Jacobs

Final 2023-2024 Upper Harbor Redredging of Long-Term Monitoring Locations and North of Wood Street Remedial Action Report

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New Bedford Harbor Superfund Site

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Final 2023-2024 Upper Harbor Redredging of Long-Term Monitoring Locations and North of Wood Street Remedial Action Report

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Jacobs Project Management Co.

6 Otis Park Drive
Bourne, MA 02532-3870
United States

T +1.508.743.0214
F +1.508.743.9177
www.jacobs.com

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Acronyms and abbreviations

AWQC	ambient water quality criteria
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CSO	Combined Sewer Overflow
cy	cubic yards
DDA	debris disposal area
EPA	U.S. Environmental Protection Agency
EZ2	East Zone 2
ft	feet
GPS	global positioning system
Jacobs	Jacobs Engineering Group, Inc.
LH	Lower Harbor
LTM	Long-term monitoring
MBES	multibeam echo sounder
mg/kg	milligrams per kilogram
MHF-LS	Material Handling Facility Logistical Solutions
MHW	mean high water
MU	management unit
NAE	U.S Army Corps of Engineers - New England District
NBHSS	New Bedford Harbor Superfund Site
NPL	Superfund National Priorities List
OD	over-dredge
OH	Outer Harbor
OU	operable unit
PCB	polychlorinated biphenyl
RAO	remedial action objective
RAL	Remedial Action Limit
ROD	Record of Decision
RTK	real-time kinematic
SBES	single beam echo sounder

SES	Sevenson Environmental Services, Inc.
Site	New Bedford Harbor
Sq ft	square feet
SWAC	surface weighted average concentration
TCL	target cleanup level
TSCA	Toxic Substances Control Act
UH	Upper Harbor
USACE	U.S. Army Corps of Engineers

1. Introduction

This document serves as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Final Remedial Action Report for the additional removal of polychlorinated biphenyl (PCB)-contaminated subtidal sediments at three long-term monitoring (LTM) locations and two post remediation areas in the Upper Harbor (UH) of the New Bedford Harbor Superfund Site (NBHSS or Site). The objective of this report is to document the additional subtidal cleanup activities performed at these five locations (LTM-115, LTM-117, LTM-128, NWS-North, NWS-South) after the completion of Operable Unit 1 (OU1) UH subtidal dredging in 2020. These activities were conducted pursuant to the requirements of the 1998 Record of Decision (ROD) as it pertains to subtidal dredging (EPA1998).

As discussed herein, redredging/removal was performed by Jacobs Engineering Group, Inc. (Jacobs) and their subcontractor Sevenson Environmental Services, Inc. (SES), under U.S. Army Corps of Engineers – New England District (NAE) Remediation Action Contract No. W912WJ-15-D-0001 at various times between March 2023 through September 2024. The primary objective of the remedial action at these five locations was to remove sediments identified in post-remediation Site monitoring to contain elevated PCB concentrations. This document supplements the *Final Remedial Action Report for Operable Unit 1 Subtidal Dredging* (Jacobs 2020).

1.1 Site Description

The New Bedford Harbor Site (Figure 1) was proposed for the Superfund National Priorities List (NPL) in 1982 and finalized on the NPL in September 1983. Pursuant to 40 Code of Federal Regulations (CFR) 300.425 (c)(2), the Commonwealth of Massachusetts nominated the harbor as its priority site for listing on the NPL. The Site is located approximately 55 miles south of Boston, in Bristol County, Massachusetts; it is bounded to the east by the Town of Acushnet and Town of Fairhaven and bounded to the west by the City of New Bedford and the Town of Dartmouth. The Site covers approximately 18,000 acres, extending from the shallow northern reaches of the Acushnet River Estuary, southward through the commercial harbor of New Bedford and into the adjacent section of Buzzards Bay. Based on the different geographic, environmental, and man-made features in the harbor, it has been subdivided into three sections identified as the Upper Harbor (UH), Lower Harbor (LH), and the Outer Harbor (OH), indicated on Figure 1.

The subtidal zone of the UH comprises approximately 250 acres and is bounded to the North by Main St in Acushnet, MA and to the South by the Coggeshall Street Bridge (Figure 1). The LH comprises approximately 750 acres and is bounded to the north by the Coggeshall Street Bridge and to the south by the New Bedford Hurricane barrier. The OH (approximately 17,000 acres) begins at the Hurricane Barrier and extends southward into Buzzards Bay to an imaginary line extending from Rock Point (the southern tip of West Island in Fairhaven) southwesterly to New Bedford Harbor navigational channel buoy, Buoy C3, and then southwesterly to Mishaum Point in Dartmouth.

A brief overview of OU1 (Figure 2) and the remedial goals of the subtidal dredging is described in the following section. A more comprehensive overview and detailed history of the Site is found in the *Final Remedial Action Report for Operable Unit 1 Subtidal Dredging* (Jacobs 2020).

1.2 Operable Unit 1 Overview and Remedial Action Objectives

The ROD for OU1 issued on September 25, 1998 (EPA 1998) outlined the following three remedial action objectives (RAOs) for the intertidal, subtidal, and saltmarsh areas of OU1:

1) Reduce risks to human health by reducing PCB concentrations in seafood, by lowering PCB concentrations in sediment and in the water column.
2) Reduce human health risks due to dermal contact with or accidental ingestion of PCB-contaminated sediment in shoreline residential or public access areas.
3) Improve the quality of the seriously degraded marine ecosystem by:
    a) reducing the exposure of marine organisms to PCB-contaminated sediment while minimizing consequent harm to the environment, and;
    b) reducing surface water PCB concentrations to comply with chronic ambient water quality criteria (AWQC) by reducing PCB sediment concentrations

1.3 Previous Dredging and Cleanup Activities

Full scale dredging of UH subtidal sediments began in 2004 and continued seasonally each year through 2020. In 2014, the proceeds of a $366.25 million settlement with a major responsible party enabled the acceleration of Site cleanup operations. Subtidal dredging was completed in 2020, although as discussed herein five small sediment areas were subsequently identified during Site monitoring efforts as needing additional dredging/removal. The more detailed specifics of the dredging program are covered in the *Final Remedial Action Report for Operable Unit 1 Subtidal Dredging* (Jacobs 2020).

Prior to 2004, the cleanup of six acres of intertidal and subtidal area north of Wood Street in Acushnet, MA was completed in March 2003 (EPA 2005). This effort was prioritized by U.S. Enivronmental Protection Agency (EPA) due to high PCB levels in close proximity to residences and public parks. Additional cleanup was performed again in 2005 after post remediation monitoring determined that high PCB levels were still present along some areas of the shoreline. A more comprehensive description of cleanup activities is found in the *First* and *Second Five-Year Review Reports for the New Bedford Harbor Superfund Site* (EPA 2005, EPA 2010).

2. Long-Term Sampling and Analysis Overview

The EPA's Research Laboratory, Atlantic Ecology Division in Narragansett, Rhode Island developed a LTM program in 1993 to assess the overall effectiveness of Site remediation efforts over time. This program includes sediment sampling of all 18,000 acres of the Site and includes enumeration of benthic organisms as well as physical and chemical analyses of sediment. The LTM program is designed to be performed approximately every five years or after major remedial milestones. Also, as compared to post-dredging compliance sampling, which is based on six-inch sample depths, the LTM program is designed to sample only the upper two centimeters of sediment (*i.e.*, the most recent sediment layer). To date, seven rounds of the LTM program have been completed. These include the "baseline" sampling event conducted in October 1993 (LTM I), a second event (LTM II) conducted immediately after removal of the "hot spot" sediments in October of 1995, and five subsequent events conducted in 1999, 2004, 2009, 2014, and 2020 (LTM III, IV,

V, VI and VII) (Figure 3). The three LTM areas with elevated PCB levels discussed in this report were identified in the most recent round of sampling (LTM VII) in 2020.

In addition to the LTM program, EPA and its subcontractors conducted a variety of sediment PCB monitoring on an as needed basis to assist in the design and implementation of remedial actions and to understand overall site conditions. This has included multiple rounds of PCB monitoring north of the Wood/Slocum St bridge due to the identification of elevated PCB levels in this area over time (EPA 2005, 2010). The most recent sampling efforts in the North of Wood Street area are presented in Section 2.2 and 2.3.

2.1 LTM VII and Additional Sampling

Again, results of the LTM VII sampling conducted in fall 2020 identified that three UH locations (LTM locations 115, 117, and 128) contained elevated levels of PCBs (AECOM 2022a). See Table 1. LTM VII in the UH was conducted by AECOM in September and October 2020, after the completion of subtidal dredging activities, which were completed in March 2020. To further understand the nature and extent of PCB contamination at these three LTM areas, AECOM performed additional sampling in November 2021. In total, fifteen additional sediment cores were collected: the three original LTM locations (115, 117, and 128) and an additional four samples surrounding each location, approximately 50 feet (ft) north, south, east and west of each original LTM location (Figures 4, 5, 6). Piston push core samples were collected to a depth of 2 ft below the sediment surface at each location, consistent with post dredge confirmatory sampling methods (Jacobs 2019a). A description of survey and sampling methods is provided by AECOM in the *Long Term Monitoring VII Additional Sampling Memorandum* (AECOM 2022a). PCB results of LTM VII and additional sampling are provided in Table 1.

2.2 North of Wood Street-North

Post-remediation and characterization sampling from 2021-2022 identified a localized area of relatively significant PCB contaminated sediment in the NWS-N area (AECOM 2020a, 2020b, 2021, 2022). The results of the sediment sampling efforts found three locations with PCB concentrations above 300 milligram per kilogram (mg/kg) (AECOM 2021b). These 3 locations, NWS-05, NWS-05E, and NWS-05S, were found to be located in an approximately 30 square foot area (Figure 7). In response to these elevated locations, Jacobs conducted a probing investigation to identify the dominant material type of the river bottom (sand vs. silt vs. gravel). This was performed by probing with a steel rod and recording the penetration depth. The depths recorded during probing are illustrated on Figure 7. The purpose of the probing was to identify locations for additional sampling by locating any pockets of soft sediments amenable to further sampling (and which due to their fine-grained nature would be expected to contain higher PCB levels). Four additional sampling stations (NWS-501 through NWS-504) were proposed following a discussion with EPA and USACE on December 9, 2021. AECOM collected samples from the four additional locations during March 2022, after the winter ice had receded (AECOM 2022b). The results of the additional four samples are also included in the inset in Figure 7.

2.3 North of Wood Street-South

The NWS-S area, defined here as from the location of the combined sewer overflow (CSO) on the shoreline of River's End Park, south to the Wood St Bridge (Figure 8), was sampled from 2020-2023 (AECOM 2020a, 2021c, 2022b). The objective of these sampling efforts was to record changes in sediment PCB concentrations in the vicinity of this CSO as well as potential sediment recontamination from years of nearby OU1 dredging operations (the NWS area is "down current" from these OU1 dredging operations on the incoming tide and is only a few blocks north of the Aerovox facility) (Figure 8). Results from these sampling efforts indicated that multiple locations had elevated PCB sediment concentrations (Table 2).

3. Dredge Prism Development and Dredging Activities

The following sections summarize the dredge prism development and dredging activities for each LTM location and NWS area. The entirety of the prism development rationale for each LTM area and work plan details are outlined in the *Draft Final Dredge Plan for LTM-115* (Jacobs 2022a), and *Draft Final Dredge Plan for LTM-117 and LTM-128* (Jacobs 2022c). The full work plan and details on prism development for NWS-N and NWS-S are available in the *Final North of Wood Street Sediment Removal Rev. 1* (Jacobs 2022e) and *Draft Final North of Wood Street Excavation Work Plan* (Jacobs 2024) respectively.

3.1 LTM-115

3.1.1 LTM-115 Prism Development

Utilizing the data collected from the additional sampling event in 2021, a dredge prism was developed for LTM-115 to remove all material in the area found to contain total PCBs in concentrations exceeding the Remedial Action Limit (RAL) of 30 mg/kg (Jacobs 2022a). The PCB concentration at LTM-115B totaled 114 mg/kg in the top 0.5 ft of sediment and was below 1 mg/kg in the deeper segments (Table 3). The four 0.0-0.5 ft interval samples collected from the cardinal directions (N, E, S, W) were each well below the 30 mg/kg RAL used during the OU1 dredging operations. Deeper intervals were therefore not analyzed.

The horizontal extent of dredging was determined by assuming a linear concentration gradient between the center point (LTM-115B) and the four offset locations in the cardinal directions (N, E, S, W) (Figure 9). As an example calculation, the PCB concentration at location LTM-115B was 114 mg/kg in the 0.0 to 0.5 ft interval, while the PCB concentration at location LTM-115N, which is 50 ft to the north of LTM-115B, is 0.167 mg/kg. On a linear scale, it was calculated that the PCB concentration dropped 2.28 mg/kg per ft along the north axis from LTM-115B, which determined that the north prism boundary is 36.9 ft from LTM-115B. This calculation was repeated for each of the cardinal directions and in regard to LTM-115B (Jacobs 2022a). The results of these calculations are shown on (Table 3).

The removal thickness (vertical extent) was determined by using the bottom of the deepest sample interval where concentrations of total PCBs were above the 30 mg/kg RAL. For LTM-115B, this elevation corresponded to 0.5 ft below the sediment surface as shown in Table 1. The neatline elevations for the prism were established using post-dredge bathymetric data from Dredge Area O (Jacobs 2019b) and subtracting the sample interval thickness. A 0.2 ft over-dredge (OD) was incorporated into the prism below the neatline,

which resulted in a cut depth of 0.7 ft. The 0.2 ft OD intended to account for any error in the remedial methods.

The LTM-115 prism was designed on a 3 ft x 3 ft grid, similar to recent hybrid and mechanical dredge efforts at NBHSS (Jacobs 2017). Due to the combination of a relatively shallow cut depth of 0.7 ft and the bottom topography not being steeply sloped, the edges of the prism did not require stepping to prevent sloughing. Figure 7 shows the location of LTM-115 and the dredge prism. The horizontal footprint was calculated to be 4,724.9 square feet (sq ft) and the planned dredge volume was 122 cubic yards (cy). A full description of the plan is available in the *Draft Final Dredge Plan for LTM-115* (Jacobs 2022a) and is provided as Attachment A.

3.1.2 LTM-115 Dredging Activities

A land-based approach was collectively agreed upon by the NBHSS Team on 12 October 2022 to address LTM-115 (Jacobs 2022a). The LTM-115 area was dredged with the Hyundai 220LC-9A amphibious excavator as part of the Intertidal Remediation of East Zone 2 (EZ2) that was currently underway (Jacobs 2022b). Dredging was conducted on March 10th and 13th, 2023. A total of approximately 114.5 cy of material was removed based on the dredge management software (HYPACK®) installed on the excavator. A field engineer verified through the software and real-time kinematic (RTK) global positioning system (GPS) survey that the entirety of the prism was completed.

The southern portion of the LTM-115 dredge area was removed first, which allowed the excavator to track over the cleaned area and extend its reach to the northern portion of the prism (Figure 9). The excavator dug to the sides and in front of itself as it advanced north into the prism. Excavation of material was generally performed at and around low tide which helped with machine access and control of residuals. Material removed by the excavator was placed directly into a Hydrema articulated dump truck and transported to the material processing area which had been established on the Eversource property at EZ2.

Sediment generated from LTM-115 was handled and disposed of as part of EZ2 waste and in accordance with the Toxic Substances Control Act (TSCA). Waste was transported via truck from EZ2 to the Sawyer Street Debris Disposal Area (DDA), stabilized with Portland cement as needed, and then shipped offsite to the transload facility, Material Handling Facility Logistical Solutions (MHF-LS) Transload, Inc. in Worcester, Massachusetts. Once at the Transload facility, the dredged sediment was transloaded to rail cars for transport to and ultimate disposal at the Wayne Disposal, Inc. Site #2 Landfill, operated by Republic Services in Belleville, Michigan.

3.2 LTM-117

3.2.1 Prism Development

The Round VII LTM sampling in 2020 showed PCB concentrations at location LTM-117 to be 1,370 mg/kg in the 0-0.5 ft interval (Table 1). PCB concentrations were also elevated in the 0.5-1.0 ft interval at 162 mg/kg. Concentrations dropped to 5.07 mg/kg from the 1.0-1.5 ft interval. Results of additional sampling collected from the cardinal direction locations ranged from 1.13 mg/kg to 54.7 mg/kg (Table 1). Utilizing

this data, a dredge prism was developed to remove all material in the area found to contain PCBs in concentrations exceeding the RAL of 30 mg/kg, as described in *Draft Final Dredge Plan for LTM-117 and LTM-128* (Jacobs 2022c).

As with the LTM-115 area, the horizontal extent of dredging was determined by assuming a linear concentration gradient between the original station location (LTM-117B) at the 0-0.5 ft sample interval and the four offset locations in the cardinal directions. The results of these calculations are shown in Table 4.

The vertical extent of the prism was determined by the bottom of the last interval where PCB concentrations were greater than or equal to 30 mg/kg at the central LTM location (1.0 ft) (Table 1). The neatline elevations for the prisms were established using post-dredge bathymetric data from the Cable Crossing dredge area (Jacobs 2019c) and subtracting the sample interval thickness. A 0.2 ft OD was incorporated into the prism, below the neatline. The 0.2 ft OD was intended to account for any error in the remedial methods. Overall, the final removal thickness was determined to be 1.2 ft. The estimated dredge volume was 355 cy. Figure 10 shows the location of LTM-117 and the dredge prism, which is entirely subtidal. The horizontal footprint was calculated to be 7982.9 sq ft.

The LTM-117 prism was designed on a 3 ft x 3 ft grid, similar to recent hybrid and mechanical dredge efforts at NBHSS (Jacobs 2017). Because the prism was located in a relatively flat portion of the river, and the cut thicknesses were designed to be approximately 1 full bucket thick or less, no sloping or increase in the planned 10 percent overlap along the prism margins was instituted (Jacobs 2022c). A full description of the prism development is found in Attachment B, *Draft Final Dredge Plan for LTM-117 and LTM-128* (Jacobs 2022c).

3.2.2 LTM-117 Dredging Activities

The most effective means of dredging LTM-117 was determined to be with the Komatsu PC-300 on a 40 ft x 60 ft barge due to the location being entirely subtidal. This decision was made collectively by the NBHSS team on 12 October 2022 (Jacobs 2022c). Dredging was completed in 2 days (October 24-25, 2023) in conjunction with the on-going Intertidal Remediation of West Zone 2-3 (Jacobs 2022d) with a total removal volume of 341.8 cy. This volume was determined through the onboard dredge management software (HYPACK®). Completion of the dredge prism was confirmed through the HYPACK® software and real-time RTK GPS survey of elevation compliance points by a field engineer (Figure 11).

Dredging was conducted in lanes the width of the dredge equipment. After a lane had been completed, a steel work boat was used to advance the barge forward or move to a new lane. Efforts were made by the vessel operators to avoid propwash over un-dredged inventory when moving scows or repositioning the barge. Full buckets of sediment were placed by the excavator into a hopper scow secured to the hip of the barge. Once scows were full, they were transported to North Dock at the Sawyer Street facility and secured for unloading.

Unloading the scows was similar to other offloading operations performed at North Dock. Poly sheeting was laid out to contain any spillage, and a Republic Services owned and operated roll-off truck was backed onto the sheeting. A long front excavator with a conventional bucket then transferred the material from the

scow to the truck. The dredged material was then transported to the DDA at Sawyer Street for stabilization with Portland cement as needed. Material was eventually shipped offsite to the transload facility, MHF-LS Transload, Inc. in Worcester, Massachusetts. Once in Worcester, the waste material was transloaded to rail cars for transport to and ultimate disposal at the Wayne Disposal, Inc. Site #2 Landfill, operated by Republic Services in Belleville, Michigan.

3.3 LTM-128

3.3.1 LTM-128 Prism Development

The LTM-128 sample, consisting of the top 0-2 cm of sediment, reported a PCB concentration of 134 mg/kg in the upper 2.0 cm during the 2020 Round VII LTM sampling event (Jacobs 2022c). However, the 2021 "B" sample was found to have a PCB concentration of 1.72 mg/kg in the upper 0.5 ft. The NBHSS project team decided on a conservative approach and dredged the upper 0.5 ft of sediment within the LTM-128 prism despite the concentration differences between sample results (Jacobs 2022c). Results of samples collected in the four cardinal directions ranged from 0.0237 mg/kg to 72.6 mg/kg (Table 1).

The dredge prism for LTM-128 was developed in the same manner as the above locations by assuming a linear concentration gradient between the LTM sample location and those at cardinal points around the original sample, with the goal of removing sediments above the RAL of 30 mg/kg horizontally. Data used in the calculations is shown on Table 4.

The vertical extent of the prism was determined by the bottom of the deepest interval where PCB concentrations were greater than or equal to the 30 mg/kg RAL, which for LTM-128, was 0.5 ft (Table 1). In consideration of the differences between the 2020 and 2021 sample results, it was decided that the removal thickness would be 0.7 ft, which includes the 0.2 ft OD (Jacobs 2022c). This prism was entirely subtidal with a corresponding volume of 220 cy. The neatline elevations for the prisms were established using post-dredge bathymetric data from the Cable Crossing dredge area (Jacobs 2019c) and subtracting the sample interval thickness. The 0.2 ft OD is intended to account for any error in the remedial methods used to estimate the removal depth.

Figure 12 illustrates the planned horizontal extent of dredging at LTM-128 based on the linear concentration gradient to RAL 30 mg/kg. The horizontal footprint was calculated to be 8,487 sq ft.

The LTM-128 prism was designed on a 3 ft x 3 ft grid, similar to recent hybrid and mechanical dredge efforts at NBHSS. Because the prism is located in a relatively flat portion of the river, and the cut thickness is approximately 1 full bucket thick or less, no sloping or increase in the planned 10 percent overlap along the prism margins was instituted. A full description of the prism development is found in Attachment B, *Draft Final Dredge Plan for LTM-117 and LTM-128* (Jacobs 2022c).

3.3.2 LTM-128 Dredging Activities

Dredging of the LTM-128 area was performed from October 26 through November 1, 2023, immediately after dredging of the LTM-117 area was completed. The same Komatsu PC-300 situated on the 40 ft x 60 ft barge, as was used for dredging LTM-117, was used to remove a total of 357 cy of material. Completion

of the dredge prism was confirmed through the onboard dredge management software and the RTK GPS survey of elevation compliance points by a field engineer (Figure 13). Over-dig horizontally and vertically during the removal process accounted for the discrepancy between the planned volume (220 cy) and the actual volume removed (357 cy).

Dredging was conducted in lanes the width of the dredging equipment and performed in a single pass due to the relatively shallow cut thickness of 0.7 ft. The barge was maneuvered within the prism area using a steel work boat. Efforts were made by the vessel operators to avoid propwash when transporting scows or moving the barge forward or to a new dredge lane. Full scows were transported to North Dock at Area C for unloading. Handling of material at North Dock was performed using the same means and methods as material from LTM-117.

3.4 NWS-N

3.4.1 NWS-N Prism Development

On April 8, 2022, EPA, USACE, AECOM, and Jacobs discussed the 2021 - 2022 sampling results and probing survey completed within the NWS area. As a result of this discussion, an excavation prism was developed which is shown on Figure 7. The excavation prism was planned to include all material to a depth of 1 ft. below the existing river bottom. The proposed excavation neat volume was determined to be 62 cubic yards (cy). Because of the hard packed gravely sediment, it was assumed that an open top, toothed digging bucket would be utilized for the material removal and therefore an OD allowance of 0.5 ft. was incorporated, bringing the total estimated excavation volume to approximately 94 cy (Jacobs 2022e). A copy of the work plan is provided as Attachment C.

3.4.2 NWS-N Dredging Activities

Material removal was completed in a total of two days (July 31st-August 1st, 2023) using the Komatsu PC-300 long front excavator positioned on a gravel platform built out into the river (Jacobs 2022e). Approximately 94 cy of excavated sediment was loaded directly into roll-off containers provided by Republic Services and transported to the Sawyer Street DDA. Portland cement was added as needed to stabilize the material before being transported offsite to the transload facility, MHF-LS, in Worcester, Massachusetts. Once in Worcester, the waste material was transloaded to rail cars for transport to and ultimate disposal at the Wayne Disposal, Inc. Site #2 Landfill, operated by Republic Services in Belleville, Michigan. Completion of the dredge prism was confirmed through the onboard dredge management software.

3.5 NWS-S

3.5.1 NWS-S Prism Development

This section briefly describes the methods that were implemented to design the excavation limits and depths for the NWS-S area. The excavation footprint was developed using 11 PCB sediment samples (Table 2). The last line of the table provides the proposed cut depth at each sample location, which is based

on the core depth that is above the 30 ppm RAL plus an assumed OD of 0.25 ft. With over-dredge, the total estimated removal volume was 3,163 cy (Jacobs 2024). A full version of the work plan is provided as Attachment D.

3.5.2 NWS-S Dredging Activities

Dredging of the NWS-S prism occurred from June 28th through September 19th, 2024, a total of 57 working days. The total quantity of material removed was calculated to be 3,068 cy. Similar to the procedure at NWS-N, material was loaded directly into roll-off containers provided by Republic Services and transported to the DDA at 103 Sawyer St. Portland cement was then used to stabilize the material before being transported offsite to the transload facility, MHF-LS in Worcester, Massachusetts. Once in Worcester, the waste material was transloaded to rail cars for transport to and ultimate disposal at the Wayne Disposal, Inc. Site #2 Landfill, operated by Republic Services in Belleville, Michigan. Complete removal of the dredge prism sediment was confirmed through the HYPACK® software and RTK GPS survey of elevation compliance points by a field engineer (Figure 14).

4. Final Bathymetry

A series of final bathymetric surveys of the UH, which captured the three LTM areas and the two NWS areas, were performed by CR Environmental Inc. between September 23, 2024, and January 3, 2025. Surveys were conducted using a multibeam echo sounder (MBES) in deeper waters and a single beam echo sounder (SBES) in shallower waters. Multibeam bathymetric data were acquired using a Teledyne Reson T20-R MBES with an AML Micro-X sound velocity sensor installed on the sonar head. Single-beam survey data were acquired using a Teledyne ODOM Echotrac CV100 echo sounder equipped with an 8-degree 200 kilohertz transducer. Data was recorded using HYPACK MAX® software interfaced to the MBES and SBES. Final bathymetry for LTM-115, LTM-117, and LTM-128 are shown in Figures 15-17. The final bathymetry of NWS-N and NWS-S is shown in Figure 18.

5. Future Monitoring

The three LTM redredge locations discussed herein will be sampled again as part of the LTM Round VIII sampling planned for summer/fall 2026. The NWS area will be sampled again in spring/summer 2026 after the expected spring high river flows. The results of these sampling efforts will be compared to the above data to evaluate the success of the redredging operations discussed herein.

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———. 2019c. September. Final Cable Crossing Area Dredge Data Report. ACE-J23-35BG6000 M17-0019|0.

