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U.S. Environmental Protection Agency

Sediment Sampling Summary Report – 2004 - 2005

Marsh Island

New Bedford Harbor Superfund Site –
New Bedford Massachusetts

Prepared by:

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EXECUTIVE SUMMARY

As part of the New Bedford Harbor Superfund Site remediation, remedial design plans were necessary for Marsh Island. An investigative survey was conducted in December 2004, 73 vibracore samples were collected to characterize the concentration of polychlorinated biphenyls (PCBs) in sub-tidal and inter-tidal bottom sediments and upland soils located around the perimeter of Marsh Island. Vibracore samples were collected from just above the elevation of mean higher high water (MHHW) to an elevation just below mean lower low water (MLLW). Stations were located in order to obtain data from areas not previously characterized by the historical sampling efforts. In October 2005, additional core samples were collected further upland, along the northern perimeter of Marsh Island, to further characterize the spatial extent of PCB contamination in the area. All sampled and historical stations are depicted in Figure 3.

The 2004 core samples, depending on the characteristics of each core sample, were either sectioned into discrete 6 inch sample segments beginning at the top of the core sample and working through the depth of the core, or sectioned in such a way as to capture a representative segment length that had distinct changes in sediment properties. The 12 inch core samples collected in 2005 were sub-sectioned into individual 6 inch horizons from each parent sediment core. Sections were analyzed individually for total PCB concentrations.

PCB data were compared to the USEPA criteria associated with a “beachcombing zone” in the Upper Harbor of New Bedford which sets a maximum PCB concentration of 25 mg/kg for the top 12 inch sediment horizon and 50 mg/kg for underlying sediments. The results exhibit that 22 of the 73 vibracore locations contained at least one sample segment in the top 12 inch horizon with a PCB concentration greater than 25 mg/kg with the peak concentration determined to be 676 mg/kg. While elevated PCB concentrations were generally limited to the top 12 inch sediment horizon, concentrations that exceeded 25 mg/kg were found to a depth of 23 inches and five stations contained a sample segment which exceeded 50 mg/kg in underlying sediments (Figures 8, 9 and 10). The results of the follow-up samples (12-inch push cores) collected at 27 stations in October 2005 identified 11 additional stations with PCB concentrations in excess of the 25 mg/kg criterion (Figures 8, 9 and 10).

The location and total PCB concentration for those cores with an associated sample segment having a PCB concentration greater than 25 mg/kg in the top 12 inch horizon is presented in Figure 11. Figure 12 presents those locations with either surface PCB concentrations that were greater than 25 mg/kg extending below the 12 inch horizon or those stations with isolated pockets of PCB contamination which exceed 50 mg/kg in the underlying sediment. These figures reveal that PCB contamination was more prominent along the northern shore of Marsh Island, including the tidal creek and salt marsh cove, and generally follow along the approximate elevation contour for mean higher high water (MHHW). PCB’s may have been transported from the Upper Harbor to this area due to PCB oil sheen carried on floating debris or the water surface. The distribution of PCB contamination

exhibit that the northern shore, with its sheltered location and higher organic marsh sediments, work more effectively in capturing and sequestering PCBs than the sandy western shore that is very exposed to wind waves.

The estimated remediation boundaries that would be required in order to satisfy the USEPA criteria are presented in Figure 13, which displays the boundaries encapsulating all coring stations which had an associated sample segment greater than 25 mg/kg in the top 12 inch horizon. In addition, the figure presents the boundaries which encapsulate areas which require more than the initial 12 inch excavation depth and shows those locations with either surface PCB concentrations that were greater than 25 mg/kg extending below the 12 inch horizon or those stations with isolated pockets of PCB contamination which exceeded 50 mg/kg in the underlying sediment.

Overall, the sampling in 2004 and 2005 provided good characterization of the Marsh Island area. Limited additional sampling and/or analysis of existing archived samples may be required to better define the boundaries of excavation as remediation planes are finalized (Table 6).

1.0 INTRODUCTION

This report summarizes the investigative sampling conducted in 2004 and 2005 at Marsh Island located in the Lower New Bedford Harbor. The objective of the field sampling and analyses presented herein was to support the remedial design plan for Marsh Island as part of the overall remediation of the New Bedford Harbor Superfund Site. In December 2004, core samples were collected to characterize the concentration of polychlorinated biphenyls (PCBs) in sub-tidal and inter-tidal bottom sediments and upland soils located around the perimeter of Marsh Island. Seventy three core samples were collected from just above the elevation of mean higher high water (MHHW) to an elevation just below mean lower low water (MLLW). In October 2005, additional core samples were collected further upland, along the northern perimeter of Marsh Island, to further characterize the spatial extent of PCB contamination in the area. This work was performed by ENSR and its subcontractor CR Environmental under contract to the USACE (Contract No. DACW33-00-D-0003, Task Order 0012).

1.1 Superfund Site Background

New Bedford Harbor is located approximately 50 miles south of Boston on the waters of Buzzards Bay in Bristol County, Massachusetts. The sediments in many areas of the Harbor are contaminated with PCB's and metals, primarily from the manufacture of electrical components which occurred at several areas around the Harbor between the 1940s and the mid-1970s. Based on human health concerns and ecological risk assessments, the U.S. Environmental Protection Agency (USEPA) added New Bedford Harbor to the National Priorities List in 1983 as a designated Superfund Site. A 1998 Record of Decision stipulated that remedial measures were required to remove PCB-contaminated sediments from the Harbor. Through an Interagency Agreement between the USEPA and the U.S. Army Corps of Engineers, New England District (USACE), the USACE is responsible for carrying out the design and implementation of the remedial measures.

The New Bedford Harbor Superfund Site extends from the shallow northern reaches of the Acushnet River estuary, south through the commercial harbor of New Bedford and out beyond the City's hurricane barrier into 17,000 adjacent acres of Buzzards Bay. The Superfund Site is divided into three areas: the Upper, Lower, and Outer Harbors defined by geographical features of the Harbor and gradients of sediment contamination (Figure 1). The industrial discharge of PCB contaminated waste, either directly into the Harbor or indirectly through the City's sewer system, was most significant in the Upper Harbor. The location of the associated PCB discharge and the hydrodynamics of the Harbor contributed to the deposition of significant levels of PCB contamination in the Upper Harbor. Furthermore, PCB contamination at lower levels was found in some areas of the Lower Harbor.

The highest sediment PCB concentrations or "hot-spots", which contained PCB concentrations in excess of 100,000 mg/kg, resided in the sediments located in the immediate area of one discharge in the Upper Harbor. These "hot-spot" sediments were removed between 1994 and 1995 as part of the

USEPA's first cleanup phase (USEPA, 1997). Remediation and restoration of wetland and mudflat areas in the northernmost section of the Upper Harbor were performed in 2002-2003 (Tetra Tech FW 2004). Much of the remaining sediment in the Upper Harbor, an area of approximately 190 acres, is still heavily contaminated. The long term effort to remediate this area was initiated in 2004, and continued in 2005, with the removal of a combined total of approximately 35,000 cubic yards of sediment with PCB concentrations in excess of 3,000 mg/kg (ESNR, 2005; ENSR, 2006).

1.2 Background on Marsh Island

Marsh Island is a small peninsula located on the Fairhaven side of Lower New Bedford Harbor, south of the Interstate 195 and adjacent to the Moby Dick Marina (Figure 2). The site is an undeveloped parcel covered primarily in grassy vegetation, brush and scattered clusters of trees. Two large radio transmission towers have been installed on the island. A distinct tidal creek flows into a small salt marsh that contains tidal and non-tidal wetland communities. On the northeast corner of the island, a stormwater outfall discharges into the cove. The western side of Marsh Island is a sandy beach and leads north to an exposed bedrock outcropping. In September 1999, PCB contamination was reported in the northern areas of Marsh Island (USEPA, 2003). The USEPA working with the New Bedford Harbor Trustee Council is preparing plans to remediate PCB contamination at Marsh Island and restore the structure of a natural salt marsh. Increased public access to Marsh Island is envisioned in the future as part of a New Bedford Harbor Trustee Council funded salt marsh restoration project.

1.3 Study Objective

The Marsh Island sampling program had two major goals:

- To identify and characterize the areas of PCB contamination, and
- To better define the vertical extent of PCB contamination.

2.0 METHODS

Vibracoring and push coring was performed in 2004 and 2005 to collect samples for the analysis of polychlorinated biphenyls (PCBs). Field efforts were conducted to determine the spatial extent of PCB contamination for the development of future remediation plans for Marsh Island.

2.1 Sediment and Soil Collection

The first round of sediment and soil sampling was completed in December 2004. A total of 73 stations were sampled around the perimeter of the island between the elevation of mean higher high water (MHHW) and mean lower low water (MLLW). Stations were located in order to obtain data from areas not previously characterized by the historical sampling efforts. For ease of reference, the site was divided into five geographic areas based on location. These stations are identified as A-1 to A-18, B-1 to B-10, C-1 to C-14, D-1 to D-15, and E-1 to E16. Supplemental soil sampling was completed at 27 stations in October 2005 to further characterize the extent of elevated PCB concentrations further inland of the 2004 sampling stations. These stations are identified as A-19 to A-26, B-11 & B-13, C-15 to C-26, D-16 to D-17, and E-18 to E-20. All sampled and historical stations are depicted in Figure 3.

Navigation

The geographical position established for each of the sampling stations are listed in Table 1 (2004 Sampling) and Table 2 (2005 Sampling). The coordinate system is NAD-83 Massachusetts State Plane (feet). Navigation to each station was achieved utilizing a Trimble Pro-XRS Differential GPS field unit. The coordinates for each station were loaded into the Trimble DGPS as a waypoint. Once a station was selected from the navigation menu, the data logger would provide range and bearing guidance to the field team to accurately position sampling equipment to within approximately 3 feet of the intended target.

Sediments

Sediment sampling was conducted from an 8 foot x 12 foot floating raft platform (Figure 4) using a mechanical vibracore (Figure 5) equipped with a 3-inch diameter stainless steel barrel and cutter-head extending up to 8 feet. Samples were collected in flexible high density polyethylene (HDPE) food grade plastic liners. Once properly positioned, the raft was fixed on station using spud poles to prevent drifting during the course of sample collection.

At each station, an HDPE liner was loaded into the barrel and secured in place by the cutter-head that was pop-riveted to the leading end of the barrel. The vibracore was lowered into the water and held just above the bottom at which time the mechanical vibrating head was activated. The vibracore was then lowered through the sediments until no further penetration or “refusal” was encountered. The

depth of penetration was determined by referencing index marks located at measured intervals along the outside of the barrel and on the lifting wire used for handling. The vibracore unit was then recovered, after which the cutter-head was removed. After exposing the HDPE liner, the bottom of the core liner was closed and secured with a tie-wrap. The HDPE liner was then drawn out of the barrel, at which time the top of the core was secured in a similar fashion. The core sample was labeled, the recovery length measured, and the description of each sample documented in the field log book. All samples were maintained on ice during field sampling activities. All sampling equipment was washed and decontaminated prior to departing for the next station using a solution of Alconox and tap water.

Marsh Soils

During the initial site characterization completed in December 2004, soil samples were collected using a 3-inch diameter stainless steel barrel and cutter-head extending up to 4 feet. Samples were collected in flexible HDPE food grade plastic liners. Equipment and personnel were shuttled to each station by a 24 foot aluminum landing craft (Figure 6) maneuvered to a suitable landing area near the position of each sampling station. Accessibility to some marsh stations was tidally dependent and was limited to the span of time that was approximately two hours either side of high tide. Once the field team put ashore, the position of the sampling station was located and marked with a wooden survey stake. From this point, the procedures used to collect soil samples were essentially the same as those described previously for sediments.

Supplemental shore based soil sampling was completed in October 2005 and was conducted by a field team using a stainless steel impact driven push core soil sampling device (Figure 7). The device was configured to house a 2-inch diameter by 12-inch long clear plastic core liner because only the top 12 inches of soil were being considered for analysis. After locating the position of each sampling station, a new 12-inch plastic core was loaded into the barrel and secured in place with a screw top cutter-head. The push core sampler was lowered onto the station and driven to the full penetration depth of 12-inches, after which the sampler was extracted out of the bore hole and the core liner removed from the sampling device. After removing the plastic core, two fitted plastic end caps were placed on each end of the core liner and secured with electrical tape. The core liner was labeled with the date, station ID and the word “top” to signify the top of the core sample. The description of each sample was documented in the field log book. All samples were maintained on ice during field sampling activities. All sampling equipment was decontaminated prior to departing for the next station using a solution of Alconox and tap water.

For those stations where the depth of penetration was limited (or precluded) by items such as rocks, cobble or debris, sampling was conducted by manual methods during low tide using a combination of a soil auger, stainless steel spoons and bowls. Each auger sample was taken in six inch increments, with a total of four samples. The sediment sample extracted was combined into a stainless steel bowl and mixed with a spoon until uniform and homogeneous. The uniform sample was spooned into a sealed glass container.

2.2 Laboratory Analyses

Core samples were stored frozen (– 20˚C) on site at the USACE Sawyer Street Project Office until delivered to the lab. In the lab, vibracore core samples were allowed time to thaw prior to commencing the sub-sectioning process. Only sediment from the center of the vibracore samples, which was not in direct contact with the liner, was considered during sub-sampling of the parent sediment core. The 2004 core samples, depending on the characteristics of each core sample, were either sectioned into discrete 6 inch sample segments beginning at the top of the core sample and working through the depth of the core, or sectioned in such a way as to capture a representative segment length that had distinct changes in sediment properties. The 12 inch core samples collected in 2005 were sub-sectioned into individual 6 inch horizons from each parent sediment core. The appropriate volume of sediment was removed from each of the designated horizons using a clean stainless steel spoon and placed into the appropriate sampling jar provided by the analytical lab.

Following collection, sediment samples selected for analysis were further homogenized at the fixed laboratory and PCBs extracted according to EPA's method 3545 (SW-846 method for Pressurized Fluid Extraction). The samples were extracted using a solvent mixture of acetone and dichloromethane and exchanged to hexane for analysis. Diatomaceous earth was also used in the procedure which, along with acetone, desiccates the sample. Extract cleanup steps included activated copper and sulfuric acid before injection to either dual-column GC/ECD or GC/MS instrumentation. Samples selected for homologue analysis were analyzed using LRMS while samples selected for the NOAA 18 congener subset analyses utilized the GC/ECD instrumentation.

Dual-column results were processed as specified in the program QAPP (Jacobs 2005) so that the lowest value obtained between the two columns was reported unless analyst discretion required otherwise (e.g. selecting the result without an interference signal). The final total PCB concentration presented in the results represents the sum of the NOAA 18 congeners multiplied by the New Bedford Harbor translation factor of 2.6. All non-detect results were included in the sum at one-half the laboratory's reporting limit.

