Sevenson Environmental Services, Inc.

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US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
Total Environmental Restoration Contract
USACE Contract Number: DACW33-03-D-0006
Task Order No. 0007

DRAFT 2011 ADDENDUM NO. 8 TO EXECUTION PLAN NEW BEDFORD HARBOR REMEDIAL ACTION

New Bedford Harbor Superfund Site
New Bedford, MA

May 2011

Prepared by
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ACE-J23-35BG0706-M1-0001

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Figures

Table

Attachments

ACRONYMS AND ABBREVIATIONS

Addendum No. 8	*2011 Draft Addendum No. 8 to Execution Plan, Pierce Mill Cove, New Bedford Harbor Remedial Action*
cy	cubic yard
DDA	debris disposal area
DMU	dredge management unit
EPA	U.S. Environmental Protection Agency
FW	Foster Wheeler Environmental Corporation
gpm	gallons per minute
GPS	global positioning system
HDC	City of New Bedford Harbor Development Commission
H_2S	hydrogen sulfide
MF	mudflat
NAE	U.S. Army Corps of Engineers - New England District
PCB	polychlorinated biphenyl
rpm	revolutions per minute
SES	Sevenson Environmental Services

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1.0 INTRODUCTION

The *2011 Draft Addendum No. 8 to Execution Plan, Pierce Mill Cove, New Bedford Harbor Remedial Action* (Addendum No. 8) has been prepared by Jacobs under U.S. Army Corps of Engineers - New England District (NAE) Total Environmental Restoration Contract (TERC) No. DACW33-03-D-0006, for the 2011 dredging activities. The July 2004 Plan, titled *Execution Plan 2004, 2005 New Bedford Harbor Remedial Action,* and subsequent addenda provided the framework for the overall remedial activities accomplished by the Jacobs team from 2004 to 2010 (Jacobs 2004, 2005b, 2006, 2007, 2008, 2009a, and 2010a).

Many of the elements of the 2004 Plan and addenda, particularly with respect to design, equipment, sampling, disposal, quality control, health and safety for hydraulic dredging, apply to this Addendum No. 8. Specific 2011 dredging details, with respect to dredge footprint, booster pump locations, transportation, and mass balance, are presented in this Addendum No. 8.

Hydraulic dredging operations performed by the Jacobs and Sevenson Environmental Services (SES) team to date (2004 through 2010 Dredge Seasons), covered by the previous execution plans and addenda, have removed approximately 184,781 cubic yards (cy) of polychlorinated biphenyl (PCB)-contaminated sediment. Areas of previous dredging efforts performed by the Jacobs/SES team and others are illustrated on Figure 1-1.

For the 2011 Dredge Season, the Jacobs/SES team has assessed approaches for hydraulic sediment removal in the northern mudflat (MF) and channel areas south of the Wood Street Bridge (Dredge Areas G, N, K, and O) and in the central portion of the upper harbor (Dredge Areas P and L). These dredge areas are briefly described in Section 3.3.1.

In addition to the hydraulic dredging activities the Jacobs/SES team is planning to mechanically excavate a 50 foot by 200 foot by 2 foot depth intertidal area, Dredge

Area Q. Dredge Area Q is being excavated in anticipation of the construction of a boathouse and dock by the City of New Bedford Harbor Development Commission (HDC). The 50 foot width of the planned dredge area is centered on the proposed dock using coordinates supplied by the HDC. More detailed Dredge Area Q information is given in Section 3.4.

Dredging operations used in 2011 will incorporate lessons learned from the 2010 Dredging Season. Detailed descriptions of the lessons learned can be found in Attachment H of the *2010 Dredge Season Data Submittal* (Jacobs 2011).

The following sections describe activities specific to the 2011 Dredge Season. Figures and a table are included for planning purposes and may be updated during the dredge season. Attachments and references supply backup information and data used to create the plans contained in this Addendum No. 8. Historical detail can be found in the reference documents.

2.0 PROJECT DESCRIPTION

The 2011 Dredge Season will utilize hydraulic dredging to remove PCB-contaminated sediment from the northern and central portions of the upper harbor of the Acushnet River. Hydraulic dredging efforts in 2011 are anticipated to employ the dredging, treatment, and disposal means and methods utilized in prior years of this contract. During the course of the 2005-2010 seasons the project has relied on rail transportation to haul the majority of waste generated through dredging. Rail transportation is not available in 2011 due to offsite rail line maintenance; therefore, all solid waste generated in 2011 will be transported for disposal via truck. The 2011 Dredge Season is anticipated to include relocating and anchoring the double walled pipeline from Area C to the Coggeshall Street Bridge and mechanical dredging of a portion of the west shoreline of the Acushnet River at the east terminus of Sawyer Street in preparation for the proposed HDC boathouse and dock construction. Prior to the 2011 dredge season an archeological survey and summary report will be completed to avoid inadvertent disturbance of potentially sensitive historic sites.

2.1 SCHEDULE

It is assumed that the hydraulic and mechanical dredging activities will commence in June 2011. Key milestone dates for the 2011 season are as follows:

- Award contract modification for dredging, May 2011.
- Initiate dredging mobilization, June 2011.
- Commence hydraulic and mechanical dredging, June 2011.
- Complete mechanical excavation, July 2011.
- Complete hydraulic dredging activities, October 2011.
- Demobilization, November 2011.

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3.0 2011 DREDGING SCOPE OF WORK

This section describes the following:

- Archeological survey (Section 3.1);
- Pipeline relocation (Section 3.2);
- 2011 hydraulic dredging scope of work (Section 3.3);
- The proposed 2011 hydraulic dredge footprint (Section 3.3.1);
- Booster pump stations (Section 3.3.2);
- Dredge to Area C Pipeline Hydraulics (Section 3.3.3);
- 2011 Sawyer Street mechanical dredging scope of work (Section 3.4);
- Proposed 2011 mechanical dredge footprint (Section 3.4.1);
- The proposed mechanical dredging process description (Section 3.4.2); and
- Proposed handling, transportation, and disposal of mechanically dredged material (Section 3.4.3).

3.1 ARCHEOLOGICAL SURVEY

Per the direction of the NAE, a remote sensing survey (side scan sonar, sub-bottom profiler, and magnetometer) will be conducted for archeological assessment purposes in Dredge Areas N, K, O, and L. These four dredge areas contain zones of varying degrees of archeological sensitivity identified in the *Stage 1B Archeological Survey* [Foster Wheeler Environmental Corporation (FW) 2003a]. Dredge Area Q was determined to have no likely archeological sensitivity due to the area being previously developed in modern times; no surveys will be conducted for archeological assessment purposes in Area Q in 2011. Following the collection and processing of remote sensing data, a qualified marine archeologist will examine the data. A summary report will be prepared by the archeologist and presented to the U.S. Environmental Protection Agency (EPA), NAE, and Jacobs. Depending on the results of the remote sensing survey the summary report may include recommendations for further investigation or site preservation. Following a review of the archeological report and survey data by project stakeholders, NAE will instruct Jacobs on any changes to dredge plans prior to the commencement of the 2011 dredge season.

3.2 PIPELINE RELOCATION

In preparation for the proposed construction of a city-owned boathouse and dock at the east end of Sawyer Street, the slurry pipeline will be relocated (Figure 3-1). It is anticipated that the pipeline will be moved north to lie along the south facing slope of the Area C confined disposal facility (CDF). The pipeline will enter the Acushnet River just north of its current location at the Area C boat ramp. The pipeline will be relocated in deeper water where possible, to the north of Dredge Area Q and anchored to the bottom. The pipeline relocation intent is to minimize or eliminate interference with anticipated future dock use by shallow-draft rowing boats. It is anticipated that up to 80 feet of additional pipeline will be installed to allow the relocation and anchoring. The new pipeline and anchoring system location will be mapped with global positioning system (GPS) equipment following anchoring for record keeping purposes.

3.3 2011 HYDRAULIC DREDGING SCOPE OF WORK

Dredging operations during the 2011 season will be guided by the location-specific cleanup criteria defined in the *Final Dredging Basis of Design/Design Analysis Report* (FW 2002) with the following objectives:

- Dredge management units (DMU) with the greatest amount of PCB mass will be remediated first.
- Remediation efforts will be focused on the DMUs in the subtidal zone to reduce restoration efforts.

3.3.1 Proposed 2011 Hydraulic Dredge Footprint

The priority for the 2011 hydraulic dredging season is removal of the PCB-impacted sediment from the northern most dredge areas: Dredge Area G (Figure 3-2), Dredge Area N (Figure 3-3), Dredge Area K (Figure 3-4), and Dredge Area O (Figure 3-5). The order in which the northern dredge areas are to be dredged and completed is anticipated to be Dredge Area G and Dredge Area K first. When Dredge Area G is completed that dredge will be repositioned in Dredge Area N, the dredge operating in Dredge Area K will move to Dredge Area O when Area K is completed. Portions of these northern

dredge areas are relatively shallow, making hydraulic dredging difficult or impossible at lower tides.

It is not anticipated that dredging will occur on a regular basis in either Dredge Area L or Dredge Area P during 2011. A dredge will be set-up in Dredge Area L for the duration of the 2011 season for use if dredging is not possible for any reason in the northern areas. More specific details regarding dredge strategy and scheduling will be presented in the 2011 Dredge Plan.

Dredge Area G [DMU-1 and DMU-102 (MF)] – The northern boundary of Dredge Area G is located approximately 500 feet south of the Wood Street Bridge. Dredging activities begun in 2007 and continued in 2009 and 2010 left this area partially dredged; it is anticipated that hydraulic dredging in Dredge Area G will be completed in 2011. The 2011 Dredge Area G footprint contains approximately 3,103 cy of material remaining to be removed over an area of approximately 1.79 acres. The majority of this footprint is shallow MFs, which will require the tide-dependent dredging approach. The tide dependant dredging approach is described in Addendum No. 3 to the Execution Plan (Jacobs 2007). Because the dredge itself does not have sufficient power to pump the dredged material directly to Manomet Street sediment will be dredged from Dredge Area G and pumped to the Hadley Street booster pump station. From the Hadley Street booster pump station, the slurry will travel to the intermediate booster pump station at Manomet Street and finally to the desanding plant for processing. The booster pump layouts for both the Hadley Street facility and the Manomet Street location are discussed in greater detail in Section 3.3.3.

Dredge Area N [DMU-102 (MF]) – Dredge Area N is located adjacent to the eastern boundary of Dredge Area G and extends to the eastern shoreline of the river. The majority of this footprint is shallow MFs, which will require the tide-dependent dredging approach. Dredge Area N contains approximately 8,530 cy of material to be dredged and

covers approximately 4.3 acres.

Dredge Area K [DMU-2, DMU-3, DMU-4, and DMU-103 (MF)] – Portions of Dredge Area K were dredged as part of 2005, 2006, and 2010 dredging activities. At the request of EPA, the central and eastern portions which were dredged previous to 2010 will be re-dredged to Z* + 1 foot to remove remaining PCB-contaminated sediments. The western portion of Dredge Area K has not been previously dredged. The 2011 Dredge Area K footprint contains 19,383 cy of sediment to remove over an area of 7.03 acres. CBI

Undredged sediment along the eastern side of Area K will be dredged when the sheet piles are moved to form Dredge Area O.

Dredge Area O [DMU-103 (MF]) – Dredge Area O is located adjacent to the eastern boundary of Dredge Area K and extends to the eastern shoreline of the river. The majority of this footprint is shallow MFs, which will require the tide-dependent dredging approach. Dredge Area O contains approximately 6,118 cy of material to be dredged over approximately 3.33 acres. CBI

A small portion of Dredge Area O was dredged in 2010 as a part of Dredge Area K operations.