———.2022a. October. Draft Final Dredge Plan for LTM-115. ACE-J23-35BG7000-P1-0030

———.2022b. April. Draft Final Intertidal Work Plan for East Zone 2, Revision 1. ACE-J23-35BG6000-M1-0086

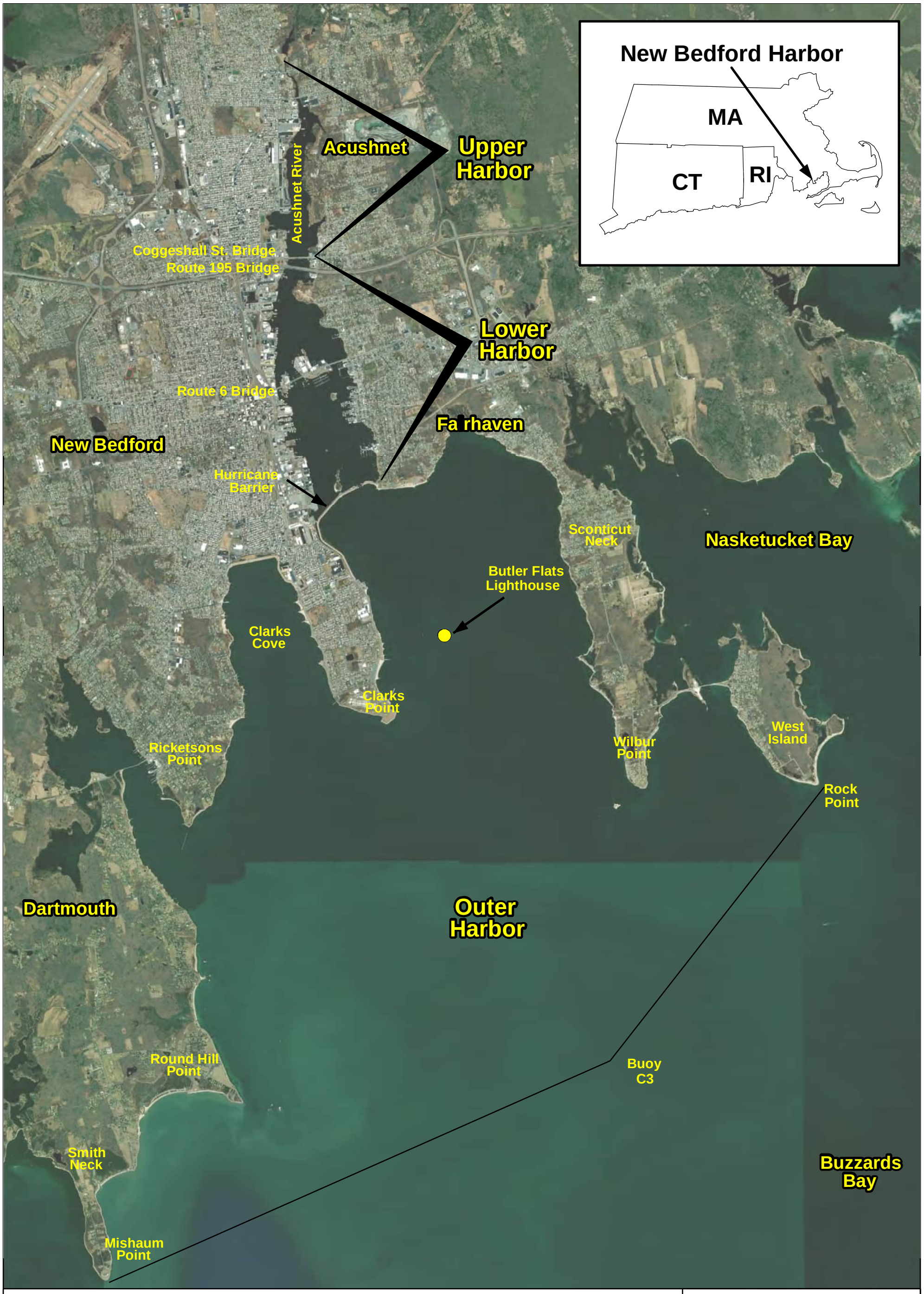
———.2022c. October. Draft Final Dredge Plan for LTM-117 and LTM-128. ACE-J23-35BG7000-P1-0032.

———.2022d. Draft Final Intertidal Work Plan for West Zone 2-3, Revision 1. ACE-J23-35BG6000-M1-0089. May. https://semspub.epa.gov/work/01/100014733.pdf

———.2022e. Final North of Wood Street Sediment Removal Rev. 1 ACE-J23-35BG7000-P1-0020.

———.2024. April. Draft Final North of Wood Street Excavation Work Plan. ACE-J23-35BG2000-M7-0021.

Figures



Legend

N

0 1 Miles

1:54,000

Basemap Reference: Bing Maps Aerial

JACOBS™

Site Location Map

New Bedford Harbor Superfund Site

NAME: jpiccuito Date: 8/11/2020

Figure 1

Path: Y:\NBH\Projects\35BG1001\20200812_Subtidal_RA_Report\ArcGIS\NBH_Site_Map_Subtidal_RA_Report_20200812.mxd

Wood St.

Acushnet

FORMER AEROVOX SITE

Upper Harbor

New Bedford

SAWYER STREET SUPPORT FACILITY

Sawyer St.

Coggeshall St.

Fairhaven

Marsh Island

EPA CAD CELL

FORMER DEWATERING FACILITY

Lower Harbor

New Bedford

Popes Island

Fish Island

6

Crow Island

Fairhaven

Hurricane Barrier

Outer Harbor

CDE CAP

0 500 1,000 Feet

Palmers Island

Hurricane Barrier

Path: Y:\NBH\Projects\35BG1001\20250211 Remedial Action Report LTM 115 117 128\ArcGIS\NBH_Dredge_Remediation_Status_Oparable_Unit1_20250331.mxd

Legend

- Dredging Completed
- Intertidal Remediation Completed
- Sediment Cap Areas
- Pilot CDF
- EPA CAD Cell

N

0 0.25 0.5 Miles

Aerial Photography MASSGIS 2021

Jacobs

New Bedford Harbor Superfund Site Operable Unit 1 Overview (as of July 2024)

New Bedford Harbor Superfund Site

NAME: jpiccuito Date: 3/31/2025

Figure 2

Legend

- Dredging Complete
- No Remediation Required
- Sediment Cap Areas
- Long Term Monitoring Sample Location

Basemap Data Source:
MassGIS 2023, ESRI

N

0 325 650
Feet
1:7,800

Aerial Photography MASSGIS 2023

Datum Info:
Horizontal - NAD83 StatePlane MA, feet

Jacobs

Upper Harbor Dredge Areas and LTM Locations

New Bedford Harbor Superfund Site

NAME: jpiccuito Date: 3/31/2025

Figure 3

Path: Y:\NBH\Projects\35BG1001\20250211 Remedial Action Report LTM 115 117 128\ArcGIS\Upper_Harbor_Dredge_Areas_and_LTM_Locations_20250211.mxd

0 180 360 Feet

S-LTM115B		S-LTM115E		S-LTM115N		S-LTM115S		S-LTM115W	
Sample Depth	Results (ppm)	Sample Depth	Results (ppm)	Sample Depth	Results (ppm)	Sample Depth	Results (ppm)	Sample Depth	Results (ppm)
0-0.5'	114	0-0.5'	6.72	0-0.5'	0.167	0-0.5'	21.4	0-0.5'	3.00
0.5-1.0'	0.345								
1.0-1.5'	0.00290								
1.5-2.1'	0.0796								

115B 115N 115E 115W 115B 115S

Site Location

Upper Harbor

Legend

Original Smple Location

Re-sampled Location

Final Dredge Area

MHHW

MLLW

Basemap Data Source: MassGIS 2021

Datum Info: Horizontal - NAD83 StatePlane MA, feet

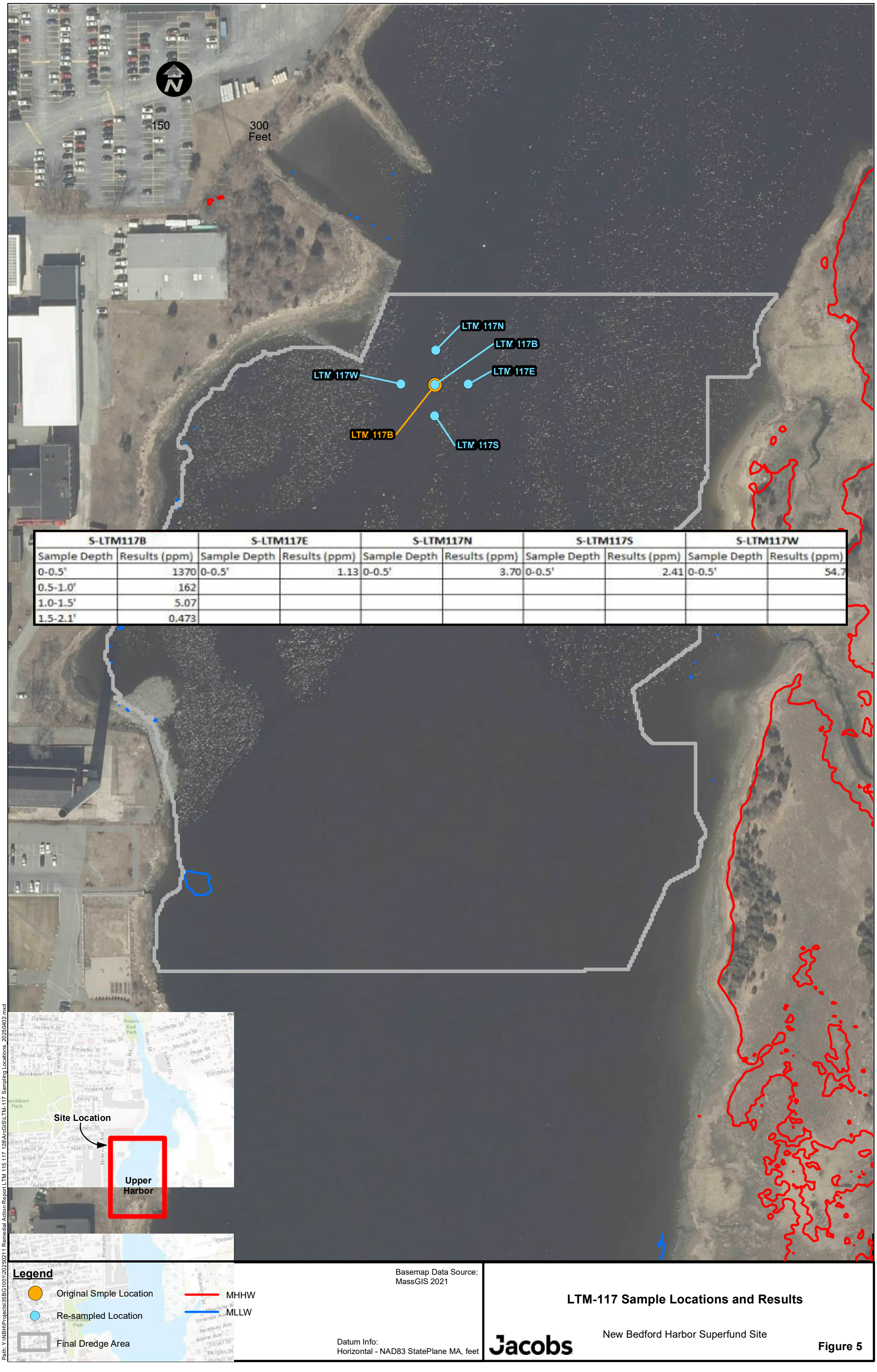
LTM-115 Sample Locations and Results

New Bedford Harbor Superfund Site

Jacobs

Figure 4

Path: Y:\NBH\Projects\35BG1001\20250211 Remedial Action Report LTM 115 117 128\ArcGIS\LTM-115 Sampling Locations_20250402.mxd



S-LTM117B		S-LTM117E		S-LTM117N		S-LTM117S		S-LTM117W	
Sample Depth	Results (ppm)	Sample Depth	Results (ppm)	Sample Depth	Results (ppm)	Sample Depth	Results (ppm)	Sample Depth	Results (ppm)
0-0.5'	1370	0-0.5'	1.13	0-0.5'	3.70	0-0.5'	2.41	0-0.5'	54.7
0.5-1.0'	162								
1.0-1.5'	5.07								
1.5-2.1'	0.473								

Legend

- Original Smple Location
- Re-sampled Location
- Final Dredge Area
- MHHW
- MLLW

Basemap Data Source:
MassGIS 2021

Datum Info:
Horizontal - NAD83 StatePlane MA, feet

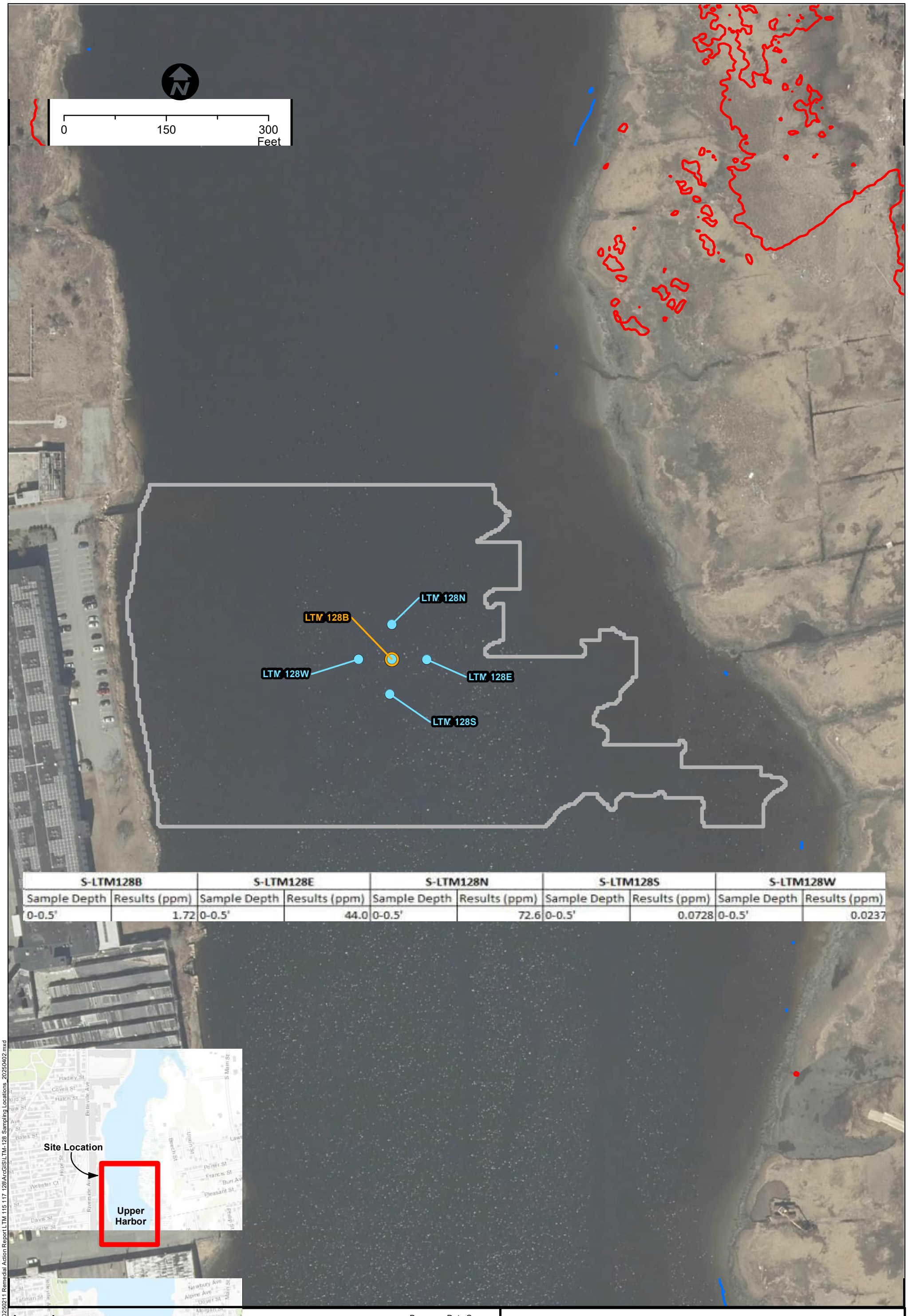
LTM-117 Sample Locations and Results

New Bedford Harbor Superfund Site

Jacobs

Figure 5

Path: Y:\NBH\Projects\35BG1001\20250211 Remedial Action Report LTM 115 117 128\ArcGIS\LTM-117 Sampling Locations_20250402.mxd



S-LTM128B		S-LTM128E		S-LTM128N		S-LTM128S		S-LTM128W	
Sample Depth	Results (ppm)	Sample Depth	Results (ppm)	Sample Depth	Results (ppm)	Sample Depth	Results (ppm)	Sample Depth	Results (ppm)
0-0.5'	1.72	0-0.5'	44.0	0-0.5'	72.6	0-0.5'	0.0728	0-0.5'	0.0237

Basemap Data Source:
MassGIS 2021

Datum Info:
Horizontal - NAD83 StatePlane MA, feet

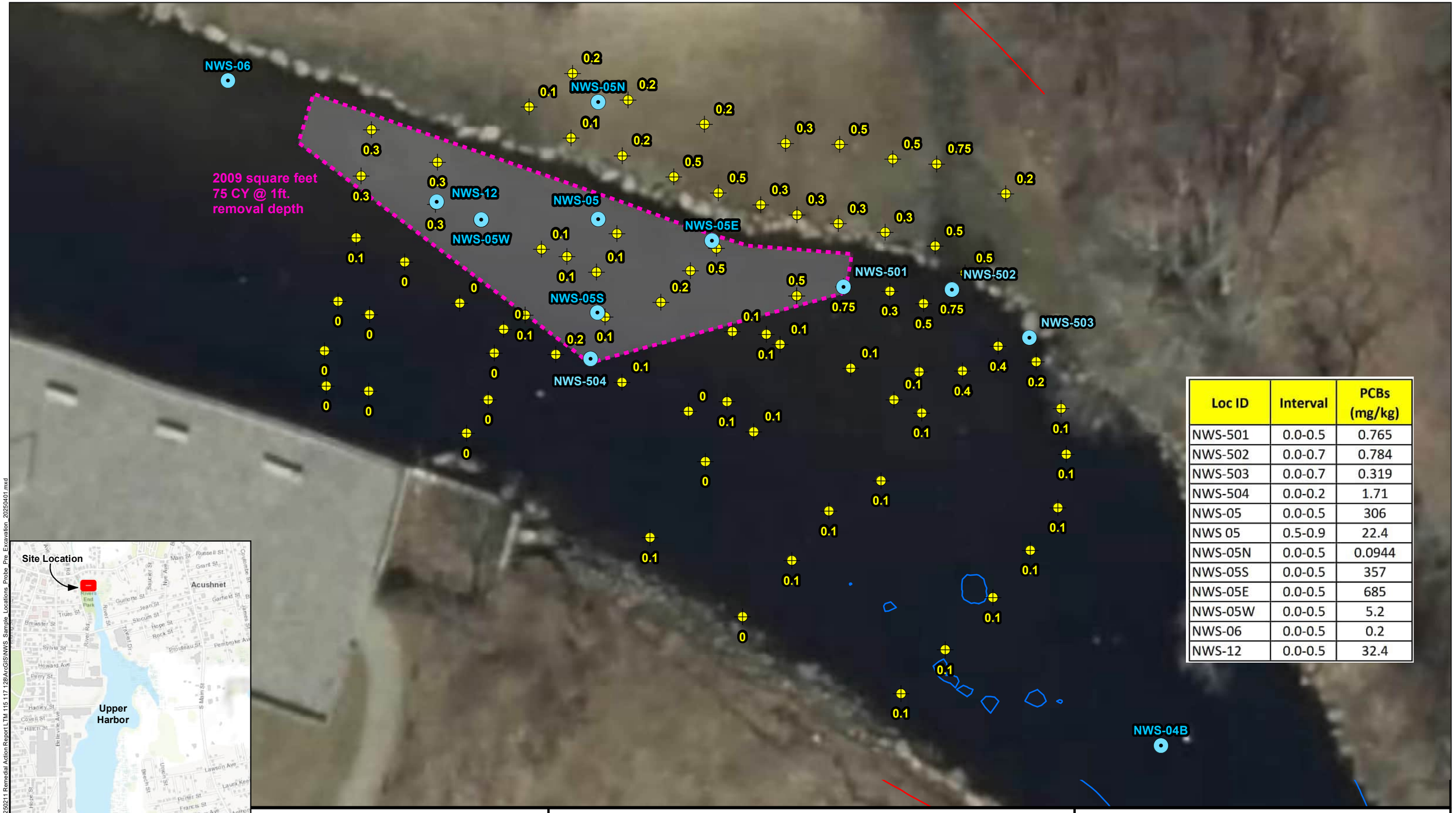
LTM-128 Sample Locations and Results

New Bedford Harbor Superfund Site

Jacobs

Figure 6

Path: Y:\NBH\Projects\35BG10012025021 Remedial Action Report LTM 115 117 128\ArcGIS\LTM-128 Sampling Locations_20250402.mxd



Loc ID	Interval	PCBs (mg/kg)
NWS-501	0.0-0.5	0.765
NWS-502	0.0-0.7	0.784
NWS-503	0.0-0.7	0.319
NWS-504	0.0-0.2	1.71
NWS-05	0.0-0.5	306
NWS 05	0.5-0.9	22.4
NWS-05N	0.0-0.5	0.0944
NWS-05S	0.0-0.5	357
NWS-05E	0.0-0.5	685
NWS-05W	0.0-0.5	5.2
NWS-06	0.0-0.5	0.2
NWS-12	0.0-0.5	32.4

NWS Excavation Area (4/21/22 revision)

MHHW

MLLW

0 20 40 Feet

May 2022

Basemap Data Source: MassGIS

Datum Info:
Vertical - NAVD88, feet
Horizontal - NAD83 StatePlane MA, feet

North of Wood St-North (NWS-N) Proposed Dredge Prism with Analytical and Probing Data

New Bedford Harbor Superfund Site

JACOBS

Figure 7

Path: Y:\NBH\Projects\35BG1001\20250211 Remedial Action Report LTM 115 117 128\ArcGIS\NWS_Sample_Locations_Probe_Pre_Excavation_20250401.mxd

0 50 100 Feet

March 2024

CSO Outfall

C015-016
NWS-10
C015-023
NWS-09
C015-028
NWS-08
C015-033
C015-040
C015-039
C015-049
C015-048

25-10F
25-10AK
25-10E
25-238
25-108
25-24
119-178
119-42
119-43
119-33
119-262
116-380
116-84
116-379
116-205
116-85
116-130
116-131
116-132

Wood Street

Site Location
Acushnet
Upper Harbor

Legend

- Core Location
- Contour (0.5 interval)
- Parcel
- Road/ROW

Elevation (MLLW)

- 0.27 - 1.45
- -0.91 - 0.27
- -2.09 - -0.91
- -3.27 - -2.09
- -4.45 - -3.27

Bathymetric Survey: CR Environmental Inc. 02/15/2024
(NAVD88, feet converted to MLLW, feet 03/08/2024)
Aerial Photography MASSGIS 2021

- MHHW
- MLLW

Datum Info:
Vertical - MLLW, feet
Horizontal - NAD83 StatePlane MA, feet

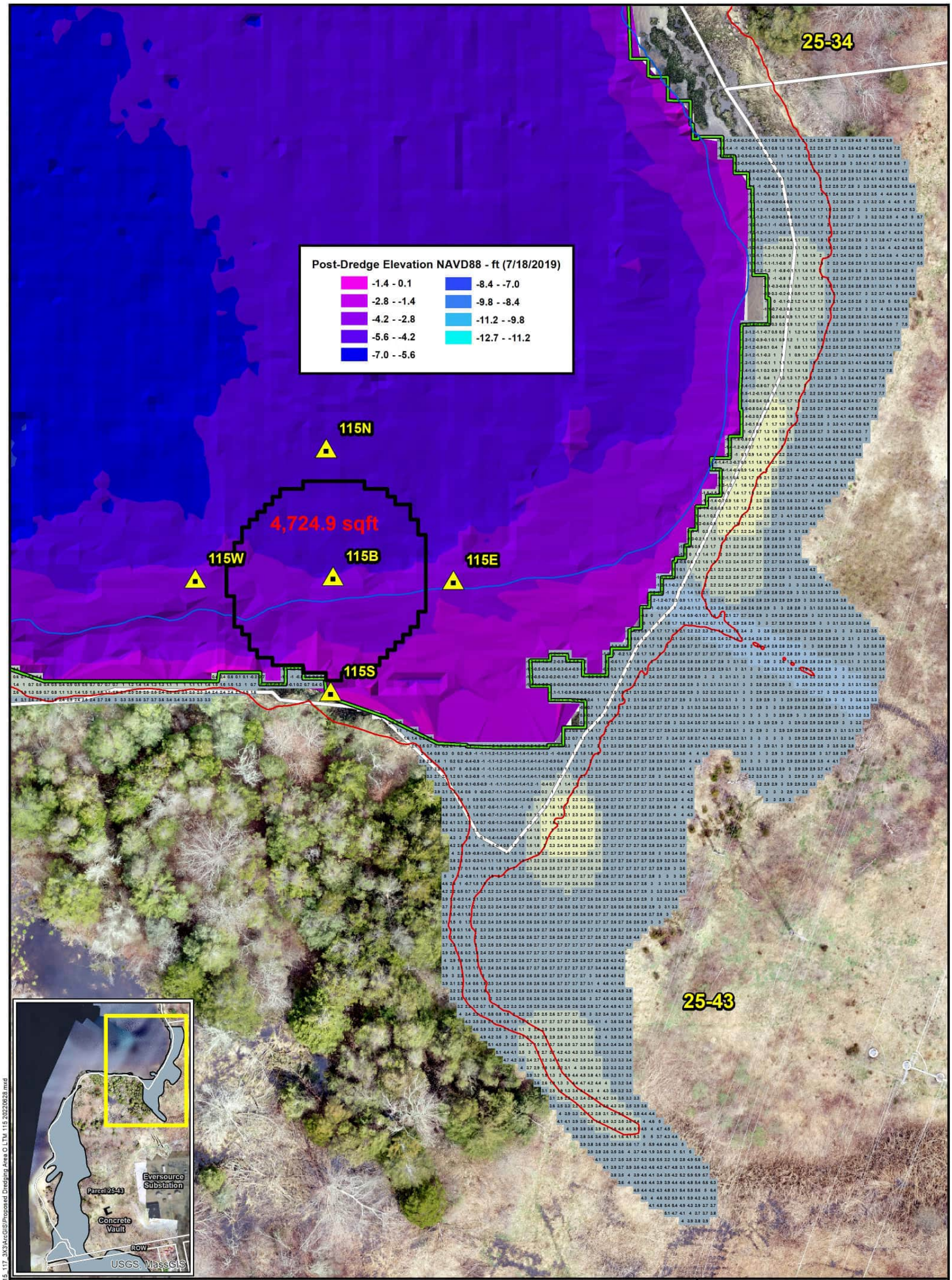
North of Wood Street-South (NWS-S) Sampling Locations and 2024 Bathymetry (Pre-dredge)

New Bedford Harbor Superfund Site

Jacobs

Figure 8

Path: Y:\NBH\Projects\35BG100\20250211 Remedial Action Report LTM 115 117 128\ArcGIS\NWS_Preliminary_Dredge_Bathy_Contours_MLLW_20250401.mxd