Selected samples were also analyzed for total petroleum hydrocarbons (TPH) according to method 8015B (SW-846). TPH extractions were performed using a methylene chloride/acetone mixture (70/30) followed by GC/FID analysis.

Further details on sampling handling and analytical methods can be found in the Project QAPP (Jacobs 2005).

3.0 RESULTS

3.1 Field Effort Summary

The initial site characterization of Marsh Island was conducted in December 2004. A total of 73 vibracore samples were collected from 5 sampling areas, Area A through E (Figure 3) around the perimeter of the island. The sub-sectioning performed on each vibracore during lab analysis, the description of the associated sediment properties observed, and the PCB concentrations associated with the discrete sediment horizons analyzed are summarized in Table 3. The results of the initial effort revealed supplemental sampling was required to better define the spatial extent of PCB contamination and 27 push cores of the top 12 inches of sediment were collected in October 2005 (Figure 3). The description of the sediment properties observed in the push cores are summarized in Table 4. All sampled and historical stations are depicted in Figure 3.

3.2 Physical Characteristics

Vibracore samples collected from 18 stations in Area A (A1 – A18) ranged in length from 22 to 50 inches. Core samples were typically a brown to black loam sand mix with a layer of peat at the surface. Sediments transitioned to an olive to dark brown loamy sand with gravel at a depth that ranged from 5 to 19 inches. The push core samples collected at the 8 supplemental stations (A19 – A26) varied from dark brown loam to medium sandy loam with the exception of stations A24 – A25 which were mainly coarse sand.

Vibracore samples collected from 10 stations in Area B (B1 – B10) ranged in length from 18 to 44 inches. Core samples varied from a brown to black peat or a gray to tan loamy sand at the surface. Sediments transitioned to an olive tan to dark brown loamy sand with gravel at a depth that ranged from 6 to 16 inches. The push core samples collected at the 2 supplemental stations (B11 & B13) varied from dark brown sandy loam to loamy sand, to dark brown organic sediment with root material.

Vibracore samples collected from 14 stations in Area C (C1 – C14) ranged in length from 27 to 55 inches. Core samples varied from a black to dark brown sand or black to dark brown peat at the surface. Sediments transitioned to a light to dark brown fine loamy sand at a depth that ranged from 13 to 38 inches. The push core samples collected at the 12 supplemental stations (C15 – C26) varied from black to dark brown silty sediment, to dark brown sediment, to grey olive silty sediment. The majority of the push core samples collected had organic root fibers in the surface layer.

Vibracore samples collected from 15 stations in Area D (D1 – D15) ranged in length from 24 to 59 inches. Core samples ranged from a black silty loam to a dark brown peat at the surface. Sediments transitioned to a dark brown silty sand to brown loamy sand at a depth that ranged from 12 to 23

inches. The push core samples collected at the 2 supplemental stations (D16 – D17) were dark brown organic sediment to dark brown silty sand.

Vibracore samples collected from 16 stations in Area E (E1 – E16) ranged in length 22 to 40 inches. Core samples were mostly dark brown to black peat or dark brown loamy sand at the surface. Sediments transitioned to a grey sandy loam to brown sand at a depth that ranged from 11 to 23 inches. The push core samples collected at the 3 supplemental stations (E18 – E20) varied from light brown sand with gravel, to dark brown sandy silt, to dark brown organic sediment.

3.3 Chemistry

Sediment core samples were sub-sectioned in the lab to generate individual segments for analysis. Push core samples were sub-sectioned into individual 6 inch segments. Vibracore samples were not sub-sectioned at fixed intervals but at the location of visual transitions in sediment properties. Therefore individual segments through the depth of each core varied in length between each station. The physical characteristics of the vibracore and push core sub-sectioned segments, along with the PCB concentrations associated with the discrete sediment horizons selected for analysis are described on Tables 3 and 4, respectively. The total PCB concentrations were calculated by multiplying the sum of the NOAA 18 congeners by the New Bedford translation factor of 2.6. The historical total PCB concentrations are listed on Table 5. A summary of the archived samples which were reserved for potential future analysis is found on Table 6. The record of analytical results is provided in Appendix A, which includes a summary of PCB data from soil and sediment sampling conducted at the Marsh Island site in 2004 and 2005.

Total PCB concentrations ranged from 0.11 to 130 mg/kg in the historical data, 0.01 to 676 mg/kg in the vibracore samples and 0.05 to 577 mg/kg in the supplemental push core samples with a majority of samples determined to have a PCB concentration of less than 1 mg/kg. The data presents the vertical distribution of the PCB concentrations for the vibracore stations where any individual sample segment was found to have a concentration greater than 25 mg/kg (Figures 8, 9 and 10). This occurred at 24 of 73 vibracore stations, primarily in samples taken from the 0 to 12 inch horizon. The data also presents the total PCB concentrations of the push core stations, 11 of the 27 stations that had a concentration greater than 25 mg/kg (Figures 8, 9 and 10). Throughout all data, PCB concentrations greater than 100 mg/kg were found at 9 sampling stations.

A total petroleum hydrocarbon (TPH) analysis was performed for vibracore samples with visible oil or a petroleum odor. Sediment segments were collected from stations A-17 (8 to 14 inch horizon), A-11 (4 to 9 inch horizon), A-4 (10 to 12 inch horizon) and D-15 (18 to 24 inch horizon). The TPH concentration in each of these sediment samples was determined to be 2600, 2400, 1600 and 660 mg/kg, respectively.

3.4 Data QC and Database Entry

Upon data receipt from the laboratory, ENSR provided a cursory review for completeness and loaded the data into a temporary database for draft data reporting capability. ENSR also performed a quick check of the QC sample results from the temporary database to evaluate overall data quality before transmitting the data to the program database. Furthermore, electronic files of the hardcopy laboratory reports were generated and provided to Battelle Ocean Sciences for subsequent data validation efforts and uploaded into the Project database.

4.0 DISCUSSION

Based on the review of historical data, the locations for 73 vibracore stations were selected to better characterize PCB concentrations along the shore line of Marsh Island to support the development of future remediation and restoration plans for the site. These stations, located from the west facing beach area to the salt marsh cove on the north shore (Figure 3) and between the elevation of mean higher high water (MHHW) and mean lower low water (MLLW), were sampled in December 2004. Cores were opened, carefully inspected, and segmented into individual samples based on visual transitions in sediment properties. PCB data were compared to the USEPA criterion associated with a "beachcombing zone" in the Upper Harbor of New Bedford which sets a maximum PCB concentration of 25 mg/kg for the top 12 inch sediment horizon and 50 mg/kg for underlying sediments (USEPA, 1998).

The results revealed that 22 of the 73 coring locations contained at least one sample segment in the top 12 inch horizon with a PCB concentration greater than 25 mg/kg with the peak concentration determined to be 676 mg/kg. While elevated PCB concentrations were generally limited to the top 12 inch sediment horizon, concentrations that exceeded 25 mg/kg were found to a depth of 23 inches and five stations contained a sample segment which exceeded 50 mg/kg in underlying sediments (Figures 8, 9 and 10). To refine the spatial extent of elevated PCB concentrations defined by the December 2004 effort, follow-up samples (12-inch push cores) were collected at 27 stations in October 2005 (Figure 3) and results identified 11 additional stations with PCB concentrations in excess of the 25 mg/kg criterion (Figure 8, 9 and 10).

The location and total PCB concentration for those cores with an associated sample segment having a PCB concentration greater than 25 mg/kg in the top 12 inch horizon is presented in Figure 11. Figure 12 presents those locations with either surface PCB concentrations that were greater than 25 mg/kg extending below the 12 inch horizon or those stations with isolated pockets of PCB contamination which exceed 50 mg/kg in the underlying sediment. These figures exhibit that PCB contamination was more prominent along the northern shore of Marsh Island, including the tidal creek and salt marsh cove, and generally follow along the approximate elevation contour for mean higher high water (MHHW). PCB's may have been transported from the Upper Harbor to this area due to PCB oil sheen carried on floating debris or the water surface or due to the documented net flux of PCBs in the water column migrating southward from the Upper Harbor (USEPA, 1997, 1998).

The distribution of PCB contamination reveal that the northern shore, with its sheltered location and higher organic marsh sediments, work more effectively in capturing and sequestering PCBs than the sandy western shore that is very exposed to wind waves. The higher PCB concentration along the elevation of MHHW implies that floating debris, especially organic matter, may adsorb surface PCB oil sheen and provide a mechanism for delivering PCB contamination to the shore where it is driven up above the tidal elevation by wind and wave action. Alternatively, the PCB contamination in the higher areas of the intertidal zone represent areas that received less daily flushing over the decades; and this

flushing served to release PCB contamination from the lower areas of the intertidal zone. Once the organic material carrier has decomposed, the PCBs would be available to bind with the highly organic sediments thus progressively elevating PCB sediment concentrations along the edge of the marsh.

The estimated remediation boundaries that would be required in order to satisfy the USEPA criteria are presented in Figure 13, which displays the boundaries encapsulating all coring stations which had an associated sample segment greater than 25 mg/kg in the top 12 inch horizon. Moreover, the figure presents additional areas which require more than the initial 12 inch excavation depth i.e., those locations with 25 mg/kg PCB concentrations extending below the 12 inch horizon or those stations with isolated pockets of PCB contamination which exceeded 50 mg/kg in the underlying sediment.

Overall, the sampling in 2004 and 2005 provided good characterization of the Marsh Island area. Limited additional sampling and/or analysis of existing archived samples may be required to better define the boundaries of excavation as remediation plans are finalized (Table 6).

5.0 REFERENCES

ENSR. 2005. *Sediment Sampling Summary Report – Progress Sampling at DMU-2 Fall 2004*. December 2005.

ENSR. 2006. *2005 Monitoring Summary Report – Progress Sampling for the Dredging of DMU-2 and DMU-4 Fall 2005*. February 2006.

Jacobs Engineering Group. 2005. *Quality Assurance Project Plan, New Bedford Harbor Superfund Site.*

Tetra Tech FW, Inc. August 2004. *North of Wood Street Confirmatory Sampling Report, New Bedford Harbor Superfund Site*.

U.S. Environmental Protection Agency. 1997. *Report on the Effects of Hot Spot Dredging Operations – New Bedford Harbor Superfund Site.* Available at http://www.epa.gov/ne/nbh/index.html

U.S. Environmental Protection Agency. 1998. *EPA Superfund Record of Decision: New Bedford*. EPA ID: MAD980731335. Available at: http://www.epa.gov/superfund/sites/rods/index.html.

U.S. Environmental Protection Agency. 2003. *New Bedford Harbor, Phase 1 Sediment Data*. Available at: http://www.epa.gov/ne/nbh/pdfs/65327.pdf

Table 1

Station Coordinates – 2004 Sampling Stations at Marsh Island
Geographic Reference -NAD-83 State Plane (feet)

Station ID	X (Easting)	Y (Northing)
MI-A1	815293.225	2698771.021
MI-A2	815289.256	2698780.892
MI-A3	815261.045	2698818.945
MI-A4	815325.621	2698835.481
MI-A5	815309.393	2698859.670
MI-A6	815394.512	2698859.349
MI-A7	815371.452	2698870.676
MI-A8	815424.408	2698890.177
MI-A9	815352.153	2698889.952
MI-A10	815439.652	2698929.436
MI-A11	815403.236	2698932.155
MI-A12	815379.737	2698940.533
MI-A13	815450.447	2698973.120
MI-A14	815444.524	2698984.493
MI-A15	815415.736	2699012.566
MI-A16	815489.873	2699054.605
MI-A17	815467.306	2699059.036
MI-A18	815438.605	2699067.466
MI-B1	815466.882	2699137.713
MI-B2	815440.356	2699157.841
MI-B3	815578.259	2699127.552
MI-B4	815574.386	2699155.887
MI-B5	815573.760	2699182.209
MI-B6	815641.730	2699110.467
MI-B7	815640.208	2699152.130
MI-B8	815638.424	2699188.153
MI-B9	815686.522	2699095.230
MI-B10	815713.396	2699148.751
MI-C1	815713.709	2699049.423
MI-C2	815744.707	2699088.016
MI-C3	815766.581	2699116.059
MI-C4	815777.355	2699027.303
MI-C5	815922.193	2698950.160
MI-C6	815824.404	2698938.857
MI-C7	815824.165	2698987.831
MI-C8	815826.471	2699048.400

Station ID	X (Easting)	Y (Northing)
MI-C9	815828.888	2699082.749
MI-C10	815905.308	2699021.460
MI-C11	815888.507	2699090.021
MI-C12	815979.754	2699073.775
MI-C13	815959.553	2699101.006
MI-C14	816018.286	2699148.692
MI-D1	816087.389	2699170.779
MI-D2	816146.756	2699196.196
MI-D3	816150.540	2699219.231
MI-D4	816156.273	2699130.770
MI-D5	816174.093	2699180.942
MI-D6	816269.528	2699091.265
MI-D7	816189.229	2699120.592
MI-D8	816230.900	2699152.100
MI-D9	816227.805	2699194.629
MI-D10	816234.657	2699214.613
MI-D11	816273.452	2699172.229
MI-D12	816270.263	2699203.024
MI-D13	816262.554	2699104.630
MI-D14	816300.553	2699153.768
MI-D15	816319.622	2699214.502
MI-E1	816039.376	2699059.656
MI-E2	816253.470	2698907.212
MI-E3	816108.222	2699074.177
MI-E4	816157.500	2699074.400
MI-E5	816230.378	2699066.266
MI-E6	816124.145	2699031.385
MI-E7	816138.794	2699033.017
MI-E8	816179.556	2699032.164
MI-E9	816113.200	2698991.200
MI-E10	816130.733	2698986.618
MI-E11	816149.092	2698987.799
MI-E12	816177.960	2698974.875
MI-E13	816169.028	2698945.360
MI-E14	816208.557	2698940.856
MI-E15	816254.556	2698919.001
MI-E16	816234.396	2698907.630

Table 2

Station Coordinates – 2005 Sampling Stations at Marsh Island
Geographic Reference - NAD-83 State Plane (feet)

Station ID	X (Easting)	Y (Northing)
A19	815448.380	2698916.243
A20	815446.180	2698898.181
A21	815432.467	2698886.687
A22	815515.330	2699049.859
A23	815487.740	2699030.330
A24	815469.402	2699035.006
A25	815488.320	2699079.574
A26	815467.721	2699083.534
B11	815617.653	2699118.796
B13	815717.338	2699089.386
C15	815824.844	2699009.161
C16	815798.060	2698988.170
C17	815824.710	2698962.946
C18	815848.122	2698988.665
C19	815872.757	2698948.642
C20	815872.377	2698940.834
C21	815870.451	2698944.567
C22	815912.284	2698960.464
C23	815927.250	2698943.937
C24	815979.739	2699005.425
C25	815988.416	2698999.016
C26	815998.791	2698992.758
D16	816133.044	2699120.587
D17	816134.833	2699145.143
E18	816068.338	2699075.976
E19	816108.853	2699061.174
E20	816107.433	2699086.103