Dredge Area L (DMU-10, DMU-12, DMU-13, and DMU-14) – Dredge Area L is located in the middle of the Upper Harbor. Dredge Area L was partially dredged in 2009 and 2010. Relatively deep water in Dredge Area L allows adequate floatation for the dredge and equipment during all tide cycles with the exceptions being the very near shore areas. Analytical data from progress and post-dredge sediment cores collected in 2009 indicate elevated PCB levels in the organic silt (OL) material remaining below the Z* elevation (Jacobs 2010). The 2010 Area L dredge plan takes into account the 2009 core data and contains dredge depths below the original Z* depths with the goal of removing the remaining PCB contamination. Due to the focus on dredging the more northern portions of the upper harbor first, only a minimal amount of dredging was conducted in Dredge Area L in 2010; 2011 dredge activities will resume where 2010 dredging left off. Dredge Area L contains 19,021 cy of material remaining to remove over an area of 8.17 acres. CBI

Dredge Area P (DMU-13, DMU-14, and DMU-15) – Dredge Area P is located adjacent to the southern boundary of Dredge Area L and stretches from the western shoreline to the eastern shoreline of the river. CBI

Although a dredge plan has been developed for Dredge Area P it is not anticipated that any activities will occur there in 2011. Dredge Area P is prepared as a contingency for the unlikely event that dredging is not possible in the more northern dredge areas or Area L in 2011.

The individual dredge plans will be presented in the 2011 Dredge Plan document, which will submitted following the completion of this Addendum No. 8. The dredge plan will describe the orientation of each dredge within the sheet pile perimeters, the path of the dredges, Z Block target elevations and thicknesses, and the sequencing of dredging operations with tide changes.

3.3.2 Predicted Dredging Production Quantities

Attachment A contains the mass balance calculations for estimating the production quantities of waste solids and waste water generated from the processing of the hydraulically dredged material for an estimated dredge season of 60 days. Table 3-1 presents the predicted quantities of both hydraulically and mechanically dredged waste material to be generated during the 2011 season. The amount of mechanically dredged material is not calculated in Attachment A because the material will not be processed prior to disposal. Various sources of data, including historical production reports and sediment core data, have been used to predict the quantities of material that will be processed in 2011. Key assumptions that affect the accuracy of Attachment A and Table 3-1 are:

- CBI

- Dredged material will process (desand and dewater) at efficiencies similar to past seasons.
- The geotechnical data for a given dredge area (FW 2003b) is representative of the material to be dredged.
- All dredged material will be TSCA, if analytical testing results allow material will be disposed of as non-TSCA waste.
- Due to lack of rail access as a result of off site track improvement, waste material for the 2011 Dredge Season will be shipped via truck-to-rail and disposed in a hazardous waste landfill.
- Mechanically dredged material will not be processed prior to disposal, only gravity drained to reduce water content.

- The average density of the mechanically dredged and drained material is approximately 1.4 tons per cy.
- It is anticipated that the 2011 Dredge Season duration will include about 60 days of active hydraulic dredging.

CBI

CBI

CBI

3.4 2011 SAWYER STREET MECHANICAL DREDGING SCOPE OF WORK

In preparation for the anticipated construction of a boathouse and dock by the City of New Bedford, mechanical dredging of PCB-contaminated sediment along the west shoreline of the Acushnet River will be performed.

3.4.1 Proposed 2011 Mechanical Dredge Footprint

The Sawyer Street Dredge Area, Dredge Area Q (Figure 3-10) is an area 50 feet by 200 feet at the east terminus of Sawyer Street extending into the Acushnet River. The shoreline is comprised primarily of sand, gravel, and debris. As the mechanical dredge area extends east into the river the silt and clay content increases. The mechanical dredge area contains approximately 702 cy of material to remove.

3.4.2 Proposed Mechanical Dredging Process Description

It is anticipated that sediment removal within Dredge Area Q will utilize both land-based and barge-mounted excavators. Prior to dredging, the limits of excavation will be delineated using a survey-grade GPS and marker stakes. Sediment nearest the shoreline will be removed by a land-based excavator with material being loaded directly into a dump truck for transportation to the Area C debris disposal area (DDA). Operations on the Acushnet River will utilize a barge mounted excavator along with scows and support boats. After being moved into position with workboats, the barge will be set into place via spuds. Sediment will be mechanically dredged and placed into a scow. Care will be taken to minimize the amount of free water transferred with the material to the scow. Once the excavator has removed all targeted material within reach of the barge position, the spuds will be lifted, and workboats will reposition the barge and scow for further dredging. The dredge and reposition sequence will continue until mechanical dredging has been completed.

3.4.3 Proposed Handling, Transportation, and Disposal of Mechanically Dredged Material

Once a scow has been loaded with material, it will be transported via workboats to the Area C dock where it will be secured for either pumping or mechanical unloading. Silt and clay-rich sediment may be pumped directly to the desanding building for processing. Coarse material such as sand and gravel will be unloaded from scows with a bucket equipped excavator and transferred to a dump truck. Polyethylene tarps, used to reduce the potential of accidentally spreading contamination, will be placed on the dock surface and the dump truck will be positioned on the tarp. The dump truck will haul the dredged material from the dock to the DDA where it will be dumped and stored until disposal. This material will be dewatered via mechanical turning/mixing and gravity draining. Following the completion of mechanical dredging activities the dewatered material and tarps will be loaded into trucks for off-site disposal. It is estimated that mechanical dredging will generate approximately 980 tons of material for disposal.

4.0 FISH MIGRATION MONITORING

Fish migration monitoring will be required, as dredging activities could potentially block the channel in Dredge Area G (Figure 3-2). The potential for blockage of fish passage is greatest at and near low tide conditions. Dredging activities will cease in Dredge Area G during periods of low water, as has been the practice in the past. Tide charts for New Bedford Harbor spanning the dredge season are included as Attachment C for reference. Potential impacts to fish migration are documented in the 2011 Jacobs document titled *Final 2011 Fish Migration Impact Plan, New Bedford Harbor Remedial Action*, this plan is anticipated to be finalized in early May 2011. The *Final 2011 Fish Migration Impact Plan* describes the location of areas to be dredged in 2011, location specific potentially negative impacts to the fisheries, and the mitigation measures to be implemented to reduce or eliminate any potentially negative impacts. As presented in the *Final 2010 Fish Migration Impact Plan* (Jacobs 2010b), there are the following two windows of fish migration during which it is critical the narrow channel in the northern most portion of Dredge Area G is not blocked:

- The "**In-Migration**" of Alewife and Blueback Herring up the Acushnet River towards the spawning ground that occurs from March 1st through June 15th; and
- The "**Out-Migration**" of the Alewife and Blueback Herring down the Acushnet River towards the ocean that occurs from September 15th through November 1st.

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5.0 AMBIENT AIR MONITORING FOR 2011

Ambient air monitoring for PCBs will be conducted similarly to previous years, following the procedure in Section 11.0 of the Field Sampling Plan (Jacobs 2009b). Current ambient air sample station locations are shown on Figure 3-11.

One pre-dredge sampling round will be conducted at the request of EPA to provide additional background data. It is anticipated that three locations will be sampled during the pre-dredge round in the vicinity of Dredge Areas N and O. The samples will be collected at the former Aerovox facility (Station 55), the east terminus of Hadley Street (Station 24), NSTAR North (Station 42), and northeast of Dredge Area N at the Century House (Station 62).

Operational ambient air samples will be collected from Coffin Avenue on the northern shore of Pierce Mill Cove (Station 46) and at the two active sediment processing areas, Area C and Area D. The actual locations at Area C (Stations 47, 48, and 49) and Area D (Stations 50, 51, and 52) will be selected at the time of sampling and are dependent on wind direction.

Operational ambient air sampling for PCBs will also be conducted at locations in the vicinity of dredging activities as well as on an active dredge (Station 53).

- When dredging in the northern dredge areas, samples will be collected at Stations 55, 24, and 56. Station 55 is located at the former Aerovox facility. Station 24 is located at the east terminus of Hadley Street, and Station 56 is located in the Acushnet Park north of the Wood Street Bridge.
- When dredging in the southern dredge areas, samples will be collected at Stations 25, 42, and 43. Station 25 is behind the Cliftex property. Stations 42 and 43 are located on the east side of the Acushnet River.
- If dredging is to occur in southern and northern areas during a sampling event, stations for each area will be sampled as described above.

It is anticipated that there will be three to four monthly sampling events, depending on season length, and one post-dredge sampling event. Samples will be collected at six to

nine selected stations as well as on the dredge during the first month of the dredge season, depending on daily dredge activities during a sampling event. The post-dredge sampling event will take place no less than one week after the completion of demobilization activities. The post-dredge sampling event will collect samples at up to eight stations only. Station 53, the dredge, will not be sampled, as hydraulic dredging will have concluded for the season.

6.0 2011 WINTERIZATION, DEMOBILIZATION, AND EQUIPMENT STORAGE

It is anticipated that funding and weather considerations will result in a shut down of hydraulic dredging activities over the winter months.

Prior to the shut down, the Jacobs team will take precautions to secure equipment and materials and protect them from weather effects. These precautions will include activities such as moving equipment and material to available indoor locations; covering materials and equipment with tarps as required; and disconnecting, flushing, and draining pipelines as necessary to prevent bursting or breaking.

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7.0 REFERENCES

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FIGURES

Acushnet

Desanding Facility

195

Fairhaven

New Bedford

Rail Yard

Dewatering Facility

6

Hurricane Barrier

Legend

Areas Partially or Fully Remediated as of 12/31/2010

Areas to be Dredged per 1998 Record of Decision (ROD)

0 875 1,750

Feet

N

1:21,000

Aerial Photography MASSGIS 2003

Y:\NBH\Projects\35BG0706\20101221\ArcGIS\NBH_dredge_overview.mxd

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New Bedford Harbor Superfund Site Areas Dredged through 2010

New Bedford Harbor Superfund Site

NAME: croberts DATE: 12/21/2010

Figure 1-1

Legend

- Dredge Area Q
- Proposed Location of Relocated Pipe
- Approximate Location of Existing Slurry Pipeline
- Dock
- Previously Dredged Area

Feet of Sediment to Remove

0.0	3.0 - 3.5
0.0 - 0.5	3.5 - 4.0
0.5 - 1.0	4.0 - 4.5
1.0 - 1.5	4.5 - 5.0
1.5 - 2.0	5.0 - 5.5
2.0 - 2.5	5.5 - 6.0
2.5 - 3.0	6.0 - 6.2