Legend

- Inland Reach of Dredge
- MHHW (1.99 ft)
- MLLW (-1.97 ft)
- Parcel Boundary

EZ2 Excavation

- 3
- 2
- 1.5
- 1

2.1 Pre-Excavation Elevations NAVD88 ft.(Nearview 2018)

Sample Location

Proposed LTM-115 Dredge Prism Thickness of Sediment to Remove = 0.5 ft. plus 0.2 ft. OD

Pre-Excavation MHHW and MLLW Elevations NAVD88 ft. and Basemap Photography Source: Nearview 2018

0 5 10 20 30 40 Feet

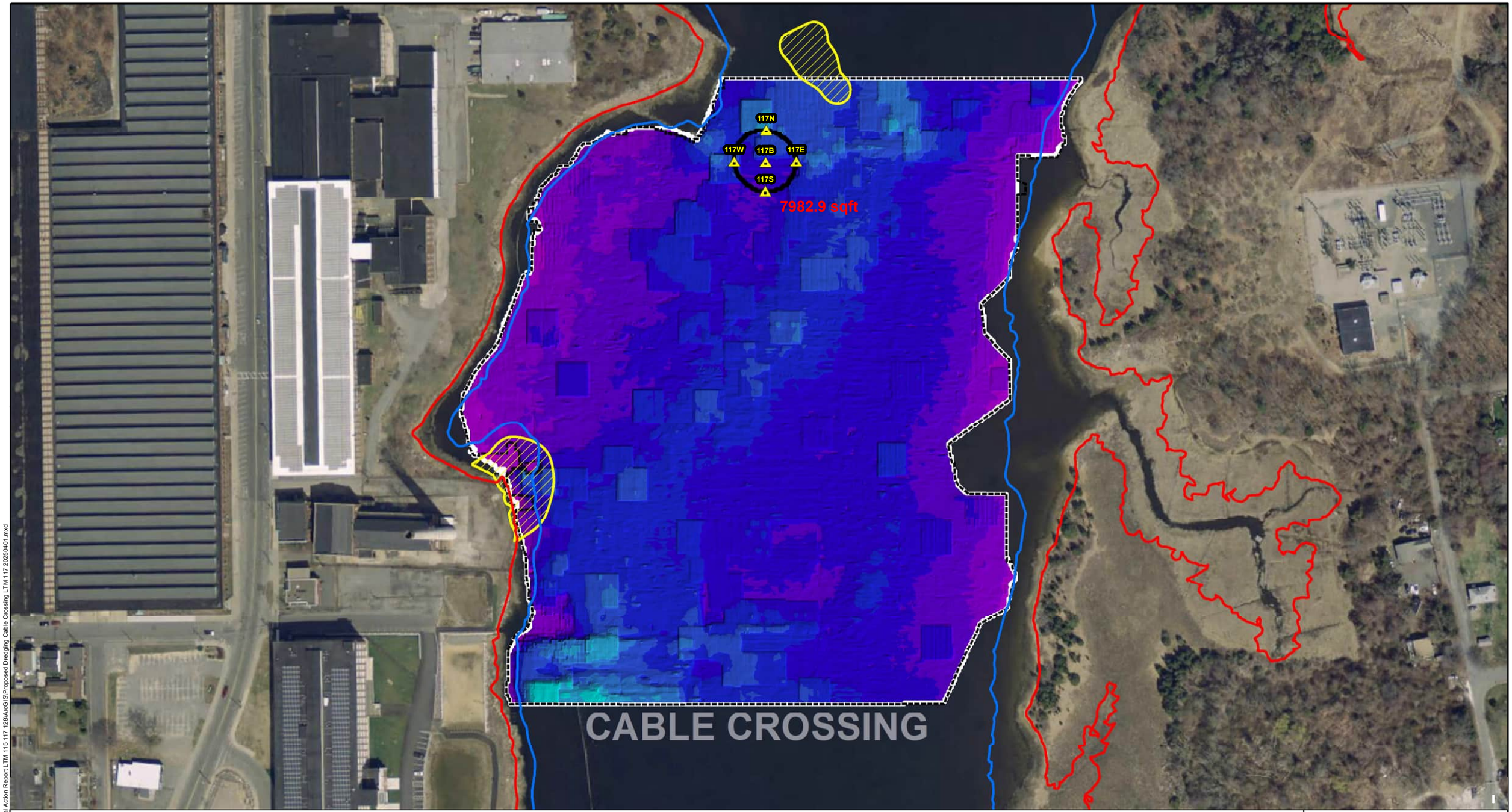
JACOBS™

LTM-115 Location and Dredge Prism

New Bedford Harbor Superfund Site

July 2022 **Figure 9**

Path: Y:\NBH\Projects\35BG1001\20220628_Proposed_Dredging_LTM115_117_3X3\ArcGIS\Proposed Dredging Area O LTM 115 20220628.mxd



Legend

- Sample Location
- Cable Crossing Dredge Area
- Cap Limit
- Proposed LTM 117 Dredge Prism Thickness of Sediment to Remove = 1.0 ft. plus 0.2 ft. OD
- MHHW
- MLLW

Post-Dredge Elevation NAVD88 - ft (10/29/2018)

-2.1 - -1.0	-7.2 - -6.2
-3.1 - -2.1	-8.2 - -7.2
-4.1 - -3.1	-9.2 - -8.2
-5.1 - -4.1	-10.3 - -9.2
-6.2 - -5.1	-11.3 - -10.3

Aerial Photography MASSGIS 2014

July 2022

0 150 Feet

1:1,800

JACOBS®

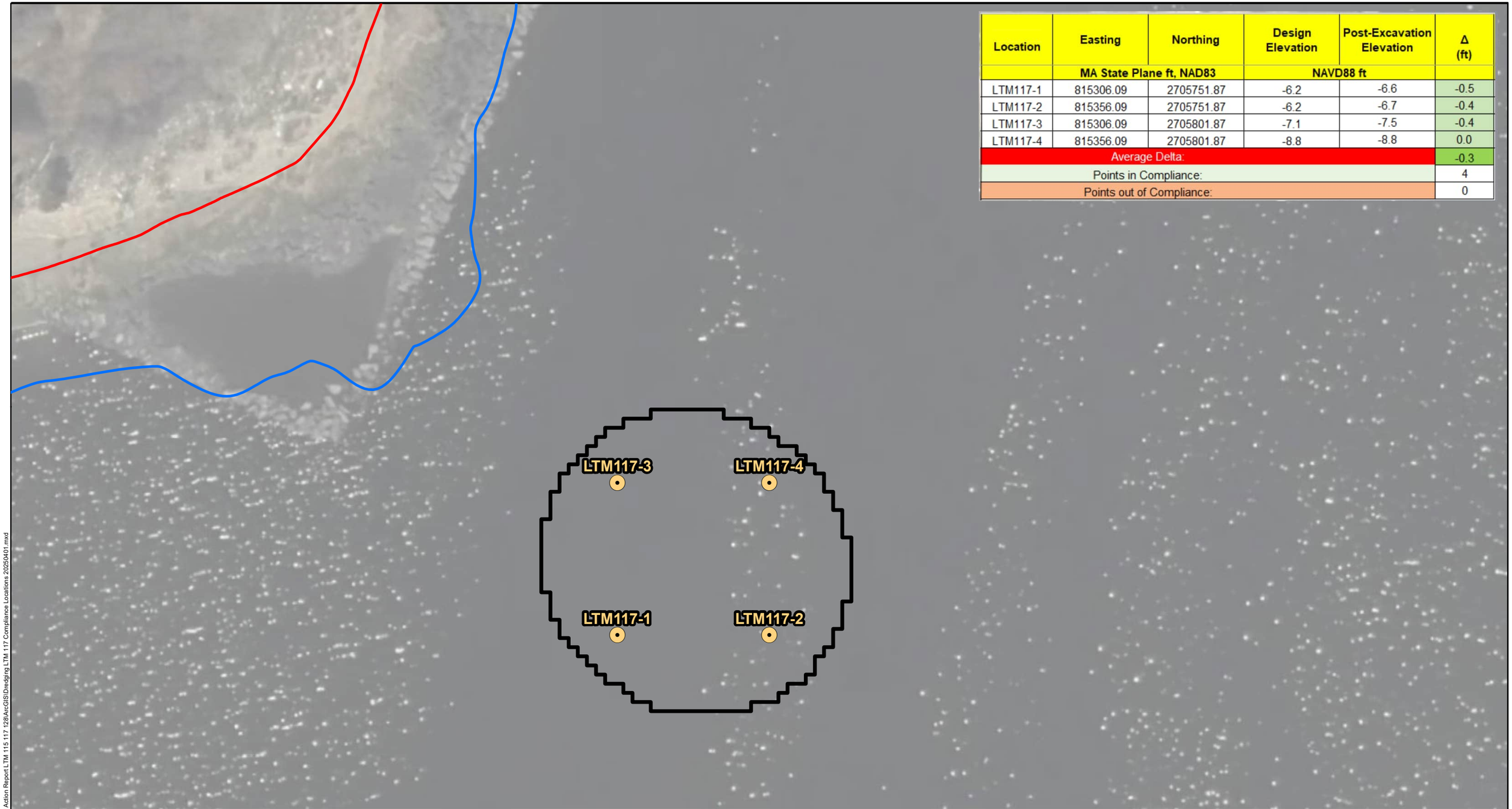
LTM-117 Location and Dredge Prism

NAME: jpicculo Date: 4/2/2025

Figure 10

Path: Y:\NBH\Projects\35BG100\120250211 Remedial Action Report LTM 115 117 128\ArcGIS\Proposed Dredging Cable Crossing LTM 117 20250401.mxd

Location	Easting	Northing	Design Elevation	Post-Excavation Elevation	Δ (ft)
	MA State Plane ft, NAD83		NAVD88 ft		
LTM117-1	815306.09	2705751.87	-6.2	-6.6	-0.5
LTM117-2	815356.09	2705751.87	-6.2	-6.7	-0.4
LTM117-3	815306.09	2705801.87	-7.1	-7.5	-0.4
LTM117-4	815356.09	2705801.87	-8.8	-8.8	0.0
Average Delta:					-0.3
Points in Compliance:					4
Points out of Compliance:					0



Legend

Compliance Location

LTM 117 Dredge Area

MHHW

MLLW

Notes:
Inset table shows compliance point coordinates and post dredge elevations surveyed by field engineer using RTK GPS.

Aerial Photography MASSGIS 2021

October 2023

0 30 Feet

1:360

Jacobs

LTM 117
Dredge Area
Compliance Locations
(50 x 50 ft grid)

NAME: jpiccuito Date: 4/2/2025

Figure 11

Path: Y:\NBH\Projects\35BG100120250211 Remedial Action Report LTM 115 117 128\ArcGIS\Dredging LTM 117 Compliance Locations 20250401.mxd

L

LTM 128N

8487 sqft

LTM 128 W

LTM 128B

LTM 128E

LTM 128S

Area R

Esri, Maxar, E

Legend

- Sample Location
- Dredge Area P
- MHHW
- MLLW
- Proposed LTM 128 Dredge Prism Thickness of Sediment to Remove = 1.0 ft. plus 0.2 ft. OD

Aerial Photography MASSGIS 2014

0 35 70

Feet

1:420

JACOBS®

Proposed LTM 128 Dredge Prism

NAME: jpicciuto Date: 4/2/2025

Figure 12

Path: Y:\NB\HIProjects\35BG\100\120250211 Remedial Action Report LTM 115 117 128\ArcGIS\Proposed Dredging Area P LTM 128_20250401.mxd

Location	Easting	Northing	Design Elevation	Post-Excavation Elevation	Δ (ft)
	MA State Plane ft, NAD83		NAVD88 ft		
LTM128-1	815368.43	2703622.77	-13.3	-13.5	-0.2
LTM128-2	815418.43	2703622.77	-12.6	-13.0	-0.4
LTM128-3	815368.43	2703672.77	-13.1	-13.2	-0.1
LTM128-4	815418.43	2703672.77	-12.0	-12.4	-0.4
Average Delta:					-0.3
Points in Compliance:					4
Points out of Compliance:					0

Legend

Compliance Location (Survey date 1 November 2023)

LTM-128 Dredge Area

Notes

Inset table shows compliance point coordinates and post dredge elevations surveyed by field engineer using RTK GPS

Aerial Photography MASSGIS 2021

October 2023

0 30 Feet

1:360

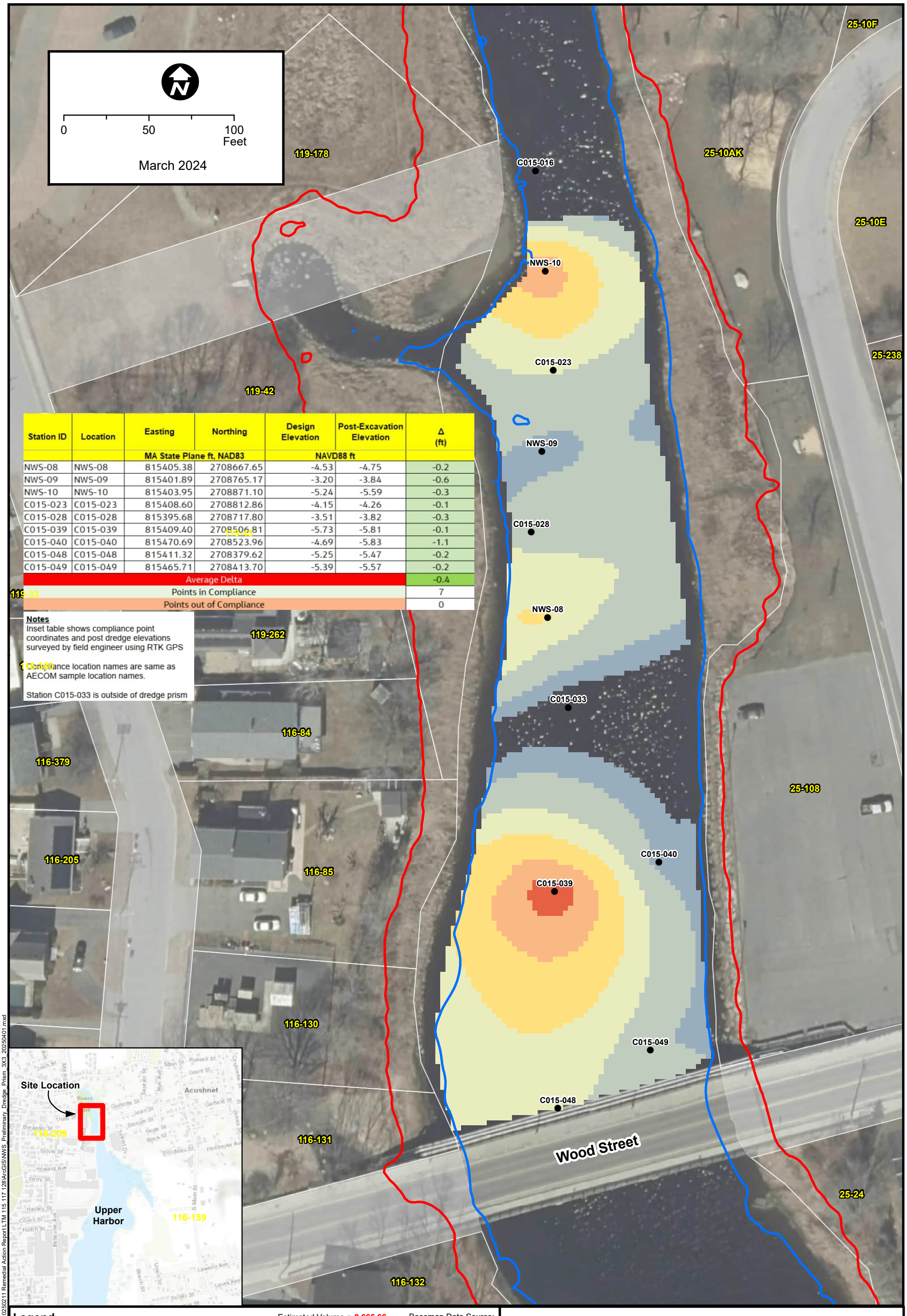
Jacobs

LTM-128
Dredge Area
Compliance Locations
(50 x 50 ft grid)

NAME: jpiccuito Date: 10/16/2023

Figure 13

Path: Y:\NBH\Projects\35BG100\120231016 LTM-117 and LTM-128 Compliance\ArcGIS\Dredging LTM 128 Compliance Locations 20231016.mxd



Station ID	Location	Easting	Northing	Design Elevation	Post-Excavation Elevation	Δ (ft)
		MA State Plane ft, NAD83		NAVD88 ft		
NWS-08	NWS-08	815405.38	2708667.65	-4.53	-4.75	-0.2
NWS-09	NWS-09	815401.89	2708765.17	-3.20	-3.84	-0.6
NWS-10	NWS-10	815403.95	2708871.10	-5.24	-5.59	-0.3
C015-023	C015-023	815408.60	2708812.86	-4.15	-4.26	-0.1
C015-028	C015-028	815395.68	2708717.80	-3.51	-3.82	-0.3
C015-039	C015-039	815409.40	2708506.81	-5.73	-5.81	-0.1
C015-040	C015-040	815470.69	2708523.96	-4.69	-5.83	-1.1
C015-048	C015-048	815411.32	2708379.62	-5.25	-5.47	-0.2
C015-049	C015-049	815465.71	2708413.70	-5.39	-5.57	-0.2
Average Delta						-0.4
Points in Compliance						7
Points out of Compliance						0

Notes
Inset table shows compliance point coordinates and post dredge elevations surveyed by field engineer using RTK GPS

Compliance location names are same as AECOM sample location names.

Station C015-033 is outside of dredge prism

Legend

- Core Location
- Parcel
- Road/ROW
- MHHW
- MLLW

Feet of Sediment To Remove: 0.5, 1, 1.5, 2, 2.5, 3

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors,

Estimated Volume = 2,665.66
Estimated Sqft = 53,721

Basemap Data Source: MassGIS 2021

Datum Info:
Horizontal - NAD83 StatePlane MA, feet

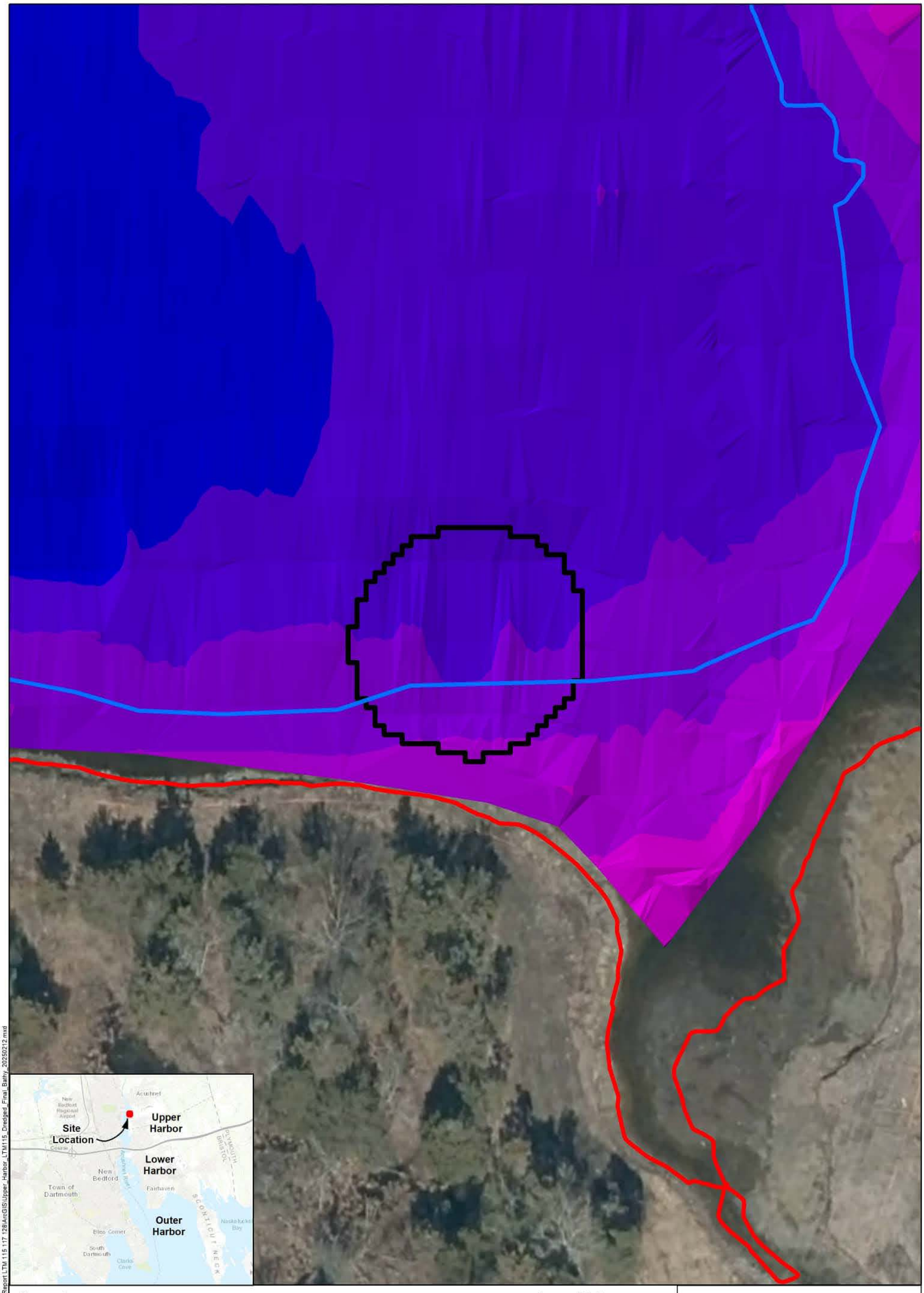
North Of Wood Street-South (NWS-S) Excavation Prism and Compliance Points

New Bedford Harbor Superfund Site

Jacobs

Figure 14

Path: Y:\NBH\Projects\35BG100\20250211 Remedial Action Report LTM 115 117 128\ArcGIS\NWS_Preliminary_Dredge_Prism_3X3_20250401.mxd



Legend

LTM-115 Final Dredged Area Extent

MHHW

MLLW

Elevation NAVD88 - ft

-1.4 - 0.1	-8.4 - -7.0
-2.8 - -1.4	-9.8 - -8.4
-4.2 - -2.8	-11.2 - -9.8
-5.6 - -4.2	-12.7 - -11.2
-7.0 - -5.6	

Basemap Data Source:
MassGIS 2023, ESRI

N

0 30 Feet

1:360

Datum Info:
Horizontal - NAD83 StatePlane MA, feet

Aerial Photography MASSGIS 2023

Jacobs

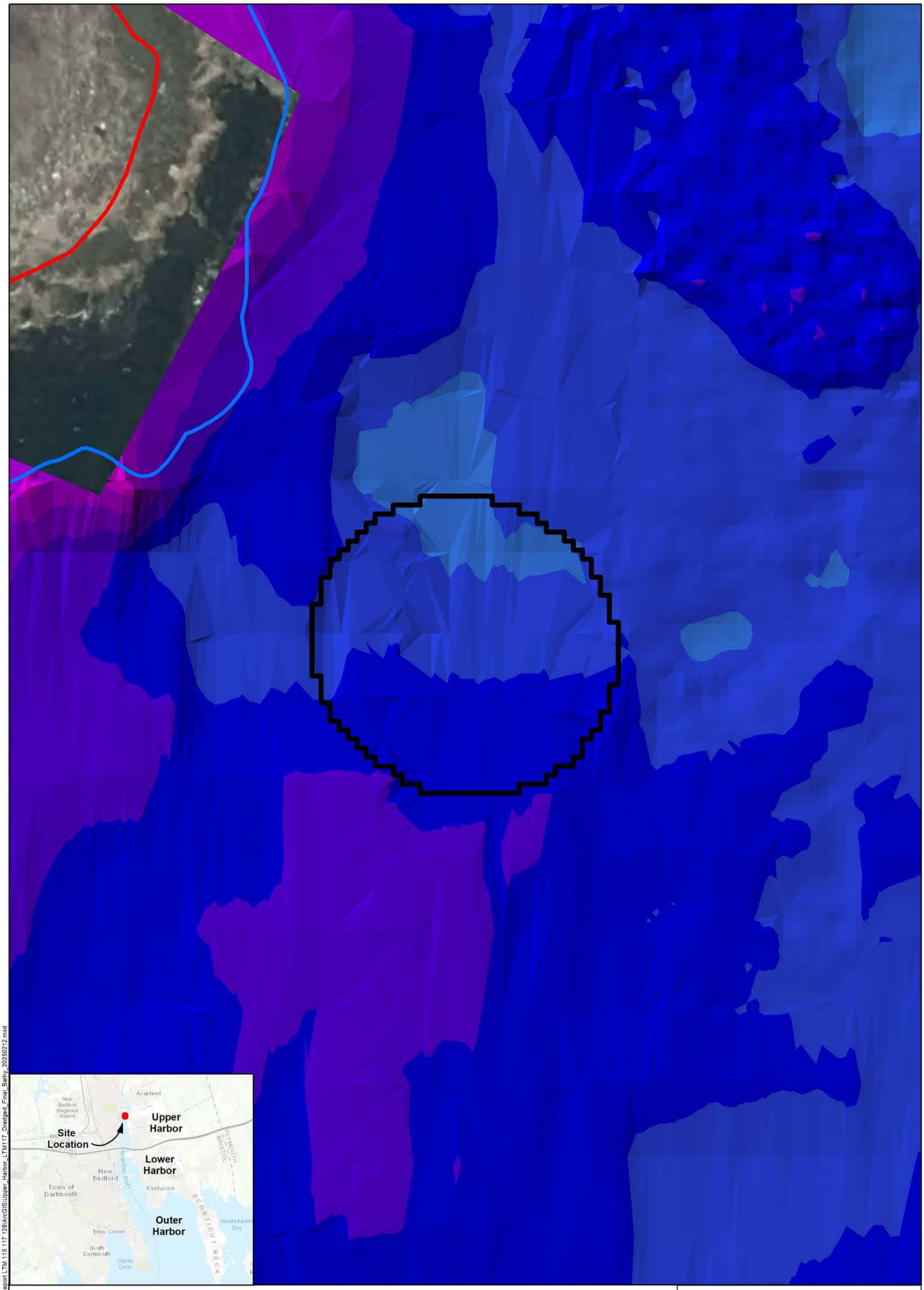
Dredged Area LTM-115 Showing Final Bathymetry

New Bedford Harbor Superfund Site

NAME: jpiccuito Date: 3/31/2025

Figure 15

Path: Y:\NBH\Projects\35BG1001\20250211 Remedial Action Report LTM 115 117 128\ArcGIS\Upper_Harbor_LTM115_Dredged_Final_Bathy_20250212.mxd



Legend

LTM-117 Final Dredged Area Extent

MHHW

MLLW

Elevation NAVD88 - ft

-1.4 - 0.1	-8.4 - -7.0
-2.8 - -1.4	-9.8 - -8.4
-4.2 - -2.8	-11.2 - -9.8
-5.6 - -4.2	-12.7 - -11.2
-7.0 - -5.6	

