0.15	0.26
07-NWS-39	0.082	0.035
07-NWS-39 Dup	-	0.06

⁽a) Sum of 18 congeners x 2.6

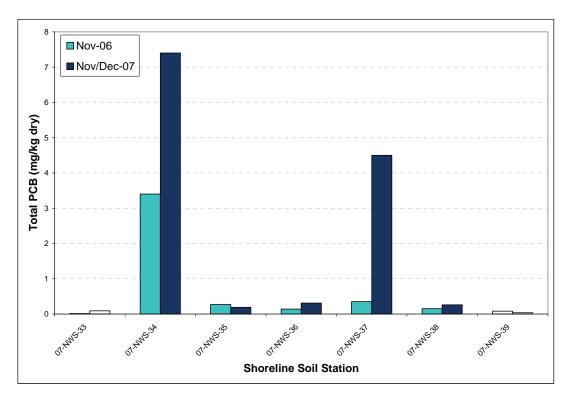


Figure 7. Total PCB Concentrations in Shoreline Soil at the NWS Area, 2006 and 2007 Post-remediation Sampling Events







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Appendix A

Sediment Sampling Logs and Core Photographs



Battelle The Business of Innovation	Project Name: Location: Client:	New E	ord Harbor I Bedford, MA JSACE NAE		ental Monitor		Vessel	G606422 I: R/V Gale Force t: Theresa Himmer
Station ID:	EN OF WWY	36-16	Time On St	ation:	1209		All measur	ements are ±0.1 feet
Core Sample ID:	13-070-	ひとってい	~¹Rorthing (N	AD 83):	27087	61.6	Water Dept	th (A):
Lögged by:	MW		Easting (NA	AD 83):	81551		 Length of p	ush core assembly (BY)
Collection Mechanism:	Rueh-Gore	Auser	GPS Accur	acy:	2.0	t	 Water surfa	ace to top of handle (C):
Date:	11/8/07	J	 Predicted T	ide (ft):	NA		Length of co	ore (from bottom) (D):
			Time of Col	lection:	1212		Surveyed e	levation (NVGD 29) (E): NA
			Time Depar	t Station:	1218	3		ice from surveyed elevation (F):
(G) Elevation of Wa	ter Surface (NVGD):	E-F	Calculation	ns for Dete	ermination of	Z* Elevat	ion	
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(I_2) Elevation of the	sediment-water inter	face as mea	asured from	water depti	n (NVGD): G	- A		
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مرائسه وسايها	ID: NWS	-36	AFM	12/11/51	7			
* Station	TO 10113	7	114/TL	(- 175			•
presumple	ID: 5-07	0 - N	A/ 2 - 20		1			
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Battelle The Business of Innovation	Project Name: <i>New B</i> Location: <i>Ne</i> Client:	ledford Harbor E ew Bedford, MA USACE NAE	Invironme	ntal Monitor		Vesse	G606422 I: R/V Gale Force t: Theresa Himmer	.,
Station ID: *5= Core Sample ID: *5= Logged by: Collection Mechanism: Date:	MW Rush Core Ang- 11/8/07	Northing (NA	AD 83): .D 83): acy: ide (ft): fection;	12 25 815 50 2. 7 NA 12 28	161.2 8.6 14	Water Dept Length of p Water surfa Length of c Surveyed e	th (A): ush core assembly (B): use to top of handle (C): ore (from bottom) (D): levation (NVGD 29) (E): use from surveyed elevation	NA NA NA 1.0 NA (F): NA
(H) Elevation of the book (z*) Elevation of visual (I) Elevation of the second (12) Elevation of the second (13)	r Surface (NVGD): E - F ottom of the core (NVGD): I transition (NVGD): H + (core diment-water interface as ediment-water interface as ± 1.0 feet, discard and res	G - (B - C) Iistance to visual measured from to measured from to	<i>transition)</i> pottom of c		H + D	ion	NA	
Elevation (NVGD)	Lithology - Include USCS code	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comme	nts
6.0	ogor Silt San	Dock Brown	10052	fine to large			5-07P-NUS Through 5-07P-10 Are	35-00-05
D of digital photograph ments: * Station ID Scample I	10: 10: 5-070-	YEW 15/11/	u7 -00-1	0				
	l and spl				Ju	(F		

Baffelle	Location: Client:		edford, MA SACE NAE					R/V Gale Force Theresa Himmer	
tation ID: 🔺 🖟	8070 NW5	37-10	Time On St	ation:	123		All measure	ments are ±0.1 feet	
ore Sample ID:	2-010-NM	5-37-10	Northing (N	AD 83):	27086	82.0	Water Depth	(A):	NA
ogged by:	MW		Easting (NA	D 83):	81553	5.0	_Length of pu	sh core assembly (B):	NA
ollection Mechanism:	Push Core	Auger	GPS Accura	acy:	3.8	7	_Water surface	ce to top of handle (C):	NA
ate:	11/8/07	, 3	Predicted T	ide (ft):	NA		_Length of ca	re (from bottom) (D):	1,0
			Time of Col	lection:	1240		_Surveyed ele	evation (NVGD 29) (E):	NA
			Time Depar	t Station:	1243		_Water surfac	ce from surveyed elevation (F):_ <i>N4</i>
			Calculation	ns for Dete	rmination of	Z* Elevati	on		
	ter Surface (NVGD):								
•	bottom of the core (N						***************************************		
,	al transition (NVGD)	·						-N/A	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
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2,	sediment-water inter			water depth	(NVGD): G -	A		_/	
(Note if I ≠ I ₂ with	n ± 1.0 feet, discard	and resamp	le)						
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30)	nde				<u>e</u>				
(NVGE	e e			 	parti		S		
vation (N	- ABC			sten	un l		e D		
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments	
+ 1.50 }-			0		2 %		1 0)		
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Of the	nued + 500 n 10: NW pre 10:5	smp 4 5 - 3∓	AEM	12/11/0	7				

Battelle The Business of Innovation	Project Name Location Client	: New I	ord Harbor Bedford, MA USACE NAI	4	ental Monito	_	Vess	el: G606422 el: R/V Gale Force st: Theresa Himmer	
Station ID: * S-OFIC	007-03	01/2/10	Time On S	tation:	1317			rements are ±0.1 feet	
Core Sample ID:			 Northing (N	NAD 83):	2708	683.1	Water Dep		NA
Logged by:	NW		Easting (N.	AD 83):		99.0		oush core assembly (B):	NA
Collection Mechanism:	Fush-Core	Auger	GPS Accui	racy:	1.90			face to top of handle (C):	NA
Date:	118/07		 Predicted 1	-	NA			core (from bottom) (D):	1.0
-	*		 Time of Co 		1326	i	_	elevation (NVGD 29) (E):	NA
			Time Depa		132	· · · · · · · · · · · · · · · · · · ·		ace from surveyed elevation (
				····	rmination of			ace nom surveyed elevation (7): 107]
(G) Elevation of Water Su							-		,
(H) Elevation of the botto									
(z*) Elevation of visual tra	nsition (NVGD)	: H + (dista	nce to visual	transition)				-M	
(I) Elevation of the sedin	nent-water inter	face as mea	asured from	bottom of c	ore (NVGD):	H + D		A	
(l_2) Elevation of the sedim									
(Note if $1 \neq 1_2$ within ± 1 .	0 feet, discard	and resamp	ole)						
G G	Ф П				0.				
Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size				
vation (NV Bottom = ,	3y - l			Consistency	E g		οS		
llevat e. Bo	holog CS c	9.0	<u>ö</u>	nsist	ximu	24	Sample IDs		
1,0	<u> </u>	Туре	Color	Ŝ	Ma	Odor	Sar	Commen	ts
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(2) Station ID: COOT-030 E Page __ of __ AEM 12/11/07 COOT Sample ID: 5-07 D-COOT-030 E-00-10 V

Battelle	Project Name: / Location: Client:	New B	ord Harbor ledford, MA ISACE NAI	4	ental Monito		Vesse	: G606422 el: R/V Gale Force et: Theresa Himmer	
Station ID: *	07-NW5-	18-10	_ Time On S	tation:	_1347	ኢ	All measu	rements are ±0.1 feet	
Core Sample ID:	5-070-NWS	-38 TC	Northing (N	NAD 83):	2708	819.2	Water Dep	th (A):	NA
Logged by:	MW		Easting (N	AD 83):	81550	4.0	Length of p	oush core assembly (B):	NA
Collection Mechanism:	Push-Gere A	uger	GPS Accui	racy:	A.	84	Water surf	ace to top of handle (C):	NA
Date:	11/8/0	7	Predicted 1	Γide (ft):	NA		 Length of c	core (from bottom) (D):	1.0
			Time of Co	llection:	1345		Surveyed e	elevation (NVGD 29) (E):	NA
			Time Depa	rt Station:	1350		Water surfa	ace from surveyed elevation (F): <u>NA</u>
			Calculatio	ns for Dete	rmination o	f Z* Elevati	on		
	r Surface (NVGD): E ottom of the core (NV		(P. C)					- 1	
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z*) Elevation of visual	transition (NVGD): I	+ (distan	ice to visua	l transition)				/ <i>K</i>	······································
	diment-water interfa diment-water interfa ± 1.0 feet, discard ar	ce as mea	sured from						
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comment	
1.0	27.30 M	MANIE	Brown	FINOUS	Cowse	1	0)		
0.8	_ 311	STIT	V''		+124	"Water and the		S-07D-NWS S-07D-NWS Archive Fi	3-38-00-
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ve sample	10:507	D - N	M2-3	8-00-	1 6				

Batte The Business of I		Location Client		Bedford, MA USACE NAE			Ch	Vesse ief Scientis	sl: R/V Gale Force t:
Station ID:		C007-C	016	Time On S	tation:	0	810		rements are ±0.1 feet
Core Sample II	OTP SER			 Northing (N				6 Water Dep	
Logged by:	<u> </u>	JMF	<u>uv u</u>	Easting (N.					oush core assembly (B):
Collection Mec	naniem:	Push-Core		GPS Accur			02		
	IB/115/111.	11/9/07			•	<u> «·</u>	06		ace to top of handle (C):
Date:	***************************************	111107		Predicted 1					ore (from bottom) (D):
				Time of Co			3:21		elevation (NVGD 29) (E):
				Time Depa	rt Station:		30	Water surfa	ace from surveyed elevation (F):
				Calculation	ns for Dete	rmination o	f Z* Elevat	ion	
		urface (NVGD	•					***************************************	
	n of the botto	m of the core	(NVGD): G	i - (B - C)					
(z*) Elevation	n of visual tra	insition (NVGE	0): H + (dist	ance to visu	al transition)		***************************************	
(I) Elevation	n of the sedin	nent-water inte	erface as m	easured fror	n bottom of	core (NVGI	D): H + D		
(1 ₂) Elevation	n of the sedin	nent-water inte	erface as m	easured fror	n water dep	oth (NVGD):	G - A		
(Note if I a	fl ₂ within ± 1.	.0 feet, discard	d and resam	nple)				***************************************	
T T		<u> </u>	ı	T	T	ı	7		
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Elevation (NVGD)	E	Jud Jud			ठे	part		2	
ation	Bottom) coc			sten	l m		e O	
Elevi		Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
	<u> </u>		SILT			20	1 -	1 0	
			314	Black	(0084	fere			S-07D-C007-016-0 PCBO
				*******	** Shinks (State Supply Common		-	-	- PCBO
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			5m104	GMD.	for	fin			S-02D-0002-04-0
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MI	· WYV CV	male et.,		W.					
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Sistion ID: COPT-COT-COT-COT-OLD Time On Station: Core Sample ID SOTT SWITE Logged by: Collection Mechanism: Push Core Push	Battelle The Business of Innovation	Client:	Bedford, MA USACE NAE				Vesse ef Scientis	el: R/V Gale Force st:
Logged by: Collection Mechanism: Push-Core GPS Accuracy: Date: Predicted Tide (ft): Time of Collection: Time of Collections for Determination of Z* Elevation (G) Elevation of the bottom of the core (NVGD): E - F (H) Elevation of visual transition (NVGD): H + (distance to visual transition) (I) Elevation of the sediment-water interface as measured from bottom of core (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) Surveyed elevation (P): Calculations for Determination of Z* Elevation (G) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D (I ₂) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample)		-						
Collection Mechanism: Push-Core GPS Accuracy: Date: Predicted Tide (ft): Time of Collection: Time of Collection of Water Surface (NVGD): E - F (H) Elevation of the bottom of the core (NVGD): H + (distance to visual transition) (I) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) Ges Accuracy: 2.1.3 Water surface to top of handle (C): 1. 9 Water surface to top of handle (C): 1. 9 / O Water surface to top of handle (C): / O Water surface from bottom) (D): Water surface from surveyed elevation (NVGD 29) (E): Water surface from surveyed elevation (F): O 338	1 5071							
Predicted Tide (ft): Time of Collection: Time of Collection: Time Depart Station: Calculations for Determination of Z' Elevation (G) Elevation of Water Surface (NVGD): E - F (H) Elevation of the bottom of the core (NVGD): G - (B - C) (Z') Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note If I ≠ I ₂ within ± 1.0 feet, discard and resample) (G) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note If I ≠ I ₂ within ± 1.0 feet, discard and resample) (G) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note If I ≠ I ₂ within ± 1.0 feet, discard and resample)	Logged by:			•				
Time of Collection: Time Depart Station: Calculations for Determination of Z* Elevation (G) Elevation of Water Surface (NVGD): E - F (H) Elevation of the bottom of the core (NVGD): G - (B - C) (z*) Elevation of visual transition (NVGD): H + (distance to visual transition) (I) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D (I ₂) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (G) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (G) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (G) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (G) Elevation of Water Surface from surveyed elevation (F): Water surface from surveyed elevation (F):				-		3	-	
## Calculations for Determination of Z' Elevation ### Calculations for Determination of Z' Elevation ### Calculations for Determination of Z' Elevation #### Calculations for Determination of Z' Elevation ###################################		771 110-1		. ,		20		
Calculations for Determination of Z' Elevation (G) Elevation of Water Surface (NVGD): E - F (H) Elevation of the bottom of the core (NVGD): G - (B - C) (z') Elevation of visual transition (NVGD): H + (distance to visual transition) (I) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D (I ₂) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (Q) (I =					179	45		
(G) Elevation of Water Surface (NVGD): E - F (H) Elevation of the bottom of the core (NVGD): G - (B - C) (z*) Elevation of visual transition (NVGD): H + (distance to visual transition) (I) Elevation of the sediment-water interface as measured from bottom of core (NVGD): H + D (I ₂) Elevation of the sediment-water interface as measured from water depth (NVGD): G - A (Note if I ≠ I ₂ within ± 1.0 feet, discard and resample) (G) Sint Black loose fine fine fine fine fine fine fine fin								
	(H) Elevation of the book (z*) Elevation of visual (I) Elevation of the second (I ₂) Elevation of the second (Note if I ≠ I ₂ within (H = work) (H = wo	transition (NVGD): H + (didiment-water interface as diment-water interface as diment-water interface as ± 1.0 feet, discard and resample Pool SOSO	G - (B - C) stance to visual measured from measured from ample)	transition, bottom of water dep	core (NVGD):	D): H + D G - A		5-07D-1007-023-00-0 72B

	Baffelle	Location: Client:		Bedford, MA JSACE NAE			Ch	Vesse nief Scientis	l: <i>R/V Gale Force</i> t:	
Stati	on ID: COO 7-02	Coob - 02	, & .	Time On S	tation:	088			rements are ±0.1 feet	
Core	Sample ID: 5-67	-0007-028	5-00 -1	3Northing (N	NAD 83):	270970			th (A):	4.4
Logg	led by: 5 - 0 7 E	' JMF	·	Easting (N.	AD 83):	015 40		Length of p	oush core assembly (B):	8
Colle	ection Mechanism:	Push-Core		GPS Accur	racy:	<u> </u>	0	Water surf	ace to top of handle (C):	1.9
Date	: <u> </u>	11.9.0	7	Predicted 1	Tide (ft):	***************************************		Length of c	core (from bottom) (D):	1.3
				Time of Co	llection:	089		Surveyed 6	elevation (NVGD 29) (E):	
				Time Depa	rt Station:	<u> </u>	00	Water surf	ace from surveyed elevation (F):	
				Calculation	ns for Deter	mination of	Z* Eleva	tion		
(G)	Elevation of Water	Surface (NVGD)	: E-F							
(H)	Elevation of the bot	tom of the core ((NVGD): G	i - (B - C)						·····
(z*)	Elevation of visual t	ransition (NVGD)): H + (dist	ance to visu	al transition))				
(I)	Elevation of the sec	iment-water inte	erface as m	easured fror	m bottom of	core (NVGD)	: <i>H</i> + <i>D</i>			
(12)	Elevation of the sec	iment-water inte	rface as m	easured fror	n water dep	th (NVGD): 0	3 - A			
	(Note if I ≠ I ₂ within ±	1.0 feet, discard	l and resam	nple)				***************************************		
		, ,		. ,				***************************************		
	r d	e				o o				
	Elevation (NVGD)	Lithology - Include USCS code				Maximum particle size		7		
	Vation (N	gy - I			tency	d Wn		e Ds		
	Elevati (I.e. Bo	tholog SCS	Туре	Color	Consistency	aximı	Odor	1 0		
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	ged by:		70	JM1	040-00-		AD 83):	8154	657	Water Depth (A): Use of push core assembly (B):				
Col	lection Me	chanism:		Push-Core	<u>al </u>	_ GPS Accu	racy: 3.	16 3.	17_	Water sur	face to top of handle (C):			
Dat	te:		11/9/	A-11	9/01	_ Predicted			A		core (from bottom) (D):			
			•			Time of Co			919		elevation (NVGD 29) (E):			
						Time Depa	iri Station.		25	water sun	face from surveyed elevation (F):			
						Calculation	ns for Deter	rmination o	f Z* Elevat	ion				
(G)				ace (NVGI	•									
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(1) (1 ₂₎					terface as mo terface as mo									
(12)					rd and resam		ii water dep	tii (IVVGD).	G-A	-				
	(Note ii i	+ 12 WILI	III ± 1.0	ieei, discai	iu anu resam	ibie)								
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	Elevation (NVGD)	= H)		olude				partícle						
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	Eleva	e. B	ĺ	Lithology - Include USCS code	Туре	Color	Consistency	Maximum síze	Odor	Sample IDs	Comments			
								2 8		J 00	5-07D-007-040-00-0			
					SANAT	Black	1000	fine			7CB			
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		affelle	Ĺ	ct Name: .ocation: Client:	New E	ford Harbor Bedford, MA JSACE NAE	i	ental Monite	_	Project #: G606422 Vessel: R/V Gale Force ief Scientist:				
	Core Si	Station ID: Core Sample ID: S -076 - 007 - 035 Logged by: Collection Mechanism: Date: Push-Core 11 9				Time On S Northing (N Easting (N) GPS Accur Predicted T Time of Co Time Depa	IAD 83): AD 83): acy: fide (ft): flection:	27085 51538 3.1	3.68 3 953	Water Dep Length of p Water surf Length of o Surveyed o	push core assembly (B): face to top of handle (C): core (from bottom) (D): elevation (NVGD 29) (E): face from surveyed elevation (F):			
	(H) E (z*) E (I) E (I ₂) E	levation of W levation of the levation of vis levation of the levation of the ote if I ≠ I ₂ with	e bottom of t sual transition e sediment-v e sediment-v	he core (N n (NVGD) vater inter	NVGD): G): H + (dista face as ma face as ma	- (B - C) ance to visu easured fror easured fror	al transition, n bottom of) core (NVGE		on				
1.0		Elevation (NVGD) (I.e. Bottom = H)		Lithology - Include USCS code	Type	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments 6-070^007-038-00-			
<i>5</i> ، ه					Somethy Somethy Somethy	Brown	fim	fine			5-070-007-038-00- PCB 6 Peat 8 transition 5-070-007-038-05- Archive			
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		_		7,000										
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	File ID of d Comments		aph(s):	ot to	stort) Haw	rea + Soi	zenplec	12/6/07 Smf/aw			