- MLLW
- MLW
- MHW
- MHHW

0 25 50 Feet

N

1:600

JACOBS™

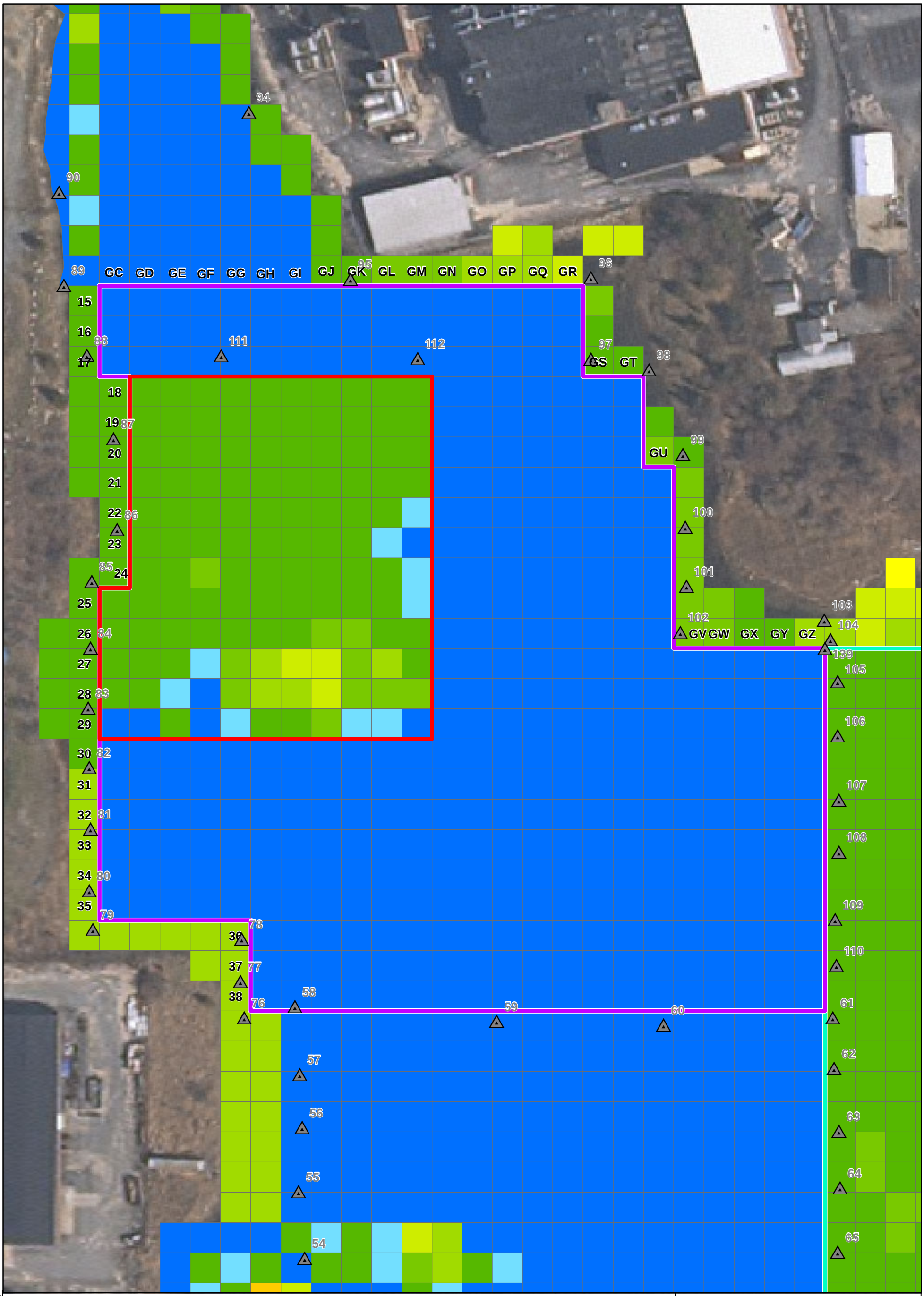
Pipeline Relocation

New Bedford Harbor Superfund Site

NAME: croberts DATE: 04/25/2011

Figure 3-1

Y:\NBH\Projects\35BG080\1201104\25\ArcGIS\Fig3-1_pipeline_relocate.mxd



Legend

Dredge Area G

Dredge Area G Remaining to be Dredged (3,103 cy)

Sheet Pile Location

Feet of Sediment to Remove

0.0	3.0 - 3.5
0.0 - 0.5	3.5 - 4.0
0.5 - 1.0	4.0 - 4.5
1.0 - 1.5	4.5 - 5.0
1.5 - 2.0	5.0 - 5.5
2.0 - 2.5	5.5 - 6.0
2.5 - 3.0	6.0 - 6.2

0 37.5 75 Feet

1:900

Aerial Photography MASSGIS 2003

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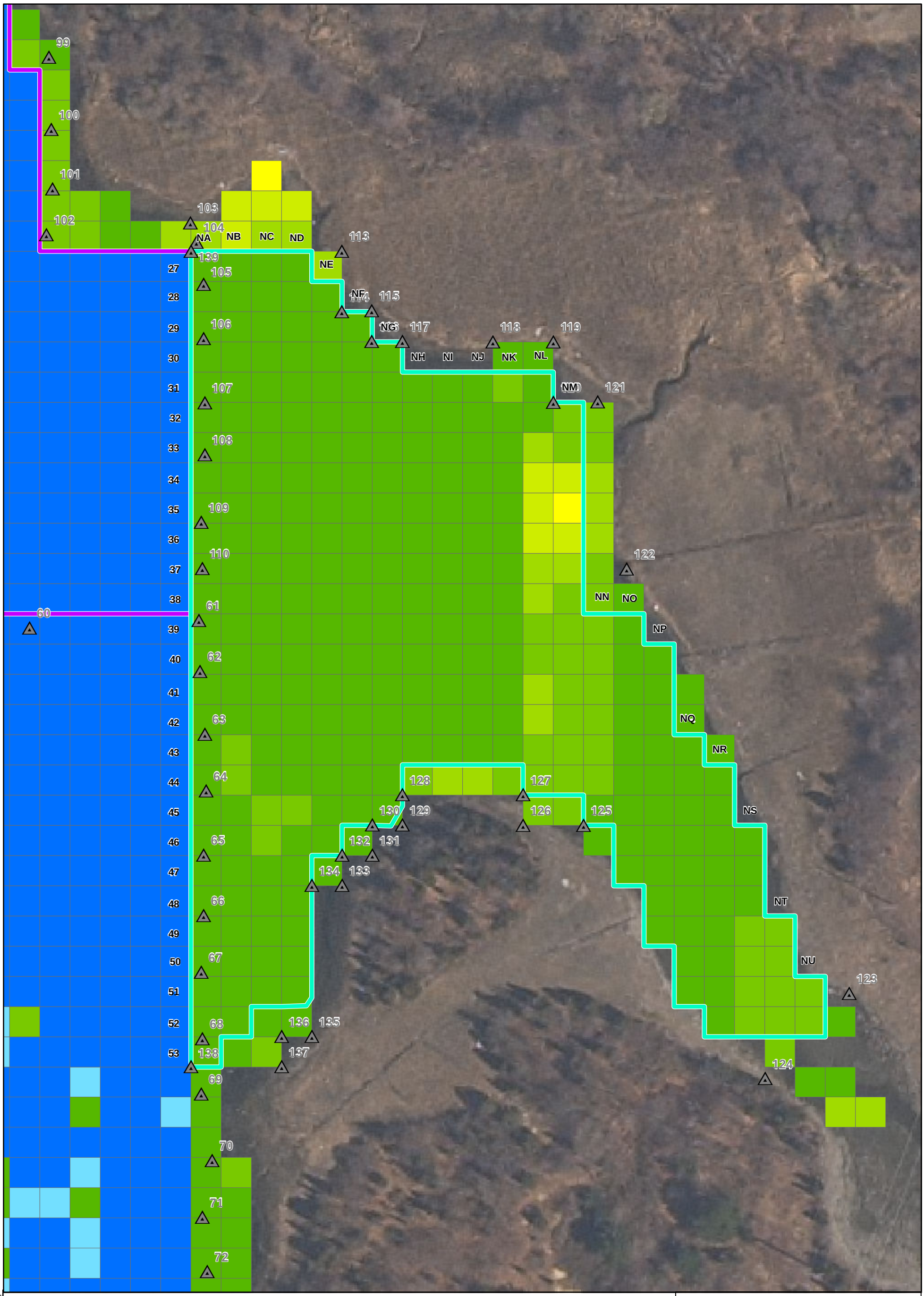
JACOBS™

2011 Dredge Area G

New Bedford Harbor Superfund Site

NAME: croberts DATE: 04/25/2011

Figure 3-2



Legend

Dredge Area N
8,530 cy

Dredge Area G

Sheet Pile Location

Feet of Sediment to Remove

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0.0 - 0.5	3.5 - 4.0
0.5 - 1.0	4.0 - 4.5
1.0 - 1.5	4.5 - 5.0
1.5 - 2.0	5.0 - 5.5
2.0 - 2.5	5.5 - 6.0
2.5 - 3.0	6.0 - 6.2

0 37.5 75
Feet

1:900

Aerial Photography MASSGIS 2003

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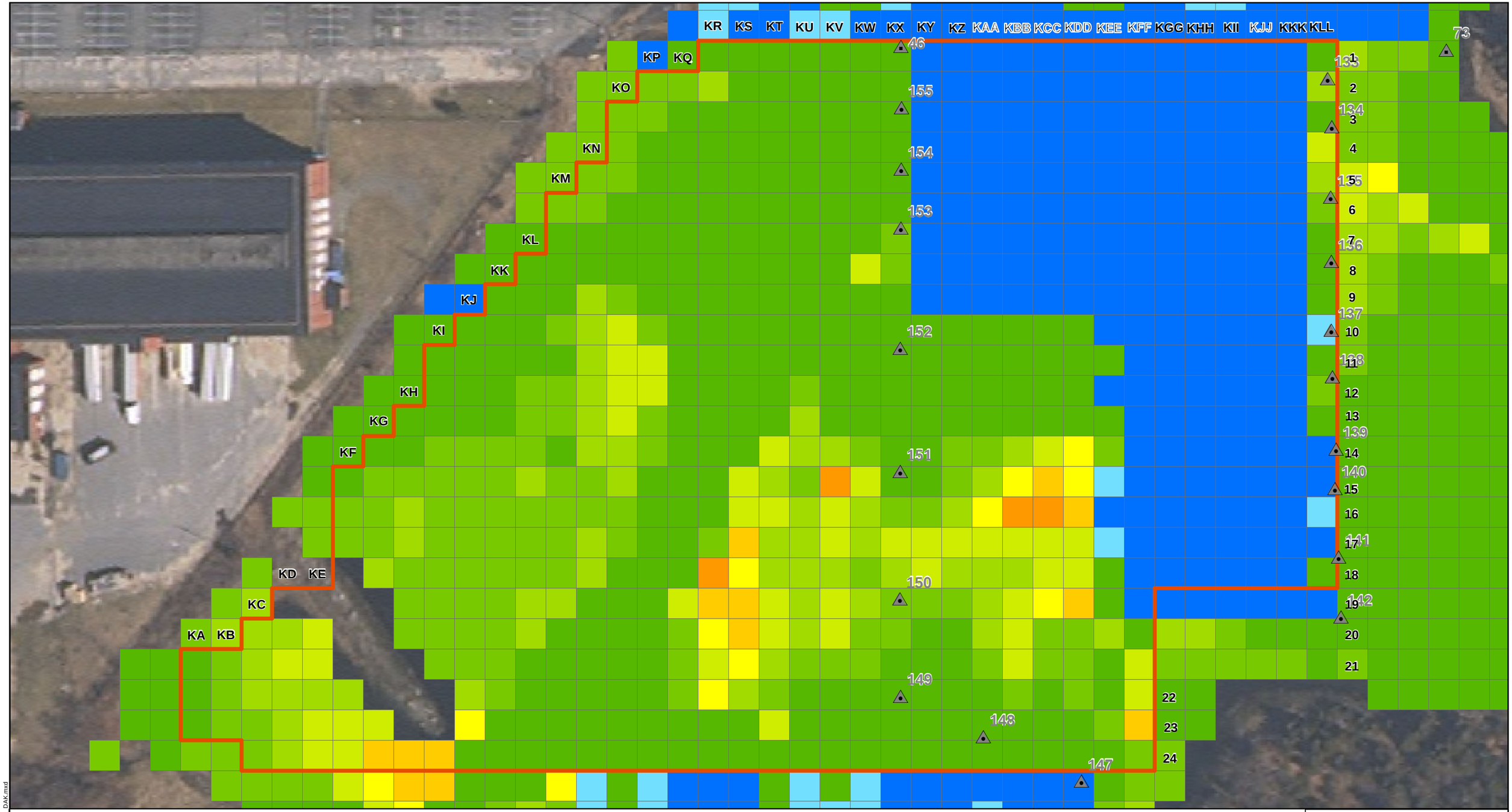
JACOBS™