Basemap Data Source:
MassGIS 2023, ESRI

N

0 30 Feet

1:360

Aerial Photography MASSGIS 2023

Datum Info:
Horizontal - NAD83 StatePlane MA, feet

Path: Y:\NBH\Projects\35BG1001\20250211 Remedial Action Report LTM 115 117 128\ArcGIS\Upper_Harbor_LTM117_Dredged_Final_Bathy_20250212.mxd

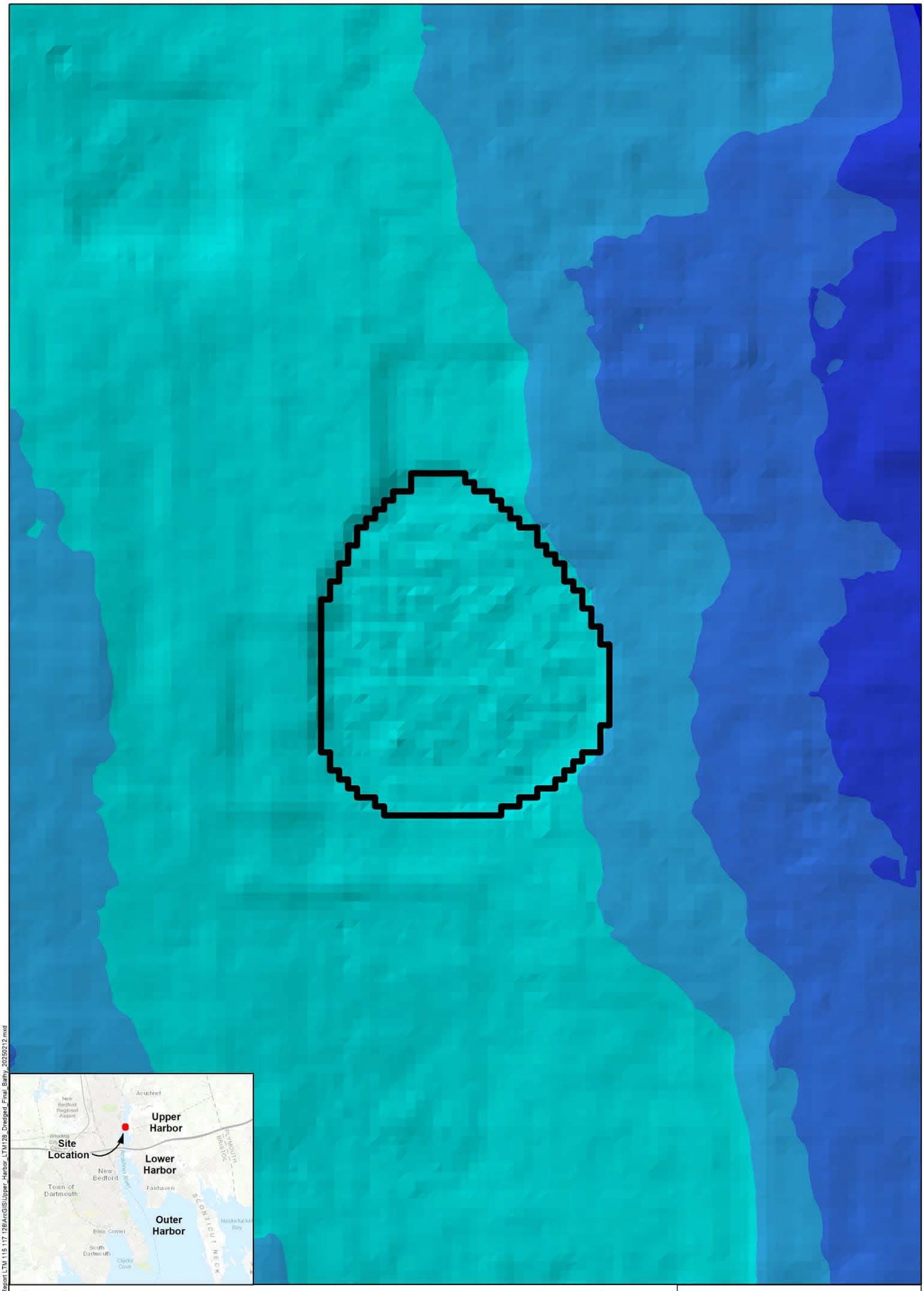
Jacobs

Dredged Area LTM-117 Showing Final Bathymetry

New Bedford Harbor Superfund Site

NAME: jpiccuito Date: 3/31/2025

Figure 16



Legend

LTM-128 Final Dredged Area Extent

Elevation NAVD88 - ft

-1.4 - 0.1	-8.4 - -7.0
-2.8 - -1.4	-9.8 - -8.4
-4.2 - -2.8	-11.2 - -9.8
-5.6 - -4.2	-26.7 - -11.2
-7.0 - -5.6	

Basemap Data Source:
MassGIS 2023, ESRI

N

Datum Info:
Horizontal - NAD83 StatePlane MA, feet

1:360

Aerial Photography MASSGIS 2023

Jacobs

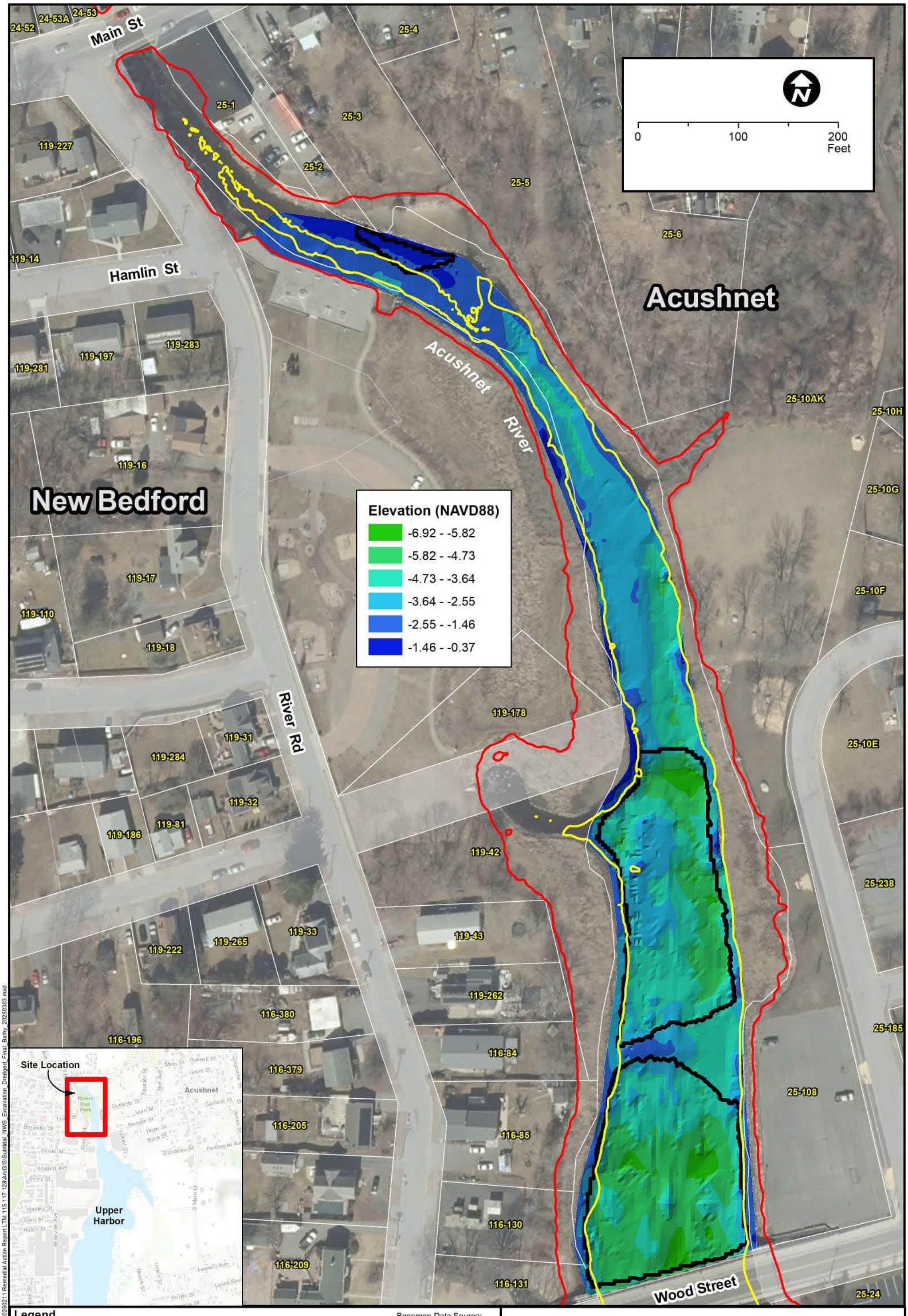
Dredged Area LTM-128 Showing Final Bathymetry

New Bedford Harbor Superfund Site

NAME: jpiccuito Date: 2/13/2025

Figure 17

Path: Y:\NBH\Projects\35BG1001\20250211 Remedial Action Report LTM 115 117 128\ArcGIS\Upper_Harbor_LTM128_Dredged_Final_Bathy_20250212.mxd



Legend

- North of Wood Street Final Dredged Area Extent
- MHHW
- MLLW
- Parcel (ID)
- Road/ROW

Basemap Data Source:
MassGIS 2021
Bathymetry CR 2024-2025

Datum Info:
Vertical - NAVD88, feet
Horizontal - NAD83 StatePlane MA, feet

North of Wood Street Excavation/Dredged Areas Showing Final Bathymetry

New Bedford Harbor Superfund Site

Jacobs

Figure 18

Path: Y:\NBH\Projects\35BG1001\20250211 Remedial Action Report LTM 115 117 128\ArcGIS\Subtidal_NWS_Excavation_Dredged_Final_Bathy_20250303.mxd

Tables

Table 1. Analytical Results Used for Determining Vertical Extent of Dredge Prisms for LTM-115, LTM-117, and LTM-128

Station ID	Sample ID	Date Analyzed	Total PCB (ppm)
LTM-115B	S-LTM115B-20FSP20-00-05	11/11/2021	114
	S-LTM115B-20FSP20-05-10	01/15/2022	0.345
	S-LTM115B-20FSP20-10-15	01/15/2022	0.0029
	S-LTM115B-20FSP20-15-21	01/15/2022	0.0796
LTM-115N	S-LTM115N-20FSP20-00-05	11/11/2021	0.167
LTM-115S	S-LTM115S-20FSP20-00-05	11/11/2021	21.4
LTM-115E	S-LTM115E-20FSP20-00-05	11/11/2021	6.72
LTM-115W	S-LTM115W-20FSP20-00-05	11/11/2021	3.0
LTM-117B	S-LTM117B-20FSP20-00-05	11/11/2021	1370
	S-LTM117B-20FSP20-05-10	01/15/2022	162
	S-LTM117B-20FSP20-10-15	01/15/2022	5.07
	S-LTM117B-20FSP20-15-21	01/15/2022	0.473
LTM-117N	S-LTM117N-20FSP20-00-05	11/11/2021	3.7
LTM-117S	S-LTM117S-20FSP20-00-05	11/11/2021	2.41
LTM-117E	S-LTM117E-20FSP20-00-05	11/11/2021	1.13
LTM-117W	S-LTM117W-20FSP20-00-05	11/11/2021	54.7
LTM-128B	S-LTM128B-20FSP20-00-05	11/11/2021	1.72
LTM-128N	S-LTM128N-20FSP20-00-05	11/11/2021	72.6
LTM-128S	S-LTM128S-20FSP20-00-05	11/11/2021	0.0728
LTM-128E	S-LTM128E-20FSP20-00-05	11/11/2021	44.0
LTM-128W	S-LTM128W-20FSP20-00-05	11/11/2021	0.0237

Note:
Analytical results are obtained from *Long Term Monitoring VII Additional Sampling Memorandum* (AECOM, 2022)

Table 2. NWS-S PCB Sample Results and Concentration Profiles

Location	C015-016	NWS-10	C015-023	C015-039	NWS-08	CO15-049	CO15-033	CO15-028	C015-048	C015-040	NWS-09
Northing	2708929.93	2708871.10	2708812.86	2708506.81	2708667.65	2708413.70	2708614.84	2708717.80	2708379.62	2708523.96	2708765.17
Easting	815398.16	815403.95	815408.60	815409.40	815405.38	815465.71	815417.44	815395.68	815411.32	815470.69	815401.89
Interval (ft.)	Sum of 209 PCB Congeners (mg/kg)										
0.0-0.5	6.42	36.2	48.2	97.4	78.8	188	5.94	140	58	56.7	37.3
0.5-1.0	22.3	7.36	31.9	35.2	64.6	2.66	8.65	30.3	56.6	20.9	8.59
1.0-1.3						0.165					
1.0-1.5	12.6	32.7	26.4	59.5	83.2			0.0566	39.6	0.259	2.01
1.0-1.7							0.0793				
1.5-2.0		21.3	0.633	131					1.28		
1.5-2.1	0.056										
1.5-2.2					0.318			0.178			
2.0-2.3		31.4	0.00873								
2.0-2.5				39.8							
RAL30 cut (ft.)	no cut	cut 2.5	cut 1.2	cut >2.5	cut 1.6	cut 0.7	no cut	cut 1.0	cut 1.5	cut 0.5	cut 0.5

Notes: Northings and Eastings in MA State Plane, NAD83, ft.
ft = feet
mg/kg = milligrams per kilogram
RAL30 = Remedial Action Limit 30 mg/kg

Table 3

Determination of Horizontal Extents for 2022 LTM-115 Prism

	LTM-115B	LTM-115N	LTM-115E	LTM-115W	LTM-115S
PCBs (mg/kg @ 0.0-0.5 ft.)	114	0.167	6.72	3.00	21.4
Distance to LTM-115B (ft.)	0	50.0	47.1	53.9	45.0
mg/kg per ft. drop from LTM-115B		2.28	2.28	2.06	2.06
Distance from LTM-115B to RAL 30 mg/kg (ft.)		36.9	36.9	40.8	40.8

Table 4

Determination of Horizontal Extents for 2022 LTM-117 and LTM-128 Dredging

	LTM-117B	LTM-117N	LTM-117E	LTM-117W	LTM-117S
PCBs (mg/kg @ 0.0-0.5 ft.)	1,370	3.70	1.13	54.7	2.41
Distance to LTM-117B (ft.)	0	52.6	49.4	51.7	47.3
mg/kg per ft. drop from LTM-117B		26.0	27.7	25.4	28.9
Distance from LTM-117B to RAL 30 mg/kg (ft.)		51.6	48.4	52.7	46.4

	LTM-128B	LTM-128N	LTM-128E	LTM-128W	LTM-128S
PCBs (mg/kg @ 0.0-0.5 ft.)	134	72.60	44	0.0237	0.0728
Distance to LTM-128B (ft.)	0	46.0	50.0	49.0	46.0
mg/kg per ft. drop from LTM-128B		1.3	1.8	2.7	2.9
Distance from LTM-128B to RAL 30 mg/kg (ft.)		77.9	57.8	38.0	35.7

Attachment A

Draft Final Dredge Plan for LTM-115

Jacobs

Project Notes

103 Sawyer Street
New Bedford, MA 02746
www.jacobs.com

Client	NAE	**Date**	13 October 2022
Project	New Bedford Harbor Superfund Site	**Project No.**	35BG7000
Prepared By	Joshua Cummings		35BG7000-P1-0030
Issued By	Lonnie Fallin		
Subject	Draft Final Dredge Plan for LTM-115		

Distribution	**See list below**			
Client	**EPA**	**Sevenson**	**Jacobs**	**MA DEP**
Kerwin Donato	Dave Dickerson	Joe Mahoney	Anita Rigassio-Smith	Paul Craffey
Marie Esten	Natalie Burgo		Josh Cummings	
Mike Degrazia			Patrick Curran	
			Lonnie Fallin	

1 PURPOSE

This project note summarizes the planned dredging of Long-Term Monitoring (LTM) station LTM-115, prospective methods, and approach chosen for remediation.

2 BACKGROUND

Prior to the initiation of cleanup efforts at the New Bedford Harbor Superfund Site (NBHSS), EPA developed a long-term monitoring program to assess the effectiveness of remediation efforts over time (EPA 1998). The planned NBHSS dredging and capping of subtidal sediments within NBH was completed in December 2020, and the temporary infrastructure constructed to support these activities was demobilized from the site.

Following the seventh round of LTM sampling and analysis, performed by AECOM in the fall of 2020, several locations were identified as having elevated PCB concentrations (AECOM 2021). These elevated LTM PCB results were reviewed by the NBH project team, and follow-up sampling was conducted at three locations during 2021. These locations were LTM-115, LTM-117, and LTM-128. Four additional samples were collected around each of the three elevated LTM locations, with each sample offset approximately 50 ft. from the LTM location along the four cardinal directions (N, E, S, W). Additionally, the original LTM locations were re-sampled and identified by a "B" suffix in the sample ID. The analytical results of the 2021 sampling effort are provided in Table 1 and documented in the 2022 AECOM memorandum, *Long Term Monitoring VII Additional Sampling Memorandum* (AECOM, 2022).

It should be noted that the samples collected during the fall 2020 LTM sampling event were collected via a ponar grab sampler and analyzed for PCB concentrations in the top 2.0 cm (AECOM 2020). Samples collected during the 2021 "B" sampling event were collected via a piston core and were subsequently processed into 0.5 ft. intervals for analysis or archiving. PCB concentrations described in this document are the sum of 209 PCB congeners using U.S. EPA Method 1668C/8270D unless otherwise noted.

During 2022, the NBH project team reviewed the 2021 sampling results for the three elevated LTM locations and decided on how to address each one. The decisions regarding LTM-117 and LTM-128 are addressed in a separate Project Note, while the remedial approach to LTM-115 is described below.

LTM-115

The PCB concentrations at locations LTM-115 and LTM-115B, 120 mg/kg and 114 mg/kg, respectively, were both elevated for the upper 2.0 cm and 0.5 ft. of sediment. PCB concentrations were below 1 mg/kg for the 0.5-

	1.0 ft. interval. The four 0.0-0.5 ft. interval samples collected from the cardinal directions (N, E, S, W) were each below 30 mg/kg. Deeper intervals were therefore not analyzed. Utilizing this data, a dredge prism was developed to remove all material in the area found to contain PCBs in concentrations exceeding the remedial action level (RAL) of 30 mg/kg, as described in the *Generic Upper Harbor Work Plan* (Jacobs 2017). The horizontal extent of dredging would be determined assuming a linear concentration gradient between the "B" sample and the four offset locations in the four cardinal directions.
3	**LTM-115 PRISM DESIGN**
	The dredge prism for LTM-115 was developed assuming linear concentration gradients with the goal of removing sediments above RAL 30 mg/kg horizontally. The vertical extent of dredging was determined using the bottom sample interval depth where PCB concentrations were found be above the 30 mg/kg RAL. Removal of material above the 30 mg/kg RAL is intended to achieve the 10 mg/kg surface weighted average clean up goal for Upper Harbor subtidal and mudflat sediments (EPA 1998). As an example, the PCB concentration at location LTM-115B is 114 mg/kg in the 0.0 to 0.5 ft interval, while the PCB concentration at location LTM-115N, which is 50 ft. to the north of the B location, is 0.167 mg/kg. On a linear scale it is calculated that the PCB concentration drops 2.28 mg/kg per ft. along the north axis from LTM-115B, which means that the north prism boundary is 36.9 ft. from LTM-115B. This calculation was repeated for each of the cardinal directions when compared to the respective "B" samples. The results of these calculations are shown on Table 2. The removal thickness was determined by the bottom of the deepest sample interval over 30 mg/kg at the "B" location. For LTM-115B, this elevation corresponded to 0.5 ft. (AECOM 2022). The neatline elevations for the prism were established using post-dredge bathymetric data from Dredge Area O (September 2019) and subtracting that sample interval thickness. A 0.2 ft. over-dredge (OD) was incorporated into the prism below the neatline which results in a cut depth of 0.7 ft. This OD will be the elevation that will be targeted for removal. The 0.2 ft. OD is intended to account for any error in the remedial methods. The LTM-115 prism was designed on a 3 ft. x 3 ft. grid, similar to recent hybrid and mechanical dredge efforts at NBHSS. Due to the relatively shallow cut depth of 0.7ft along with the area not being steeply sloped, the edges of the prism will not be stepped or sloped to prevent sloughing. **LTM-115 Prism** Figure 1 illustrates the planned horizontal extent of proposed dredging at LTM-115 based on the linear concentration gradient to RAL 30 mg/kg. The horizontal footprint is 4,724.9 square feet (sq ft). Only the upper 0.5 ft. was found to be above 30 mg/kg at the LTM-115B location. Including the OD, the removal thickness will be 0.7 ft. The planned dredge volume is 122 cubic yards (cy). This prism is directly adjacent to the intertidal zone EZ2, with some portions located in the intertidal zone.
4	**EQUIPMENT**
	LTM-115 has the potential for remediation via a land-based approach using an amphibious excavator or could be dredged via a floating plant as described in the Project Note *Draft Dredge Plan for LTM-117 and LTM-128* (Jacobs 2022). Both approaches are presented below. **LAND-BASED APPROACH** **Land-based Amphibious Excavator** Should LTM-115 be remediated using a land-based approach, it would utilize the equipment currently mobilized for EZ2 intertidal remediation and would be excavated during this effort. The amphibious excavator intended for the EZ2 remedial efforts is a Hyundai 220LC-9A. This excavator can reach material approximately 49 ft. from the center pin (in ideal conditions) and operate in a water depth up to approximately 4 ft. This maximum operable depth is dependent on the stability of sediments underneath the tracks. The excavator is equipped with a 1 cy smooth, open top bucket.

	Excavated sediment would be loaded into a Hydrema all-terrain dump truck with a 6 cy capacity. Due to the anticipated unconsolidated nature of the sediment, it is likely the dump truck will not be loaded to full capacity to prevent spillage during transit to the stabilization area. **WATER-BASED APPROACH** There are two potential options for a water-based approach: Remu Amphibious Excavator with Big Float™ Pontoons or the Komatsu PC-300 Excavator on a 40ft x 60 ft barge. Either machine can be equipped with a 1 cy level cut environmental bucket to remove material. A 1 cy bucket would be smaller than the buckets previously used for the Upper Harbor Hybrid Dredging Program. It is estimated that 100 cy/day could be excavated and offloaded under normal tidal conditions using two scows by either the Remu or barge mounted excavator. **Remu Amphibious Excavator with Big Float™ Pontoons** The Remu Amphibious Excavator with Big Float™ Pontoons is similar to amphibious excavators used at NBHSS to perform the excavation of contaminated sediments in salt marshes. Spuds would be added to the machine to allow it to dredge in water where the tracks are not grounded. If the Remu is to be used, it would likely be assembled at Area C and launched at the Area C boat Ramp, adjacent to Parcel 265. **Komatsu PC-300 Excavator on a 40 ft. x 60 ft. Barge** This barge would be set up similar to previously used barge configurations at NBHSS. The 40 ft. x 60 ft. barge would be constructed of modular 5 ft. high floats (Poseidon or similar) and equipped with spuds. The barge would be equipped with a diesel powerpack and hydraulic winches to raise and lower the spuds. The 40 ft. x 60 ft. barge would be assembled at the Area C North Dock, and the excavator would likely be mounted on to the barge utilizing shoreline access near the Dattco Motorcoach facility in Fairhaven. Others have used this access point in past dredging efforts. **Other Equipment:** Below is a list and description of additional equipment required to dredge the LTM locations. • *Steel work boats*. Two steel work boats with outboard motors will be utilized to move the floating plant and scows. • *Hopper scows*. Two modular hopper scows will be utilized to temporarily store and transport the sediment to the North Dock for offloading. • *Komatsu PC-300 long reach* (or similar). A long reach excavator will be utilized to dig sediment out of the scows and move it into roll off containers for transport to the DDA. • *Roll off truck*. Truck to be equipped with roll off container or dump truck with sealed gate for transporting dredged sediment from North Dock to the DDA.
5	**LAND-BASED METHODOLOGY**
	Dredge management software (HYPACK®) will be installed on the excavator and will be calibrated similar to previous intertidal remedial efforts at NBHSS. The calibration will be checked daily during use, prior to the start of each day. The GPS error tolerance will be set 0.2 ft. vertical and 0.5 ft. horizontal. All calibration checks will be documented in the daily report. The excavation plan will utilize the post-dredge bathymetric survey data for Dredge Area O (September 2019) and the target elevations will be derived from that data using the planned thickness to remove. The excavation will utilize a 3 ft x 3 ft grid similar to the planned EZ2 excavation work. The southern portion of the LTM-115 dredge area would be removed first, which would allow the excavator to track over the cleaned area and extend its reach. The excavator will dig to the sides and in front of itself as it

	advances into the prism. Ideally this portion of the work would be done at lower tides which would allow the operator to control any residuals which could be left behind. The excavator will methodically remove the sediment and overlap the adjacent cut slightly to help control residuals. The operator will make an effort to take full buckets and minimize the amount of free water taken. In order to reach the northern most extent of LTM-115, a short gravel ramp will be built into the LTM-115 dig area to allow a Hydrema to back down and receive material from the excavator. This also allows for the Hydrema to remain on clean material. Figure 2 shows the placement of the gravel ramp, as well as the haul road, which will be used by the Hydrema to transport the sediment to the stabilization area. The gravel ramp will extend approximately 20 ft. into the LTM-115 excavation area. The approximate width and height are 15 ft. x 2 ft., requiring at least 22 cy of gravel. Additional gravel will be required if the sediments are very soft. Due to water depths, it is likely the excavator will only be able to work from the northernmost position during the lower portions of the tide cycle. Given the anticipated tidal restrictions for dredging this area, it is anticipated it will take up to 3 partial days of removal to complete the dredge footprint. When the tide restricts the machine from dredge operations, it will continue with EZ2 intertidal excavation. Production rate of dredging is assumed to be similar to that of the EZ2 intertidal work of 120 cy/day. As an alternative to the gravel ramp, the excavator could cast the excavated material towards shore and then load it into the truck after positioning itself closer to shore. This method, while it would not require the gravel ramp, may not be as clean. Once the prism has been excavated to the planned elevations and confirmed via RTK GPS, the gravel road will be removed, and the gravel re-used as backfill for the restoration of EZ2. Any gravel intermingled with sediment will be left in place but smoothed out as subgrade fill for the planned EZ2 restoration.
6	**FLOATING DREDGE PLANT METHODOLOGY**
	The dredge set utilized for LTM locations will incorporate a 10% overlap, similar to previous dredging efforts at NBHSS. Due to the single cut thickness of 0.7 ft., it is planned that LTM-115 will be dredged in a single pass. Each bucket taken will target the deepest 3 ft. x 3 ft. grid in that bucket footprint, which is also similar to previous dredge efforts. Dredge management software (HYPACK®) will be installed on the dredging excavator and calibrated in the same manner as previous hybrid or mechanical dredge efforts. The calibration will be checked daily before the machine begins operating. The vertical tolerance will be 0.2 ft., and the horizontal tolerance will be 0.5 ft. horizontal. The bucket rotation sensor will also be checked daily for proper function. Calibration checks will be documented in the daily report. Dredging will be conducted in lanes the width of the dredge set. The dredge will advance over the dredged area as it moves forward after a dredge set has been completed. A steel work boat(s) will position the dredge as needed. Efforts will be made by vessel operators to avoid propwash over un-dredged inventory when moving scows or repositioning the barge. Full buckets of sediment will be placed into a hopper scow secured to the hip of the excavator or barge. When a scow is full it will be pushed by a steel work boat to North Dock. Although not planned, it may be necessary to short load some scows or temporarily suspend dredging during periods of low water. Full scows will be pushed up perpendicular to North Dock and secured for unloading. It should be noted that access to the North Dock through Pierce Mill Cove may present tidal restrictions during periods of low water. Potential methods of mitigating a work slowdown due to tides could include scheduling the activity around favorable tide cycles or adjusting the loading of scows throughout the tide cycle to minimize the chances of grounding. Unloading the scows will be similar to other offloading operations performed at North Dock. Poly sheeting will be laid out to contain any spillage, and the roll off or dump truck will be backed onto the poly sheeting. A long reach excavator with a conventional bucket will transfer the material from the scow to the transport vehicle. The dredged material will then be transported to the DDA for stabilization with Portland cement as needed.