Table 3

Description of Cores Collected at Marsh Island with Total PCB Concentrations for Discrete Sediment Horizons Selected for Analysis (2004 Samples)

Station	Recovery	Description	Segments Analyzed Distance from Top of Core (inches)	Total PCB Concentration (mg/kg)
Area A				
MI-A1	33"	0-6" Tan coarse loamy sand, 6-8" black fine sandy peat, 8-13" dark brown peat, organic odor, 13-19" dark brown peat, organic odor, 19-28" dark brown fine loamy sand, some plant material, organic odor, 28-33" brown fine loamy sand	0-6	1
			6-8	0.6
			8-13	0.1
MI-A2	26"	0-3" Olive brown sandy peat with clam shells, 3-9" dark brown loamy sand with some plant material, organic odor, 9-13" dark olive brown loamy sand, streaks of dark brown from horizon above, some plant material, 13-16" olive brown loamy sand, 16-21" brown loamy sand, 21-26" olive gray very fine loamy sand	0-3	3.5
			3-9	0.2
			9-13	0.01
MI-A3	36"	0-4" Black fine loamy sand with shells, 4-8" gray fine loamy sand, 8-13" light brown loamy sand, 13-19" brown sand, 19-24" olive brown loamy sand, 24-29" olive brown fine loamy sand, 29-34" olive tan fine loamy sand, 34-36" rust color fine loamy sand	0-4	2.1
			4-8	0.3
			8-13	0.01
			13-19	0.01
			19-24	0.01
			24-29	0.01
MI-A4	22"	0-4" Olive gray peat, organic odor, 4-7" dark gray sandy peat, 7-10" gray sand, 10-12" black fine sand, petroleum odor, 12-14" dark gray sand, 14-15" black loamy coarse sand, slight petroleum odor, 15-18" brown fine loamy sand, 18-22" olive brown loamy coarse sand with rocks	0-4	1.2
			4-7	1.9
			7-10	0.2
			10-12	0.07
MI-A5	47"	0-7" Black loamy sand with shells, 7-9" dark gray loamy sand, 9-15" dark brown fine sandy loam, 15-21" dark olive brown loamy sand, 21-28" dark olive brown loamy sand, 28-38" dark olive brown loamy gravely coarse sand, 38-47" light olive brown fine sandy loam with rocks	0-7	3
			7-9	0.3
			9-15	0.1
MI-A6	24"	Sample collected with auger. 0-6" tan sand, 6-12" tan sand some gravel - streaks of olive, 12-18" tan sand / gravel, 18-24" tan sand. Collected approximately 3' north of station.	0-6	0.4
			6-12	0.2
			12-18	0.2

Notes: Total PCB Concentrations (mg/kg) based on (sum of NOAA congeners) * 2.6

Table 3 (continued)

Description of Cores Collected at Marsh Island with Total PCB Concentrations for Discrete Sediment Horizons Selected for Analysis (2004 Samples)

Station	Recovery	Description	Segments Analyzed Distance from Top of Core (inches)	Total PCB Concentration (mg/kg)
MI-A7	33"	0-6" Dark brown loamy sand with peat, 6-10" dark gray loamy sand, 10-19" dark brown fine loamy sand with rocks, 19-26" dark brown loamy sand with rocks and gravel, 26-33" dark brown loamy sand with rocks and gravel	0-6	2.6
			6-10	0.06
			10-19	0.01
MI-A8	29"	0-3" Brown peat with plastic debris, 3-7" dark gray/brown fine loamy sand, some plant material, 7-14" dark tan fine loamy sand, 14-21" tan fine loamy sand, 21-29" olive tan fine loamy sand	0-3	43
			3-7	10
			7-14	0.2
MI-A9	34"	0-7" black loamy sand, 1 large rock, 7-13" tan loamy sand with black streaking, 13-18" tan loamy sand with black streaking, 18-25" olive brown loamy sand, 25-34" olive gray loamy sand	0-7	0.6
			7-13	0.01
			13-18	0.03
MI-A10	35"	0-4" black loamy sand, <5% plant material, dry, 4-7" brown loamy sand, dry, 7-11" dark brown loamy sand, dry, 11-18" light brown loamy sand, dry with rocks, 18-28" olive light brown loamy sand, 28-35" olive brown loamy sand	0-4	11
			4-7	12
			7-11	27
MI-A11	25"	0-4" Dark olive gray loamy sand and coarse sand, 4-9" dark gray to black loamy coarse sand, petroleum odor, 9-15" dark brown fine loamy sand, 15-21" dark brown fine loamy sand, 21-25" olive brown fine loamy sand	0-4	5.9
			4-9	19
			9-15	0.04
MI-A12	38"	0-4" Black fine loamy sand with clam shells, 4-8" dark gray loamy sand with small gravel and shell, 8-17" brown fine loamy sand, 17-24" olive brown fine sandy loam, 24-32" dark brown loamy sand with coarse sand mixed in, 32-38" dark brown fine loamy sand	0-4	5.6
			4-8	0.3
			8-17	0.02
I-A13	25"	0-6" Dark brown loamy peaty sand with small rocks and gravel, 6-10" tan loamy sand with gravel, 10-15" tan coarse sand with rocks, 15-25" olive tan loamy gravely sand with rocks	0-6	16
			6-10	7.1
			10-15	3.6
MI-A14	26"	0-5" Olive gray coarse sand with some gravel, 5-10" tan coarse sand with rocks, 10-19" light tan coarse loamy sand with gravel, 19-26" olive tan loamy coarse sand with rocks and gravel	0-5	4.4
			5-10	0.9
MI-A15	26"	0-8" Black loamy sand and coarse sand with shells, 8-18" olive gray loamy sand with rocks and coarse sand, 18-26" olive tan loamy sand with coarse sand and gravel	0-8	7.1
			8-18	0.2
			18-26	0.03

Notes: Total PCB Concentrations (mg/kg) based on (sum of NOAA congeners) * 2.6

Table 3 (continued)

Description of Cores Collected at Marsh Island with Total PCB Concentrations for Discrete Sediment Horizons Selected for Analysis (2004 Samples)

Station	Recovery	Description	Segments Analyzed Distance from Top of Core (inches)	Total PCB Concentration (mg/kg)
MI-A16	40"	0-3" Dark brown peat, 3-7" tan loamy sand with rocks, 7-8" black fine loamy sand, 8-12" tan loamy sand, 12-14" olive brown loamy sand, 14-19" golden tan fine sand, 19-29" dark rust loamy sand and gravel, 29-36" olive dark tan loamy sand and coarse sand, 36-40" dark tan fine loamy sand	0-3	6.7
			3-7	15
			7-8	47
			8-12	66
			12-14	17
MI-A17	43"	0-8" Olive tan sand and coarse sand, 8-14" black fine loamy sand with gravel, strong petroleum odor, 14-20" olive tan with black streaking from horizon above (mixing zone), fine loamy sand, 20-26" olive tan fine loamy sand, 26-32" dark olive tan fine loamy sand, 32-37" olive tan fine loamy sand, 37-43" olive tan fine loamy sand	0-8	3.3
			8-14	109
			14-20	0.07
			20-26	0.02
MI-A18	50"	0-6" Black fine loamy sand with clam shells / organic odor, 6-9" dark gray loamy coarse sand, 9-12" olive gray loamy sand, 12-18" olive tan fine loamy sand, 18-23" olive tan fine loamy sand, 23-31" light olive tan fine loamy sand, 31-38" light olive tan fine loamy sand, 38-45" light olive tan fine loamy sand with light brown mottles, 45-50" light olive tan fine loamy sand with light brown mottles	0-6	3.7
			6-9	1.5
			9-12	0.3
Area B				
MI-B1	24"	Sample collected with auger. 0-6" tan sand with rocks and gravel. 6-12" dark tan silty sand with gravel. 12-18" dark tan silty sand. 18-24" gray silty sand.	0-6	1.9
			6-12	0.2
			12-18	0.3
MI-B2	24"	Sample collected with auger. 0-6" Very dark gray sand with shells and gravel, 6-12" olive gray sandy silt, 12-18" olive gray sandy silt/clay, 18-24" light gray sandy silt.	0-6	1.3
			6-12	0.4
			12-18	0.6
MI-B3	32"	0-2" Dark gray loamy sand and coarse sand and some gravel, 2-9" olive tan loamy sand, 9-16" tan loamy sand, 16-22" dark tan loamy sand, 22-28" olive tan fine loamy sand with gravel, 28-32" golden tan loamy sand with gravel	0-2	1.5
			2-9	2.5
			9-16	0.2
MI-B4	18"	0-6" Black peat with clam shells, organic odor, 6-12" dark brown sandy gravel with rocks, 12-18" olive brown loamy coarse sand with gravel	0-6	10
			6-12	0.5

Notes: Total PCB Concentrations (mg/kg) based on (sum of NOAA congeners) * 2.6

Table 3 (continued)

Description of Cores Collected at Marsh Island with Total PCB Concentrations for Discrete Sediment Horizons Selected for Analysis (2004 Samples)

Station	Recovery	Description	Segments Analyzed Distance from Top of Core (inches)	Total PCB Concentration (mg/kg)
MI-B5	24"	0-8" Black loamy sand with rocks, 8-13" olive tan loamy sand and gravel, 13-19" dark olive loamy gravel with a large rock (<.5"), 19-24" light olive tan loamy sand and gravel with rocks	0-8	3.7
			8-13	0.3
			13-19	0.2
MI-B6	44"	0-7" Black organic peat, 7-12" black fine sandy loam, 12-19" dark golden tan fine loamy sand some plant material, 19-25" tan fine loamy sand, 25-31" dark brown fine loamy sand, 31-36" dark brown fine loamy sand, 36-44" olive brown fine loamy sand	0-7	90
			7-12	0.5
			12-19	0.03
MI-B7	37"	0-5" Brown peat, organic odor, 5-9" dark gray fine loamy sand with peat, 9-16" gray brown loamy sand, 16-22" olive tan fine loamy clay sand with rocks and gravel, one large rock, 22-31" olive brown fine loamy sand and gravel, 31-37" olive tan very fine loamy sand with <5% gravel	0-5	12
			5-9	5.1
			9-16	0.04
			16-22	0.01
MI-B8	31"	0-5" Black loamy sand with shells, some organic odor, 5-14" brown loamy sand with some coarse sand <5%, 14-21" light olive brown silty clay w/ one rock, hard pack, 21-26" olive beige silty clay, hard pack, 26-31" light brown silty sand with coarse sand & gravel	0-5	2
			5-14	0.08
			14-21	0.01
MI-B9	22"	0-5" Dark brown peat, 5-9" tan loamy sand with plant material (plowed horizon), 9-10" black peat (buried A horizon), 10-14" dark brown peat, 14-22" dark brown fine loamy sand with plant material	0-5	59
			5-9	4.5
			9-10	1.8
			10-14	0.3
MI-B10	24"	0-8" Black fine silty sand, 8-13" dark brown fine silty sand with shells, 13-19" brown fine loamy sand, 19-24" olive brown gravelly sand	0-8	2.5
			8-13	0.3
			13-19	0.03
Area C				
MI-C1	53"	0-3" Black peat & sand, 3-7" dark brown peat, 7-10" tan sand, 10-13" dark brown sandy peat, 13-20" brown sandy peat, 20-26" brown sandy peat, 26-32" brown sandy peat, 32-39" dark brown loamy sand w/ 50% plant material, 39-46" dark brown loamy sand w/ 50% plant material, 46-53" dark brown loamy sand w/ 30% plant material	0-3	20
			3-7	31
			7-10	1.7
			10-13	0.3

Notes: Total PCB Concentrations (mg/kg) based on (sum of NOAA congeners) * 2.6

Table 3 (continued)

Description of Cores Collected at Marsh Island with Total PCB Concentrations for Discrete Sediment Horizons Selected for Analysis (2004 Samples)

Station	Recovery	Description	Segments Analyzed Distance from Top of Core (inches)	Total PCB Concentration (mg/kg)
MI-C2	46"	0-3" Black organic layer, organic odor, 3-12" olive brown loamy peat, organic odor, 12-19" brown sandy & silty peat, 19-25" brown sandy & silty peat, 25-29" dark brown fine silty sand, 29-37" brown loamy sand, 37-46" dark brown loamy sand	0-3	6.6
			3-12	0.1
			12-19	0.01
			19-25	0.01
MI-C3	45"	0-5" Very dark gray silty sand, 5-11" dark brown sandy peat, 11-16" dark brown sandy peat, 16-25" dark brown loamy sand, 25-32" brown silty sand, 32-38" golden brown loamy sand, 38-45" golden brown loamy sand	0-5	3.7
			5-11	0.1
			11-16	0.05
			16-25	0.01
MI-C4	46"	0-5" Black sandy peat, 5-14" dark gray fine loamy sand, organic odor, 14-17" black loamy sand with peat, 17-21" gray / dark gray loamy sand with areas of coarse sand, 21-27" brown sandy peat, strong organic odor, 27-34" brown sandy peat, strong organic odor, 34-41" dark brown loamy sand with rocks, 41-46" brown loamy sand with areas of gravel	0-5	2.2
			5-14	0.8
			14-17	38
MI-C5	35"	0-9" Dark brown peat, organic color, 9-13" gray peat, 13-20" gray fine sandy loam, 20-25" black fine sandy peat organic odor, 25-30" dark gray fine sandy loam, 30-35" dark gray fine sandy loam	0-9	49
			9-13	14
			13-20	6.9
MI-C6	37"	0-7" Dark brown peat, 7-15" dark gray fine sandy loam with plant material, 15-20" very dark gray fine sandy loam, 20-28" black gray peat, organic odor, 28-31" olive gray peaty sandy loam, 31-37" dark brown peat	0-7	5.7
			7-15	10
			15-20	11
MI-C7	32"	0-4" Black peat, 4-10" brown peat, organic odor, 10-16" brown peat, 16-22" brown peat, 22-32" brown peat	0-4	676
			4-10	3.3
			10-16	45
MI-C8	33"	0-8" Dark gray loamy sand with clam shell, 8-17.5" black loamy sand, organic smell, 17.5-19" olive gray sand, 19-23" dark brown peat, 23-28" dark brown sandy silty peat, 28-33" dark olive gray loamy sand w/ plant material	0-8	5.1
			8-16	14
			16-18	0.3
MI-C9	55"	0-9" Black silty sand with clam shell & organic material, 9-15" olive gray loamy sand with some plant material, 15-23" peat, organic odor, 23-32" dark brown loamy sand with 30% peat, 32-38" dark brown loamy sand, 38-44" fine sand olive brown, 44-50" fine sand olive brown, 50-55" fine sand olive brown	0-9	29
			9-15	0.08

Notes: Total PCB Concentrations (mg/kg) based on (sum of NOAA congeners) * 2.6

Table 3 (continued)

Description of Cores Collected at Marsh Island with Total PCB Concentrations for Discrete Sediment Horizons Selected for Analysis (2004 Samples)

Station	Recovery	Description	Segments Analyzed Distance from Top of Core (inches)	Total PCB Concentration (mg/kg)
MI-C10	39"	0-8" Dark gray peat, 8-14" dark brown peat, 14-21" dark brown peat, 21-27" sandy peat, 27-33" brown sand, 33-39" brown sand with <5% coarse sand	0-8	1.2
			8-14	0.1
			14-21	0.08
MI-C11	39"	0-3" Very dark brown/black sand with some coarse sand mixed in, 3-10" dark brown loamy sand with plant material, 10-17" dark brown loamy sand with plant material, 17-26" olive brown loamy sand, 26-32" light olive brown loamy sand, 32-39" light olive brown loamy sand	0-3	11
			3-10	0.4
			10-17	0.1
			17-26	0.02
MI-C12	27"	0-5" Black peat w/ clam shells, organic odor, 5-11" dark brown silty sandy peat, 11-16" dark brown silty sandy peat, 16-21" brown / dark brown / light brown mixing zone, loamy sand <10% plant material, 21-27" dark brown loamy sand, <5% plant material	0-5	1
			5-11	0.08
			11-16	0.01
MI-C13	49"	0-10" Dark olive gray coarse loamy sand, 10-19" olive brown fine loamy sand, 19-25" light olive brown fine loamy sand, 25-31" light olive brown fine loamy sand, 31-37" light olive brown fine loamy sand, 37-43" light olive brown fine loamy sand, 43-49" light olive brown fine loamy sand	0-10	0.2
			10-19	0.02
			19-25	0.01
			25-31	0.01
MI-C14	39"	0-6" Dark brown loamy sand with plant material, organic odor, 6-15" dark brown coarse loamy sand, 15-19" olive brown loamy sand, 19-27" olive brown coarse loamy sand, some gravel, 27-31" dark brown loamy sand, 31-36" dark olive brown fine loamy sand, 36-39" olive gray fine sandy loam	0-6	0.7
			6-15	0.05
			15-19	0.03
Area D				
MI-D1	42"	0-5" Black silty sand with clam shells, organic odor, 5-9" brown / gray loamy sand <5% plant material, 9-17" olive brown loamy sand with <10% plant material, 17-25" light olive gray loamy sand w/ 5% coarse sand, 25-31" olive gray loamy coarse sand w/ gravel, 31-37" light olive gray loamy sand, 37-42" light olive gray loamy sand	0-5	3.6
			5-9	0.2
			9-17	0.02
			17-25	0.03

Notes: Total PCB Concentrations (mg/kg) based on (sum of NOAA congeners) * 2.6

Table 3 (continued)

Description of Cores Collected at Marsh Island with Total PCB Concentrations for Discrete Sediment Horizons Selected for Analysis (2004 Samples)

Station	Recovery	Description	Segments Analyzed Distance from Top of Core (inches)	Total PCB Concentration (mg/kg)
MI-D2	54"	0-6" Histisol- black organic layer, organic smell, 6-12" Histisol- black organic layer, organic smell, 12-17" Histisol - black organic layer, organic smell, 17-23" dark brown loamy sand, with organic streaking from horizon above, 23-29" dark brown loamy sand, with organic streaking from horizon above, 29-38" brown loamy sand, 38-47" olive brown loamy coarse sand & some gravel, 47-54" light olive brown sand	0-6	26
			6-12	43
			12-17	34
			17-23	0.2
MI-D3	28"	0-7" black silty loam, 7-13" black loamy organic material, 13-24" dark gray fine sandy loam, 24-28" very dark gray fine sandy loam. Organic odor throughout	0-7	20
			7-13	27
			13-24	1.7
			24-28	0.5
MI-D4	35"	0-4" Dark brown peat, organic odor, 4-15" brown peat, organic odor, 15-22" very dark brown loamy sand with plant material, 22-35" brown loamy sand w/50% plant material, some rocks, organic odor	0-4	34
			4-15	1.4
			15-22	0.2
MI-D5	54"	0-10" Black fine loamy sand, 10-16" dark olive gray loamy sand, 16-20" dark gray loamy sand, 20-24" dark brown loamy sand, 24-26" olive brown loamy sand, 26-32" brown loamy sand, 32-37" brown loamy sand, 37-43" brown loamy sand, 43-48" brown loamy sand, 48-54" brown loamy sand	0-10	24
			10-16	0.07
			16-20	0.04
MI-D6	24"	Sampled collected with auger. 0-6" Brown organics w/ some sand and plant material, 6-12" brown organics, some fine sand, 12-18" brown w/ sand, much dryer, some clay, 18-24" brown sand and some clay	0-6	0.05
			6-12	0.01
			12-18	0.01
MI-D7	35"	0-9" Black sandy peat with 3 clams, 9-15" black peaty sand w/ sheen and petroleum odor, organic odor, 15-24" dark gray loamy sand, 24-33" dark olive gray loamy sand, 33-35" olive gray coarse sand & some gravel	0-9	9.9
			9-15	0.9
			15-24	0.2
MI-D8	57"	0-8" Black fine loamy sand with organic material (seaweed), organic odor, 8-16" dark brown fine loamy sand, 16-23" brown loamy sand, 23-28" brown loamy sand, 28-34" brown loamy sand, 34-40" light olive brown loamy sand, 40-46"light olive brown loamy sand, 46-52" light brown loamy sand with golden brown mottles, 52-57" light brown loamy sand with golden brown mottles	0-8	13
			8-16	0.1
			16-23	0.01
			23-28	0.01

Notes: Total PCB Concentrations (mg/kg) based on (sum of NOAA congeners) * 2.6

Table 3 (continued)

Description of Cores Collected at Marsh Island with Total PCB Concentrations for Discrete Sediment Horizons Selected for Analysis (2004 Samples)

Station	Recovery	Description	Segments Analyzed Distance from Top of Core (inches)	Total PCB Concentration (mg/kg)
MI-D9	50"	0-9" Black loamy sand, 9-16" dark gray sand, 16-25" olive gray sand, 25-29" dark gray fine sand, 29-37" very dark brown organic peat, 37-39" black loamy sand, 39-44" light brown sand, 44-50" brown sand	0-9	43
			16-25	0.05
			25-29	0.05
MI-D10	33"	0-12" Black peat, with shells, 12-14" gray/olive gray sand, depleted layer, 14-23" black sandy peat, slight petroleum odor (petroleum sheen found on piece of glass), 23-28" dark olive gray sandy loam, with some shell parts, 28-33" olive gray sand with two clams.	0-12	27
			12-14	5.3
			14-23	115
			23-28	0.7
MI-D11	59"	0-10" Very dark gray fine sandy loam with shells & rocks, organic odor, 10-17" black fine sandy loam, 17-35" gray loamy sand, 35-45" dark brown peat, 45-49" black sandy loam, 49-56" light brownish gray sand, 56-59" brown sand	0-10	107
			10-17	55
			17-35	0.2
MI-D12	58"	0-7" Black organic layer with organic odor, 7-14" Black organic layer with organic odor, 14-21" dark olive gray silty clay, 21-27" olive gray silty clay sand with clamshells, 27-34" gray silty sand, 34-40" gray silty sand, 40-43" dark gray silty clay, 43-50" very dark brown organic peat, 50-58" very dark brown organic peat	0-7	18
			7-13.5	36
			13.5-21	0.3
			21-27	0.3
MI-D13	24"	Sample collected with auger. 0-6" Light brown sand with gravel. 6-12" light brown silty sand. 12-18" light brown silty sand with gravel - darker. 18-24" light brown silty sand with gravel.	0-6	0.4
			6-12	0.3
			12-18	6.6
MI-D14	24"	Sample collected with auger. 0-6" Dark brown sandy / organics with plant material. 6-12" rocks, dark brown, sandy / organics / gravel / fine sand loam. 10-12" lighter brown fine sandy loam. 12-14" some organic material, silty sand, 14-18" lighter brown silty sand with some gravel.	0-6	0.8
			6-12	1.1
			12-18	0.6
MI-D15	24"	Sample collected with auger. 0-6" Dark brown peat. 6-12" sandy peat, brown gravel. 12-18" dark brown sandy, silty and organic with gravel. 18-24" silty sand, dark brown. Oily with strong oil odor. Oily sheen on water as sample was pulled to surface.	0-6	1.8
			6-12	1.3
			12-18	6.2
			18-24	12

Notes: Total PCB Concentrations (mg/kg) based on (sum of NOAA congeners) * 2.6

Table 3 (continued)

Description of Cores Collected at Marsh Island with Total PCB Concentrations for Discrete Sediment Horizons Selected for Analysis (2004 Samples)

Station	Recovery	Description	Segments Analyzed Distance from Top of Core (inches)	Total PCB Concentration (mg/kg)
Area E				
MI-E1	32"	0-4" Very dark gray peat organic odor, 4-10" dark gray fine sandy loam, 10-13" black peat, 13-23" dark gray fine loam with plant material, 23-32" dark gray fine loam	0-4	4.6
			4-10	4.3
			10-13	70
MI-E2	22"	0-5" Dark brown loamy sand, 5-12" light brown fine sand, 12-16" brown fine sand, 16-22" brown peat	0-5	0.2
			5-12	0.1
			12-16	0.04
MI-E3	40"	0-7" Dark brown peat, 7-14" black sandy peat, 14-18" dark gray loamy sand with rocks, 18-33" light brown fine loamy sand, <5% plant material, 33-40" olive brown loamy sand with some coarse sand	0-7	30
			7-14	32
			14-18	5.8
			18-33	0.07
MI-E4	28"	0-6" black sandy peat with clam shells, 6-14" sand, coarse sand with loamy sandy, very dark gray, 14-19" sand & coarse sand, gray, 19-28" brown sand	0-6	7
			6-14	0.1
			14-19	0.04
			19-28	0.01
MI-E5	24"	Sample collected with auger. 0-6" (0-1") Dark brown organic, (1-6") light brown silty sand with gravel. 6-12" (6-8") brown sand with gravel (8-12") light brown silty sand with gravel. 12-18" (12-16") light brown silty sand with gravel, (16-18") dark brown silty sand, with plant material, 18-24" brown silty sand, (18-22") sand with gravel, debris, (22-26") olive color sand	0-6	0.3
			6-12	0.3
			12-18	1
MI-E6	33"	0-10" Peat, dark brown, 1 clam, 10-14" brown peat, 14-19" black loamy sand, 19-26" light brown fine sand & coarse sand, 26-33" light brown fine sand & coarse sand, organic odor	0-10	15
			10-14	0.1
			14-19	0.07
			19-26	0.01
MI-E7	36"	0-10" Black silty peat with plant material, 10-14" very dark gray, silty sand, 14-17" gray olive sand, 17-23" brown sand & coarse sand, 23-26" very dark brown sand, 20% coarse sand, 26-36" brown / olive brown sand with 5% rocks	0-10	52
			10-14	5.6
			14-17	0.4
			17-23	0.1

Notes: Total PCB Concentrations (mg/kg) based on (sum of NOAA congeners) * 2.6

Table 3 (continued)

Description of Cores Collected at Marsh Island with Total PCB Concentrations for Discrete Sediment Horizons Selected for Analysis (2004 Samples)

Station	Recovery	Description	Segments Analyzed Distance from Top of Core (inches)	Total PCB Concentration (mg/kg)
MI-E8	24"	Sample collected with auger. 0-6" silty sand, peat, dark olive brown. 6-12" dark brown sandy peat - sulfur odor. 12-18" dark brown, sandy peat - odor. 18-24" dark brown sandy peat - odor.	0-6	6
			6-12	0.6
			12-18	0.3
MI-E9	24"	Sample collected with auger. 0-6" Organic layer, root material, brown sand, 6-12" organic, some sand, root material, 12-18" olive/gray sand, some mottles, wood fragments, 18-24" gray clay w/ very fine sand, some mottles, iron streaking, oxidized rhisospheres	0-6	1.1
			6-12	0.2
			12-18	0.1
MI-E10	22"	0-11" Black peaty loamy sand, organic odor, 11-20" dark olive gray, fine loamy sand, 20-22" dark gray fine loamy sand	0-11	133
			11-20	4.7
			20-22	6.2
MI-E11	25"	0-4" dense peat, brown, 4-11" dark brown peat, 11-25" dark gray fine loamy sand	0-4	110
			4-11	3.6
MI-E12	34"	0-4" Peat dense, dark brown, 4-14" very dark gray fine sandy loam, with some plant material, 14-29" olive gray fine sandy loam, 29-34" dark olive gray fine sandy loam	0-4	15
			4-14	0.05
			14-29	0.01
MI-E13	25"	0-4" Dark brown organic peat, 4-12" light brown silty clay with mottles, 50% plant material, 12-21" gray silty clay, 30% plant material, 21-24" light sand with 20% plant material, 24-25" dark gray, fine sandy loam	0-4	0.2
			4-12	0.04
			12-21	0.03
MI-E14	30"	0-4" Organic layer dark brown, 70% plant material, 4-12" loamy sand, 30% plant material, 12-23" dark olive gray silty loam, some plant material, organic odor, 23-26" light olive gray silty loam, some plant material, 26-30" dark gray silty loam	0-4	5.3
			4-12	0.3
			12-23	0.02
			23-26	0.02
MI-E15	32"	0-13" Dark olive brown peat, 13-17" gray sandy gravel, 17-22" black organic peat, 22-27" olive gray fine sand, 27-32" olive brown peat	0-13	5.6
			13-17	7.3
			17-22	73
MI-E16	24"	0-4" Black fine sandy loam, with organic material, 4-11" olive brown fine sandy loam, with organic material, 11-15" dark brown fine sandy loam, 15-18" black & olive gray fine sandy loam, 18-24" dark olive gray loamy sand	0-4	0.20
			4-11	0.02
			11-15	0.03

Notes: Total PCB Concentrations (mg/kg) based on (sum of NOAA congeners) * 2.6

Table 4

Description of Cores Collected at Marsh Island with Total PCB Concentrations for Discrete Sediment Horizons Selected for Analysis (2005 Samples)

Station	Recovery	Description	Segments Analyzed Distance from Top of Core (inches)	Total PCB Concentration (mg/kg)
Area A				
A19	12"	0-3" Dark brown sandy loam, 3-9" dark brown sandy loam with medium brown sandy loam, 9-12" dark brown sandy loam	0-6	19
			6-12	1.8
A19 REP	12"	0-3" Organic debris with dark brown loam, 3-8" medium brown sandy loam, 8-12" dark brown loam	na	
A20	12"	0-4" Dark brown sandy loam, 4-8" medium brown sandy loam, 8-12" dark brown sandy loam	0-6	0.7
			6-12	0.2
A21	12"	0-6" Medium brown sandy loam, 6-12" dark brown organic material	0-6	23
			6-12	0.7
A22	12"	0-6" Brown to dark brown loamy sand, 6-12" medium brown sand with black mottles	0-6	19
			6-12	0.4
A23QA	12"	0-6" Dark brown sandy loam with debris, 6-12" medium brown sandy loam with dark brown sandy loam	0-6	33
A24	12"	0-12" Medium dark brown coarse sand	0-6	3.6
			6-12	7.5
A25	12"	0-3" Dark brown organic layer with sand, 3-12" dark brown organic loam	0-6	19
			6-12	22
A26	12"	0-10" Medium brown coarse sand, 10-12" black to dark brown course sand - petroleum odor	0-6	2.5
			6-12	16
Area B				
B11	12"	0-3" Dark brown sandy loam, 3-6" medium brown loamy sand, 6-12" dark brown sandy loam	0-6	52
			6-12	87
B13	12"	0-12" Dark brown organic sediment, with organic root material	0-6	207
			6-12	87

Table 4 (continued)

Description of Cores Collected at Marsh Island with Total PCB Concentrations for Discrete Sediment Horizons Selected for Analysis (2005 Samples)

Station	Recovery	Description	Segments Analyzed Distance from Top of Core (inches)	Total PCB Concentration (mg/kg)
Area C				
C15	12"	0-8" Black silty sediment, 8-12" dark brown sediment	0-6	28
			6-12	21
C16	12"	0-6" Dark brown sediment organic debris, 6-12" brown sediment with organic debris	0-6	293
			6-12	0.8
C17	12"	0-12" Dark brown sediment with root pulp	0-6	16
			6-12	1.8
C18	12"	0-12" Medium brown sediment with organic root pulp	0-6	577
			6-12	6.2
C19	9"	0-2" Medium brown with organic root matter, 2-9" medium brown sediment	0-6	19
			6-12	32
C20	12"	0-5" Medium brown organic layer with sediment and root debris, 5-10" gray brown sediment, 10-12" gray clay material	0-6	26
			6-12	17
C21QA	12"	0-3" Dark brown silty sediment with root fiber, 3-12" dark brown silty sediment	0-6	17
C22	12"	0-6" Dark brown gray sediment with root fibers, 6-12" gray olive material	0-6	28
			6-12	23
C22 REP	12"	0-6" Dark brown gray sediment with root fibers, 6-12" gray olive material		
C23	12"	0-4" Dark brown sediment with root fibers, 4-12" gray brown organic material	0-6	8.8
			6-12	13
C24	12"	0-4" Gray brown sediment, 4-12" gray olive material	0-6	42
			6-12	26
C25	12"	0-3" Gray olive silty sediment with root fibers, 3-12" gray olive silty sediment	0-6	9.4
			6-12	18
C26	12"	0-5" Dark brown sediment with root fibers, 5-12" dark brown gray sediment	0-6	13
			6-12	19

Notes: Total PCB Concentrations (mg/kg) based on (sum of NOAA congeners) * 2.6

Table 4 (continued)

Description of Cores Collected at Marsh Island with Total PCB Concentrations for Discrete Sediment Horizons Selected for Analysis (2005 Samples)

Station	Recovery	Description	Segments Analyzed Distance from Top of Core (inches)	Total PCB Concentration (mg/kg)
Area D				
D16	12"	0-12" Dark brown organic sediment with root debris	0-6	32
			6-12	10
D17	12"	0-2" Dark brown silty sand, 2-12" light dark brown silty sand	0-6	17
			6-12	0.3
Area E				
E18	12"	0-2" Light brown sand with gravel, 2-12" light brown coarse sand	0-6	0.1
			6-12	0.05
E19	12"	0-12" Dark brown sandy silt	0-6	2.6
			6-12	2.3
E20	12"	0-12" Dark brown organic sediment with root debris	0-6	6.2
			6-12	1.4

Notes: Total PCB Concentrations (mg/kg) based on (sum of NOAA congeners) * 2.6

Table 5

Total PCB Concentrations for Historical Marsh Island Sampling Stations

Station ID	Segment Analyzed: Distance from Top of Core (inches)	Total PCB Concentration (mg/kg)
S-af238	0-12	58
S-304	0-12	1.8
S-304	12-24	18
S-305	0-12	2.2
S-305	12-24	65
S-306	0-12	2.4
S-306	12-24	0.5
S-307	0-12	0.1
S-307	12-24	0.01
S-308	0-12	60
S-308	12-24	1.5
S-309	0-12	2.8
S-309	12-24	0
S-310	0-12	130
S-310	12-24	0.7
S-3047	0-6	9.5
S-3047	6-13	7.9
S-3047	13-19	1.8
S-3047	19-25	0.8
S-3169	0-12	40
S-3169	12-19	55
S-3169	19-24	1.9
S-3169	24-36	0.1
S-3169	36-48	0.5
S-881	0-12	19
S-881	12-24	7.9
S-881	24-36	2.7
S-882	0-12	44
S-882	12-24	45
S-882	24-36	2.5

Notes: -Sample Data from USEPA database website at: http://www.epa.gov/ne/nbh/pdfs/65327.pdf
-Total PCB Concentration (mg/kg) based on (sum of NOAA Congeners) * 2.6, with the exception of data associated with Station S-af238 which is presented in total Arochlors.

Table 6

Archived Core Segments within Estimated Remediation Boundaries Available for Analysis

Station ID	Analyzed Sample Intervals					Archived Sample Intervals
MI-A8	0-3"	3"-7"	7"-14"			14"-21", 21"-29"
MI-A10	0-4"	4"-7"	7"-11"			11"-18", 18"-28", 28"-35"
MI-A16	0-3"	3"-7"	7"-8"	8"-12"	12"-14"	14"-19", 19"-29", 29"-36", 36"-40"
MI-A17	0-8"	8"-14"	14"-20"	20"-26"		26"-32", 32"-37", 37"-43"
MI-B6	0-7"	7"-12"	12"-19"			19"-25", 25"-31", 31"-36", 36"-44"
MI-B9	0-5"	5"-9"	9"-10"	10"-14"		14"-22"
MI-C1	0-3"	3"-7"	7"-10"	10"-13"		13"-20", 20"-26", 26"-32", 32"-39", 39"-46", 46"-53"
MI-C4	0-5"	5"-14"	14"-17"			17"-21", 21"-27", 27"-34", 34"-41", 41"-46"
MI-C5	0-9"	9"-13"	13"-20"			20-25", 25"-30", 30"-35"
MI-C7	0-4"	4"-10"	10"-16"			16"-22", 22"-32"
MI-C9	0-9"	9"-15"	15"-23"			23"-32", 32"-38", 38"-44", 44"-50", 50"-55"
MI-D2	0-6"	6"-12"	12"-17"	17"-23"		23"-29", 29"-38", 38"-47", 47"-54"
MI-D3	0-7"	7"-13"	13"24"	24"-28"		
MI-D4	0-4"	4"-15"	15"-22"			22"-35"
MI-D9	0-9"	9"-16"	16"-25"	25"-29"		29"-37", 37"-39", 39"-44", 44"-50"
MI-D10	0-12"	12"-14"	14"-23"	23"-28"		28"-33"
MI-D11	0-10"	10"-17"	17"-35"			35"-45", 45"-49", 49"-56", 56"-59"
MI-D12	0-7"	7"-14"	14"-21"	21"-27"		27"-34", 34"-40", 40"-43", 43"-50", 50"-58"
MI-E1	0-4"	4"-10"	10"-13"			13"-23", 23"-32"
MI-E3	0-7"	7"-14"	14"-18"	18"-33"		33"-40"
MI-E7	0-10"	10"-14"	14"-17"	17"-23"		23"-26", 26"-36"
MI-E10	0-11"	11"-20"	20"-22"			
MI-E11	0-4"	4"-11"				11"-25"
MI-E15	0-13"	13"-17"	17"-22"			22"-27", 27"-32"

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Figure 1. New Bedford Harbor Overview

Map Source:
NAD 83 Mass State Plane ft
Date: 03.09.06

Marsh Island Study Area

ENSR | AECOM

0 0.25 0.5 1 Miles

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Figure 2. Marsh Island Site Locus

Sources:
NAD 83 Mass State Plane ft
Date: 03.09.06

Marsh Island Study Area

ENSR | AECOM

0 250 500 1,000 1,500 Feet

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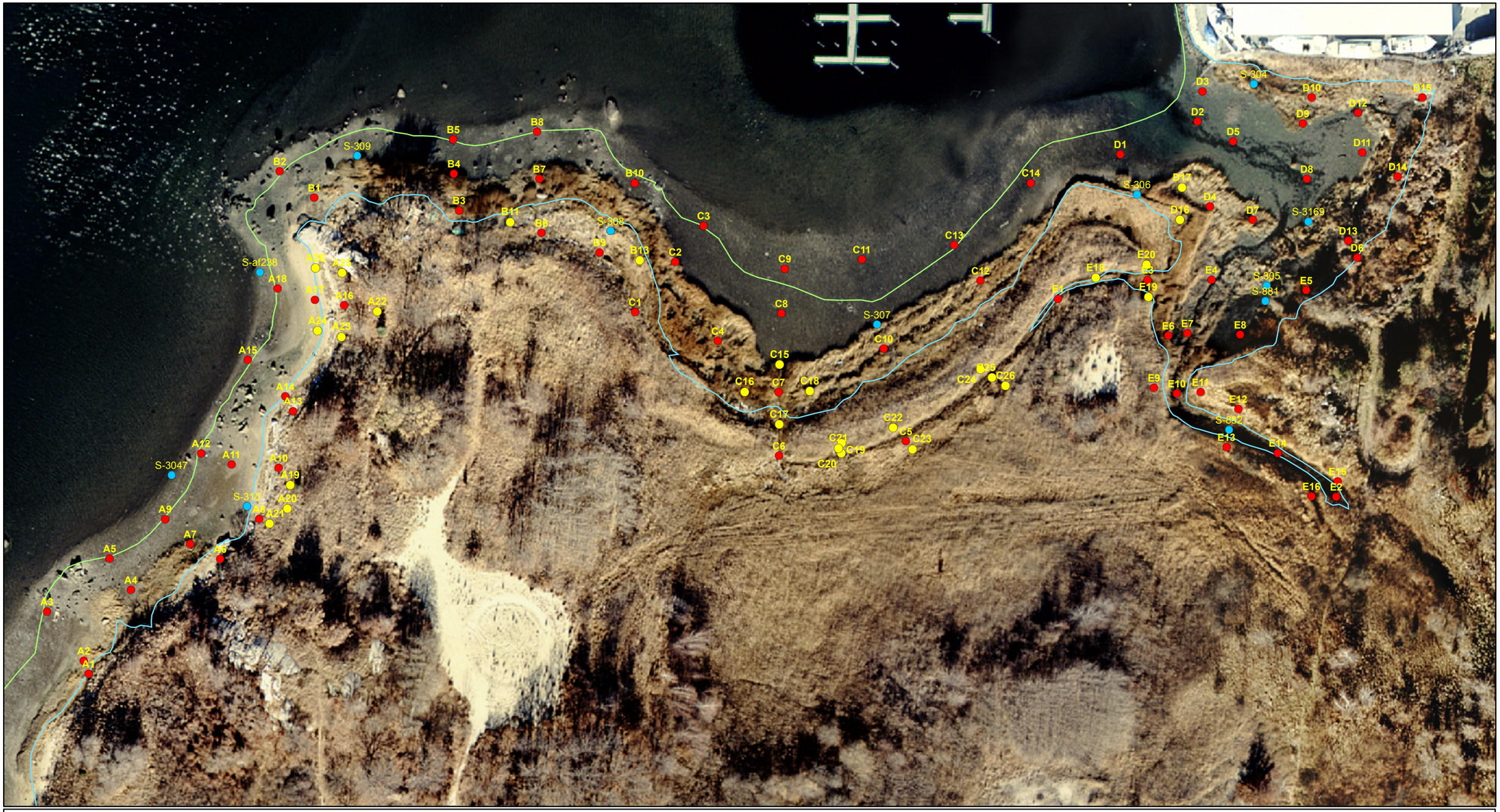

Figure 3. Marsh Island Sampled Stations

Map Source:
NAD 83 Mass State Plane ft
Date: 03.08.06

ENSR | AECOM

0 50 100 200 300 400 Feet

Mean High Water
Mean Lower Low Water

2005 Sampled Stations
2004 Sampled Stations
Historical Sampled Stations

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Figure 4 Raft Platform Used to Collect Shallow Water Samples

Figure 5 Mechanical Vibracore Used to Collect Land-Based Samples

Figure 6 Landing Craft Used for Site Access

Figure 7 Impact Driven Push Core Soil Sampling Device Used for Short Cores

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Figure 8. Areas A & B - Profiles of PCB Concentrations with Depth at Stations Where Elevated PCBs Were Detected

Map Source:
NAD 83 Mass State Plane ft
Date: 03.06.06

ENSR | AECOM

0 37.5 75 150 225 300 Feet

Note: PCB core analysis measured in inches.
PCB cores presented contain core segments greater than 25 mg/kg

Sampled Stations
Mean High Water
Mean Lower Low Water

Total PCB Concentrations (mg/kg)*
- ≤ 1.0
- 1.1 - 10.0
- 10.1 - 25.0
- 25.1 - 100.0
- ≥ 100.1

* Total PCB Concentration (mg/kg) based on (sum of NOAA Congeners) * 2.6, except for sample S-af238 based on total Aroclors

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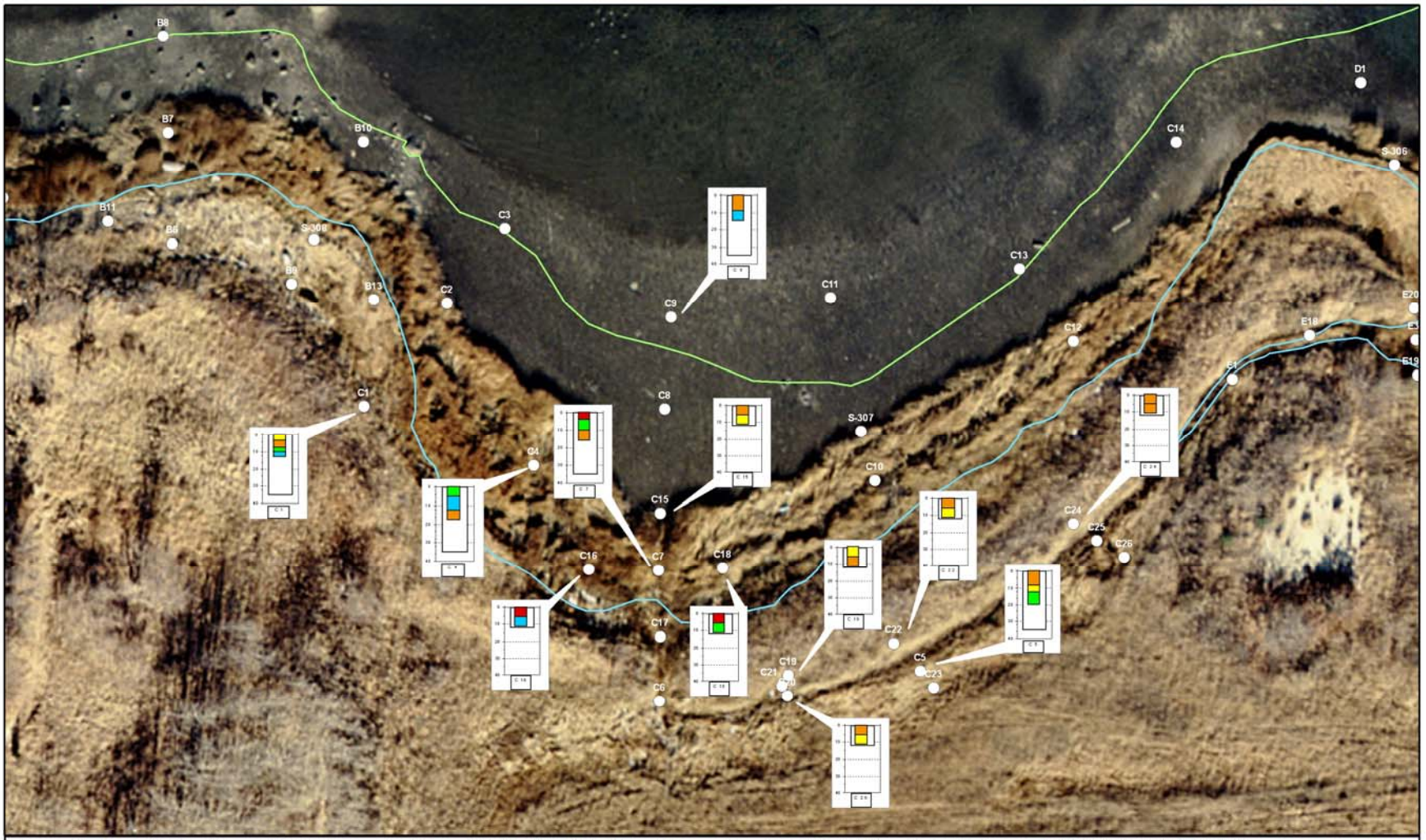

Figure 9. Area C - Profiles of PCB Concentrations with Depth at Stations Where Elevated PCBs Were Detected

Map Source:
NAD 83 Mass State Plane ft
Date: 03.06.06

ENSR | AECOM

0 25 50 100 150 200 Feet

Note: PCB core analysis measured in inches.
PCB cores presented contain core segments greater than 25 mg/kg

Sampled Stations
Mean High Water
Mean Lower Low Water

Total PCB Concentrations (mg/kg)*
≤ 1.0
1.1 - 10.0
10.1 - 25.0
25.1 - 100.0
≥ 100.1

* Total PCB Concentration (mg/kg) based on (sum of NOAA Congeners) * 2.6

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Figure 10. Areas D & E - Profiles of PCB Concentrations with Depth at Stations Where Elevated PCBs Were Detected

Map Source:
NAD 83 Mass State Plane ft
Date: 03.06.06

ENSR | AECOM

0 30 60 120 180 240 Feet

Note: PCB core analysis measured in inches.
PCB cores presented contain core segments greater than 25 mg/kg

Sampled Stations
Mean High Water
Mean Lower Low Water

Total PCB Concentrations (mg/kg)*
- ≤ 1.0
- 1.1 - 10.0
- 10.1 - 25.0
- 25.1 - 100.0
- ≥ 100.1

* Total PCB Concentration (mg/kg) based on (sum of NOAA Congeners) * 2.6

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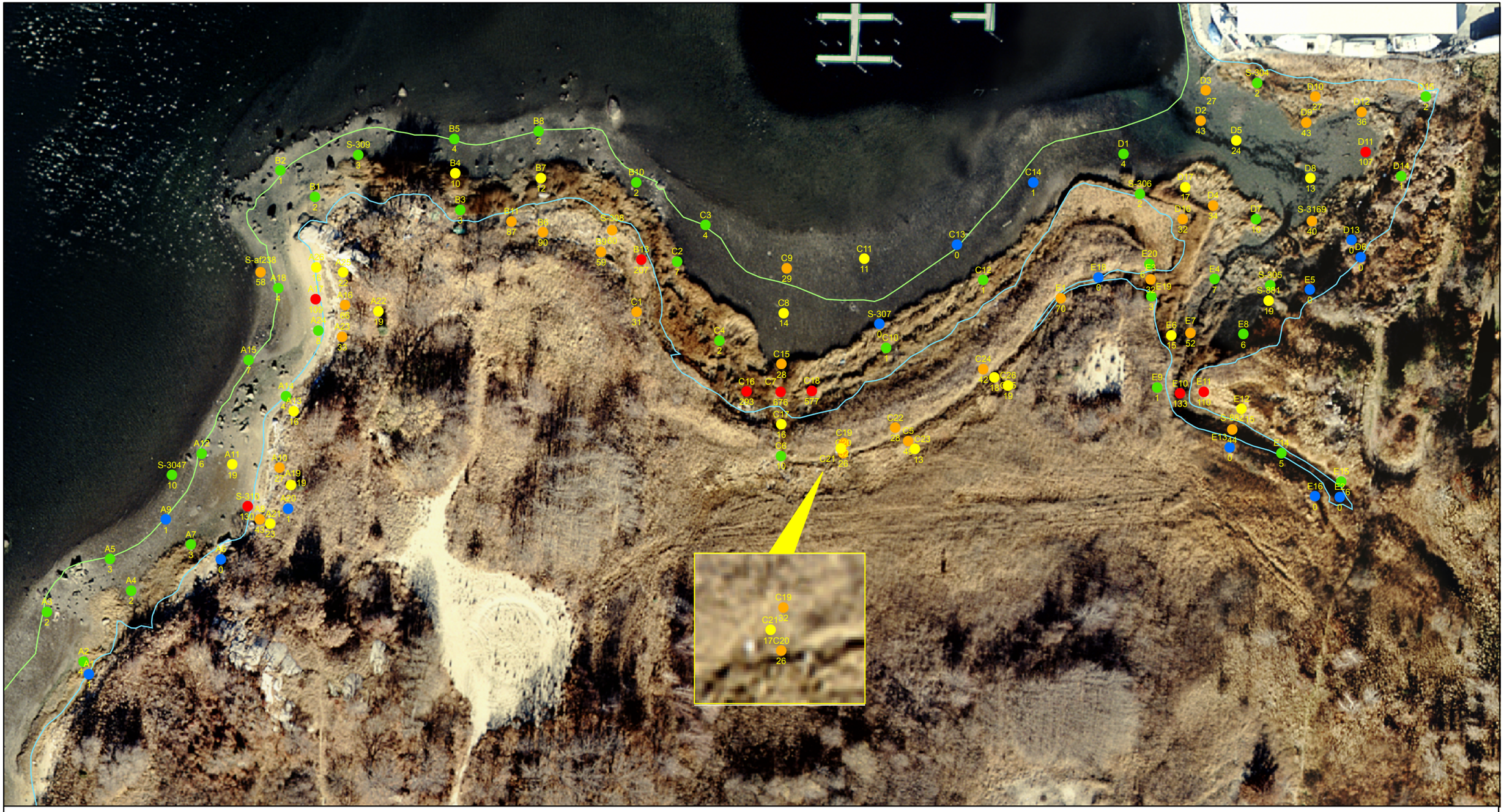

Figure 11. Total PCB Concentrations in the Surficial Layer (0-12")

Map Source:
NAD 83 Mass State Plane ft
Date: 03.06.06

ENSR | AECOM

0 50 100 200 300 400 Feet

* Total PCB Concentration (mg/kg) based on (sum of NOAA Congeners) * 2.6, except for sample S-af238 based on total Aroclors

* The 0 - 12" sediment layer contains multiple analyzed segments. The highest PCB Concentration is displayed where more than one segment was analyzed within the 0-12" layer.

Mean High Water
Mean Lower Low Water

Key: Station ID
Total PCB Concentration

Total PCB Concentrations (mg/kg)
- ≤ 1.0
- 1.1 - 10.0
- 10.1 - 25.0
- 25.1 - 100.0
- ≥ 100.1

* PCB Concentrations rounded to the nearest whole number

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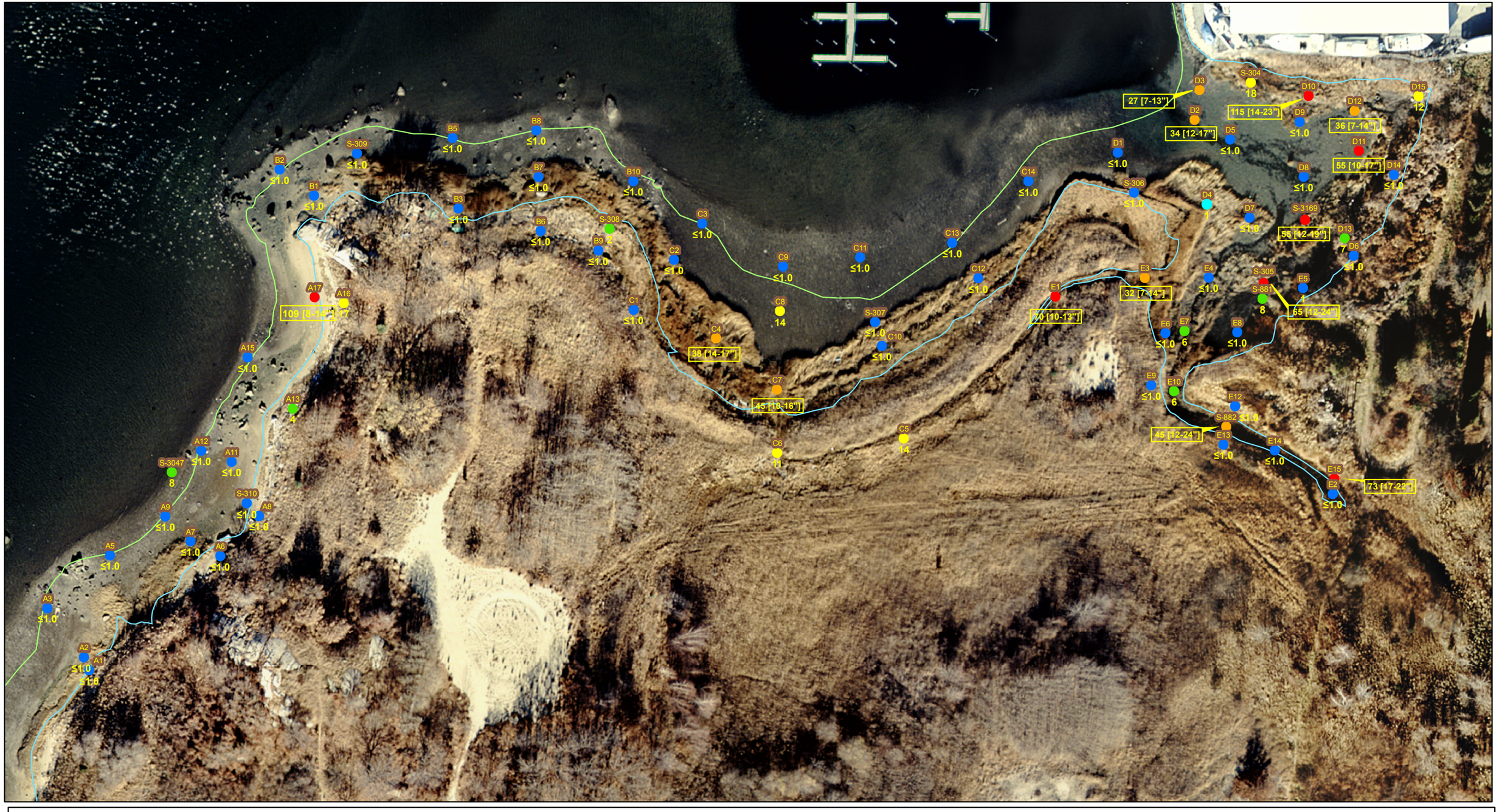

Figure 12. Total PCB Concentrations at Depths Greater than 12"

Map Source:
NAD 83 Mass State Plane ft
Date: 08.01.06

ENSR | AECOM

0 30 60 120 180 240 Feet

* The sediment layer below 12" contains multiple analyzed segments. The highest PCB Concentration is displayed where more than one segment was analyzed within the layer.

* Analyses were not conducted for all stations below the 12" layer, some stations are not be represented.

Mean High Water
Mean Lower Low Water

○ Sampled Marsh Island Stations
a [b - b"] a - concentration (mg/kg)*
b - analyzed segment length (inches)

Total PCB Concentrations (mg/kg)*
- ≤ 1.0
- 1.1 - 10.0
- 10.1 - 25.0
- 25.1 - 50.0
- ≥ 50.1

* Total PCB Concentration (mg/kg) based on (sum of NOAA Congeners) * 2.6

* PCB Concentrations rounded to the nearest whole number

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Figure 13. Approximate Boundaries of Areas Needing Shoreline Remediation

Map Source:
NAD 83 Mass State Plane ft
Date: 07.25.06

ENSR | AECOM

0 45 90 180 270 360 Feet

Mean High Water
Mean Lower Low Water

Sampled Marsh Island Stations

Elevated TPH Concentrations Detected (refer to section 3.3 for details)

Total PCB Concentration > 25 mg/kg, within the upper 12"

Total PCB Concentration > 50 mg/kg below the 12 inch horizon

* Total PCB Concentration (mg/kg) based on (sum of NOAA Congeners) * 2.6

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APPENDIX A

SUMMARY OF PCB DATA FROM SOIL AND SEDIMENT SAMPLING CONDUCTED AT THE MARSH ISLAND SITE – 2004 - 2005

Sample ID	Sample Date	Unit	Total PCBs
S04A-MIA1-0-0.50	Dec-04	MG/KG_DRYWT	1
S04A-MIA1-0.50-0.67	Dec-04	MG/KG_DRYWT	0.6
S04A-MIA1-0.67-1.08	Dec-04	MG/KG_DRYWT	0.1
S04A-MIA2-0-0.25	Dec-04	MG/KG_DRYWT	3.5
S04A-MIA2-0.25-0.75	Dec-04	MG/KG_DRYWT	0.2
S04A-MIA2-0.75-1.08	Dec-04	MG/KG_DRYWT	0.006
S04A-MIA3-0-0.33	Dec-04	MG/KG_DRYWT	2.1
S04A-MIA3-0.33-0.67	Dec-04	MG/KG_DRYWT	0.3
S04A-MIA3-0.67-1.08	Dec-04	MG/KG_DRYWT	0.01
S04A-MIA3-1.08-1.58	Dec-04	MG/KG_DRYWT	0.005
S04A-MIA3-1.58-2.00	Dec-04	MG/KG_DRYWT	0.005
S04A-MIA3-2.00-2.42	Dec-04	MG/KG_DRYWT	0.006
S04A-MIA4-0-0.33	Dec-04	MG/KG_DRYWT	1.2
S04A-MIA4-0.33-0.58	Dec-04	MG/KG_DRYWT	1.9
S04A-MIA4-0.58-0.83	Dec-04	MG/KG_DRYWT	0.2
S04A-MIA4-0.83-1.00	Dec-04	MG/KG_DRYWT	0.07
S04A-MIA5-0-0.58	Dec-04	MG/KG_DRYWT	3
S04A-MIA5-0.58-0.75	Dec-04	MG/KG_DRYWT	0.3
S04A-MIA5-0.75-1.25	Dec-04	MG/KG_DRYWT	0.1
S04A-MIA6-0-0.5	Dec-04	MG/KG_DRYWT	0.4
S04A-MIA6-0.5-1.0	Dec-04	MG/KG_DRYWT	0.2
S04A-MIA6-1.0-1.5	Dec-04	MG/KG_DRYWT	0.2
S04A-MIA7-0-0.50	Dec-04	MG/KG_DRYWT	2.6
S04A-MIA7-0.50-0.83	Dec-04	MG/KG_DRYWT	0.06
S04A-MIA7-0.83-1.58	Dec-04	MG/KG_DRYWT	0.006
S04A-MIA8-0-0.25	Dec-04	MG/KG_DRYWT	43
S04A-MIA8-0.25-0.58	Dec-04	MG/KG_DRYWT	10
S04A-MIA8-0.58-1.17	Dec-04	MG/KG_DRYWT	0.2
S04A-MIA9-0-0.58	Dec-04	MG/KG_DRYWT	0.6
S04A-MIA9-0.58-1.08	Dec-04	MG/KG_DRYWT	0.01
S04A-MIA9-1.08-1.50	Dec-04	MG/KG_DRYWT	0.03
S04A-MIA10-0-0.33	Dec-04	MG/KG_DRYWT	11
S04A-MIA10-0.33-0.58	Dec-04	MG/KG_DRYWT	12
S04A-MIA10-0.58-0.92	Dec-04	MG/KG_DRYWT	27
S04A-MIA11-0-0.33	Dec-04	MG/KG_DRYWT	5.9
S04A-MIA11-0.33-0.75	Dec-04	MG/KG_DRYWT	19
S04A-MIA11-0.75-1.25	Dec-04	MG/KG_DRYWT	0.04
S04A-MIA12-0-0.33	Dec-04	MG/KG_DRYWT	5.6
S04A-MIA12-0.33-0.67	Dec-04	MG/KG_DRYWT	0.3

Notes: -Total PCB Concentration (mg/kg) based on (sum of NOAA Congeners) * 2.6
-Non-detects were replaced with ½ the reporting limit

Sample ID	Sample Date	Unit	Total PCBs
S04A-MIA12-0.67-1.42	Dec-04	MG/KG_DRYWT	0.02
S04A-MIA13-0-0.50	Dec-04	MG/KG_DRYWT	16
S04A-MIA13-0.50-0.83	Dec-04	MG/KG_DRYWT	7.1
S04A-MIA13-0.83-1.25	Dec-04	MG/KG_DRYWT	3.6
S04A-MIA14-0-0.42	Dec-04	MG/KG_DRYWT	4.4
S04A-MIA14-0.42-0.83	Dec-04	MG/KG_DRYWT	0.9
S04A-MIA15-0-0.67	Dec-04	MG/KG_DRYWT	7.1
S04A-MIA15-0.67-1.50	Dec-04	MG/KG_DRYWT	0.2
S04A-MIA15-1.50-2.17	Dec-04	MG/KG_DRYWT	0.03
S04A-MIA16-0-0.25	Dec-04	MG/KG_DRYWT	6.7
S04A-MIA16-0.25-0.58	Dec-04	MG/KG_DRYWT	15
S04A-MIA16-0.58-0.67	Dec-04	MG/KG_DRYWT	47
S04A-MIA16-0.67-1.00	Dec-04	MG/KG_DRYWT	66
S04A-MIA16-1.00-1.17	Dec-04	MG/KG_DRYWT	17
S04A-MIA17-0-0.67	Dec-04	MG/KG_DRYWT	3.3
S04A-MIA17-0.67-1.17	Dec-04	MG/KG_DRYWT	109
S04A-MIA17-1.17-1.67	Dec-04	MG/KG_DRYWT	0.07
S04A-MIA17-1.67-2.17	Dec-04	MG/KG_DRYWT	0.02
S04A-MIA18-0-0.50	Dec-04	MG/KG_DRYWT	3.7
S04A-MIA18-0.50-0.75	Dec-04	MG/KG_DRYWT	1.5
S04A-MIA18-0.75-1.00	Dec-04	MG/KG_DRYWT	0.3
S04A-MIB1-0-0.5	Dec-04	MG/KG_DRYWT	1.9
S04A-MIB1-0.5-1.0	Dec-04	MG/KG_DRYWT	0.2
S04A-MIB1-1.0-1.5	Dec-04	MG/KG_DRYWT	0.3
S04A-MIB2-0-0.5	Dec-04	MG/KG_DRYWT	1.3
S04A-MIB2-0.5-1.0	Dec-04	MG/KG_DRYWT	0.4
S04A-MIB2-1.0-1.5	Dec-04	MG/KG_DRYWT	0.6
S04A-MIB3-0-0.17	Dec-04	MG/KG_DRYWT	1.5
S04A-MIB3-0.17-0.75	Dec-04	MG/KG_DRYWT	2.5
S04A-MIB3-0.75-1.33	Dec-04	MG/KG_DRYWT	0.2
S04A-MIB4-0-0.50	Dec-04	MG/KG_DRYWT	10
S04A-MIB4-0.50-1.00	Dec-04	MG/KG_DRYWT	0.5
S04A-MIB5-0-0.67	Dec-04	MG/KG_DRYWT	3.7
S04A-MIB5-0.67-1.08	Dec-04	MG/KG_DRYWT	0.3
S04A-MIB5-1.08-1.58	Dec-04	MG/KG_DRYWT	0.2
S04A-MIB6-0-0.58	Dec-04	MG/KG_DRYWT	90
S04A-MIB6-0.58-1.00	Dec-04	MG/KG_DRYWT	0.5
S04A-MIB6-1.00-1.58	Dec-04	MG/KG_DRYWT	0.03
S04A-MIB7-0-0.42	Dec-04	MG/KG_DRYWT	12

Notes: -Total PCB Concentration (mg/kg) based on (sum of NOAA Congeners) * 2.6
-Non-detects were replaced with ½ the reporting limit

Sample ID	Sample Date	Unit	Total PCBs
S04A-MIB7-0.42-0.75	Dec-04	MG/KG_DRYWT	5.1
S04A-MIB7-0.75-1.33	Dec-04	MG/KG_DRYWT	0.04
S04A-MIB7-1.33-1.83	Dec-04	MG/KG_DRYWT	0.01
S04A-MIB8-0-0.42	Dec-04	MG/KG_DRYWT	2
S04A-MIB8-0.42-1.17	Dec-04	MG/KG_DRYWT	0.08
S04A-MIB8-1.17-1.75	Dec-04	MG/KG_DRYWT	0.008
S04A-MIB9-0-0.42	Dec-04	MG/KG_DRYWT	59
S04A-MIB9-0.42-0.75	Dec-04	MG/KG_DRYWT	4.5
S04A-MIB9-0.75-0.83	Dec-04	MG/KG_DRYWT	1.8
S04A-MIB9-0.83-1.17	Dec-04	MG/KG_DRYWT	0.3
S04A-MIB10-0-0.67	Dec-04	MG/KG_DRYWT	2.5
S04A-MIB10-0.67-1.08	Dec-04	MG/KG_DRYWT	0.3
S04A-MIB10-1.08-1.58	Dec-04	MG/KG_DRYWT	0.03
S04A-MIC1-0-0.25	Dec-04	MG/KG_DRYWT	20
S04A-MIC1-0.25-0.58	Dec-04	MG/KG_DRYWT	31
S04A-MIC1-0.58-0.83	Dec-04	MG/KG_DRYWT	1.7
S04A-MIC1-0.83-1.08	Dec-04	MG/KG_DRYWT	0.3
S04A-MIC2-0-0.25	Dec-04	MG/KG_DRYWT	6.6
S04A-MIC2-0.25-1.00	Dec-04	MG/KG_DRYWT	0.1
S04A-MIC2-1.00-1.58	Dec-04	MG/KG_DRYWT	0.01
S04A-MIC2-1.58-2.08	Dec-04	MG/KG_DRYWT	0.008
S04A-MIC3-0-0.42	Dec-04	MG/KG_DRYWT	3.7
S04A-MIC3-0.42-0.92	Dec-04	MG/KG_DRYWT	0.1
S04A-MIC3-0.92-1.33	Dec-04	MG/KG_DRYWT	0.05
S04A-MIC3-1.33-2.08	Dec-04	MG/KG_DRYWT	0.01
S04A-MIC4-0-0.42	Dec-04	MG/KG_DRYWT	2.2
S04A-MIC4-0.42-1.17	Dec-04	MG/KG_DRYWT	0.8
S04A-MIC4-1.17-1.42	Dec-04	MG/KG_DRYWT	38
S04A-MIC5-0-0.75	Dec-04	MG/KG_DRYWT	49
S04A-MIC5-0.75-1.08	Dec-04	MG/KG_DRYWT	14
S04A-MIC5-1.08-1.67	Dec-04	MG/KG_DRYWT	6.9
S04A-MIC6-0-0.58	Dec-04	MG/KG_DRYWT	5.7
S04A-MIC6-0.58-1.25	Dec-04	MG/KG_DRYWT	10
S04A-MIC6-1.25-1.67	Dec-04	MG/KG_DRYWT	11
S04A-MIC7-0-0.33	Dec-04	MG/KG_DRYWT	676
S04A-MIC7-0.33-0.83	Dec-04	MG/KG_DRYWT	3.3
S04A-MIC7-0.83-1.33	Dec-04	MG/KG_DRYWT	45
S04A-MIC8-0-0.67	Dec-04	MG/KG_DRYWT	5.1
S04A-MIC8-0.67-1.33	Dec-04	MG/KG_DRYWT	14

Notes: -Total PCB Concentration (mg/kg) based on (sum of NOAA Congeners) * 2.6
-Non-detects were replaced with ½ the reporting limit

Sample ID	Sample Date	Unit	Total PCBs
S04A-MIC8-1.33-1.48	Dec-04	MG/KG_DRYWT	0.3
S04A-MIC9-0-0.75	Dec-04	MG/KG_DRYWT	29
S04A-MIC9-0.75-1.25	Dec-04	MG/KG_DRYWT	0.08
S04A-MIC10-0-0.67	Dec-04	MG/KG_DRYWT	1.2
S04A-MIC10-0.67-1.17	Dec-04	MG/KG_DRYWT	0.1
S04A-MIC10-1.17-1.75	Dec-04	MG/KG_DRYWT	0.08
S04A-MIC11-0-0.25	Dec-04	MG/KG_DRYWT	11
S04A-MIC11-0.25-0.83	Dec-04	MG/KG_DRYWT	0.4
S04A-MIC11-0.83-1.42	Dec-04	MG/KG_DRYWT	0.10
S04A-MIC11-1.42-2.17	Dec-04	MG/KG_DRYWT	0.02
S04A-MIC12-0-0.42	Dec-04	MG/KG_DRYWT	1
S04A-MIC12-0.42-0.92	Dec-04	MG/KG_DRYWT	0.08
S04A-MIC12-0.92-1.33	Dec-04	MG/KG_DRYWT	0.01
S04A-MIC13-0-0.83	Dec-04	MG/KG_DRYWT	0.2
S04A-MIC13-0.83-1.58	Dec-04	MG/KG_DRYWT	0.02
S04A-MIC13-1.58-2.08	Dec-04	MG/KG_DRYWT	0.006
S04A-MIC13-2.08-2.58	Dec-04	MG/KG_DRYWT	0.006
S04A-MIC14-0-0.50	Dec-04	MG/KG_DRYWT	0.7
S04A-MIC14-0.50-1.25	Dec-04	MG/KG_DRYWT	0.05
S04A-MIC14-1.25-1.58	Dec-04	MG/KG_DRYWT	0.03
S04A-MID1-0-0.42	Dec-04	MG/KG_DRYWT	3.6
S04A-MID1-0.42-0.75	Dec-04	MG/KG_DRYWT	0.2
S04A-MID1-0.75-1.42	Dec-04	MG/KG_DRYWT	0.02
S04A-MID1-1.42-2.08	Dec-04	MG/KG_DRYWT	0.03
S04A-MID2-0-0.50	Dec-04	MG/KG_DRYWT	26
S04A-MID2-0.50-1.00	Dec-04	MG/KG_DRYWT	43
S04A-MID2-1.00-1.42	Dec-04	MG/KG_DRYWT	34
S04A-MID2-1.42-1.92	Dec-04	MG/KG_DRYWT	0.2
S04A-MID3-0-0.58	Dec-04	MG/KG_DRYWT	20
S04A-MID3-0.58-1.08	Dec-04	MG/KG_DRYWT	27
S04A-MID3-1.08-2.00	Dec-04	MG/KG_DRYWT	1.7
S04A-MID3-2.00-2.33	Dec-04	MG/KG_DRYWT	0.5
S04A-MID4-0-0.33	Dec-04	MG/KG_DRYWT	34
S04A-MID4-0.33-1.25	Dec-04	MG/KG_DRYWT	1.4
S04A-MID4-1.25-1.83	Dec-04	MG/KG_DRYWT	0.2
S04A-MID5-0-0.83	Dec-04	MG/KG_DRYWT	24
S04A-MID5-0.83-1.33	Dec-04	MG/KG_DRYWT	0.07
S04A-MID5-1.33-1.67	Dec-04	MG/KG_DRYWT	0.04
S04A-MID6-0-0.5	Dec-04	MG/KG_DRYWT	0.05

Notes: -Total PCB Concentration (mg/kg) based on (sum of NOAA Congeners) * 2.6
-Non-detects were replaced with ½ the reporting limit

Sample ID	Sample Date	Unit	Total PCBs
S04A-MID6-0.5-1.0	Dec-04	MG/KG_DRYWT	0.01
S04A-MID6-1.0-1.5	Dec-04	MG/KG_DRYWT	0.01
S04A-MID7-0-0.75	Dec-04	MG/KG_DRYWT	10
S04A-MID7-0.75-1.25	Dec-04	MG/KG_DRYWT	0.9
S04A-MID7-1.25-2.0	Dec-04	MG/KG_DRYWT	0.2
S04A-MID8-0-0.67	Dec-04	MG/KG_DRYWT	13
S04A-MID8-0.67-1.33	Dec-04	MG/KG_DRYWT	0.1
S04A-MID8-1.33-1.92	Dec-04	MG/KG_DRYWT	0.01
S04A-MID8-1.92-2.33	Dec-04	MG/KG_DRYWT	0.01
S04A-MID9-0-0.75	Dec-04	MG/KG_DRYWT	43
S04A-MID9-1.33-2.08	Dec-04	MG/KG_DRYWT	0.05
S04A-MID9-2.08-2.42	Dec-04	MG/KG_DRYWT	0.05
S04A-MID10-0-1.0	Dec-04	MG/KG_DRYWT	27
S04A-MID10-1.0-1.17	Dec-04	MG/KG_DRYWT	5.3
S04A-MID10-1.17-1.92	Dec-04	MG/KG_DRYWT	115
S04A-MID10-1.92-2.33	Dec-04	MG/KG_DRYWT	0.7
S04A-MID11-0-0.83	Dec-04	MG/KG_DRYWT	107
S04A-MID11-0.83-1.42	Dec-04	MG/KG_DRYWT	55
S04A-MID11-1.42-2.92	Dec-04	MG/KG_DRYWT	0.2
S04A-MID12-0-0.58	Dec-04	MG/KG_DRYWT	18
S04A-MID12-0.58-1.12	Dec-04	MG/KG_DRYWT	36
S04A-MID12-1.12-1.75	Dec-04	MG/KG_DRYWT	0.3
S04A-MID12-1.75-2.25	Dec-04	MG/KG_DRYWT	0.3
S04A-MID13-0-0.5	Dec-04	MG/KG_DRYWT	0.4
S04A-MID13-0.5-1.0	Dec-04	MG/KG_DRYWT	0.3
S04A-MID13-1.0-1.5	Dec-04	MG/KG_DRYWT	6.6
S04A-MID14-0-0.5	Dec-04	MG/KG_DRYWT	0.8
S04A-MID14-0.5-1.0	Dec-04	MG/KG_DRYWT	1.1
S04A-MID14-1.0-1.5	Dec-04	MG/KG_DRYWT	0.6
S04A-MID15-0-0.5	Dec-04	MG/KG_DRYWT	1.8
S04A-MID15-0.5-1.0	Dec-04	MG/KG_DRYWT	1.3
S04A-MID15-1.0-1.5	Dec-04	MG/KG_DRYWT	6.2
S04A-MID15-1.5-2.0	Dec-04	MG/KG_DRYWT	12
S04A-MIE1-0-0.33	Dec-04	MG/KG_DRYWT	4.6
S04A-MIE1-0.33-0.83	Dec-04	MG/KG_DRYWT	4.3
S04A-MIE1-0.83-1.08	Dec-04	MG/KG_DRYWT	70
S04A-MIE2-0-0.42	Dec-04	MG/KG_DRYWT	0.2
S04A-MIE2-0.42-1.00	Dec-04	MG/KG_DRYWT	0.1
S04A-MIE2-1.00-1.33	Dec-04	MG/KG_DRYWT	0.04

Notes: -Total PCB Concentration (mg/kg) based on (sum of NOAA Congeners) * 2.6
-Non-detects were replaced with ½ the reporting limit

Sample ID	Sample Date	Unit	Total PCBs
S04A-MIE3-0-0.58	Dec-04	MG/KG_DRYWT	30
S04A-MIE3-0.58-1.17	Dec-04	MG/KG_DRYWT	32
S04A-MIE3-1.17-1.50	Dec-04	MG/KG_DRYWT	5.8
S04A-MIE3-1.50-2.75	Dec-04	MG/KG_DRYWT	0.07
S04A-MIE4-0-0.50	Dec-04	MG/KG_DRYWT	7
S04A-MIE4-0.50-1.17	Dec-04	MG/KG_DRYWT	0.1
S04A-MIE4-1.17-1.58	Dec-04	MG/KG_DRYWT	0.04
S04A-MIE4-1.58-2.33	Dec-04	MG/KG_DRYWT	0.009
S04A-MIE5-0-0.5	Dec-04	MG/KG_DRYWT	0.3
S04A-MIE5-0.5-1.0	Dec-04	MG/KG_DRYWT	0.3
S04A-MIE5-1.0-1.5	Dec-04	MG/KG_DRYWT	1
S04A-MIE6-0-0.83	Dec-04	MG/KG_DRYWT	15
S04A-MIE6-0.83-1.17	Dec-04	MG/KG_DRYWT	0.1
S04A-MIE6-1.17-1.58	Dec-04	MG/KG_DRYWT	0.07
S04A-MIE6-1.58-2.17	Dec-04	MG/KG_DRYWT	0.01
S04A-MIE7-0-0.83	Dec-04	MG/KG_DRYWT	52
S04A-MIE7-0.83-1.17	Dec-04	MG/KG_DRYWT	5.6
S04A-MIE7-1.17-1.42	Dec-04	MG/KG_DRYWT	0.4
S04A-MIE7-1.42-1.92	Dec-04	MG/KG_DRYWT	0.1
S04A-MIE8-0-0.5	Dec-04	MG/KG_DRYWT	6
S04A-MIE8-0.5-1.0	Dec-04	MG/KG_DRYWT	0.6
S04A-MIE8-1.0-1.5	Dec-04	MG/KG_DRYWT	0.3
S04A-MIE9-0-0.5	Dec-04	MG/KG_DRYWT	1.1
S04A-MIE9-0.5-1.0	Dec-04	MG/KG_DRYWT	0.2
S04A-MIE9-1.0-1.5	Dec-04	MG/KG_DRYWT	0.07
S04A-MIE10-0-0.92	Dec-04	MG/KG_DRYWT	133
S04A-MIE10-0.92-1.67	Dec-04	MG/KG_DRYWT	4.7
S04A-MIE10-1.67-1.83	Dec-04	MG/KG_DRYWT	6.2
S04A-MIE11-0-0.33	Dec-04	MG/KG_DRYWT	110
S04A-MIE11-0.33-0.92	Dec-04	MG/KG_DRYWT	3.6
S04A-MIE12-0-0.33	Dec-04	MG/KG_DRYWT	15
S04A-MIE12-0.33-1.17	Dec-04	MG/KG_DRYWT	0.05
S04A-MIE12-1.17-2.42	Dec-04	MG/KG_DRYWT	0.009
S04A-MIE13-0-0.33	Dec-04	MG/KG_DRYWT	0.2
S04A-MIE13-0.33-1.00	Dec-04	MG/KG_DRYWT	0.04
S04A-MIE13-1.00-1.75	Dec-04	MG/KG_DRYWT	0.03
S04A-MIE14-0-0.33	Dec-04	MG/KG_DRYWT	5.3
S04A-MIE14-0.33-1.00	Dec-04	MG/KG_DRYWT	0.3
S04A-MIE14-1.00-1.92	Dec-04	MG/KG_DRYWT	0.02

Notes: -Total PCB Concentration (mg/kg) based on (sum of NOAA Congeners) * 2.6
-Non-detects were replaced with ½ the reporting limit

Sample ID	Sample Date	Unit	Total PCBs
S04A-MIE14-1.92-2.17	Dec-04	MG/KG_DRYWT	0.02
S04A-MIE15-0-1.08	Dec-04	MG/KG_DRYWT	5.6
S04A-MIE15-1.08-1.42	Dec-04	MG/KG_DRYWT	7.3
S04A-MIE15-1.42-1.83	Dec-04	MG/KG_DRYWT	73
S04A-MIE16-0-0.33	Dec-04	MG/KG_DRYWT	0.2
S04A-MIE16-0.33-0.92	Dec-04	MG/KG_DRYWT	0.02
S04A-MIE16-0.92-1.25	Dec-04	MG/KG_DRYWT	0.03
S-05B-A19-0-0.5	Oct-05	MG/KG_DRYWT	19
S-05B-A19-0-0.5 REP	Oct-05	MG/KG_DRYWT	19
S-05B-A19-0.5-1.0	Oct-05	MG/KG_DRYWT	1.8
S-05B-A19-0.5-1.0 REP	Oct-05	MG/KG_DRYWT	0.8
S-05B-A20-0-0.5	Oct-05	MG/KG_DRYWT	0.7
S-05B-A20-0.5-1.0	Oct-05	MG/KG_DRYWT	0.2
S-05B-A21-0-0.5	Oct-05	MG/KG_DRYWT	23
S-05B-A21-0.5-1.0	Oct-05	MG/KG_DRYWT	0.7
S-05B-A22-0-0.5	Oct-05	MG/KG_DRYWT	19
S-05B-A22-0.5-1.0	Oct-05	MG/KG_DRYWT	0.4
S-05B-A23-0-0.5 QA	Oct-05	MG/KG_DRYWT	33
S-05B-A24-0-0.5	Oct-05	MG/KG_DRYWT	3.6
S-05B-A24-0.5-1.0	Oct-05	MG/KG_DRYWT	7.5
S-05B-A25-0-0.5	Oct-05	MG/KG_DRYWT	19
S-05B-A25-0.5-1.0	Oct-05	MG/KG_DRYWT	22
S-05B-A26-0-0.5	Oct-05	MG/KG_DRYWT	2.5
S-05B-A26-0-0.5MS	Oct-05	MG/KG_DRYWT	15
S-05B-A26-0-0.5MSD	Oct-05	MG/KG_DRYWT	8.9
S-05B-A26-0.5-1.0	Oct-05	MG/KG_DRYWT	16
S-05B-B11-0-0.5	Oct-05	MG/KG_DRYWT	52
S-05B-B11-0.5-1.0	Oct-05	MG/KG_DRYWT	87
S-05B-B13-0-0.5	Oct-05	MG/KG_DRYWT	207
S-05B-B13-0.5-1.0	Oct-05	MG/KG_DRYWT	87
S-05B-C15-0-0.5	Oct-05	MG/KG_DRYWT	28
S-05B-C15-0.5-1.0	Oct-05	MG/KG_DRYWT	21
S-05B-C16-0-0.5	Oct-05	MG/KG_DRYWT	293
S-05B-C16-0.5-1.0	Oct-05	MG/KG_DRYWT	0.8
S-05B-C17-0-0.5	Oct-05	MG/KG_DRYWT	16
S-05B-C17-0.5-1.0	Oct-05	MG/KG_DRYWT	1.8
S-05B-C18-0-0.5	Oct-05	MG/KG_DRYWT	577
S-05B-C18-0.5-1.0	Oct-05	MG/KG_DRYWT	6.2
S-05B-C19-0-0.5	Oct-05	MG/KG_DRYWT	19

Notes: -Total PCB Concentration (mg/kg) based on (sum of NOAA Congeners) * 2.6
-Non-detects were replaced with ½ the reporting limit

Sample ID	Sample Date	Unit	Total PCBs
S-05B-C19-0.5-1.0	Oct-05	MG/KG_DRYWT	32
S-05B-C20-0-0.5	Oct-05	MG/KG_DRYWT	26
S-05B-C20-0.5-1.0	Oct-05	MG/KG_DRYWT	17
S-05B-C21-0-0.5 QA	Oct-05	MG/KG_DRYWT	17
S-05B-C22-0-0.5	Oct-05	MG/KG_DRYWT	28
S-05B-C22-0-0.5 REP	Oct-05	MG/KG_DRYWT	24
S-05B-C22-0.5-1.0	Oct-05	MG/KG_DRYWT	23
S-05B-C22-0.5-1.0 REP	Oct-05	MG/KG_DRYWT	24
S-05B-C23-0-0.5	Oct-05	MG/KG_DRYWT	8.8
S-05B-C23-0-0.5MS	Oct-05	MG/KG_DRYWT	8.6
S-05B-C23-0-0.5MSD	Oct-05	MG/KG_DRYWT	7.1
S-05B-C23-0.5-1.0	Oct-05	MG/KG_DRYWT	13
S-05B-C24-0-0.5	Oct-05	MG/KG_DRYWT	42
S-05B-C24-0.5-1.0	Oct-05	MG/KG_DRYWT	26
S-05B-C25-0-0.5	Oct-05	MG/KG_DRYWT	9.4
S-05B-C25-0.5-1.0	Oct-05	MG/KG_DRYWT	18
S-05B-C26-0-0.5	Oct-05	MG/KG_DRYWT	13
S-05B-C26-0.5-1.0	Oct-05	MG/KG_DRYWT	19
S-05B-D16-0-0.5	Oct-05	MG/KG_DRYWT	32
S-05B-D16-0-0.5MS	Oct-05	MG/KG_DRYWT	2.9
S05B-D16-0-0.5MSD	Oct-05	MG/KG_DRYWT	1.8
S-05B-D16-0.5-1.0	Oct-05	MG/KG_DRYWT	10
S-05B-D17-0-0.5	Oct-05	MG/KG_DRYWT	17
S-05B-D17-0.5-1.0	Oct-05	MG/KG_DRYWT	0.3
S-05B-E18-0-0.5	Oct-05	MG/KG_DRYWT	0.1
S-05B-E18-0.5-1.0	Oct-05	MG/KG_DRYWT	0.1
S-05B-E19-0-0.5	Oct-05	MG/KG_DRYWT	2.6
S-05B-E19-0.5-1.0	Oct-05	MG/KG_DRYWT	2.3
S-05B-E20-0-0.5	Oct-05	MG/KG_DRYWT	6.2
S-05B-E20-0.5-1.0	Oct-05	MG/KG_DRYWT	1.4

Notes: -Total PCB Concentration (mg/kg) based on (sum of NOAA Congeners) * 2.6
-Non-detects were replaced with ½ the reporting limit