2011 Dredge Area N

New Bedford Harbor Superfund Site

NAME: croberts DATE: 04/25/2011

Figure 3-3



Legend

Dredge Area K
19,383 cy

Sheet Pile Location

Feet of Sediment to Remove

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0.0 - 0.5	3.5 - 4.0
0.5 - 1.0	4.0 - 4.5
1.0 - 1.5	4.5 - 5.0
1.5 - 2.0	5.0 - 5.5
2.0 - 2.5	5.5 - 6.0
2.5 - 3.0	6.0 - 6.2

N

0 37.5 75

Feet

1:900

JACOBS™

2011 Dredge Area K

New Bedford Harbor Superfund Site

NAME: croberts DATE: 04/25/2011

Figure 3-4

Y:\NBH\Projects\35BG08001\2011\0425\ArcGIS\Fig1-4_DAK.mxd

OA OB OC OD OE OF OG OH OI OJ

72 73 74

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

133 134 135 136 137 138 139 140 141 142

OK OL OM ON OO OP OQ OR

Y:\NBH\Projects\35BG0706\20110425\ArcGIS\Fig1-5_DAO.mxd

Legend

Dredge Area O
6,118 cy

Dredge Area K

Sheet Pile Location

Feet of Sediment to Remove

0.0	3.0 - 3.5
0.0 - 0.5	3.5 - 4.0
0.5 - 1.0	4.0 - 4.5
1.0 - 1.5	4.5 - 5.0
1.5 - 2.0	5.0 - 5.5
2.0 - 2.5	5.5 - 6.0
2.5 - 3.0	6.0 - 6.2

0 25 50 Feet

1:600

Aerial Photography MASSGIS 2003

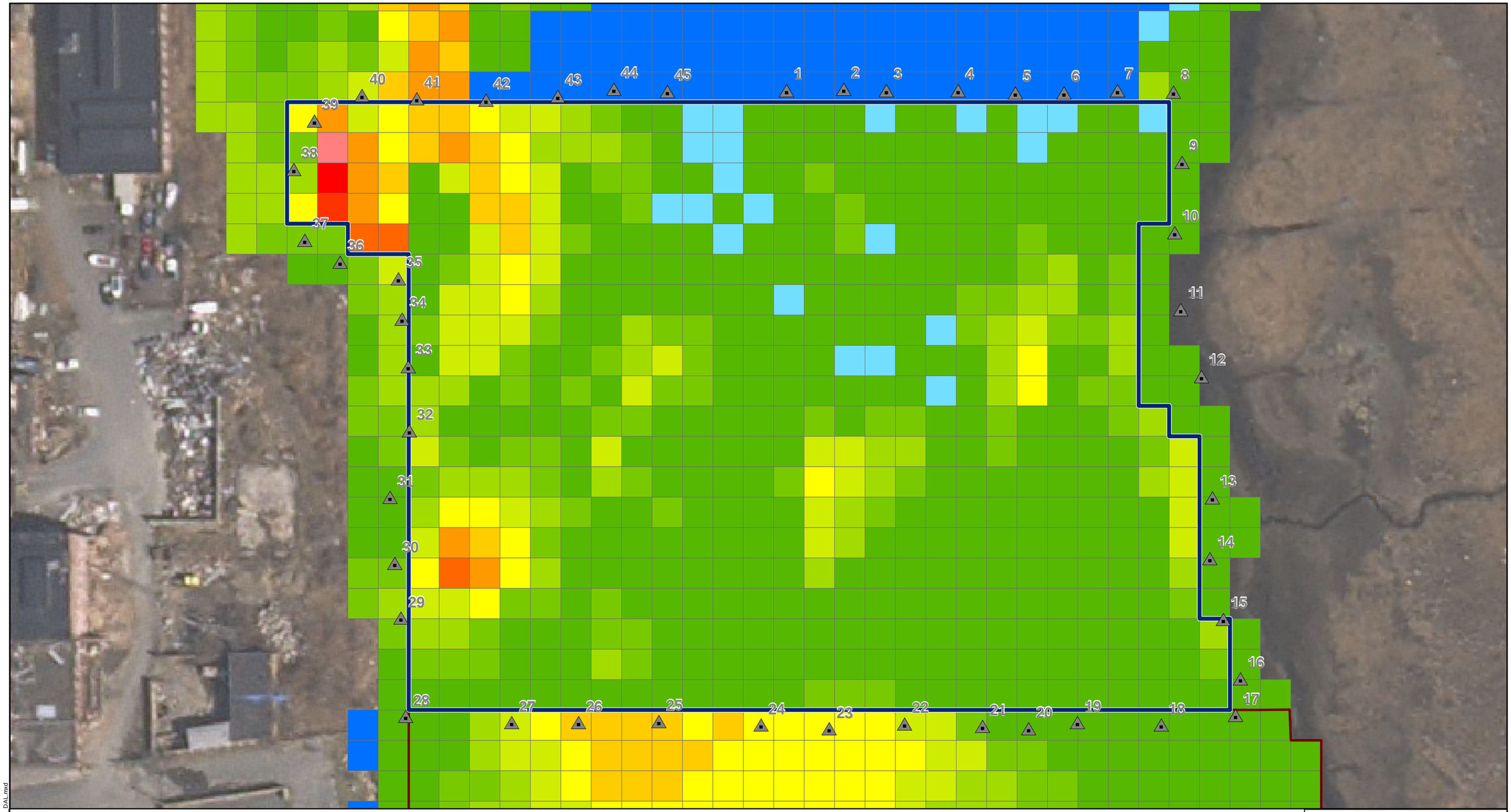
JACOBS™

2011 Dredge Area O

New Bedford Harbor Superfund Site

NAME: croberts DATE: 04/25/2011

Figure 3-5



Legend

Dredge Area L
19,021 cy

Sheet Pile Location

Feet of Sediment to Remove

0.0	3.0 - 3.5
0.0 - 0.5	3.5 - 4.0
0.5 - 1.0	4.0 - 4.5
1.0 - 1.5	4.5 - 5.0
1.5 - 2.0	5.0 - 5.5
2.0 - 2.5	5.5 - 6.0
2.5 - 3.0	6.0 - 6.2

N

0 37.5 75

Feet

1:900

JACOBS

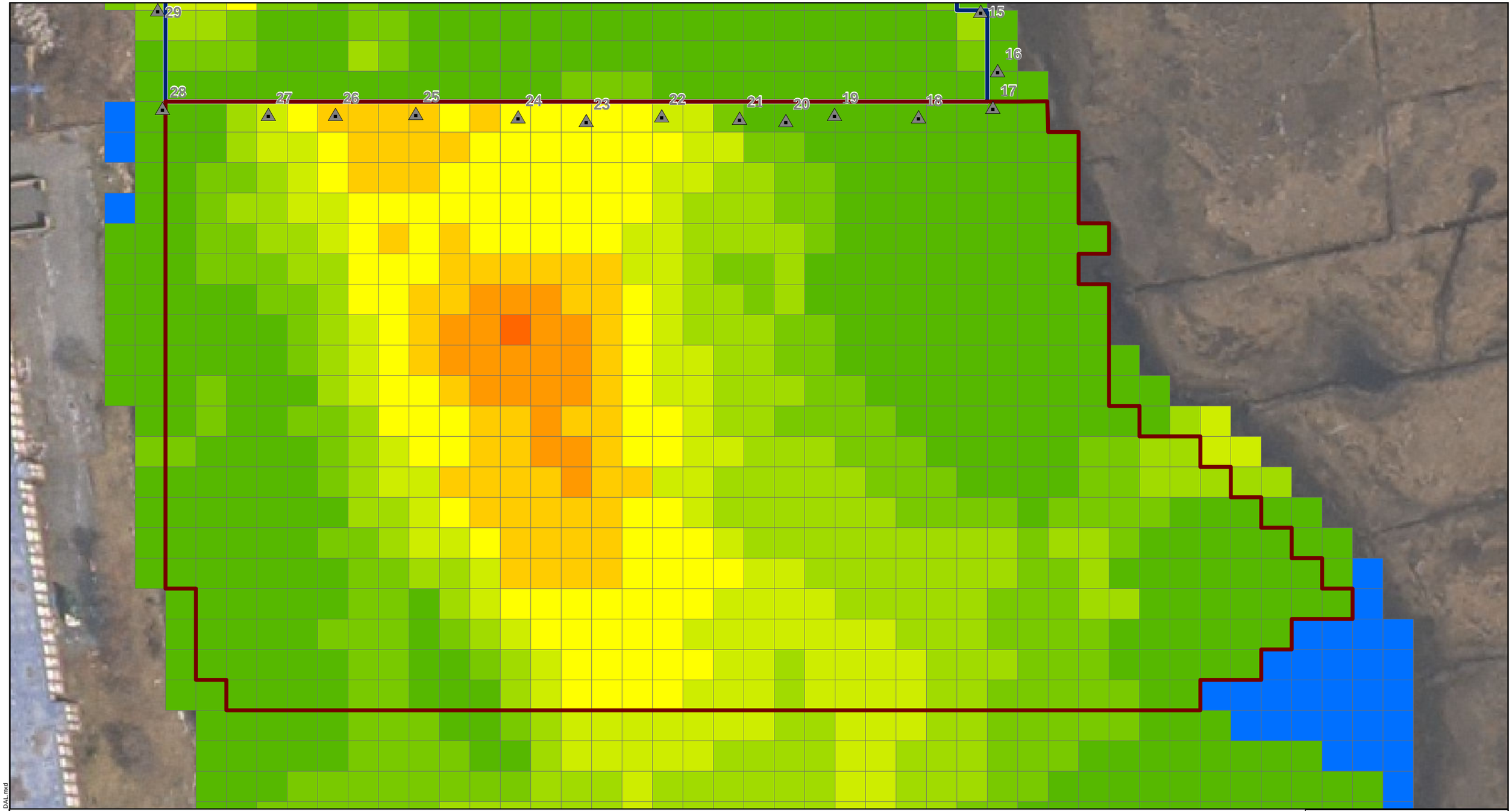
2011 Dredge Area L

New Bedford Harbor Superfund Site

NAME: croberts DATE: 04/25/2011

Figure 3-6

Y:\NBH\Projects\SBG\801\2011\0425\ArcGIS\Fig1-6_DAL.mxd



Legend

Dredge Area P
36,470 cy

Dredge Area L

Sheet Pile Location

Feet of Sediment to Remove

0.0	3.0 - 3.5
0.0 - 0.5	3.5 - 4.0
0.5 - 1.0	4.0 - 4.5
1.0 - 1.5	4.5 - 5.0
1.5 - 2.0	5.0 - 5.5
2.0 - 2.5	5.5 - 6.0
2.5 - 3.0	6.0 - 6.2