7	**COMPLETION AND VERIFICATION**
	The dredge management software (HYPACK®) will record progress and allow for a record that the excavation work has been completed. A check of the excavated prism by the field engineer with an RTK GPS will verify that the target elevations have been achieved.
8	**DISPOSAL**
	Material from LTM-115 will be handled and disposed of with material excavated from EZ2.
9	**DECISION ON APPROACH**
	A land-based approach was collectively agreed upon by the NBHSS Team on 12 October 2022 to address LTM-115. The LTM-115 area will be dredged with the Hyundai 220LC-9A amphibious excavator as part of the Intertidal Remediation of EZ2 currently underway.
10	**TABLES AND FIGURES**
	Table 1. Analytical results from *Long Term Monitoring VII Additional Sampling Memorandum* (AECOM, 2022) **Table 2.** Determination of Horizontal Extents for 2022 LTM-115 Dredging **Figure 1.** Proposed LTM-115 Dredge Prism **Figure 2.** Proposed LTM-115 Dredge Prism Operational Configuration
11	**REFERENCES**
	AECOM, 2022 (March). Long Term Monitoring VII Additional Sampling Memorandum AECOM, 2021 (July). New Bedford Harbor Superfund Site Long Term Monitoring – Round VII Final Summary Report AECOM, 2020 (July). Sediment Field Sampling Plan 20, Long-Term Monitoring VII– Draft Final. New Bedford Harbor Superfund Site, New Bedford, MA. Draft Final, July 2020 Jacobs, 2017 (August). Draft-Final Upper Harbor Hybrid Generic Work Plan. ACE-J23-35BG1001-M1-0110 U.S. EPA, 1998 (September). Record of Decision for the Upper and Lower Harbor Operable Unit New Bedford Harbor Superfund Site New Bedford, Massachusetts

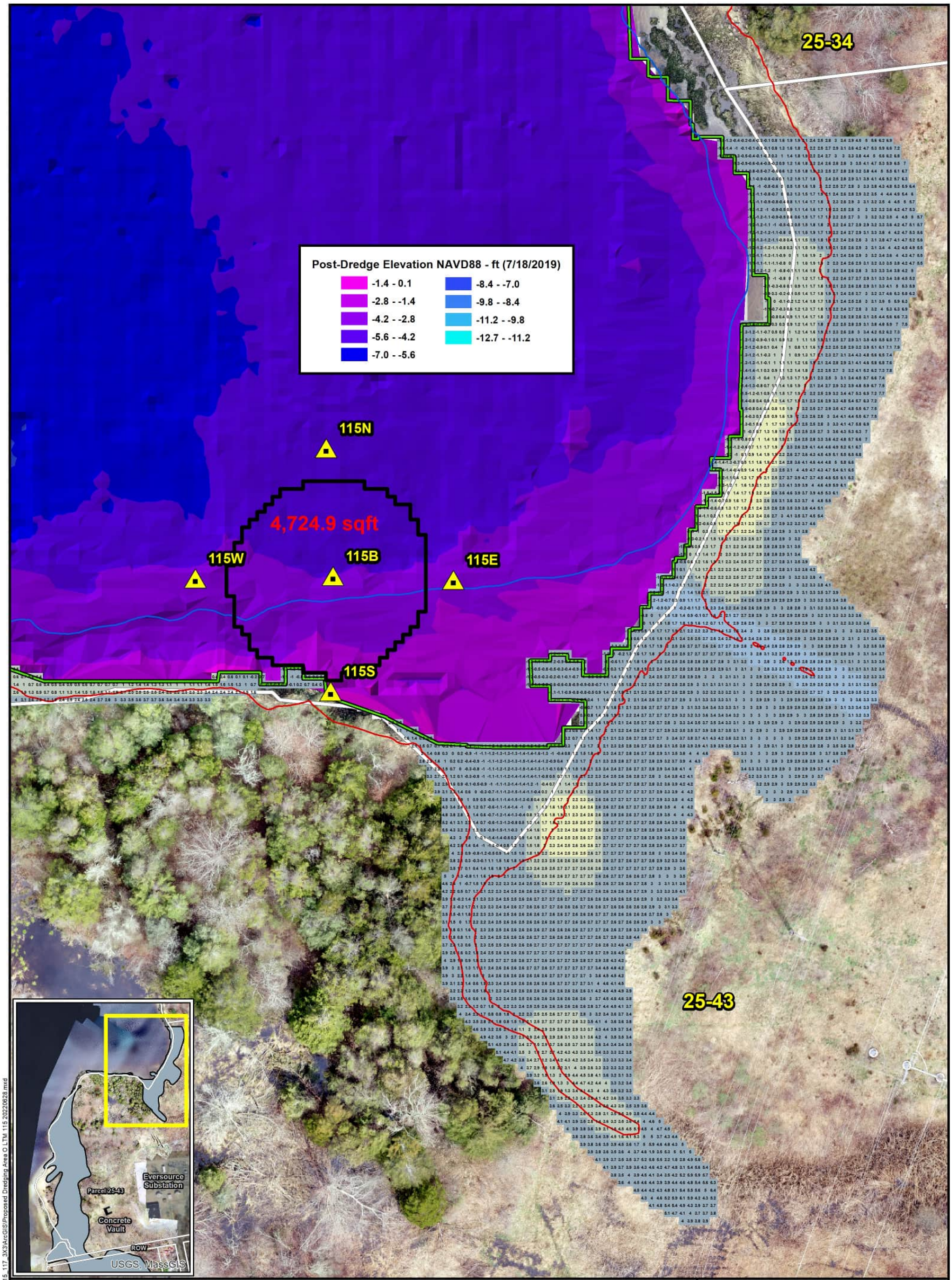
Table 1. Analytical results from *Long Term Monitoring VII Additional Sampling Memorandum* (AECOM, 2022).

Station ID	Sample ID	Date Analyzed	Total PCB (ppm)
LTM-115B	S-LTM115B-20FSP20-00-05	11/11/2021	114
	S-LTM115B-20FSP20-05-10	01/15/2022	0.345
	S-LTM115B-20FSP20-10-15	01/15/2022	0.0029
	S-LTM115B-20FSP20-15-21	01/15/2022	0.0796
LTM-115N	S-LTM115N-20FSP20-00-05	11/11/2021	0.167
LTM-115S	S-LTM115S-20FSP20-00-05	11/11/2021	21.4
LTM-115E	S-LTM115E-20FSP20-00-05	11/11/2021	6.72
LTM-115W	S-LTM115W-20FSP20-00-05	11/11/2021	3.0
LTM-117B	S-LTM117B-20FSP20-00-05	11/11/2021	1370
	S-LTM117B-20FSP20-05-10	01/15/2022	162
	S-LTM117B-20FSP20-10-15	01/15/2022	5.07
	S-LTM117B-20FSP20-15-21	01/15/2022	0.473
LTM-117N	S-LTM117N-20FSP20-00-05	11/11/2021	3.7
LTM-117S	S-LTM117S-20FSP20-00-05	11/11/2021	2.41
LTM-117E	S-LTM117E-20FSP20-00-05	11/11/2021	1.13
LTM-117W	S-LTM117W-20FSP20-00-05	11/11/2021	54.7
LTM-128B	S-LTM128B-20FSP20-00-05	11/11/2021	1.72
LTM-128N	S-LTM128N-20FSP20-00-05	11/11/2021	72.6
LTM-128S	S-LTM128S-20FSP20-00-05	11/11/2021	0.0728
LTM-128E	S-LTM128E-20FSP20-00-05	11/11/2021	44.0
LTM-128W	S-LTM128W-20FSP20-00-05	11/11/2021	0.0237

Table 2

Determination of Horizontal Extents for 2022 LTM-115 Prism

	LTM-115B	LTM-115N	LTM-115E	LTM-115W	LTM-115S
PCBs (mg/kg @ 0.0-0.5 ft.)	114	0.167	6.72	3.00	21.4
Distance to LTM-115B (ft.)	0	50.0	47.1	53.9	45.0
mg/kg per ft. drop from LTM-115B		2.28	2.28	2.06	2.06
Distance from LTM-115B to RAL 30 mg/kg (ft.)		36.9	36.9	40.8	40.8



Legend

- Inland Reach of Dredge
- MHHW (1.99 ft)
- MLLW (-1.97 ft)
- Parcel Boundary

EZ2 Excavation

- 3
- 2
- 1.5
- 1

2.1 Pre-Excavation Elevations NAVD88 ft.(Nearview 2018)

Sample Location

Proposed LTM-115 Dredge Prism Thickness of Sediment to Remove = 0.5 ft. plus 0.2 ft. OD

Pre-Excavation MHHW and MLLW Elevations NAVD88 ft. and Basemap Photography Source: Nearview 2018

0 5 10 20 30 40 Feet

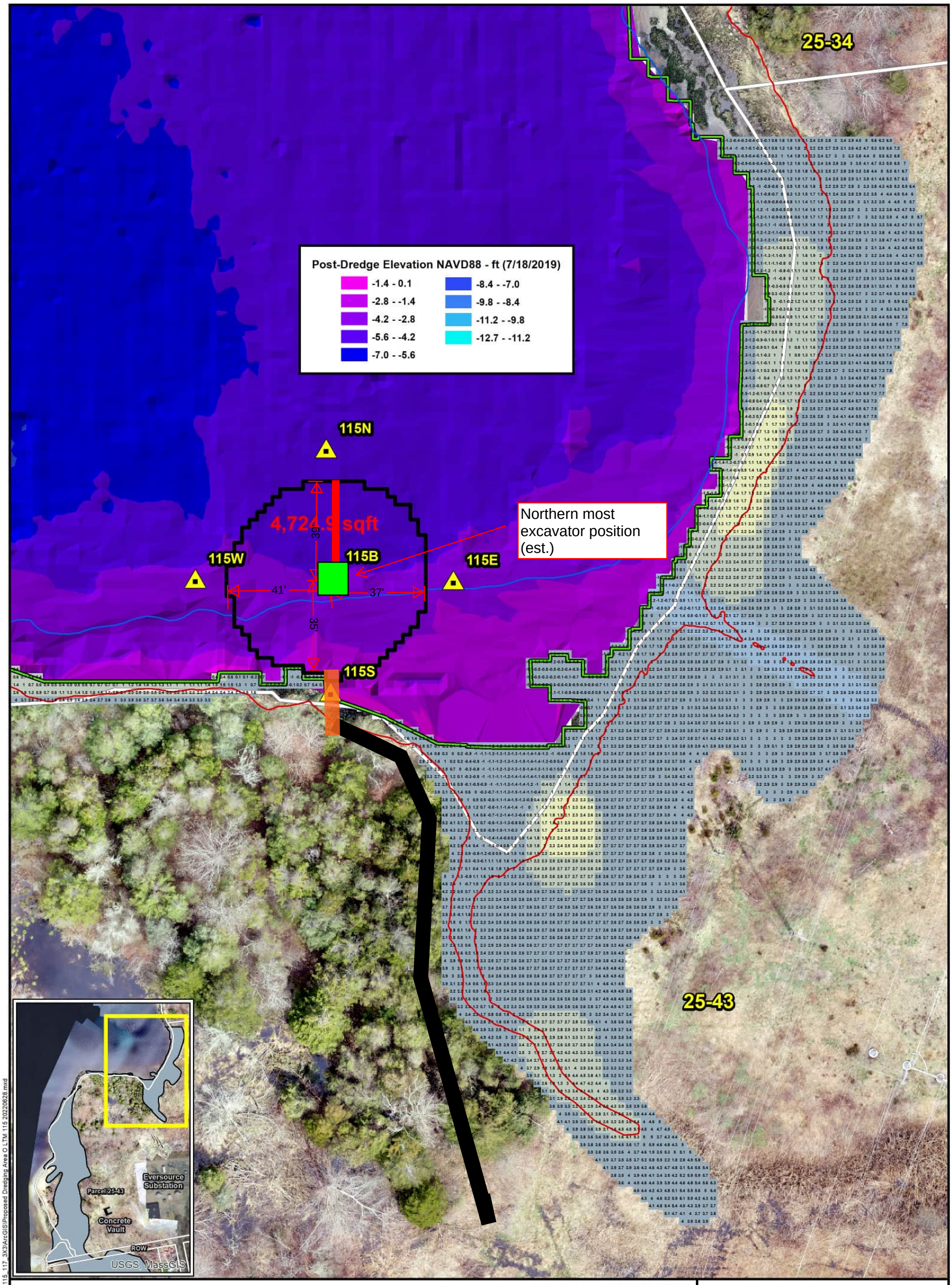
JACOBS™

Proposed LTM-115 Dredge Prism

New Bedford Harbor Superfund Site

July 2022 **Figure 1**

Path: Y:\NBH\Projects\35BG1001\20220628_Proposed_Dredging_LTM115_117_3X3\ArcGIS\Proposed Dredging Area O LTM 115 20220628.mxd


Post-Dredge Elevation NAVD88 - ft (7/18/2019)
-1.4 - 0.1
-2.8 - -1.4
-4.2 - -2.8
-5.6 - -4.2
-7.0 - -5.6
-8.4 - -7.0
-9.8 - -8.4
-11.2 - -9.8
-12.7 - -11.2
25-34
115N
115W
115B
115E
115S
4,724.9 sqft
39'
41'
37'
35'
Northern most excavator position (est.)
25-43
Eversource Substation
Parcel 25-43
Concrete Vault
ROW
USGS, MassGIS
Legend
Inland Reach of Dredge
MHHW (1.99 ft)
MLLW (-1.97 ft)
Parcel Boundary
EZ2 Excavation
3
2
1.5
1
2.1 Pre-Excavation Elevations NAVD88 ft.(Nearview 2018)
Sample Location
Proposed LTM 115 Dredge Prism Thickness of Sediment to Remove = 0.5 ft. plus 0.2 ft. OD
Gravel Ramp
Haul Road
Excavator
Pre-Excavation MHHW and MLLW Elevations NAVD88 ft. and Basemap Photography Source: Nearview 2018
0 5 10 20 30 40
Feet
JACOBS
Proposed LTM-115 Dredge Prism Operational Configuration
New Bedford Harbor Superfund Site
July 2022
Figure 2
Path: Y:\NBH\Projects\35BG100\20220628_Proposed_Dredging_LTM115_117_3X3\ArcGIS\Proposed Dredging Area O LTM 115 20220628.mxd

Attachment B

Draft Final Dredge Plan for LTM-117 and LTM-128

Jacobs

Project Notes

103 Sawyer Street
New Bedford, MA 02746
www.jacobs.com

Client	NAE	**Date**	13 October 2022
Project	New Bedford Harbor Superfund Site	**Project No.**	35BG7000
Prepared By	Joshua Cummings		35BG7000-P1-0032
Issued By	Lonnie Fallin		
Subject	Draft Final Dredge Plan for LTM-117 and LTM-128		

Distribution	**See list below**			
Client	**EPA**	**Sevenson**	**Jacobs**	**MA DEP**
Kerwin Donato	Dave Dickerson	Joe Mahoney	Anita Rigassio-Smith	Paul Craffey
Marie Esten	Natalie Burgo		Josh Cummings	
Mike Degrazia			Patrick Curran	
			Lonnie Fallin	

1 PURPOSE

This project note summarizes the planned subtidal dredging of Long-Term Monitoring (LTM) stations LTM-117 and LTM-128, prospective methods, and the approach selected for remediation.

2 BACKGROUND

Prior to the initiation of cleanup efforts at the New Bedford Harbor Superfund Site (NBHSS), EPA developed a long-term monitoring program to assess the effectiveness of remediation efforts over time (U.S. EPA, 1998). The planned NBHSS dredging and capping of subtidal sediments within NBH was completed in December 2020, and the temporary infrastructure constructed to support these activities was demobilized from the site.

Following the seventh round of LTM sampling and analysis, performed by AECOM in the fall of 2020, several locations were identified as having elevated PCB concentrations (AECOM, 2021). These elevated LTM PCB results were reviewed by the NBH project team, and follow-up sampling was conducted at three locations during 2021. These locations were LTM-115, LTM-117, and LTM-128. Four additional samples were collected around each of the three elevated LTM locations, with each sample offset approximately 50 ft. from the LTM location along the four cardinal directions (N, E, S, W). Additionally, the original LTM locations were re-sampled and identified by a "B" suffix in the sample ID. The analytical results of the 2021 sampling effort are provided in Table 1 and documented in the 2022 AECOM memorandum, *Long Term Monitoring VII Additional Sampling Memorandum* (AECOM, 2022).

It should be noted that the samples collected during the fall 2020 LTM sampling event were collected via a ponar grab sampler and analyzed for PCB concentrations in the top 2.0 cm (AECOM, 2020). Samples collected during the 2021 "B" sampling event were collected via a piston core and were subsequently processed into 0.5 ft. intervals for analysis or archiving. PCB concentrations described in this document are the sum of 209 PCB congeners using U.S. EPA Method 1668C/8270D unless otherwise noted.

During 2022, the NBH project team reviewed the 2021 sampling results for the three elevated LTM locations and decided on how to address each one. The decisions are briefly summarized below.

LTM-117

The PCB concentrations at locations LTM-117 and LTM-117B, are 161 mg/kg (0-2.0 cm) and 1,370 mg/kg (0-0.5ft). PCB concentrations were also elevated in the 0.5-1.0 ft. interval with 162 mg/kg detected during the "B" sampling event. Concentration dropped to 5.07 mg/kg at the 1.0-1.5 ft interval. Utilizing this data, a dredge prism

	was developed to remove all material in the area found to contain PCBs in concentrations exceeding the remedial action level (RAL) of 30 mg/kg, as described in the Generic Upper Harbor Work Plan (Jacobs, 2017). The horizontal extent of dredging was determined by assuming a linear concentration gradient between the "B" samples and the four offset locations in the four cardinal directions. Results of samples collected in the four cardinal directions ranged from 1.13 mg/kg to 54.7 mg/kg (Table 1). **LTM-128** The LTM-128 location had a PCB concentration of 134 mg/kg in the upper 2.0 cm during the 2020 sampling event. However, the 2021 "B" sample was found to have a PCB concentration of 1.72 mg/kg in the upper 0.5 ft. The NBH project team decided that the upper 0.5 ft. of sediment within the LTM-128 prism would be dredged despite the concentration differences. Results of samples collected in the four cardinal directions ranged from 0.02 mg/kg to 72.6 mg/kg (Table 1).
3	**LTM-117 AND LTM-128 PRISM DESIGN**
	The dredge prisms for the LTM-117 and LTM-128 locations were developed assuming linear concentration gradients with the goal of removing sediments above the RAL of 30 mg/kg horizontally. Achieving the RAL of 30 mg/kg allows for the Upper Harbor averaged target cleanup level (TCL) of 10 mg/kg to be met. As an example, the PCB concentration at location LTM-117B from 0-0.5' is 1,370 mg/kg, while the PCB concentration at location LTM-117N from 0-0.5', which is 52.6 ft. to the north of LTM-117, is 3.70 mg/kg. On a linear scale it is calculated that the PCB concentration drops 26 mg/kg per ft. along the north axis from LTM-117, which means that the north prism boundary is 51.6 ft. from LTM-117. This calculation was repeated for each of the cardinal directions when compared to the respective samples in the center of the polygon. The results of these calculations are shown on Table 2. The vertical extent of the prism is determined by the bottom of the last interval where PCB concentrations were greater than or equal to 30 mg/kg at the central LTM location. The neatline elevations for the prisms were established using post-dredge bathymetric data from the Cable Crossing dredge area (August 2019) and subtracting the sample interval thickness. A 0.2 ft. over-dredge (OD) will be incorporated into the prism, below the neatline. This OD will be the elevation that will be targeted for removal. The 0.2 ft. OD is intended to account for error in the remedial methods designated for removal. Both LTM prisms are designed on a 3 ft. x 3 ft. grid, similar to recent hybrid and mechanical dredge efforts at NBHSS. Because both LTM prisms are located in relatively flat portions of the river, and the cut thicknesses are approximately 1 full bucket thick or less, there will be no sloping or increase in the planned 10 percent overlap along the prism margins. **LTM-117 Prism** Figure 1 illustrates the planned horizontal extent of dredging at LTM-117 based on the linear concentration gradient to RAL 30 mg/kg. The horizontal footprint is 7,982.9 sq ft. The upper 1.0 ft. is above 30 mg/kg at the LTM-117B location. Including the OD, the removal thickness will be 1.2 ft. The planned dredge volume is 355 cy. This prism is entirely subtidal and based on the calculations presented in Table 2, is very circular in shape. **LTM-128 Prism** Figure 2 illustrates the planned horizontal extent of dredging at LTM-128 based on the linear concentration gradient to RAL 30 mg/kg. The horizontal footprint is 8,487 sq ft. In consideration of the differences between the 2021 and 2022 sample results, it was decided that the removal thickness would be 0.7 ft., which includes the 0.2 ft. OD. This prism is entirely subtidal and represents a volume of 220 cy.
4	**EQUIPMENT OPTIONS**
	Depending on the timing of the work and availability of equipment, two different floating plants are presented as potential dredge options. Either machine can be equipped with a 1 cy level cut environmental bucket to remove

	material. A 1 cy bucket would be smaller than the buckets previously used for the Upper Harbor Hybrid Dredging Program. It is estimated that 100 cy/day could be excavated and offloaded under normal tidal conditions using two scows by either the Remu or barge mounted excavator. **Remu Amphibious Excavator with Big Float™ Pontoons** The Remu Amphibious Excavator with Big Float™ Pontoons is similar to amphibious excavators used at NBHSS to perform the excavation of contaminated sediments in salt marshes. Spuds would be added to the machine to allow it to dredge in water where the tracks are not grounded. If the Remu is to be used, it would likely be assembled at Area C and launched at the Area C boat ramp, adjacent to Parcel 265. **Komatsu PC-300 Excavator on a 40 ft. x 60 ft. Barge** This barge would be set up similar to previously used barge configurations at NBHSS. The 40 ft. x 60 ft. barge would be constructed of modular 5 ft. high floats (Poseidon or similar) and equipped with spuds. The barge would be equipped with a diesel powerpack and hydraulic winches to raise and lower the spuds. The 40 ft. x 60 ft. barge would be assembled at the Area C North Dock, and the excavator would likely be mounted on to the barge utilizing shoreline access near the Dattco Motorcoach facility in Fairhaven. Others have used this access point in past dredging efforts. **Other Equipment:** Below is a list and description of additional equipment required to dredge the LTM locations. • *Steel work boats*. Two steel work boats with outboard motors will be utilized to move the floating plant and scows. • *Hopper scows*. Two modular hopper scows will be utilized to temporarily store and transport the sediment to the North Dock for offloading. • *Komatsu PC-300 long reach* (or similar). A long reach excavator will be utilized to dig sediment out of the scows and move it into roll off containers for transport to the DDA. • *Roll off truck*. Truck to be equipped with roll off container or dump truck with sealed gate for transporting dredged sediment from North Dock to the DDA.
5	**DREDGE SET, ACCURACY, AND METHODOLOGY**
	The dredge set utilized for both LTM locations will incorporate a 10% overlap, similar to previous dredging efforts at NBHSS. It is anticipated that there will be only one cut thickness for each area. Due to the single cut thickness, it is planned that LTM-128 will be dredged in a single pass, whereas LTM-117 will be completed in two passes to account for the thicker cut and prevent overfilling of the bucket. Each bucket taken will target the deepest 3 ft. x 3 ft. grid in that bucket footprint, which is also similar to previous dredge efforts. Dredge management software (Hypack®) will be installed on the dredging excavator and calibrated in the same manner as previous hybrid or mechanical dredge efforts. The calibration will be checked daily before the machine begins operating. The vertical tolerance will be 0.2 ft., and the horizontal tolerance will be 0.5 ft. horizontal. The bucket rotation sensor will also be checked daily for proper function. Calibration checks will be documented in the daily report. Dredging will be conducted in lanes the width of the dredge set. The dredge will advance over the dredged area as it moves forward after a dredge set has been completed. A steel work boat(s) will position the dredge as needed. Efforts will be made by vessel operators to avoid propwash over un-dredged inventory when moving scows or repositioning the barge. Full buckets of sediment will be placed into a hopper scow secured to the hip of the excavator or barge. When a scow is full it will be pushed by a steel work boat to North Dock. Although not planned, it may be necessary to short load some scows or temporarily suspend dredging during periods of low water.