Co	ore Sample ID: S		-33-w-	/2Northing (N	NAD 83):		040.0	Water Dep	Water Depth (A):				
Lo	gged by:	DIME		_ Easting (N.		81533		Length of	push core assembly (B):				
Co	ollection Mechanism:	Push-Core	Augu	GPS Accur	racy:	2.3b		Water surf	They've				
Da	ite:	1/9/3	74	_ Predicted 1	Γide (ft):			Length of	core (from bottom) (D):	1.2			
				Time of Co			58	_Surveyed	elevation (NVGD 29) (E):				
				Time Depa	rt Station:	//	06	Water surf	face from surveyed elevation (F):	J#####			
			***************************************	Calculation	ns for Dete	ermination o	f Z* Elevati	ion					
(G) Elevation of Wate	r Surface (NVGD)	: <i>E-F</i>					***************************************					
(H) Elevation of the b	ottom of the core	(NVGD): G	- (B - C)				***************************************					
(Z*	*) Elevation of visua	transition (NVGE)): H + (dist	ance to visu	al transitior	7)				***			
(1)	Elevation of the se	ediment-water inte	rface as m	easured fror	n bottom of	f core (NVGE)): H + D						
(12) Elevation of the se	ediment-water inte	rface as m	easured fror	n water de	oth (NVGD):	G - A						
	(Note if I ≠ I ₂ within	± 1.0 feet, discard	and resam	nple)						-			
	-			·	·		4						
	(GD)	epn				9							
] 3	Lithology - Include USCS code			5	Maximum particle		s ₂					
	vation (N	logy S coc			Consistency	l mm		Sample IDs					
	(F.e.		Туре	Color	Cons	Maxi	Odor	Samp	Comments				
			Or Danie	BUSTY	im	Like 6			5-07D-NUS-33	-00-			
_	Wante Wante		organiza ul sona	Sugar	12 -	timed	**************************************		5-07D-NWS-33 PLB				
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Batte The Business of		Location Clien		Bedford, M. USACE NA			CI	Vesse nief Scientis	el: R/V Gale Force st:
Station ID:		07-NWS	5-34	Time On S	Station:		D		rements are ±0.1 feet
Core Sample	ID: 5-0	75-07-NWS	-34-00	(I	NAD 83):	270	8923.	3_Water Dep	oth (A):
Logged by:	U	JMF JMF		Easting (N	IAD 83):	8123		Length of p	push core assembly (8):
Collection Me	echanism:	Push-Core	Augan	GPS Accu	racy:	2.3	2	Water surf	face to top of handle (C):
Date:			101-9	Predicted	Tide (ft):			Length of d	core (from bottom) (D):
		. ,		Time of Co	ollection:	11	5	Surveyed	elevation (NVGD 29) (E):
				Time Depa	art Station:	_///	8	Water surf	ace from surveyed elevation (F):
	***************************************			Calculatio	ns for Dete	ermination o	f Z* Elevai	tion	
		ter Surface (NVGI		. (5. 6)				***************************************	
		bottom of the core							
(z*) Elevat	ion of visu	ial transition (NVG	D): H + (dis	tance to visu	ial transitioi	7)			
		sediment-water in				•	,		
(12) Elevat	ion of the	sediment-water in	terface as m	neasured fro	m water de	pth (NVGD):	G - A		
(Note if	l ≠ l ₂ withi	n ± 1.0 feet, disca	rd and resar	mple)					
		<u> </u>						T	
Elevation (NVGD)	= H	Lithology - Include USCS code				Maximum particle size			
N) u	Ę	- In			ncy	n pa	_	Ds	
vatio	Bottom	olog)	l w	5	Consistency	imur		Sample IDs	
ᆲ	(-) (-)	Lift Lift	Type	Color	S	Max	Odor	Sam	Comments
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			All Aller	Brens					RCB Hamologue
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Baffelle	Location	: New E	ford Harbor Bedford, MA	1	entai Monito	_		R/V Gale Force	
·	Client	: (JSACE NAE		A 54 1-7	Ch	ief Scientist:		
Station ID: Core Sample ID: 54071	307-010 Delasa-110	1 ^/- ^	Time On S		0953	17 €	***************************************	ments are ±0.1 feet	4/6 4.3
ogged by:	MW	<u> </u>	Easting (N		8/5 20	: 7.5 : 3.5	Water Depth	(A): sh core assembly (B):	Ý. ()
Collection Mechanism:	Push-Core		GPS Accur		a.3	<u> </u>		te to top of handle (C) :	2.1
pate:	11/14/0	7	Predicted 1	•		***************************************	nionia.	re (from bottom) (D):	0.6
-		***************************************	Time of Co		1028	3	_	vation (NVGD 29) (E):	V
			Time Depa		1031			e from surveyed elevation	(F):
								-	
G) Elevation of Water H) Elevation of the bot 2*) Elevation of visual t C) Elevation of the sec 2) Elevation of the sec (Note if I ≠ I₂ within ±	tom of the core ransition (NVGI timent-water intelliment-water intelliment	(NVGD): G D): H + (dist erface as me erface as me	i - (B - C) ance to visu easured fron easured fron	<i>al transition</i> n bottom of	core (NVGD): H + D			
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Commer	nts
0.0-		5 and gravel	groze	1000	fine toge			S-070-CO	007-010-00 BO TOP.S 1007-810-0
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iicino.			pled on	1 1.		Land			1

	of Innovation	Client 1 - C066 - C		Time On Sta	ation:	19	28	ef Scientis All measu	rements are ±0.1 feet
	e ID: S- 2	78 - (007 - (7P			AD 83): D 83): acy: de (ft): ection:	270851 815 41 3.4 	3.66 2.04 3	Water Dep Length of p Water surfa Length of c	~ 1
						mination of	Z* Elevati	on	
(H) Eleva (z*) Eleva (I) Eleva (I ₂) Eleva	ation of the bation of visual ation of the sation of the sation of the s	er Surface (NVGE pottom of the core al transition (NVG sediment-water int sediment-water int a ± 1.0 feet, discar	(NVGD): G · D): H + (distated as medical earning as medical earning as medical earning earning as medical earning earn	nce to visua asured from asured from	n bottom of	core (NVGD			
Flavation ANGD)	(i.e. Bottom = H)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Comments
			515	Black	10050	fine	H ₂ S		S-07D-C007-039-
			Sandus	Brown	firm	fire	HzS	on of working and position of the services	S-07D-COU7-039.
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File ID of digi Comments:		ph(s):	<1; - h+	Shara	n sor	Loco of	دمرا		
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Battelle The Business of Innovation	Спепт	: (Bedford, MA JSACE NAE	<u> </u>		Ch	ief Scientis	el: <i>R/V Gale Force</i> et:		
Station ID:	C007-				119	10	All measu	rements are ±0.1 feet		
Core Sample ID: S -	13 - CO07 - C	30W-00-	√ orthing (N	NAD 83):	2708		Water Dep	oth (A):		
Logged by:	JW JMF	•	_ Easting (N.	AD 83):	815	<u> 363.1</u>	Length of p	Length of push core assembly (B):		
Collection Mechanism:	— - Push-Core*	Augen	_ GPS Accur	acy:	2.43		Water surf	Water surface to top of handle (C):		
Date:	11/9/07		_ Predicted 1	Γíde (ft):	-		Length of o	core (from bottom) (D):	1.0	
			Time of Co	llection:	1	144	Surveyed	elevation (NVGD 29) (E):		
			Time Depa	rt Station:	1	147	Water surf	ace from surveyed elevation (F)	*	
			Calculation	ns for Dete	ermination o	f Z* Elevat	ion			
(G) Elevation of Wa	ater Surface (NVGD): <i>E-F</i>					***************************************			
(H) Elevation of the	bottom of the core	(NVGD): <i>G</i>	- (B - C)							
(z*) Elevation of vis	ual transition (NVG	0): H + (dist	ance to visu	al transitio	n)		***************************************			
(I) Elevation of the	sediment-water inte	erface as m	easured fror	n bottom o	f core (NVGI	D): <i>H + D</i>				
(12) Elevation of the	sediment-water inte	erface as me	easured fron	n water de _l	oth (NVGD):	G - A				
(Note if I ≠ I ₂ with	in ± 1.0 feet, discard	d and resam	ıple)							
			1							
(GD)	nde				ele Gle					
4	Lithology - Include USCS code			ıcy	particle		S			
vation (N	S co			Consistency	Maximum síze		Sample IDs			
Eley (1.e.	Litho	Туре	Color	Cons	Maxi	Odor	Sam	Comments		
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			-	fin	fire.] .		5-040-C007	1-030W-	
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		1/82.	H2S,	sont.		~ ~ *		121	CIVE JULY	

Battelle The Business of Innovation	Project Name: Location: Client:	New E	ord Harbor Bedford, MA ISACE NAE	i	ental Monito	_	-	: <i>G606422</i> I: <i>R/V Gale Force</i> t:		
Station ID:	C007-0	33	Time On St	tation:	1129		All measu	rements are ±0.1 feet		
	-070-C007-033	-00-1				14.23		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	3.3	
Logged by:	mw		Easting (NA					ush core assembly (B):	8.0	
Collection Mechanism:	Push-Core		GPS Accur	acy:	2.84		- Water surfa	ace to top of handle (C):	3.6	
Date:	11/12/07	•	 Predicted T	Predicted Tide (ft):		- Length of c	Length of core (from bottom) (D):			
			Time of Co	llection:	1133		- Surveyed e	levation (NVGD 29) (E):		
			Time Depart Station: (1 40				-	ace from surveyed elevation	(F):	
 (H) Elevation of the (Z*) Elevation of vis (I) Elevation of the (I) Elevation of the 	ter Surface (NVGD): bottom of the core (Nual transition (NVGD) sediment-water inter sediment-water inter in ± 1.0 feet, discard	E - F NVGD): G : H + (distantantantantantantantantantantantantant	- (B - C) ance to visual easured from easured from	a <i>l transition</i> n bottom of	core (NVGE): H + D	on			
Elevation (NVGD)	Lithology - Include USCS code	silf which was to be a started to the started to th	Black Oliva	Consistency	Maximum particle size	^{bo} ₀	Sample IDs	R	17-1033-01 13 ©	
-	e	Sand	Bio					S-07D-CQ Archim	197-1833-1	
10 4 45-3-1-3		1								
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Battelle The Business of Innovation	Project Name: Location: Client:	New B	ord Harbor E edford, MA SACE NAE	Environme	ntal Monito		•	G606422 : R/V Gale Force :		- The state of the
Station ID:	CUU7 - 06	2	Time On Sta	ation:	084	2	All measure	ements are ±0.1 feet		
	70-6007-0	62-00-	Northing (N/	AD 83):	2708	65.1	Water Deptl	n (A):	4.5	ĺ
Logged by:	NW		Easting (NA		8155	65.6	_ _Length of ρι	ish core assembly (B):	8.0	ĺ
Collection Mechanism:	Push-Core		GPS Accura	icy:	2-9	Ч	Water surfa	ce to top of handle (C):	<u> 2.3</u>	l
Date:		x 7	- Predicted Ti	de (ft):			_ Length of co	ore (from bottom) (D):	0.9	ĺ
.			- Time of Call	ection:	0850	>	Surveyed el	evation (NVGD 29) (E):		į
			Time Depart	Station:	085	Ì	Water surfa	ce from surveyed elevation	(F):	
			Calculation	s for Deter	mination of	Z* Elevati	on			
(G) Elevation of Wate	er Surface (NVGD)): <i>E-F</i>								
H) Elevation of the b	oottom of the core	(NVGD): G	- (B - C)							
z*) Elevation of visua	al transition (NVGE)): H + (dista	ance to visua	al transition!)					
,	sediment-water inte). H + D				
	sediment-water inte sediment-water inte						***************************************			
				i water depi	iii (i vv GD). i	3 - A				
(Note if I ≠ I ₂ within	1 ± 1.0 feet, discard	d and resam	ple)							
		1								
(GD)	Inde				ticle					
N) E	He He			бу	par		S			
Elevation (NVGD)	Lithology - Include USCS code			Consistency	Maximum particle size		Sample IDs			
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Battelle Business of Innovation	Project Name Location	: New I	Bedford, MA	l	ental Monit		Vesse	: G606422 I: R/V Gale Force		
-	Client		USACE NAE		4 54		ief Scientis			4
tation ID:		<u>55 </u>	Time On S		08			rements are ±0.1 feet	1 7	-
ore Sample ID: 5	WW.	- 00 - h.:		·	37083	307 / 17	Water Dep		6.3	-
ogged by:	······································		Easting (N/		8154 4.			ush core assembly (B):	9.0	-
ollection Mechanism: _ ate:	Push-Core	2	GPS Accur	•		ru		ace to top of handle (C):		-
ate.		7	Predicted T		090	.4		ore (from bottom) (D):	1.5	-
			Time of Co		***************************************			levation (NVGD 29) (E):	_	-
			Time Depa	n Station:	010	<u> </u>	Water surfa	ace from surveyed elevation (F):	1
			Calculation	s for Dete	rmination o	f Z* Elevat	ion			1
Elevation of Water	er Surface (NVGD): <i>E-F</i>								
f) Elevation of the b	oottom of the core	(NVGD): G	i - (B - C)]
*) Elevation of visua	al transition (NVGI	D): H + (dist	ance to visu	al transition)					
Elevation of the s	ediment-water inte	erface as m	easured fron	n bottom of	core (NVGE)): H + D				1
e) Elevation of the s										1
(Note if I ≠ I ₂ within					,		***************************************			1
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Elevation (NVGD)	Lifhology - Include USCS code				icle					
N) = E0	- Inc			δ	part		l s			
vation (N	S co			Consistency	Maximum particle size		Sample IDs			
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Battelle Business of Innovation	Project Name Location Client	: New E	ford Harboi Bedford, Mi USACE NAI	4	ental Monito	J	-	#: G606422 el: R/V Gale Force st:	
ation ID:	007-049		Time On S		0913			rements are ±0.1 feet	
ore Sample ID: 5-67	0-0007-04	8-00-le	— 〗Northing (f	NAD 83):	THO83	85.1	Water Dep		5.3
ogged by:	MW		Easting (N	AD 83):	81541			push core assembly (B):	8.0
ollection Mechanism:	Push-Core		 GPS Accu	racy:	3,3		Water surf	face to top of handle (C):	1.5
ate:	11/14/0	1	Predicted	Tide (ft):			 Length of a	core (from bottom) (D):	ī.a
			Time of Co	ellection:	091	1 &	-	elevation (NVGD 29) (E):	
			Time Depa	rt Station:	092		Water surf	ace from surveyed elevation (F):
			Calculation	ns for Dete	rmination o	Z* Elevati	ion		
Elevation of Water	Surface (NVGD)): <i>E-F</i>							
() Elevation of the bo			, ,				****		
*) Elevation of visual							***************************************		
Elevation of the se					•	•			
,) Elevation of the se	diment-water inte	erface as me	easured from	n water dep	th (NVGD): i	G - A			
(Note if I ≠ I ₂ within =	: 1.0 feet, discard	d and resam	nple)				***************************************		
(GD) H)	пде				<u> </u>				
≥	Lithology - Include USCS code			25	Maximum particle size		S		
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Elev (I.e. f	Lithol	Туре	Color	Consistency	Maxir size	Odor	Sample IDs	Comment	
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Battelle The Business of Innovation	Project Name: Location: Client:	New E	ford Harbor Bedford, MA JSACE NAE	l	ental Monito		•	: <i>G606422</i> al: <i>R/V Gale Force</i> at:	
Station ID:	067-049		Time On S	tation:	0921			rements are ±0.1 feet	
Core Sample ID: 5 0 7	D-1007-04	9-00-11			27084		Water Dep		5.1
_ogged by:	MW		Easting (N	AD 83):	81546	8.1	Length of p	oush core assembly (B):	4.0
Collection Mechanism:	Push-Core		_ GPS Accur	acy:	3.9	1	Water surfa	ace to top of handle (C):	1.6
Date:	11/14/07		_ Predicted 1	Tide (ft):			Length of c	core (from bottom) (D):	1.1
			Time of Co	llection:	0930		Surveyed e	elevation (NVGD 29) (E):	
			Time Depa	rt Station:	213	<u> </u>	Water surfa	ace from surveyed elevation (F):
			Calculation	ns for Dete	rmination o	Z* Elevat	ion		
(G) Elevation of Water (H) Elevation of the bo (z*) Elevation of visual (I) Elevation of the se (I ₂) Elevation of the se (Note if I ≠ I ₂ within :	ottom of the core (transition (NVGE diment-water inte	(NVGD): G 0): H + (dista erface as me erface as me	ance to visu easured fror easured fror	n bottom of	core (NVGD				
Elevation (NVGD)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	· Commen	to.
1.1		Silt	Black	10066	Civa		0)		
0.8	Name and Address		**************************************			edireli gazzie-		5-03D-C	\$07-049-00.
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tation ID: 🛴	<u> </u>		Time On S	tation:	0926		All measu	urements are ±0.1 feet	
ore Sample ID:5-670	-	-00-1	🕺 Northing (N	NAD 83):		<u>107,5</u>	_Water Dep	pth (A):	5.3
gged by:	MW		Easting (N	AD 83):		68,1	_Length of	push core assembly (B):	8,0
ollection Mechanism:	Push-Core		GPS Accui	rácy:	3.99	<u> </u>	_Water surf	face to top of handle (C) :	1.2
ite:	11/14/0	}	Predicted 1	Tide (ft):			_Length of	core (from bottom) (D):	1.3
			Time of Co	llection:	0137		_Surveyed	elevation (NVGD 29) (E):	
			Time Depa	rt Station:	0948		_Water surf	face from surveyed elevation (F):
G) Elevation of Wate H) Elevation of the be P) Elevation of visua Elevation of the se (Note if I ≠ I₂ within	ottom of the core transition (NVG ediment-water integrater integrater)	(NVGD): 0 D): H + (dist terface as m terface as m	G - (B - C) tance to visu leasured fron	<i>al transition</i> m bottom of	core (NVGD	i): H + D			
Elevation (NVGD) (i.e. Bottom = H)	Lithology - Include USCS code	Туре	Color	Consistency	Maximum particle size	Odor	Sample IDs	Commen	ts
1.2		5.1	Black	1008	E.M.			0 275 650	2 N/O 5 . 0
0.8		and the second						2-010-600	7-044-00P
		P3 /	ord gray	CITAL	Fine			S-070-coo?	$\mathcal{B}_{\mathbb{Q}}$
		CIMY	3 2						
0.0-								S-07D-C00	7-049-0
								Archi	retroven
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						-			
					are military				
of digital photograph	(s):			***************************************					
				1-1-	Ther law				
nents:	and to	uhe	1.1 17	1 1 10 -1	/ 1 Mar / 1 Mar /	2 2			
nents:	aved ts	aganp	led 12	1110+	SMF/mi	O .			