N

0 37.5 75

Feet

1:900

JACOBS™

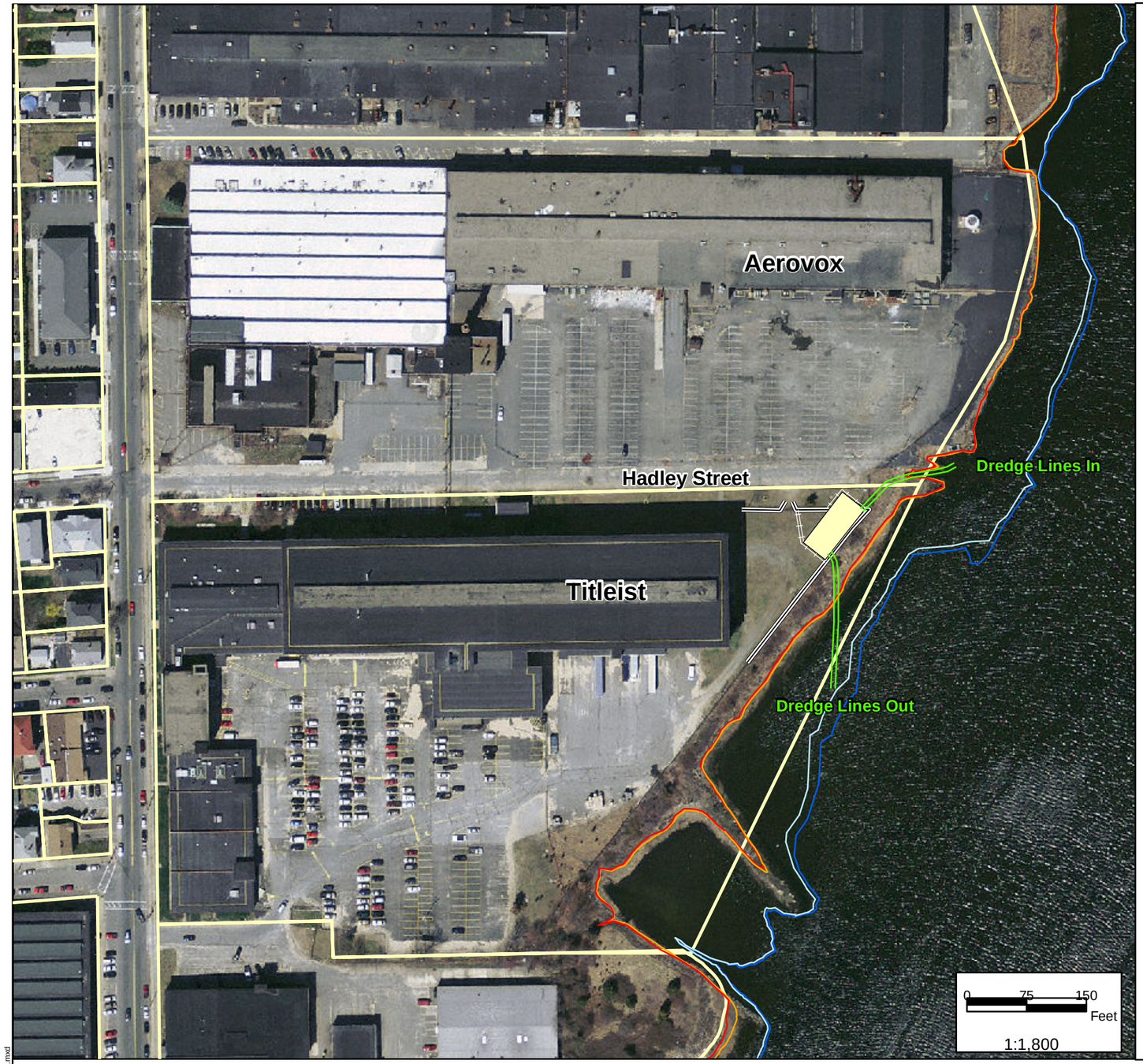
2011 Dredge Area P

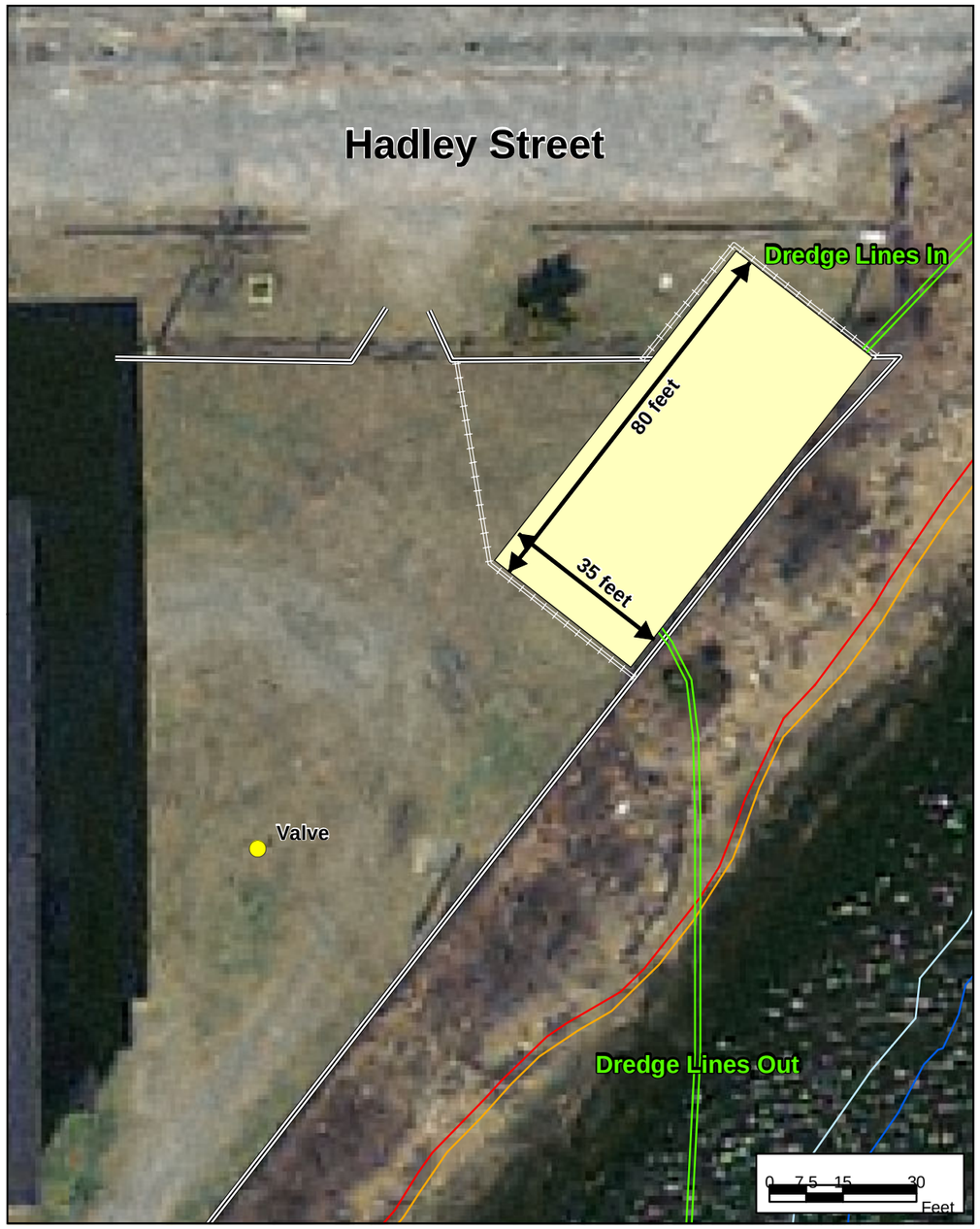
New Bedford Harbor Superfund Site

NAME: croberts DATE: 04/25/2011

Figure 3-7

Y:\NBH\Projects\35BG\08012011\04252\ArcGIS\Fig3-6_DAL.mxd





Legend

- NBH Parcels
- Hadley Street Booster Pump Location
- MLLW
- MLW
- MHW
- MHHW
- Security Fencing
- Existing Fencing
- Dredge Lines

Aerial Photography MASSGIS 2009

N

JACOBS™

Hadley Street Booster Pump

New Bedford Harbor Superfund Site

NAME: croberts DATE: 03/04/2011

Figure 3-8

Y:\NBH\Projects\35\BG07\06\20113\04\ArcGIS\option2.mxd

CBI

Legend

Dredge Area Q (702 cy)

Proposed Dock

Previously Dredged Area

MLLW
MLW
MHW
MHHW

Feet of Sediment to Remove

0	3.1 - 3.5
0.1 - 1.0	3.6 - 4.0
1.1 - 1.5	4.1 - 4.5
1.6 - 2.0	4.6 - 5.0
2.1 - 2.5	5.1 - 5.5
2.6 - 3.0	

N

0 25 50

Feet 1:600

JACOBS™

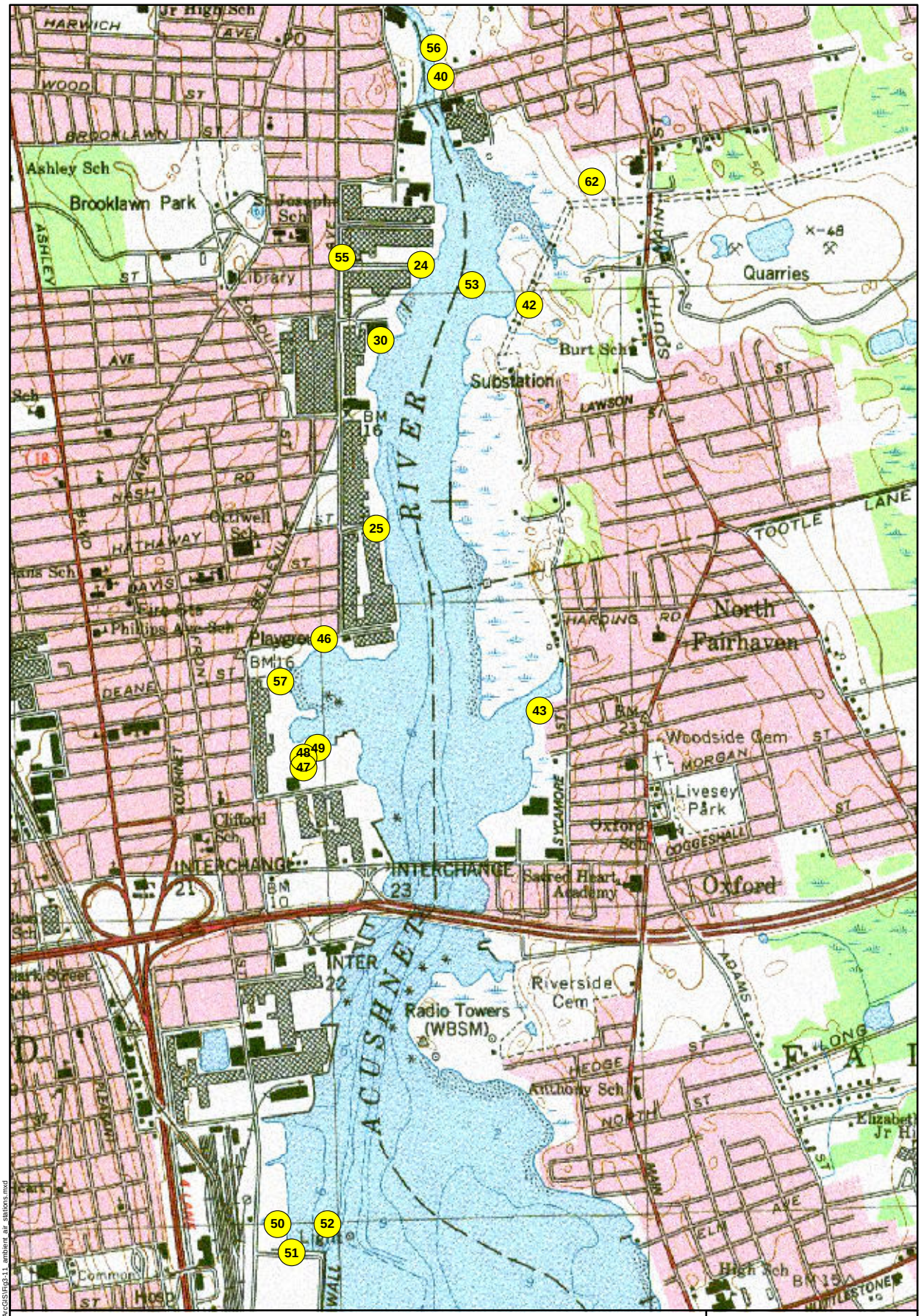
2011 Dredge Area Q

New Bedford Harbor Superfund Site

NAME: croberts DATE: 04/25/2011

Figure 3-10

Y:\NBH\Projects\35BG07061\20110425\ArcGIS\Fig3-10_boat_house_dock.mxd



Legend

- Ambient Air Sampling Location

0 750 1,500 Feet

1:18,000

JACOBS

2011 Ambient Air Sampling Station Locations

New Bedford Harbor Superfund Site

NAME: croberts DATE: 04/25/2011

Figure 3-11

Y:\NBH\Projects\3580\07\01\20110425\ArcGIS\Fig3-11_ambient_air_stations.mxd

TABLE

CBI

ATTACHMENT A

Mass Balance Calculations

CBI

ATTACHMENT B

Hydraulic Calculations for Dredge to Area C

CBI

ATTACHMENT C

May – December 2011 Tide Charts

Tides:NEW BEDFORD, MASS.

Harmonic station (NOAA)
41° 38 N 70° 55 W

May 2011

Monthly High & Low
High May 16, 7:48p 5.2 ft
Low May 17, 2:02a -0.7 ft

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1(EDT) ft 1:12a 0.2 L 7:17a 3.4 H 12:39p 0.2 L 7:35p 4.1 H	2(EDT) ft 1:31a 0.1 L 7:58a 3.4 H 1:10p 0.1 L 8:15p 4.1 H	3(EDT) ft 1:58a 0.0 L 8:39a 3.4 H 1:45p 0.0 L 8:55p 4.1 H	4(EDT) ft 2:30a -0.1 L 9:20a 3.4 H 2:21p 0.0 L 9:36p 4.1 H	5(EDT) ft 3:05a -0.1 L 10:03a 3.3 H 3:00p 0.0 L 10:18p 3.9 H	6(EDT) ft 3:43a -0.1 L 10:47a 3.2 H 3:42p 0.1 L 11:03p 3.8 H	7(EDT) ft 4:24a 0.0 L 11:35a 3.1 H 4:27p 0.1 L 11:52p 3.6 H
8(EDT) ft 5:09a 0.1 L 12:27p 3.1 H 5:19p 0.3 L	9(EDT) ft 12:46a 3.5 H 6:00a 0.1 L 1:24p 3.2 H 6:18p 0.3 L	10(EDT) ft 1:44a 3.4 H 6:57a 0.1 L 2:22p 3.4 H 7:26p 0.4 L	11(EDT) ft 2:45a 3.4 H 7:59a 0.1 L 3:21p 3.7 H 8:42p 0.3 L	12(EDT) ft 3:45a 3.5 H 9:06a 0.0 L 4:18p 4.0 H 10:01p 0.1 L	13(EDT) ft 4:43a 3.7 H 10:11a -0.2 L 5:13p 4.4 H 11:13p -0.2 L	14(EDT) ft 5:38a 3.8 H 11:12a -0.4 L 6:06p 4.8 H
15(EDT) ft 12:15a -0.4 L 6:32a 4.0 H 12:09p -0.6 L 6:57p 5.0 H	16(EDT) ft 1:10a -0.6 L 7:24a 4.1 H 1:02p -0.7 L 7:48p 5.2 H	17(EDT) ft 2:02a -0.7 L 8:15a 4.2 H 1:53p -0.7 L 8:38p 5.1 H	18(EDT) ft 2:51a -0.7 L 9:05a 4.1 H 2:42p -0.5 L 9:27p 5.0 H	19(EDT) ft 3:40a -0.6 L 9:56a 4.0 H 3:31p -0.3 L 10:18p 4.7 H	20(EDT) ft 4:27a -0.3 L 10:47a 3.9 H 4:19p -0.1 L 11:08p 4.3 H	21(EDT) ft 5:14a -0.1 L 11:40a 3.7 H 5:09p 0.3 L
22(EDT) ft 12:00a 4.0 H 5:59a 0.2 L 12:33p 3.5 H 6:00p 0.6 L	23(EDT) ft 12:53a 3.6 H 6:44a 0.4 L 1:27p 3.4 H 6:59p 0.8 L	24(EDT) ft 1:46a 3.3 H 7:29a 0.6 L 2:21p 3.3 H 8:30p 1.0 L	25(EDT) ft 2:40a 3.1 H 8:13a 0.7 L 3:14p 3.3 H 10:18p 1.0 L	26(EDT) ft 3:33a 3.0 H 8:57a 0.7 L 4:04p 3.4 H 11:13p 0.9 L	27(EDT) ft 4:24a 3.0 H 9:41a 0.7 L 4:52p 3.6 H 11:49p 0.8 L	28(EDT) ft 5:13a 3.0 H 10:25a 0.6 L 5:38p 3.8 H
29(EDT) ft 12:10a 0.6 L 5:59a 3.1 H 11:09a 0.5 L 6:22p 3.9 H	30(EDT) ft 12:31a 0.5 L 6:45a 3.2 H 11:52a 0.3 L 7:05p 4.1 H	31(EDT) ft 1:00a 0.3 L 7:29a 3.3 H 12:35p 0.2 L 7:48p 4.2 H				

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Tides:NEW BEDFORD, MASS.

Harmonic station (NOAA)
41° 38 N 70° 55 W

June 2011

Monthly High & Low
Jun 14, 7:29p 5.0 ft
Jun 16, 2:44a -0.4 ft

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1 (EDT) ft 1:35a 0.1 L 8:14a 3.4 H 1:17p 0.1 L 8:31p 4.3 H	2 (EDT) ft 2:12a 0.0 L 8:58a 3.4 H 2:01p 0.0 L 9:15p 4.3 H	3 (EDT) ft 2:51a -0.1 L 9:43a 3.5 H 2:45p 0.0 L 9:59p 4.2 H	4 (EDT) ft 3:32a -0.1 L 10:29a 3.5 H 3:31p 0.0 L 10:45p 4.1 H
5 (EDT) ft 4:14a -0.1 L 11:18a 3.5 H 4:20p 0.1 L 11:34p 4.0 H	6 (EDT) ft 4:59a -0.1 L 12:09p 3.6 H 5:13p 0.2 L	7 (EDT) ft 12:26a 3.8 H 5:48a -0.1 L 1:02p 3.7 H 6:11p 0.3 L	8 (EDT) ft 1:22a 3.6 H 6:40a 0.0 L 1:59p 3.8 H 7:16p 0.3 L	9 (EDT) ft 2:20a 3.5 H 7:37a 0.0 L 2:56p 4.0 H 8:28p 0.3 L	10 (EDT) ft 3:19a 3.5 H 8:39a 0.0 L 3:54p 4.2 H 9:46p 0.3 L	11 (EDT) ft 4:18a 3.5 H 9:43a -0.1 L 4:50p 4.5 H 11:03p 0.1 L
12 (EDT) ft 5:16a 3.6 H 10:47a -0.2 L 5:45p 4.7 H	13 (EDT) ft 12:09a -0.1 L 6:11a 3.8 H 11:49a -0.3 L 6:38p 4.9 H	14 (EDT) ft 1:06a -0.2 L 7:04a 3.9 H 12:46p -0.3 L 7:29p 5.0 H	15 (EDT) ft 1:57a -0.3 L 7:56a 4.0 H 1:39p -0.3 L 8:19p 4.9 H	16 (EDT) ft 2:44a -0.4 L 8:46a 4.0 H 2:29p -0.3 L 9:08p 4.8 H	17 (EDT) ft 3:27a -0.3 L 9:35a 4.0 H 3:16p -0.1 L 9:56p 4.6 H	18 (EDT) ft 4:08a -0.2 L 10:24a 3.9 H 4:00p 0.1 L 10:43p 4.3 H
19 (EDT) ft 4:44a 0.0 L 11:12a 3.8 H 4:42p 0.3 L 11:30p 4.0 H	20 (EDT) ft 5:17a 0.2 L 12:01p 3.7 H 5:23p 0.5 L	21 (EDT) ft 12:17a 3.7 H 5:47a 0.3 L 12:50p 3.5 H 6:03p 0.8 L	22 (EDT) ft 1:06a 3.3 H 6:19a 0.5 L 1:40p 3.4 H 6:47p 0.9 L	23 (EDT) ft 1:55a 3.1 H 6:56a 0.6 L 2:30p 3.4 H 7:36p 1.0 L	24 (EDT) ft 2:47a 2.9 H 7:38a 0.7 L 3:22p 3.4 H 8:33p 1.1 L	25 (EDT) ft 3:40a 2.8 H 8:27a 0.7 L 4:12p 3.5 H 9:39p 1.0 L
26 (EDT) ft 4:32a 2.8 H 9:20a 0.6 L 5:02p 3.7 H 10:47p 0.9 L	27 (EDT) ft 5:24a 2.9 H 10:17a 0.5 L 5:50p 3.8 H 11:43p 0.7 L	28 (EDT) ft 6:14a 3.1 H 11:12a 0.4 L 6:37p 4.1 H	29 (EDT) ft 12:30a 0.5 L 7:02a 3.3 H 12:06p 0.3 L 7:23p 4.2 H	30 (EDT) ft 1:13a 0.2 L 7:49a 3.5 H 12:57p 0.1 L 8:08p 4.4 H		

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Tides:NEW BEDFORD, MASS.

Harmonic station (NOAA)
41° 38 N 70° 55 W

July 2011

Monthly High & Low
High July 31, 9:17p 4.7 ft
Low July 31, 2:26p -0.4 ft

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 (EDT) ft 1:55a 0.0 L 8:35a 3.6 H 1:47p -0.1 L 8:54p 4.5 H	2 (EDT) ft 2:37a -0.2 L 9:21a 3.8 H 2:35p -0.1 L 9:39p 4.5 H
3 (EDT) ft 3:19a -0.3 L 10:08a 3.9 H 3:24p -0.2 L 10:26p 4.4 H	4 (EDT) ft 4:01a -0.4 L 10:56a 4.0 H 4:14p -0.1 L 11:14p 4.3 H	5 (EDT) ft 4:46a -0.3 L 11:46a 4.1 H 5:06p 0.0 L	6 (EDT) ft 12:05a 4.1 H 5:32a -0.3 L 12:39p 4.1 H 6:02p 0.1 L	7 (EDT) ft 12:59a 3.8 H 6:21a -0.2 L 1:35p 4.2 H 7:03p 0.3 L	8 (EDT) ft 1:56a 3.6 H 7:15a -0.1 L 2:33p 4.2 H 8:14p 0.4 L	9 (EDT) ft 2:56a 3.5 H 8:15a 0.1 L 3:33p 4.3 H 9:40p 0.5 L
10 (EDT) ft 3:57a 3.4 H 9:22a 0.1 L 4:31p 4.4 H 11:09p 0.4 L	11 (EDT) ft 4:57a 3.4 H 10:34a 0.1 L 5:28p 4.5 H	12 (EDT) ft 12:17a 0.2 L 5:54a 3.6 H 11:44a 0.1 L 6:22p 4.6 H	13 (EDT) ft 1:10a 0.1 L 6:48a 3.7 H 12:44p 0.0 L 7:13p 4.7 H	14 (EDT) ft 1:56a -0.1 L 7:38a 3.9 H 1:36p -0.1 L 8:01p 4.7 H	15 (EDT) ft 2:35a -0.1 L 8:26a 4.0 H 2:21p -0.1 L 8:47p 4.6 H	16 (EDT) ft 3:09a -0.1 L 9:12a 4.0 H 3:01p 0.0 L 9:32p 4.5 H
17 (EDT) ft 3:39a -0.1 L 9:57a 4.0 H 3:37p 0.1 L 10:15p 4.2 H	18 (EDT) ft 4:05a 0.0 L 10:41a 4.0 H 4:10p 0.3 L 10:58p 4.0 H	19 (EDT) ft 4:31a 0.1 L 11:25a 3.8 H 4:43p 0.4 L 11:40p 3.7 H	20 (EDT) ft 4:58a 0.2 L 12:10p 3.7 H 5:17p 0.6 L	21 (EDT) ft 12:25a 3.4 H 5:29a 0.4 L 12:57p 3.5 H 5:55p 0.8 L	22 (EDT) ft 1:11a 3.1 H 6:05a 0.5 L 1:46p 3.4 H 6:38p 1.0 L	23 (EDT) ft 2:02a 2.9 H 6:46a 0.6 L 2:38p 3.4 H 7:29p 1.1 L
24 (EDT) ft 2:57a 2.7 H 7:35a 0.6 L 3:32p 3.4 H 8:30p 1.1 L	25 (EDT) ft 3:54a 2.7 H 8:31a 0.7 L 4:27p 3.5 H 9:41p 1.0 L	26 (EDT) ft 4:51a 2.8 H 9:35a 0.6 L 5:20p 3.7 H 10:56p 0.8 L	27 (EDT) ft 5:44a 3.1 H 10:41a 0.5 L 6:10p 4.0 H 11:58p 0.5 L	28 (EDT) ft 6:35a 3.4 H 11:44a 0.3 L 6:58p 4.3 H	29 (EDT) ft 12:48a 0.2 L 7:23a 3.7 H 12:42p 0.0 L 7:45p 4.5 H	30 (EDT) ft 1:33a -0.1 L 8:10a 4.0 H 1:35p -0.2 L 8:31p 4.7 H
31 (EDT) ft 2:16a -0.4 L 8:57a 4.3 H 2:26p -0.4 L 9:17p 4.7 H						

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Tides:NEW BEDFORD, MASS.

Harmonic station (NOAA)
41° 38 N 70° 55 W

August 2011

Monthly High & Low
Aug 31, 10:07a 5.0 ft
Aug 31, 3:19a -0.8 ft

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 (EDT) ft 2:59a -0.5 L 9:44a 4.5 H 3:15p -0.5 L 10:04p 4.7 H	2 (EDT) ft 3:42a -0.6 L 10:32a 4.6 H 4:04p -0.4 L 10:53p 4.5 H	3 (EDT) ft 4:26a -0.6 L 11:22a 4.6 H 4:55p -0.2 L 11:43p 4.2 H	4 (EDT) ft 5:12a -0.4 L 12:15p 4.5 H 5:49p 0.0 L	5 (EDT) ft 12:37a 3.9 H 6:00a -0.2 L 1:11p 4.4 H 6:50p 0.3 L	6 (EDT) ft 1:35a 3.6 H 6:54a 0.0 L 2:11p 4.2 H 8:05p 0.5 L
7 (EDT) ft 2:37a 3.4 H 7:56a 0.3 L 3:13p 4.2 H 9:54p 0.6 L	8 (EDT) ft 3:40a 3.3 H 9:15a 0.4 L 4:15p 4.2 H 11:23p 0.5 L	9 (EDT) ft 4:42a 3.3 H 10:49a 0.4 L 5:13p 4.2 H	10 (EDT) ft 12:23a 0.4 L 5:39a 3.5 H 12:03p 0.3 L 6:07p 4.3 H	11 (EDT) ft 1:09a 0.2 L 6:31a 3.7 H 12:56p 0.2 L 6:56p 4.4 H	12 (EDT) ft 1:47a 0.1 L 7:19a 3.9 H 1:37p 0.1 L 7:41p 4.4 H	13 (EDT) ft 2:17a 0.0 L 8:03a 4.0 H 2:11p 0.0 L 8:24p 4.4 H
14 (EDT) ft 2:41a 0.0 L 8:46a 4.1 H 2:41p 0.1 L 9:05p 4.3 H	15 (EDT) ft 3:01a 0.0 L 9:27a 4.2 H 3:08p 0.1 L 9:45p 4.2 H	16 (EDT) ft 3:22a 0.0 L 10:08a 4.1 H 3:36p 0.2 L 10:24p 3.9 H	17 (EDT) ft 3:47a 0.1 L 10:49a 4.0 H 4:05p 0.3 L 11:04p 3.7 H	18 (EDT) ft 4:15a 0.2 L 11:31a 3.8 H 4:38p 0.5 L 11:46p 3.4 H	19 (EDT) ft 4:46a 0.3 L 12:15p 3.6 H 5:14p 0.7 L	20 (EDT) ft 12:30a 3.1 H 5:22a 0.4 L 1:03p 3.4 H 5:55p 0.8 L
21 (EDT) ft 1:21a 2.8 H 6:04a 0.5 L 1:56p 3.3 H 6:45p 1.0 L	22 (EDT) ft 2:18a 2.7 H 6:53a 0.6 L 2:54p 3.3 H 7:44p 1.1 L	23 (EDT) ft 3:20a 2.7 H 7:53a 0.7 L 3:53p 3.4 H 8:56p 1.0 L	24 (EDT) ft 4:20a 2.9 H 9:03a 0.7 L 4:49p 3.7 H 10:15p 0.8 L	25 (EDT) ft 5:16a 3.2 H 10:17a 0.5 L 5:42p 4.0 H 11:24p 0.5 L	26 (EDT) ft 6:08a 3.6 H 11:27a 0.2 L 6:32p 4.3 H	27 (EDT) ft 12:18a 0.1 L 6:57a 4.0 H 12:28p -0.1 L 7:19p 4.6 H
28 (EDT) ft 1:06a -0.3 L 7:44a 4.5 H 1:22p -0.4 L 8:06p 4.8 H	29 (EDT) ft 1:51a -0.6 L 8:31a 4.8 H 2:12p -0.6 L 8:53p 4.9 H	30 (EDT) ft 2:35a -0.8 L 9:19a 5.0 H 3:01p -0.7 L 9:41p 4.8 H	31 (EDT) ft 3:19a -0.8 L 10:07a 5.0 H 3:51p -0.6 L 10:30p 4.6 H			

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Tides:NEW BEDFORD, MASS.

Harmonic station (NOAA)
41° 38 N 70° 55 W

September 2011

Monthly High & Low
Sep 28, 8:54a 5.3 ft
Sep 28, 2:09a -0.9 ft

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1(EDT) ft 4:04a -0.7 L 10:58a 4.9 H 4:41p -0.4 L 11:21p 4.3 H	2(EDT) ft 4:50a -0.5 L 11:52a 4.7 H 5:35p 0.0 L	3(EDT) ft 12:16a 3.9 H 5:40a -0.1 L 12:49p 4.5 H 6:38p 0.3 L
4(EDT) ft 1:15a 3.6 H 6:35a 0.2 L 1:50p 4.2 H 8:05p 0.6 L	5(EDT) ft 2:19a 3.4 H 7:46a 0.5 L 2:54p 4.0 H 10:03p 0.7 L	6(EDT) ft 3:24a 3.3 H 9:40a 0.7 L 3:57p 3.9 H 11:19p 0.6 L	7(EDT) ft 4:26a 3.3 H 11:15a 0.6 L 4:55p 4.0 H	8(EDT) ft 12:12a 0.4 L 5:22a 3.5 H 12:13p 0.4 L 5:48p 4.0 H	9(EDT) ft 12:54a 0.3 L 6:11a 3.7 H 12:56p 0.3 L 6:34p 4.1 H	10(EDT) ft 1:25a 0.2 L 6:56a 3.9 H 1:30p 0.2 L 7:17p 4.2 H
11(EDT) ft 1:48a 0.2 L 7:37a 4.1 H 1:55p 0.2 L 7:57p 4.2 H	12(EDT) ft 2:03a 0.1 L 8:17a 4.2 H 2:16p 0.1 L 8:36p 4.1 H	13(EDT) ft 2:19a 0.1 L 8:56a 4.3 H 2:38p 0.1 L 9:14p 4.0 H	14(EDT) ft 2:41a 0.0 L 9:35a 4.2 H 3:04p 0.2 L 9:53p 3.8 H	15(EDT) ft 3:07a 0.1 L 10:15a 4.1 H 3:33p 0.3 L 10:32p 3.6 H	16(EDT) ft 3:37a 0.1 L 10:55a 3.9 H 4:05p 0.4 L 11:12p 3.3 H	17(EDT) ft 4:10a 0.2 L 11:38a 3.7 H 4:41p 0.6 L 11:56p 3.0 H
18(EDT) ft 4:47a 0.4 L 12:25p 3.5 H 5:23p 0.7 L	19(EDT) ft 12:47a 2.8 H 5:30a 0.5 L 1:19p 3.3 H 6:12p 0.9 L	20(EDT) ft 1:46a 2.7 H 6:22a 0.6 L 2:18p 3.3 H 7:11p 0.9 L	21(EDT) ft 2:49a 2.8 H 7:24a 0.7 L 3:20p 3.4 H 8:21p 0.9 L	22(EDT) ft 3:51a 3.0 H 8:38a 0.7 L 4:18p 3.6 H 9:38p 0.7 L	23(EDT) ft 4:47a 3.4 H 9:57a 0.5 L 5:13p 3.9 H 10:47p 0.3 L	24(EDT) ft 5:40a 3.9 H 11:09a 0.1 L 6:04p 4.3 H 11:45p -0.1 L
25(EDT) ft 6:29a 4.4 H 12:11p -0.3 L 6:53p 4.6 H	26(EDT) ft 12:35a -0.5 L 7:18a 4.8 H 1:05p -0.6 L 7:41p 4.8 H	27(EDT) ft 1:23a -0.7 L 8:06a 5.2 H 1:56p -0.8 L 8:29p 4.8 H	28(EDT) ft 2:09a -0.9 L 8:54a 5.3 H 2:46p -0.8 L 9:18p 4.7 H	29(EDT) ft 2:55a -0.9 L 9:44a 5.3 H 3:36p -0.7 L 10:08p 4.5 H	30(EDT) ft 3:42a -0.7 L 10:35a 5.1 H 4:27p -0.4 L 11:00p 4.2 H	

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Tides:NEW BEDFORD, MASS.

Harmonic station (NOAA)
41° 38 N 70° 55 W

October 2011

Monthly High & Low
Oct 27, 8:32a 5.4 ft
Oct 27, 1:45a -0.9 ft

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 (EDT) ft 4:30a -0.4 L 11:29a 4.8 H 5:22p 0.0 L 11:56p 3.9 H
2 (EDT) ft 5:21a 0.0 L 12:27p 4.5 H 6:27p 0.3 L	3 (EDT) ft 12:56a 3.6 H 6:21a 0.4 L 1:28p 4.1 H 8:01p 0.6 L	4 (EDT) ft 1:59a 3.4 H 7:44a 0.7 L 2:31p 3.9 H 9:46p 0.7 L	5 (EDT) ft 3:03a 3.3 H 9:55a 0.7 L 3:33p 3.7 H 10:56p 0.6 L	6 (EDT) ft 4:03a 3.4 H 11:10a 0.6 L 4:31p 3.7 H 11:47p 0.5 L	7 (EDT) ft 4:58a 3.6 H 12:03p 0.5 L 5:21p 3.7 H	8 (EDT) ft 12:25a 0.5 L 5:45a 3.8 H 12:43p 0.4 L 6:07p 3.8 H
9 (EDT) ft 12:53a 0.4 L 6:28a 4.0 H 1:12p 0.3 L 6:48p 3.9 H	10 (EDT) ft 1:09a 0.3 L 7:09a 4.1 H 1:32p 0.3 L 7:28p 3.9 H	11 (EDT) ft 1:20a 0.2 L 7:48a 4.3 H 1:49p 0.2 L 8:07p 3.9 H	12 (EDT) ft 1:38a 0.1 L 8:27a 4.3 H 2:09p 0.2 L 8:45p 3.8 H	13 (EDT) ft 2:03a 0.1 L 9:06a 4.3 H 2:36p 0.2 L 9:24p 3.7 H	14 (EDT) ft 2:33a 0.1 L 9:45a 4.1 H 3:06p 0.3 L 10:04p 3.5 H	15 (EDT) ft 3:05a 0.1 L 10:26a 4.0 H 3:40p 0.3 L 10:46p 3.3 H
16 (EDT) ft 3:41a 0.2 L 11:08a 3.8 H 4:18p 0.5 L 11:31p 3.0 H	17 (EDT) ft 4:21a 0.3 L 11:55a 3.6 H 5:00p 0.6 L	18 (EDT) ft 12:22a 2.9 H 5:06a 0.5 L 12:48p 3.4 H 5:49p 0.7 L	19 (EDT) ft 1:19a 2.9 H 6:00a 0.6 L 1:47p 3.3 H 6:46p 0.7 L	20 (EDT) ft 2:21a 3.0 H 7:04a 0.7 L 2:47p 3.4 H 7:52p 0.7 L	21 (EDT) ft 3:21a 3.2 H 8:18a 0.6 L 3:47p 3.6 H 9:03p 0.5 L	22 (EDT) ft 4:18a 3.7 H 9:36a 0.4 L 4:43p 3.8 H 10:11p 0.1 L
23 (EDT) ft 5:12a 4.1 H 10:49a 0.1 L 5:36p 4.1 H 11:11p -0.2 L	24 (EDT) ft 6:03a 4.6 H 11:52a -0.3 L 6:27p 4.4 H	25 (EDT) ft 12:05a -0.5 L 6:53a 5.0 H 12:48p -0.6 L 7:17p 4.6 H	26 (EDT) ft 12:56a -0.8 L 7:43a 5.3 H 1:41p -0.7 L 8:06p 4.6 H	27 (EDT) ft 1:45a -0.9 L 8:32a 5.4 H 2:32p -0.8 L 8:57p 4.6 H	28 (EDT) ft 2:34a -0.8 L 9:23a 5.3 H 3:22p -0.6 L 9:48p 4.4 H	29 (EDT) ft 3:23a -0.7 L 10:15a 5.1 H 4:14p -0.4 L 10:41p 4.2 H
30 (EDT) ft 4:13a -0.4 L 11:08a 4.8 H 5:09p -0.1 L 11:36p 3.9 H	31 (EDT) ft 5:06a 0.0 L 12:04p 4.4 H 6:11p 0.2 L					

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Tides:NEW BEDFORD, MASS.

Harmonic station (NOAA)
41° 38 N 70° 55 W

November 2011

Monthly High & Low
Nov 25, 7:14a 5.2 ft
Nov 25, 12:27a -0.8 ft

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 (EDT) ft 12:34a 3.6 H 6:06a 0.4 L 1:02p 4.0 H 7:30p 0.5 L	2 (EDT) ft 1:34a 3.4 H 7:28a 0.7 L 2:02p 3.7 H 9:04p 0.7 L	3 (EDT) ft 2:35a 3.4 H 9:28a 0.8 L 3:01p 3.5 H 10:15p 0.7 L	4 (EDT) ft 3:32a 3.4 H 10:44a 0.8 L 3:56p 3.4 H 11:07p 0.6 L	5 (EDT) ft 4:25a 3.5 H 11:38a 0.7 L 4:47p 3.4 H 11:45p 0.6 L
6 (EST) ft 4:13a 3.7 H 11:18a 0.6 L 4:33p 3.4 H 11:08p 0.5 L	7 (EST) ft 4:57a 3.8 H 11:48a 0.5 L 5:16p 3.5 H 11:18p 0.4 L	8 (EST) ft 5:39a 4.0 H 12:06p 0.4 L 5:58p 3.6 H 11:34p 0.3 L	9 (EST) ft 6:20a 4.1 H 12:22p 0.3 L 6:38p 3.6 H	10 (EST) ft 12:01a 0.2 L 7:00a 4.2 H 12:45p 0.3 L 7:19p 3.6 H	11 (EST) ft 12:32a 0.1 L 7:40a 4.2 H 1:14p 0.2 L 8:00p 3.5 H	12 (EST) ft 1:06a 0.0 L 8:21a 4.1 H 1:47p 0.2 L 8:42p 3.4 H
13 (EST) ft 1:43a 0.1 L 9:02a 4.0 H 2:23p 0.2 L 9:25p 3.3 H	14 (EST) ft 2:22a 0.1 L 9:46a 3.9 H 3:02p 0.3 L 10:11p 3.1 H	15 (EST) ft 3:04a 0.2 L 10:32a 3.7 H 3:44p 0.3 L 11:00p 3.1 H	16 (EST) ft 3:52a 0.3 L 11:23a 3.5 H 4:32p 0.4 L 11:54p 3.1 H	17 (EST) ft 4:46a 0.4 L 12:18p 3.4 H 5:26p 0.4 L	18 (EST) ft 12:52a 3.2 H 5:48a 0.5 L 1:16p 3.4 H 6:25p 0.3 L	19 (EST) ft 1:51a 3.5 H 6:58a 0.4 L 2:15p 3.5 H 7:30p 0.2 L
20 (EST) ft 2:49a 3.8 H 8:14a 0.3 L 3:13p 3.6 H 8:36p 0.0 L	21 (EST) ft 3:45a 4.2 H 9:29a 0.1 L 4:09p 3.8 H 9:40p -0.3 L	22 (EST) ft 4:39a 4.6 H 10:36a -0.2 L 5:03p 4.0 H 10:39p -0.5 L	23 (EST) ft 5:31a 4.9 H 11:35a -0.4 L 5:55p 4.2 H 11:34p -0.7 L	24 (EST) ft 6:23a 5.1 H 12:30p -0.6 L 6:47p 4.3 H	25 (EST) ft 12:27a -0.8 L 7:14a 5.2 H 1:22p -0.7 L 7:38p 4.3 H	26 (EST) ft 1:18a -0.8 L 8:04a 5.2 H 2:12p -0.6 L 8:29p 4.2 H
27 (EST) ft 2:09a -0.6 L 8:55a 4.9 H 3:02p -0.4 L 9:21p 4.1 H	28 (EST) ft 2:59a -0.4 L 9:47a 4.6 H 3:52p -0.2 L 10:14p 3.9 H	29 (EST) ft 3:50a -0.1 L 10:39a 4.3 H 4:43p 0.1 L 11:07p 3.7 H	30 (EST) ft 4:43a 0.3 L 11:32a 3.9 H 5:35p 0.3 L			

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Tides:NEW BEDFORD, MASS.

Harmonic station (NOAA)
41° 38 N 70° 55 W

December 2011

Monthly High & Low
Dec 24, 6:58a 4.9 ft
Dec 25, 1:11a -0.7 ft

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1(EST) ft 12:02a 3.5 H 5:41a 0.6 L 12:26p 3.5 H 6:31p 0.6 L	2(EST) ft 12:58a 3.4 H 6:58a 0.8 L 1:21p 3.3 H 7:36p 0.7 L	3(EST) ft 1:53a 3.3 H 8:49a 0.9 L 2:14p 3.1 H 8:38p 0.7 L
4(EST) ft 2:46a 3.3 H 9:58a 0.9 L 3:06p 3.0 H 9:15p 0.7 L	5(EST) ft 3:36a 3.4 H 10:45a 0.8 L 3:56p 3.0 H 9:41p 0.6 L	6(EST) ft 4:23a 3.6 H 11:18a 0.7 L 4:43p 3.1 H 10:13p 0.5 L	7(EST) ft 5:09a 3.7 H 11:38a 0.6 L 5:28p 3.2 H 10:50p 0.3 L	8(EST) ft 5:52a 3.9 H 11:58a 0.4 L 6:12p 3.3 H 11:28p 0.2 L	9(EST) ft 6:35a 4.0 H 12:25p 0.3 L 6:56p 3.4 H	10(EST) ft 12:07a 0.0 L 7:17a 4.1 H 12:58p 0.1 L 7:39p 3.4 H
11(EST) ft 12:47a -0.1 L 8:00a 4.1 H 1:33p 0.0 L 8:22p 3.4 H	12(EST) ft 1:28a -0.1 L 8:42a 4.1 H 2:11p 0.0 L 9:06p 3.4 H	13(EST) ft 2:11a -0.1 L 9:26a 4.0 H 2:50p -0.1 L 9:51p 3.4 H	14(EST) ft 2:55a -0.1 L 10:11a 3.8 H 3:31p -0.1 L 10:38p 3.4 H	15(EST) ft 3:43a 0.0 L 11:00a 3.7 H 4:16p -0.1 L 11:30p 3.4 H	16(EST) ft 4:35a 0.1 L 11:52a 3.5 H 5:05p 0.0 L	17(EST) ft 12:24a 3.5 H 5:33a 0.2 L 12:47p 3.4 H 6:00p 0.0 L
18(EST) ft 1:22a 3.6 H 6:38a 0.2 L 1:46p 3.4 H 7:00p -0.1 L	19(EST) ft 2:22a 3.8 H 7:51a 0.2 L 2:46p 3.4 H 8:05p -0.1 L	20(EST) ft 3:21a 4.1 H 9:11a 0.1 L 3:45p 3.5 H 9:13p -0.2 L	21(EST) ft 4:18a 4.4 H 10:27a -0.1 L 4:43p 3.6 H 10:20p -0.4 L	22(EST) ft 5:13a 4.6 H 11:31a -0.3 L 5:37p 3.8 H 11:22p -0.6 L	23(EST) ft 6:06a 4.8 H 12:27p -0.4 L 6:30p 4.0 H	24(EST) ft 12:19a -0.7 L 6:58a 4.9 H 1:17p -0.5 L 7:21p 4.1 H
25(EST) ft 1:11a -0.7 L 7:47a 4.8 H 2:04p -0.6 L 8:11p 4.1 H	26(EST) ft 2:00a -0.6 L 8:36a 4.7 H 2:47p -0.5 L 8:59p 4.0 H	27(EST) ft 2:46a -0.5 L 9:24a 4.4 H 3:27p -0.3 L 9:48p 3.9 H	28(EST) ft 3:29a -0.2 L 10:11a 4.1 H 4:04p -0.1 L 10:36p 3.7 H	29(EST) ft 4:10a 0.0 L 10:58a 3.7 H 4:37p 0.1 L 11:25p 3.5 H	30(EST) ft 4:49a 0.3 L 11:47a 3.4 H 5:09p 0.3 L	31(EST) ft 12:16a 3.3 H 5:29a 0.6 L 12:36p 3.1 H 5:44p 0.5 L

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