	Full scows will be pushed up perpendicular to North Dock and secured for unloading. It should be noted that access to the North Dock through Pierce Mill Cove may present tidal restrictions during periods of low water. Potential methods of mitigating a work slowdown due to tides could include scheduling the activity around favorable tide cycles or adjusting the loading of scows throughout the tide cycle to minimize the chances of grounding. Unloading the scows will be similar to other offloading operations performed at North Dock. Poly sheeting will be laid out to contain any spillage, and the roll off or dump truck will be backed onto the poly sheeting. A long reach excavator with a conventional bucket will transfer the material from the scow to the transport vehicle. The dredged material will then be transported to the DDA for stabilization with Portland cement as needed.
6	**DISPOSAL**
	The stabilized sediment will either be disposed of offsite with other TSCA material, or stockpiled for disposal under the future Pilot CDF cap. This decision will be made based on the timing of the dredge activity. Dredging of the LTM prisms to the allowable OD will remove 575 in-situ cy, and the material will bulk an estimated 10% to 633 cy. The in-situ density of soft river sediments is estimated at 1.08 tons/cy giving the dredged material a weight of approximately 621 tons. An estimated 10% dry Portland cement will be added to the material by weight. This will result in a stabilized sediment with an estimated volume of 682 cy weighing 683 tons. Compaction may be possible to further reduce the volume as the material is stabilized and gains strength.
7	**COMPLETION VERIFICATION**
	The dredge management software (Hypack®) will record progress and allow for verification that the dredge work has been completed. Once the dredge management software indicates that a prism has been completed, Jacobs will collect field measurements with an RTK GPS and extension stadia rods equipped with a mud shoe to verify that the sediment surface elevation has been dug to the planned elevations or slightly over. If the field measurements indicate high spots, that data will be used to guide any required cleanup dredging. Following acceptable elevation checks, the dredge equipment will be demobilized or utilized for unrelated tasks.
8	**DECISION ON APPROACH**
	Further evaluation of the spud length for the Remu Amphibious Excavator determined that it would not be capable of removing material at LTM-128 based on the depth. Therefore, the NBHSS Team collectively agreed on 12 October 2022, that the most effective means of dredging both LTM-117 and LTM-128 would be with the Komatsu PC-300 on a 40 ft by 60 ft barge.
9	**Table and Figures**
	Table 1 Analytical results from *Long Term Monitoring VII Additional Sampling Memorandum* (AECOM, 2022) Table 2 Determination of Horizontal Extents for 2022 LTM Dredging Figure 1 Proposed LTM-117 Dredge Prism Figure 2 Proposed LTM-128 Dredge Prism
10	**REFERENCES**
	AECOM, 2022 (March). Long Term Monitoring VII Additional Sampling Memorandum AECOM, 2021 (July). New Bedford Harbor Superfund Site Long Term Monitoring – Round VII Final Summary Report AECOM, 2020 (July). Sediment Field Sampling Plan 20, Long-Term Monitoring VII– Draft Final. New Bedford Harbor Superfund Site, New Bedford, MA. Draft Final, July 2020 Jacobs, 2017 (August). Draft Final Upper Harbor Hybrid Generic Work Plan. ACE-J23-35BG1001-M1-0110

	U.S. EPA, 1998 (September). Record of Decision for the Upper and Lower Harbor Operable Unit New Bedford Harbor Superfund Site New Bedford, Massachusetts

Table 1. Analytical results from *Long Term Monitoring VII Additional Sampling Memorandum* (AECOM, 2022).

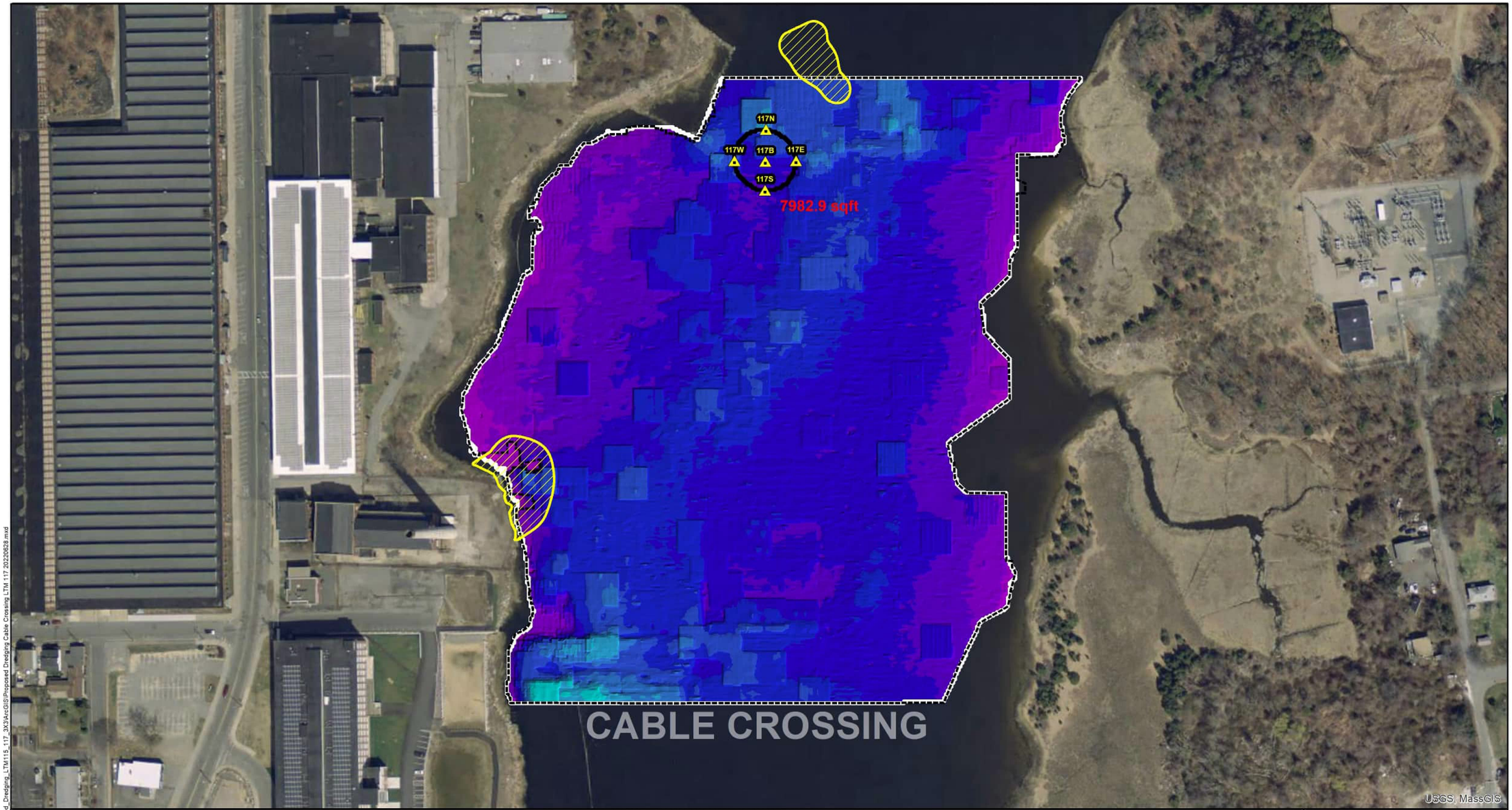
Station ID	Sample ID	Date Analyzed	Total PCB (ppm)
LTM-115B	S-LTM115B-20FSP20-00-05	11/11/2021	114
	S-LTM115B-20FSP20-05-10	01/15/2022	0.345
	S-LTM115B-20FSP20-10-15	01/15/2022	0.0029
	S-LTM115B-20FSP20-15-21	01/15/2022	0.0796
LTM-115N	S-LTM115N-20FSP20-00-05	11/11/2021	0.167
LTM-115S	S-LTM115S-20FSP20-00-05	11/11/2021	21.4
LTM-115E	S-LTM115E-20FSP20-00-05	11/11/2021	6.72
LTM-115W	S-LTM115W-20FSP20-00-05	11/11/2021	3.0
LTM-117B	S-LTM117B-20FSP20-00-05	11/11/2021	1370
	S-LTM117B-20FSP20-05-10	01/15/2022	162
	S-LTM117B-20FSP20-10-15	01/15/2022	5.07
	S-LTM117B-20FSP20-15-21	01/15/2022	0.473
LTM-117N	S-LTM117N-20FSP20-00-05	11/11/2021	3.7
LTM-117S	S-LTM117S-20FSP20-00-05	11/11/2021	2.41
LTM-117E	S-LTM117E-20FSP20-00-05	11/11/2021	1.13
LTM-117W	S-LTM117W-20FSP20-00-05	11/11/2021	54.7
LTM-128B	S-LTM128B-20FSP20-00-05	11/11/2021	1.72
LTM-128N	S-LTM128N-20FSP20-00-05	11/11/2021	72.6
LTM-128S	S-LTM128S-20FSP20-00-05	11/11/2021	0.0728
LTM-128E	S-LTM128E-20FSP20-00-05	11/11/2021	44.0
LTM-128W	S-LTM128W-20FSP20-00-05	11/11/2021	0.0237

Table 2

Determination of Horizontal Extents for 2022 LTM-117 and LTM-128 Dredging

	LTM-117B	LTM-117N	LTM-117E	LTM-117W	LTM-117S
PCBs (mg/kg @ 0.0-0.5 ft.)	1,370	3.70	1.13	54.7	2.41
Distance to LTM-117B (ft.)	0	52.6	49.4	51.7	47.3
mg/kg per ft. drop from LTM-117B		26.0	27.7	25.4	28.9
Distance from LTM-117B to RAL 30 mg/kg (ft.)		51.6	48.4	52.7	46.4

	LTM-128B	LTM-128N	LTM-128E	LTM-128W	LTM-128S
PCBs (mg/kg @ 0.0-0.5 ft.)	134	72.60	44	0.0237	0.0728
Distance to LTM-128B (ft.)	0	46.0	50.0	49.0	46.0
mg/kg per ft. drop from LTM-128B		1.3	1.8	2.7	2.9
Distance from LTM-128B to RAL 30 mg/kg (ft.)		77.9	57.8	38.0	35.7



Legend

- Sample Location
- Cable Crossing Dredge Area
- Cap Limit
- Proposed LTM 117 Dredge Prism Thickness of Sediment to Remove = 1.0 ft. plus 0.2 ft. OD

Post-Dredge Elevation NAVD88 - ft (10/29/2018)

-2.1 - -1.0	-7.2 - -6.2
-3.1 - -2.1	-8.2 - -7.2
-4.1 - -3.1	-9.2 - -8.2
-5.1 - -4.1	-10.3 - -9.2
-6.2 - -5.1	-11.3 - -10.3

Aerial Photography MASSGIS 2014

July 2022

0 150 Feet

1:1,800

JACOBS

Proposed LTM 117 Dredge Prism

NAME: jpiccuito Date: 7/21/2022

Figure 1

Path: Y:\NBH\Projects\35BG100\20220628_Proposed_Dredging_LTM115_117_3X3\ArcGIS\Proposed Dredging Cable Crossing LTM 117 20220628.mxd

Area L

LTM 128N

8487 sqft

LTM 128 W

LTM 128B

LTM 128E

LTM 128S

Area R

Legend

- Sample Location
- Dredge Area P
  Note: No bathymetric data
- Proposed LTM-128 Dredge Prism
  Thickness of Sediment to
  Remove = 1.0 ft. plus 0.2 ft. OD

Aerial Photography MASSGIS 2014

0 35 70
Feet

1:420

JACOBS®

Proposed LTM-128 Dredge Prism

NAME: jpiccuito Date: 9/2/2022

Figure 2

Path: Y:\NB\HIProjects\35BG\10012022082\9_Area_P_LTM128\ArcGIS\Proposed Dredging Area P LTM 128_20220902A.mxd

Attachment C

Final North of Wood Street Sediment Removal Rev. 1

Jacobs

Project Notes

103 Sawyer Street
New Bedford, MA 02746
www.jacobs.com

Client	NAE	**Date**	10 June 2022
Project	New Bedford Harbor Superfund Site	**Project No.**	35BG7000
Prepared By	Josh Cummings	**DCN**	ACE-J23-35BG7000-P1-0020
Issued By	Lonnie Fallin		
Subject	FINAL: North of Wood Street Sediment Removal Rev. 1		

Distribution	(* Denotes Part Time Participation)	**Distribution (attendees plus)**	**See below**	
Client	**EPA**	**Sevenson**	**Jacobs**	
Kerwin Donato	Dave Dickerson	Joe Mahoney	Anita Rigassio Smith	
Marie Esten	Natalie Burgo		Lonnie Fallin	
Robert Ward			Josh Cummings	
			Patrick Curran	

1 PURPOSE

This project note summarizes the planned excavation of contaminated sediments in the Acushnet River, adjacent to Rivers End Park in New Bedford, MA. This area is referred to as North of Wood Street (NWS).

2 BACKGROUND AND PLANNING

Intertidal and subtidal PCB contaminated sediments located north of the Wood St. Bridge within the Acushnet River were identified and subsequently excavated between 2001 and 2003 as part of the Superfund remediation effort. Following excavation, the area was restored to its previous state as a river with fringing wetlands. Additional restoration work was later performed by the City of New Bedford on the west side of the river during construction of the Rivers End Park. Since the completion of cleanup activities in 2003, the sediments located north of the Wood St. bridge have been periodically sampled for PCB contamination (re-contamination). Sampling conducted by AECOM during 2021 identified a localized area of relatively significant PCB contaminated sediment, follow up sampling was conducted around the most elevated location. The results of the sediment sampling efforts found three locations having PCB concentrations above 300 PPM (Figure 1). These 3 locations, NWS-05, NWS-05E, and NWS-05S are all in an area approximately 30 ft. square. In response to these elevated locations, Jacobs conducted a probing investigation to identify the dominant material type of the river bottom (sand vs. silt vs. gravel), this was performed by probing with a steel rod and recoding the penetration depth, generally softer sediments allowed deeper penetration. The depths recorded during probing are illustrated on Figure 1. The purpose of this was to identify locations for additional sampling by locating any pockets of soft sediments. Generally, the river bottom was made up of coarse sand or gravel with some areas with finer material. Four additional sampling stations (NWS-501 through NWS-504) were proposed following a discussion with EPA and USACE on December 9, 2021. The purpose of the additional sampling locations was to define the edge of the proposed excavation presented in this document. AECOM collected these samples during March 2022, after the winter ice had receded. The results of the additional four samples are included as an inset in Figure 1 along with other recent NWS sampling data from 2021.

On April 8, 2022, EPA, USACE, AECOM and Jacobs discussed the 2021 - 2022 sampling results and probing survey. As a result of this discussion, an excavation prism was developed, this prism is shown on Figure 1 and Figure 2. The excavation is planned to include all material within the proposed footprint to a depth of 1

	ft. below the existing river bottom, if possible, due to hard pan. The proposed excavation neat volume is 62 cubic yards (CY). Because of the hard packed gravely sediment, it is assumed that an open top, toothed digging bucket will be utilized for the material removal. The over dredge allowance will be 0.5 ft. because of the toothed bucket, and the total excavation volume will be approximately 94 CY. The north-eastern edge of the excavation will be within 2-3 feet of the large two-man stone that marks the limit of the previously restored area except in the immediate vicinity of NWS-05E. Within 10 ft. of both sides of NWS-05E, along the northern excavation boundary, sediment will be excavated directly adjacent to the line of two-man stone. If the line of stones is disturbed during excavation, they will be reset in their current location during backfilling. This off-set is expected to be sufficient to leave the two-man stone undisturbed.
3	**MOBILIZATION & PREPERATION**
	The access to the proposed excavation location is planned to be through the Rivers End Park on River Road in New Bedford, Massachusetts (Figure 2). The Rivers End Park parking lot is constructed of landscape pavers. Access from the parking lot to the Acushnet River is possible down a steep embankment at the edge of the parking lot and through a saltmarsh which was recently restored by the City of New Bedford. Excavation will be planned to be outside of the biannual herring migration within the Acushnet River. Historically the in-migration has been documented as April 1st through June 15th and the out-migration has been documented to be September 1st through November 15th. Prior to mobilization areas within the park with the potential to be impacted will be photo documented. It is planned that the photo documentation will include parking lot pavers, fence posts, signage, concrete walls, rock walls, trees, lawn areas and the restored saltmarsh. Temporary fencing, barricades or caution tape will be used to delimit the work area and warn park goers of active construction in the area. To prepare the staging area, Jacobs and Sevenson will install plastic construction mats over a portion of the parking lot to protect the pavers. The matted area will be used for staging roll off containers and any tracked vehicles when not in use. It is estimated that approximately 3,000 square ft. of construction mats will be required. Access from the parking lot to the saltmarsh will require the temporary removal of an ornamental rope fence along the top of slope. The fence will be removed in a manner to allow its reinstallation during demobilization, or it will be replaced. From the edge of the construction mats in the parking lot, and down the embankment to the edge of the water, a ramp will be built consisting of gravel underlain by a geotextile fabric. The ramp will be minimally 15 ft. wide on the driving surface and sloped on the sides as needed to maintain stability. Construction mats, underlain by geotextile fabric, will be installed to create a temporary road from the ramp, through the saltmarsh to the river. Additional gravel will be placed on top of the mats as needed to secure the mats. The haul road will be approximately 130 ft. long. At the edge of the Acushnet River and into the river, gravel will be placed to create a temporary pad where the excavator will sit and operate from. Figure 2 shows the approximate location of this gravel pad. The exact orientation and size of the pad will be developed in the field. If the pad is required to be within the excavation prism footprint, the portion of the prism to be covered by the pad will be excavated to the planned elevation prior to building the temporary pad.
4	**EXCAVATION PLAN**
	Once mobilization has been completed, an exclusion zone and contaminant reduction zone with a boot wash, PPE disposal station and personal clean up supplies. will be established within the work area. The excavator will then be moved to the end of the pad. A roll-off truck will then be backed down the temporary haul road to a position which allows for loading of the roll-off container by the excavator. Poly sheeting will be placed over

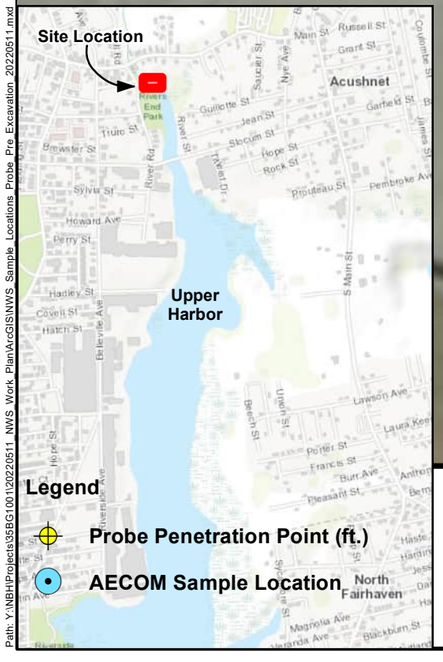
	the excavator swing area on the restored salt marsh and secured. A field engineer with an RTK GPS will mark out the edges of the excavation prism with stakes and provide guidance when digging up to within 2-3 ft of the two-man stone. The excavator will begin digging from the far edges of the prism to the gravel pad. Full buckets will be taken to the extent possible to reduce the amount of water placed in the roll-offs. Provided the tide is low enough, the excavated material may be temporarily stockpiled for gravity drainage on unexcavated inventory. Any stockpiled material will be loaded out by the end of the workday. If necessary, Portland Cement will be added to the excavated material for stabilization, this will happen when the roll off is on the temporary haul road during or after loading, the excavator will mix the cement with the sediment. Following stabilization, if necessary, the roll off will be moved to the staging area in the parking lot. Filled roll-offs will be inspected, and any free water will be pumped off for and containerized for transportation to Sawyer St. Containerized water will be pumped into Cell 2, allowed to settle, sampled, and discharged to the POTW. When the roll offs are deemed to be ready for over the road transport, by the T& D contractor, they will be covered and appropriately placarded, and manifested for transport to the Area C DDA. While the filled roll off is being prepared for transport to Area C, a second truck with an empty roll off will back down the ramp and excavation will resume. This process will continue daily as tidal conditions allow or until the excavation has been completed. All full roll-offs will be transported to Area C by the end of each workday. No full containers will be left at Rivers End Park at the end of a workday. At the end of each workday all equipment, poly sheeting and tools will be moved from the salt marsh to higher ground. The excavator bucket will be rinsed of all visible sediment and wrapped in poly sheeting. Any empty roll offs will be covered. Hand tools, consumable supplies, safety equipment and any other small items will be removed for overnight storage at Sawyer St. The work area will be closed off by high visibility fencing or rope. Access to the haul road will be blocked by heavy equipment. Heavy equipment will be locked up each night. Completion of the excavation will be determined by the field engineer via an RTK GPS. The engineer will confirm that the horizontal and vertical extent of excavation has been achieved or will direct additional excavation as needed. No post-excavation confirmatory samples will be collected. Upon completion of excavation, the excavator bucket will be rinsed of all visible sediment. The prism area will then be filled with clean gravel, using gravel from the temporary gravel pier as much as possible, and graded to roughly match the pre-existing topography. Additional gravel will be brought in as necessary to complete the backfilling. Sediment transported to the DDA will be stockpiled and disposed of as TSCA waste.
5	**DEMOBIILIZATION**
	Demobilization will begin with the removal of the gravel pad. This material will be used to the extent possible to backfill the excavation area. Any remaining gravel will be loaded into clean roll-offs for transport to Area C for eventual reuse. Any gravel comingled with river sediment will not be reused, it will either be disposed of with intertidal sediment or stockpiled to be placed under the DDA cap when intertidal work has been completed. The gravel haul road and ramp will be removed for reuse. The plastic construction mats will be rinsed or dry decontaminated and transported to Area C for storage. Geotextile fabric will be removed for disposal.

	Equipment will be dry decontaminated as needed and transported to Area C. Following the removal of the roll-offs and excavator, the construction mats in the parking lot will be removed and transported to Area C for storage. The ornamental rope fencing removed during mobilization will be reinstalled to pre-existing conditions. Following removal of the temporary haul road in the salt marsh, the area will be evaluated by Jacobs and USACE. If native wetland plants are found to be damaged beyond recovery, they will be replaced in kind and protected from herbivory as appropriate. The upland areas will be restored to pre-existing condition as needed. Efforts will be made to protect the pavers within the parking lot. The area will be inspected for damage following the removal of plastic mats. Any damaged pavers will be replaced as needed.

1,684 square feet
62 CY @ 1ft. re-
moval depth

NWS 06
NWS 05N
NWS 12
NWS 05
NWS 05W
NWS 05E
NWS 05S
NWS 504
NWS 501
NWS 502
NWS 503
NWS 04B

Loc ID	Interval	PCBs (mg/kg)
NWS-501	0.0-0.5	0.765
NWS-502	0.0-0.7	0.784
NWS-503	0.0-0.7	0.319
NWS-504	0.0-0.2	1.71
NWS-05	0.0-0.5	306
NWS 05	0.5-0.9	22.4
NWS-05N	0.0-0.5	0.0944
NWS-05S	0.0-0.5	357
NWS-05E	0.0-0.5	685
NWS-05W	0.0-0.5	5.2
NWS-06	0.0-0.5	0.2
NWS-12	0.0-0.5	32.4



Legend
Probe Penetration Point (ft.)
AECOM Sample Location

NWS Excavation Area (4/21/22 revision)

0 20 40 Feet

May 2022

Basemap Data Source:
MassGIS

Datum Info:
Vertical - NAVD88, feet
Horizontal - NAD83 StatePlane MA, feet

North of Wood St. Proposed Excavation with Analytical and Probing Data

New Bedford Harbor Superfund Site

JACOBS

Figure 1

Path: Y:\NBH\Projects\35BG100\20220511_NWS_Work Plan\ArcGIS\NWS Sample Locations Probe Pre Excavation 20220511.mxd

Main St

Tarkiln Hill Rd

Hamlin St

Acushnet

Gravel Pad for Excavator, gravel to be used as backfill following excavation

Plastic mat haul road over fabric. 15' wide.

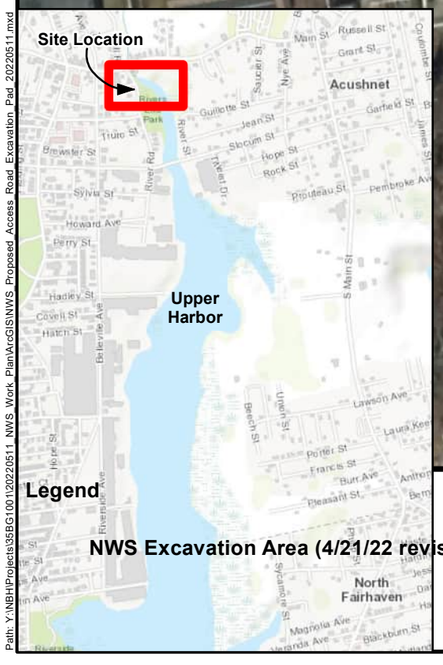
Acushnet River

River Rd

Approximatley 4 ft. drop, construct gravel ramp over fabric

Staging area for rolloffs

New Bedford



0 80 160 Feet

May 2022

Basemap Data Source:
MassGIS

Datum Info:
Vertical - NAVD88, feet
Horizontal - NAD83 StatePlane MA, feet

North Of Wood Street Excavation Area with Proposed Access Road and Excavation Pad

New Bedford Harbor Superfund Site

JACOBS

Figure 2

Path: Y:\NBH\Projects\35BG10012\20220511 NWS Work Plan\ArcGIS\NWS Proposed Access Road Excavation Pad 20220511.mxd

Attachment D

Draft Final North of Wood Street Excavation Work Plan

New Bedford Harbor Superfund Site

U.S. Army Corps of Engineers New England District

Draft Final North of Wood Street Excavation Work Plan

ACE-J23-35BG2000-M7-0021

April 2024

New Bedford Harbor Superfund Site

Project no:	35BG2000
Document title:	Draft Final North of Wood Street Excavation Work Plan
Document No.:	ACE-J23-35BG2000-M7-0021
Revision:	0
Date:	April 2024
Client name:	U.S. Army Corps of Engineers New England District
Project manager:	Lonnie Fallin
Author:	Shane Taylor

Jacobs
103 Sawyer Street
New Bedford, MA 02746
508-996-5462
508-996-6742
www.jacobs.com

Document history and status

Revision	Date	Description	By	Review	Approved

Table of Contents

Figures

Tables

Appendices

Acronyms and Abbreviations

APP	Accident Prevention Plan
bgs	below ground surface
CR	CR Environmental Inc.
CRZ	contaminated reduction zone
CSO	combined sewer outfall
cy	cubic yards
DDA	debris disposal area
EPA	U.S. Environmental Protection Agency
GPS	global positioning system
HDPE	high density polyethylene
LF	linear feet
MHF	Material Handling Facility
MHHW	Mean Higher High Water
MLLW	Mean Lower Low Water
NWS	North of Wood Street
NWSWP	North of Wood Street Excavation Work Plan
PCB	polychlorinated biphenyl
ppm	parts per million
RAL	remedial action level
RTK	real time kinematics
sf	square feet
SWAC	surface weighted average concentration
UH	Upper Harbor

1.0 Introduction

This North of Wood Street Excavation Work Plan (NWSWP) summarizes the planned excavation of contaminated sediments in the Acushnet River, from the southern end of Rivers End Park in New Bedford, MA south to the Wood St. Bridge. This remedial area is referred to as North of Wood Street (NWS). Work will be conducted out of a vacant parking lot in Acushnet, MA, located at the intersection of Slocum St. and River St.

1.1 Project Objectives

The objectives of this NWSWP and subsequent remedial action is to excavate and dispose of polychlorinated biphenyl (PCB) contaminated sediment above a remedial action level (RAL) of 30 milligrams per kilogram (mg/kg). The sediments with elevated PCB levels were identified during long term monitoring sampling activities as discussed in Section 1.3 Sampling Effort. This Section and Section 1.4 provide the existing conditions for the North of Wood Street excavation area and site-specific details that are the basis for the excavation approach.

1.2 Previous Dredge Operations

Intertidal and subtidal PCB contaminated sediments located north of the Wood St. Bridge, within the Acushnet River, were identified and subsequently excavated between 2001 and 2003 as part of the Superfund remediation effort. Following excavation, the area was restored to its previous state as a tidal river with fringing wetlands. Additional saltmarsh creation and park restoration work was later performed by the City of New Bedford on the west side of the river during construction of the Rivers End Park. This effort removed approximately 15,619 cubic yards (cy) of contaminated sediments for offsite disposal (Tetra Tech, 2005). Since the completion of cleanup activities in 2003, the sediments located north of the Wood St. bridge have been periodically sampled and analyzed for PCB contamination (recontamination). During 2005 Jacobs conducted a small excavation and restoration of the salt marsh area where the access roads (finger and haul roads) are planned to be located during the effort presented in this NWSWP, a total of 451 cy of contaminated sediments were removed for disposal during this effort (Jacobs 2006). As a note of clarification, Wood St. in New Bedford becomes Slocum St. in Acushnet.