Page ____ of ___

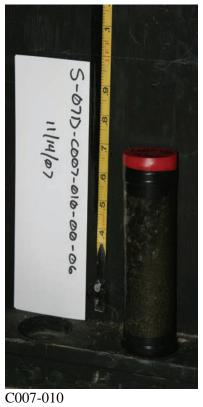
	The)	Batte Business of			roject Nam Locatio Clien	n: <i>New l</i>	ford Harbo Bedford, M. USACE NA	A	ental Monito	_	-	: G606422 I: R/V Gale Force I:	
	Stat	ion ID:			NWS	-39	Time On S		113	5	All measu	rements are ±0.1 feet	
	Core	e Sample	ID:	<u>s</u> -	07D-	NW3-39-	WNorthing (NAD 83):	2702	88/4, 7	_ Water Dep	th (A):	NA
	Logg	ged by:			ME/M	W	Easting (N	IAD 83):	815.5	109.2	Length of p	ush core assembly (B):	NA
	Colle	ection Me	chanis	sm:	Push-Core	Agas	GPS Accu	iracy:	21	15	Water surfa	ice to top of handle (C):	NA
1	Date	e:			2/6/0	<u> </u>	Predicted	Tide (ft):			Length of c	ore (from bottom) (D):	401
							Time of Co	ollection:	_//	45	Surveyed e	levation (NVGD 29) (E):	NA
							Time Depa	art Station:	211	<i>∆</i>	Water surfa	ce from surveyed elevation	(F): <u>N P</u>
							Calculatio	ns for Dete	rmination of	f Z* Elevati	ion		
	(G)	Elevati	ion of	Water Su	rface (NVGI	D): <i>E-F</i>							
	(H)	Elevati	ion of	the botton	n of the core	e (NVGD): G	i - (B - C)						***************************************
	(z*)	Elevati	on of	visual trar	nsition (NVG	GD): H + (dist	ance to visu	ual transition	1)				
	(1)	Elevati	on of	the sedim	ent-water in	terface as m	easured fro	m bottom of	core (NVGD)): H + D			
	(12)								oth (NVGD): (-	***************************************		
	, =/								(5.5)	- /.			
		(Note if	i≠l ₂ V	vitnin ± 1.0	u feet, disca	rd and resan	nple)						
		GD)	Î		nde				e cie				
		Elevation (NVGD)	11		Lithology - Include USCS code			\ \frac{1}{2}	Maximum particle size		S		
		ation	Bottom		ogy S			Consistency	unu		Sample IDs		
		Elevi	e l		ithol JSC8	Туре	Color	Sonsi	faxin	Odor	amp	0	4-
10			\dashv		1 2 2	0 1		Junior -	≥ «		°	Commen	
						SAND W	Burn	Coase	him-	wante [®]		S-07-D-W	NS-39-1
.						org. mater	Ta)	toose	Louis	***************************************		OP.	CB* ~
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						of any	wy.					S-07D-NU OPC S-07D-NU	10-29-A
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Battelle The Business of Innovation	Location Client		edford, MA ISACE NAE				ief Scientis	el: <i>PIV Gale Force</i> st:	alija i di
Station ID:	NWS-0		Time On S			5	All measu	rements are ±0.1 feet	·
Core Sample ID: $ \mathcal{S} $ -	OD-NWS-	039-DUP	Northing (N	IAD 83):	2708	519.7	Water Dep	oth (A):	NA
Logged by:	_ JMF/MU	N	_ Easting (N/	AD 83):	8150	07.2	Length of p	oush core assembly (B):	NA
Collection Mechanism:	Push-Core	Ayer	GPS Accur	acy:	2.	15_	Water surf	ace to top of handle (C):	NA
Date:	12/6/0	7	Predicted 1	Tide (ft):			Length of d	core (from bottom) (D):	_1.01
	•		Time of Co	llection:	1/5	<u>ට</u>	Surveyed e	elevation (NVGD 29) (E):	NA
			Time Depa	rt Station:	615	72	Water surf	ace from surveyed elevation (F): NA
			Calculation	ns for Dete	ermination of	Z* Elevat	tion		
(G) Elevation of Wat	er Surface (NVGD)): <i>E-F</i>							
(H) Elevation of the	bottom of the core	(NVGD): G	- (B - C)					***************************************	
(z*) Elevation of visu	al transition (NVG	D): <i>H + (dista</i>	ance to visu	al transition	7)				
(I) Elevation of the	sediment-water int	erface as me	asured fror	n bottom of	f core (NVGD). H + D	" Mar		
(I2) Elevation of the	sediment-water int	erface as me	easured from	n water de _l	pth (NVGD):	G-A	Very		
	n ± 1.0 feet, discar				,				
(ii / F ig willin	1.5 1661, UI3641	unu resalli	P.C)						
(D)	9				<u>a</u>				
Elevation (NVGD)	Lithology - Include			5:	Maximum particle Size		,,		
otton	- /g			steno	<u> </u>		ļ Š		
e. B	tholo	Туре	Color	Consistency	axim	Odor	Sample IDs		l
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		org.	Brown	10000	fine -	_		5-070-NWS.	·039-00P
		Materia			Comp			Open	ļ
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		govel w				_		C ~ w	020 040
		SAND	guy	loose	couse			S-07D-NWS- OPCB S-07D-NWS Archive	-039007
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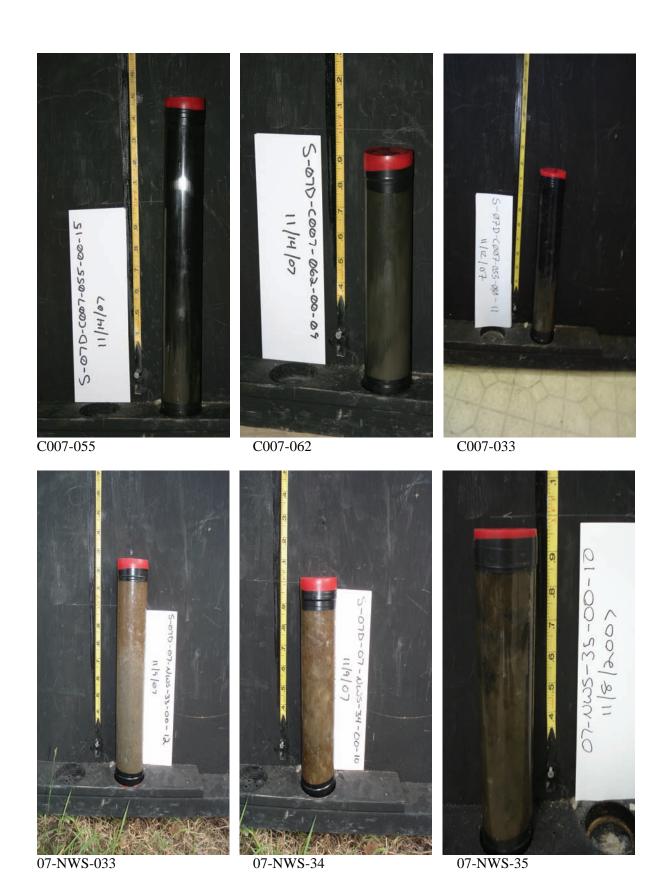
C007-016

















07-NWS-36 07-NWS-37 07-NWS-38





07-NWS-39 07-NWS-39 duplicate

Appendix B PCB Analytical Data



Station ID	07-NWS-3	5		07-NWS-3	6		07-NWS-	37		07-NWS-3	8	
Collection Date		11/	8/2007	,	11	/8/2007	,	11/	8/2007	7	11	/8/2007
Fraction	TOTAL			TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA			SA		
Samp ID		/S-35-00-05			/S-36-00-05			NS-37-00-05		-	S-38-00-05	
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
2,4'-Dicb (PCB 8)		MG/KG_DRYWT			MG/KG_DRYWT				DU		MG/KG_DRYWT	D
2,2',5-Tricb (PCB 18)		MG/KG_DRYWT				D		_	D		MG/KG_DRYWT	D
2,4,4'-Tricb (PCB 28)		MG/KG_DRYWT				D			D		MG/KG_DRYWT	D
2,2',3,5'-Tetracb (PCB 44)		MG/KG DRYWT			_	D			D		MG/KG_DRYWT	D
2,2',5,5'-Tetracb (PCB 52)		MG/KG_DRYWT			MG/KG_DRYWT	D		_	D		MG/KG_DRYWT	D
2,3',4,4'-Tetracb (PCB 66)		MG/KG_DRYWT			MG/KG_DRYWT				D		MG/KG_DRYWT	D
2,2',4,5,5'-Pentacb (PCB 101)		MG/KG_DRYWT			MG/KG_DRYWT				Dp		MG/KG_DRYWT	D
2,3,3',4,4'-Pentacb (PCB 105)		MG/KG_DRYWT				Dp			Dp		MG/KG_DRYWT	D
2,3',4,4',5-Pentacb (PCB 118)	0.0074	MG/KG_DRYWT	D	0.0078	MG/KG_DRYWT	D	0.178		D	0.01	MG/KG_DRYWT	D
2,2',3,3',4,4'-Hexacb (PCB 128)		MG/KG_DRYWT		0.00034	MG/KG_DRYWT	Dp	0.014	MG/KG_DRYWT	Dp	0.0011	MG/KG_DRYWT	D
2,2',3,4,4',5'-Hexacb (PCB 138)	0.0056	MG/KG_DRYWT	D		MG/KG_DRYWT	D	0.182		D	0.0075	MG/KG_DRYWT	D
2,2',4,4',5,5'-Hexacb (PCB 153)	0.0081	MG/KG_DRYWT	D	0.0089	MG/KG_DRYWT	D	0.216	MG/KG_DRYWT	Dp	0.011	MG/KG_DRYWT	D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.00052	MG/KG_DRYWT	Dp	0.00082	MG/KG_DRYWT	Dp			D	0.00098	MG/KG_DRYWT	D
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.0032	MG/KG_DRYWT	Dp	0.0096	MG/KG_DRYWT	Dp	0.023	MG/KG_DRYWT	D	0.0023	MG/KG_DRYWT	Dp
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.00073	MG/KG_DRYWT	D	0.0015	MG/KG_DRYWT	D	0.011	MG/KG_DRYWT	DU	0.0013	MG/KG_DRYWT	D
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.0002	MG/KG_DRYWT	DU	0.00019	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.0002	MG/KG_DRYWT	DU	0.00019	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.0002	MG/KG_DRYWT	DU	0.00019	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU
Total MonoCB												
Total DiCB												
Total TriCB												
Total TetraCB												
Total PentaCB												
Total HexaCB												
Total HeptaCB												
Total OctaCB												
Total NonaCB												
DecaCB												
Total PCB Congeners (sum CONG x												
2.6)	0.19	MG/KG_DRYWT		0.31	MG/KG_DRYWT		4.5	MG/KG_DRYWT		0.26	MG/KG_DRYWT	
Total PCB Homologues (sum HOM)												

Station ID	07-NWS-33	3	07-NWS-3	34		07-NWS-39	ı		07-NWS-3	9		
Collection Date		11/	/9/2007	,	11,	/9/2007	7	12/	6/2007	7	12/	/6/2007
Fraction	TOTAL			TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA			REP		
Samp ID		S-033-00-05			VS-034-00-05		S-07D-NWS	S-039-00-05		-	S-039-DUP-00-05	
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
2,4'-Dicb (PCB 8)	0.00063	MG/KG_DRYWT	Dp		MG/KG_DRYWT	D			DU		MG/KG_DRYWT	Dp
2,2',5-Tricb (PCB 18)	0.0024	MG/KG_DRYWT	D.	0.156	MG/KG_DRYWT	D	0.00052	MG/KG_DRYWT	Dp	0.0015	MG/KG_DRYWT	D.
2,4,4'-Tricb (PCB 28)			D	0.274	MG/KG_DRYWT	D		MG/KG_DRYWT	D.		MG/KG_DRYWT	D
2,2',3,5'-Tetracb (PCB 44)		MG/KG_DRYWT	D		MG/KG_DRYWT			_	Dp		MG/KG_DRYWT	D
2,2',5,5'-Tetracb (PCB 52)	0.0076	MG/KG_DRYWT	D	0.364	MG/KG_DRYWT	D	0.0036	MG/KG_DRYWT	Dp	0.0051	MG/KG_DRYWT	Dp
2,3',4,4'-Tetracb (PCB 66)	0.0015	MG/KG_DRYWT	D	0.225	MG/KG_DRYWT	D	0.00093	MG/KG_DRYWT	Dp	0.0017	MG/KG_DRYWT	D
2,2',4,5,5'-Pentacb (PCB 101)	0.002	MG/KG_DRYWT	D	0.372	MG/KG_DRYWT	D	0.00078	MG/KG_DRYWT	D	0.0016	MG/KG_DRYWT	D
2,3,3',4,4'-Pentacb (PCB 105)	0.0056	MG/KG_DRYWT	Dp	0.127	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	UJ	0.00036	MG/KG_DRYWT	Dp
2,3',4,4',5-Pentacb (PCB 118)	0.0032	MG/KG_DRYWT	D	0.381	MG/KG_DRYWT	D	0.0019	MG/KG_DRYWT	D	0.0028	MG/KG_DRYWT	D
2,2',3,3',4,4'-Hexacb (PCB 128)	0.0002	MG/KG_DRYWT	DU	0.058	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU
2,2',3,4,4',5'-Hexacb (PCB 138)			D		MG/KG_DRYWT		0.0013	MG/KG_DRYWT	D	0.002	MG/KG_DRYWT	D
2,2',4,4',5,5'-Hexacb (PCB 153)			D		MG/KG_DRYWT				D		MG/KG_DRYWT	D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.0002	MG/KG_DRYWT	DU	0.022	MG/KG_DRYWT	D			DU		MG/KG_DRYWT	DU
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.0002	MG/KG_DRYWT	DU	0.035	MG/KG_DRYWT	D	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.0002	MG/KG_DRYWT	DU	0.0082	MG/KG_DRYWT	DpJ	0.0003	MG/KG_DRYWT	Dp	0.00031	MG/KG_DRYWT	Dp
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.0002	MG/KG_DRYWT	DU	0.01	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.0002	MG/KG_DRYWT	DU	0.01	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.0002	MG/KG_DRYWT	DU	0.01	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU	0.0002	MG/KG_DRYWT	DU
Total MonoCB				0.042	MG/KG_DRYWT	U						
Total DiCB				0.274	MG/KG_DRYWT							
Total TriCB				1.064	MG/KG_DRYWT							
Total TetraCB				1.756	MG/KG_DRYWT							
Total PentaCB				2.188	MG/KG_DRYWT							
Total HexaCB				1.365	MG/KG_DRYWT							
Total HeptaCB				0.265	MG/KG_DRYWT	J						
Total OctaCB				0.209	MG/KG_DRYWT	U						
Total NonaCB				0.063	MG/KG_DRYWT	U						
DecaCB				0.021	MG/KG_DRYWT	DU						
Total PCB Congeners (sum CONG x												
2.6)	0.089	MG/KG_DRYWT			MG/KG_DRYWT		0.035	MG/KG_DRYWT		0.06	MG/KG_DRYWT	
Total PCB Homologues (sum HOM)				6.9	MG/KG_DRYWT							