The periodic sampling identified several areas where sediment PCB concentrations were elevated. In 2023, approximately 94 CY of sediment along the Acushnet shoreline, about 300 ft south of the Main Street Bridge, was removed. This work was completed from a land based staging area located in Rivers End Park. Roll-offs were placed in the staging area, a high density polyethylene (HDPE) construction mat haul road lead to a gravel pad constructed in the river for the excavator allowing access to the sediments of concern (Jacobs, 2022). Material utilized for the gravel pad acted as clean backfill to replace the excavated sediment. The lessons learned and excavation approach are applicable to the current effort.

1.3 Sampling Effort

As part of the long-term monitoring plan for the Upper Harbor, sampling was conducted at NWS by AECOM during 2021. Data revealed multiple sediment samples with significant PCB contamination. The maximum concentration observed was 188 parts per million (ppm) for sample C015-049 (Figure 1). The samples were used to support this excavation plan (Figure 1, Table 1). Further information is provided Section 2.1 for the dredge prism development.

1.4 Existing Conditions

1.4.1 Bathymetry

A bathymetric survey of the area of interest was conducted by CR Environmental Inc. (CR) in February 2024, which showed water depths ranging from 1.0 to -4 ft. Mean Lower Low Water (MLLW), as represented in Figure 1. The western portion of the river (New Bedford) is predominantly shallow and slopes gradually toward the 40 ft wide channel that runs along the eastern site (Acushnet) of the river. The eastern side of the river slopes steeply to the channel.

1.4.2 Sediment Characterization

The analytical results and associated boring logs for the 11 samples collected in the area of interest are summarized in Table 1 and Appendix A, respectively. The boring logs show that on average, 0-0.5 ft. below ground (sediment) surface (bgs), black organic sediment transitions to a gray silt or coarse sand for the remainder of the sediment core to approximately 2 ft. bgs. In addition, there are pockets of shells and gravel within the core descriptions. The core logs were used as a design factor to adjust the dredge cut thickness to correlate the sediment type with the analytical result intervals. For example, if the analysis was for the 0.5-1.0 ft. interval and the boring log indicated the sediment transition from black silt to gray silt or sand was at 1.2 ft., the dredge cut was designed to 1.2 ft.

1.4.1 Utilities

There are no underground or overhead utilities that are anticipated to impact excavation operations. There is a City of New Bedford owned combined sewer outfall (CSO) that empties into the Acushnet River at the north end of the excavation prism on the western edge of the river. It is not within the excavation footprint or anticipated to be affected by any excavation work. There is a storm drain outfall on the far northeast side above the proposed NWS excavation prism, this structure will not be impacted by the planned excavation. The locations of these structures is shown on Figure 4.

1.4.2 Equipment Considerations

Site reconnaissance of the area has shown there are numerous rocky outcrops and boulders located within the excavation area, many of which are visible at low tide. It is not anticipated that debris or rocks will impact production rates or require separate debris removal equipment (grapple, etc.). Alternative approaches considered in the remediation of this area included barge-based work, sheet pile cofferdams, and amphibious equipment. The shallow conditions and presence of large rocks and rock outcrops eliminated these alternatives from consideration.

2.0 Excavation Design Development

This section describes the methods that were implemented to design the excavation limits and depths to achieve the cleanup goals for North of Wood Street.

2.1 Prism Development

PCB concentrations with depth (bgs) for the 11 sediment samples collected in the area of interest are provided in Table 1. The last line of the table provides the proposed cut depth at each sample location, which is based on the core depth that is above 30 ppm. The corresponding cut depth and sample location was then integrated into GIS and kriged to a RAL of 30 parts per million (ppm). This kriged model is presented in Figure 2 with the range of cut depths from 0.5 to 3.0 ft. The planned RAL 30 prism is designed to remove a neat volume of 2,666 cy over an area of 53,721 square feet (sf), which correlates to an average cut depth (neatline) of 1.34 ft. for the entire prism. The assumed over dredge for excavation is 0.25 ft. resulting in a total estimated removal volume of 3,163 cy.

A difference map comparing the 2015 and 2024 bathymetric surveys, conducted by CR, shows areas of accretion of up to 1.5 ft. in certain zones within the excavation area (Figure 3). Considering this time frame accounts for less than half of the time period between the first cleanup operations in 2003 and the present day, the data support the theory that the NWS recontamination is the result of the accretion of contaminated sediments from outside of the NWS prism footprint. These sediment deposits are described within the boring logs (Appendix A).

2.2 Cleanup Performance

The cleanup performance of this remedial action will be based upon post excavation evaluation of the dredge management software (DredgePack or Trimble) output files to verify that the cut depths provided in Figure 2 have been met. Post-excavation bathymetry will not be used to verify cut depths because removal of the required finger roads may leave some clean residual material within the dredge footprints, which would appear as undredged inventory. Previous experience at NBHSS has shown a close correlation between the DredgePack/Trimble output and bathymetric survey results so the team has high confidence in using the dredge management software to verify target excavation elevations have been met. Re-excavation will only be required if the excavator data/dredge management software or compliance points described in Section 5.0 show there is undredged inventory above the neatline. There will be no post excavation cores collected to verify the removal of soft sediment or residual contamination levels. However, sediment sampling will be performed in 2025 in this area as part of long-term monitoring.

Large boulders, bedrock outcrops or shoreline armor stone will limit excavation where they are present. If excavation to the target elevation is not possible in an area due to immovable obstructions, the limits of excavation will be documented along with an explanation for the deviation to the excavation plan. These deviations will be documented in the daily reports.

2.3 Potential Impacts to Fish Migration

New Bedford Harbor and the Acushnet River are a known migration pathway for several species of river herring including the alewife and blueback Herring. These fish are expected to in-migrate between approximately April 15th-June 15th and out-migrate between September 1st – November 15th. These dates are approximate based

on past behavior and predicted temperatures. Excavation work is planned to be initiated and completed between these migration periods, during the summer. In the unlikely event excavation work continues into the out-migration period, efforts will be made to ensure that safe fish passage is available at all times. This means maintaining an open, unobstructed pathway with at least 6 inches of clearance at low tide and minimizing turbidity to the extent possible. In the event that mitigation measures are found to be ineffective at preventing negative impacts to migrating fish, additional measures, including a temporary work stoppage will be considered by the project team. Further information is presented in *Draft Final 2016 Fish Migration Impact Plan, Revision 3* (Jacobs 2019).

3.0 Construction Operations

This section describes the specific construction-based operations developed with Sevenson Environmental Services Inc. (SES) to remove and dispose the contaminated sediment presented in Figure 2.

3.1 Equipment

The following equipment list, or equivalent, is required to perform the work described in this section:

- Komatsu PC-300 long stick excavator equipped with RTK GPS and smooth-edged conventional excavator bucket (1 cy capacity).
- Hydrema offroad dump truck (road construction).
- Komatsu WA380 Loader (road construction).
- Telehandler (road construction).
- (2) roll off trucks.
- (3) gasket sealed 25 cy roll offs.
- (80) 7 ft. x 14 ft. HDPE construction mats.
- Small work boat. (support)

3.2 Finger and Haul Road Construction

Prior to road construction activities, the path of the haul road and finger roads through the marshes will be staked. Larger vegetation such as shrubs and small trees will be cut flush with the ground if necessary. An RTK GPS topographic survey of the marsh area will be performed, by Jacobs, prior to any mats or heavy equipment entering the marsh. A photographic survey of the marsh, parking lot, gates, fencing and general area will be performed prior to mobilization, to document pre-existing conditions. The proposed haul road is shown on Figure 4.

The HDPE construction mat haul road will be installed over geotextile fabric in upland areas adjacent the marsh. HDPE construction mat finger roads will be constructed off of the haul road, through the saltmarsh, towards the proposed rock finger roads in the river. Gravel will be used as necessary to level or stabilize the roads through the marsh. Gravel will be placed on or under the HDPE mats but above the geotextile to prevent mixing with marsh soils. If gravel is required it is anticipated to be dense grade aggregate (DGA), since this material can be re-used it is anticipated that less than 100 cy of DGA will be required for the finger roads planned to cross the saltmarsh.

Finger roads in the Acushnet River will be constructed with 4-10 inch crushed stone. The surface will be leveled, and HDPE construction mats installed as needed to allow the roll off truck access. The finger roads will be topped with HDPE construction mats for the entire length except for the final 40 ft. where the excavator will sit. The finger roads connected to the haul road will be angled to allow the roll off truck to access the finger roads with minimal difficulties as shown in Figure 4. It should be noted that the finger roads in the saltmarsh and Acushnet River are shown in proposed locations, the actual locations may vary based on field conditions at the time of construction.

The excavator has a swing radius of 50 ft., which was used as the basis for the finger road spacing of approximately 90 ft. There is a total of 6 finger roads required to complete the work, which are an average of 125 ft. in length and 15 ft. wide. The average water depth for the NWS area is -2 ft. MLLW. The finger roads are to be constructed to have at least 2 ft. of freeboard above Mean Higher High Water (MHHW), resulting in an average finger road thickness of 8 ft. of material. Using the average dimensions noted above, as well as a 2:1 slope considered for the angle of repose for the crushed stone (both sides of the finger road), this results in an estimated finger road volume of 600 cy. To allow for flexibility and an additional factor of safety, it is estimated that the total delivered crushed stone material will be approximately 1,000 cy, this quantity also accounts for losses of stone during recovery of finger road material. A slope stability analysis will be conducted by a Jacobs engineer prior to mobilization, this analysis is intended to minimize the chances of structural issues with the 4-10 inch crushed stone roads during use. Past project experience with this stone finger road approach at NBH and other sites, by Sevenson, has proven the approach can be implemented successfully.

There are six proposed stone finger roads with an average length of 125 ft. each for a total of 750 linear ft. of stone finger roads. The 15 ft. wide road surface on the top of the stone fingers provide a level operating area of 11,250 square ft.

3.3 Excavation Approach

The general approach is that work will progress from the north end of the prism to the south. A temporary shore-based haul road will be built on the Acushnet side of the river (Figure 4), the haul road will begin at the north side of the parking lot and extend to the north end of the prism. From the haul road finger roads will be built through the saltmarsh to the shoreline. Remedial excavation will begin from the shore with excavation of the area where the first finger road will be installed. Excavation will commence with the removal of contaminated sediments in the footprint of the first stone finger road. This preliminary excavation will include all targeted sediments within reach from the shoreline within the stone finger road footprint plus a lateral buffer of at least 5 ft. Following this excavation, the excavator bucket will be rinsed of any visible sediment and crushed stone will be placed to create the first section of the first stone finger road. The excavator will then move to the end of the first section of stone finger road and excavate the next section of the finger road footprint (plus a lateral buffer). Once this area has been excavated to the planned elevation the excavator bucket will again be rinsed of visible sediment and additional stone will be placed to extend the finger road further. HDPE construction mats will be installed on the finger road by an offroad telehandler to allow the roll off truck to back on to the crushed stone finger road. All excavated material will be loaded directly into a lined 25 cy roll off. This process of excavating, placing stone and placing mats will continue until the crushed stone finger road allows the excavator to reach all targeted sediment on the west side of the prism. The excavator will remove all sediment within reach of a particular finger road then the bucket will again be rinsed of visible sediment and the removal of the stone finger road will begin. Any large rocks recovered during excavation will be rinsed of sediment and placed back in the river.

The construction of 230 ft. of HDPE mat haul road and six 100 ft. HDPE mat fingers total 830 linear ft. of HDPE mat roads. The 100 ft. long mat fingers connect the upland haul road through the marsh and cover the stone finger roads completely except for the final 40 ft. of each stone finger where the excavator will sit on the stone. Since these roads will be build and removed one at a time up to 51 mats will be needed for the haul road and fingers.

A Hydrema off road dump truck will be utilized to move stone from the stone storage area in the parking lot to the finger road construction area and then back again to the stone storage area during the removal of each finger road. A front end loader will be used to manage the stone storage area. The stone storage area will be constructed of HDPE construction mats with concrete bin blocks on the sides. The stone storage area has initially been sized to accommodate at least 350 cy of stone (42 ft. x 42 ft.) but can be increased as needed with the addition of HDPE construction mats which are intended to protect the paved surface. The stone storage area may need to be relocated during construction activities to allow shoreline access. The location of the stone storage area on Figure 4 is the proposed first location when finger roads to the north are being utilized. Because of size limitation of the paved parking area and traffic paths for stone delivery and roll off truck travel a single location for stone storage may not be practical. Eighteen mats will be used to build the stone storage area. Eleven additional mats will be on hand to protect the paving lot as needed in areas where roll-offs will be unloaded or where the tracked excavator will move across any paved areas. No geotextile fabric will be required under mats in the parking lot.

Free water generated during excavation will be limited by taking full buckets of sediment and decanting any free water over uncleaned areas. Sediment will then be placed into lined, sealed roll off containers for transport to the DDA at 103 Sawyer St. Dewatering of the filled roll offs at the NWS site is not planned.

A small workboat will be available during the NWS effort for support. This workboat will be used as needed to deploy oil boom (if a sheen is observed), assist with survey tasks, and provide in water support to construction if needed.

3.4 Sequencing and Production Rates

The sequence of excavation and finger road construction has an estimated daily excavation production rate of 50 cy or 50 linear feet (LF), and 50 LF of road construction. This process will continue until the finger road is completed, which is estimated to be 3 days. After finger road completion, the excavator will remove the remaining contaminated sediment at an estimated rate of 100 cy/day. Upon completion of excavation, the finger road will be removed at a rate of 200 cy/day, taking on average 3 days. Some finger road material may remain within the dredge footprint. The pre-excavation elevation data will be used within the dredge management software to allow the operator to verify that any remaining road material is below pre-excavation elevations. There is no plan to backfill the excavated dredge prism.

3.5 Residual Management

The generation of residuals or resuspension of sediment will be minimized by the following practices.

- Dredge cuts will be taken with a smooth-edged 1 cy conventional excavator bucket, this will prevent mixing of contaminated sediments with deeper uncontaminated sediments.
- Dredge management software will be utilized for all excavation activities to ensure complete excavation.

- The operator will take full buckets of sediment whenever possible to minimize the need to decant liquid from the bucket.
- Bucket movement will be slow and methodical to prevent the suspension of adjacent sediments and to reduce spillage when loading roll offs.
- Poly sheeting will be used to protect the finger roads and shorelines from spillage.
- Excavation may be slowed or temporarily suspended if excess turbidity is, or if schools of migrating fish are observed.
- Cuts for finger roads will be wider than the proposed road width so road material will remain clean and dredge working edge will not be covered by the road.

3.6 Sediment Transport and Processing

Excavated sediment will be placed into lined roll offs for transportation from the NWS project area to the debris disposal area (DDA) at 103 Sawyer St. Transportation will be performed by properly licensed waste haulers, under manifest. It is anticipated that 2 roll off trucks with drivers and (3) 25 cy sealed roll off containers will be used during excavation activities. Each load will be inspected by the driver or T&D coordinator prior to transport.

Roll off containers will be emptied at the DDA by dumping off a ramp. The excavated sediment will be stabilized with Portland cement and stockpiled. It is anticipated that 10% by weight Portland Cement will be added to the sediment to stabilize it.

3.7 Transportation and Disposal

Once the stabilized material has set up sufficiently it will be loaded into lined trailer dump trucks for transportation under manifest, by a licensed waste hauler, to the MHF transload facility in Worcester, MA. From there the waste will be placed into rail cars for transportation by rail to Wayne Disposal, Inc. Site #2 Landfill in Belleville, MI for disposal.

It is estimated that the total dredged volume (including over-dredge of 0.25 ft) of 3,163 cy will result in a disposal quantity of 4,840 tons following stabilization. This is an estimated tonnage based on 1.53 tons/cy, this is the conversion which has been used by Jacobs for the estimation of stabilized marsh soils and sediments excavated during prior intertidal work at NBH.

3.8 Site Restoration

Any areas of the marshes with significant compaction or rutting will be repaired or backfilled as needed. Vegetated areas which were matted over will be assessed for viable plant regrowth by Jacobs or a qualified subcontractor. If necessary, a planting plan will be developed to accelerate the re-establishment of suitable native species. The upland areas will be restored to pre-existing conditions as required.

Below is a description for the complete restoration and replanting of the impacted marsh and upland areas, this restoration activity will be implemented on an as-needed basis, depending on conditions following the removal of materials and equipment related to the planed excavation work.

Following the demobilization of equipment from the marsh area, the area will be inspected for damages and restored to pre-excavation topography. The pre-excavation GPS survey will be used as the basis for the marsh soil restoration. It is anticipated that up to 6 inches of manufactured wetland topsoil will be required to fill compacted areas where haul roads were located. For the entire haul road area, the amount of soil is 95 cy/124 tons @ 1.3 tons/cy. Any ruts will be raked out and the surface prepared for planting/seeding following soil placement.

Areas where salt marsh grasses were located will be replanted as necessary following soil placement, in the event all marsh grasses within the matted area need replanting approximately 900 sq ft. of low marsh and 900 sq ft. of high marsh will be installed, these quantities were estimated based on the planting plan developed after the 2005 NWS excavation conducted by Jacobs (Jacobs 2006), Figure 5 was generated during 2006 to document this restoration, it should be noted that elevations shown on Figure 5 are in the superseded vertical datum NGVD29. Critter fencing will be installed to protect any newly planted marsh areas. Approximately 135 liner ft. of fencing will be needed to protect the seaward edges and carry the fencing about 15 ft. into the marsh to prevent goose intrusion from the sides.

Within the transition zone, just above the wrack line 5 Iva frutescens will be installed at 3 ft. on center spacing within each of the 3 proposed roadways going through the saltmarsh.

Following marsh plantings, salt tolerant conservation seed mix will be installed on the restored roadways, above the transition zone, this area is estimated to be 3,300 sq ft. If the impacted area includes the park area planted with lawn grass a suitable lawn seed mixture will be applied rather than conservation seed mix. A weed free mulch straw will be applied over the newly applied seed. It is anticipated that 1 small tree may require removal and 1 large tree will need limbing.

It is not anticipated that any restoration will be required along the shoreline for the 3 southern most finger roads which will be accessed via the parking lot over a rip rap protected slope. Care will be taken to leave the rip rap slope intact during demobilization.

3.9 Site Demobilization

As excavation progresses, the finger roads will be removed for material reuse to the extent possible. It is likely that some road material will be left in place where it is commingled with river sediments. At the conclusion of excavation, in-river access road material which is not recovered will be spread out over the excavated area per section 3.4. Excess or unused road material will be transported back to Sawyer St. for future reuse.

HDPE construction mats in the marshes will be removed and rinsed or dry decontaminated and transported to 103 Sawyer St. for additional decontamination (if necessary) and demobilization off site. Equipment will be dry decontaminated as needed and transported to 103 Sawyer St.

The asphalt parking lot area will be swept, and any construction related materials or debris removed.

4.0 Quality Control

As excavation progresses, the dredge management software will record the horizontal and vertical extents of excavation utilizing RTK GPS. This data will be compared to the excavation prism daily to enable the crew to identify over or under excavation and take corrective actions as needed. The excavator calibration will be verified daily by comparison to a second GPS unit. Acceptable tolerances will be +/- 0.25 ft. vertical and +/- 0.5 ft. horizontal.

The 11 sample locations used to design the prism will be utilized as compliance points and be checked by RTK GPS after completion of each area to verify that the target elevation has been archived. Any under dredged areas will be corrected by additional excavation. Under excavation due to obstructions such as a bedrock outcrop will be documented in the daily reports.

Following the completion of demobilization, a bathymetric survey will be conducted to document post-excavation conditions.

Post excavation sediment sampling will be conducted in 2025 to document conditions in the NWS area as part of the long-term monitoring program.

5.0 Safety Considerations

An addendum to the site Accident Prevention Plan (APP) will be developed for this work prior to mobilization. AHA's will be updated or generated for each definable feature of work. Each workday will start with a safety tailgate meeting, all contractors involved in the task will attend. Site health and safety staff from Jacobs and Sevenson will be onsite and monitoring the work for the duration of the activity.

The edges of the river will define the exclusion zone for this work, a contamination reduction zone (CRZ) will be established at the edge of the river where to currently operating finger road is located. The CRZ location will move with the work. The DDA will be operated as it was during prior intertidal work.

5.1 Air Monitoring

Air Monitoring will be conducted per the Draft Final Ambient Air Monitoring Plan for Remediation Activities revision 5 (unless superseded) via EPA method TO-10A. The specific stations to be monitored for this activity have not yet been defined but are anticipated to include several locations around the NWS project area as well as 103 Sawyer St. (station 47). It is anticipated that up to 5 stations will be monitored during this work, including station 47.

6.0 References

Jacobs (Jacobs Engineering Group). 2022 (June). *Project Note Final North of Wood Street Sediment Removal Rev 1, New Bedford Harbor Superfund Site, Massachusetts*. ACE-J23-35BG7000-P1-0020.

_____. 2019 (March). *Draft Final 2016 Fish Migration Work Plan, Revision 3. New Bedford Harbor Superfund Site.* ACE-J23-35BG6000-M1-0002.

_____. 2006 (August). *2005 After Action Report New Bedford Harbor Remedial Action.* New Bedford Harbor Superfund Site. ACE-J23-35BG0107-M17-0003.

Tetra Tech (Tetra Tech FW, Inc.). 2005. *After Action Report for North of Wood Street Remediation. New Bedford Harbor Superfund Site, Massachusetts*.

Figures

0 50 100 Feet

March 2024

119-178 C015-016 25-10AK 25-10F 25-10E 25-238

NWS-10 C015-023 NWS-09 C015-028 NWS-08 C015-033 C015-040 C015-039 C015-049 C015-048

119-42 119-43 119-33 119-262 116-380 116-84 116-379 116-205 116-85 116-130 116-131 116-132 25-108 25-24

Wood Street

Site Location

Acushnet

Upper Harbor

Path: Y:\NBH\Projects\35BG10012\20240308_NWS_Bathy_MLLW_Contours_Request\ArcGIS\NWS_Preliminary_Dredge_Bathy_Contours_MLLW_20240311.mxd

Legend

- Core Location
- Contour (0.5 interval)
- Parcel
- Road/ROW

Elevation (MLLW)

- 0.27 - 1.45
- -0.91 - 0.27
- -2.09 - -0.91
- -3.27 - -2.09
- -4.45 - -3.27

Bathymetric Survey: CR Environmental Inc. 02/15/2024
(NAVD88, feet converted to MLLW, feet 03/08/2024)

Datum Info:
Vertical - MLLW, feet
Horizontal - NAD83 StatePlane MA, feet

Aerial Photography MASSGIS 2021

North Of Wood Street Existing Bathymetry (MLLW) and Sampling Locations

Jacobs

New Bedford Harbor Superfund Site

Figure 1

0 50 100 Feet

March 2024

119-178 C015-016 25-10AK 25-10F 25-10E 25-238 NWS-10 C015-023 119-42 NWS-09 C015-028 119-43 119-33 NWS-08 119-262 116-380 C015-033 116-84 116-379 25-108 C015-040 116-205 116-85 C015-039 116-130 C015-049 C015-048 116-131 Wood Street 25-24 116-132

Site Location

Acushnet

Upper Harbor

116-209 116-159

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors,

Basemap Data Source: MassGIS 2021

Legend

- Core Location
- Parcel
- Road/ROW

Feet of Sediment To Remove
0.5
1
1.5
2
2.5
3

Estimated Neat Volume = **2,665.66 cy**

Estimated Volume with 0.25 ' OD = **3,163 cy**

Estimated Sq Ft. = **53,721**

Datum Info:
Horizontal - NAD83 StatePlane MA, feet

North Of Wood Street
RAL 30 PPM Preliminary Excavation Prism

Jacobs

New Bedford Harbor Superfund Site

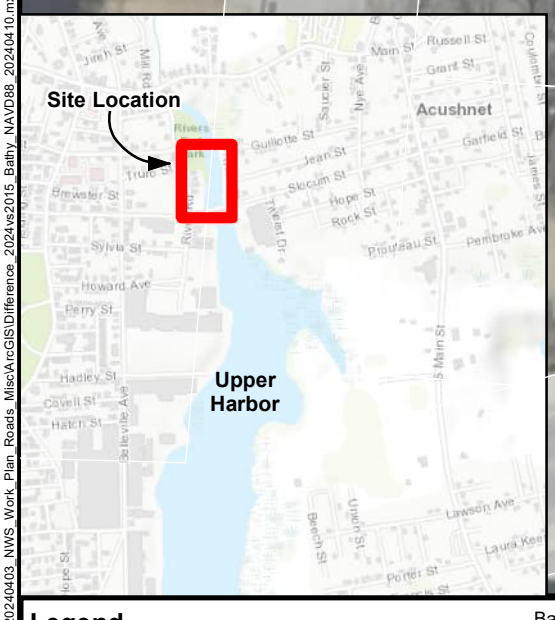
Figure 2

Path: Y:\NBH\Projects\35BG100\1\20240229_NWS_Pre_Dredge_Prisms_Support\ArcGIS\NWS_Preliminary_Dredge_Prism_3X3_RAL_30_PPM_20240229.mxd

0 50 100 Feet

March 2024

MINIMUM DIFFERENCE (FT)	MAXIMUM DIFFERENCE (FT)	COLOR SCHEME
-2	-0.5	
-0.5	-0.25	
-0.25	0.25	
0.25	0.5	
0.5	0.75	
0.75	1	
1	1.5	
1.5	3	