Station ID	C007-030	Σ	C007-01	3		C007-02	3		C007-02	8		
Collection Date		11.	/8/2007	7	11/	9/2007		11/9	9/2007	7	11/	/9/2007
Fraction	TOTAL			TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA			SA		
Samp ID	_	007-030E-00-05		S-07D-C	007-016-00-05		S-07D-C	007-023-00-05		S-07D-C007-028-00-05		
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
2,4'-Dicb (PCB 8)	0.0037	MG/KG_DRYWT	D			D			D		MG/KG_DRYWT	D
2,2',5-Tricb (PCB 18)		MG/KG_DRYWT	D			D			D		MG/KG_DRYWT	D
2,4,4'-Tricb (PCB 28)			D			D			D		MG/KG_DRYWT	D
2,2',3,5'-Tetracb (PCB 44)			D			D			D		MG/KG_DRYWT	D
2,2',5,5'-Tetracb (PCB 52)	0.031	MG/KG_DRYWT	D	2.693	MG/KG_DRYWT	D			D	8.212	MG/KG_DRYWT	D
2,3',4,4'-Tetracb (PCB 66)	0.0093	MG/KG_DRYWT	D	0.423	MG/KG_DRYWT	D	0.334	MG/KG_DRYWT	D	0.111	MG/KG_DRYWT	DU
2,2',4,5,5'-Pentacb (PCB 101)	0.015	MG/KG_DRYWT	D	0.733	MG/KG_DRYWT	D	0.611	MG/KG_DRYWT	D	2.235	MG/KG_DRYWT	D
2,3,3',4,4'-Pentacb (PCB 105)	0.011	MG/KG_DRYWT	Dp	0.057	MG/KG_DRYWT	D	0.039	MG/KG_DRYWT	D	0.111	MG/KG_DRYWT	DU
2,3',4,4',5-Pentacb (PCB 118)	0.017	MG/KG_DRYWT	D	0.537	MG/KG_DRYWT	D	0.455	MG/KG_DRYWT	D	1.533	MG/KG_DRYWT	D
2,2',3,3',4,4'-Hexacb (PCB 128)	0.002	MG/KG_DRYWT	D	0.032	MG/KG_DRYWT	D	0.019	MG/KG_DRYWT	D	0.111	MG/KG_DRYWT	DU
2,2',3,4,4',5'-Hexacb (PCB 138)	0.013	MG/KG_DRYWT	D	0.407	MG/KG_DRYWT	D	0.321	MG/KG_DRYWT	D	0.955	MG/KG_DRYWT	D
2,2',4,4',5,5'-Hexacb (PCB 153)	0.02	MG/KG_DRYWT	D	0.74	MG/KG_DRYWT	D	0.608	MG/KG_DRYWT	D	2.216	MG/KG_DRYWT	D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.0016	MG/KG_DRYWT	D	0.052	MG/KG_DRYWT	D	0.034	MG/KG_DRYWT	D	0.111	MG/KG_DRYWT	DU
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.0023	MG/KG_DRYWT	D	0.069	MG/KG_DRYWT	D	0.052	MG/KG_DRYWT	D	0.111	MG/KG_DRYWT	DU
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.0019	MG/KG_DRYWT	D	0.087	MG/KG_DRYWT	D	0.066	MG/KG_DRYWT	D	0.111	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.00019	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.111	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.00019	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.111	MG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.00019	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.111	MG/KG_DRYWT	DU
Total MonoCB				0.021	MG/KG_DRYWT	J						
Total DiCB				2.024	MG/KG_DRYWT							
Total TriCB				9.87	MG/KG_DRYWT							
Total TetraCB				9.222	MG/KG_DRYWT							
Total PentaCB				5.299	MG/KG_DRYWT							
Total HexaCB				2.495	MG/KG_DRYWT							
Total HeptaCB				0.487	MG/KG_DRYWT	J						
Total OctaCB				0.124	MG/KG_DRYWT	J						
Total NonaCB				0.084	MG/KG_DRYWT	U						
DecaCB				0.028	MG/KG_DRYWT	DU						
Total PCB Congeners (sum CONG x	1											T
2.6)	0.44	MG/KG_DRYWT			MG/KG_DRYWT		23	MG/KG_DRYWT		78	MG/KG_DRYWT	
Total PCB Homologues (sum HOM)				30	MG/KG_DRYWT							T

Station ID	C007-030	W		C007-03	3		C007-039	9		C007-04	0	
Collection Date		11,	/9/2007	•	11	/9/2007	7	11	/9/2007	7	11	/9/2007
Fraction	TOTAL			TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA			SA		
Samp ID	_	07-030W-00-05			007-038-00-05			007-039-00-05		_	007-040-00-05	
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
2,4'-Dicb (PCB 8)	0.0028	MG/KG_DRYWT	D			D			D		MG/KG_DRYWT	D
2,2',5-Tricb (PCB 18)			D			D			D		MG/KG_DRYWT	D
2,4,4'-Tricb (PCB 28)	0.019	MG/KG_DRYWT	D	5.388	MG/KG_DRYWT	D	21.68	MG/KG_DRYWT	D		MG/KG_DRYWT	D
2,2',3,5'-Tetracb (PCB 44)	0.011	MG/KG_DRYWT	D			D	8.93	MG/KG_DRYWT	D		MG/KG_DRYWT	D
2,2',5,5'-Tetracb (PCB 52)	0.03	MG/KG_DRYWT	D	7.873	MG/KG_DRYWT	D	27.82	MG/KG_DRYWT	D	2.014	MG/KG_DRYWT	D
2,3',4,4'-Tetracb (PCB 66)	0.0093	MG/KG_DRYWT	D	0.107	MG/KG_DRYWT	DU	0.22	MG/KG_DRYWT	DU	0.28	MG/KG_DRYWT	D
2,2',4,5,5'-Pentacb (PCB 101)	0.013	MG/KG_DRYWT	D	1.952	MG/KG_DRYWT	D	7.341	MG/KG_DRYWT	D	0.552	MG/KG_DRYWT	D
2,3,3',4,4'-Pentacb (PCB 105)	0.0092	MG/KG_DRYWT	Dp	0.107	MG/KG_DRYWT	DU	0.22	MG/KG_DRYWT	DU	0.031	MG/KG_DRYWT	D
2,3',4,4',5-Pentacb (PCB 118)	0.017	MG/KG_DRYWT	D	1.338	MG/KG_DRYWT	D	5.175	MG/KG_DRYWT	D	0.395	MG/KG_DRYWT	D
2,2',3,3',4,4'-Hexacb (PCB 128)	0.00065	MG/KG_DRYWT	D	0.107	MG/KG_DRYWT	DU	0.22	MG/KG_DRYWT	DU	0.016	MG/KG_DRYWT	D
2,2',3,4,4',5'-Hexacb (PCB 138)	0.009	MG/KG_DRYWT	D	0.108	MG/KG_DRYWT	DU	3.809	MG/KG_DRYWT	D	0.305	MG/KG_DRYWT	D
2,2',4,4',5,5'-Hexacb (PCB 153)	0.017	MG/KG_DRYWT	D	1.929	MG/KG_DRYWT	D	8.016	MG/KG_DRYWT	D	0.557	MG/KG_DRYWT	D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.0013	MG/KG_DRYWT	D	0.107	MG/KG_DRYWT	DU	0.22	MG/KG_DRYWT	DU	0.032	MG/KG_DRYWT	D
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.002	MG/KG_DRYWT	D	0.107	MG/KG_DRYWT	DU	0.22	MG/KG_DRYWT	DU	0.046	MG/KG_DRYWT	D
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.0021	MG/KG_DRYWT	D	0.107	MG/KG_DRYWT	DU	0.22	MG/KG_DRYWT	DU	0.061	MG/KG_DRYWT	D
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.00019	MG/KG_DRYWT	DU	0.107	MG/KG_DRYWT	DU	0.22	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.00019	MG/KG_DRYWT	DU	0.107	MG/KG_DRYWT	DU	0.22	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.00019	MG/KG_DRYWT	DU	0.107	MG/KG_DRYWT	DU	0.22	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU
Total MonoCB							0.088	MG/KG_DRYWT				
Total DiCB							10.98	MG/KG_DRYWT				
Total TriCB							53.51	MG/KG_DRYWT				
Total TetraCB							49.19	MG/KG_DRYWT				
Total PentaCB							24.64	MG/KG_DRYWT				
Total HexaCB							13.87	MG/KG_DRYWT				
Total HeptaCB								MG/KG_DRYWT				
Total OctaCB								MG/KG_DRYWT				
Total NonaCB								MG/KG_DRYWT				
DecaCB							0.032	MG/KG_DRYWT	D			
Total PCB Congeners (sum CONG x												
2.6)	0.4	MG/KG_DRYWT		68	MG/KG_DRYWT			MG/KG_DRYWT		20	MG/KG_DRYWT	
Total PCB Homologues (sum HOM)							160	MG/KG_DRYWT				

Station ID	C007-03	3	C007-01	0		C007-048	.		C007-049)		
Collection Date		11/	12/2007		11/1	14/2007	•	11/1	4/2007	7	11/	14/2007
Fraction	TOTAL			TOTAL			TOTAL			TOTAL		
QC Code	SA			SA			SA			SA		
Samp ID		007-033-00-05			007-010-00-05			07-048-00-05			007-049-00-05	
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
2,4'-Dicb (PCB 8)		MG/KG_DRYWT	D			D			DU			D
2,2',5-Tricb (PCB 18)		MG/KG_DRYWT	D			D		MG/KG_DRYWT	D		_	D
2,4,4'-Tricb (PCB 28)		MG/KG_DRYWT	D		MG/KG_DRYWT				D			D
2,2',3,5'-Tetracb (PCB 44)		MG/KG_DRYWT	D		MG/KG_DRYWT			_	D		_	D
2,2',5,5'-Tetracb (PCB 52)		MG/KG_DRYWT	D		MG/KG_DRYWT			_	D		_	D
2,3',4,4'-Tetracb (PCB 66)		MG/KG_DRYWT	D		MG/KG_DRYWT				DU			D
2,2',4,5,5'-Pentacb (PCB 101)		MG/KG_DRYWT	D			D			D			D
2,3,3',4,4'-Pentacb (PCB 105)		MG/KG_DRYWT	DU			DpJ			DU			D
2,3',4,4',5-Pentacb (PCB 118)		MG/KG_DRYWT	D			D		_	DU		_	D
2,2',3,3',4,4'-Hexacb (PCB 128)		MG/KG_DRYWT	DU		MG/KG_DRYWT			_	DU		_	Dp
2,2',3,4,4',5'-Hexacb (PCB 138)		MG/KG_DRYWT	D		MG/KG_DRYWT			_	DU		_	D
2,2',4,4',5,5'-Hexacb (PCB 153)		MG/KG_DRYWT	D			D			D			D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.227	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU			DU			D
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.227	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.107	MG/KG_DRYWT	DU	0.055	MG/KG_DRYWT	D
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.227	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.107	MG/KG_DRYWT	DU	0.08	MG/KG_DRYWT	D
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.227	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.107	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.227	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.107	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.227	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU	0.107	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU
Total MonoCB												
Total DiCB												
Total TriCB												
Total TetraCB												
Total PentaCB												
Total HexaCB												
Total HeptaCB												
Total OctaCB												
Total NonaCB												
DecaCB												
Total PCB Congeners (sum CONG x												
2.6)	120	MG/KG_DRYWT		4.5	MG/KG_DRYWT		43	MG/KG_DRYWT		25	MG/KG_DRYWT	
Total PCB Homologues (sum HOM)												

Station ID	C007-049			C007-055	j		C007-062		
Collection Date		11/1	4/2007	7	11/1	4/2007	,	11	1/14/2007
Fraction	TOTAL			TOTAL			TOTAL		
QC Code	REP			SA			SA		
Samp ID	S-07D-C0	07-049-DUP-00-05		S-07D-C0	07-055-00-05		S-07D-C00	7-062-00-05	
Analyte	Result	Unit	FinQ	Result	Unit	FinQ	Result	Unit	FinQ
2,4'-Dicb (PCB 8)	0.641	MG/KG_DRYWT	D	3.9	MG/KG_DRYWT	D	0.813	MG/KG_DRYWT	D
2,2',5-Tricb (PCB 18)	1.466	MG/KG_DRYWT	D	9.534	MG/KG_DRYWT	D	1.864	MG/KG_DRYWT	D
2,4,4'-Tricb (PCB 28)	2.473	MG/KG_DRYWT	D	15.28	MG/KG_DRYWT	D	1.795	MG/KG_DRYWT	D
2,2',3,5'-Tetracb (PCB 44)	0.98	MG/KG_DRYWT	D	5.854	MG/KG_DRYWT	D	0.295	MG/KG_DRYWT	D
2,2',5,5'-Tetracb (PCB 52)	3.123	MG/KG_DRYWT	D	20.33	MG/KG_DRYWT	D	2.545	MG/KG_DRYWT	D
2,3',4,4'-Tetracb (PCB 66)	0.419	MG/KG_DRYWT	D	1.304	MG/KG_DRYWT	D	0.14	MG/KG_DRYWT	D
2,2',4,5,5'-Pentacb (PCB 101)	0.834	MG/KG_DRYWT	D	5.164	MG/KG_DRYWT	D	0.334	MG/KG_DRYWT	D
2,3,3',4,4'-Pentacb (PCB 105)	0.052	MG/KG_DRYWT	D	0.23	MG/KG_DRYWT	DU	0.0034	MG/KG_DRYWT	DpJ
2,3',4,4',5-Pentacb (PCB 118)	0.602	MG/KG_DRYWT	D	3.352	MG/KG_DRYWT	D	0.24	MG/KG_DRYWT	D
2,2',3,3',4,4'-Hexacb (PCB 128)	0.032	MG/KG_DRYWT	D	0.23	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU
2,2',3,4,4',5'-Hexacb (PCB 138)	0.446	MG/KG_DRYWT	D	2.51	MG/KG_DRYWT	D	0.167	MG/KG_DRYWT	D
2,2',4,4',5,5'-Hexacb (PCB 153)	0.844	MG/KG_DRYWT	D	5.44	MG/KG_DRYWT	D	0.447	MG/KG_DRYWT	D
2,2',3,3',4,4',5-Heptacb (PCB 170)	0.053	MG/KG_DRYWT	D	0.23	MG/KG_DRYWT	DU	0.019	MG/KG_DRYWT	D
2,2',3,4,4',5,5'-Heptacb (PCB 180)	0.083	MG/KG_DRYWT	D	0.23	MG/KG_DRYWT	DU	0.028	MG/KG_DRYWT	D
2,2',3,4',5,5',6-Heptacb (PCB 187)	0.115	MG/KG_DRYWT	D	0.23	MG/KG_DRYWT	DU	0.037	MG/KG_DRYWT	D
2,2',3,3',4,4',5,6-Octacb (PCB 195)	0.01	MG/KG_DRYWT	DU	0.23	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU
2,2',3,3',4,4',5,5',6-Nonacb (PCB 206)	0.01	MG/KG_DRYWT	DU	0.23	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU
Decacb - Congener (PCB 209)	0.01	MG/KG_DRYWT	DU	0.23	MG/KG_DRYWT	DU	0.011	MG/KG_DRYWT	DU
Total MonoCB									
Total DiCB									
Total TriCB									
Total TetraCB									
Total PentaCB									
Total HexaCB									
Total HeptaCB									
Total OctaCB									
Total NonaCB									
DecaCB									
Total PCB Congeners (sum CONG x									
2.6)	32	MG/KG_DRYWT		190	MG/KG_DRYWT		23	MG/KG_DRYWT	
Total PCB Homologues (sum HOM)									

PCB Data Qualifiers

Qualifiers:

В	Analyte concentration found in the sample at < 5 x the level detected in the procedural blank
D	Dilution run. Initial run outside linear range of instrument
E	Estimate, result is greater than the highest concentration level in the calibration
Н	Surrogate diluted out. Used when surrogate recovery is affected by excessive dilution of the sample extract
J	Analyte detected below the sample specific reporting limit
ME	Significant Matrix Interference - Estimated value
N	Quality Control value is outside the accuracy or precision data quality objective (DQO)
NA	Not applicable
Т	Holding time exceeded
U	Analyte not detected at 3:1 signal:noise ratio. Reporting limit is reported.
D	The relative percent difference (RPD) between the values obtained from the dual columns is >40%.



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Technical Memorandum

Date: June 20, 2008

To: Robert Leitch, USACE North Atlantic Division New England District

From: Deirdre Dahlen, Battelle

Subject: Sawyer Street 2007 Semi-annual Groundwater Monitoring Results

This Technical Memorandum presents a summary of the groundwater monitoring activities conducted at the Sawyer Street Confined Disposal Facility (CDF) in New Bedford, Massachusetts during the 2007 semi-annual monitoring period. The 2007 monitoring study is a continuation of a multi-year groundwater sampling program to sample six groundwater wells located at the perimeter of the CDF. Results from the monitoring study are used to assess potential trends in concentrations of polychlorinated biphenyls (PCBs as Aroclor) and selected metals (cadmium, chromium, copper, and lead) and to evaluate the integrity of the CDF. Groundwater well development and results from monitoring conducted since 2001 are presented in ENSR (2006). Results from the 2007 semi-annual monitoring study are discussed in this Technical Memorandum.

Field Activity Summary

Sampling was conducted in the early summer and fall of 2007, on June 28-29, 2007 and October 15-16, 2007. During both events, *in-situ* water quality measurements (temperature, specific conductivity, dissolved oxygen [DO], pH, Oxidative Redox Potential [ORP], turbidity), groundwater levels, and samples of groundwater were collected at six wells located at the perimeter of the CDF (Figure 1), identified as MW-1, MW-3, MW-4A, MW-5, MW-6, and MW-7A. All field measurements and groundwater collection were conducted according to the Field Sampling Plan (FSP) developed for this investigation (Battelle, 2006). Field activities are summarized briefly below.

Groundwater sampling was performed according to the procedures for Low-Flow (Low-Stress) Purging and Sampling based on EPA Region I Low Stress (flow) Purging and Sampling Groundwater Procedure for the Collection of Groundwater Samples from Monitoring Wells, Rev. 2, July 30, 1996 (EPA, 1996). A Geotech GeoPump II Peristaltic Pump was used during the June 2007 sampling event and a bladder pump (equipped with dedicated Teflon bladders) was used during the October 2007 event. Dedicated sampling tubing was used to collect groundwater samples during both events to minimize the risk of sample contamination and cross contamination between wells. Upon arrival for sample collection, the water level was measured with a cleaned water level tape and the well volume was calculated. The water level tape was cleaned between wells following decontamination procedures described in the FSP (Battelle, 2006). The pump (peristaltic or bladder) was then affixed to the dedicated tubing which was placed into the well. The well depth was measured again before purging the well to account for any water displacement from the pump. Groundwater samples for PCB Aroclor and metals analysis were collected once the well was purged and all diagnostic parameters (i.e., pH, DO, specific conductivity, turbidity, temperature, and ORP) achieved a steady state. The flow rate was verified using a graduated cylinder and timepiece and then recorded on the field log sheets.

In addition to the field samples, field and laboratory quality control (QC) samples were collected to meet measurement quality objectives defined in the FSP. During each sampling event, one field duplicate sample and one equipment blank were collected; one matrix spike/matrix spike duplicate (MS/MSD) were also collected to provide 'extra' water for the preparation of laboratory-based QC samples.





Field measurements were recorded on detailed field logs sheets that are provided as an attachment to this Technical Memorandum (Appendix A). The integrity of the groundwater samples was maintained by using cleaned, dedicated sampling tubing for each well, by not introducing contaminants into the samples during collection, by collecting the samples in clean bottles provided by the analytical laboratories, by keeping the samples cold on ice during transport to the analytical laboratories, and by analyzing the samples within the required holding time.

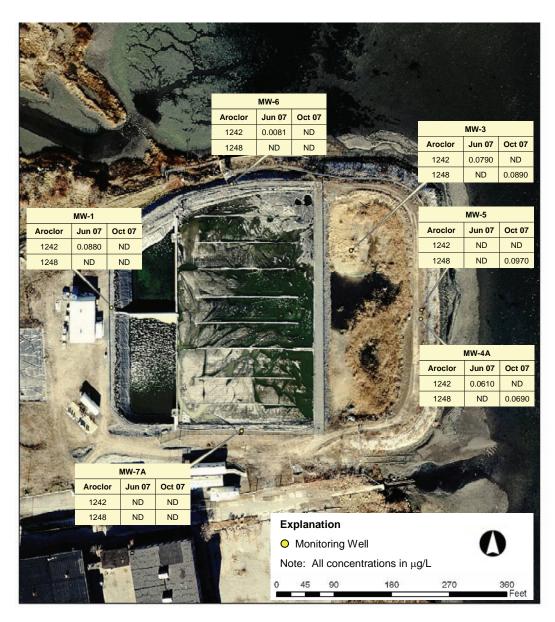


Figure 1: Sawyer Street CDF Monitoring Well Locations and PCB Aroclor 1242 and 1248 Concentrations in Groundwater





In-situ Water Quality Summary

Water quality parameters were measured during the initial pumping of groundwater from the wells before the actual groundwater sample collection. *In-situ* measurements were made using an YSI[®] multi-meter sonde and a flow-thru cell. The flow-thru cell was disconnected from the discharge line during the actual sample collection. The YSI[®] sonde was calibrated and used according to all manufacturer's specifications. Calibration records are documented on the field logs (Appendix A). Turbidity was measured using a LaMotte, 2020E turbidity meter. Once the diagnostic parameters had stabilized, sample collection was initiated. These data are summarized in Table 1.

Chemistry Water Quality Summary

The groundwater samples collected from the June and October 2007 sampling events were analyzed for PCB Aroclors and selected metals, including cadmium, chromium, copper, and lead. PCB Aroclor analysis was performed by Battelle, located in Duxbury, Massachusetts and metals analysis was performed by Battelle Marine Science Laboratory, located in Sequim, Washington. Sample results are summarized in Table 2 (PCB Aroclor) and Table 3 (metals), and are compared to the Massachusetts Contingency Plan (MCP), Method 1 category GW-3 criteria for groundwater that has a potential to discharge to a surface water body (http://www.mass.gov/dep/cleanup/laws/0974_2.htm).

Concentrations of PCB Aroclors were generally low or undetected in the groundwater samples. Aroclor 1242 was detected in 4 of the 6 wells (MW-1, MW-3, MW-4A, and MW-6) during the June 2007 event; Aroclor 1248 was detected in 3 of the 6 wells (MW-3, MW-4A, and MW-5) during the October 2007 event; and Aroclor 1260 was detected in 1 of the 6 wells (MW-7A) during the June 2007 event (Table 2). All PCB Aroclors were measured at levels below the MCP GW-3 criteria of 10 μ g/L, which is consistent with earlier monitoring events conducted from 2004 to 2006 (ENSR, 2006). The June and October 2007 sampling results for Aroclor 1242 and 1248 are shown on Figure 1. Figure 1 shows that Aroclor 1242 detections are located in the western, northern, and eastern portions of the site, whereas Aroclor 1248 detections are observed in the eastern portion of the site only. The lone Aroclor 1260 detection was observed in MW-7A, which is located in the southern portion of the site where neither Aroclor 1242 nor Aroclor 1248 was detected.

Consistent with earlier monitoring events conducted since 2001 (ENSR, 2006), metals concentrations measured in the groundwater sampled in 2007 were below the MCP GW-3 criteria (Table 3). Cadmium was detected at low concentrations (0.018 to 0.718 μ g/L) in groundwater collected at all 6 wells during the 2007 semi-annual monitoring, with the highest concentrations measured at well MW-7A. Chromium, copper, and lead were detected above the laboratory method detection limits in all the field samples. Due to the low-level background contamination (see Quality Control section), sample results for chromium, copper, and lead were "U" qualified during third party validation because the concentrations were below five times the concentrations in the equipment blanks.

Quality Control

Analytical data received third party validation and the data were qualified according to Region 1 Data Validation guidelines. Qualifiers reported on Tables 2 and 3 represent the final qualifier assigned by the data validator. Results from the field QC samples were also evaluated to assess data quality in terms of precision (field duplicate) and potential contamination (equipment blank) that may contribute to contaminant concentrations measured in the field samples, as follows.





Field Duplicates – PCB Aroclor and metals results were comparable between the original sample and the replicate sample collected at well MW-5 (June 2007 event) and at MW-4A (October 2007 event) (see Tables 2 and 3).

Equipment Blanks – PCB Aroclors were undetected in the equipment blanks, indicating that the sampling methods were free of PCB Aroclor contamination. Metals were detected in the equipment blanks (Table 3) at concentrations equal to or lower compared to earlier investigations (ENSR, 2006). Sample concentrations of cadmium were generally one order of magnitude higher compared to equipment blank concentrations, suggesting that the impact to data quality is minimal. Concentrations of chromium, copper, and lead in the groundwater samples were frequently less than five times the equipment blank concentrations, suggesting that sample concentrations for these metals may be biased high (sample values <5x equipment blank values are 'U' qualified on Table 3). While potential field contamination may have contributed to sample concentrations for chromium, copper, and lead, all metals concentrations in all of the groundwater samples are well below the MCP GW-3 criteria (Table 3).

Summary

Semi-annual monitoring was performed in 2007 at the Sawyer Street CDF as part of the ongoing groundwater monitoring program. Groundwater levels, water quality parameters, PCB Aroclor, and selected metals were monitored in all six wells at the facility. Analysis of groundwater samples indicates that although low-level detections of PCB Aroclor and metals were observed, concentrations are all below MCP GW-3 criteria. The groundwater data collected during the semi-annual monitoring suggest that the integrity of the CDF is currently maintained.

Literature Cited

Battelle, 2006. Groundwater Monitoring Final Field Sampling Plan-New Bedford, Massachusetts. Prepared by Battelle. June 2006.

ENSR, 2006. Final Sawyer Street Groundwater Report: New Bedford Harbor Superfund Site - New Bedford, Massachusetts. Prepared by ENSR Corporation. December 2006.

EPA, 1996.EPA Region I Low Stress (flow) Purging and Sampling Groundwater Procedure for the Collection of Groundwater Samples from Monitoring Wells, Rev. 2, July 30, 1996.

Massachusetts Department of Environmental Protection, 2008. MCP Method 1 Groundwater Standards. 310 CMR 40.0974(2). http://www.mass.gov/dep/cleanup/laws/0974_2.htm

Table 1: Summary of In-situ Groundwater Data Collected Immediately Prior to Sampling

	Well ID	Date/ Time	Depth to Water (ft)	pН	Spec Cond. (µS/cm)	Temp (°C)	DO (mg/L)	Turbidity (NTU)	ORP (mV)	Purge Vol. (L)	Flow Rate (mL/ min)	Color/ Odor	Draw- down* (ft)	
	June 2007 Sampling Event													
	MW-1	6/28/2007 17:55	17.7	7.19	848	18.17	2.12	5.6	-93.4	6.3	96	Clear	1.2	
	MW-3	6/28/2007 13:50	16.8	7.35	4322	15.58	0.18	7	-205.1	6.4	158	H2S Odor	1.7	
N	MW-4A	6/28/2007 10:21	12.96	7.55	4518	17.39	0.39	1.8	-285.8	2.6	50	H2S Odor	2.11	
	MW-5	6/28/2007 12:48	13.0	7.93	3370	16.59	0.23	1.2	-229.2	4.9	109	H2S Odor	2.81	
	MW-6	6/28/2007 15:46	14.95	7.54	517	15.8	0.52	2.4	-96.3	8.5	148	H2S Odor	1.55	
N	MW-7A	6/29/2007 10:18	11.55	6.67	777	14.12	1.46	0.35	183.1	5.3	113	Clear	0.2	
						Octobe	r 2007 Sampli	ng Event						
	MW-1	10/16/2007 10:11	18.7	6.63	1023	16.66	0.67	1.22	-192.5	4.6	76	H2S	2.3	
	MW-3	10/16/2007 13:33	15.6	6.86	8016	16:46	0.35	9.87	-313.3	4.1	76	Rusty brown, slight H2S	0.9	
N	MW-4A	10/15/2007 12:43	15.1	6.73	5985	16.57	0.18	3.9	-409.8	3.6	62	H2S	2.7	
	MW-5	10/15/2007 15:12	12.9	7.2	4236	16.08	0.16	6.6	-418.9	4.1	76	H2S	2.0	
	MW-6	10/16/2007 11:36	13.7	7.18	478	16.16	0.61	5.14	-270.5	3.7	89	Reddish particles	0.9	
	MW-7A	10/16/2007 15:01	11.5	6.48	850	16.6	0.44	0	26	2.4	74	Clear	0.2	

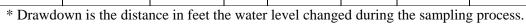






Table 2: PCB Aroclor Results from June and October 2007 Sampling Events

							Res	ult (µg/L)							
Well ID	Date	Aroclor 1016	Final Qual	Aroclor 1221	Final Qual	Aroclor 1232	Final Qual		Final Qual	Aroclor 1248	Final Qual		Final Qual		Final Qual	U
MCP GW-3 Criteria		10		10		10		10		10		10		10		
MW-1	6/28/2007	0.0061	\mathbf{U}^1	0.0033	\mathbf{U}^1	0.0071	U^1	0.0880		0.0071	U^1	0.0053	U^1	0.0043	U^1	
171 77 - 1	10/16/2007	0.0061	\mathbf{U}^1	0.0033	\mathbf{U}^1	0.0071	U^1	0.0066	U^1	0.0071	U^1	0.0053	U^1	0.0043	U^1	
MW-3	6/28/2007	0.0061	\mathbf{U}^1	0.0033	\mathbf{U}^1	0.0071	U^1	0.0790		0.0071	U^1	0.0053	U^1	0.0043	U^1	
WI W - 3	10/16/2007	0.0061	\mathbf{U}^1	0.0033	\mathbf{U}^1	0.0071	U^1	0.0066	U^1	0.0890		0.0053	U^1	0.0043	U^1	
MW-4A	6/28/2007	0.0061	\mathbf{U}^1	0.0033	\mathbf{U}^1	0.0071	U^1	0.0610		0.0071	U^1	0.0053	U^1	0.0043	U^1	
IVI W -4A	10/15/2007	0.0061	\mathbf{U}^1	0.0033	\mathbf{U}^1	0.0071	U^1	0.0066	U^1	0.0690		0.0053	U^1	0.0043	U^1	
MW-5	6/28/2007	0.0061	\mathbf{U}^1	0.0033	\mathbf{U}^1	0.0071	\mathbf{U}^1	0.0066	U^1	0.0071	U^1	0.0053	U^1	0.0043	U^1	Ĺ
IVI VV -3	10/15/2007	0.0061	\mathbf{U}^1	0.0033	\mathbf{U}^1	0.0071	\mathbf{U}^1	0.0066	U^1	0.0970		0.0053	U^1	0.0043	U^1	The E
	6/28/2007	0.0061	\mathbf{U}^1	0.0033	\mathbf{U}^1	0.0071	\mathbf{U}^1	0.0081		0.0071	U^1	0.0053	U^1	0.0043	U^1	Business (
MW-6	10/16/2007	0.0061	U^1	0.0033	\mathbf{U}^1	0.0071	\mathbf{U}^1	0.0066	U^1	0.0071	U^1	0.0053	U^1	0.0043	U^1	less c
MW-7A	6/29/2007	0.0061	U^1	0.0033	\mathbf{U}^1	0.0071	\mathbf{U}^1	0.0066	U^1	0.0071	U^1	0.0053	U^1	0.0095		s of Innova
IVI VV -/A	10/16/2007	0.0061	\mathbf{U}^1	0.0033	\mathbf{U}^1	0.0071	\mathbf{U}^1	0.0066	U^1	0.0071	U^1	0.0053	U^1	0.0043	U^1	10va
Field QC								-						_		tion
MW-4A	10/15/2007	0.0061	\mathbf{U}^1	0.0033	\mathbf{U}^1	0.0071	\mathbf{U}^1	0.0066	U^1	0.0690		0.0053	U^1	0.0043	U^1	
MW-4A REP	10/15/2007	0.0061	\mathbf{U}^1	0.0033	\mathbf{U}^1	0.0071	U^1	0.0066	U^1	0.0680		0.0053	U^1	0.0043	U^1	
MW-5	6/28/2007	0.0061	\mathbf{U}^1	0.0033	\mathbf{U}^1	0.0071	\mathbf{U}^{1}	0.0066	U^1	0.0071	U^1	0.0053	U^1	0.0043	U^1	
MW-5 REP	6/28/2007	0.0061	\mathbf{U}^1	0.0033	\mathbf{U}^1	0.0071	\mathbf{U}^{1}	0.0066	U^1	0.0071	U^1	0.0053	U^1	0.0043	U^1	
Equipment Plant	6/28/2007	0.0061	\mathbf{U}^{1}	0.0033	\mathbf{U}^1	0.0071	\mathbf{U}^{1}	0.0066	U^1	0.0071	U^1	0.0053	U^1	0.0043	U^1	
Equipment Blank	10/18/2007	0.0061	U^1	0.0033	U^1	0.0071	U^1	0.0066	U^1	0.0071	U^1	0.0053	U^1	0.0043	U^1	

Notes:

 $\stackrel{=}{}_{1}$ 'U' qualifier indicates chemical not detected at concentration above the laboratory reporting limit.







Table 3: Metals Results from June and October 2007 Sampling Events

					Result (μg/L)			
Well ID	Date	Cadmium	Final Qual	Chromium	Final Qual	Copper	Final Qual	Lead	Final Qual
MCP GW-3 Criteria		4		300		NA		10	
MW-1	6/28/2007	0.18		2.668	U^2	1.668	U^2	1.028	
IVI VV - I	10/16/2007	0.269		5.16	U^2	2.66		1.11	
MW-3	6/28/2007	0.039		3.778	U^2	3.467	U^2	0.046	U^2
IVI VV -3	10/16/2007	0.19		8.79	U^2	1.87		0.221	U^2
MW-4A	6/28/2007	0.055		4.96		4.633		0.413	
IVI VV -4A	10/15/2007	0.021		9.96		0.622	U^2	0.159	U^2
MW-5	6/28/2007	0.042		1.201	U^2	3.422	U^2	0.052	
IVI VV - 3	10/15/2007	0.028		7.73	U^2	0.653	U^2	0.123	U^2
MW-6	6/28/2007	0.079		2.505	U^2	1.752	U^2	0.292	
IVI VV -O	10/16/2007	0.033		1.83	U^2	0.707	U^2	0.102	U^2
MW-7A	6/29/2007	0.537		1.155	U^2	3.996	U^2	0.076	
IVI VV - / A	10/16/2007	0.718		3.64	U^2	5.86		0.078	U^2
Field QC									
MW-4A	10/15/2007	0.021		9.96		0.622	U^2	0.159	U^2
MW-4A REP	10/15/2007	0.018		6.4	UJ^2	0.594	U^2	0.061	U^2
MW-5	6/28/2007	0.042		1.201	U^2	3.422	U^2	0.052	
MW-5 REP	6/28/2007	0.042		1.367	U^2	2.164	U^2	0.027	UJ^2
Equipment	6/28/2007	0.0032		0.93		0.857		0.01	
Blank	10/16/2007	0.001	\mathbf{U}^1	1.79		0.293		0.0761	
Method Detection Limit		0.001		0.08		0.004		0.001	

MCP: Massachusetts Contingency Plan, Method 1 MCP GW-3 standard from 310 CMR 40.0974(2).

^{= &}lt;sup>1</sup> 'U' qualifier indicates chemical not detected at concentration above the laboratory reporting limit ² 'U' qualifier indicates chemical not detected at concentration above 5x equipment blank values

J = estimated value

Appendix A

Field Logs



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Well ID MW-4A

			Grou	ndwater	Sample (Collectio	n Record				_
Client:	USIAC				Date:le-28	9:08	Time:	Start	0908	am/pm	
Project No:	<u>GW</u>	25408						Finish	1109	am/pm	
Site Location	Ľ	New	Bedfad	<u>Hador</u>							
Weather Cor	nditions:	ONY CO	<u> </u>	***************************************	Collectors:	J. Felley	,TH	immer	S. Walt	<u> </u>]
						and the same					
1. WATER	LEVEL / WI	ELL DATA			W. W. W. W. W. W. W. W. W. W. W. W. W. W		· · · · · · · · · · · · · · · · · · ·				7
Measured		Height of		2 21		0.16 GAL/F	T (2 IN)				
	24.6'	Water Colum	nn:	13.75	•	0.65 GAL/F	, ,		Gallons (Vol	ume)	
	to top of					1.5 GAL/FT	(6 IN)	8. 33 4			
Depth to			Purged	2.55 4							
Water:	10851	from that casing	Volume:	4.334	d						_
		9,7									
	COLLECTI	ION									
Method:											
Field Equipm			A 4 - 1 -		84		0.715				
	Equipment Sorvor		Make 451		Model		Serial Numb		-		
					WOOK_		05E2		-		
	GED PUM		GROTECT		2020 I		466	11-/	-		
	CATAPAIN	<u> </u>	<u>Currect</u>	r 	44		144		-		
					*****				-	, Ind	
									10,85	with to look	_ D
Time	Tomp (9C)	Spec Cond.	DO (===/L)	-11	ODD (==\0)	Turbidity	Removed	Flow Rate	- DIAWOOMIT	1	7
(24 hr)	Temp (°C)	(µS/cm)	DO (mg/L)	pН	ORP (mV)	(NTU)	(Liters)	(mL/min)	(Feet)	Color/Odor	+
<u> 29320</u>	21-195	3 8 7 1 K f	11.17.	7.3/	-260 L	0.65	1.2	4.3	-12.95	1-2.1	١,
0946	16.4	44 66	9.09	<u> </u>	-2608	1.8	1,8	100 M		4	0
0949	16.39	4824	7.19	7.34	-766.3	1.60		125-1	1	-2.28	1.3
10/0	17.68	4746 4792	3,7% 5,4%	7.49	-2864	1.5	2.1	50 ml/Mus	T	-1.85	40
1013	17.99	T	5.0%	7.53	7283.0	 	2.25	DUALI NIN	-12-81/	1.96	1
7019	17.6	4690	4 470		72833 72898	1.9	2.4	1 11	-12-89	4-2: -2.04	1
1021	17.37	4518	4.19.	7.55 	-Z85. 8	1.8	2,55	11	12.96	-2.11	1
- 66	11:2/	73/8	1-/-/	<u> </u>	C 53. 5	* * * *	1 2000	1	12.101	400	1
										1	1
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	L	L.				1					!
Sample ID		No. Containe	ers	Container Ty	/ne	Preservation	า	Analysis Re	a.	Tìme	
	A-06280			-	Bottle		12	PCB		1022	
uu1-64	4 - 06280	7 22	(TRESPRE)							1.0	
		3/5	I TH	+	3						
<u> </u>											
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	- d2 UAL	per min	BONDANANAN	***			Committee of the	nefice to		1	
**	2 190 mlp	w BALA	11.217	7.41				124260	A sura oin 1	/	
	om al A	roph-1	495-				4	Maria	Townson	0 1007 60 M/MIN 37	
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	AHIL I	1 1 7)		 		······································	18000	1 - 1-1	<u> </u>	
Signature:	1111	4						_Date:	7/2/6	97	

Well ID MW-5

EVEL / WELL E Heigh 9.13 Water	PATA t of Column:		Date: 6/28		TH, S	Start Finish	12:40	
EVEL / WELL E Heigh 9.13 Water	ATA t of Column:	51	Collectors:		TH, S	•	12:46	am/pm
EVEL / WELL E Heigh 9.13 Water	ATA t of Column:	51	Collectors:		TH, S	<i>~</i>		
EVEL / WELL E Heigh 9.13 Water	ATA t of Column: Purged	3	Collectors:		TH, S	<i></i>		
Heigh	t of Column: Purged	9.42		0.16 GAL/F	······································			
Heigh	t of Column: Purged	9.42		0.16 GAL/F				
9.13 Water	Column:	9.42		U. IU GALI	Γ (2 IM)			***************************************
1.74	Purged	3		0.65 GAL/F		151	Gallons (Volu	umo)
***************************************	•			1.5 GAL/FT		5.712	Canona (Voic	arrio)
***************************************	•			.,,	(*)			
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OLLECTION								
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quipment	Make	-1101	Model					
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LOKUMP 4	GEOTEU	6.CODHMY	<u> </u>		466			
		······································						
							Depluto	with
1 '	i i) pH	ORP (mV)	Turbidity (NTU)	Removed (Liters)	Flow Rate (mL/min)	Drawdown (Feet)	Color/Odor
181 38	03 /67.	8 14	- 18 3.	1 2.9	: 390	130 ml/Hir	10.5	H, Sodon
17.41 29	07 13.7%	8.00	-181.1	2.4	,78	130 Mlnis	10.85	1
17.60 29	22 10.29.	7.92	-1915	2.7	1.17	130 m//m/z	11.05	
17.5 29	24 7.07	<u>٦.۶</u>	-194.4	3.0	1.80	130 m1/m	11.25	
17.54 28	99 6.19	7.91	-1946	2.5	1.95	130 m/m	11.37	4
			-197.2	2.6	2.08	130 m/ min		
	88 4.87	7.79	-199.6		2,47			
				-		1300 pi	1	
1 40			-207.7	1.5	T	130ml/200	11.9	<u> </u>
			(213.)	1.0	3.64	130 mly	12.0	
16.93 36	139 a.77.	18.5	FJ34.7	حصصحابات المتنبا	443	109 py mis	12.2	
				Preservation		etite.		Time
062807	<u> </u>			-				1215
	a	Tetion			····			
062 807- 6	<u>sp '</u>							1
		1etion	<i>.</i>	terd		EIACS	***************************************	***
	uipment 15t TH 21b. Methy EDFump F 10 Fump F 10 Fump F 11 10 29 17 12 29 17 5 29 17 54 28 17 02 29 18 30 18 30 18 30 No. C 18 30 No. C 18 30 No. C	uipment Make 15t TH Lacok 21b. Methy LAMOY DOPump II Garrau emp (°C) Spec Cond. (µS/cm) DO (mg/L 18 1 3003 167. 17.41 2907 13.79. 17.60 2922 10.39. 17.5 2924 7.07. 17.54 2897 6.17. 17.55 2924 7.07. 17.54 2897 6.17. 17.55 3988 487 18.86 3092 3.87. 18.86 3092 3.87. 18.93 3239 3.77. No. Containers OLZ 807 21 No. Containers	uipment Make 1ST TH LOOK THE SI 2Vb. Methy LAMOURE DO PRUMP IF GEDTELL GEOPH MY emp (°C) (µS/cm) DO (mg/L) pH 181 3003 167. 814 17.41 2907 13.72 8.00 17.60 2922 10.39, 3.92 17.51 2899 617. 7.8 17.54 2899 617. 7.8 17.54 2899 617. 7.9 18.65 3988 487. 7.8 18.65 3988 487. 7.8 18.61 3092 3.87. 7.8 18.70 3175 3.2 7.85 18.93 3239 2.79. 7.87 No. Containers Container T 1. Amount of the state of th	wipment Make Model 185 TH LOOP THE SI Lebore 2020 ED Plump TF GOTTELL GEORMY & IL emp (°C) (μS/cm) DO (mg/L) pH ORP (mV) 181 3003 167. 814 -183. 17.41 2907 13.77. 8 00 181.1 17.60 2922 10.29. 7.92 -191.5 17.5 2924 7.07. 7.8 -194.9 17.54 2897 6.17. 7.8 -194.6 14.02 2958 5.57. 7.78 -194.6 14.03 3030 4.37. 7.8 -207.9 16.86 3092 3.87. 7.8 -207.9 16.93 3239 2.79. 7.87 -224.2 No. Containers Container Type L. Amber 7641000	Make Mode	uipment Make Model Serial Number 15t TH Look 15t TH Look 15t Using Cose 23	Lipse Make Model Serial Number Set TH Loop Fig. 45 Lelor OSE 2392 1/6 Methy Lament 2020 4674-1103 EDPainp F Spec Cond. Gus/cm) DO (mg/L) pH ORP (mV) Turbidity Removed Flow Rate (mL/min) 181 3003 167 814 -183 2.9 390 30 m/hir 17.41 2907 12.77 8.00 -181.1 2.4 .78 130 m/hir 17.40 2922 10.37 7.92 -191.5 2.7 1.17 130 m/hir 17.5 2924 7.07 7.8 -194.9 2.5 1.95 /30 m/hir 17.5 2939 4.17 7.91 -194.6 2.5 1.95 /30 m/hir 17.5 2988 4.87 7.78 -197.2 2.6 2.08 (30 m/hir 17.87 2030 1.31 7.8 -204.2 2.7 2.14 120 m/hir 18.87 2030 1.31 7.8 -204.2 2.4 2.8 120 m/min 18.88 3092 3.87 7.8 207.9 1.5 3.25 130 m/hir 18.93 3239 2.77 7.87 -204.2 2.4 2.8 120 m/min 18.94 3078 3.87 7.8 207.9 1.5 3.25 130 m/min 18.95 3239 2.77 7.8 -204.2 2.4 2.8 120 m/min 18.96 3092 3.87 7.8 207.9 1.5 3.25 130 m/min 18.97 3.297 3.297 3.297 3.297 3.297 3.297 18.98 3092 3.87 7.8 207.9 1.5 3.25 130 m/min 18.99 3.299 2.77 7.8 -204.2 2.4 2.8 120 m/min 18.99 3.299 2.77 7.8 -204.2 2.4 2.8 120 m/min 18.99 3.299 2.77 7.8 -204.2 2.4 2.8 120 m/min 18.99 3.299 2.77 7.8 -204.2 2.4 2.8 120 m/min 18.99 3.299 2.77 7.8 -204.2 2.4 2.8 120 m/min 18.99 3.299 2.77 7.8 -204.2 2.4 2.8 120 m/min 18.99 3.299 2.77 7.8 -204.2 2.4 2.8 120 m/min 18.99 3.299 2.77 7.8 -204.2 2.4 2.8 120 m/min 18.99 3.299 2.77 7.8 -204.2 2.4 2.8 120 m/min 18.99 3.299 3.299 2.77 7.8 -204.2 2.4 2.8 120 m/min 18.99 3.299 3.299 2.77 7.8 -204.2 2.4 2.8 120 m/min 18.99 3.299 3.299 3.299 3.299 3.299 3.299 3.299 3.299 3.299 3.299 3.299 3.299 3.299 3.299 3.299 3.299 3.299	When Wake Mode Serial Number Serial

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MW-5 Well ID

Pr Si W	roject No: ite Location Veather Cor . WATER leasured]:	NGF	t ucest, b		_		Time:	Start Finish		am/pm am/pm
Si W	ite Location Veather Cor . WATER Ieasured	n: nditions:	NBi		wy	Collectors:			Finish _		am/pm
1. Me	Veather Con WATER leasured	nditions:			wy.	Collectors:					
1. M	. WATER		<u></u>	icest, b	wy/_	Collectors:					
W	leasured	LEVEL / WE									***************************************
W	leasured		ELL DATA				and the state of				
w		***************************************	Height of		**********************		0.16 GAL/F1	Γ (2 IN)		***************************************	
	/ell Deoth:		Ü	nn:		and the second second	0.65 GAL/FT		(Gallons (Volu	ıme)
De		***************************************	, rraior ooian	-		*	1.5 GAL/FT		***************************************	Sallono (1 oro	
	epth to			Purged				(=)			
1	/ater:			Volume:							
LVV	rater.	W. C. C. C. C. C. C. C. C. C. C. C. C. C.	-	volume.	480H SHAP ASSAURTON HOUSE (200 A) THE CONTRACTOR	***************************************					**************************************
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Fi	ield Equipm						and the second s				
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											#
				Guran						Deptu +	to Wester
Γ	Time (24 hr)		Spec Cond.		рН	ORP (mV)	Turbidity	Removed	Flow Rate	Drawdown	Color/Odor
\vdash		Temp (°C)	(µS/cm)	DO (mg/L)			(NTU)	(Liters)	(mL/min)	(Feet)	<u> </u>
┢	1209	16.80	3257	2:8%	790	-225-2			109 pollogia		Hz Sodor
-		16.76	3296	2.5%	7.91	-2214	1.5	4.4	109.1/mil		
L	12:12	14.59	3370	2.4%	793	-229.2	1,2	4.9	10901/MIA	12.52	
L	12:17			ļl				ļ		13.0"	at 12:48
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Well ID MW-3

			Grou	<u>undwater</u>				<u> </u>	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	**************************************	1
Client:		4LE	·····		Date:	12:54	Time:	Start		am/om	
Project No:		560642	2		(el (-10)			Finish	1420	am/pm	
Site Location	n:		<u>3H</u>	***************************************	•						
Weather Co	onditions:	overce	15t-+12C	489	Collectors:	JMF	4 TH 4	<u> SW</u>]
				-0							
4 WATER) [PT\{PT / \A/	F DATA									
	R LEVEL / W		***************************************			0.40.011.05	T (0.1N)	A		A.,	1
Measured	72 a	Height of		8.8'		0.16 GAL/F	` '	1 4/1	0.11 04.4		
weii Depiri:	23.9	Water Colur	nn:			1.5 GAL/FT	T (4 IN) =			ume)	
Depth to			Purged			1.5 GAL/FT	(0 114)	V 103 km			
Water:	15.1 fo	on tero	Volume:	6.46							
TT CACOT.	of cases		voidino.							* <u></u>	J
2. SAMPLI	E COLLECTI	ON									
Method:											
Field Equipm	ment Used:										
	Equipment		Make		Model		Serial Num	ber			
	SONDE		4SI	6	0001		05 € 2	239 Z	-		
,	TURE M	cter L	AMOTTE		2020		4074	-1103	-		
	GEOPU	110	GEOTELH		I		Ц	le le	-		***
									-	Color/Odor	down -
										water Dr	1.7'
Time.		Coop Cond	T 33		T	Turkisht.	I Damasad	I Claw Data	Reprint		7
Time (24 hr)	Temp (°C)	Spec Cond. (µS/cm)	DO (mg/E)	pH	ORP (mV)	Turbidity (NTU)	Removed (Liters)	Flow Rate (mL/min)	(Feet)	Color/Odor	
1311	IS.83	4952	7.4%	7.49	-158.6	40	0.5	148 m/ Min	 	Hos-slight	Rust coloned particles
1316	15.82	4776	6.3%	7.42	-15 9 .20		12/2			J J	pautideo
1321	15.55	4599	4.7%	7.42	770.1	19	1.9	148 ml/m	1]
1326	15.36	4462	3.47.	7.44	7180.8	13	2.6	142 m/m]
1331	15.33	4391	2.8%	7.44	- 190.1	7.6	3.3	142 mlm	16.8]
1336	15.50	4361	2.5	7.44	-197.2	5.9	4.1	156 Mai	16.8		
1341	15.36	4327	2.2	7.44	-198.9	5.1	4.9	156mla:			Osla
1344	15.45	4330	2.1	7.47	200.8	4.7	5.4	156m/ M.			157,2
1347	15.5	4319	1.9	7.38	-203.9	4.9	5.9	158 m/m			4
1350	15.58	4322	1.8	7.35	- 205.1	7.00	6.4	158 m/mi	16.8		4
<u> </u>	<u> </u>					<u></u>			end de		J
_									,	i	
Sample ID	! m Al. mara	No. Contain	ers	Container Ty		Preservation	1	Analysis Re		Time	
	-062807			1LAMbe	^	Culd		Pem		1353	~~
	5-062807			Tetlan 11 Aval	A.Sa.	Aud Cold		Meta PCB	3		-
	0658-0			Tetter		Acid		Mete	<u>J</u>		-
				I CTLEAM	-	mua		, rure	<u> </u>		٦
MW-003.			er	e vieb	, how lot	s of condu	MSOMI	en			
MW-003.	QAS		20	· Viel	ta) can			er ·			
MW - 003, . NOTES:	QAS	plit tak		r viel 8	ring to col	ued so	aplas				
MW - 003, . NOTES:	lected	plit tak		r viel 8	ring to col	ued so	aplas		1:25 pm	.	

Battelle The Business of Innovation

Well ID OOD MW-6

			Grou	undwater	Sample	Collection	n Record			
Client:	USA				Date:	6/28/20	Time:	Start	1445	am/pm
Project No:	9(100422	***************************************		•	*		Finish	1615	_am/pm
Site Location	n:	NB	1		-				•	
Weather Co	nditions:	Quan	y bus	4	Collectors:	TH, JF,	SW			
		,	J 7 " - 6							
	LEVEL / W			······································		······································				
Measured	100	Height of		- (1		0.16 GAL/F		e% e		
Well Depth:	18.9	Water Colun	nn:	5.5	-	0.65 GAL/F		0.88	_Gallons (Vo	lume)
						1.5 GAL/FT	(6 IN)	3.334		
Depth to	13.4		Purged Volume:	8.54						
Vater:	1 200		volume:	UV						
2. SAMPLI	E COLLECT	ION								
Method:										
Field Equipn	nent Used:									
	Equipment		Make		Model		Serial Numb	oer		
	SONDE		451		(000HL		05€	2392.	_	
	THRE A		LAMOTT	E	2020		4074	1-1103	- -	
	GEOPUM.	μ	Glotec	1	I		40	e le	-	
				·						1
Time	1	Spoo Cond				I Turbidity	Removed	Flow Rate	Deoth to	swakes
(24 hr)	Temp (°C)	Spec Cond. (µS/cm)	DO (mg/L)	pН	ORP (mV)	Turbidity (NTU)	(Liters)	(mL/min)	(Feet)	Color/Odor
laitia							gode annua tem 17º	140 millaria	14.8	NONE
1454	17.84	49501	19.0	7.27	53.4	19	0.7	140 ml/min	14.8	1
1457	17.64	509	12.8	7.03	52.3	1)		14001 Page		V
1504	16.71	512	9.5	7.06	23.2	9.2	2.1	146ml/HIA	15.0	
1509	16.37	512	8.2	7,16	-9,8	6.1	2.8	146 M/MI	1	
1514	1619	613	7.1	7,28	-30.5	5.7	3, 6	146 rolling	15.0	
1519	16:03	53	1,5	7.37	-41.4	6.5	4.3	146ml/wa		
1524	15-68	518	6.1	7.44	54.4	3,8	5.1	16 bollan	15.1	
1629	15.67	616	7.4	7.46	-63.8	74	6.0	166 m/m		
1634	15.60	517	6.6	7.48	74.0	4.3	6.8	166 mllar		
1534	15.47	LS17	5.7	7.50	-81.0	16.1	7,3	New milm	15.17	
)										
Sample ID		No. Containe	ers	Container Ty		Preservation		Analysis Re	q.	Time
	-042807	'		Ambu		4°±2		<u> </u>		1530
<u> </u>	· · · · · · · · · · · · · · · · · · ·			<u>I.J.La</u>	1100	N. Anc	Accor	<u>Met</u>	215	Ψ
***************************************			***************************************	¥						
NOTES:				4						
			· outs	ided for	L.L		Ř	11~		
10120.								8 35		
10120.			e much +	o ald a	ato		J/r.X	Doller 10	1.9	
			· outs	o old g	0.40		Jr. X	Dept 1	19	

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Battelle The Business of Innovation

Signature:

NW-6 Well ID

Olient:										
	***************************************				Date:			Start		am/pm
Project No:	***************************************				·			Finish	······	am/pm
Site Location				and the second s						
Weather Co	nditions:	· ····································			Collectors:			······································	,, , , , , , , , , , , , , , , , , , ,	
WATER		F1: 5474								
. WATER /leasured	LEVEL / W		·····			0.16 GAL/FT	. (O INI)			
		Height of	an.		and the second s	0.65 GAL/FT			Gallons (Volu	ıma)
теп Берит.	McMacdada and an analysis and a second	Water Colum			•	1.5 GAL/FT		<u></u>	Canons (Void	iiiio j
Depth to			Purged				(0)			
Nater:			Volume:							
2. SAMPLE	COLLECT	ON								
Method:										
Field Equipn						and the second				
	Equipment		Make		Model		Serial Number	er		
		·			Market Control of the	,,, ., ., ., ., .,	· · · · · · · · · · · · · · · · · · ·		-	
									-	
	M.		The state of the s							
	Market 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			***************************************				***************************************	-	
			 						expth to	wake
Time (24 hr)	Temp (°C)	Spec Cond. (µS/cm)	DO (mg/L)	pН	ORP (mV)	Turbidity (NTU)	Removed (Liters)	Flow Rate (mL/min)	Drawdown (Feet)	Color/Odor
1540	15.63	516	5,4	751	-87.9	8.12.1	(25mg)	148 Mlau	15.10	4
1543	15.9	517	5.1	7.53	-93.5	1.9	Lo-98.	14801 m	15.0	
1546	15.8	517	5.3	7.54	~ 96.3	2,4	2-385		,14.95	
1/10						,		/		
1713										
1.7.13										

Battelle

The Business of Innovation

Well ID MW-

Client:	11	SALE			Date:	Collection 6/23/07		Start	1440	am/nm
			7	**************************************	Duits.	<u> </u>	THE ICE	Finish		am/pm
Site Location		**************************************	BH C	bE	-			FIIII511	1003	απγμπ
Weather C			DA C	2.	Collectors:	TMIET	- Let ison	25/251	n -14 10	120/x7
Weather of	onanons.		<u> </u>	bures	Conectors.			<u> </u>	0 7H le	I-AIN I
1. WATEI	R LEVEL / W	ELL DATA								
Measured		Height of	······································			0.16 GAL/FT	 Γ (2 IN)			HANDA PARAMETER ON PHINAMETER OF THE BOOK
	: 23.9		nn:	7.4'				1 18	Gallons (Volu	ıme)
	*******************************	-		***************************************	•	1.5 GAL/FT	(6 IN)	4.482	Gallons (Volu	,
Depth to			Purged	/3 .			• ,			
Water:	16.57)	Volume:	Q 3L						
	\int_{C}	om top of	Volume: PVC Cass	W.E.						
2. SAMPL	E COLLECT	ION		9						
Method:										
Field Equip	ment Used:									
	Equipment		Make		Model	X 1	Serial Numb	· · · · · · · · · · · · · · · · · · ·		
	SONILE		451	***************************************	GOOR	· · · · · · · · · · · · · · · · · · ·	05 € 23		_	
	TURB M		LAMOT		2020	***************************************		- 1103	_	
	6,EDPUN	3 <u>P</u>	GIEB TEZH	<i>t</i>			44	<u>V</u>		
						·····				
	**************************************	**************************************	- Agrica							Alex
Time	1	Spec Cond.	7,		1	Turbidity	Removed	Flow Rate	Depth top	**************************************
(24 hr)	Temp (°C)	(µS/cm)	DO (mg/L)	pН	ORP (mV)	(NTU)	(Liters)	(mL/min)	(Feet)	Color/Odor
16.54	19.53	756	13.7	7.27	59.1	45	0.7	130	17.85 /135	RUSTY /NA
16:59	18.86	755	9.4	7.13	58.T	24	-domaga 1944 2000	130	18.25/145	RUSTY
17:04	18.51	763	8.0	9.18	58.1	16	2.1	130	18.4/2.1	Oft Som.
17:09	18.72	758	9.5%	7.21	-18.2	11	2.4	97	18.8/2.3	
17:14	19,15	479	11.2%	7.23	-51.5	12	3.1	97	18,8/23	V
17:19		773	12.27.	7.25	-62.5	12		12.97	18.7/2.2	
17:24	19,09	781	17,0	7.26	-73.u	10	4.3	112	18.7/2.2	
17:29	18.90	9 26	22.7	7.26	-834	10		 	 	
17	 								ļ	wateran and an area to be an area of the a
4.739									-	
4-34				-						
Sample ID		No. Containe	ers	Container Ty	уре	Preservation		Analysis Re	·q.	Time
***************************************									······································	A. M. A. M. L. L. M. M. M. M. M. M. M. M. M. M. M. M. M.
	Military of the same of the sa	42	rest							,
NOTES:					V ₂ .			.000	1 110	
@ S	opped ?	runsed a	151 1st	of vari	able 20	Jaluls	-ONCE	rinsed	4 451 A	(ad
at	vosphere	P ~967.	0							
	\$	* 1								
	***************************************	Ile r	*			P	***************************************		**************************************	

Well ID	M	W-)	

lient:					Date:	and the second s	Time:	Start		am/pm
oject No:					- Commission of the Commission		•	Finish		am/pm
te Location	:	****			-					
eather Cor	nditions:	**************************************		<u> </u>	Collectors:					***************************************
	LEVEL / W				······································				· · · · · · · · · · · · · · · · · · ·	
easured		Height of			, marine	-0.16 GAL/FT				
fell Depth:		Water Colun	nn:			0.65 GAL/FT	' '		_Gallons (Volu	ume)
epth to			Durgod	and the second s		1.5 GAL/FT	(6 IN)			
/ater:			Purged Volume:							
								THE STATE SALES OF THE STATE OF		
. SAMPLE	COLLECTI	ON								
lethod:										
ield Equipm	ent Used:					and the same of th				
	Equipment	***************************************	Make		Model	all the land of th	Serial Numb	er	<u></u>	
									_	
						T-100-100-100-100-100-100-100-100-100-10		***************************************	••	
									-	
						······································			_	
Time		Spec Cond.			7	Tuebiditu	Domound	Flow Data	I Drowdown	
(24 hr)	Temp (°C)	(µS/cm)	DO (mg/L)	рН	ORP (mV)	Turbidity (NTU)	Removed (Liters)	Flow Rate (mL/min)	Drawdown (Feet)	Color/Odor
17:35	20:44	842	31.57	7.26	-93.0	90	4.4	96	18.05/1.55	RUSTY
7:40	19.18	840	30.21.	7.24	- 87.7	H 5/16	3474 4.8	96	1795/1.45	clear
17:43	18.74	835	28.5/6	7.25	-86.4	13	5.1	96	17.85/1.35	clear
17:46	18.55	838	27.8%	7.23	_ 87.4	9.2	5.4	90	17.8/1.3	clear
17:49	(8.50	842	25.97.	7.22	-89.9	4.5	5 <i>6335</i> 3	96	17.75/1.25	Ctlar
17:52	18.42	844	23.6	7.21	-928	5.8	74 6.0	94	17-72/1.23	deam
17:55	18.17	848	22.5	7-19	-93,4	5.6	63	96	17.7/119	12 dear
17:5									 	
									<u> </u>	
ARWANIA	······································	<u> </u>			<u> </u>					
) I - ID				0.1.		m				- Name -
Sample ID W-001 -0	62807	No. Containe		Container Ty (L Ambu		Preservation		Analysis Re	q.	Time 17-56
11				ATEHO		Aud		metal	<	1 7 - 0
* -				400 16 710	-	muu		pun	. vedi	
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			***************************************						
IOTES:			104WL	the A	terres DE #	. A Pat	leated	butor o	fur bidit	
N	Re TO MC	Unadu	21/11/d.	SINGE	other a	en car	Leis he	cul ac	turbiditi	Ze –
	Compaci	7 20	2 2 2	was the sinte		-	at Action	~ ~ ~	Annual Control	
							/		7/2/0	

Milke

Signature:

MW-O7A Well ID

7/2/19

Date:

774

Clier	nt:		4 LE			Date:	6/29/07	Time:	Start	9:33	am/pm
Proje	ect No:	6,60	06422						Finish		am/pm
Site	Location		New 1	ed ford t	farbor (	DF"		<i>+</i>			
Wea	ther Co	nditions:	Ceci, b	12 ge		Collectors:	<u> 74/</u>	JF	······································		
Mea	sured	LEVEL/W	Height of		3.47	7	0.16 GAL/F		6		***************************************
weii	Deptn:	LL. VE	_water Colum	nn:	<u> </u>	-	1.5 GAL/FT		Z.162	Gallons (Vol	ume)
Dept	th to			Purged			1.5 GADET	(6 114)	6106		
Wate	9	1.35		Volume:	5.3L						
Meth	nod:	nent Used:  Equipment		Make 45 (		Model		Serial Numb	oer 2392	-	
		TURP N	WELV	LAMORE		2020			14-1103	_	
		GEORUM		GEDTERH		 II			4	-	
									***************************************	<u>-</u>	
1	Time 24 hr)	Temp (°C)	Spec Cond.	DO (mg/L)	рН	ORP (mV)	Turbidity (NTU)	Removed (Liters)	Flow Rate (mL/min)	Drawdown (Feet)	Color/Odor
9	:37	18 03	934	40,44,/36	4.25	114	1.9	0.4	+3° 133	11:45/0.1	clear /som
9	42	14.54	837	21.270/22	6 56	140.1	1.0	0.9	109	11.50/0.1	5 ()
9	48	14.44	777	20.4/2.08	6.62	138.2	0.8	1.5	110	11.50/01	5 11
9:	52	14.40	755	18.9/1.92	6.63	1746	0.25	2.1	113	11.50/01	- 11
9	57	14,24	741	170/1.73	6.65	192.9	0.30	2.7	113	11.55/0.2	6 //
10	:02	14.18	745	16.0/1.63	6.lele	1942	0.40	3.3	1:3	11.55 10.	
10	:07	14.14	754	15.1/1.55	4.67	185.4	0.15	3.9	113	11.5510.	
10	: 12	14.11	765	14-5/1.48	4.67	179.2	0,35	4.4	112	11.55/	
+0	-17	14.11	770	14.4/1.47	4.67	179.3	0.38	4.8	112	11.55/0	
	18	14.12	777	14.2/1.44	6.67	183.1	0.35	5.3	113	11.55/0	20 "
Sam	nple ID	NIA -17	No. Containe		Container Ty IL Amb Tulfor		Preservation 4'C Acid ite		Analysis Re PCB Me feel	<del></del>	Time / U : 2
	ES:		gin							randikalan kerdaga di 1886 alikhira kanya ya ya ya kaya kaya	

	Batt	elle
g	42	11 2

Well ID NW-4A

The Business of Innovation		L	<u> </u>	/1:								
Ground	Groundwater Sample Collection Record											

Client:	USACE	Date: / 0 / /	5 <u>/07</u>	Time: 1430	Start	1130 (am/pm
Project No:	New Bootons Harbon				Finish	<u>1320_</u> am/pm
Site Location:	Sauge Street					
Weather Cond	ditions:	Collectors:	JMF/	THH.	····	

## 1. WATER LEVEL / WELL DATA

Measured	Height of Water Column	-0.1	0.16 GAL/FT (2 IN)	
Well Depth:	정역 역 Water Column:	14.4	0.65 GAL/FT (4 IN) =	Gallons (Volume)
	-		1.5 GAL/FT (6 IN)	
Depth to Water:	Purge Volum	d according		
Water:	Volun	ne: ~ 3612 m l		
	with calsuna			
	and Carro. A			

## 2. SAMPLE COLLECTION

Method:

Field Equipment Used:

Equipment	Make	Model	Serial Number
TURB METER	- LAMONTE	2020	and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s
PUMP	aed	1.75" SAW	PRE PRO
CONTROLLER	BED	MPID	
COMPRESSOR	WELL W	FEARD 3026	
YSI		600 XUV	<b>\</b>

Time (24 hr)	Temp (°C)	Spec Cond.	DO (mg/L)	рН	ORP (mV)	Turbidity (NTU)	Volume Removed (Liters)	Flow Rate (mL/min)	Depth to Water (Feet)	Drawdown (Feet)	Color/Odor
11:54	162/0	7015	4.05	6.79	-357.6	#87 Calmin		130	13.7	1, 7	Sulve
12:02	17:03	6848	3 69	6.75	-3783	10.0		4110	14.1	2.1	Seffer
1201	17.90	6747	3.59	6.75	-399.1	k2.0			14.	2.	
12:12	17.78	1,705	0.43	6.68	-397.2	- 9.2		62	14.2	2.2	
1216	17,21	6495	0.30	6.66	-408.0	6.8		<u></u>	14.3	2.3	
1221	1703	6360	0.27	6.70	-407.8	46			14.4	2.4	
12:24	17:00	6264	0.24	6.67	-408.8	5.X		1	14.45	2.45	
12:31	17.17	6222	020	6.66	-398.9	11. Le	······································	_ <b>V</b>	14.5	2.5	
12:34	17.04	0195	0.19	6.65	-400.0	8.4	*****	V	14.6	2.6	
12:37	11.85	الع	0.18	6.67	_4024	5.3			14.65	2.65	
12:41	1664	10044	0.18	6.70	-407.3	4.2			14.7	2.7	
12:43	16:57	5985	0.18	6.73	-409.8	3.9			14.7	2.7	x Sample
									15.1	e) and of coll	oction
										<b>7</b> 3.1	

Signature:

No. Containers

Container Type
Preservation
Analysis Req.
Time
Mw. O.4A - 161507

2

G1955 (Tetlum
Cold/High
Mutuls PCB
12:45

Time
Mutuls PCB
12:45

Roll High
PCB Motals 1:00

NOTES:

Date:

Date:

Date:

collected

0

Ba	tte	lle	<b>.</b>

The Business of Innovation

Well ID MW-.5

<b></b>			Gro	undwate	r Sample	Collectio	n Record	<u> </u>			<b>-</b>	
Client:	<u> </u>				_Date:	10/15/07	_Time:	Start	<u>1405</u>	_am/pm͡>		
Project No:	Nen	) Bedfort	Hashe	<u> </u>	<del></del>			Finish	1533	am/pm	@ 62m1/m	
Site Location	n:	S_	wya S								O GZM)/M	1+/1
Weather Co	nditions:	Pall	Lloud	4~600	Collectors:	JMF/	TMH		·····		]	
		~	) breign	J								
1. WATER	R LEVEL / W	/ELL DATA										
Measured Well Depth:	19	Height of Water Colur		0 1		0.16 GAL/F 0.65 GAL/F			Gallons (Vol	lumo)	1	
well Depth.		_ water colur	HII.	-0-11-		1.5 GAL/FT			_Gallons (Vol	iume)		
Depth to Water:	19 10.º	1	Purged Volume:	~ 4071	1						Ì	
(Vator	A		voiding.		<u> </u>						1	
2. SAMPLE	E COLLECT	ION										
Method:												
Field Equipn	nent Used:											
	Equipment		Make		Model		Serial Numb	er	_			
	TURB	METER	LAM	OTE	2020			****				
-	Pump		QET		.75" 5	AMPLE	PRO		_			
(	CONTROLL		OFT	······································	MPID				_			
(	OMPRE	SSOR	WEL	L WIZZ	4RD 30				<del>-</del>			
	US F				LOOXL	<u>m</u>			<b></b>			
	· ·	The state of	4.8%	ı .		¥1.5°	T	Т	1	T	1	1
T:	3%	37,	10°1.	401	± 10 mg	10%	Volume	Elaw Data	Depth to			
Time (24 hr)	Temp (°C)	Spec Cond. (µS/cm)	DO (mg/L)	pН	ORP (mV)	Turbidity (NTU)	Removed (Liters)	Flow Rate (mL/min)	Water (Feet)	Drawdown (Feet)	Color/Odor	
1411	18.55	4420	279	7.29	-284.2	47.4		621	11.1	0,2	nulhar	
1416	7.45	4356	1,22	7.27	-259.4	44.8		80	11.4	0.5	,V	@ I west
1421	17.09	4333	0.58	7.26	-224.3	40.3		41	11.6	0.7		Sett
1426	17.12	4320	m.35	7.26	259.5	41.1		11	11.8	0.9		
1431	16.86	4323	6.23	7.75	-328,5	34.8		68	11.9	84 1F3		
1436	16.52	4320	42-00	97.25	-3622	29.0		- 1	12.1	1,2		
1441	16.60	4297	0.15	7.25	-383.4	25.0		62	12.2	1.3		
1446	16.64	4292	0.14	7.23	-393,6			776	124	1.5		
1449	16.62	4288	0.13	7,23	-403.9	17.1			12.5	1.6		-
1451	14.58	4285	6.13	7.22	-408.6	15.9	•		12.6	1.7		-
1454	14.54	4281	0.13	7.27	-412.4	14.4			12.7	1.8		-
15°0	16.49	4270	0.13	7.21	- 414.6			77/	12.7	1.8		1
1503	1636	4267 4259	6.14 6.14	7.20 7.21	-420.1 -422.8	10.5 9.43		- JF	1	19		
1506	16.30	4954	0.15	7.20	-423,0				12.8	1.9		1
1509	11 17	4239		7,20	- 426.1	7.17	***************************************		12.9	2 fr		*
1512	14.08	4236	0.1k	7.20	- 418.9				12.9		Os18 0.	4
Sample ID		No. Containe		Container Ty		Preservation		Analysis Rec		Time	2WE	\$ *
MW-005		2		GlasslTe		4°C/A4		PCB/Te	•	1 <b>5</b> 13	2,000	
2:28X ~ U.Z					x 1 (1 8 ³		7		***************************************			
											ı	
NOTES:	· Red	ared &	Laddia	***	*5	ample	Luken	toididi	dy jost o	steel of which	ı	
		aced B	J. M. C. C. S. Land			acceptor	kud w	diardew	in or	r Kick		
1	13.3	Sinul a:	ipth	7		Wo les	nu poue	meder	as st			
<u> </u>	\$	1-	1							2M1.		
Signature:	-A	for 1	カイニ					Date:	10/13	1/04		
		· · · · · · · · · · · · · · · · · · ·			***************************************							

## Battelle The Business of Innovation

Mw-JK I Well ID

Client:	USAC	٤			Date: 10	116/07	Time:	Start	0835	(am/pm	1	
Project No:	. 1	W Bod C				,	-	Finish	1030	(am/pm		
Site Location	n:	Sau	yer Son	est.	_		4					
Weather Co	nditions:	Sur	M. Clean	bush	Collectors:	SMF	TMH				]	
			)	<i>'</i>								
1. WATER	LEVEL / W	ELL DATA										
Measured	042	Height of Water Colur	· ·	7.0		0.16 GAL/F 0.65 GAL/F			Gallons (Vo	luma)		
		_				1.5 GAL/FT			_Gallons (vo	iurrie)		
Depth to Water:	17.2	Pour P	Purged	4567 m	3							
vator.	11. 4	Part Part	voiding.	10010	<u> </u>						1	
2. SAMPLE	COLLECT	ION										
Method:												
Field Equipm	nent Used:											
. ,	Equipment		Make		Model		Serial Numb	er				
₃₀ 4	TURB 1	ne Tex		NOTE	2020		. April 1980	**				J
	PUMP		OED		l.75"5+	MALE	PRO -	and the second	-			
	CONTROL	wp	aED	٨	1910.			menintary and	<del>-</del>			
(	COMPRI	SSOL	WER	L WIF	BARD	3020			-			
	1SI				Leco	KUM			_			
	×, 15 √	122	-	V/	/	·		<b>,</b>	·			-
	3/10	590	1070	1 0 %	510	10 th	Volume		Depth to			
Time (24 hr)	Temp (°C)	Spec Cond. (µS/cm)	DO (mg/L)	pН	ORP (mV)	Turbidity (NTU)	Removed (Liters)	Flow Rate (mL/min)	Water (Feet)	Drawdown (Feet)	Color/Odor	
0357	16.42	400	5.89	10.87	44.1	20.4	(Citers)	100	17.5	Diawdown (r eet)	Coloi/Cdol	*10 + 1%
0902	16.39	914	3.69	1.77	28.0	14.4		100	17.9	1-6		
0907	16.53	951	3.82	6.76	-102.0	11.9		56	18.0	1,0	Slightifuc	reduced purp franchis
b912	16.39	970	2.96	6.71	-113.6	15.9			18.2	1.8	3 33	
6917	16,20	885	1.43	667	-127.8			78	18.3	1.9		1
0922	14-39	925	1.29	6.63	-145.5	457		92	19.35	1.95	·	1
542	16.28	954	1,22	1.63	-157.1	6.04		20	18,2	1.8		1
6932	15.48	978	1.42	6.67	164.7	5.18		30	18.1	1.7		1
0937	علايها ا	947	1.51	6.69	~170,2	2.98		36	18,0	1.6		1
6942	16.62	990	1.61	4.68	-174.8	3.0		46	17.9	1,5		
0947	16.81	1000	1.59		-178.0	3.95			17.9	1.5		Sutdia
0457	14.51	1015	1,41	6,64	~1833	3.3			17.4	1.2		bottey
6957	14.49	1015	1.25	6.65	-186.9	2.4		59	17.7	1.3		
1002	16.62	1021	1.02	6,65	-189.9	1.9	*****		17.7	1, 3		- clayed
1005	16.40	1028	0,81	6.64	-192.9	1.18			18.7	2.3		Front rate
100%	16.20	1023	6.65	6.63	-193.1	.89		76	18,45	2.25		dischard to high
1011 1	المامال	1023	0.67	6.63	-192,5	1,22	ngapara di Pili Salah Salah di Makada da Pangapangan pangapan salah salah salah salah salah salah salah salah s	and the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of t	15.7	2.3		<b>)</b>
ample ID	1100	No. Containe	rs	Container Typ		Preservation	à	Analysis Req		Time		
W-34K-107	<u>wt-</u>	2		<u> </u>	elden	4°C/K	, d	PLB N	elds	1012		
MW-00	1-101607								····			
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IOTES:	4	11 1 0 1	10 1	1 0. 700	*****							
	18.6	H20 clight	Opd.	1 SOMPUR	)							
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E	Battelle	

Well ID MW-6

The Busine	ss of Innovatio	on.	_				_				_
	- A - I,	E	Gro	undwate		Collectio			2		1
ient:	USAC		·····		_Date: /	0/11/07	_Time:	Start	1045	-	
oject No:	<u>NBI</u>		٠					Finish	145	_am/pm	
te Locatio		3844	fer SI		_	-trans-					
eather Co	onditions:	Xmay	) clear		Collectors:	JMF )	_/W/-/			- 14 3 H	]
WATER	R LEVEL / W	ELL DATA								.5	
easured ell Depth:	***************************************	Height of -Water Colur	mn:	5.8	p	0.16 GAL/F 0.65 GAL/F			Gallons (Vo	lume)	
•	7WAD / 70	-	Purged			1.5 GAL/FT				iono,	
ater: /3		5	Volume:	~ 36	18m1		····	·		ALLOW NEW YORK TO THE TOTAL NAME OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PARTY OF THE PART	
0.4401		101									
SAMPLI ethod:	E COLLECT	ION									
	nent Used:										
	Equipment		Make		Model		Serial Numb	er			
	Pump		DED	1.7		npee pi			-		
	CONTRO	LLER	d	М	P10				_		
	compr	ESSOR		WELL		20 302	20		_		
	<u> 45I</u>				6001				-		
		WTER		LAMO	TE	2020			-		
	7.5	3.70	4,12	T	7	10%	I	T	T	I	
Time	350	Spec Cond.	104.	3.1	510	Turbidity	Volume Removed	Flow Rate	Depth to Water		
24 hr)	Temp (°C)	(µS/cm)	DO (mg/L)	pH	ORP (mV)	(NTU)	(Liters)	(mL/min)	(Feet)	Drawdown (Feet)	Color/Odor
<u> 2055</u>	576	484	3.58	7,19	-231.1	20,4		90	13.7	19	A 2 2 2 3
1100	15.34	477	2.03	718	-248,7	14.0		90	13.7	I fr	Reddish po
201	16.03	477	1.17	4.17	-260.7	11.6			13.7	0.9	
1110 <u> </u>	16.13	478	0.96	7.16	-267.8		,,	•	13. P	V (1	
118	16.19	478	0.87	7.16	-268,2	6.77			13.7	A 9	***************************************
121	16.20	478	0.119	7.17	-268.9	3,39		<b> </b>	13.7-	0.9	
124	16.22	478	0.73	7.18	-269.8			89	13 7	0.9	
127	16.19	478	0.69	717	7270.9			1 2 1	13.7	0.9	
130	16.22	478	ماما.٥	7.18	-269,4	5.32			13.7	0.9	
133	16.21	478	0.63	7.18	-270.7	5.32			13.7	0.9	
136	16.16	478	0.61	7.18	-270.5	4551			13.7	0.9	
										•	
				non			*				
nple ID		No. Containe	ers d	Container Ty	pe	Preservation		Analysis Red	•	Time	
	101601-					4°C/1		TPCB M	etals	1137	C 70 - 0.0
n-000°	-10/6/07	-MS/mgB_		atos G	lass/Heta	6 4t/	<u>Acii a</u>	PCB/M	tals o	2-MS/MSD : I MS/MSD f	a KBS
***************************************	·····	·	***************************************			······································	······································	······		I MS/MSD F	a Netals
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	ittelle							Well ID	<u> Mw-3</u>		-
The Busine	ess of Innovatio	on.	_				_		3hr	ter well	J
r	D 0-			undwate	r Sample				1	20.	٦
Client:		USACE			_Date: /	116/07	_Time:	Start	1240	_am/pm)	
Project No:	N	<u>BH</u>						Finish	1351	_am/pm	
Site Location	on:	<u> Sarrye</u>	n Songer			1					]
Weather Co	onditions:	SUND	y, dia	<u> </u>	Collectors:	$\underline{\mathfrak{IM}}_{f}/7$	MA		<del></del>		_
1 14/4757	3 1 EVEL ( ) N	CLL DATA									
	R LEVEL / W			~ n./		0.16 GAL/F					7
Well Depth:	23.95	_Water Colur	nn:	9.25	_	0.65 GAL/F	T (4 IN) =		_Gallons (Vo	lume)	
Depth to	15/4	4.7	Purged		4	1.5 GAL/FT	(6 IN)				
Water:	15/13	-7	Purged Volume:	4086 n	<u> </u>				·····		]
2 SAMPI	E COLLECT	ION									
Method:	L JOLLEOI	1014									
Field Equipr	ment Used:										
o.u Equipi	Equipment		Make		Model		Serial Numb	er			
	TIRA	METER		no TE	2020		- 21.00 1.00 lb	<del></del>	-		
	PUMP		QED		15" SAV		0 -	age of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of the same of			
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·	451					xim	*		•		
		·		<b>√</b>		,			-		
	37.	370	10%	401	£10	10%	Volume		Depth to		
Time (24 hr)	Temp (°C)	Spec Cond.	DO (mg/L)	pН	ORP (mV)	Turbidity (NTU)	Removed (Liters)	Flow Rate (mL/min)	Water (Feet)	Drawdown (Feet)	Color/Odor
	17.97	(µS/cm)	2.95	pn 1,94	-254.9	58.5	(Liters)	(mDmin)	15.3	A 2	ļ
1245 1250	1		V	6.89	-2633	50.5		72	15.6	0.6	Rustyl Brown
1255	17.67	4720 5224	1.56	6.85		43.7		82	15,7	1.0	31.44 316
	17.31	25 AL		6.84	<i>-283,3</i> <i>-303,</i> 9	35.7 35.7		05	15.7	1.0	31 40 34 tj
13:00	16 81	<del>- / 1 /// (</del>	0.73		314 4	26.9		92	15.7		
13:05	16.81	6143	0.512	6.85		-		1/4		49	
13:10	- V4K-1-K-4	6464	0.47	6.84	-3H.O	17.4		90	15.le	0.7	
13.15	16.62	7869	0.43	6.84	-315.3	14.9		10	15.7	1-48-	
13.20	16.63	7963	0.39	6.85	-314.5	13.1			15.6	0.4	
<u> 1325 </u>	1649	8016	0.37	6 84	-313.a	9.97		عام الم	15.6	0.9	
1330	1, 52	4011	0.35	1,85	-314.9	9.58		<b>3</b> 46	15.6	<u> </u>	
1333	16.46	9016	0.35	6.86	-313.3	9.87		- 4F	15.6	<u> </u>	
····											
	1 1				1				1		

Sample ID		lo. Containers 2	Container Type Glass Teffen	Preservation	Analysis Re	q. Time Motals 1334
NOTES:						
	( in all	K. K. W. K.	6.9			
Signature:		ai m	1,2		Date:	10/11/07
	1	//				•

	Batt	elle	
77	D:	ft e	

Well ID MW- 7A

Client:				***************************************	_Date: /	0/14/01	_Time:	Start	1415	_am/pm	
Project No:	NB		<u> </u>		-			Finish	1514	_am/pm	
Site Locatio		-Jan	LA STREST	1. ( ) 1	Collostass	ma. =	-				
Weather Co	nditions:	<u>oun</u>	y dear,	light bu	Collectors:	JMF,	THH		<u> </u>		
1. WATEF	R LEVEL / W	ELL DATA Height of		***************************************		0.16 GAL/F	T (2 IM)				
Well Depth:	148	_Water Colur	mn:	3,5	-	0.65 GAL/F 1.5 GAL/FT	T (4 IN) =		_Gallons (Vo	lume)	
Depth to Water:	11.3/	····	Purged Volume:	2442	ml						
2. SAMPLI	E COLLECT	ION									
Method:											
Field Equipr	nent Used:										
	Equipment		Make		Model		Serial Numb	oer	_		
	TURB	METE	R LA	MOTLE	2020		101	4			
	Pump		QED		75" Si	AMPLE	POD 1		<del></del>		
	CONTR		U		MPI	D	13		-		
	Compl			WIZAK		20	-		-		
	451	and the transform	weu	w-: 271 K	(200 x		<b>→</b>		-		
	734	7			LEVUX	7	<del>-</del>				
Time	3%	Spec Cond.	(A)	10 ¹	t 10	16% Turbidity	Volume Removed	Flow Rate	Depth to Water		
(24 hr)	Temp (°C)	Spec Cond. (μS/cm)	DO (mg/L)	pН	ORP (mV)	(NTU)	(Liters)	(mL/min)	(Feet)	Drawdown (Feet)	Color/
1428	17,26	932	1.05	1=51	-128,5	3 14		74	34115	44	
1432	17.31	813	0.19	6.47	-110.8	21-9	<b> </b>	1-	115	n. 2	
1437	17 23	871	0.66	6.45	-86.0	1.12		R	11.5	100	
1442	17.01	861	0.59	1 121	-60.8	0		74	1112		<del></del>
1115	16.94	854	0.54	6.44	-50.0	0		<del>                                     </del>	1110	<del>                                     </del>	
1152	11.92	953	0.49	6.45		0			11.2		
1455	10.10	452		- W /	-34.8				11.2		
	14.50		0.47	6.46	729.2	0			11.0	<u> </u>	
1458	16,65	850	0,45	6.48	27.2	<u> </u>		<u> </u>	11.5	<del>  \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \</del>	
<u> 1501</u>	16.60	850	0.44	6.48	26.0	0		<u> </u>	11.5	0.3	·
								<u> </u>		23	
										92	
		*****				····				200	
										672	
										47	
										43	
										-615	

# YSI Calibration Form Daily 2007 GW Monitoring for New Bedford Harbor – G606422

Instrument Model #		Andread Million and American	S/	'N#
Date: 10 15 20	507	Initials:	JMF /	TNH
DO membrane changed?		T1	urbidity Wiper	Mr.
Battery Voltage:		Turbidly	wiper parks 1	80° from optics?
Parameter		Initial Reading	Calibrated Reading	Calibration Data (acceptable range)
Conductivity (mS/cm)		1009	1000	Cell constant (4.55 – 5.45)
Depth (ft)				Pressure offset, vented (0 ± 6)
Turbidity (NTU) 0		Ø	<i>,</i> 65	Turbidity Offset:
Turbidity (NTU) 123 10		10	16	
D.O. (% Sat)		102.8%	100.9%	D.O. Gain (0.7 - 1.4)
pH 4	4.04	4.00		
pH 7	7.21	7.00 1		
ORP		186.6	107.1	
Comments:				

	Date:   6 16 200	14	Initials:	JMF					
	DO membrane changed?		Turbidity Wiper Changed?						
	Y (N)		YN						
			Turbidly	wiper parks 1	80° from optics?				
	Battery Voltage:		And the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second s	YN					
	Parameter		Initial Reading	Calibrated Reading	Calibration Data (acceptable range)				
١	Conductivity (mS/cm)		979	1000	Cell constant (4.55 – 5.45)				
	Depth (ft)	•••••	***************************************	Pressure offset, vented ( 0 ± 6)					
۶	Turbidity (NTU) 0	0	0	Turbidity Offset:					
	Turbidity (NTU) 123	10,28	10.00						
	D.O. (% Sat)	103.07	10170	D.O. Gain (0.7 - 1.4)					
l	pH 4	3,99	4.00						
	pH 7	PO 4	7.00						
1	ORP		108.8	1091					
	Comments:			,					

Variety S

Linete

The Business of Innovation			
Project Name:	New Bedford HAIR COR	Date:	F0/F3/3
Project Number:	6606922		

#### Water Quality Instrument Calibration Log

	Instr	rument		Calibrati	on Solution	1	Standard		Initial	Adjusted				Post-Cal	libration	
Parameter	Manufacturer	Model	S/N	Manufacturer	Lot No.	Exp. Date	Value @ 25C	Ambient Temp	Measured Value	Measured Value	Initials	Date/Time	Ambient Temp	Measured Value	Initials	Date/Time
Dissolved Oxygen	YS F	book	65EZ36	2 NA	_16482640144444400000000000000000000000000000		100%	25°C	100.47	NA	774	6/27	NA	Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the Street Control of the	ar yel consenses con the conse	Commence
pH 4	E-market			VWR	7075	1/09	4.00	Serang	4.14	4.00			-250	4,0	TH	6/27
pH 7	a violence			VWR	700	1/09	7.00		6.82	7.00			!	7.0	4	V
Conductivity			Q	0451	06CZZ39	12/07	10:00	4	SuperSfromes	manafarfarana garigina			V	50,118	TH	6/27
ORP	+	4		VWR	4275	9/00	SUB	750	497	NA	TH	4/27/12:20	I)	, and the second		
Turbidity	LAMOTTE	2020	4074-	0	When a reconstruction of the second	700.	0/1011	4 ~ 25°C	0/97	0/10	TH	UZÉ/07	254	0/10	774	6/28/07

O. O and 10 NTM they bidity standards supplied by U.S. Environmental Rental - 166/27/07
TH

(Cond = 50,000 mt = 25°c intral measured was 47,990, final 50,122 TH 6/27/07 6/27/07 TH

3 451 calibrated by US Environ me tal initially, The ORP measurement checked and was

	Battelle
The	Business of Innovati

Project Name:

6/29/67 Date:

Project Number:

## Water Quality Instrument Calibration Log

	Instrument			Calibration Solution			Standard		Initial	Adjusted			Post-Calibration			
Parameter	Manufacturer	Model	S/N	Manufacturer	Lot No.	Exp. Date	Value @ 25C	Ambient Temp	Measured Value	Measured Value	Initials	Date/Time	Ambient Temp	Measured Value	Initials	Date/Time
Dissolved Oxygen	451	600R	OSEZBIZ	NA	Carleston Color Philosophicals		100%	~25°C	99.770	NA	TH	ulm 7:12	NA			and the second second second
pH 4							4.0		4.0	NA	4	Ų	NA	. Agraeth-delthalanu		-
pH 7							7.0	Ų	7.2	7.0	774	4	250	7.01	71-1	6/29 /7:26
Conductivity (1)							500	1250 C	422	500	TH	6/29 7:40	250	500.5	774	6/29 7.4E
ORP							V W/L	THE V	4	V	V	V	-			
Turbidity							0/16	25	0/10	NA	774	Ca/29 8 13	252	10	74	8-1

10 Conduction by State 50,00 50 m3/cm, initial value 49.9 no recal performed TH 6/29/07 9:51