Legend

- Core Location
- Parcel
- Road/ROW

Aerial Photography MASSGIS 2021

Bathymetric Survey: CR Environmental Inc. 02/15/2024 and 11/2/2015

Datum Info:
Vertical - NAVD88, feet
Horizontal - NAD83 StatePlane MA, feet

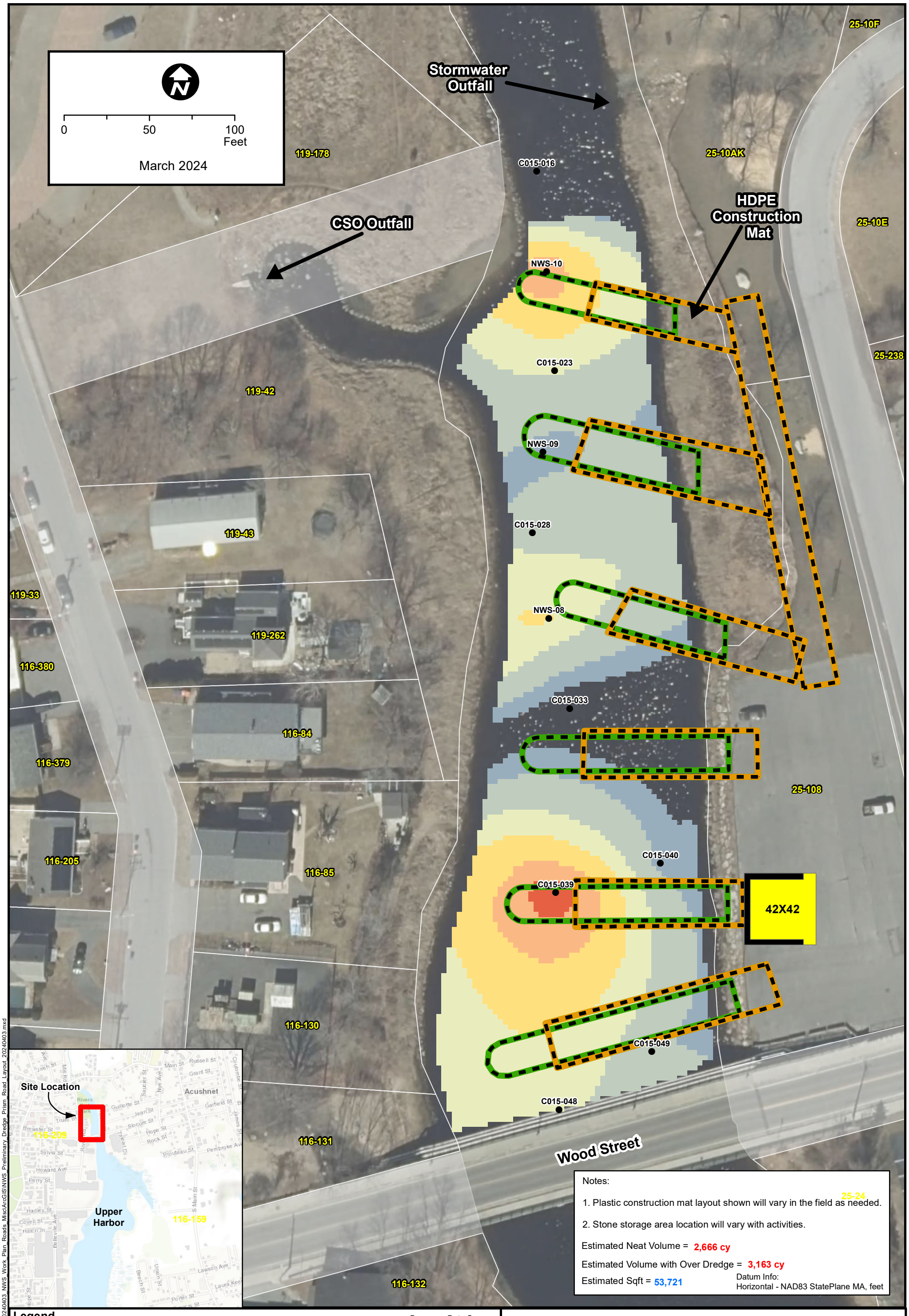
North Of Wood Street Difference Map (2015 and 2024 Surveys)

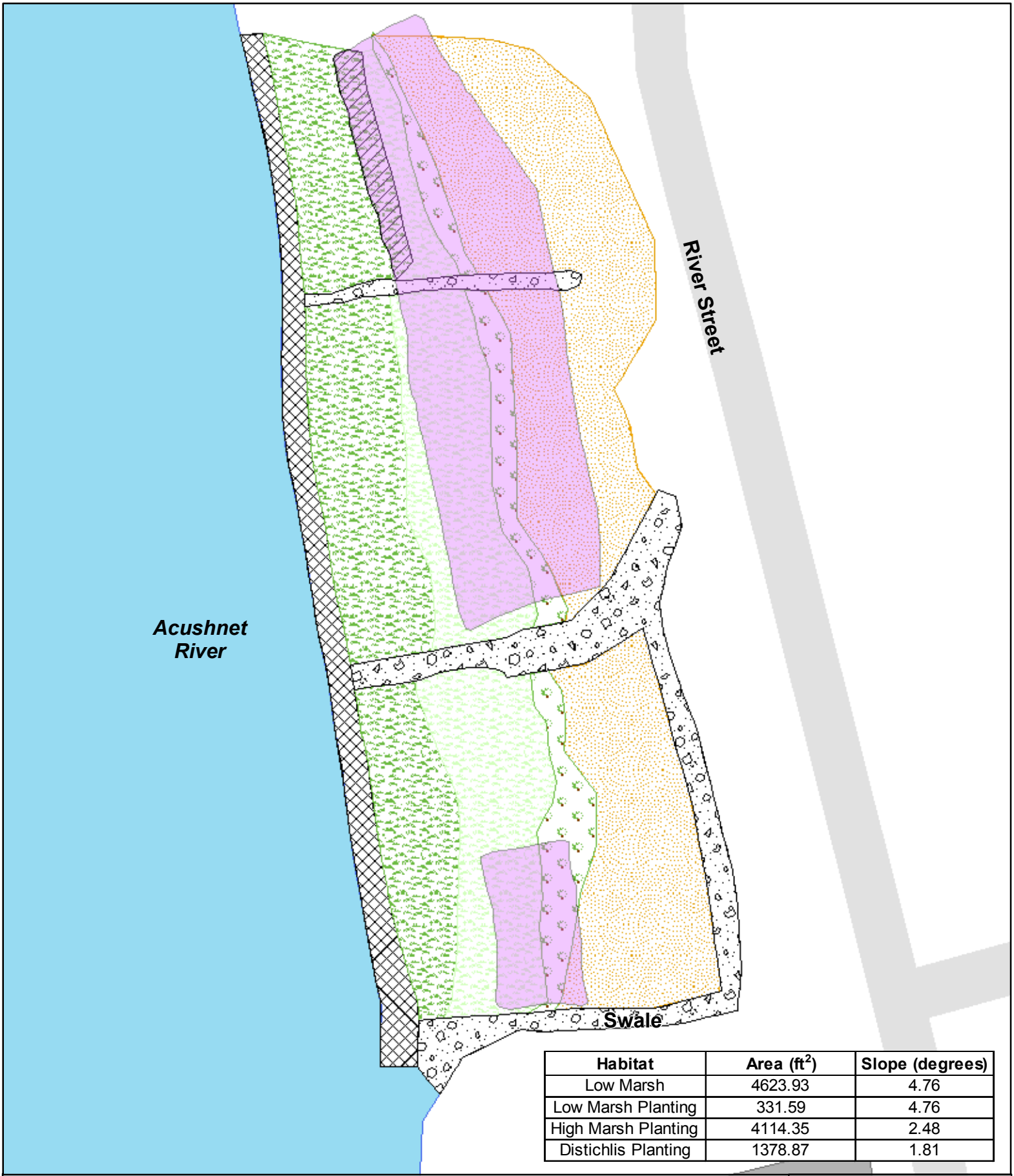
New Bedford Harbor Superfund Site

Jacobs

Figure 3

Path: Y:\NBH\Projects\35BG10012\20240403_NWS_Work_Plan_Roads_Misc\ArcGIS\Difference_2024vs2015_Bathy_NAVD88_20240410.mxd


0
50
100
Feet
March 2024
Stormwater Outfall
CSO Outfall
HDPE Construction Mat
25-10F
25-10AK
25-10E
25-238
25-108
119-178
119-42
119-43
119-33
119-262
116-380
116-84
116-379
116-205
116-85
116-130
116-131
116-132
C015-016
NWS-10
C015-023
NWS-09
C015-028
NWS-08
C015-033
C015-040
C015-039
C015-049
C015-048
42X42
Wood Street
Site Location
116-209
Acushnet
Upper Harbor
116-159
Notes:
1. Plastic construction mat layout shown will vary in the field as needed.
2. Stone storage area location will vary with activities.
Estimated Neat Volume = 2,666 cy
Estimated Volume with Over Dredge = 3,163 cy
Estimated Sqft = 53,721
Datum Info:
Horizontal - NAD83 StatePlane MA, feet
Legend
Core Location
Parcel
Road/ROW
Crushed Stone Finger Road
Feet of Sediment To Remove
0.5
1
1.5
2
2.5
3
Concrete Bin Block
Stone Storage Area
Plastic Construction Mat Temporary Road
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors,
Basemap Data Source: MassGIS 2021
North Of Wood Street
NWS Excavation Plan and Finger Road Layout
New Bedford Harbor Superfund Site
Jacobs
Figure 4
Path: Y:\NBH\Projects\35BG100120240403_NWS_Work_Plan_Roads_Misc\ArcGIS\NWS_Preliminary_Dredge_Prism_Road_Layout_20240403.mxd



Habitat	Area (ft^2)	Slope (degrees)
Low Marsh	4623.93	4.76
Low Marsh Planting	331.59	4.76
High Marsh Planting	4114.35	2.48
Distichlis Planting	1378.87	1.81

Legend

- Excavated Area
- Roads
- Parking Lot
- Low Marsh < 2.5 ft NGVD
- Low Marsh Planting < 2.5 ft NGVD
- High Marsh Planting 2.5ft - 3.5 ft NGVD
- Distichlis Planting 3.5ft - 4.0ft NGVD
- Upland Area > 4.0 ft NGVD
- River
- Toe Stone
- Rip-Rap

N

0 15 30 Feet

1:360

JACOBS

North of Wood Street
Planting Zones
(2006)

New Bedford Harbor Superfund Site

NAME: croberts DATE: 03/28/2006

Figure 5

Y:\NBH\Projects\35B00101\072006\424\ArcGIS\NWS_contours.mxd

Tables

Table 1. Collected Sample PCB Concentration Profiles

Location	C015-016	NWS-10	C015-023	C015-039	NWS-08	CO15-049	CO15-033	CO15-028	C015-048	C015-040	NWS-09
Northing	2708929.93	2708871.10	2708812.86	2708506.81	2708667.65	2708413.70	2708614.84	2708717.80	2708379.62	2708523.96	2708765.17
Easting	815398.16	815403.95	815408.60	815409.40	815405.38	815465.71	815417.44	815395.68	815411.32	815470.69	815401.89
Interval (ft.)	Sum of 209 PCB Congeners (mg/kg)										
0.0-0.5	6.42	36.2	48.2	97.4	78.8	188	5.94	140	58	56.7	37.3
0.5-1.0	22.3	7.36	31.9	35.2	64.6	2.66	8.65	30.3	56.6	20.9	8.59
1.0-1.3						0.165					
1.0-1.5	12.6	32.7	26.4	59.5	83.2			0.0566	39.6	0.259	2.01
1.0-1.7							0.0793				
1.5-2.0		21.3	0.633	131					1.28		
1.5-2.1	0.056										
1.5-2.2					0.318			0.178			
2.0-2.3		31.4	0.00873								
2.0-2.5				39.8							
RAL30 cut (ft.)	no cut	cut 2.5	cut 1.2	cut >2.5	cut 1.6	cut 0.7	no cut	cut 1.0	cut 1.5	cut 0.5	cut 0.5

Notes: Northings and Eastings in MA State Plane, NAD83, ft.
ft = feet
mg/kg = milligrams per kilogram

Appendix A

AECOM

250 Apollo Drive, Chelmsford, MA 01824
(978) 905-2100 - office, (978) 905-2101 - fax

Core ID: C015-016

Core Collected Date/Time: 6/14/2023 0735 Page 1 of 1

Client: USACE NAE	Attempt No.: 1	Logged by: P. Winchell
Project Number: 60597627	Sampler: PW/AA/MW	
Northing: 2708929.933 Easting: 815398.157	Sampling Equipment: piston core	
Water Elevation: -1.077	Core Diameter (in): 3.5	Logged date/time: 06/15/2023
Check box if GPS data cross-checked against GPS file ☐	Core catcher used?: No	
Target delta ≤ 3ft: (Yes) or No (circle one)	Water Depth: 4.2'	

Depth Range (feet)	Sample ID	Sample Time	Analyses	USCS	Description
0-0.5	S-C015016-SD-FSP21-00-05	1025	PCB Congs	OL	0-0.3 black to very dark brown organic w/silt wet, strong H_2S odor
0.5-1.0	S-C015016-SD-FSP21-05-10	1030	Archive		Contact zone @ 0.3' bgs
1.0-1.5	S-C015016-SD-FSP21-10-15	1035	↓		0.3-0.7 dark brown ~~sandy~~ silty sand, wet to moist, med stiff
1.5-2.1	S-C015016-SD-FSP21-15-21	1040	↓		0.7-1.3 dark brown sandy silt w/few gravel
				ML	1.3-2.1 dark brown silt, med. stiff, moist
					0.1 ripple of sand @ 1.7-1.8' bgs - end of core -

Target Penetration (ft):	1.5
Actual Penetration (ft):	2.1
Recovery (ft):	2.1
Recovery within 0.2 ft? (Yes) or No (circle one)	

Comments:

AECOM

250 Apollo Drive, Chelmsford, MA 01824
(978) 905-2100 - office, (978) 905-2101 - fax

Core ID: NWS-10

Core Collected Date/Time: 6/14/2023 0818 Page 1 of 1

Client: USACE NAE	Attempt No.: 1	Logged by: PWinchell
Project Number: 60597627	Sampler: PW/AA/MW	
Northing: 2708871.698 Easting: 815403.949	Sampling Equipment: piston core	
Water Elevation: -3.114	Core Diameter (in): 3.5	Logged date/time: 06/15/2023
Check box if GPS data cross-checked against GPS file ☐	Core catcher used?: No	
Target delta ≤ 3ft: (Yes) or No (circle one)	Water Depth: 3.2'	

Depth Range (feet)	Sample ID	Sample Time	Analyses	USCS	Description
0 - 0.5	S-NWS10-SD-FSP21-00-05	1050	PCB Congs	OL	0-0.7 Black to very dark brown organic c w/ silt wet, strong H_2S odor
0.5 - 1.0	S-NWS10-SD-FSP21-05-10	1055	PCB Congs Archive		Contact zone @ 0.7' bgs
1.0 - 1.5	S-NWS10-SD-FSP21-10-15	1100		ML	0.7-1.0 gray medium to coarse sand, moist, loose
1.5 - 2.0	S-NWS10-SD-FSP21-15-20	1105		OL	1.0-1.3 black to very dark brown organic c w/ silt ~~wet~~ moist, H_2S odor
2.0 - 2.3	S-NWS10-SD-FSP21-20-23	1110		ML	1.3-2.0 gray to brown silt/clay w/ few gravel + sand, moist
				OL	2.0-2.3 black to very dark brown
					- end of core

Target Penetration (ft):	1.5
Actual Penetration (ft):	2.3
Recovery (ft):	2.3
Recovery within 0.2 ft? (Yes) or No (circle one)	

Comments:

AECOM

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Core ID: C015-023

Core Collected Date/Time: 6/14/2023 0849 Page 1 of 1

Client: USACE NAE	Attempt No.: 1	Logged by: W. McKenna
Project Number: 60597627	Sampler: PW/AA/MW	
Northing: 2708812.856 Easting: 815408.595	Sampling Equipment: Piston core	
Water Elevation: ~0.21 8	Core Diameter (in): 3.5"	Logged date/time: 6/15/2023
Check box if GPS data cross-checked against GPS file ☐	Core catcher used?: No	
Target delta ≤ 3ft: (Yes) or No (circle one)	Water Depth: 2.6'	

Depth Range (feet)	Sample ID	Sample Time	Analyses	USCS	Description
0-0.5	S-C015023-SD-FSP21-00-05	1200	PCP Cons		0-1.2 black - dark brown organic, wet, strong H_2S odor
0.5-1.0	S-C015023-SD-FSP21-05-10	1225	Archive		contact zone @ 1.2
1-1.5	S-C015023-SD-FSP21-10-15	1230			1.2-2.3 dark brown-gray, moist, chunks of wood
1.5-2.0	S-C015023-SD-FSP21-15-20	1235			
2.0-2.3	S-C015023-SD-FSP21-20-23	1240			

Target Penetration (ft): 1.5	**Comments:**
Actual Penetration (ft): 2.3	
Recovery (ft): 2.3	
Recovery within 0.2 ft? (Yes) or No (circle one)	

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Core ID: C015-039

Core Collected Date/Time: 6/14/2023 1137 Page 1 of 1

Client: USACE NAE	Attempt No.: 1	Logged by: W. McKenna
Project Number: 60597627	Sampler: PW/AA/NW	
Northing: 2708506.813 Easting: 815409.399	Sampling Equipment: piston core	
Water Elevation: -3.054	Core Diameter (in): 3.5	Logged date/time:
Check box if GPS data cross-checked against GPS file ☐	Core catcher used?: No	
Target delta ≤ 3ft: (Yes) or No (circle one)	Water Depth: 2.0'	

Depth Range (feet)	Sample ID	Sample Time	Analyses	USCS	Description
0.0-0.5	S-C015039-SD-FSP21-00-05	1300	PCB Congen		0.0-2.3 black, dark brown organic, H_2S smell, wet
0.5-1.0	S-C015039-SD-FSP21-05-10	1305	Archive		2.3 contact zone
1.0-1.5	S-C015039-SD-FSP21-10-15	1310	↓		2.3-2.5 dark brown, gray silt, moist
1.5-2.0	S-C015039-SD-FSP21-15-20	1315	↓		
2.0-2.5	S-C015039-SD-FSP21-20-25	1320	↓		

Target Penetration (ft):	1.5
Actual Penetration (ft):	2.5
Recovery (ft):	2.5
Recovery within 0.2 ft? (Yes) or No (circle one)	

Comments:

AECOM

250 Apollo Drive, Chelmsford, MA 01824
(978) 905-2100 - office, (978) 905-2101 - fax

Core ID: NWS-08

Core Collected Date/Time: 6/14/2023 1028 Page 1 of 1

Client: USACE NAE	Attempt No.: 1	Logged by: W. McKenna
Project Number: 60597627	Sampler: PW/AA/MW	
Northing: 2708667.048 Easting: 815405.377	Sampling Equipment: piston core	
Water Elevation: -2.814	Core Diameter (in): 3.5	Logged date/time: 6/15/2023
Check box if GPS data cross-checked against GPS file ☐	Core catcher used?: No	
Target delta ≤ 3ft: (Yes) or No (circle one)	Water Depth: 1.6'	

Depth Range (feet)	Sample ID	Sample Time	Analyses	USCS	Description
0.0-0.5	S-NWS08-SD-FSP21-00-05	1320	PCB Congen	OL	0.0-1.3 black, dark-brown, organic, wet, H_2S smell,
0.5-1.0	S-NWS08-SD-FSP21-05-10	1325	Archive		~~Contact~~ fine 1.3-1.6 dark brown, gray small organics transition to silt
1.0-1.5	S-NWS08-SD-FSP21-10-15	1330	↓	ML	1.6-2.2 gray silt, moist
1.5-2.2	S-NWS08-SD-FSP21-15-22	1335	↓		

Target Penetration (ft):	1.5
Actual Penetration (ft):	2.2
Recovery (ft):	2.2
Recovery within 0.2 ft? (Yes) or No (circle one)	

Comments:

AECOM

250 Apollo Drive, Chelmsford, MA 01824
(978) 905-2100 - office, (978) 905-2101 - fax

Core ID: CO15-049

Core Collected Date/Time: 6/14/2023 1241 Page 1 of 1

Client: USACE NAE	Attempt No.: 1	Logged by:
Project Number: 60597627	Sampler: PW/AA/MW	
Northing: 2708413.702 Easting: 815465.713	Sampling Equipment: piston core	
Water Elevation: -4.343	Core Diameter (in): 3.5	Logged date/time:
Check box if GPS data cross-checked against GPS file ☐	Core catcher used?: No	
Target delta ≤ 3ft: (Yes) or No (circle one)	Water Depth: 3.4'	

Depth Range (feet)	Sample ID	Sample Time	Analyses	USCS	Description
0.0-0.5	S-CO15049-SD-FSP21-00-05	1350	PCB Congeners	ML	0.0-0.5 black, dark brown, wet silt, shell hash
0.5-1.0	S-CO15049-SD-FSP21-05-10	1355	Archive		0.5-0.7 dark brown, gray, moist silt
1.0-1.3	S-CO15049-SD-FSP21-10-13	1400	↓		0.7-1.3 gray silt, some moist, some ~~aggregate~~ gravel

Target Penetration (ft): 1.5	**Comments:**
Actual Penetration (ft): ~~1.3~~ 1.5 PW 6/14	
Recovery (ft): 1.3	
Recovery within 0.2 ft? (Yes) or No (circle one)	

AECOM

250 Apollo Drive, Chelmsford, MA 01824
(978) 905-2100 - office, (978) 905-2101 - fax

Core ID: C015-033

Core Collected Date/Time: 6/14/2023 1056 Page 1 of 1

Client: USACE NAE	Attempt No.: 1	Logged by:
Project Number: 60597627	Sampler: PW/AA/MW	
Northing: 2708014.837 Easting: 815417.440	Sampling Equipment: piston core	
Water Elevation: -3.172	Core Diameter (in): 3.5	Logged date/time:
Check box if GPS data cross-checked against GPS file ☐	Core catcher used?: No	
Target delta ≤ 3ft: (Yes) or No (circle one)	Water Depth: 1.9'	

Depth Range (feet)	Sample ID	Sample Time	Analyses	USCS	Description
0.0-0.5	S-C015033-SD-FSP21-00-05	1440	PCB Cong		0.0-0.3 coarse sand & gravel, wet
0.5-1.0	S-C015033-SD-FSP21-05-10	1445	Archive ↓		0.3-0.6 black, wet organics
1.0-1.7	S-C015033-SD-FSP21-10-17	1450	↓		0.6-~~1.7~~ 1.5 coarse sand & gravel, moist
					1.5-1.7 gray-dark brown sandy silt, dense, moist

Target Penetration (ft):	1.5
Actual Penetration (ft):	1.7
Recovery (ft):	1.7
Recovery within 0.2 ft? (Yes) or No (circle one)	

Comments:

AECOM

Core ID: C015-028

250 Apollo Drive, Chelmsford, MA 01824
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Core Collected Date/Time: 6/14/2023 0957 Page 1 of 1

Client: USACE NAE	Attempt No.: 1	Logged by:
Project Number: 60597627	Sampler: PW/AA/MW	
Northing: 2708717.799 Easting: 815395.675	Sampling Equipment: piston core	
Water Elevation: -0.844	Core Diameter (in): 3.5	Logged date/time:
Check box if GPS data cross-checked against GPS file ☐	Core catcher used?: No	
Target delta ≤ 3ft: (Yes) or No (circle one)	Water Depth: 1.9'	

Depth Range (feet)	Sample ID	Sample Time	Analyses	USCS	Description
0.0-0.5	S-C015028-SD-FSP21-00-05	1440	PCB congeners	OL	0.0-0.75 black, dark-brown, wet, organic, H_2S smell, contact zone
0.5-1.0	S-C015028-SD-FSP21-05-10	1445	Archive		0.75-2.25 gray silt, fine sand, moist, rare organics
1.0-1.5	S-C015028-SD-FSP21-10-15	1450	↓		
1.5-2.25	S-C015028-SD-FSP21-15-225	1455	↓		

Target Penetration (ft):	1.5
Actual Penetration (ft):	2.25
Recovery (ft):	2.25
Recovery within 0.2 ft? (Yes) or No (circle one)	

Comments:

AECOM

250 Apollo Drive, Chelmsford, MA 01824
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Core ID: C015-048

Core Collected Date/Time: 6/14/2023 1200 Page 1 of 1

Client: USACE NAE	Attempt No.: 1	Logged by: W. McKenna
Project Number: 60597627	Sampler: PW/AA/MW	
Northing: 2708379.010 Easting: 815411.320	Sampling Equipment: Piston Core	
Water Elevation: -3.098	Core Diameter (in): 3.5	Logged date/time: 6/15/2023
Check box if GPS data cross-checked against GPS file ☐	Core catcher used?: No	
Target delta ≤ 3ft: (Yes) or No (circle one)	Water Depth: 2.8'	

Depth Range (feet)	Sample ID	Sample Time	Analyses	USCS	Description
0.0-0.5	S-C015048-SD-FSP21-00-05	1505	PCB Congeners	OL	0.0-0.75 black, dark brown wet organics, H_2S smell
0.5-1.0	S-C015048-SD-FSP21-05-10	1510	Archive	ML	0.75-0.85 gray, dark brown wet silt
1.0-1.5	S-C015048-SD-FSP21-10-15	1515		OL	0.85-1.15 black, dark brown wet organics
1.5-2.0	S-C015048-SD-FSP21-15-20	1520		ML	1.15-2.0 gray, dark brown wet silt, Spare whole Shell, gravel

Target Penetration (ft): 1.5	Comments:
Actual Penetration (ft): 2.0	
Recovery (ft): 2.0	
Recovery within 0.2 ft? (Yes) or No (circle one)	

AECOM

250 Apollo Drive, Chelmsford, MA 01824
(978) 905-2100 - office, (978) 905-2101 - fax

Core ID: C015-040

Core Collected Date/Time: 6/14/2023 1221 Page 1 of 1

Client: USACE NAE	Attempt No.: 1	Logged by: W. McKenna
Project Number: 60597627	Sampler: DW/AA/MW	
Northing: 2708523.956 Easting: 815470.086	Sampling Equipment: piston core	
Water Elevation: -4.821	Core Diameter (in): 3.5	Logged date/time: 6/15/2023
Check box if GPS data cross-checked against GPS file ☐	Core catcher used?: No	
Target delta ≤ 3ft: (Yes) or No (circle one)	Water Depth: 4.0'	

Depth Range (feet)	Sample ID	Sample Time	Analyses	USCS	Description
0.0-0.5	S-C015040-SD-FSP21-00-05	1530		OL	0.0-0.3 black, wet organics, H_2S odor, some gravel
0.5-1.0	S-C015040-SD-FSP21-05-10	1535		ML	0.3-1.0 gray, moist silty sand
1.0-1.55	S-C015040-SD-FSP21-10-155	1540			1.0-1.55 gray, moist silt, coarse gravel

Target Penetration (ft):	1.5
Actual Penetration (ft):	1.55
Recovery (ft):	1.55
Recovery within 0.2 ft? (Yes) or No (circle one)	

Comments:

AECOM

Core ID: NWS-09

250 Apollo Drive, Chelmsford, MA 01824
(978) 905-2100 - office, (978) 905-2101 - fax

Core Collected Date/Time: 6/14/2023 0923 Page 1 of 1

Client: USACE NAE	Attempt No.: 1	Logged by: Walter McKenna
Project Number: 60597627	Sampler: PW/AA/MW	
Northing: 2708705.166 Easting: 815401.887	Sampling Equipment: piston core	
Water Elevation: -1.875	Core Diameter (in): 3.5	Logged date/time: 6/15/2023
Check box if GPS data cross-checked against GPS file ☐	Core catcher used?: No	
Target delta ≤ 3ft: (Yes) or No (circle one)	Water Depth: 2.4'	

Depth Range (feet)	Sample ID	Sample Time	Analyses	USCS	Description
0.0-0.5	S-NWS09-SD-FSP21-00-05	1550	PCB Congeners	OL	0.0-0.3 black organics, sandy silt, wet H_2S odor
0.5-1.0	S-NWS09-SD-FSP21-05-10	1555	Archive	ML	~~0.0~~ 0.3-1.0 gray, dark brown silty sand, moist
1.0-1.55	S-NWS09-SD-FSP21-10-155	1600	↓		1.0-1.55 gray silt with fine sand, dense, moist

Target Penetration (ft):	1.5
Actual Penetration (ft):	1.55
Recovery (ft):	1.55
Recovery within 0.2 ft? (Yes) or No (circle one)	

Comments: